Final Report

Socioeconomic Assessment of the Upper Yellowstone River Valley

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December 27, 2002

Socioeconomic Assessment of the Upper Yellowstone River Valley

Prepared for

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Introduction and Summary for the Upper Yellowstone River Socioeconomic Assessment

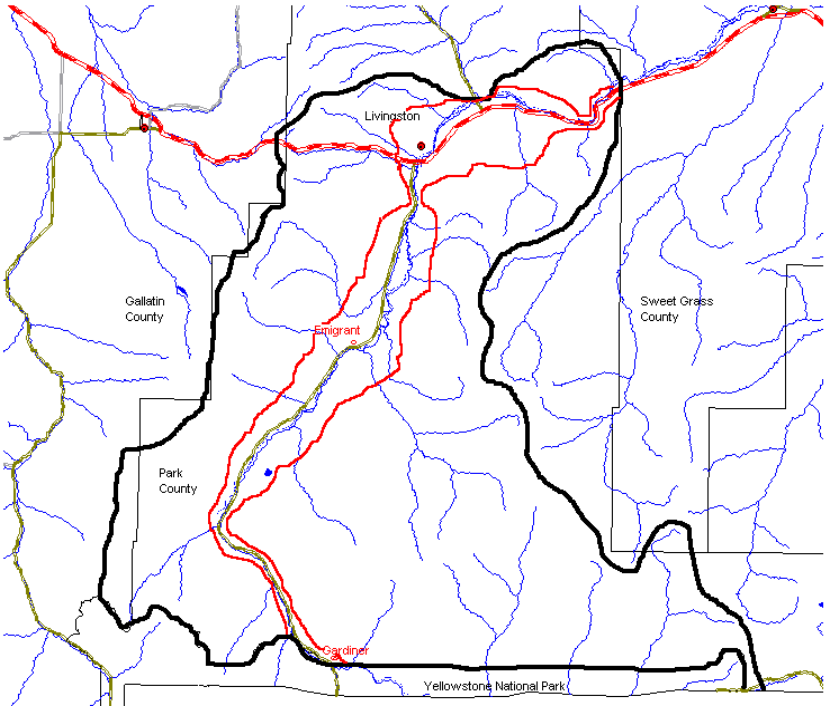
Introduction

In collaboration with the Governor's Upper Yellowstone River Task Force (Task Force), the US Army Corps of Engineers (Corps) contracted with BBC Research and Consulting (BBC) to conduct a socioeconomic assessment of the Upper Yellowstone River Valley in 2002. This work is one of many studies that will contribute to the Corps' Special Area Management Plan and the Task Force's decision and recommendation process for the Montana Governor. BBC initiated data collection for this process in February 2002 with a public meeting to engender input from the stakeholders in the study area. BBC completed data compilation in September 2002 with another public meeting to review the assessment's preliminary results.

The socioeconomic research and analyses conducted during that period were performed and documented in individual Task Reports (1-7b, plus 9a and 9b). The subject matter and workscope of each of the task reports was determined by the Corps working in conjunction with the Task Force. These Task Reports were prepared and reviewed independently for the dual purpose of stand-alone reports on particular subjects and as part of this comprehensive socioeconomic assessment for the Upper Yellowstone River Valley. In that latter role, the ensuing report is a compendium of the individual task reports. This executive summary synthesizes the results of the individual task reports into seamless conclusions and implications for the socioeconomic assessment.

The study area as defined by the Task Force and Corps is as shown in Exhibit S-1. BBC typically focused on the study area outlined in red, the river corridor from Springdale through to Gardiner in Park County. For certain research, it was appropriate to examine a broader study area than that, at times including the lowlands and foothills of the Upper Yellowstone River Valley shown in Exhibit S-1 and at other times relying on the whole of Park County. Economic and demographic data is generally reported for Park County as a whole, and the bulk of county activity occurs in the river corridor. Specific references in the task reports indicate which study area the collected data refer.

Exhibit S-1.
Upper Yellowstone River Study Area Map



Source: US Army Corps of Engineers.

Study objectives. This study was intended to provide a socioeconomic portrait of the Upper Yellowstone River Valley, which runs from Gardiner downstream to Springdale in Park County. The Task Force and Corps set out the following objectives for the Upper Yellowstone River Socioeconomic Assessment:

- Identify recent and longer-term historical trends in social values and cultural heritage and resources.
- Identify present key stakeholder groups and the special interests they represent.
- Assess current social values of stakeholders for the management of the study area.
- Assess current cultural values and resources of stakeholders.
- Establish a baseline characterization of the current economic and demographic activity within the study area, with focus on economic and demographic trends, changes in public services and displacement of farms.
- Describe changes in land use and land use plans in recent years to provide a baseline picture of past trends.

- Depict current and historic management actions on the Upper Yellowstone River, with a focus on institutional frameworks, bank stabilization projects, water rights and irrigation uses.
- Consider the secondary by-products of growth and change in the study area by assessing potential change to the character of the resident population with changes in the elements of local quality of life.
- Describe the existing 404 permit process and project what might be expected for social and economic conditions in 2025 if current river management protocol remains as it stands today.
- Provide ample opportunity for the public to give input into the socioeconomic assessment process.

Based on early tasks, the Corps and BBC determined that economic values should be assessed and that the assessment of social and cultural values should be combined.

Research Methods

At this level of study, minimal analysis and no modeling was performed. Hence, the methods employed for this study pertain to identification of data sources, collection, and portrayal of the information. BBC implemented the following methodology for the socioeconomic assessment:

Task 1 — Historical Overview. BBC collected secondary data, including published histories about Park County, from the Park County library, Park County Historical Society, Montana State University Library and State Library in Helena. BBC interviewed local historians for firsthand accounts of local history to help synthesize the material into a coherent story of the study area. Various government agencies offered background about river management and other issues.

Task 2 — Stakeholders. BBC interviewed 37 local stakeholders through in-depth, 90-minute-plus meetings. BBC compiled these interviews into a report on the identified stakeholder groups and their views on the river.

Tasks 3 and 4 — Economic and Social/Cultural Values. BBC designed and carried out three surveys during summer 2002, applying appropriate survey design and techniques for each. The first was a telephone survey of Park County households. We completed 364 surveys out of a population of 6,828 households, producing survey results with a 95 percent confidence level. BBC also conducted a personal, door-to-door survey of 176 businesses in Park County. There are roughly 2,160 businesses in the county, implying that BBC's business survey results are accurate to at least the 90 percent confidence level. Finally, BBC personally surveyed 288 visitors to Park County out of an estimated population of visitors at the time of 70,000. These survey results are accurate at the 90 percent confidence level. These survey results were cross-tabulated as needed and compared with one another to reveal a picture of values and perceptions in the study area.

Task 5a — Local Economic Trends. BBC collected secondary data from federal, state and local government sources and interviewed local experts in planning, agriculture, economics and real estate to paint a picture of the local economy and demography. We analyzed and interpreted these data using descriptive techniques, applying percentage change and comparisons with the State of Montana as relevant.

Task 5b — Land Use. BBC gathered land use data from public sources and interviewed local experts in planning, agriculture and real estate to depict land use in the study area. Consideration was given to the most accurate land use data available to avoid comparisons that would not be meaningful.

Task 6 — Historic and Current River Management. BBC relied heavily on government sources for the information in this task. Federal, state and local agencies provided secondary data on responsibilities, water rights, permitting actions, uses and irrigation. BBC interviews with government officials also offered insight into the institutional frameworks of the various public agencies that manage the Upper Yellowstone River.

Task 7a — Quality of Life. BBC used the Tasks 1 through 4 reports as sources of information and insight into the elements of quality of life in the study area most potentially affected by river management.

Task 7b — 404 Permit Process and No-Action Scenario. BBC gathered data from the Corps on its 404 permit process. BBC used established forecasting techniques to project the social and economic conditions that might exist in the study area in 2025 under the no-action scenario, assuming the current river management regimen does not change.

Task 9a and 9b — Public Participation. The Study Team led two public meetings and a final presentation to the Task Force and the stakeholders. Public participation was also facilitated through stakeholder interviews and surveys of residents, businesses and households.

Executive Summary

The research results of the socioeconomic study are summarized by topic, as opposed to task, below.

Demographic Trends

- Park County's population has generally grown in fits and starts since the county's beginnings in the late 1800s. Growth slowed in the latter half of the 20th century but picked up again toward the end of the millennium.

- Park County's population and housing stock are growing moderately. Almost all growth is occurring outside but surrounding Livingston and in more rural areas of the county. Minimal annexation around Livingston and a preference for rural lifestyles likely explain this phenomenon.

- Accounting for about eight percent of the total population, seasonal residents are a notable economic presence in the county.

- Residents and businesses perceived the river as being vitally important to the economy and as an amenity to local quality of life, which attracts and holds residents and businesses. The river is also a central, valuable part of the visitor's experience.

- The no-action scenario indicates that county population will grow from about 15,700 persons to 19,000 persons by the year 2025 or 21 percent with housing units growing slightly faster.

Economic Trends and Values

- The economy of Park County has evolved with the ebb and flow of different industries, including ranching, mining, timber, railroad transportation and tourism. Ranching has been a constant, while tourism is on the ascendancy as of 2002.

- Personal incomes have risen quite substantially in the past 30 years; most growth has occurred in the nonfarm sectors. The greatest increase has come from non-wage components of income, including dividends, interest, rent and transfer payments. These non-wage elements of income are disproportionately high in Park County as compared with the State of Montana.

- Personal incomes will more than double with inflation, but grow only modestly on a constant dollar basis. Wealth increases will lead other income measures.

- The household and business surveys indicated that locals perceived tourists, ranchers and longtime residents as important to the Park County economy. River-related and other tourist-related businesses were also considered important economic contributors. Spring creeks were not well understood by residents or businesses. New and seasonal residents were viewed as generally less important to the economy than the other groups.

- Tourism is clearly the strongest element of the Park County economy in 2002, generating sales, jobs and income for many residents and businesses.

- Residents and businesses perceived overuse of the Upper Yellowstone River as a major problem, but visitors did not agree.

- Fishing, whitewater, the wild and undeveloped feel of the river, relatively little manmade noise, adequate public access, and the presence of ranching all contributed positively to the visitor experience.

- If visitors could plan their trip over again, they would stay longer in Park County.

- Residents and businesses agreed, and visitors confirmed, that riverbank vegetation is a vital part of the river and visitor experience. Scenery along the river generally contributes very positively to the visitor experience.

- Ranching in 2002 is a relatively modest, stable component of the Park County economy. However, ranching is still important to Park County, generating income and earnings for hundreds of ranchers, their employees and their families and spreading secondary effects of local spending throughout the area.

- Out-migration of longtime ranchers is driven mostly by increasing land prices ($25,000 to $35,000 per animal unit) and adverse ranching economics. High land values make it advantageous to relocate ranches to cheaper locales or to retire. This may prompt concern on the part of local residents who value ranchers' contributions to the community, history and attractiveness of the area.

- Park County employment is projected to increase from about 8,900 persons in 2000 to 12,600 persons by 2025 under the no-action scenario. This 40 percent increase will occur mostly in tourism-related economic sectors.

Social/Cultural Values

- Residents of Park County, from the original American Indians to today's inhabitants, have valued the river for many reasons, including drinking water, transportation, recreation and contributions to the scenery.

- The communities of Park County have been strong and civically oriented from the beginning. Traditionally, ranchers have played and continue to play an important role in community leadership.

- Ranchers and longtime residents were perceived to be the most important groups contributing to the Park County social and cultural environment. Tourists, new permanent residents, and river-related and other tourist-related businesses were also viewed as making important contributions. Seasonal residents and spring creek related activities were seen as less important.

- Residents appreciated the contribution tourists make to the community through their patronage of local activities, arts, and cultural enterprises, and through the cultures and customs they bring with them.

- The beauty of the Upper Yellowstone River is paramount in its contributions to quality of life in Park County.

- Fishing and other river-related recreational activities, like rafting and floating, are very important components of the quality of life here in Park County.

- Even though the river contributes much to the Park County quality of life through its recreation and its beauty, residents were divided as to whether the river is the single most important physical element of the community.

- Quality of life perceptions are summarized below:

Exhibit S-2.
QOL Matrix

Issue	Stakeholders	Residents	Business	Visitors
Recreation	Important	Important	Important	Important
Aesthetics/Scenery	Very Important	Very Important	Very Important	Very Important
Noise	Unimportant	Unimportant	Unimportant	Unimportant
Development/Land Use Theory	Important	Important	Important	Unimportant
Ranching and Displacement	Very Important	Very Important	Important	Important
Movement and Displacement of People	Important	Important	Important	Important

Source: BBC Research and Consulting.

Land Use Trends

- Current land use patterns are the result of the economic evolution and movement of people in and out of the area over time.
- Residential development and land use change in the river valley is perceived to be somewhat of a threat to the quality of life, but visitors do not see it as detraction yet. In fact, change has been rather slow historically.
- Park County and the Upper Yellowstone River study area have experienced changes in land use patterns in the past 30 years. Population density changes, coupled with land use maps, point to moderately increased urbanization within the river corridor study area.
- Wealthy, out-of-state landowners are replacing Montana ranchers at a relatively slow rate. Large parcels of ranchland are remaining intact or growing larger, while some smaller parcels have been subdivided to make room for 5-, 10-, 20- and 40-acre parcels for residential development.
- Both households and businesses more often than not believed that property owners should not have a right to subdivide and build in the floodplain. Visitors had mixed views on this issue.
- Subdivisions have centered along the Upper Yellowstone River and its tributaries and along local infrastructure such as roads and communications lines. This development has supplanted some shrublands, grasslands and forestlands.
- The river corridor clearly has the greatest potential for growth, given the subdivided parcels there, but the entire study area has some growth potential that will depend upon infrastructure development.

- National and local economic conditions will drive development. If the economy booms again, there will be increased demand for second homes in the Paradise Valley. If the economy slows down, residential growth will slow, as well.

- Development will continue to occur in the river corridor over the next 25 years in previously approved subdivisions, under the no-action scenario.

River Management Issues

- The stakeholder interview process suggested that there are a number of different stakeholder groups within the study area with different views about use of the Yellowstone River, threats to the river, management viewpoints and underlying basic values.

- The water level in the river was considered important to the economy, and droughts were perceived as more negative than floods. When visitors thought about water levels in 2002, they viewed them as a positive part of their visitor experience generally.

- There is widespread recognition of the importance of the Yellowstone River to the area and some recognition of the need to compromise to achieve a good management system.

- Flood and erosion management along the Upper Yellowstone River have existed since white settlement, and most bank stabilization has occurred in the section of the river between Emigrant and Livingston. Floods have traditionally stimulated periods of bank stabilization efforts and installations of new structures on the river.

- Physical modifications to the course of the river are primarily regulated by a combination of the USACE (at the federal level), MTDNRC (at the state level) and PCD (at the local level). Historic changes to the river were regulated by transportation or agricultural departments or not at all.

- The volume of water and diversions from the river are principally regulated by MTDNRC.

- Floodplain development and modifications are regulated primarily by local floodplain managers implementing state and federal requirements while considering local circumstances.

- More households and businesses agreed than disagreed that prior river management — defined in the surveys as dikes, barbs, riprap, etc. — has been ineffective and inconsistent.

- As of 1998, for the Gardiner to Springdale river corridor, nine percent of the riverbank was riprapped, and there were more than 100 rock barbs and an additional 100 rock jetties. Eroding banks were estimated at 12 percent of the total riverbank in the study area.

- The changes in rock jetties and barbs were substantial between 1987 and 1998. Riprap also increased somewhat. The largest overall change occurred from Pine Creek Bridge to Carters Bridge.

- There are contradictory views among stakeholder groups concerning the benefits of riprap and river management, subdivisions along the river, cattle grazing and lesser issues.

- Residents and businesses generally agreed that management of the Upper Yellowstone River for flooding and erosion is the best thing for the overall economic and social well being of the county. Visitors believed that an unmanaged, free-flowing river is best.

- Using manmade structures, such as riprap, levees and dikes, to protect private property was supported by the majority of residents and businesses, though 30 percent disagreed. Less than half the visitors were opposed to these structures, and existing structures have generally not detracted from the visitor's experience.

- There are 2,277 active water rights in the study area; agriculture and stock watering account for 86 percent of rights, while fish, wildlife and recreation purposes account for 5 percent of the rights granted. The remaining nine percent is for domestic use, lawn and garden use, mining, power generation, industry, commerce, municipal use and fire protection.

- The total quantified water rights amount to 2.2 million acre-feet per year and of this, 1.53 million are dedicated to fish, wildlife and recreational purposes mostly held by Montana Fish, Wildlife and Parks Department.

- Consumptive water use for hay is about 25 inches per acre per year. Four acre-feet must be diverted to supply an acre-foot of consumptive use to study area crops.

Synthesis

The individual findings from this study can be synthesized to bring meaning or clarity to the socioeconomic portrait of the Upper Yellowstone River Valley.

A comparison of issues, perceptions and realities. The survey and interview results from Tasks 2, 3 and 4 yielded certain issues that can be compared with the factual information from Tasks 5 and 6 (see Exhibit S-3).

Park County is highly sensitive to change. A pattern throughout the study was an apprehension about change. Some viewed change as a threat. Examples of these change anxieties are found in Exhibit S-4.

Exhibit S-3.
Stakeholder Issues, Perceptions and Reality

Stakeholder Issue	Residents' View	Businesses' View	Visitors' View	Conclusions from data
Lower or higher than normal water levels negatively affect businesses and community	Agree, normal best	Agree, normal best	Liked water level in 2002	Water level in 2002 was near average, maintaining average water levels important to community
Subdivision and building in floodplain a concern	Agree, building bad	Agree, building bad	Mixed perceptions	Subdivision already occurred; development increasing modestly along river
River important for bringing new people to area	Agree	Agree	N/A	New residents and businesses coming
River and visitor experience intertwined and vital to area	Agree	Agree	Agree	Tourism is increasingly important
Overuse of river a concern	Agree	Agree	Disagree	River use is increasing; limit unknown
Riverbank vegetation important to river experience	Agree	Agree	Agree	Vegetation analyzed in separate study
Scenery vitally important to residents and visitors	Agree	Agree	Agree	Undeniable scenery values exist
Fishing, whitewater, "wild feel," little noise, good access, ranching character important to visitor experience	N/A	N/A	Agree	Visitor experience increasingly important to economy, strongly linked to river
Fishing and river recreation important to quality of life	Agree	Agree	N/A	Resident river recreation increasing
River single most important element of economy, community	Mixed	Mixed	N/A	River is central to the economy
Flood/erosion management best for County	Generally agree	Generally agree	Disagree	Conclusions pending integrated study results
Prior management not consistent or effective	Agree	Agree	N/A	Many agencies managing river
Flood management structures a concern	Mixed	Mixed	Not affected much as of 2002	River management structures increasing
Ability to manage for floods a concern	Needed; mixed	Needed; mixed	Generally disagree	Conclusions pending integrated study results

Source: BBC Research and Consulting.

Exhibit S-4.
An Examination of Change Anxieties Among Park County Residents

Nature of change	Catalyst for change	Study observations
Changing economy	Economics	Economy is evolving toward retail trade and services
Influx of newcomers	Economics, attractiveness of area	Newcomers bring pluses and minuses with them
Rural residential development	Economics, lifestyle preferences	Most development is rural residential, and most is spurred by outsiders and wealth, "too much" is relative
Ranchers declining in economic importance, what happens to community?	Economics, lifestyle preferences	Ranchers are leaving slowly, have been important part of community, have better chance of survival if connected with tourism
Tourism is precarious	Economics, visitor preferences	Tourism is the single most important economic sector; susceptible to many influences
Increasing use of the river	Economics, visitors, new residents	Use is increasing steadily, "too much" is relative
River increasingly important to quality of life and economy	Tradition, economics, new residents, tourism	Tourism is increasingly important to the economy, river vital to tourism, new residents appreciate river
River losing "wild feel"	Increased use, development	River usage is increasing, development is occurring along the river, "too much" is relative, "wild feel" may depend on where on river individual lives
Floods and drought wreck havoc	Natural cycles	Floods and droughts happen, but what should be done?
Increased river management	Floods, drought, overuse	Floods have always occurred and spurred management/river modification

Source: BBC Research and Consulting.

Behind these fears is a well-founded belief that the beauty and physical attributes of the area are the dominant component of quality of life and economic well being in the study area. Anxiety can come from seeing changes in other places in Montana, like Bozeman, Big Sky or other river valleys. "Things are just starting here." In fact, change has been relatively slow thus far in Park County.

Implications for subsequent impact analysis. This study offers a baseline picture which might be used for and compared with a future impact analysis which examines several river management scenarios. This second study would become Phase III of the socioeconomic assessment, and it will only occur if the Corps determines at some point in the future that it is necessary. The implications of the present study for the Phase II work are discussed below.

A primary purpose of this socioeconomic assessment was to compare all the ways in which the residents, businesses and visitors of Park County view and value the Upper Yellowstone River versus the realities of that river and its role in the county's economy and community. The final step was then to overlay river management on those perceptions and realities and discuss how it potentially affects that picture — considering the implications for future impact studies.

Where does river management intersect with socioeconomic issues? Socioeconomic issues potentially affected by a change in river management are enumerated in Exhibit S-5 below.

Exhibit S-5.
Issues and Perceptions to be Considered in Future Impact Studies

Issues and perceptions
Preservation of income sources from river or spring creeks, subsequent family viability
Erosion prevention for protection of ranchlands or homes
Effect on riverside property values through protection, ability to build
Change to natural environment (i.e., management) bad for economy
Amount of cattle grazing along riverbanks
Beauty of river valley affected by river management
Management effects on "wild feel" of river
Weeds spread by uncontrolled floods
Viability of fishery potentially impacted by management
Consistency of management, coherence of plan
Erosion of gravelbanks
Effect of river management on land use planning
Potential encroachment on private property rights
Property owners (private, ranchers, State, Federal) treated equally
River and environmental quality as the biggest attraction to area for visitors, new residents, old residents
River management effects on fishing and whitewater experience

Source: BBC Research and Consulting.

The Phase II study will need to be sensitive to historical trends. History revealed that the Upper Yellowstone River has been a vital component of life in the study area from the start. It provided food and drinking water, transportation and a vital element of a beautiful place in which to live. These values were intimately connected to both the economy and the community, bolstering settlement and growth and creating a quality of life that kept many families in the area for generations. Management of the river also played a role in the economy and community from the start. Floods threatened towns and settlements and eroded ranchland on the riverbanks. Residents riprapped the river, built bridges that created bottlenecks for river flow and raised levees to prevent flooding.

Current stakeholders, residents, businesses and visitors revealed that they believe the Upper Yellowstone River is not only vitally important to their economy and community but is also a great concern to them in many ways. They understand that the river supports many river-related businesses directly and contributes to the economy by encouraging tourism. They perceive ranchers as very important to the economy and community, and the river provides ranchers much of their crucial irrigation water. They believe that the river contributes to the local quality of life through its scenery and recreation. This quality of life, they reckon, does much to attract and keep new residents and businesses.

Stakeholders, residents, businesses and visitors were also concerned about the river in its vital role in the economy and community. They fear rural and riverside residential development is slowly degrading the scenic and recreational values of the river that are so vital to the economy and local quality of life. They worry that too many residents and visitors are using the river for fishing, floating and rafting and that the overuse will drive away the tourism that has become vital to the economy. They are concerned that cattle grazing on the riverbanks degrades riparian vegetation and impairs the river experience.

And it is in their concerns for the river and the economy and community that river management arises as a major issue. Stakeholders, residents, businesses and visitors believe that river management is beneficial because it protects homes, land and spring creeks that are critical, up to a point, to the families, businesses and ranchers that depend on them. Many believe that being able to protect one's property using river management techniques is an imperative right to be protected. At the same time, others fear that riprap and levees degrade the scenic value and wild feel of the river and threaten the integrity of the fishery. Both elements of the river are fundamental parts of the area's tourism industry, and in fact, stakeholders indicated that the area's aesthetic quality is indisputably valuable. This divergence in values and perceptions indicates that the inherent quality of any given natural resource: what is often beneficial for one particular individual may be costly for others.

Though some locals fear that riprap and levees are degrading the river experience, visitors overall did not notice them negatively affecting their river encounters. Overuse of the river is an important concern, but its relationship to the current stage of river management is tenuous at best. The surveys suggest that overuse is a relative term. Visitors do not see it yet, while some locals do. What is perceived to be overuse is probably not significantly affecting the local economy as of 2002, but this must be considered in any examination of the future.

Any future impact analysis will need to consider the full spectrum of scientific studies which are being sponsored by the Task Force, the Corps and others. The socioeconomic assessment has revealed the particularly sensitive resources and their relative important to social and economic conditions. The projected changes in, for example, stream bank conditions or fisheries, will need to be factored in to the eventual socioeconomic impact analysis. In an important way, the socioeconomic impact analysis must draw from all the Task Force and Corps work for the study area that has been previously performed.

The socioeconomic impact study must consider ecosystem management as described below:

> *"Ecosystem Management is management driven by explicit goals, executed by policies, protocols, and practices, and made adaptable by monitoring and research based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem structure and function."*
>
> — De Leo, G.A., and S. Levin. 1997. The multifaceted aspects of ecosystem integrity. *Conservation Ecology* 1(1): 3-23.

Information sources for Phase II. The Study Team preliminarily suggests the following data sources for making appropriate projections and impact analyses in Phase II.

- PCensus — a software package that makes demographic projections.
- IMPLAN Model — an economic model capable of estimating future economic outputs based on a set of assumptions.
- AGSIM Model — an EPA model for estimating economic impacts on agricultural production.
- US Census Bureau — regular projections of population and other data elements.
- Montana's Census and Economic Information Center — projections for employment and other important variables.
- All other Task Force studies — hydrologic and physical scientific studies of the environment, past and likely future effects

Of course, other data sources and issues will be identified as the information base is reviewed at the time of such an impact analysis, should it move forward.

Task 1.
Historical Overview

Introduction

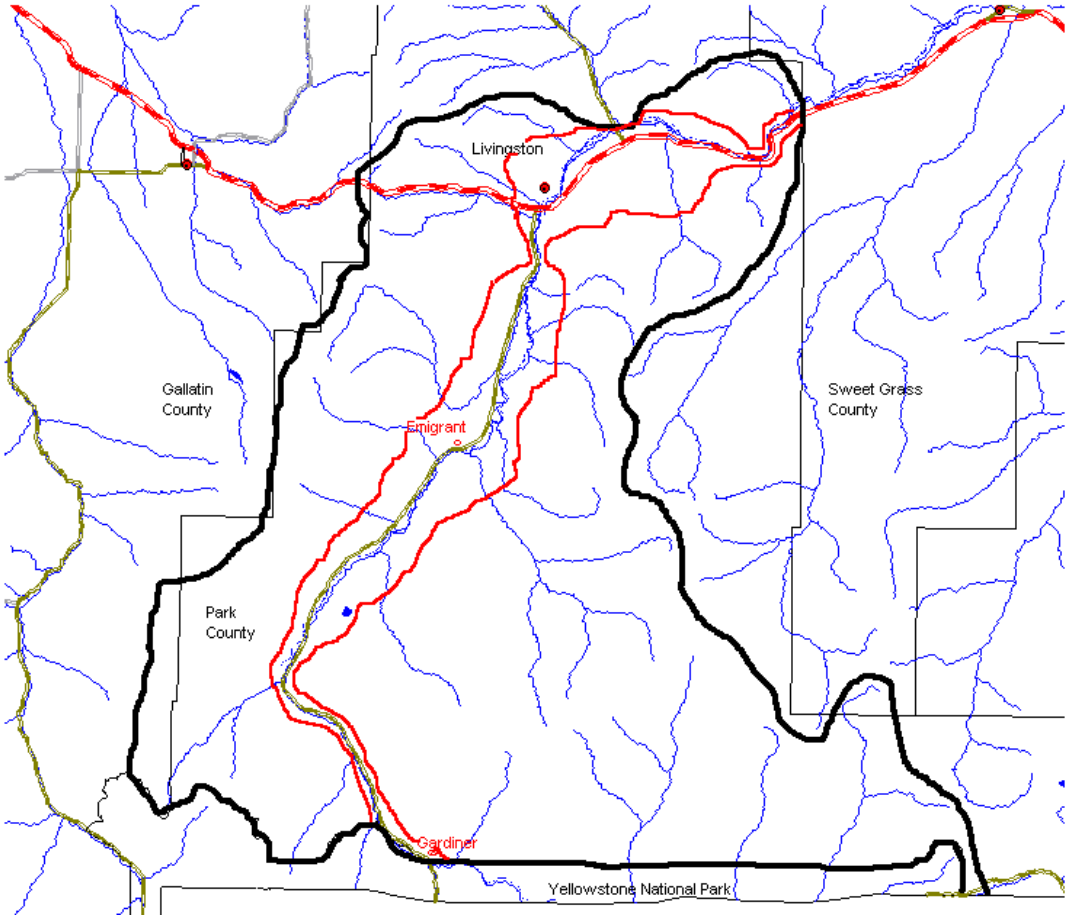
The Upper Yellowstone River Socioeconomic Assessment is one of several studies being conducted on the Upper Yellowstone River by the U.S. Army Corps of Engineers and the Governor's Upper Yellowstone River Task Force. These studies are intended to answer a host of questions related to river management. The Socioeconomic Assessment will lend historic, demographic, economic and social/cultural context to the results of the science-based studies looking at geomorphology, riparian vegetation and fisheries, among other topics.

This first task of the socioeconomic assessment, a historical overview of the Upper Yellowstone River Valley, has two primary purposes. First, the study team must understand the people and the region as best they can to facilitate a comprehensive socioeconomic study. Second, the historical overview of the area will provide some context to the greater socioeconomic study. To understand where people are today, one must understand from where they came, and the historical overview accomplishes this goal.

This historical overview relates to later components of the socioeconomic study. First, the stakeholder groups through history are profiled, followed by analysis of economic trends. Land use trends and historical river management strategies fill out the overview. The "study area" covered in this and subsequent task reports was defined by the Army Corps of Engineers to be the river corridor from the Springdale bridge through to Gardiner (see Exhibit 1-1 below). All future references to the "Upper Yellowstone River study area" or "Task Force study area" or "study area" refer to this map. The "Upper Yellowstone River Valley" refers to the study area plus the lowlands and foothills of the Upper Yellowstone River from Springdale through to Gardiner in Park County.

American Indians first populated the area that in 1887 became known as Park County, Montana. Captain Clark of the Lewis and Clark team was the first white man to record the presence of this region during their journey in 1806. The City of Livingston was incorporated as the first town in the County in 1882. Throughout its history, inhabitants have derived sustenance from value from and appreciated the Yellowstone River that runs through the heart of the County.

Exhibit 1-1.
Upper Yellowstone River Study Area Map



Source: US Army Corps of Engineers.

Early History of Park County

Many different groups of people have passed through the Upper Yellowstone River Valley. Each had different reasons for which the river was important to them.

American Indians. American Indians were the first peoples to inhabit the Upper Yellowstone River Valley. The dominant tribe was the Crow, but several other tribes were present in the area, including the Snakes, Rees, Blackfeet, Piegans, Bloods, Gros Ventres, Flatheads, and Pend Oreilles. As whites pressed west in the early to mid-1800s, they pushed the Sioux from the plains into Yellowstone country. The Sioux squeezed out all but the Crows and "a small band of 'Sheepeaters' who seemed to be refugees from Shoshone and Bannack Indians."[1]

[1] Vern Craig, *Montana Wildlife*, "Floating through the Yellowstone Waterway," July 1966, page 6.

The Indians valued the Yellowstone River for drinking water and transportation. Indians used a boat with a name given by the white man of "bullboat;" it was a saucer shaped vessel made of willow wood and buffalo hide.[2] Transportation through such mountainous and climatically challenging terrain was essential to tap the other resources that made the area important: food and wood. The river itself offered trout, waterfowl, and muskrats and beavers, while the surrounding terrain supported populations of buffalo, deer, and elk. Wood and forage was also always abundant in the region's dense forests, though the forbidding winter climate was the likely deterrent to any permanent settlements.

The Upper Yellowstone River Valley was a general hunting ground for the Indians, and no one tribe made any permanent settlements there — "it was a crossroads for Indian travelers, an intersection of many trails."[3] The later site of the City of Livingston was a favorite Crow campsite.

White historians did not record much about the early Indians' social and cultural values; however, one can extrapolate from more modern studies of the Indians in the Yellowstone Valley. Indians valued their communities very highly — the survival of one depended upon the actions of all in the tribe. Indians' technologies were typically adapted for resource exploitation for hunter/gatherer societal needs. Each individual's contribution to finding food, providing clothing and shelter, and protecting against enemies was essential.

To protect their communities, the Indians of the Yellowstone often fought other Indian communities and invading white people. They fought to protect their resources and territory, or to gain more of either. They fought to prove themselves to their fellow tribe members. In their love of community and their fierce struggle to survive, the Indians expressed their connection to the land, waters, plants, and animals that sustained them. Their connection to the Yellowstone River and its upper valley was vitally strong.

The White man arrives. Though Captain Clark of Lewis and Clark was the first white man to record his observation of the Upper Yellowstone River Valley in 1806, he was likely not the first white man to actually traverse the area. Historians maintain that other explorers, such as the French Canadian, Charles LeRays, and illiterate hunters and trappers who would have been unable to record their journeys traveled through the Yellowstone region for ten or twenty years before Clark's arrival.[4]

The Upper Yellowstone River Valley meant one main thing to the first white people — transportation. Before the time of wagon roads or railroads, rivers — especially large rivers like the Yellowstone — were the most efficient mode of transportation through the wilds of the Montana Territory. Their relationship to the river was simple — water to drink and a road back home.

The fur and gold booms. Following Clark's recorded "discovery" of the Upper Yellowstone River Valley, white people arrived in greater numbers. First came the hunters and trappers, primarily for furs of the beaver, mink, and river otter. Then came the roving wolfers, whose sole purpose was to trap, shoot, and poison wolves to prepare the wilds of Montana for white agricultural and mining

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[2] Vern Craig, *Montana Wildlife*, "Floating through the Yellowstone Waterway," July 1966, page 9.

[3] Vern Craig, *Montana Wildlife*, "Floating through the Yellowstone Waterway," July 1966, page 6. The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 3.

[4] Vern Craig, *Montana Wildlife*, "Floating through the Yellowstone Waterway," July 1966, page 7.

settlements. Finally, in 1862 and 1863, prospectors struck gold at Bannack and Emigrant Gulch. By 1864, several hundred prospectors populated the Upper Yellowstone River Valley, from what would become the City of Livingston to Cinnabar near the future Yellowstone National Park (YNP). Gold and coal mining dominated the valley, and small mining settlements sprouted all along the river.[5]

The first white inhabitants of the Upper Yellowstone River Valley produced gold, beaver skins, coal, and timber. Initially, there was likely almost as much traffic heading east as there was heading west. Those who had struck it rich or had given up ever finding gold and those who lost a market when beaver furs became unfashionable headed downstream on the Yellowstone back to civilization.[6] This group did not have the same ties to the region or the land as the area's original residents, the Indians. They saw the Upper Yellowstone River Valley as an enormous resource for their tapping, and many saw their residence there as only temporary. If they struck it rich or failed utterly, they would return home and leave Montana behind.

Hot springs. Andrew Jackson Hunter discovered in 1864 a set of natural hot springs about 20 miles east of Livingston near Springdale, which he later named Hunter's Hot Springs. Chico Hot Springs, originally Emigrant Warm Springs, was platted in 1883, and Corwin Hot Springs just north of Gardiner opened in 1909. These three health and leisure resorts demonstrated long-standing benefits of the Upper Yellowstone River Valley — the health benefits and relaxation that the area's natural amenities could offer. It was generally the wealthy who enjoyed the pleasures of the springs and the supposed health benefits (the springs were rumored to cure any number of ailments, from rheumatism and gout to colic and troubles of the womb).[7]

Beyond the hot springs, other forms of relaxation and recreation came to life in the Valley's early days. Boat tours began as early as 1867, and with the formation of Yellowstone National Park (YNP) in 1872, tourism became an important part of everyday life in the region.[8] These activities reflected values of yet an entirely different kind — appreciation of the beauty, grandeur, and attractiveness of the wild nature of the Upper Yellowstone River Valley. This appreciation would endure, for different groups at different times, throughout the valley's history.

Sheep and cattle ranching. Ranching followed the miners to the Valley in 1866, primarily to provide meat for the new settlers.[9] Early ranching involved both cattle (for meat) and sheep (for meat and wool), as sheep were better suited to the rocky terrain surrounding the river valley. Sheep shared the Upper Yellowstone River Valley with beef cattle until the 1960s when the value of wool plummeted and most ranchers switched to all cattle.[10] Settlers also farmed, though much less

[5] Vern Craig, *Montana Wildlife*, "Floating through the Yellowstone Waterway," July 1966, page 8. The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 4.

[6] The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 4.

[7] The Livingston Enterprise, *Centennial Scrapbook*, 1982, pages 27-30.

[8] Vern Craig, *Montana Wildlife*, "Floating through the Yellowstone Waterway," July 1966, pages 9-10.

[9] The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 5.

[10] Ted Watson, personal interview, 27 February 2002.

extensively. In 1890, less than a square mile of land in the Valley was growing wheat, but by 1920, there were 452 square miles of wheat under cultivation in the Yellowstone Valley.[11] Hay and natural pasturage for stock was and continues to be the dominant crop of the valley.

The Livingston Enterprise's *Holiday Enterprise* in 1891 advertised Park County as being "three-fifths…agricultural and grazing land…all abundantly supplied with water for irrigating purposes, and destined to support, when fully settled and utilized, a large farming population."[12] Irrigation waters diverted from the Yellowstone River and its tributaries was and is vital to agriculture in the Upper Yellowstone River Valley. Most ranching and farming then and now required irrigation, and primarily flood irrigation that uses large quantities of water. It was only in the 1960s that ranchers began the switch to sprinkler (gravity or pivot) irrigation that saved them thousands of gallons of water each growing season and reduced their dependence on the river.[13]

The Northern Pacific Railroad and the City of Livingston. After the arrival of the mining prospectors and the ranchers, pivotal change for the Upper Yellowstone River Valley came with the advent of the railroad. The Northern Pacific railroad reached the bend in the river where Livingston was to be platted by November 1882. The city was located a short distance to the north of the original supply store settlement, Clark City, that had been established in July of that year. From Livingston, the railroad left the Yellowstone Valley and rose through the Bozeman Pass to Bozeman.

Northern Pacific decided that Livingston was a logical place for their machine and repair shops, the largest of their operating stations between Brainerd, Minnesota, and Portland, Oregon.[14] "The announcement that the city would become a Northern Pacific division point and home of the railroad shops guaranteed that the town would grow," and by the city's two month-anniversary, the population had already reached more than 500.[15]

In just one year from its founding, Livingston grew into a well-developed city. Platted carefully by Northern Pacific, the city spread parallel to the railroad tracks on either side of them, and the main business district developed along Main and Park Streets. Three businesses begun in 1883 have operated in Livingston continuously since that time — The First Bank of Livingston, the Livingston Enterprise, and the Sax and Fryer Company.[16] The early days of Livingston also enjoyed 40 to 50 saloons, plus houses with "painted ladies." The saloons were important social centers, generally friendly gathering places, "where men talked, played cards and drank." There was a professional baseball team, livery stables, and a theater called the Opera House.[17]

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[11] John Hudson, "The Yellowstone River," *Montana, The Magazine of Western History*, Autumn 1985, page 66.

[12] The Livingston Enterprise, *Holiday Enterprise*, December 1891, pages 6-7.

[13] Roger and Helen Nelson, personal interview, 28 February 2002.

[14] John Hudson, "The Yellowstone River," *Montana, The Magazine of Western History*, Autumn 1985, pages 64-65. Park County Historical Society, *History of Park County, Montana 1984*, page 5. The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 13.

[15] The Livingston Enterprise, *Centennial Scrapbook*, 1982, pages 15-16.

[16] The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 21.

[17] Copeland C Burg, *The Livingston Story*, 1 September 1960, pages 2-3.

Several manufacturing plants populated the town, as well, including three cigar factories, a flourmill, an overall factory, and three brickyards.[18] While the railroad provided the most significant amount of employment in the city, the railroad also brought a steady stream of settlers who employed themselves in the many industries necessary to support a booming railroad town. By 1890, Livingston had almost 3,000 residents (see Exhibit 1-2).

Exhibit 1-2.
Population Trends

Source:
US Census Bureau.

Year	Livingston	Park County
1882	199	--
1890	2,850	6,881
1920	6,311	11,330
1950	7,683	11,999
1970	6,883	11,197
1980	6,994	12,689
1990	6,701	14,562
2000	6,851	15,694

The first people in Livingston were "rough and tough railroad workers, who spent their days hammering iron spikes and their nights drinking hard liquor." Things quickly improved, though, and by January 1884, the first theatre offered entertainment that would be "strictly moral with nothing to offend the fastidious." The Livingston Enterprise wrote in 1883 that there were more families of education and culture in Livingston than in any town in Montana.[19] All of the major Christian denominations were represented in the town by as early as 1917.[20] A 1909 advertisement for the city intimated that the town enjoyed low taxes; well-equipped and well-attended schools with high standards; substantial government buildings and organization; continuous streets with sidewalks, sewerage systems, and water supply; and electric arc lighting.[21]

The values and social ideas of the first people of Livingston were as varied as the places from which they came. Most were Americans recent immigrants from Western Europe. Norwegians and Swedes formed the Norwegian Lutheran Church on the east side of town and were joined by the Baptists and Methodists. The Italians built the Catholic church on the west side of town and were joined by the Congregationalists and Episcopalians.[22] Germans and Irish also were represented in the valley.[23] The settlers formed scores of social groups in addition to their churches, including such organizations as the Masonic Lodge, Scottish Rite of Freemasonry, Grand Army and Women's Relief Corps, and women's Christian Temperance Union.[24] With such variation, their appreciation of the river was widely varied, too.

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[18] The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 43.

[19] The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 22.

[20] The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 67.

[21] "We Welcome You to Livingston," 1909.

[22] The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 71.

[23] Helen and Edwin Nelson, *Growing Up in Paradise: The History of Nelson's Spring Creek Ranch*, 1998, page 2.

[24] The Livingston Enterprise, *Holiday Enterprise*, December 1891, page 6.

To those early permanent residents, the Yellowstone River meant water for drinking, cleaning, and irrigating; scenic beauty; and recreation for fishing, swimming, and boating.

The Gateway to Wonderland. Livingston and Park County, from their beginning, benefited directly from YNP as the town and county became known as the Gateway to Wonderland. A "human chain of trade and travel" intimately linked Livingston, the valley, and the Park from the time of the park's inception in 1872. The Northern Pacific enhanced this relationship in 1883 when it completed the Park Branch that extended along the Upper Yellowstone River from Livingston down to Cinnabar and then to Gardiner at the entrance to YNP. Tourists came in droves right from the start, with as many as 20,000 passing through Livingston in the first summer of the railroad.[25] The tourists did not come simply for the Park; there were the hot springs, the fishing holes, and the boating tours. Livingston was already beginning to be known as "one of the best points in the west for trout fishing" in the late 1880s, and pleasure boating tours had begun as early as the 1860s. The hot springs at Hunter's, Corwin, and Chico provided relaxing resorts for people from all over the world, though they suffered from excessive isolation and declining interest in wilderness recreation in the Roaring 20s.[26]

The prominence of tourism in the Upper Yellowstone River Valley from the early days reflects the importance of the river for recreational purposes. The Holiday Enterprise from 1891 expressed some of these early views well: "No city in the state possesses a more pleasing natural location or is endowed with richer or more extensive resources [situated] to build up and maintain a populous and thriving [city] center. Supplementing the charming mountain scenery, [and] in almost every direction greets the eye, is the more [surreal] landscape of river plain and woodland."[27] Early on, people appreciated the Upper Yellowstone River Valley for resources other than those that could be materially extracted — for its beauty, its peace and quiet, and its recreation potential.

Economic History of Park County

By the end of the 19th century, the major stakeholder groups of the Valley had established themselves — the miners, ranchers, loggers, the railroad workers, townspeople, businesspeople, the tourists and people who worked to make the tourism industry flourish. The 20th century saw changes in these groups, their characteristics, and the dynamics between them as the area's economic, social, and cultural conditions evolved.

Extractive industries decline. By the 1930's, gold and other mining, as well as timber in the Upper Yellowstone River Valley had diminished considerably. The discovery of gold and coal was one of the primary drivers of early settlement of the area, and gold and coal mines from Jardine and Emigrant Gulch up to Cokedale near Livingston sustained much of the economy of the Upper Yellowstone River Valley from the 1860s to the early 1900s. Emigrant Gulch attracted gold miners into the region for some years after the placer gold deposits there played out in 1866, and the goldmines at Jardine-Bear Gulch near Gardiner pulled in additional settlers and kept them in the area until 1909. Development of the Bear Gulch mines stopped that year as the quality of the ore continued to

[25] The Livingston Enterprise, *Centennial Scrapbook*, 1982, page 39.

[26] Vern Craig, *Montana Wildlife*, "Floating through the Yellowstone Waterway," July 1966. The Livingston Enterprise, *Centennial Scrapbook*, 1982.

[27] The Livingston Enterprise, *Holiday Enterprise*, December 1891, page 1.

decline. By that time, coal mining in Cokedale also dropped off, and copper mines and smelters that used coal decreased in importance. In 1921, the Jardine Mining Company in Bear Gulch switched from gold mining to conversion of arsenopyrite into arsenic to feed a great demand for the chemical to control the boll weevil on farms in the South. When arsenic prices fell in 1936, the mine remained open only intermittently until permanently closing in 1996Upper Yellowstone River Valley.[28] A large Yuba gold dredge setup near Old Chico in 1940 contributed significantly to the area through the extension of power lines south from Livingston to the Emigrant area. Montana Power Company later extended power lines through Gardiner, Jardine and YNP.

Even with renewed efforts by various private parties in the area to reestablish mining, it has never again played a significant role in the area. Arsenic has never again been profitable enough to reopen the mine near Jardine. Gold deposits have played out, and the introduction of natural gas and other fuels to the area has made local coal mining obsolete. Today, only two mine reclamation/cleanup sites exist within Gallatin National Forest (but not on US Forest Service land in the county), while one travertine mine near Gardiner (30 acres) and one ballast mine near Emigrant (169 acres) still operate.[29] There are also seven sand and gravel pits throughout the study area. The Corwin Springs pit lies between US89 and the Upper Yellowstone River. There are additional pits on the Chicory fishing access road, on the Boulder Road east of the Interstate 90 overpass, on Chicken Creek, on the Shields River Road, near the Park County landfill and on Sundling Ranch.

Though never a large economic or social component of the Valley, timber was nonetheless indispensable to the Valley. The American Indians who depended on the forest for fuel, the pioneers used the wood for fuel and building materials for new towns and settlements and the Northern Pacific Railroad used wood for its thousands of railroad ties. Several sawmills supported the lumberjacks in the early days into the early 1900s, but after the railroad finished its work and the towns were built, the timber industry, as with the mining industry, declined rapidly.[30] Only one small sawmill still exists today in Livingston. There are three major active timber sales on US Forest Service lands, and several smaller sales, totaling roughly 11 million board feet of timber and 1,200 acres of land. The Forest Service also contracts with local businesspeople to thin and improve timber stands in the county over about 200 acres per year.[31]

Ranches grow larger. Originally, ranching in the Upper Yellowstone River Valley was primarily for sustenance and the raising of sheep for wool. Ranchers diversified to survive, and one family recalls getting along on "fish, wild game, a chicken now and then, garden produce by the bucket, gallons of strawberries and milk and cream…[and] potatoes…[and] apples ripened in the orchard."[32] Local ranching families recount that the nature of ranching changed in the 1930s, though, as the nation's

[28] Western Heritage Center, *Along the Yellowstone: A Guide to Historic Sites of the Yellowstone River Valley*, date unknown, pages 16 – 18.

[29] Mary Beth Marks, US Forest Service, phone interview, 4 September 2002.

[30] John Fryer, personal interview, 18 April 2002.

[31] Tim Hancock, US Forest Service, phone interview, 29 August 2002.

[32] Helen and Edwin Nelson, *Growing Up in Paradise: The History of Nelson's Spring Creek Ranch*, 1998, page 13.

demand for wool dropped while its appetite for beef skyrocketed. The ranchers of the Valley followed the trends, and over the next thirty years, they switched almost completely from sheep to beef cattle and converted nearly all crop production to hay.[33]

Ranching became more commercial in the 20th century, and though ranchers still "spent a lot of time back then with neighbor helping neighbor,"[34] ranches grew larger and depended on an economy of scale to survive. One family recounted that a rancher could survive on 30 head of cattle as late as the 1960s, but another family intimated that they had to have 150 head by the 1950s and grew to over 500 head by the 1990s.[35] Though the nature of ranching in the valley changed, it did not lose (and still has not lost) its place as one of the most significant economic and social forces in the region. Ranchers still graze some 1,200 sheep, 8 horses, and 2,660 cattle on US Forest Service lands throughout the county.[36]

Railroad wanes. The Northern Pacific Railroad (NP) built the town of Livingston in 1882, Park County's largest town and the hub of life in the Upper Yellowstone River Valley. With the town, NP built the largest locomotive machine shops in the region, which easily made NP the largest employer in the Upper Yellowstone River Valley, and expanded those shops three times, in 1901, 1943, and 1957.[37] NP also built the Park Branch rail line first from Livingston to Cinnabar in 1883 and then to Gardiner in 1903.[38] With its aggressive promotions of YNP and the surrounding area, NP created a viable tourist trade from the wilds of the Upper Yellowstone River Valley. As many as six passenger trains per day served Livingston in the early days of the railroad, and regular passenger transportation to YNP ran through 1948, when it ceased operations on the line.[39]

The closing of the Park Branch was really only a symptom of NP's decline that had begun years earlier with the advent of the car culture. The present US89 bridge in Gardiner was completed in1930, though the approaches were not completed for several months due to contracting complications. The bridge replaced two existing bridges that had not enabled much vehicular traffic from the Upper Yellowstone River Valley into YNP.[40] The bridge allowed the automobile to surpass the train as the primary driver of the burgeoning tourism economy that began in earnest around the same time. By the time NP merged with Burlington Northern in 1969, much of the employment in the machine shops was lost. Whereas NP employed nearly 1,200 people in Livingston in the early 1900s, Talgo, which now controls the machine shops, employs just fewer than 100 people.[41] Though the railroad continued to be a powerful economic force in the area for many years, it has only a modest impact on the community today.

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[33] Ted Watson, personal interview, 27 February 2002. Daryl Smith, personal interview, 17 April 2002.

[34] Helen and Edwin Nelson, *Growing Up in Paradise: The History of Nelson's Spring Creek Ranch*, 1998, page 15.

[35] Ted Watson, personal interview, 27 February 2002. Roger and Helen Nelson, personal interview, 28 February 2002.

[36] Kathy Quane, US Forest Service, Gallatin National Forest, email, 18 September 2002.

[37] John Hudson, "The Yellowstone River," *Montana, The Magazine of Western History*, Autumn 1985, page 86.

[38] Western Heritage Center, *Along the Yellowstone: A Guide to Historic Sites of the Yellowstone River Valley*, date unknown, page 27.

[39] John Hudson, "The Yellowstone River," *Montana, The Magazine of Western History*, Autumn 1985, page 86.

[40] Western Heritage Center, *Along the Yellowstone: A Guide to Historic Sites of the Yellowstone River Valley*, date unknown, page 41.

[41] John Hudson, "The Yellowstone River," *Montana, The Magazine of Western History*, Autumn 1985, pages 67 and 86.

Dudes, anglers, and escapees. Though always an economic factor, tourism first reached its heyday in the 1920s and 30s. Three major factions of the tourism trade can be identified historically: pleasure seekers looking to experience the "Old West" (i.e., the "dudes"), the anglers and other river recreationists, and the escapees (i.e., those who ran from the cities of the east and west coasts to find solace in seasonal residency or vacations in the wilds of Montana).

Dude ranching in all of Montana actually began in Park County, at the OTO Ranch just a few miles north of YNP in 1900. To supplement his income, the owner of OTO began leading "hunting parties, pack trips, and later, paying fishermen throughout the area to…capitalize on a burgeoning interest in the 'Old West.'" Tourists from all over came to Park County seeking what they perceived to be the "old west experience." OTO eventually had its own post office, Dude Ranch Montana, as the dude ranch operation had become such a large enterprise.[42] Dude ranching became increasingly important in following decades, and many other local ranchers throughout the Upper Yellowstone River Valley started dude ranches and created a "mecca for 'dudes,'" totaling 17 ranches within a two and a half hour drive of Livingston by the 1920s.[43] The 63 Dude Ranch southeast of Livingston opened in 1929 and was the first ranch designed *only* as a dude ranch with no other commercial ranching onsite. Dude ranching since has been an enduring enterprise and continues to be "a powerful lure for tourists from the East and abroad seeking a 'western' experience."[44]

Angling always had a presence in the Upper Yellowstone River Valley. In the earliest days, its primary role was to supplement the food supply. Of course, fishing for recreation was evident from the start, but commercial recreational angling emerged in the 1930s when Dan Bailey opened his flyshop in Livingston. The surge in recreational angling, and especially in flyfishing, occurred after WWII in the 50s and 60s. It was then that anglers discovered the value of fishing in the Upper Yellowstone's three spring creeks, and three of the four owners of the creeks began charging for use of the creeks. They started at $5 per rod per day, but the price rose nearly every year up to 2002's cost of $100 per rod on average per day. With each passing summer, increasing numbers of both tourists and locals ply the waters of the Yellowstone River. Biannual angling use surveys indicate that total angling use days increased from over 46,000 in 1982 to over 70,000 in 1999. Fishing has become a dominant element of the tourist and recreation sector in the Upper Yellowstone River Valley.[45]

The third major component of the tourism boom of the 20th century was the escapees, or those who ran from the worries of urban life to the simplicity of life in the Upper Yellowstone River Valley. In the early days, escapees were transient visitors, not newcomer seasonal or short-lived residents. It was in the 1960's that people began migrating to Livingston and other parts of Park County to purchase land or a house and call the area home for more than a few days or a week per year. Escapees tended to live in Park County for only short periods at a time, however, using the area as a break from the

[42] Western Heritage Center, *Along the Yellowstone: A Guide to Historic Sites of the Yellowstone River Valley*, date unknown, page 34.

[43] Western Heritage Center, *Along the Yellowstone: A Guide to Historic Sites of the Yellowstone River Valley*, date unknown, page 38.

[44] Western Heritage Center, *Along the Yellowstone: A Guide to Historic Sites of the Yellowstone River Valley*, date unknown, page 35.

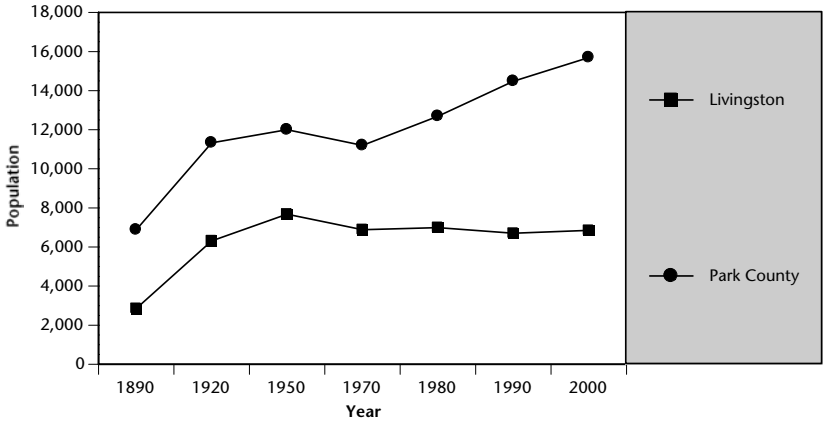
[45] Daryl Smith, personal interview, 17 April 2002. John Fryer, personal interview, 18 April 2002. Jerry O'Hair, personal interview, 28 February 2002. Roger and Helen Nelson, personal interview, 28 February 2002. Helen and Edwin Nelson, *Growing Up in Paradise: The History of Nelson's Spring Creek Ranch*, 1998, pages 27-31. Montana Fish, Wildlife and Parks Department's Angling Use Survey, 2002.

hustle and bustle of everyday life. They typically did not take jobs in the area, and many were retirees. Escapees' economic status escalated over time, as new escapees were increasingly wealthy individuals.[46] Escapees have always contributed to the economy, but they have typically avoided full integration into the community. They tend to stay to themselves, at least for the first few years. Because they are not permanent, fulltime residents who have jobs and actively contribute to the community, they are often considered part of the tourism economy. Their importance in that tourism economy is no less today than in the early days. Escapees still employ builders and purchase goods and services from local providers. In a sense, they function as tourists; only they buy land or homes and stay longer.

Modern economic times. The Upper Yellowstone River Valley, from the start, has been an economically diverse area. Mining, timber, ranching, manufacturing, the railroads, and tourism have carried the Valley through the decades. A balance has usually been struck, and the area's population has been fairly stable, with booms at the beginning. Buoyed more recently by recognition of the quality of life of the area, newcomers have been attracted to the area, which has experienced growth again in past decades similar to the 1890-1920 period (see Exhibit 1-3 on the following page).

Exhibit 1-3. Population Change in Livingston and Park County

Source:
US Census Bureau.



A summary of economic statistics for the past three decades is found in Exhibit 1-4 below. Economic and demographic activity will be discussed further in Task 5a.

[46] John Fryer, personal interview, 18 April 2002.

Exhibit 1-4.
The Upper Yellowstone River Valley (Park County) Economy Since 1970 (Millions of Year 2000 Dollars)

	1970	1975	1980	1985	1990	1995	2000	% Change 1970-2000
Total Earnings	$115	$139	$160	$135	$123	$171	$165	43%
Farm Earnings	$18	$9	$4	$0	$4	$5	$4	-78%
NonFarm Earnings	$97	$130	$156	$135	$119	$166	$161	66%
Government Earnings	$14	$18	$19	$22	$20	$23	$25	79%
Private Earnings	$83	$112	$137	$113	$99	$143	$136	64%
(% of Private Earnings)								
Agricultural services	1%	1%	1%	1%	1%	D	1%	100%
Forestry, fishing, etc.	0%	0%	0%	0%	0%	0%	0%	250%
Mining	0%	1%	1%	2%	6%	D	1%	753%
Construction	6%	7%	5%	6%	8%	13%	12%	220%
Manufacturing	8%	11%	9%	8%	8%	12%	7%	43%
Transportation and public utilities	40%	41%	48%	31%	12%	10%	10%	-61%
Railroad transportation	34%	34%	41%	23%	6%	4%	4%	-82%
Wholesale trade	1%	2%	1%	3%	3%	3%	3%	300%
Retail trade	19%	16%	13%	19%	19%	15%	17%	44%
Automotive dealers and service stations	6%	4%	4%	4%	4%	3%	4%	20%
Eating and drinking places	4%	4%	3%	5%	5%	6%	5%	133%
Finance, insurance, and real estate	6%	4%	4%	4%	5%	5%	8%	120%
Services	18%	16%	18%	26%	37%	34%	40%	260%
Hotels and other lodging places	D	D	D	4%	7%	8%	10%	N/A
Amusement and recreation services	0%	0%	1%	1%	2%	1%	1%	N/A

Note: (D) Information not disclosed but contained in totals.

Source: US Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.

These earnings data include the effects of inflation.

Historical Land Ownership and Land Use in the Park County

The first land users in the Upper Yellowstone River Valley were the American Indians, and though the various tribes were territorial, they were not ownership-oriented. The Indians used the land transiently for camping, hunting, gathering, and to pass through on their way to other lands, but they protected their uses of the land from other tribes and later from pioneers. Ownership of the lands of the valley arrived with white people in the 1860s, and their first land uses were hunters' camps, transit posts and camps for explorers, and mining claims and their attendant settlements. White people also established an Indian reservation for the Crow in the valley east of the Upper Yellowstone River through to the Powder River, north of YNP. The government dissolved that reservation and moved the Crow in the 1880s, however, to make room for additional white settlements.

With the establishment of YNP in 1872 and of the Gallatin National Forest in 1899, the federal government became a major factor in regional land use.[47] Yellowstone and Gallatin represented the nation-at-large's desire to preserve and protect natural wonders and resources "for the benefit and enjoyment of the people."[48] Land uses in YNP were limited to scenic viewing, driving, camping, fishing, hiking, and many other recreational uses. The government prohibited commercially extractive activities. The Gallatin, however, was preserved *for* extraction — extraction of timber,

[47] Personal conversation with Dan Roy, Information Assistant for the Bozeman Ranger District, US Forest Service, 25 April 2002.

[48] Western Heritage Center, *Along the Yellowstone: A Guide to Historic Sites of the Yellowstone River Valley*, date unknown, page 34.

minerals, oil, grazing. The federal government retained control over those uses, however, and they have changed greatly over time. Today, the Gallatin's primary land use is recreation, though grazing, timber extraction and mining persist at relatively low levels.

The Northern Pacific Railroad also shaped Park County land ownership and use. The federal government gave more than a million acres of land in Montana to the railroad to build its transcontinental line in the late 1800s. Along with the right-of-ways, NP also received additional land along the line that it could sell to settlers to finance its construction. Livingston was an NP-platted town designed as a passenger depot for tourists heading to YNP and as a locomotive rebuild center. NP sold lots surrounding its depot and rebuild center and created a town that would endure to modern times with a population of nearly 7,000. The land uses in town included businesses, homes, churches, government buildings, parks, streets, public utilities, and all the other necessities of a growing frontier community. Other communities in the valley, Corwin Springs, Emigrant, Gardiner, Miner, Pine Creek, Pray, and Springdale, had similar land uses.

With settlement, ranching became the largest private land use in the Upper Yellowstone River Valley. Ranchers continue to use their land in the valley to graze their cattle, to cultivate alfalfa hay and other crops, to winter their cattle, to provide watering areas, and to build their homes and working buildings.

Homes outside the valley communities are nothing new. Settlers' homesteads were usually parts of small ranches or farms. In the latter half of the 1900's, the number of homes and subdivided parcels developing throughout the valley has increased substantially, however, and these homes are not necessarily tied to active ranching anymore. Since 1990 alone, residents have developed 274 new subdivision lots and 86 subdivisions (some as small as just dividing one parcel into two parcels) in rural Park County. Since 1967, residents have installed over 2,000 new septic tanks, typically precursors of new homes and businesses, representing a relatively slow rate of growth.

Land uses have changed over time with land ownership throughout the valley, often following the changes in population and economic conditions. With this evolution, the use of the Upper Yellowstone River has changed also. Current land use patterns are examined in detail in Task 5b.

Historical Social Conditions in Park County

A brief examination of religious and social organizations will help describe the social evolution in the Upper Yellowstone River Valley.

Religious background. The role of religious organizations in the Valley has been important since the earliest settlement. Though many of the first settlers of the area were rough and rowdy miners, builders, and homesteaders, Exhibit 1-5 on the following page indicates that early residents of the Upper Yellowstone River Valley also established religious organizations shortly after arrival. The majority of major Christian denominations, for example, had their beginnings within the first ten years of Livingston's founding. All of these same churches *still* have a presence in the Valley, which hints at the longevity and steadfastness of the religious influence in this region. The nature of the religious side of life in Park County has not changed much either. All the churches established in the past 20 years have been Christian. As of 1984, there was no record of non-Christian religious

organizations. Most Valley residents are Caucasian, of European origin, and of Christian background. Data from the US Census Bureau's 1990 and 2000 censuses support this conclusion, as well (see Exhibit I-6 on page14).

Exhibit 1-5.
Religious Organizations of the Upper Yellowstone River Valley

Name	Year Established	Denominations	Community
Holbrook Congregational Church	1883	Congregationalist	Livingston
Holbrook United Methodist Church	1883	Methodist	Livingston
Saint Andrew's Episcopal Church	1883	Episcopalian	Livingston
Saint Mary's Catholic Church	1884	Catholic	Livingston
First Baptist Church	1888	Baptist	Livingston
American Lutheran Church	1892	Lutheran	Livingston
Pine Creek Church	1899	Methodist	Pine Creek
Seventh Day Adventist	1899	Christian	Livingston
Saint Joseph's Episcopal Church	1900	Episcopalian	Emigrant
Gardiner Community Church	1903	Nondenominational	Gardiner
Redeemer Lutheran Church	1906	Lutheran	Livingston
Church of Jesus Christ of Latter Day Saints	1910	Mormon	Livingston
Luccock Park	1923	Methodist	Pine Creek
Temple Hills Baptist Camp	1926	Baptist	Mill Creek
Grace United Methodist	Pre-1930	Methodist	Livingston
Assembly of God	1930	Christian	Livingston
Unity Truth Center	1930s	Christian	Livingston
Church of the Nazarene	1938	Christian	Livingston
Livingston Bible Church	1940	Nondenominational	Livingston
Church of Christ	1944	Christian	Livingston
Saint Paul's Evangelical Lutheran Church	1948	Lutheran	Livingston
Paradise Valley Community Church	1953	Nondenominational	Paradise Valley
Saint William's Catholic Church	Pre-1954	Catholic	Gardiner
Yellowstone Bible Encampment	1955	Christian	Pray
Livingston Congregational Church	1961	Congregationalist	Livingston
Gardiner Baptist Church	1976	Southern Baptist	Gardiner
New Life Christian Center	1981	Nondenominational	Livingston
Church Universal and Triumphant	1982	Christian	Gardiner
Heritage Baptist Church	1982	Baptist	Livingston

Source: History of Park County, 1984, pages 50-57.

Exhibit 1-6.
Races of Park County, 2000, and Ancestries, 1990

Source:
US Census Bureau.

Race or Ancestry	Percentage of Reported Answers
White	96.6%
Black	.4
American Indian or Alaska Native	.9
Asian	.4
English	15%
French	5
German	25
Irish	13
Norwegian	7
Scottish	3.5
Swedish	4
European	More than 75%
Other ancestries	7

Historical social conditions. Exhibit 1-7 on the following page displays many of the organizations that have existed in Park County since its founding, and the types of clubs shown do not vary much throughout time. However, this list was compiled from a history of Park County written in 1984, and no documentation of changes since that time is available.

Beginning in the 1960s, Park County's social organizations began to focus on serving the needs and desires of specific interest groups, from the elderly to those interested in astronomy to the young and needy. Older clubs usually emphasized social interaction, entertainment, and community service. Modern organizations share those important elements but also provide specific services and outlets for people with particular interests, availability of spare time, and priorities. One stakeholder interviewee indicated that people spend much more time with their families and at home nowadays then they used to, which indicates that the importance of social clubs has likely declined in the past few decades.[49] The nature of social clubs has changed, too, and many are family (not individual) oriented and aimed more at social development for children, athletic pursuits, or service to community through projects of interest to their members — serving food to the needy, improving the environment, or building homes for low-income members of the community. A common thread of social interaction and growth, development of personal interests, and service to the community has comprised the social fabric of Park County throughout its history.

[49] John Fryer, personal interview, 18 April 2002.

Exhibit 1-7.
Social Clubs of Park County

Organization Name	Year Established	Purpose/Activity
Ancient Free and Accepted Masons	1883	Social interaction through the celebration of masonry
Livingston Volunteer Fire Department	1883	Volunteers fight fires in the Livingston area
Knights of Pythias	1886	Social interaction through celebration of Pythias
Royal Arch Masons	1886	Social interaction through celebration of masonry
Livingston Scottish Rite Bodies	1888	Social interaction through celebration of Scottishness
Order of the Eastern Star	1890	Social interaction through community service
Park County Hereford Breeders	1890	Promotion of Hereford cattle
Yellowstone Club	1892	Study of literature and art
Park Branch Canal	1893	Management of the irrigation canal
United Transportation Local	1894	Protection and promotion of railroad workers
American Baptist Women	1899	Social interaction through weddings, coffee hours, meals, and other events
Royal Neighbors of America	1899	Patriotism and Christian ideals through fraternal principles
Ladies Auxiliary of the United Transportation Union	1900	Social interaction through celebration of the work of transportation employees
Livingston Golf and Country Club	1900	Enjoyment and social interaction from golf
Pine Creek United Methodist Women	1900	Active support of the Pine Creek Methodist Church
Lutheran Church Women	1906	Spread the word of God for the Redeemer Church
Pythian Sisters	1907	Heal wounds between the North and South
Moose Lodge	1911	Contribute to the betterment of Mooseheart and Moosehaven and community of Livingston
Rotary Club of Livingston	1916	Community service to improve Livingston
American Red Cross	1917	Service to military families and aid in disasters
Livingston Shrine Club	1917	Marching band
American Legion Auxiliary – Park Unit #23	1919	Social interaction through service to veterans and celebration of Americanism
Catholic Daughters of the Americas	1921	Poetry and essay contests; catering for special events; lending a helping hand to the needy
Livingston Kiwanis Club	1922	Rendering important community service without thought of personal gain
Order of Rainbow for Girls	1922	Teaching girls their place in home, school, church, and social life of the nation
Park County Farm Bureau	1922	Promotion and aid to the agricultural community
Livingston Roundup	1923	Livingston's local rodeo
Park County 4H Council	1929	Contests in home economics and agriculture
Park Farmers Co-op	1929	Put ranchers' money together to bring goods in at a Chapter rate
Park County Pioneers	1932	Social interaction in an annual banquet and dance
Park County Stockgrowers	1934	Promote and protect business of raising livestock
Girl Scouts	1936	Public service projects and social growth

Exhibit 1-7 (continued)
Social Clubs of Park County

Organization Name	Year Established	Purpose/Activity
Livingston Junior Woman's Club	1940	Rally for equal rights for women through public service
Livingston Saddle Club	1945	Trail rides, O-Mok-See's, and dances
Yellowstone Gem and Mineral Society	1947	Study, collection, and enjoyment of gems and minerals
Bath Zabbia Nile Club	1949	Support of the Shrine hospitals
Emma Roukema Circle	1950	Spread money of Grace United Methodist Church to community through projects
Sapphira Nile Club #8	1950	Support for the Shriner's Hospital for Crippled Children
Livingston Memorial Hospital League	1954	Provides services and items relating to patient comfort
Delta Kappa Gamma International Society	1956	Organization for women with a professional interest in education; recruitment awards
Park County Cowbelles	1960	Promotion of beef
Park County Historical Society	1962	Perpetuate the history of Park County
Big Sky Astronomical Society	1964	Observation of special astronomical events
Big Sky Snowriders Club	1966	Snowmobilers social organization
Livingston Toastmistress Club	1968	Leadership training and speech improvement for women
Park County Senior Citizens Center	1968	Entertainment, meals, and social interaction for senior citizens
Meals-on-Wheels	1973	Provision of meals to needy elderly persons
Park County Council on Aging	1973	Provide service and programs for the general welfare of older citizens
Danforth Gallery	1974	Nonprofit community art gallery
Big Brothers and Sisters	1976	Establishment of matches between needy youth and adult volunteers
Counterpoint Training Center	1976	Educational services for retarded citizens
Community Center	1981	Host for a variety of social services
American Legion Post No. 23	Unknown	Livingston
American Legion Post No. 118	Unknown	Gardiner
Elks Lodge No. 246	Unknown	Livingston

Source: History of Park County, 1984.

Park County also has the historic sites, shown in Exhibit 1-8 below, listed on the National Register of Historic Places. These landmarks represent important cultural, historic and social value for the communities in Park County. The Montana State Historical Preservation Office estimated that the county has a total 420 archaeological and 220 historic sites of importance.[50] To protect the integrity of these sites, Montana state law prohibits the Office from divulging the names and locations of those 640 sites.

[50] Damon Murdo, Montana State Historic Preservation Office. Email, 28 October 2002.

Exhibit 1-8.
Historic Sites in Park County on the National Register of Historic Places

Source:
National Register of Historic Places.

Site	Location
B Street District	Livingston
Chico Hot Springs	Pray
Livingston Commercial District	Livingston
Cooke City Store	Cooke City
Detention Hospital	Livingston
East Side Residential District	Livingston
Ebert Ranch	Rural
Harvat Ranch	Rural
KPRK Radio	Livingston
Krohne Island House	Krohne Island
Krohne Spring House	Krohne Island
Northeast Entrance to YNP	YNP
Northside School	Livingston
Rolfson House	Livingston
Sixty-Three Ranch	Rural
Trowbridge Dairy	Livingston
Urbach Cabin	Ninth Street Island
Livingston US Post Office	Livingston
West Side Residential District	Livingston

A History of River Management

The Yellowstone River is often referred to as the longest stretch of undammed major river in the lower 48 states, but there is a long history of river management. The residents of the Upper Yellowstone River Valley have been managing the Yellowstone for floods and erosion since they arrived more than 100 years ago. River management is examined in detail in Task 6 and summarized below.

Trends in historical bank stabilization. According to a local historian, flood and erosion management along the Upper Yellowstone River began early on after white settlement.[51] Ranchers and others riprapped banks with old automobiles, locomotives or large rocks to prevent soil erosion.

Road and railroad builders built bridges and riprap to protect the bridges' abutments. The pace of these bank stabilizations very likely followed flooding patterns. After floods, there would be more pressure to stabilize; in intervening times, that pressure would decline.

Theories abound about who built or funded early bank stabilization in the study area. One theory expounds that the Soil Conservation Service (now the USDA Natural Resources Conservation Service) funded the building of levees and riprap to prevent extensive soil erosion in the middle part of the 1900s. BBC has been unable to confirm whether early structures were indeed privately or

[51] Doris Whithorn, personal interview, February 2002.

publicly funded, but the historical pattern suggests that federal, state and local officials fought against the negative effects of flooding with whatever tools were at their disposal. Erosion, especially after the Great Depression, was considered a public enemy, and the Soil Conservation Service and others expended much public money to thwart its effects across the US.

Further, highway bridges and railroad crossings did not consider the full spectrum of riverine issues that they would today. BBC concluded after interviews with local history experts and ranchers that bridges and highway levees were funded primarily by public dollars unless they were built before the time of public transportation funding. As for efforts undergone by ranchers or other private landowners, it is unclear whether government funding was involved in any particular stabilization. It is clear, though, that before the 1970s and the advent of NEPA and the Corp's active role in river management, there was limited consideration for the cumulative impacts of bank stabilizations when planning projects.

The cumulative trends in bank stabilization by section of the river were revealed after the USDA Natural Resources Conservation Service and Montana Department of Environmental Quality contracted with Task Force members, private citizens and others to complete the physical features inventory of the Upper Yellowstone River in 1998. For detailed descriptions of the extent of flood and erosion management by river section, please see the Task 6 report, page 13. Several important summary points include:

- Bank stabilization was minimal from Gardiner to the Yankee Jim river access and from the Carbella river access to the gravel pit access.
- Bank stabilization was heavily concentrated in the stretches between the Yankee Jim river access and the Carbella river access and between the gravel pit access and the Springdale bridge.
- The heaviest concentration of bank stabilization was between Pine Creek and Livingston.

Irrigation canals. One of the original and most prevalent uses of the river, even today, is irrigation water. In order to siphon water to the fields in which water is used for irrigation, ranchers built irrigation dams linked to canals that divert water out of the river and along lands in the river bottoms. The first canal was the Park Branch Canal, operational by 1893. Private water users built the canal, but the State of Montana took control of Park Branch Canal in 1936. In 1995, the State sold the canal back to the users, much to their consternation with all the repairs the canal needed.[52] Other canals along the river include the Livingston Ditch and the Paradise Canal, a branch of the Park Branch Canal that is diverted under the Upper Yellowstone River through a concrete inverted siphon to supply the canal on the east side of the Valley. Each irrigation channel involves some form of river management structure — low dams, riprap, and/or levees.

The spring creeks. The three spring creeks along the Upper Yellowstone River — the DePuy, the Armstrong-O'Hair, and the Nelson — have flood management structures in place to maintain the creeks' structure and flow. The owners of the Upper Yellowstone's spring creeks have spent much time and money protecting their creeks to avoid loss of land, to maintain operational viability, to make fishery improvements, and to preserve the cultural heritage of the region.

[52] Jerry O'Hair, personal interview, 28 February 2002.

The proposed Allenspur Dam. The Allenspur Gap is just a few miles south of Livingston in the Upper Yellowstone River Valley. The river canyon becomes narrow at this point, and developers from the early 1900s through the 1970s thought it would be an ideal place for a dam. A group of Montanans first proposed a dam at Allenspur in 1902 to provide irrigation water and power to the region. The proposal returned "several times during the next four decades. But for reasons ranging from economics to bureaucratic decisions made by competitive government agencies, the Allenspur proposals all failed." In the 1970s, the Allenspur debate came back during the nation's energy crisis. In order to mine nearby coal, the mining companies needed water from the Upper Yellowstone. Again, a dam was proposed at Allenspur, and again the proposal died. Poor geology from the porous limestone canyon and strong dissension among residents and environmental groups ended further attempts to dam the Upper Yellowstone.[53]

Bridges. There are roughly 15 bridges that span the Upper Yellowstone River in Park County. Bridges can serve as floodplain restrictors because their spans are not as wide as the river's floodplain. Bridges then funnel the river's flow under those spans instead of allowing a spread-out flow continuously through the study area. The bridges, their owners, their span lengths and their years built are as follows in Exhibit 1-9.

Exhibit 1-9.
Bridges on the Upper Yellowstone River

Bridge Location/Type	Owner	Span Length (feet)	Year Built
Springdale (Road)	County	144	1980
Wilsall Exit (Rail)	Montana Rail Link	316	1918
Wilsall Exit (Road)	State	120	1955
East Livingston (Road)	State	154	1934
East Livingston (Rail)	Montana Rail Link	366	1919
Interstate 90 (Road)	State	222	1962
Ninth Street Island (Road)	County	55	1964
Carter's Bridge (Road)	State	87	1921
Pine Creek (Road)	County	114	1990
Mill Creek (Road)	State	111	1960
Emigrant (Road)	State	93	1949
US 89 South of Emigrant (Road)	State	139	1958
Tom Miner (Road)	County	54	1918
Corwin Springs	County	90	1908
Gardiner	State	125	1930

Source: Montana Department of Transportation, October 2002. Montana Rail Link, October 2002.

[53] Riprapping began as early as 1955.

When building bridges, the Montana Department of Transportation generally determined bridge span lengths by the structural aspects of the bridge design. The department accounted for hydraulic considerations, as well. Freeboard as it may have related to such hydraulic criteria as pressure flow, scour, debris, ice, location of the pier with regard to stream banks, irrigation diversions, road overtopping and determination of final road grades influenced bridge design. The design of the bridge waterway opening was composed by the bridge engineer, hydraulic engineer, road designer and, when scour was involved, the geotechnical engineer. It was an iterative process and may have taken several trials to come up with the optimal design. The department may have preferred to say that fewer piers were "better," but the overall design needed to consider all of the items listed above. In many cases, the addition of a pier or piers may actually have been a more economic design while reducing risks or impacts at the site.[54]

Floods of the past. The first major flood on record occurred in 1895, when Carter's bridge washed out. The next occurred in 1918, when the Carter's bridge again washed away, and the Ninth Street Island bridge collapsed. In that flood, Northern Pacific's tracks near Point of Rocks also washed out, halting train service to Gardiner for three weeks.[55] The flood also badly damaged the Harvat's bridge, and the total damage to Park County roads and bridges totaled $75,000. It was the most devastating flood on record to that time.[56] A flood in 1937 knocked out the bridge at Springdale, and interviews with local residents and historical records revealed that there were floods in 1955 and 1974.

The floods of 1996 and 1997. Two one-hundred-year-floods in a row, the floods of 1996 and 1997 surpassed the flood of 1918 as the most devastating floods in the Upper Yellowstone River Valley's history. Damage was widespread, from a failed causeway between Ninth Street Island and Siebeck Island in Livingston, to a breached bank at O'Hair's spring creek, to saturation of Livingston's premier riverside park, Sacajawea, with groundwater. Ranchers and landowners lost land and riverbanks, and bridges were threatened with failure. It was a "classic man-against-nature struggle, with some points being scored by both sides."[57] The Yellowstone River was "bigger, faster, and raging harder than it ever [had] since scientists began measuring it in 1910."[58] The flooding was so severe that the Corps erected a dike along Sacajawea Park and Mayor's Landing fishing access in anticipation of the melt of that year's 200 percent snowpack, and the Montana Department of Transportation reinforced riprap around its several bridges for US Highway 89 and Interstate Highway 90.[59]

River management has always been a part of life along the Upper Yellowstone River. This socioeconomic study examines many aspects of river management.

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[54] Mark Goodman, Montana Department of Transportation, personal email, October 2002.

[55] Doris Whithorn, personal note, no date.

[56] Jane McFarlane, *The Livingston Enterprise*, "The Flood of 1918," 20 May 1997.

[57] Jim Day, *The Livingston Enterprise*, "National Guard arrives," 12 June 1996.

[58] Jim Day, *The Livingston Enterprise*, "…the flood of the century," 10 June 1996.

[59] Heidi Hagemeier, *The Livingston Enterprise*, "Worst could be sometime Thursday," 3 June 1997. Heidi Hagemeier, *The Livingston Enterprise*, "High, wide and muddy," 5 June 1997.

Indicators of Change

A history of Park County is one way of depicting change in the Upper Yellowstone River study area. Another way is to track indicators of each variable of interest in this socioeconomic assessment and their changes through history. These indicators and their changes are listed below in Exhibit 1-10.

Exhibit 1-10.
Historical Change in Indicators of Economic and Social Interest

Indicator	Change through History
Movement of people, measured by number of different cultures	American Indians to miners and homesteaders to ranchers permanent residents
Economic shifts, measured by number of different industries	Hunter/gatherers to mining, ranching, timber, railroad to tourism, services, retail trade
Land use transitions, measured by number and amount of different land uses	Hunting/gathering/transport to settlement, industry, agriculture to recreation, tourism, scenery
Spiritual/religious shifts, measured by number and longevity of different houses of worship	Churches have only increased over time; few have ceased practice; Christian, Mormon, others; 30 recorded
Social change/evolution, measured by number and longevity of social institutions, clubs, organizations	Organizations have only increased over time; few have ceased operations; new organizations rare now; 58 recorded
Shift in historical appreciation	19 historic sites registered
Change in views on river management	Management increasing over time; increasing respect for river; rising interest in understanding river system

Source: BBC Research and Consulting.

Summary

BBC offers several summary points on the history of the Upper Yellowstone River in Park County.

- Residents of Park County, from the original American Indians to today's inhabitants, have valued the river for many reasons, including drinking water, transportation, recreation and contributions to the scenery and feel of the area.

- The economy of Park County has evolved with the ebb and flow of different industries, including ranching, mining, timber, railroad transportation and tourism. Ranching has been a constant, while tourism is on the ascendancy as of 2002.

- White settlement, ranching, mining, the development of Livingston and the development of a tourism and seasonal economy and community have influenced land use in Park County.

- The communities of Park County have been strong and civically oriented from the beginning. Ranchers have played an important role in community leadership for a long time.

- Flood and erosion management along the Upper Yellowstone River have existed since white settlement, and most bank stabilization has occurred in the section of the river between Emigrant and Livingston. Floods have traditionally stimulated periods of bank stabilization efforts and installations of new structures on the river. A new understanding of the broad spectrum of river management issues has greatly expanded the public and private scrutiny that proposed new structures now receive.

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Task 2.
Stakeholder Groups and Their Issues in the Upper Yellowstone River Basin

This task report focuses on the identification and issues of key stakeholder groups in the Upper Yellowstone River (UYR) study area. This was accomplished through extensive personal interviews with individual stakeholders. The process and result of those interviews follow.

Task Purpose

The primary purpose of this task was to identify the key stakeholder groups, ascertain their issues with respect to the Upper Yellowstone River and its management and to determine how these individual stakeholder groups could be surveyed to complete subsequent requirements of the socioeconomic study embodied in Tasks 3 and 4.

At the same time, these stakeholder interviews were intended to identify the key issues that would comprise the socioeconomic portrait of the study area. Key issues were confined to the stakeholders' viewpoints and relationship to the Upper Yellowstone River from a social, cultural and economic standpoint. These issues were instrumental in the design of the surveys in subsequent tasks of this socioeconomic study.

Design of the Stakeholder Interview Process

The stakeholder groups and the individuals within those groups were identified on an iterative basis throughout the course of the stakeholder interviews. Initially, stakeholder groups were identified through historical research concerning the Upper Yellowstone River Valley. This information was supplemented with an identification of the constituencies represented on the Governor's Upper Yellowstone River Task Force and discussion with task force members at an early point in the research. Since the task force was originally comprised of individuals representing a careful cross-section of interests in the study area, these stakeholder groups were a good place to start. For example, agricultural interests, spring creek owners, tourist-related businesses and other local business interests are represented on the Task Force. Second, each initial stakeholder interview ended with a question about what other stakeholder groups existed and what other individuals we should speak with regarding Upper Yellowstone River issues. This "snowballing" technique allowed the expansion of the survey effort to progress as further knowledge was gained during the course of the interview process. Participants in these stakeholder interviews were not chosen on a purely random basis.

The BBC study team conducted the interviews almost entirely in person from February to April 2002. A total of 37 interviews were drawn from the following groups (as depicted in Exhibit 2-1 on the following page):

Exhibit 2-1.
Number of Stakeholder Interviews by Group

Source:
BBC Research and Consulting, 2002.

Study Area Group	Number of Interviews Completed
Spring Creek Owners	4
Local Government	6
Local Economic Development Agencies	4
Angling Outfitters and Organizations	3
Other Ranchers and Agriculturalists	4
Realtors	2
Business Dependent on River	3
Businesses Not Directly Dependent on the River	6
Riverbank Residents	2
Environmental Advocates	3
Total	**37**

The stakeholder interview process was intended to be as broad as possible for many different groups, but the interview results, by similarities and differences in responses, would determine what stakeholder groups were ultimately identified for the study. A list of individuals interviewed is provided in Exhibit 2-2.

Exhibit 2-2.
List of Stakeholders Interviewed

Name	Affiliation
Jim Barrett	Park County Environmental Council
Ed Carrell	Park County Commissioner
Andy Dana	Spring Creek Owner
David DePuy	DePuy Law Firm
John Erickson	Best Western Yellowstone Inn
Jeff Faerber	Flying Pig
John Fanuzzi	Golden Ratio
John Fryer	Sax and Fryer, Co.
Michelle Goodwine	Maverick Realty
Dan Gutebier	Park County Commissioner
Kathy Kellogg	Livingston Area Chamber of Commerce
Roy Korkalo	Talgo
Tom Lane, Sr.	Ranchers and the Agricultural Community
Matthew Long	Long Outfitting
Marty Malone	Montana State University Extension Service, Park County Extension Office
Helen and Roger Nelson	Spring Creek Owners/ Ranchers and the Agricultural Community
Jerry and Virginia O'Hair	Spring Creek Owners/ Ranchers and the Agricultural Community
Justin O'Hair	Chimney Rock Outfitters
Julia Page	Yellowstone Raft Company
Richard Parks	Parks' Fly Shop
Ed Schilling	Park County Commissioner
Daryl Smith	DePuy/Armstrong Spring Creek/ Ranchers and the Agricultural Community
Jeanne-Marie Souvigney	American Rivers
John Sullivan	Private Land Owners Along the River/ Livingston Enterprise
Dana Taylor	Park County Economic Development Alliance
Lee Watson	Trout Unlimited
Ted Watson	Ranchers and the Agricultural Community
Todd Wester	Independent Outfitter
Dave Viers, Sr.	David Viers and Associates
Bob Wiltshire	International Fly Fishing Center
Ellen Woodbury	Park County Planner
Jim Woodhull	City of Livingston Planner

Source: BBC Research and Consulting, 2002.

The survey questions themselves were purposely open-ended. The survey interview guides are provided in Exhibits 2-3.

Exhibit 2-3.
Yellowstone River Impacts — Business Stakeholder Interview Instrument

Contact Information

Name:

Address:

Telephone Number:

Email Address:

Background and Affiliation

Stakeholder group(s):

Personal/business history in the valley:

Personal/Business Experience with the River (Financial and Economic/Social Effects)

Past Experience in Utilizing the River (i.e. water diversions, water rights, floating, angling, frequency – QUANTIFY IF POSSIBLE):

Personal/Business Issues with Utilizing the River:

Past Experience in Managing the River (diking, riprapping, diverting, other structures, QUANTITIES):

Personal/Business Issues with Managing the River:

Other Ways in which the River Affects Your Financial Wellbeing (income, flood damage, property values, QUANTIFY):

Other Ways in which the River Affects Your Economic/Nonfinancial Wellbeing (quality of life, aesthetics, health, QUANTIFY):

Threats to the River

What are the top threats?

Opportunities for the Future

What opportunities does the river present for the future?

What Should Be Done about the River?

How would your plan affect various stakeholders?

With Which Stakeholder Group(s) Do You Associate?

What Are the Characteristics of that Group?

Landuse:

Location/Geography:

For how long have they been in the area?

Number of people:

Age of members:

Social structure affiliation:

What Groups Should We Contact?

Groups, clubs, affiliations, stakeholder groups:

Contacts (names, phonenumbers):

Suggested surveying method:

Source: BBC Research and Consulting.

The discussion centered on the individual's background, social and economic interests in the region and their views and current and future threats to the Yellowstone River. Each interview lasted an average of 90 minutes.

Interview Results

Given the open-ended nature of the interviews, the results are not amenable to simple tabulation, nor are the number of interviews, which were widely dispersed among many different groups, amenable to statistical estimates or confidence intervals. On the other hand, these interviews were conducted with depth, which allowed for full discussions of any relevant issues by a single respondent. To protect the confidentiality of individual respondents, the interview results are summarized below without attribution.

Exhibit 2-4 summarizes the perceptions of stakeholder groups with regard to economic and social effects of river management. For example, spring creek owners view flood management as the means to preserve their incomes and potentially maintain their livelihoods. These economic impacts represent the potential viability of these families, with a long history in Park County, to stay on their ranches as vital parts of the community in terms of social effects. The loss of these families in the community would represent a significant social impact. The ranchers in agricultural communities perceive similar economic and social effects from river management. Angling outfitters and businesses related to the river have an opposite view; they see a risk to their income and a potential loss of livelihood from river management. Realtors, businesses not directly related to the river and riverbank residents can see mixed effects of river management. On the one hand, river management represents a preservation of land and assets, but on the other, it might not promote a healthy river or the quality of life they value. Environmental advocacy groups are less equivocal, believing that a change in the natural environment is likely to be bad for the local economy and community.

Exhibit 2-5 highlights the issues of each stakeholder group related to the use of the Yellowstone River. The exhibit lists all of the prominent issues that were raised in the stakeholder interviews. Clearly, individual stakeholder groups have their particular issues associated with the use of the Yellowstone River that are somewhat unique to them and somewhat in common with other stakeholder groups. It is important to note that it is quite possible that other stakeholder groups will agree with issues raised by another; however, they did not volunteer those issues during the interviews. In this manner, this interview technique brings out those issues that are uppermost in the minds of the stakeholder groups but does not necessarily speak to other opinions they might hold. The broad-based surveys in Tasks 3 and 4 accomplish that purpose. Certain interesting observations from Exhibit 2-5 are:

- Overuse of the river and its potential to degrade the aesthetics and the recreational values of the river is a concern of almost all stakeholder groups. It is the single most strongly held view related to use that came from the stakeholder interviews.

- Overdevelopment along the riverbanks is also a prominent issue among at least three of ten stakeholder groups.

- Preservation of the wild and uncontrolled nature of the river, and the essential role that element plays in the river experience, was also mentioned as important by three of the stakeholder groups.

Exhibit 2-4.
Stakeholders' Perceptions of Economic and Social Effects of River Management

Stakeholder Group	Economic Effects	Social Effects
Spring Creek Owners	Preservation of substantial income; potential maintenance of livelihood	Maintenance of viability of families with long Park County history
Angling Outfitters	Risk of income loss; potential loss of livelihood	Risks region's link to angling past
Ranchers and Agricultural Community	Preserves irrigation water and land	Maintains important social group
Realtors	Mixed effects on property values and quality of life	Link between newcomers and old-timers
Businesses Not Directly Related to River	Only as it affects entire study area; healthy river means healthy economy; flood protection and quality of life important	Some business interests have deep roots; support community and residents
Businesses Related to River	Means healthy economy; fear of risking income loss	Some business interests have deep roots
Environmental Advocates	Change to natural envioronment bad for economy	Healthy environment breeds healthy social conditions
Riverbank Residents	Might be negative and positive	Newcomers and established families

Source: BBC Research and Consulting, 2002.

Exhibit 2-5.
Stakeholders' Issues Related to Yellowstone River Use

Issues	Spring Creek Owners	Local Government and Economic Development	Angling Outfitters	Ranching/Agricultural Community	Realtors	Businesses Not Directly River Related	Businesses Related to River	Environmental Advocates	Riverbank Residents
1. River supports property values and taxes	✓	✓		✓					
2. Overuse degrading River aesthetics, recreation	✓	✓	✓	✓	✓	✓	✓		✓
3. Nonresidents do not see river overuse a problem yet.					✓				
4. Promote River's use to visitors						✓			
5. Increased use causes breach of private property rights	✓								
6. Agriculture contibutes to River experience		✓							
7. Cattle degrades riverbank, hurts fishery			✓					✓	✓
8. Cattle need access to bank for drinking water and calving				✓					
9. Conflicts between River users			✓				✓		✓
10. Bait fishing destroys fishery			✓						
11. Wildness and uncontrolled nature part of experience			✓			✓			✓
12. Locals appreciate river aesthetics, recreation, too					✓	✓			✓
13. Newcomers appreciate river recreation, related quality of life					✓	✓			✓
14. River vital in attracting people					✓	✓			
15. Irrigation diversions less important now than recreation, aesthetics					✓				
16. Overdevelopment on banks of river threatens River experience		✓	✓					✓	
17. Building near river preserves high property values					✓				
18. Property owners limiting access, newcomers resist						✓			
19. Public access vital to enjoyment						✓			
20. River use can increase if fish population maintained						✓			

✓ = Yes
✗ = No
Source: BBC Research and Consulting.

- The potential for cattle to degrade riverbanks and injure fisheries was mentioned by three stakeholder groups.

- At least three stakeholder groups believe that locals as well as newcomers appreciate the river's aesthetics, its recreation, and its contribution to the quality of life.

- Three stakeholder groups also mentioned that there were conflicts between different users on the river, such as between rafters and anglers.

- Three stakeholder groups pointed out that the river was an important feature in maintaining and increasing property values in Park County, but that fact also means higher property taxes.

Clearly there are conflicting perceptions related to Yellowstone River use. Whereas overuse was a concern to most, one stakeholder group pointed out that the river's use must be promoted more to visitors to grow the economy. Whereas a number of groups believed that overdevelopment on the banks along the riverbanks threatens the river, others point out that the ability to develop on the riverbanks preserves high property values. Certain groups believe that cattle degrade the riverbank, while others point out that cattle must have access to the riverbank for drinking water and calving. Whereas some stakeholders believe private property owners should be able to limit access to the river, others point out that public access is vital to river enjoyment. In sum, there is agreement among stakeholders on a number of river use issues but clearly disagreement on other issues.

Exhibit 2-6 highlights the various threats to the river as perceived by the different stakeholder groups and suggestions or viewpoints about river management. Threats to the river, as perceived by three or more stakeholder groups include:

- Subdivisions along the river and in the floodplain;

- Forest fires and subsequent soil erosion;

- Drought as a threat to the river's health;

- Sewage and stormwater runoff from urban development; and

Individual stakeholder groups saw other threats as well.

There were many suggestions and observations about management of the Upper Yellowstone River (as might be expected). Most often mentioned by different stakeholder groups were:

- Avoid riprap for new structures in the floodplain;

- Some protection for riparian zones in the floodplain is needed; and

- Community is not yet ready for management of river use.

Exhibit 2-6.
Threats to the River and Management Viewpoints Held by Stakeholder Group

Issues	Spring Creek Owners	Local Government and Economic Development	Angling Outfitters	Ranching/Agricultural Community	Realtors	Businesses Not Directly River Related	Businesses Related to River	Environmental Advocates	Riverbank Residents
1. Riprap and barbs better fish habitat than natural banks	✓		✓						
2. Subdivisions along river or in floodplain a threat to river	✓		✓			✓			
3. Restricted riverbank development decreases property values					✓				
4. Subdivision threat as riverbanks exaggerated						✓			
5 Over-regulation threat to river	✓								
6. Water diversions in drought		✓	✗						
7. Water diversion generally a threat								✓	✓
8. Forest fires and soil erosion		✓	✓	✓					
9. Urban runoff		✓			✓	✓	✓		
10. Development threatens access to angling			✓						
11. Drought a major threat to river's health			✓		✓	✓	✓		
12. Important to protect riparian zone and river floodplain			✓				✓	✓	
13. Flooding good for river			✓						
14. Inconsistent flood management helps some, hurts others			✓						
15. Weeds are great threat to river				✓					
16. One-size-fits-all solution pushes off ranchers, brings development, riprap, aesthetic loss				✓					
17. Poor vegetation, wildlife management in YNP worsening floods				✓					
18. Remove snags in side channels to let river spread out				✓					
19. Community not ready for managed river use					✓	✓	✓		
20. Everyone involved in river management, do what they want						✓			
21. Erosion of gravelbanks a threat						✓			
22. Let nature manage river						✓	✓		
23. Basic river access development needed						✓	✓		
24. Don't allow riprap for new structures in floodplain			✓			✓	✓		
25. Riprap prevents erosion; needed to protect property				✓		✓			
26. Riprap not a net positive for fish							✓	✓	
27. Special management circumstances should not drive policy							✓		
28. Straightening river or banks a problem						✓			
29. Fishing docks, retention walls ok						✓			
30. Geology should dictate flood management									✓
31. Management is necessary						✓			✓
32. Conservation easements good approach								✓	
33. Water quality a concern								✓	
34. Habitat and vegetation must spread out								✓	
35. Growth itself a threat								✓	

✓ = Yes
✗ = No
Source: BBC Research and Consulting.

As anticipated, there were contradictory views on some management alternatives:

- Some perceived riprap to be good fish habitat, but others disagreed with that notion.
- Some supported restricting subdivisions along the bank, but others disagreed.
- Some thought that over-regulation was a big threat to the river, but others believed that careful management was a good idea. To that point, however, some believed that inconsistent flood management has an arbitrary effect on different parties, whereas others believed that a one-size-fits-all solution ends up being bad for everyone.

Exhibit 2-7 highlights values or belief systems that stakeholders held and expressed during the interview process as they relate to the Yellowstone River. Most striking is the near unanimity associated with the importance of private property rights. Almost all stakeholder groups believe that private property rights in some instances can supercede public rights and should be respected. There is also agreement among at least four stakeholder groups that protecting the spring creeks is a priority. Other value systems are held by one or two stakeholder groups but not mentioned (although not refuted) by other stakeholder groups. It should be noted that compromise is a thread running through a number of value systems of different stakeholder groups.

Summary

The stakeholder interview process and the perceptions gained from it suggest that there are indeed a number of different stakeholder groups within the study area and that they do have different views about use of the Yellowstone River, threats to the river, management viewpoints and underlying basic values. Secondly, there is a long list of issues about the use of the Yellowstone River, threats to it and management of it, and there are a number of areas where agreement will be easier to achieve than others. There are contradictory views among stakeholder groups concerning the benefits of riprap and river management, subdivisions to the river, riverbank used by cattle and other issues, but these contradictory views are not universal. There is widespread recognition of the importance of the Yellowstone River to the area and some recognition of the need to compromise to achieve a good management system.

This stakeholder interview process identified the groups that must be addressed in the widespread surveys in Tasks 3 and 4. It is believed that a household and business survey should cover most of these interests across stakeholder groups. The more prominent issues mentioned during the stakeholder interviews helped in the design of the surveys undertaken in Tasks 3 and 4.

Exhibit 2-7.
Stakeholders' Values Related to Yellowstone River

Issues	Spring Creek Owners	Local Government and Economic Development	Angling Outfitters	Ranching/Agricultural Community	Realtors	Businesses Not Directly River Related	Businesses Related to River	Riverbank Residents
1. Private property rights can supercede public rights to river enjoyment	✓	✓		✓	✓	✓		✓
2. Protecting spring creeks a priority	✓		✓		✓		✓	
3. Irrigation water vital to area survival	✓		✗	✓				
4. Newcomers not so committed to local area values, interest in river		✓						
5. We suffer from "last man syndrome"		✓						
6. River advocates have improved river health			✓					
7. Compromises must be made			✓					
8. Flood management ok as long as fish protected			✓					
9. Riparian habitat is important			✓					
10. Treat ranchers like other land owners and MDOT				✓				
11. Want to do what is best for river as long as it doesn't hurt me				✓				
12. Newcomers appreciate river					✓		✓	
13. Locals appreciate river					✓		✓	
14. Environmental quality biggest attraction to area					✓			
15. Negative attitudes about river beginning to form						✓		
16. River is lifeblood to community						✓	✓	
17. River users must respect each other							✓	

✓ = Yes
✗ = No
Note: Stakeholder groups have been collapsed to reflect only those groups with relevant responses to stakeholders' values with regard to the river.
Source: BBC Research and Consulting.

TASK 3.
Economic Values in the Upper Yellowstone River Study Area

Introduction

This Task 3 report identifies and describes the perceived personal values on economic issues that are most important to the people of Task Force study area with regard to the Upper Yellowstone River. The Task 3 report conclusions are based on interviews of representatives of many stakeholder groups in the area and field surveys of residents, businesses and visitors to Park County along with a historical study of the area.

The workscope originally included a Task 3 report about social values and a Task 4 report focusing on cultural values. In its work in Task 2, however, BBC realized that stakeholders in study area distinguished between economic and social/cultural values, not between social and cultural values. With Corps and Task Force Socioeconomic Committee concurrence, BBC altered Task 3's focus to economic values, and the Task 4 report dedicated to social/cultural values.

BBC performed the historical analysis of economic values in Park County (Task 1 report) to lend context to the understanding of current economic values. The economy has changed much over the years, from a booming mining and railroad community to today's economy based much more heavily on tourism and agriculture. Understanding the evolution of economic values of Park County residents was essential to this report.

Following the historical study, BBC completed in-depth interviews with representatives of several stakeholder groups, as profiled in the Task 2 report. These interviews allowed BBC to effectively categorize the major stakeholder groups on the river, as well as to identify the river-related economic issues and values that were important to them. These interviews contributed to the design of the surveys of residents, businesses and visitors to Park County.

For this Task 3 report, BBC performed extensive surveys of residents, businesses and visitors to Park County in order to document the actual current values held in the study area. These efforts contributed to the verification of the economic values suggested in the Task 2 stakeholder interviews. It is important to note that this task's work aimed to understand personal perceptions of economic issues rather than collect economic values data to include in a later impact analysis.

From earlier work, BBC identified the major economic issues most raised by Park County residents, businesses and visitors:

- Impacts of different levels of water flow in the river (drought, normal and flood);
- Economic importance of different population groups to the Park County economy, including:
  - Tourists;
  - Ranchers;

  - Spring-creek related activities;
  - River-related businesses;
  - Tourist-related businesses;
  - New permanent residents;
  - Longtime residents; and
  - Seasonal residents.
- The rights of property owners to subdivide and build in the floodplain and to protect their property from flooding;
- Overuse or overcrowding of the river threatening the economy;
- The importance of riverbank vegetation to the river and visitor experience;
- Need for management of the river for flooding and erosion;
- Effectiveness of prior management attempts to control floods and erosion;
- Economic importance of the visitor's river experience;
- Importance of the river in attracting and retaining employees and residents;
- Yellowstone River as the lifeblood of the county; and
- The importance of the fishing, whitewater, scenery, wild nature of the river, noise, water level, public access, overcrowding, residential development, ranching activities, and manmade structures on the visitor experience on the river.

In this task report, following a brief summary of the results of the surveys, BBC addresses each economic issue in turn according to the surveys of residents, businesses and visitors to Park County. The report presents the survey results and relevant cross tabulations about various subpopulations of the survey groups, followed by BBC's observations of this information. Please see Appendices A, B and C for more detail on the results of the surveys of residents, businesses and visitors to Park County.

Summary of the Surveys

BBC administered three separate surveys during Summer 2002. BBC first surveyed residents in the study area over the phone. We completed 364 surveys out of a population of 6,828 households, creating survey results with a 95 percent confidence level. BBC then completed an in-person, door-to-door survey of 176 businesses in the study area. There are roughly 2,161 businesses in the study area, so BBC's business survey results are accurate to at least the 90 percent confidence level. Finally, BBC surveyed 288 visitors to Park County out of an estimated population of visitors at the time of 70,000. These survey results are accurate at the 90 percent confidence level. These three confidence levels, derived using normal distributions, imply that results of the surveys, i.e. percentages of the population that answered questions in certain ways, are likely to be correct 90 to 95 percent of the time. Additionally, crosstab analyses were presented for informational purposed only; no statistical significance tests were performed on the differences noted. See Appendices A, B and C for further information on these surveys' methods and results.

The questions BBC asked in these three surveys are enumerated in Exhibit 3-1 on the following page. The table also indicates which groups the questions were asked and in which report, economic or social/cultural values, the questions and their analysis appear. All answers to these questions were recorded and analyzed; "don't know" and "no opinion" responses were included.

Exhibit 3-1.
Survey Questions and Groups Asked

Source:
BBC Research and Consulting.

Question	Residents	Businesses	Visitors
Do drought or low flows have good, bad or no effects on your household/business?	Economic	Economic	
Do normal river flows by season (i.e., higher in the spring, lower in summer and autumn) have good, bad or no effects on your household/business?	Economic	Economic	
Do flood flows have good, bad or no effects on your household/business?	Economic	Economic	
How would you rate the effect of how high the water in the river was on your experience?			Economic
Given the current water level and depth of the river, the Upper Yellowstone River was as positive a part of my visitor experience as it could have been.			Economic
How important are tourists or other temporary visitors to the Park County economy?	Economic	Economic	
How important are ranchers to the Park County economy?	Economic	Economic	
How important are spring creek-related activities to the Park County economy?	Economic	Economic	
How important are river-related businesses to the Park County economy?	Economic	Economic	
How important are other tourist-related businesses to the Park County economy?	Economic	Economic	
How important are new permanent residents who have moved here in the past five years to the Park County economy?	Economic	Economic	
How important are longtime residents to the Park County economy?	Economic	Economic	
How important are seasonal residents to the Park County economy?	Economic	Economic	
Property owners should have a right to subdivide and build in the floodplain.	Economic	Economic	
How would you rate the effect that residential development along the river had on your experience?			Economic
Property owners should be able to protect their property from flooding with manmade structures, such as riprap, levees or dikes.	Economic	Economic	
Property owners along the riverbanks should be able to protect their property from flooding with manmade structures along the riverbanks.			Economic
How would you rate the effect that manmade structures, such as riprap, barbs, levees, dikes and bridges had on your experience?			Economic
The Upper Yellowstone River is an important reason why people move here *and* stay here.	Economic		
The Upper Yellowstone River is important in attracting and retaining employees.		Economic	
Overuse or overcrowding of the Upper Yellowstone River threatens the economic well being of Park County.		Economic	
Overuse or overcrowding of the Upper Yellowstone River threatens the well being of Park County residents.	Economic		
Riverbank vegetation is important to the river experience.	Economic	Economic	
How would you rate the effect that the amount of natural vegetation along the riverbank had on your experience?			Economic
A river that is managed to reduce flooding and erosion is in the best overall economic an d social interest of Park County residents.	Economic	Economic	
An unmanaged, free-flowing river is in the best interest of the visitor to Park County.			Economic

Exhibit 3-1 (continued)
Survey Questions and Groups Asked

Source:
BBC Research and Consulting.

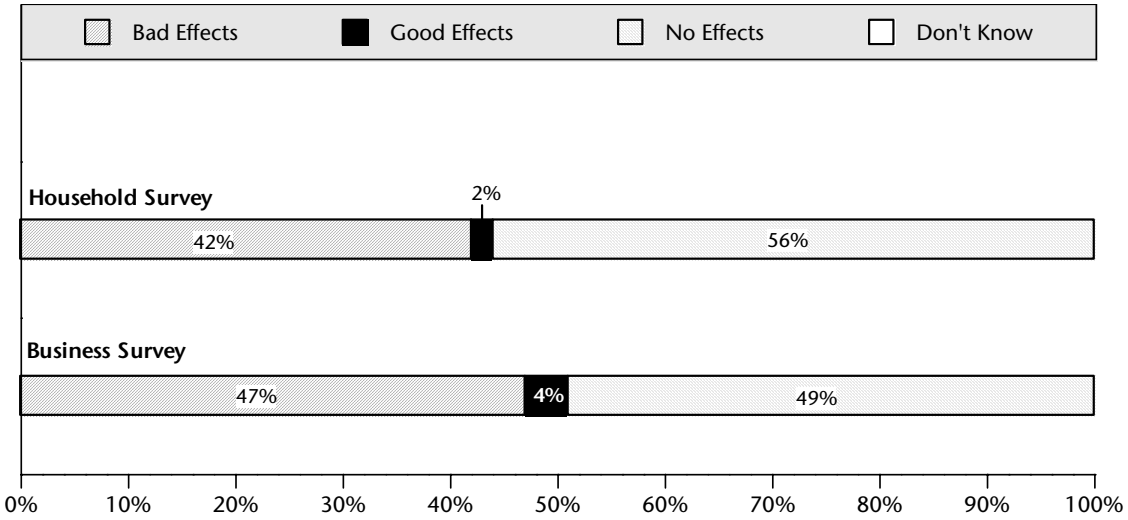
Question	Residents	Businesses	Visitors
Prior management of the river has been consistent and effective.	Economic	Economic	
The quality of the visitor experience on the river is very important to the economic well being of Park County.		Economic	
The quality of the visitor experience on the river is very important to the well being of Park County.	Social		
The Upper Yellowstone River is the lifeblood of Park County.	Social	Economic	
How would you rate the effect that the quality of the fishing in the river had on your experience?			Economic
How would you rate the effect that the quality of the whitewater in the river had on your experience?			Economic
How would you rate the effect that the quality of the scenery on or near the river had on your experience?			Economic
How would you rate the effect that the wild and undeveloped nature of the river had on your experience?			Economic
How would you rate the effect that the level of unnatural/manmade noise had on your experience?			Economic
How would you rate the effect that public access to the river had on your experience?			Economic
How would you rate the effect that cattle or ranching activities along the river had on your experience?			Economic
If you could plan your trip to Park County over again, and after the experiences you had with the Upper Yellowstone River, you would stay here longer next time.			Economic
How important are tourists or other temporary visitors to the social and cultural environment of Park County?	Social	Social	
How important are ranchers to the social and cultural environment of Park County?	Social	Social	
How important are spring creek-related activities to the social and cultural environment of Park County?	Social	Social	
How important are river-related businesses to the social and cultural environment of Park County?	Social	Social	
How important are other tourist-related businesses to the social and cultural environment of Park County?	Social	Social	
How important are new permanent residents to the social and cultural environment of Park County?	Social	Social	
How important are longtime residents to the social and cultural environment of Park County?	Social	Social	
How important are seasonal residents to the social and cultural environment of Park County?	Social	Social	
Fishing in the Upper Yellowstone is a major component of the quality of life of the Park County labor force.		Social	
Fishing in the Upper Yellowstone is a major component of the quality of life of Park County residents.	Social		
Other river-related recreational activities are important components of the quality of life of the Park County labor force.		Social	
Other river-related recreational activities are important components of the quality of life of Park County residents.	Social		
The beauty of the Upper Yellowstone River is an important component of the quality of life for the Park County labor force.		Social	
The beauty of the Upper Yellowstone River is an important component of the quality of life of Park County residents.	Social		

The Issues and Results

Effects of river flows. The first set of questions BBC asked of residents, businesses and visitors concerned the impact of different levels of water flow in the Upper Yellowstone River.

Drought flows. When asked how drought flows affected their households or businesses, survey respondents most often answered that they had no effect. Of those households and businesses affected by drought flows, however, most of them were negatively affected.

Exhibit 3-2.
Do drought or low flows have good, bad, or no effects on your household/business?



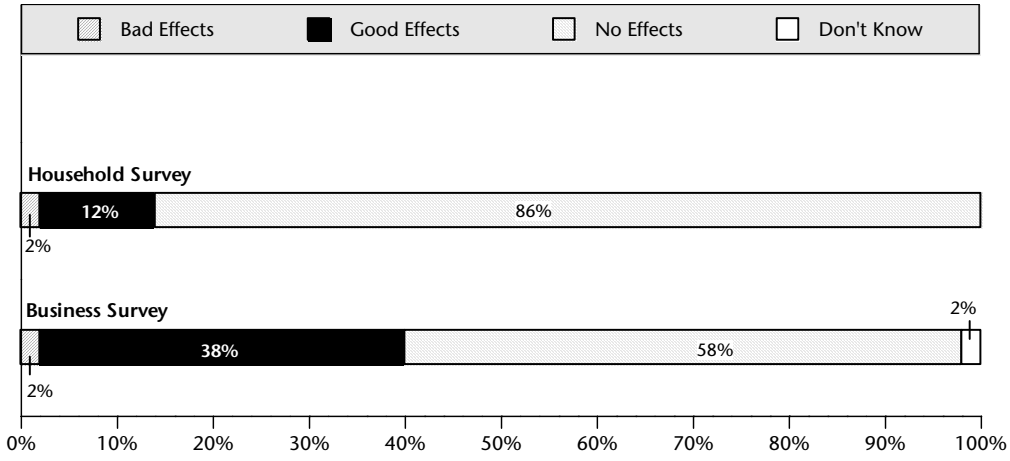
Source: BBC Research and Consulting.

It is important to note that a significant portion of Park County is concerned about the river reaching drought flow levels, which suggests an understanding of the negative economic effects of drought.

There was no significant difference in the answers given by newer versus older businesses. Businesses were classified as being in Park County more or less than 10 years. Each group represented roughly 50 percent of respondents. The more dependent a business's sales were on the river, however, the more often it recognized the negative impacts from drought flows. Businesses were classified as having 0 to 3 percent of their sales dependent on the river, 4 to 10 percent, 11 to 25 percent, and 26 to 100 percent. Each group represented roughly 25 percent of respondents.

Normal flows. BBC asked residents and businesses what impact normal river flows by season might have on them, and again, most of them indicated that they experienced no appreciable effects. Of those who did experience impacts from normal river flows, the majority was positively affected.

Exhibit 3-3.
Do normal river flows by season (i.e., higher in the spring, lower in summer and autumn) have good, bad, or no effects on your household/business?



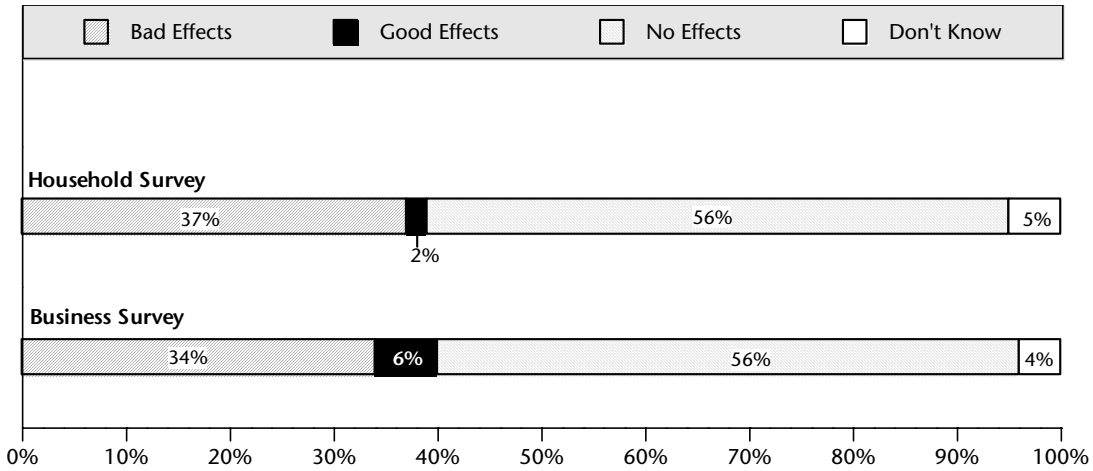
Source: BBC Research and Consulting.

These responses suggest that most residents and businesses do not think about the flows of the Upper Yellowstone River when they are "normal by season." If they do, however, most people think normal flows are a positive thing for the area.

There was no notable difference in responses to normal river flows from newer versus older businesses. As a business's sales were increasingly dependent upon the river, however, they were more often positively affected by normal river flows.

Flood flows. When asked about the impact of flood flows, most respondents said that there was no impact. Approximately one third of homes and businesses said that they were negatively affected.

Exhibit 3-4.
Do flood flows have good, bad, or no effects on your household/business?



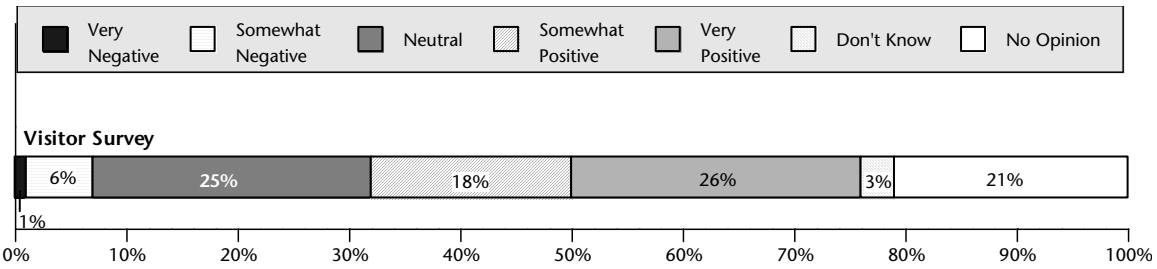
Source: BBC Research and Consulting.

Contrary to what might be expected, it is apparent that flood flows do not affect the majority of residents and businesses in Park County. However, a significant portion of the population considers floods to be a detriment to their households or businesses

Older businesses tended to experience negative impacts from flooding (41 percent) more often than younger businesses (28 percent), perhaps reflecting that flooding is a periodic event, and older businesses likely have experienced more floods than younger businesses have. Businesses with more sales dependent on the river were also more likely to be negatively affected by flood flows.

Water levels for the visitor. BBC asked visitors to Park County to rate the effects of water level on their visitor experience, and visitors were mixed in their responses (see Exhibit 3-5). About 25 percent were neutral on the issue, and only 7 percent thought it was a negative aspect of their experience. About 24 percent of respondents did not express an opinion. An estimated 44 percent were positively affected by the water level in the river. It is clear that many visitors who *do* think about it, consider the water level to be a positive part of their visitor experience. The important message is that maintaining good levels of water in the river is often important to the visitor who contributes much to the economy in Park County.

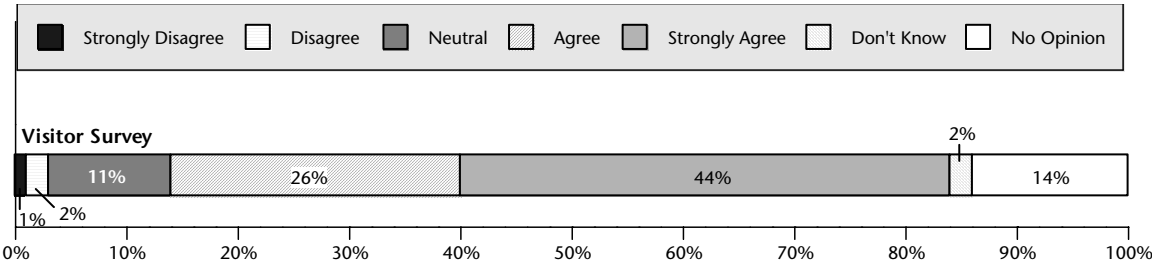
Exhibit 3-5.
How would you rate the effect of how high the water in the river was on your experience?



Source: BBC Research and Consulting.

Current water level in the visitor experience. BBC asked visitors, given the current water level and depth of the river, whether the Upper Yellowstone River was as positive a part of their visitor experience as it could have been. Visitors overwhelmingly agreed. About 70 percent of visitors agreed or strongly agreed with this statement, while only 3 percent disagreed or strongly disagreed. Water levels are an important consideration in the visitor's experience and overall visitors were quite satisfied with their experience given whatever the water level was at the time, regardless of whether it was higher or lower than they expected.

Exhibit 3-6.
Given the current water level and depth of the river, the Upper Yellowstone River was as positive a part of my visitor experience as it could have been.



Source: BBC Research and Consulting.

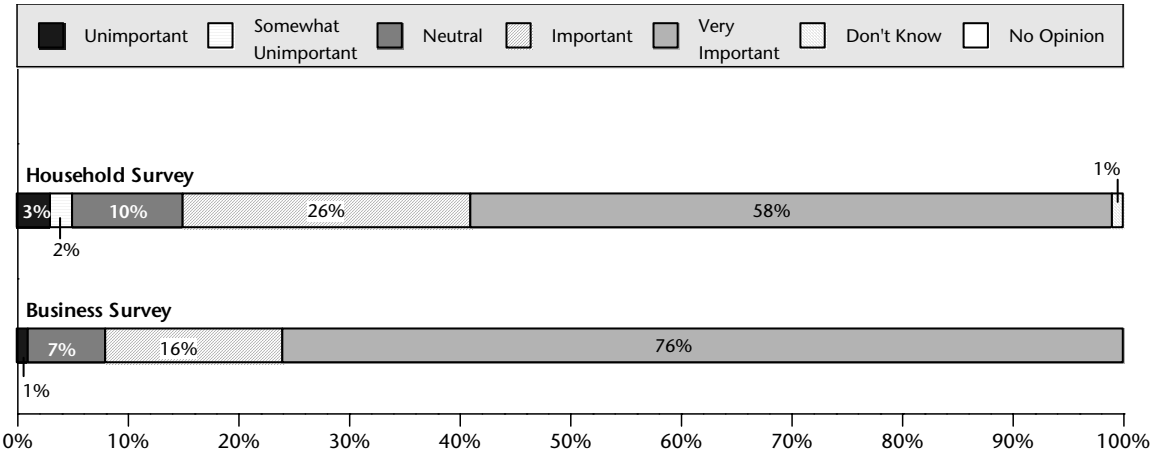
Summary of the impacts of water flows. BBC can draw several generalizations about the economic values of river flows. First, the majority of residents and businesses consider themselves unaffected by the river's levels. A sizeable group are both negatively impacted by droughts and floods and positively affected by normal flows. Interestingly, drought flows appear to be of *greater* concern than flood flows to residents and businesses. Also, water levels are important to visitors, but they are generally pleased with their visitor experience regardless of how high the water levels were at the time.

Water levels in the river are perceived to be important to the economy, both directly to residents and businesses — though less vitally so to visitors. Water levels, drought as well as flood, should be an important consideration in river management planning.

Importance of different population groups. BBC asked residents and businessowners about eight different population groups in the county, to understand how important they perceived each group to be in the Park County economy.

Tourists. When asked how important tourists are to the Park County economy, almost all residents and businesses largely believed them to be very important or important.

Exhibit 3-7.
How important are tourists or other temporary visitors to the Park County economy?



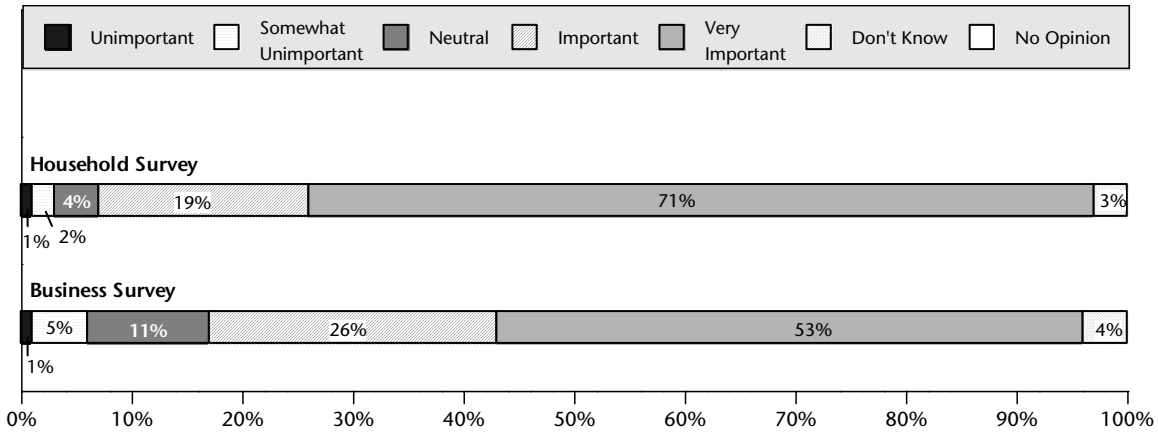
Source: BBC Research and Consulting.

The importance of tourists was even greater to residents outside Livingston (95 percent) than to Livingston residents (82 percent), which perhaps reflects a strong perception of tourism-dependence more often held by Emigrant, Gardiner and Paradise Valley residents. There were no significant differences in responses from residents whose parents had lived in Park County versus those whose parents had not, from longer-term versus shorter-term residents, or from residents whose homes were along the river versus those whose homes were not. Longer-term residents had lived in Park County for more than 10 years, while shorter-term residents had lived in the county for less than 10 years.

Newer businesses indicated that tourists were very important to the economy (87 percent) more often than older businesses did (66 percent). Newer businesses are likely more dependent upon tourists, as the tourism industry has boomed in past years. Businesses whose sales are more dependent on the river also more often thought that tourists are important to the economy.

Ranchers. The next inquiry was how important residents and businesses thought ranchers were in the economy. The majority of both groups of respondents thought that ranchers are very important, and more than 75 percent of each group thought ranchers important or very important.

Exhibit 3-8.
How important are ranchers to the Park County economy?

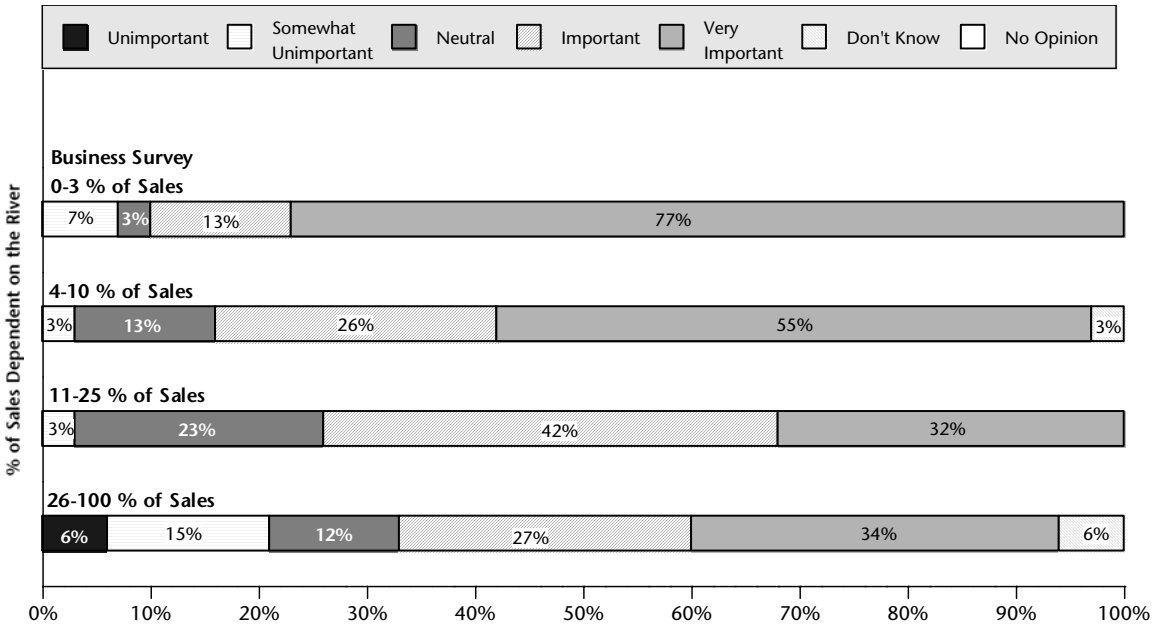


Source: BBC Research and Consulting.

Naturally, ranching residents thought themselves (ranchers) more important than the general survey population did — 91 percent thought ranchers very important to the economy. Longer-tenured residents also thought ranchers very important to the economy (74 percent) more often than shorter-tenured residents did (61 percent). There were no notable differences in the responses from residents whose homes were along the river versus those whose homes were not.

There was not much difference between responses from older versus newer businesses. Businesses whose sales were more dependent on the river, however, tended to believe ranchers less important to the economy than less river-dependent companies did (see Exhibit 3-9 below).

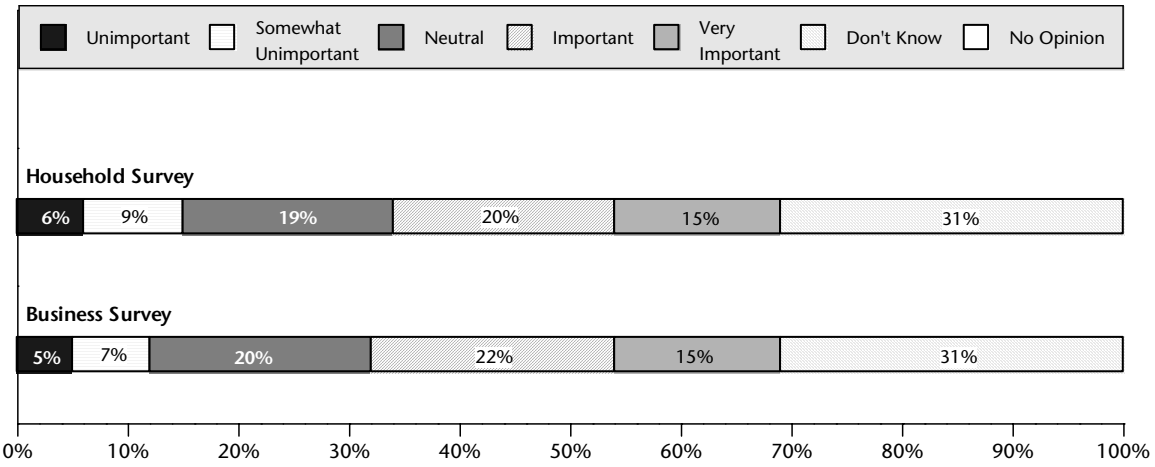
Exhibit 3-9.
How important are ranchers to the economy by percent of business sales during the summer?



Source: BBC Research and Consulting.

Spring creek-related activities. BBC asked residents and businesses how important they thought spring creek-related activities were economically. Responses were well distributed between neutral, important and very important. It should be noted that a neutral or don't know response was offered by about half the household and business respondents. Though many residents and businesses appreciate the spring creeks' contributions to the economy, even more people do not know about the creeks or recognize the creeks' economic contributions to be only neutral to minimal.

Exhibit 3-10.
How important are spring creek-related activities to the Park County economy?

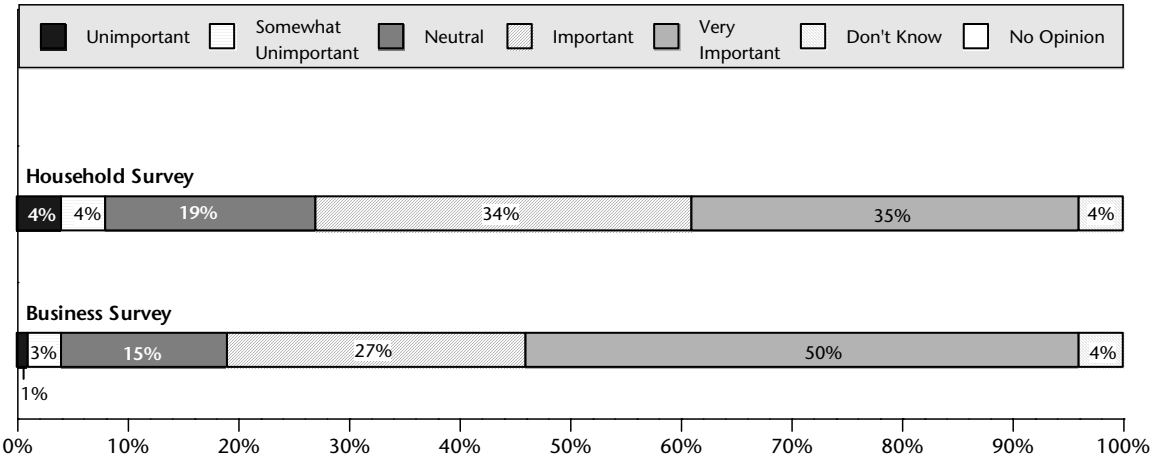


Source: BBC Research and Consulting.

Ranching residents and residents employed in nontourist-related businesses thought that spring creeks were relatively more important. Spring creeks are relatively more important to summer-oriented companies. Companies were classified as having 0 to 33 percent of their sales in summertime, 34 to 50 percent, 51 to 75 percent and 76 to 100 percent. Each group represented roughly 25 percent of respondents.

River-related businesses. When asked how important river-related businesses are to the Park County economy Park County, most residents and businesses thought them important or very important. Residents thought them slightly less important than businesses, as shown in Exhibit 3-11. These results indicate that both residents and businesses perceive river-related businesses as being a vital part of the economy in the study area.

Exhibit 3-11.
How important are river-related businesses to the Park County economy?

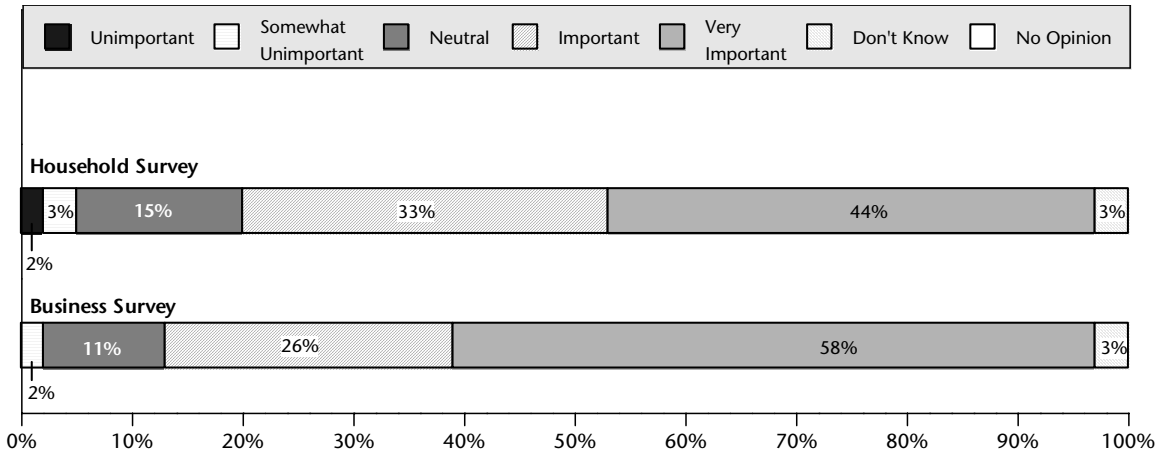


Source: BBC Research and Consulting.

The most summer-oriented businesses thought river-related businesses most often very important (72 percent) versus less summer-dependent companies that thought river-related businesses very important only 41-46 percent of the time. There was no significant discrepancy in the response distributions of older versus newer businesses, however.

Other tourist-related businesses. BBC asked residents and businesses how important they believed other tourist-related businesses, such as hotels and souvenir shops, are to the Park County economy. Both groups thought these businesses generally were important or very important economically, though businesses viewed their other tourist-related counterparts as being somewhat more important than residents did, as shown in Exhibit 3-12. It is clear that both residents and businesses realize how important other tourist-related businesses are to the economy in Park County.

Exhibit 3-12.
How important are other tourist-related businesses to the Park County economy?

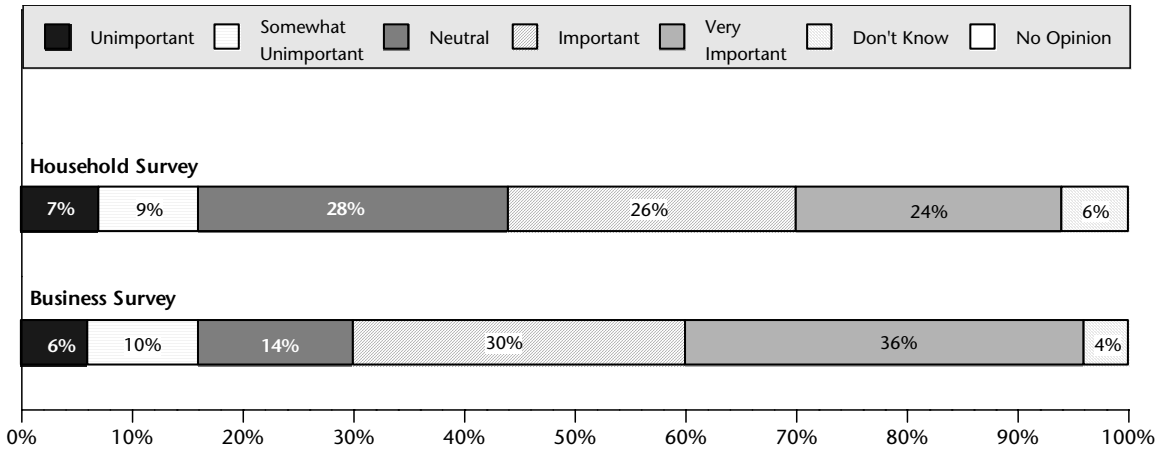


Source: BBC Research and Consulting.

Ranching residents thought other tourist-related businesses were less important than the general resident survey population did. Younger companies thought that other tourist-related businesses were more often very important (64 percent) than older companies did (51 percent). Gardiner residents and businesses thought other tourist-related businesses more important than other residents and businesses.

New permanent residents. Residents and businesses overall perceived new permanent residents as being important or very important to the economy in Park County, though businesses thought them somewhat more important than residents did.

Exhibit 3-13.
How important are new permanent residents who have moved here in the past five years to the Park County economy?

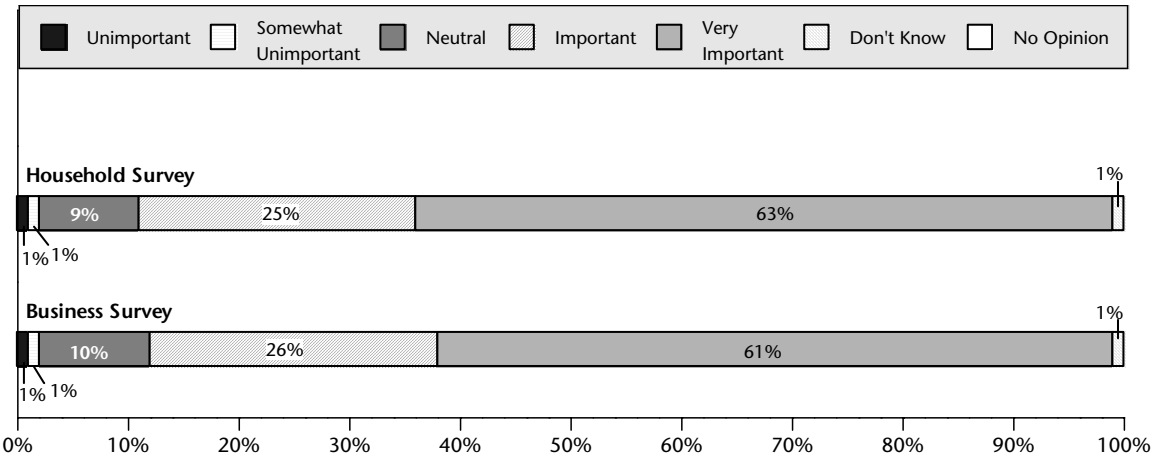


Source: BBC Research and Consulting.

Newer residents naturally thought themselves (new permanent residents) more often important or very important to the economy (73 percent) than longer-term residents did (44 percent).

Longtime residents. When asked how important longtime residents are to the Park County economy, both residents and businesses (almost 90 percent) thought them important or very important, indicating a clear belief that longtime residents are the foundation of the economy in this area for both employment and consumer spending.

Exhibit 3-14.
How important are longtime residents to the Park County economy?

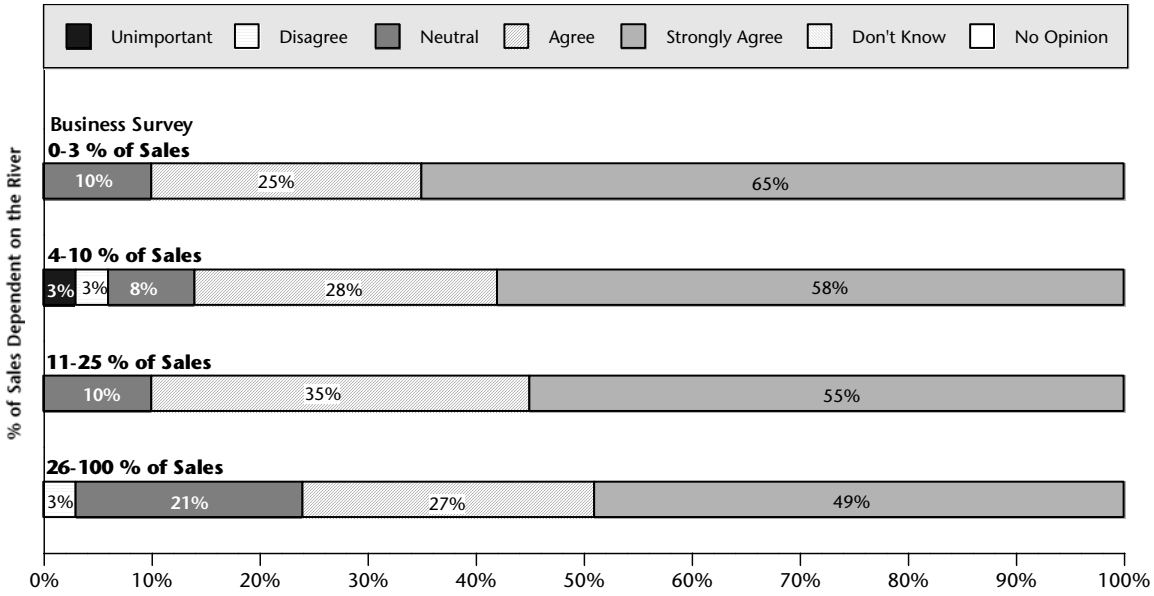


Source: BBC Research and Consulting.

Ranching residents thought longtime residents are very important to the Park County economy (82 percent) more often than the general resident survey population did (63 percent). Longer-term residents also viewed themselves as being important or very important more often (90 percent) than newer residents did (80 percent). There were no other major differences in responses from the cohorts of the resident survey population, including residents with Park County versus non-Park County parents, residents with homes on or off the river, or residents in Livingston or outside town.

The more dependent a business was on the river for sales, the more likely it was to think longtime residents less important to the economy here (see Exhibit 3-15).

Exhibit 3-15.
How important are longtime residents to the Park County economy by percent of sales dependent on the river?

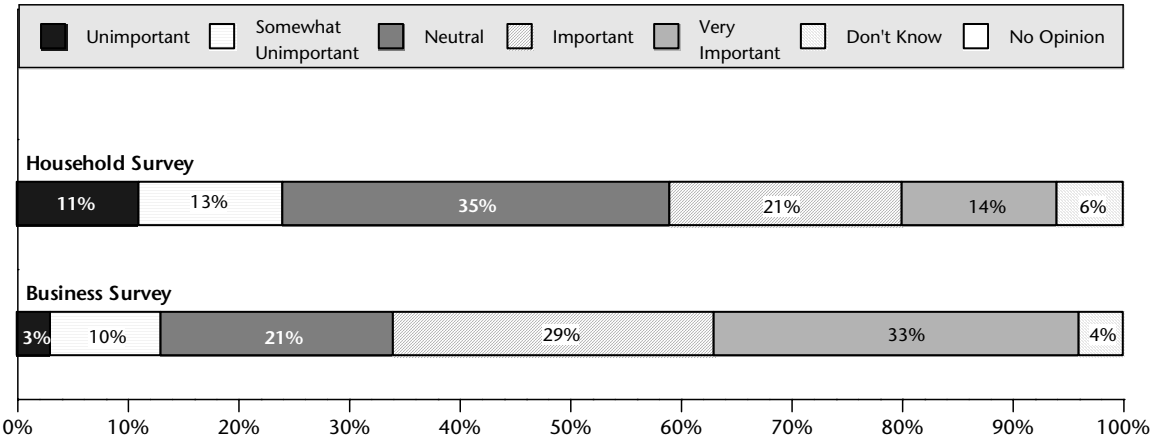


Source: BBC Research and Consulting.

There was no significant difference in response distributions between older and newer businesses.

Seasonal residents. Residents and businesses were mixed in their perceptions of the importance of seasonal residents to the economy in Park County. Businesses thought them much more important than residents did, though businesses thought them more often neutral or unimportant compared with new permanent or longtime residents.

Exhibit 3-16.
How important are seasonal residents to the Park County economy?



Source: BBC Research and Consulting.

For residents whose parents lived in Park County, seasonal residents were more often unimportant or somewhat unimportant to the economy (31 percent) than to residents whose parents were not County residents. On the other hand, residents outside Livingston more often believed seasonal residents were important or very important to the economy (47 percent) than Livingston residents did (32 percent), perhaps reflecting a rural understanding of the county's changing land ownership patterns stemming from seasonal residents. There was no notable difference in perceptions of seasonal residents' importance between riverbank and off-riverbank residents.

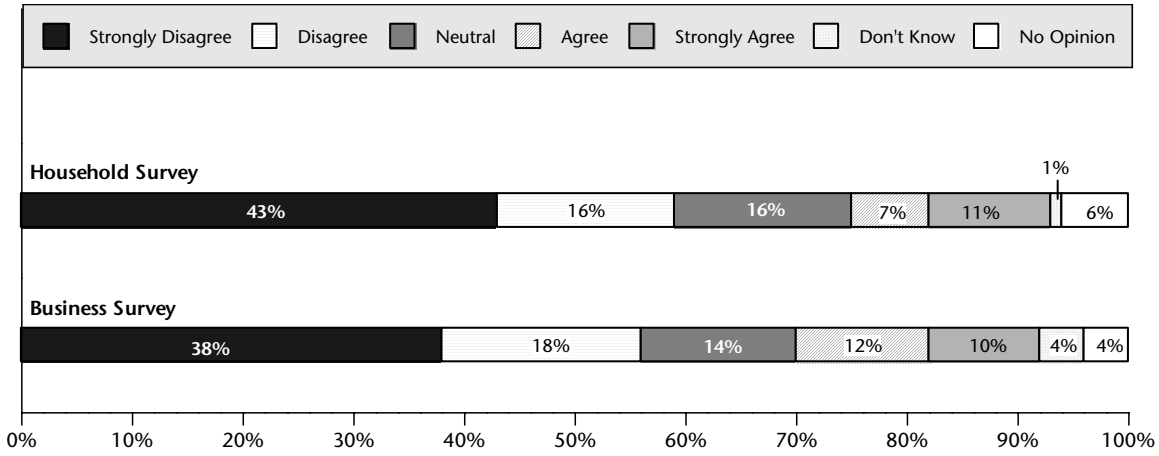
Newer businesses more often thought that seasonal residents are very important to the economy (39 percent) than older businesses did (26 percent). More summer-oriented companies also more often thought seasonal residents important to the economy.

Summary of population groups economic importance. The themes in this section are clear: residents and businesses perceive tourists, ranchers and longtime residents to be important or very important to the Park County economy. Ranchers and long-time residents might be respected for their historical as well as current roles in the local economy, as indicated in the historic overview in Task 1. River-related businesses and other tourist-related businesses are not far behind in how economically important residents and businesses perceive them to be. Finally, residents and businesses perceive spring creek-related activities, new permanent residents and seasonal residents to have impacts that are less clear or more moderate on the Park County economy.

Value statements. BBC lastly presented residents, businesses and visitors with several questions and statements that probed their economic value sets. The results are presented below.

Subdividing, building and residential development in the floodplain. When BBC asked residents and businesses whether property owners should have a right to subdivide and build in the floodplain, the majority disagreed or strongly disagreed. Business and resident responses broke down similarly as shown in Exhibit 3-17 below.

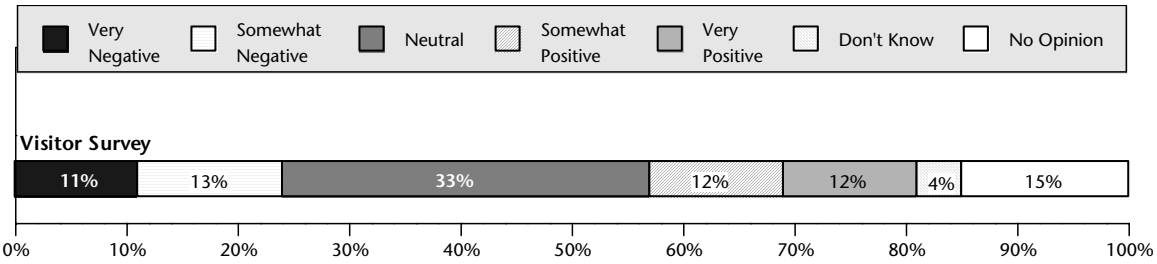
Exhibit 3-17.
Property owners should have a right to subdivide and build in the floodplain.



Source: BBC Research and Consulting.

When BBC asked visitors how residential development along the river affected their visitor experience, they were quite divided. The largest number of visitors was neutral on the issue, but one quarter thought that residential development was negative and one quarter positive for the visitor experience. Hence, the visitor experience offers limited guidance on this issue as of 2002.

Exhibit 3-18.
How would you rate the effect that residential development along the river had on your experience?



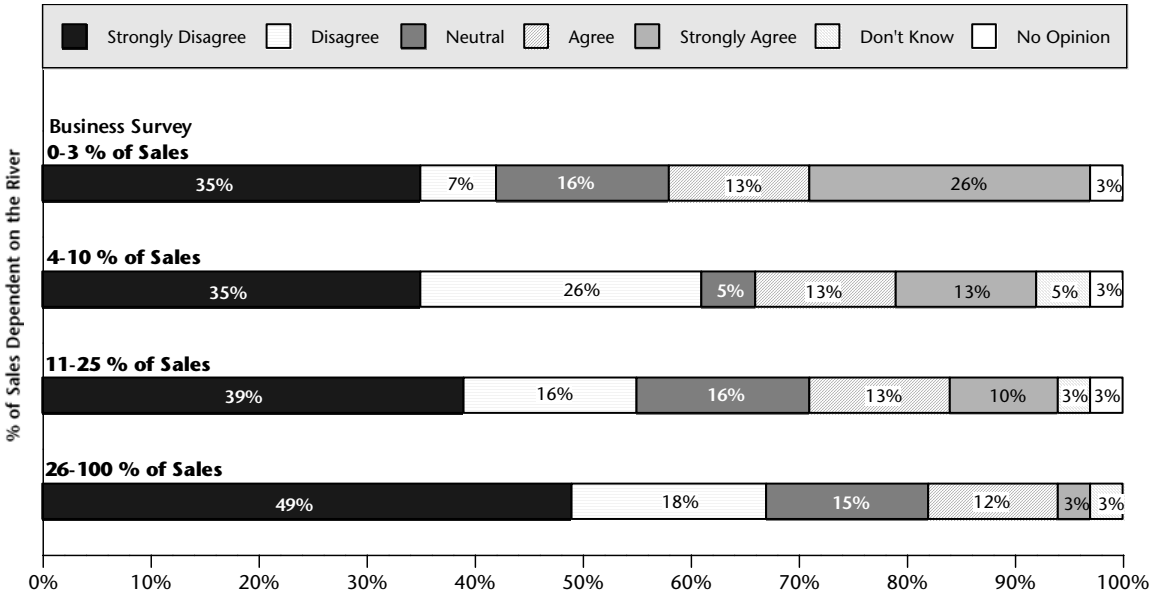
Source: BBC Research and Consulting.

BBC asked visitors who had visited Park County before whether they had noticed any changes that affected their visitor experience. Of those visitors who did notice changes, 43 percent of them thought that residential development along the river somewhat or very negatively affected their visitor experience, while only 18 percent of visitors who did not notice changes thought residential development negative.

Ranching residents agreed or strongly agreed that property owners should be able to subdivide and build in the floodplain more often (45 percent) than the general resident survey population did (18 percent). No other resident subgroups had major differences in response distributions, however.

As businesses were more dependent upon the river for their sales, they were also more likely to think that subdivision and building in the floodplain was not a good idea (see Exhibit 3-19). Their incomes are dependent upon the experiences people have on the river, which they might believe is threatened by subdivision.

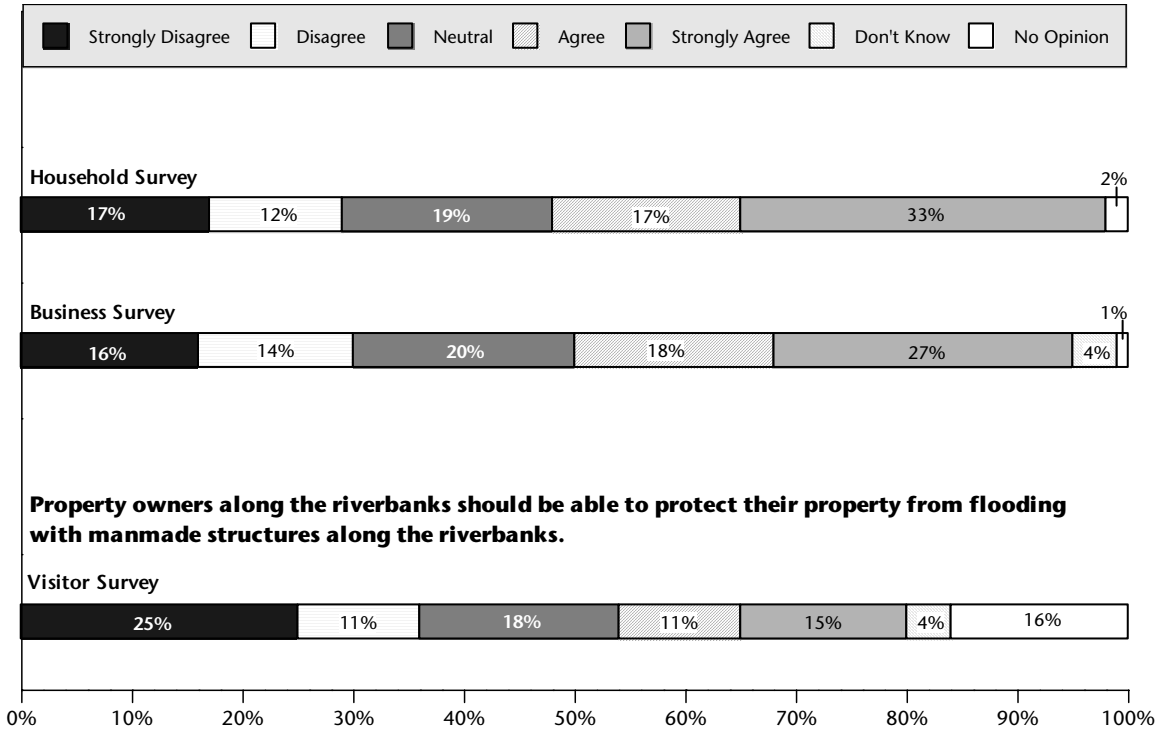
Exhibit 3-19.
Property owners should have a right to subdivide and build in the floodplain, by percent of sales dependent on the river.



Source: BBC Research and Consulting.

Protecting property from flooding with manmade structures. BBC asked residents, businesses and visitors whether property owners should be able to protect their property from flooding with manmade structures such as riprap, levees and dikes. Among respondent households, half agreed or strongly agreed with the statement, but 29 percent disagreed or strongly disagreed. For respondent business, the percentages were 45 percent and 30 percent, respectively. Visitors were somewhat more opposed to the idea; 36 percent disagreed or strongly disagreed, while 26 percent agreed or strongly agreed. It is clear that the county is divided on this issue of flood protection, which reflects the difficult tradeoffs involved in protecting property and structures in the Upper Yellowstone River's floodplain.

Exhibit 3-20.
Property owners should be able to protect their property from flooding with manmade structures such as riprap, levees, or dikes.

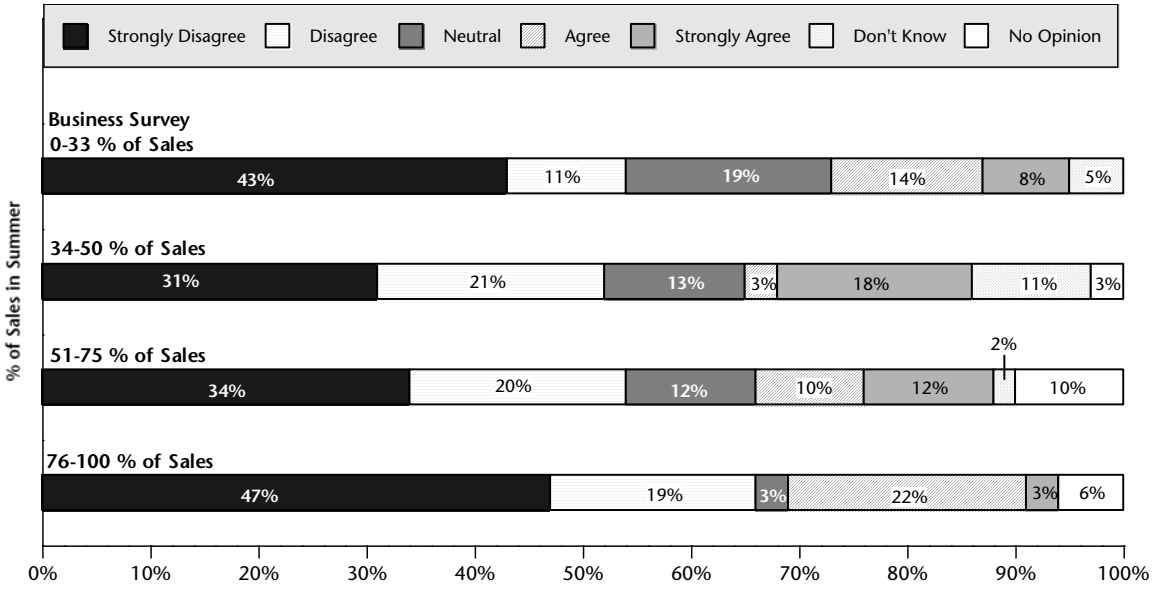


Source: BBC Research and Consulting.

Ranching residents more often agreed or strongly agreed with the idea of flood protection (82 percent) than the general resident survey population did (50 percent). On the other hand, newer residents disagreed or strongly disagreed with this idea more regularly (38 percent) than longer-time residents did (27 percent). A similar situation existed for residents whose parents did not live in Park County (35 percent) versus those whose parents did live in the area (21 percent). There were no differences in response distributions for resident subgroups whose homes were located near the river versus those whose homes were not near the river or for those residents located in Livingston versus non-Livingston locales.

There was no notable difference in the response distributions of older versus newer businesses in Park County with regard to protection of property from flooding with manmade structures. Businesses with more sales in summertime, however, more often disagreed with property owners' right to protect property from flooding (see Exhibit 3-21), reflecting their concerns that the visitor experience on the river might be threatened by these structures.

Exhibit 3-21.
Property owners should be able to protect their property from flooding with manmade structures such as riprap, levees, or dikes, by percent of sales in summer.

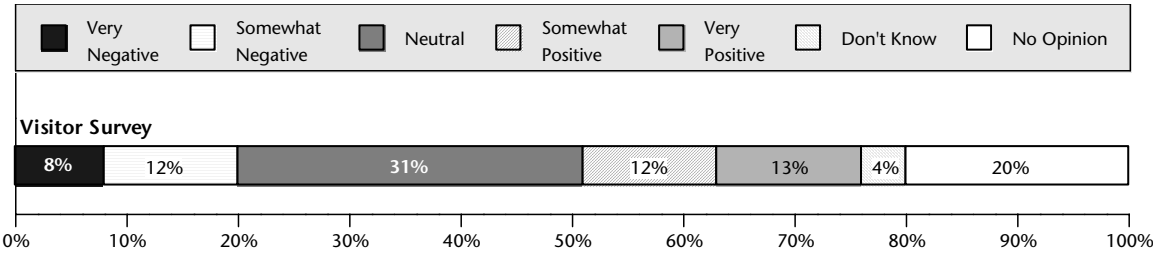


Source: BBC Research and Consulting.

Visitors who have visited Park County before more often disagreed or strongly disagreed with the idea of property owners protecting their property from flooding with manmade structures (41 percent) than visitors who had not visited before (29 percent).

BBC also asked visitors how manmade structures, such as riprap, barbs, levees, dikes, and bridges, affected their visitor experience, and visitors were generally agreeable with them. Only 20 percent of visitors thought they were somewhat or very negative for their visitor experience, and 25 percent thought them positive. Another 31 percent of visitors were neutral about manmade structures and their visitor experience, while 12 percent did not know or had no opinion.

Exhibit 3-22.
How would you rate the effect that manmade structures, such as riprap, barbs, levees, dikes, and bridges had on your experience?

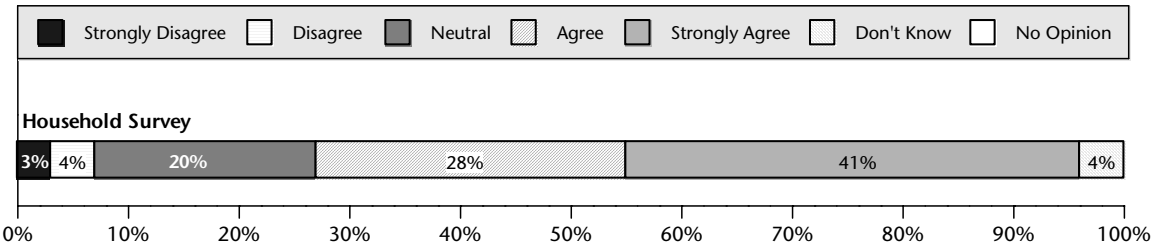


Source: BBC Research and Consulting.

BBC asked visitors who had visited Park County before whether they had noticed any changes that affected their visitor experience. Of those visitors who did notice changes, 30 percent of them thought that manmade structures on the river somewhat or very negatively affected their visitor experience, while only 16 percent of visitors who did not notice changes thought manmade structures innocuous. Visitors who rafted more often agreed with protection.

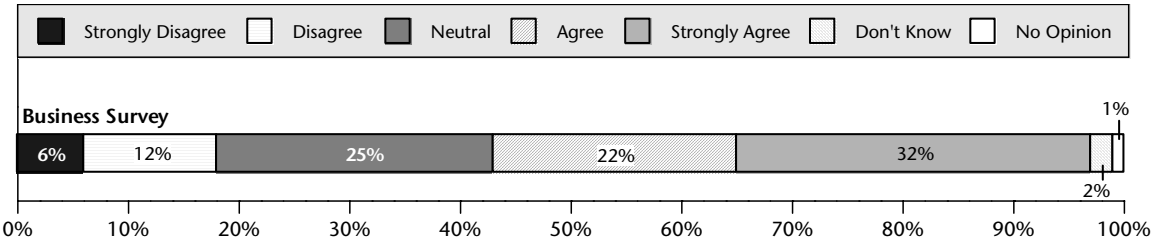
The river is important in attracting (and keeping) new residents and employees. BBC asked residents whether they believed the Upper Yellowstone River is an important reason why people move here and stay here, and they overwhelmingly agreed with this statement, with some 69 percent agreeing or strongly agreeing. Businesses were asked a similar question about the river being important in attracting and retaining employees, and again the majority of respondents indicated agreement, with 54 percent agreeing or strongly agreeing. Though residents' perceptions of the importance of bringing new people into the area and keeping current people here was somewhat stronger than businesses' perceptions, both groups supported the idea that the Upper Yellowstone River is an important component of the quality of life that attracts and keeps new residents and employees in the study area.

Exhibit 3-23.
The Upper Yellowstone River is an important reason why people move here *and* stay here.



Source: BBC Research and Consulting.

Exhibit 3-24.
The Upper Yellowstone River is important in attracting and retaining employees.

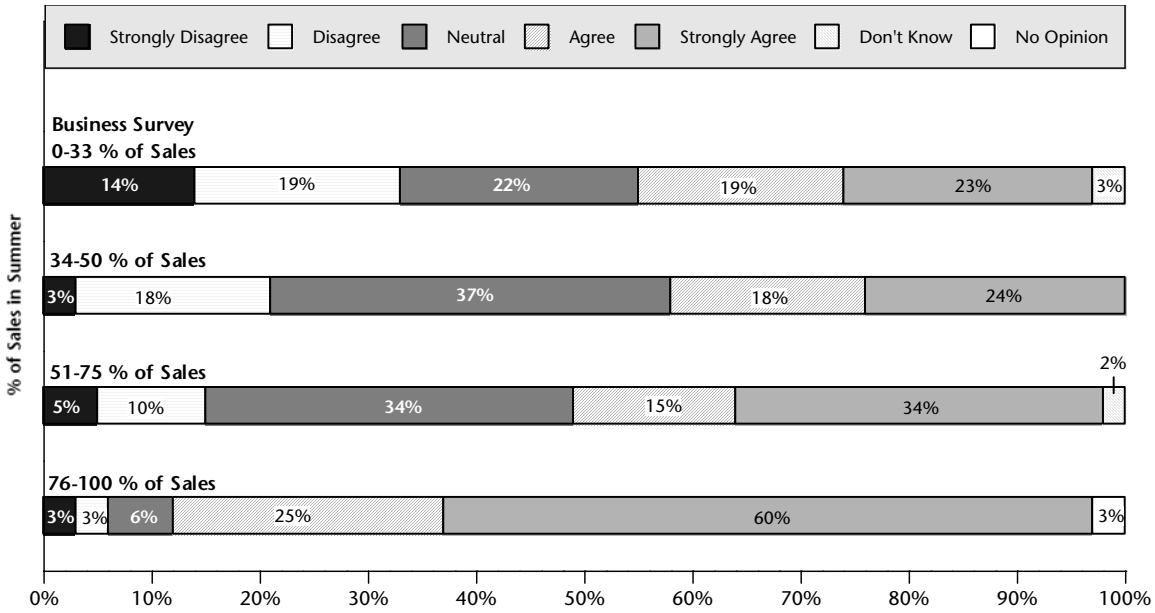


Source: BBC Research and Consulting.

Ranching residents — 91 percent of them — agreed or strongly agreed that the river is an important part of why people move to Park County and stay here, reflecting their deep-rooted appreciation of the river as part of their lives. Residents whose homes were on the banks of the Upper Yellowstone River or in its floodplain also more often agreed or strongly agreed with the idea of the river attracting and retaining newcomers (77 percent) than non-riverside residents did (68 percent). There were no other notable differences in response distributions for other resident subgroups.

Though there were no discernable differences in responses from older and newer businesses, there was a clear pattern in the responses from businesses of different levels of summer dependence with regard to the river's ability to recruit and retain employees. As a business's sales were increasingly dependent on summertime, the business was more likely to agree that the river was important in attracting and retaining employees (see Exhibit 3-25). The more summer-oriented a business is, the more tourism- and river-oriented it likely is, and the more important the river and activities related to the river are in staffing these positions.

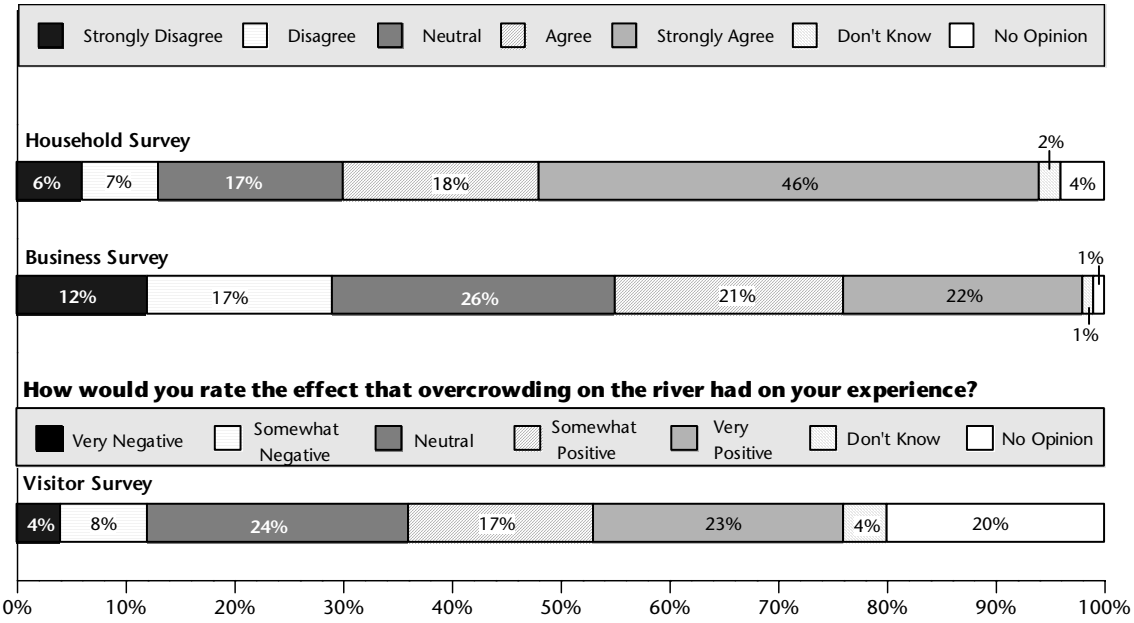
Exhibit 3-25.
The Upper Yellowstone River is important in attracting and retaining employees, by percent of sales in the summer months.



Source: BBC Research and Consulting.

Overuse of the river. When asked whether overuse or overcrowding of the Upper Yellowstone River threatens the well being of Park County or affected the quality of the visitor experience, almost two-thirds of household respondents agreed or strongly disagreed. Businesses were much more split on this issue; 44 percent agreed while 30 percent disagreed. Visitors, however, did not often feel that overuse of the river negatively affected their visitor experience. These results appear contrary — businesses and residents fear overuse of the river for its impact on the visitor experience and on their own experiences as users, but visitors generally have not noticed overuse as a problem.

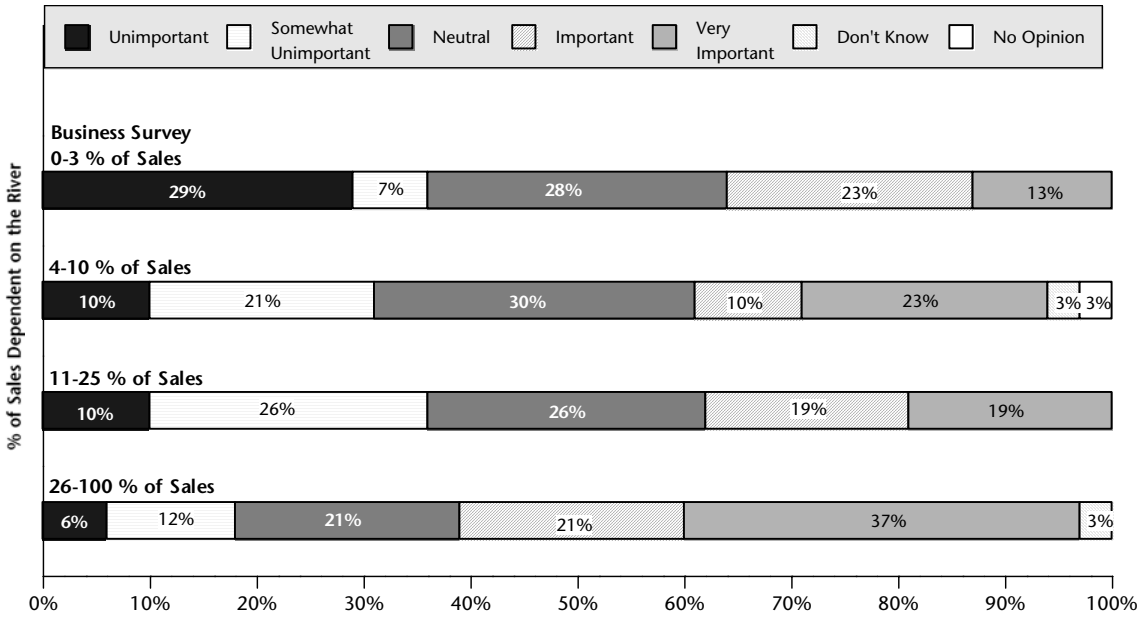
Exhibit 3-26.
Overuse or overcrowding of the Upper Yellowstone River threatens the [economic] well being of Park County residents.



Source: BBC Research and Consulting.

Ironically, the more businesses were dependent on the river for their sales, the more likely they were to think that overuse of the Upper Yellowstone River threatened the economic well being of Park County (see Exhibit 3-27 below).

Exhibit 3-27.
Overuse or overcrowding of the Upper Yellowstone River threatens the [economic] well being of Park County residents, by percent of sales dependent on the river.

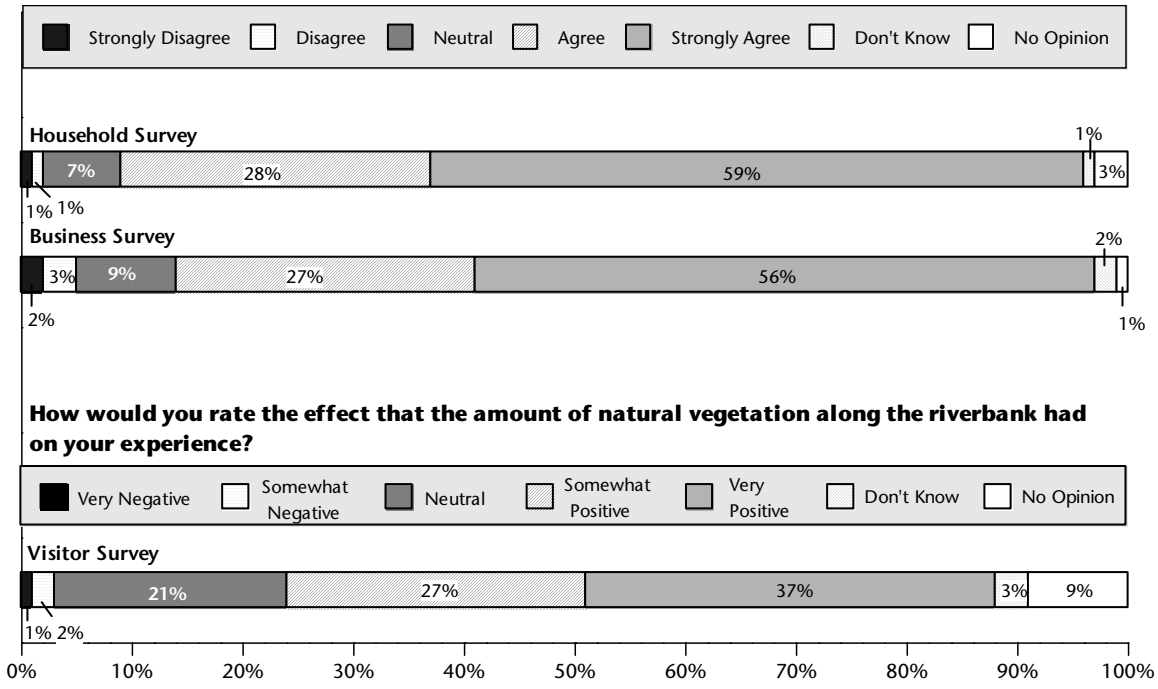


Source: BBC Research and Consulting.

There were no notable differences in response distributions among visitor cohorts.

Riverbank vegetation is important to the river experience. BBC inquired about whether residents, businesses and visitors believed that riverbank vegetation is important the river/visitor experience. Residents and businesses responded with similar distributions of agreement and overwhelmingly agreed with the statement, 87 percent and 83 percent, respectively. Two-thirds of visitor respondents indicated that the amount of natural vegetation along the Upper Yellowstone River's banks was a positive part of their visitor experience. The clear message is that riverbank vegetation is indeed a vital part of the experience of the Upper Yellowstone River.

Exhibit 3-28.
Riverbank vegetation is important to the river experience.



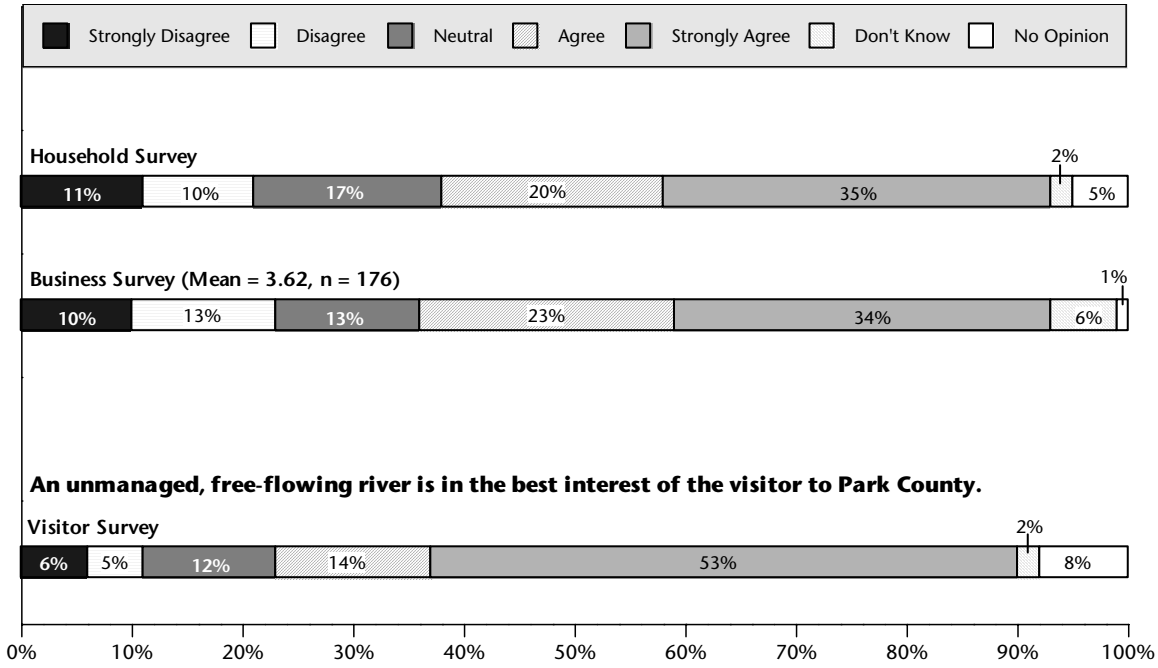
Source: BBC Research and Consulting.

Newer businesses tended to agree or strongly agree more often with riverbank vegetation's importance in the river experience (90 percent) than older businesses did (76 percent).

A managed river is best. When asked whether a river that is managed to reduce flooding and erosion is in the best overall economic and social interest of Park County residents (or the Park County Labor Force), residents and businesses were generally supportive, although one fifth of the respondents disagreed or strongly disagreed with this statement. The majority of residents (55 percent) and businesses (57 percent) agreed or strongly agreed with this statement. Visitors, on the other hand, when asked whether an *unmanaged*, free-flowing river is in the best interest of the visitor to Park County, overwhelmingly agreed with this statement, with 67 percent of respondents either agreeing or strongly agreeing. Thus, residents and businesses in Park County are at odds with visitors on whether management of the Upper Yellowstone River for flooding and erosion is the best course of action. Visitors, whose average time spent in Park County was only two and a half days, would rather

see the river wild and free-flowing to enhance their visitor experience. Residents and businesses, on the other hand, who have to reckon with the river every day, year in and year out, would prefer to see some kind of river management.

Exhibit 3-29.
A river that is managed to reduce flooding and erosion is in the best overall economic and social interest of Park County residents.



Source: BBC Research and Consulting.

Residents whose parents lived in Park County more often agreed or strongly agreed with the idea of a managed river (61 percent) than residents whose parents did not live in Park County did (53 percent). Residents with non-Park County parents also disagreed or strongly disagreed with this idea more often (25 percent) than residents with Park County parents did (15 percent). This result reflects again the reality that longer-term residents and families have dealt more often with floods and are more likely to see the Upper Yellowstone River as a natural force to be managed.

Surprisingly, residents whose homes were on the riverbanks or in the Upper Yellowstone River's floodplain *less* often agreed or strongly agreed with the idea of a managed river (48 percent) than residents whose homes were outside the floodplain did (57 percent). In addition, residents in the floodplain also disagreed or strongly disagreed with this idea of managing the river *more* often (28 percent) than residents outside the floodplain did (20 percent). This unanticipated result might suggest that floodplain residents have a concern that management in one part of the river can be a problem for downstream residents.

There was also a difference in the response distributions of residents in Livingston versus residents outside Livingston with regard to the idea of a managed river being best for Park County. Livingston residents clearly more often agreed or strongly agreed with this idea (59 percent) than non-Livingston

residents did (46 percent), and non-Livingston residents more often disagreed or strongly disagreed with river management as the best course of action (37 percent) than Livingston residents did (18 percent).

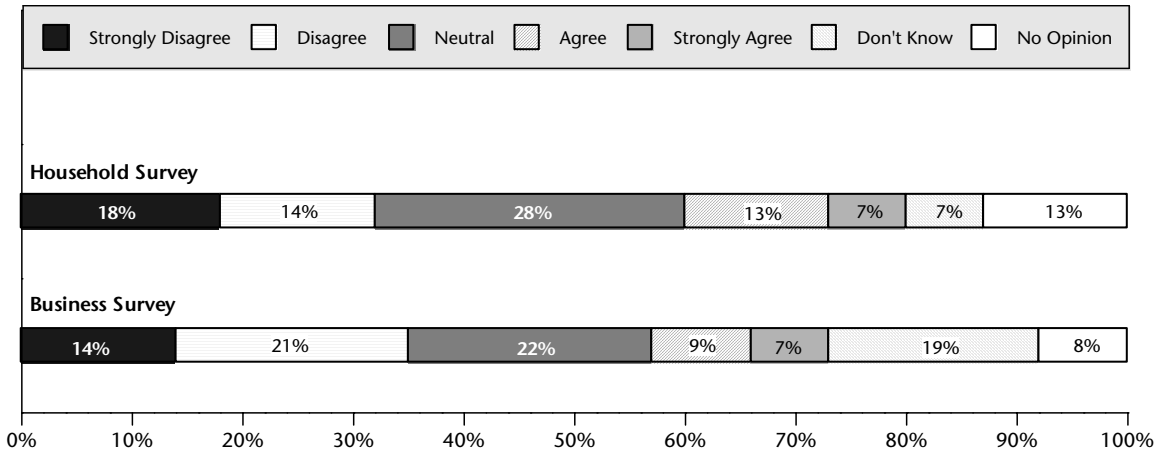
Newer businesses tended to more often disagree or strongly disagree with river management (27 percent) than older businesses did (19 percent), though both groups agreed or strongly agreed with this idea with roughly the same distributions (55 and 59 percent respectively). This result reflects the same reality as was found with longer-term versus shorter-term residents — the longer one has lived or worked in Park County, the more often one has dealt with the wild nature of the Upper Yellowstone River.

Businesses whose sales are more dependent upon the Upper Yellowstone River are more likely to disagree or strongly disagree with the idea of management of the river being the best idea for Park County. These river-dependent businesses are closely tied to the experience that visitors and users of the river have when fishing, rafting or otherwise enjoying the river. The wild, unmanaged nature of the river is perceived to be an important component of that experience.

BBC asked visitors who had visited before whether they had noticed any changes in the area that had affected their visitor experience. Of the ones who had noticed changes, it is important to note that about 80 percent of them agreed or strongly agreed that an unmanaged, free-flowing river is in the best interest of the visitor to Park County. Of the visitors who had not noticed any changes, 63 percent thought an unmanaged river was best. This result hints at a sense of urgency that returning visitors feel as they notice their Upper Yellowstone River undergoing changes.

Prior management has been consistent and effective. When asked whether they thought prior management of the river had been consistent and effective, both residents and businesses responded with very similar distributions of answers, amounting to highly mixed results. Both residents and businesses were more heavily weighted toward disagreeing or strongly disagreeing with this idea of effective and consistent prior management (32 and 35 percent respectively), though both groups' most often responded with neutrality. It is clear that Park County is divided on the issue of whether past river management has been consistent and effective, confirming the important mission of the Task Force and the Army Corps.

Exhibit 3-30.
Prior management of the river has been consistent and effective.



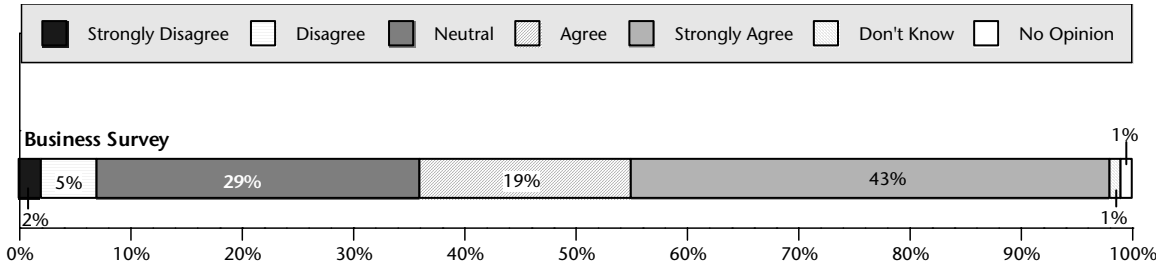
Source: BBC Research and Consulting.

Longer-time residents disagreed or strongly disagreed that prior management has been effective more often (33 percent) than newer residents (25 percent). Newer residents also did not know or had no opinion more often (30 percent) than longer-time residents did (18 percent). Longer-time residents have dealt with floods and the attempts at controlling those floods more often than newer residents, so they would have more time over which to form an opinion about this management issue. No other subgroups of residents had notable discrepancies in their response distributions for this question.

Older businesses, like longer-time residents, more often disagreed or strongly disagreed that prior management has been consistent and effective (40 percent) than new businesses (30 percent). The most river-dependent businesses also most often strongly disagreed with prior river management.

The quality of the visitor experience is important. BBC asked businesses whether they agreed that the quality of the visitor experience on the river is important to the economic well being of Park County, and they overwhelmingly agreed — 62 percent either agreed or strongly agreed with this statement (see Exhibit 3-31).

Exhibit 3-31.
The quality of the visitor experience on the river is very important to the economic well being of Park County.

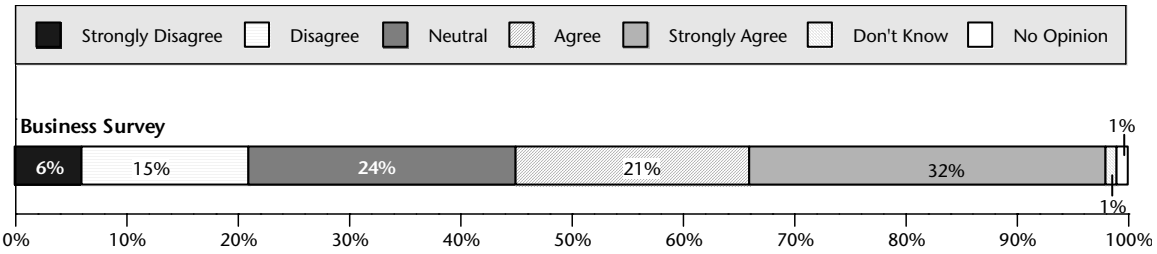


Source: BBC Research and Consulting.

Newer businesses more often agreed or strongly agreed with the important economic role the visitor experience on the river plays (67 percent) than older businesses (56 percent), reflecting newer businesses' emphasis on tourism. As businesses' sales were increasingly dependent upon summertime spending, those companies were also more likely to agree that the visitor experience on the river is economically important. The visitor experience on the river means tourism dollars, and summer-oriented businesses are tourism-centered.

The lifeblood of Park County. When asked whether they believe the Upper Yellowstone River is the lifeblood of Park County, the majority of businesses agreed or strongly agreed. This finding confirms that the Upper Yellowstone River is a cornerstone of the Park County economy. Only 21 percent — just over one-fifth — of businesses disagreed or strongly disagreed that the river is the lifeblood of the county, while another quarter were neutral, did not know, or had no opinion about this idea of river as lifeblood. BBC asked residents this same question for the Task 4 report.

Exhibit 3-32.
The Upper Yellowstone River is the lifeblood of Park County.

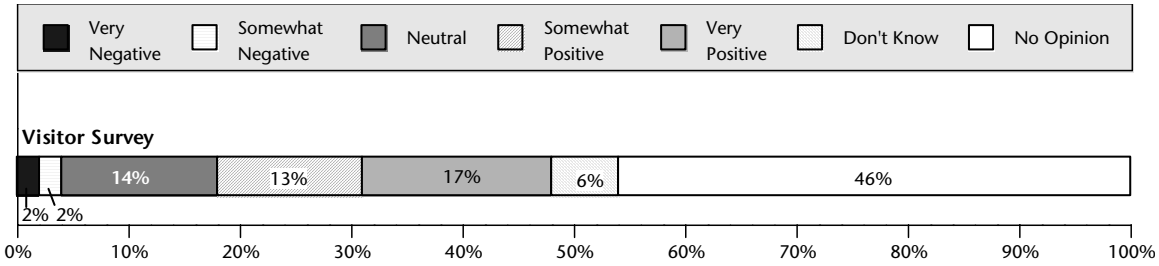


Source: BBC Research and Consulting.

Newer businesses more often agreed or strongly agreed that the Upper Yellowstone River is the lifeblood of Park County (59 percent) than older businesses did (49 percent), which reflects older businesses' faith in the old economy and a recognition that economic sectors ebb and flow. Businesses with more sales in summertime also tended to agree with this idea of river as lifeblood more often. Summer-oriented businesses are dependent upon tourists, many of whom come for the Upper Yellowstone River.

Quality of fishing for the visitor. BBC asked visitors how the quality of the fishing in the river affected visitors' experiences, and the majority of respondents (50 percent) did not know or had no opinion, implying that they likely were not fishing in the river on their trip. Of those visitors who did have an opinion, the majority (60 percent) said that the fishing in the Upper Yellowstone River was somewhat positive or very positive for their visitor experience here in Park County, while another 28 percent were neutral on the issue and 8 percent thought the fishing negatively affected their experience. Though perhaps only half the visitors may fish on their trips here in Park County, more than half of those who do fish think that the quality of the fishing is good enough to positively affect their visitor experience.

Exhibit 3-33.
How would you rate the effect that the quality of the fishing in the river had on your experience?

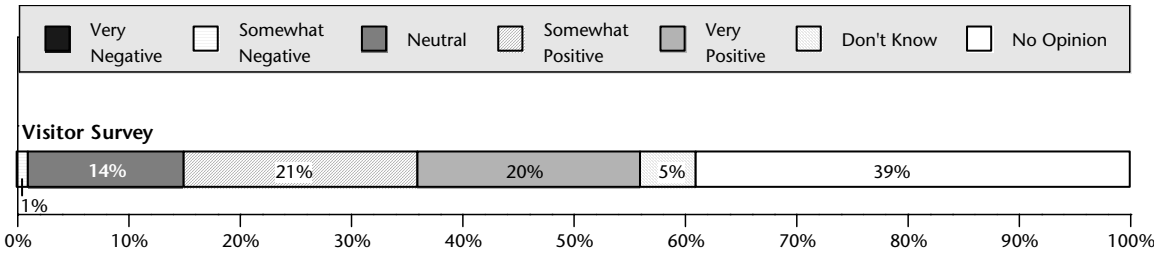


Source: BBC Research and Consulting.

The quality of the fishing was more often somewhat or very positive for the visitor experience of visitors who had visited before (38 percent) than it was for visitors who had not visited before (19 percent).

Quality of the whitewater for the visitor. When asked how the quality of the whitewater in the Upper Yellowstone River rated in its effect on their visitor experience, visitors were fairly split. About 44 percent of respondents did not know or had no opinion, indicating that they likely did not use the river in such a way as to experience the whitewater. For those that had an opinion, though, they overwhelmingly thought the whitewater was positive for their visitor experience. Some 73 percent of those visitors who had an opinion about the whitewater thought that the whitewater was somewhat or very positive.

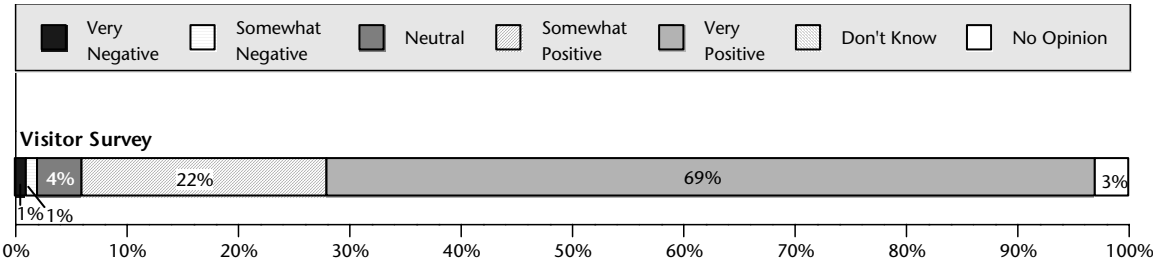
Exhibit 3-34.
How would you rate the effect that the quality of the whitewater in the river had on your experience?



Source: BBC Research and Consulting.

Quality of the scenery for the visitor. BBC asked visitors how the quality of the scenery on or near the river rated in its effect on their experience, and visitors overwhelmingly approved. Some 91 percent of visitors said that the scenery somewhat or very positively affected their visitor experience.

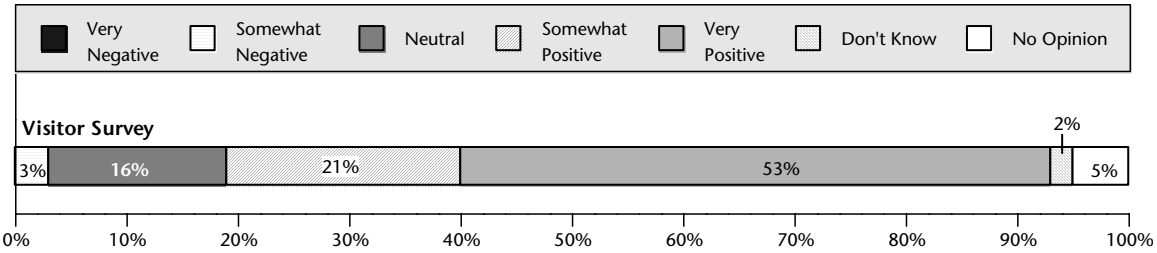
Exhibit 3-35.
How would you rate the effect that the quality of the scenery on or near the river had on your experience?



Source: BBC Research and Consulting.

The wild and undeveloped nature of the river. Visitors overwhelmingly thought that the wild and undeveloped nature of the river positively affected their visitor experience in Park County. Nearly three-quarters of respondents were somewhat or very positively affected by this wild river nature.

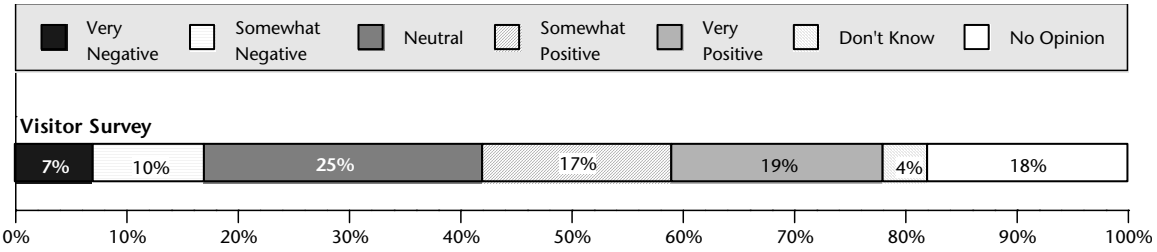
Exhibit 3-36.
How would you rate the effect that the wild and undeveloped nature of the river had on your experience?



Source: BBC Research and Consulting.

Unnatural/manmade noise for the visitor. When asked how the level of unnatural/manmade noise on the river affected their visitor experience, visitors were somewhat mixed (see Exhibit 3-37). About 36 percent of visitors thought the effects of unnatural noise were positive, implying that they either enjoyed the manmade noise they heard or did not hear a significant amount of manmade noise that would have detracted from their experience. Another 17 percent of visitors were disappointed with the level of manmade noise, however, suggesting that there could be improvement in this area that would enhance the visitor experience.

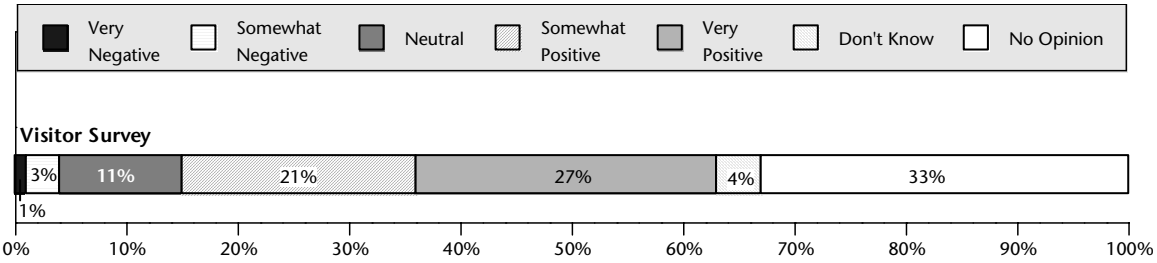
Exhibit 3-37.
How would you rate the effect that the level of unnatural/manmade noise on the river had on your experience?



Source: BBC Research and Consulting.

Public access and the visitor. Though 37 percent of visitors did not know or had no opinion (see Exhibit 3-38 below), other visitors' responses were generally positive with regard to how public access to the river affected their visitor experience. Of those visitors who had opinions, 73 percent thought that public access had a somewhat or very positive effect on their experience, and only 6 percent suffered negative effects. The message from the visitors is that public accesses are adequate and good for visitor use.

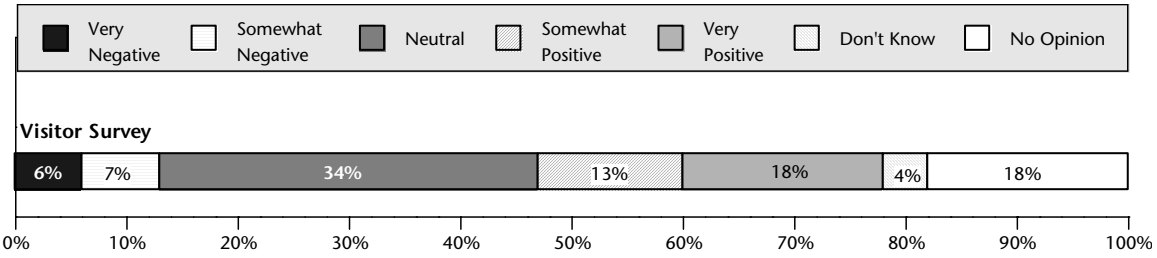
Exhibit 3-38.
How would you rate the effect that public access to the river had on your experience?



Source: BBC Research and Consulting.

Ranching and the visitor. When asked how cattle or ranching activities along the river affected their visitor experience, visitors were generally neutral. Roughly 31 percent of respondents thought that ranching somewhat or very positively affected their visitor experience, while only 13 percent thought it was somewhat or very negative. These results suggest that visitors often do not think about ranching with regard to their experience. It is merely a part of the landscape.

Exhibit 3-39.
How would you rate the effect that cattle or ranching activities along the river had on your experience?

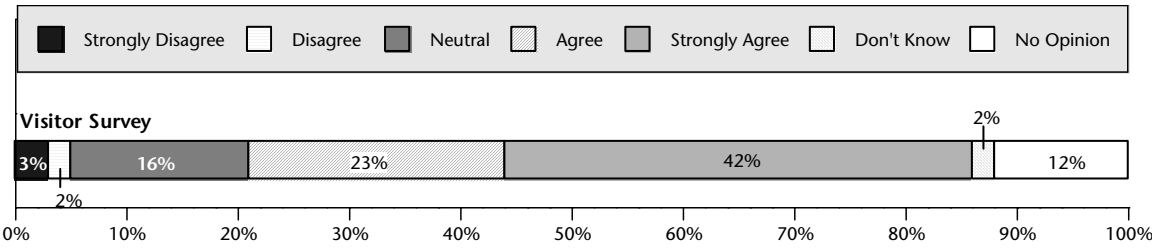


Source: BBC Research and Consulting.

For those visitors who had visited Park County before, 35 percent thought ranching was somewhat or very positive for their experience. For those who had not visited before, only 25 percent thought ranching positive. Keeping ranching as a part of the river landscape is important to maintaining the quality of the visitor experience.

Staying longer next time. When asked whether, if they could plan their trips to Park County over again, and after the experiences they had with the Upper Yellowstone River, they would stay here longer next time, 65 percent of visitors agreed. Only 5 percent disagreed with this idea, pointing out again that the Upper Yellowstone River was overall an important and positive part of visitors' experiences here in Park County.

Exhibit 3-40.
If you could plan your trip to Park County over again, and after the experiences you had with the Upper Yellowstone River, you would stay here longer next time?



Source: BBC Research and Consulting.

Summary of Park County Economic Values

The household, business and visitor surveys lead to the following summary observations regarding economic values in the study area.

- The water level in the river is considered important to the economy, and droughts are perceived as more negative than floods. When visitors think about water levels, they viewed it as a positive part of their visitor experience generally.

- The household and business surveys indicated that tourists, ranchers and longtime residents were all important to the Park County economy. River-related and other tourist-related businesses are also considered important economic contributors. Spring creeks are not well understood by residents or businesses.

- Both households and businesses more often than not believe that property owners should not have a right to subdivide and build in the floodplain. Visitors have mixed views on this issue.

- Using manmade structures, such as riprap and dikes, to protect private property is supported by the majority of residents and businesses, though 30 percent disagree. Less than half the visitors are opposed to these structures, and existing structures have generally not detracted from the visitor experience thus far.

- Residents and businesses perceive the river as being vitally important to the economy and as an amenity to the quality of life, which attracts and holds residents and businesses. The river is also a central, valuable part of the visitor's experience.

- Residents and businesses perceive overuse of the Upper Yellowstone River as a major problem, but visitors do not agree.

- Residents and businesses agree, and visitors confirm, that riverbank vegetation is a vital part of the river and visitor experience. Scenery along the river generally contributes very positively to the visitor experience.

- Fishing, whitewater, the wild and undeveloped feel of the river, relatively little manmade noise, adequate public access, and the presence of ranching all contribute positively to the visitor experience.

- Residents and businesses generally agree that management of the Upper Yellowstone River for flooding and erosion is the best thing for the overall economic and social well being of the county. Visitors believe that an unmanaged, free-flowing river is best.

- More households and businesses agree than disagree that prior river management has been ineffective and inconsistent.

- And the best news is that if residents could plan their trip over again, they would stay longer in Park County.

TASK 4.
Social and Cultural Values in the Upper Yellowstone River Study Area

Introduction

Task 4 identifies and describes the social values of the people in the Task Force study area as they relate to the Upper Yellowstone River. This Task 4 report summarizes BBC's work in determining those social values, based on a historical study of the area combined with interviews of representatives of many stakeholder groups in the area and field surveys of residents and businesses in the study area.

BBC performed the historical analysis of social values in Park County (Task 1 report) to lend context to the understanding of current social values. The history of Park County offers a base for the social and cultural values for residents in 2002. The community has changed much over the years, from a booming, frontier town to today's community bustling with visitors from around the globe, with old-timers and newcomers coming into increasing contact with one another. Understanding the history of social values of the people of Park County was essential to understanding those same values today.

Following the historical study, BBC completed in-depth interviews with representatives of different stakeholder groups, as profiled in the Task 2 report. These interviews allowed BBC to effectively categorize the major stakeholder groups on the river, as well as to identify the social issues and values that were of utmost importance to them with regard to the river. These interviews then fed into designing the surveys of residents and businesses in the study area that would comprise the bulk of the information presented here in the Task 4 report.

Finally, BBC performed extensive surveys of residents and businesses in the study area to document the actual current social and cultural values for this Task 4 report. These major efforts helped verify or refute the social values gleaned from the Task 2 stakeholder interviews.

BBC identified the major social issues most raised by study area residents and businesses:

- Importance of different population groups to the Park County social and cultural environment, including:
  - Tourists;
  - Ranchers;
  - Spring-creek related activities;
  - River-related businesses;
  - Tourist-related businesses;
  - New permanent residents;
  - Longtime residents; and
  - Seasonal residents.
- Impact of the quality of the visitor experience on the well being of Park County;

- The importance of fishing, other river-related recreational activities and the beauty of the river in the quality of life here; and
- Whether the Upper Yellowstone River is the lifeblood of the community.

In this task report, following a brief summary of the results of the surveys, BBC addresses each social issue in turn as asked in the surveys of residents and businesses. The report presents the results of the survey, cross tabulations about various subpopulations of the survey groups, and discussions of the meaning of the data. Please see Appendices A and B for more detail on the results of the surveys of residents and businesses.

Summary of the Surveys

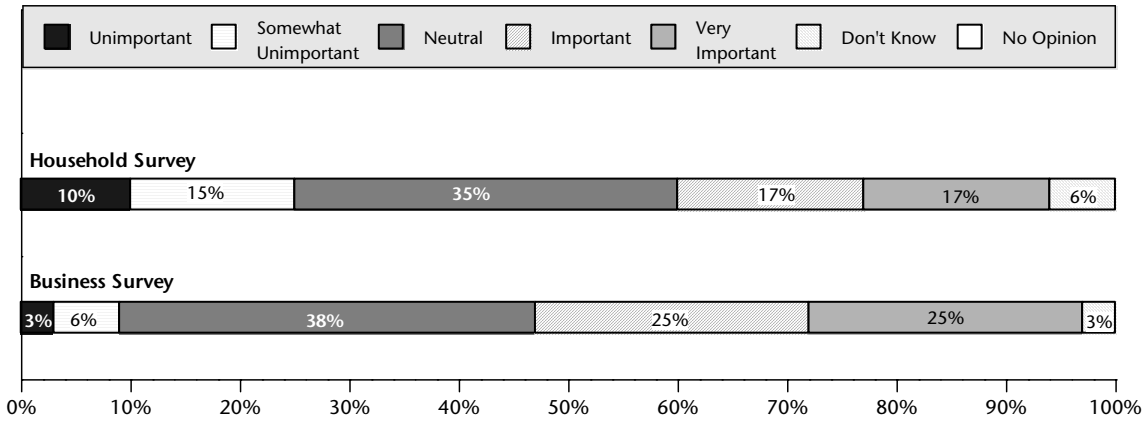
BBC administered two surveys in the summer of 2002 in the study area. BBC first surveyed residents in the study area over the phone. We completed 364 surveys out of a population of 6,828 households, creating survey results with a 95 percent confidence level. BBC then completed an in-person, door-to-door survey of 176 businesses in the study area. There are roughly 2,161 businesses in the study area, so BBC's survey results are at the 90 percent confidence level. These three confidence levels, derived using normal distributions, imply that results of the surveys, i.e. percentages of the population that answered questions in certain ways, are likely to be correct 90 to 95 percent of the time. Additionally, crosstab analyses were presented for informational purposed only; no statistical significance tests were performed on the differences noted. BBC's list of survey questions and groups queried can be found in the Task 3 report, Exhibit 3-1. See Appendices A and C for further information on these surveys' methods or results.

The Issues and Results

Importance of different population groups. BBC questioned residents and businessowners about eight different population groups in the county, seeking to understand how important they perceived each group to be in the social and cultural fabric of Park County.

Tourists. When asked how important tourists are to the social and cultural environment in Park County, residents and businesses were split. About 34 percent of residents and 50 percent of businesses believed tourists were important or very important to the social fabric of the area, and only 25 percent of residents and 9 percent of businesses thought them unimportant or somewhat unimportant.

Exhibit 4-1.
How important are tourists or other temporary visitors to the social and cultural environment of Park County?



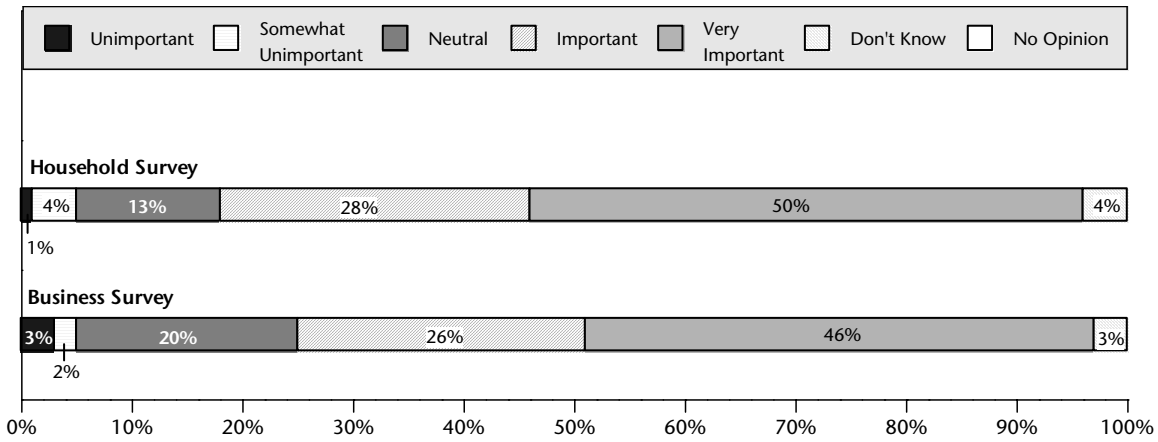
Source: BBC Research and Consulting.

Residents who live in the floodplain think tourists are more important than residents outside the floodplain. There were no other notable differences in response distributions among the residents subgroups, including longer-time versus newer residents, residents who live in the floodplain versus those who do not, or residents who live in Livingston versus those who do not.

Newer business more often thought that tourists are important or very important to the social fabric of Park County (55 percent) than longer-time businesses (44 percent) — perhaps reflecting the greater interdependence of newer, tourist-oriented businesses. Newer businesses were those businesses in Park County less than 10 years; older businesses were in the area for more than 10 years. Each group represents roughly 50 percent of respondents. As a business's sales were more dependent upon summertime spending, the businessowner also tended to believe tourists more important to the social and cultural environment. Businesses were classified as having 0 to 33 percent of their sales in summertime, 34 to 50 percent, 51 to 75 percent and 76 to 100 percent. Each group represents roughly 25 percent of respondents.

Ranchers. The next question asked how important residents and businesses thought ranchers were to the social and cultural environment in Park County. A large majority of both groups of respondents thought that ranchers are important or very important.

Exhibit 4-2.
How important are ranchers to the social and cultural environment of Park County?



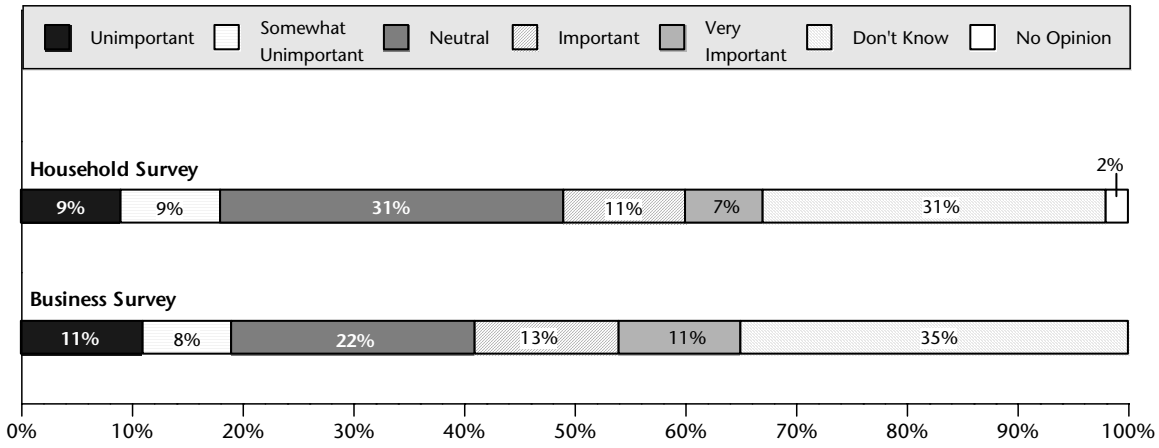
Source: BBC Research and Consulting.

Naturally, ranching residents thought themselves (ranchers) more important than the general survey population did — 73 percent thought ranchers very important socially and culturally. There were no other notable differences in response distributions among the resident subgroups, including longer-time versus newer residents, residents who live in the floodplain versus those who do not, or residents who live in Livingston versus those who do not.

Older businesses clearly valued ranchers more often for their social and cultural contributions — 82 percent thought them important or very important — than newer companies (63 percent). This result suggests that longer-time businessowners with more knowledge of the region have seen and perceive ranchers' role in the community as being more vital than newer businessowners might yet know. There were no other notable discrepancies in the response distributions of more and less summer- or river-oriented companies.

Spring creek-related activities. When BBC asked residents and businesses how important they thought spring creek-related activities were socially and culturally, they were well distributed between all degrees of importance, but more respondents answered that they did not know. These results reflect that many residents and businesses either do not know about the creeks or believe the creeks' contributions to be only neutral.

Exhibit 4-3.
How important are spring creek-related activities to the social and cultural environment of Park County?

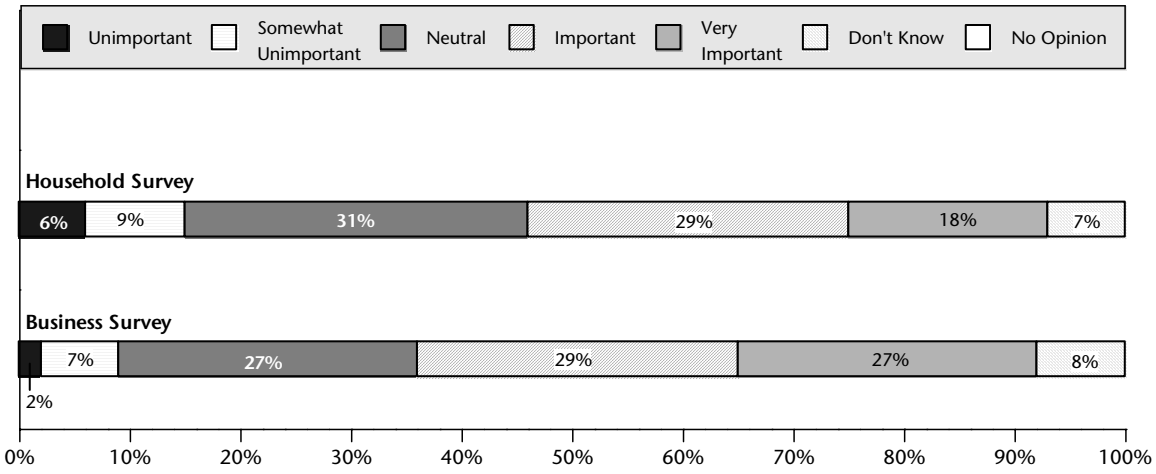


Source: BBC Research and Consulting.

There were no major discrepancies in responses between older and newer businesses. Spring creeks were more important to Livingston businesses, however, than to others in Park County. Businesses whose sales were more dependent on the river were more likely to think the spring creeks were important or very important contributors to the social fabric of the area than less river-dependent businesses were. These businesses' dependence upon the river probably acquaints them more with spring creeks than other business sectors. Businesses were classified as having 0 to 3 percent of their sales dependent on the river, 4 to 10 percent, 11 to 25 percent and 26 to 100 percent. Each group represents roughly 25 percent of respondents.

River-related businesses. When asked how important river-related businesses were to the social and cultural environment in Park County, about half of responding residents and businesses thought them important or very important. Many of both the survey respondent elements were also neutral on this group. Residents thought them slightly less important than businesses did, as shown in Exhibit 4-4. These results indicate that both residents and businesses perceive river-related businesses as being important social members of this community, though somewhat less important than the tourists themselves. This finding might imply that tourists as individuals contribute more socially and culturally through the cultures and customs they bring with them as compared with the tourist-related businesses themselves, which might contribute through their support of local social organizations or other involvement.

Exhibit 4-4.
How important are river-related businesses to the social and cultural environment of Park County?

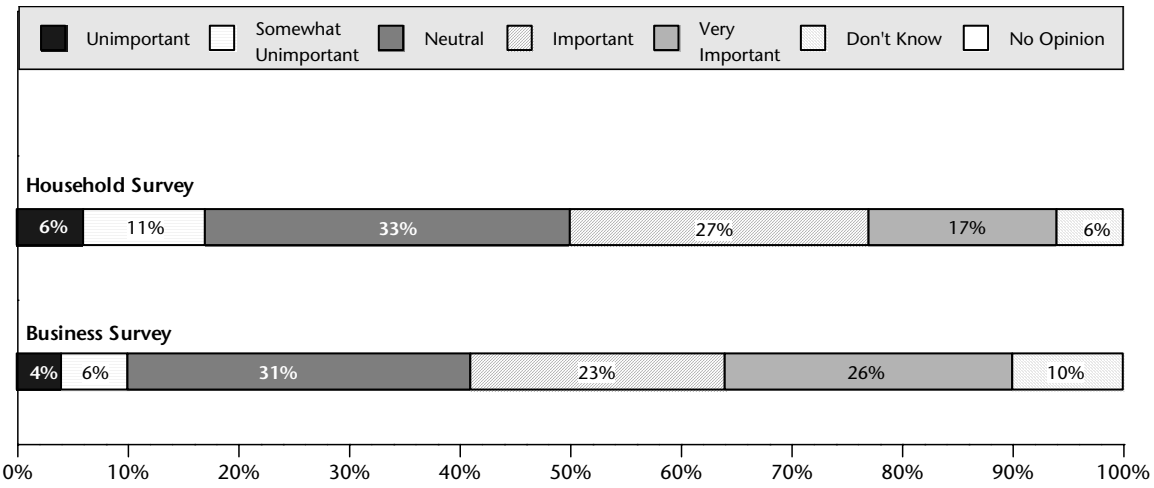


Source: BBC Research and Consulting.

Ranching residents thought river-related businesses more important than the general survey population. The more summer-oriented a business's sales were, the more likely the businessowner was to think that river-related businesses are important contributors to the social and cultural environment of this area. This result reflects the fact that summer-oriented businesses are likely more river-oriented, and of course they would see their river-oriented counterparts in a favorable light for their social contributions.

Other tourist-related businesses. BBC asked residents and businesses how important they believe other tourist-related businesses, such as hotels and souvenir shops, were to the Park County community. Both groups, 44 percent and 49 percent, respectively, thought these businesses were important or very important socially, though businesses viewed their other tourist-related counterparts as being somewhat more important than residents did, as shown in Exhibit 4-5. A significant portion of residents (39 percent) and businesses (41 percent) were neutral on this group or did not know, perhaps indicating that neither residents nor businesses overwhelmingly perceived other tourist-related businesses as being vital components of the social fabric.

Exhibit 4-5.
How important are other tourist-related businesses to the social and cultural environment of Park County?

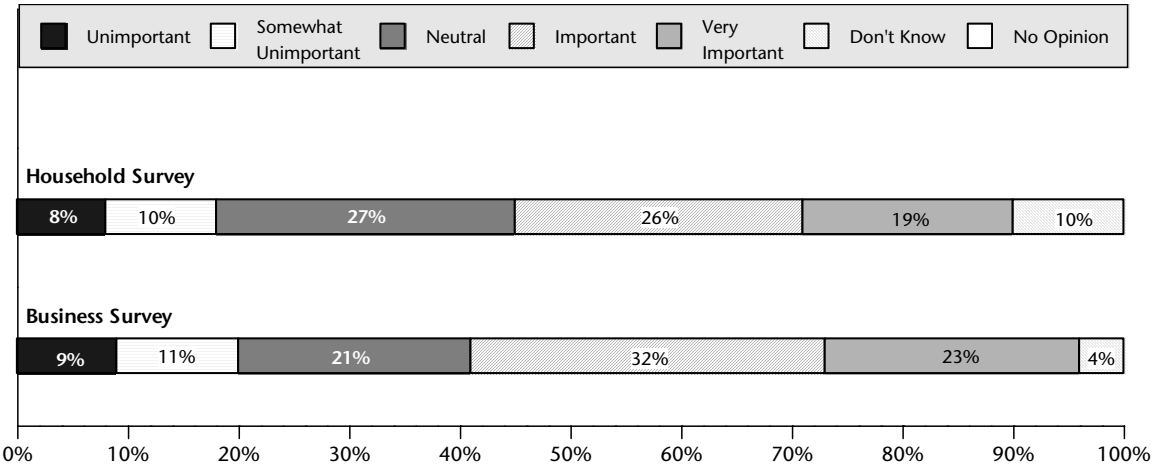


Source: BBC Research and Consulting.

Ranching residents thought other tourist-related businesses were more important than the general resident survey population. Younger companies thought that other tourist-related businesses were more often important or very important (53 percent) than older companies (43 percent). Younger companies might recognize Park County's increasing dependence on tourism as a source of cultural connection. The more summer-oriented businesses tended to perceive other tourist-related businesses as being socially important, likely because summer-oriented businesses *are* those other tourist-oriented businesses.

New permanent residents. Residents (45 percent) and businesses (55 percent) overall perceived new permanent residents as being important or very important to the social and cultural environment in Park County.

Exhibit 4-6.
How important are new permanent residents who have moved here in the past five years to the social and cultural environment of Park County?



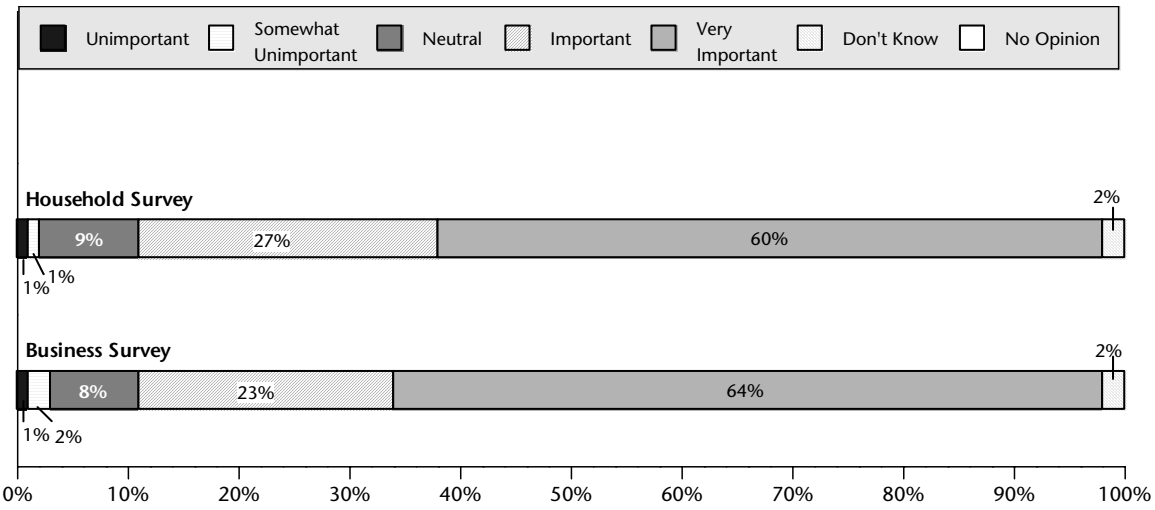
Source: BBC Research and Consulting.

Ranching residents more often thought new residents socially important or very important (63 percent) than the general resident survey population (45 percent), indicating a surprising appreciation that longtime resident ranchers felt for the social and cultural contributions new residents make. Newer residents naturally thought themselves more often important or very important socially and culturally (66 percent) than longer-term residents (40 percent). Newer residents were those residents who have lived in Park County less than ten years; longer-term residents have lived in the county longer than 10 years. Each group represents roughly 50 percent of respondents. There were no other important differences in responses from other subgroups of the resident survey population, such as residents on the river or off and residents in Livingston versus non-Livingston.

Older businesses more often believed new permanent residents were unimportant or somewhat unimportant to the community (29 percent) than newer businesses (12 percent), likely reflecting the social groups one group belongs to versus the other. For more summer-oriented businesses, new residents were less important than for less summer-oriented businesses.

Longtime residents. When asked how important longtime residents were to the Park County community, both residents and businesses overwhelmingly thought them very important, indicating a clear belief that longtime residents are the basis of the social and cultural fabric of this area.

Exhibit 4-7.
How important are longtime residents to the social and cultural environment of Park County?

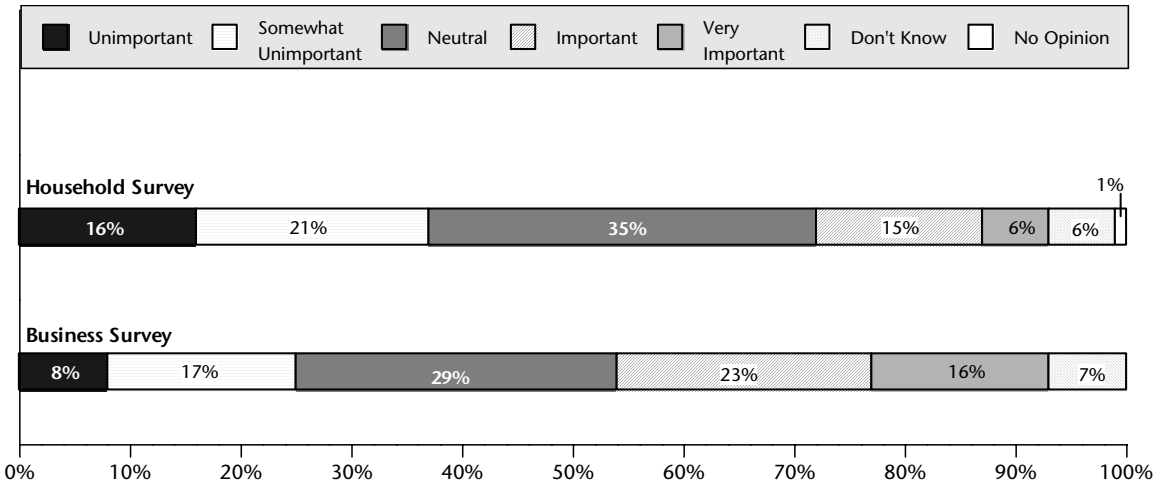


Source: BBC Research and Consulting.

Ranching residents thought longtime residents were very important socially and culturally more often (82 percent) than the general resident survey population (60 percent). Rural residents living outside Livingston also more often perceived longtime residents as being important or very important socially and culturally (94 percent) than Livingston residents (86 percent), which suggests that the county's rural residents have a greater appreciation for the social and cultural contributions that longer-time residents make to the community. The more summer-dependent businesses less frequently thought longtime residents were important or very important socially and culturally.

Seasonal residents. Residents and businesses were more mixed in their perceptions of the importance of seasonal residents to the social and cultural environment in Park County. An estimated 37 percent of households believe seasonal residents are unimportant or somewhat unimportant socially, and another third are neutral on this point. Businesses thought seasonal residents more important than households, though respondents in each group thought them neutral more often than any other response. Residents do not accord much social contribution from seasonal residents, but businesses who interact with and depend on them are more favorable.

Exhibit 4-8.
How important are seasonal residents to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

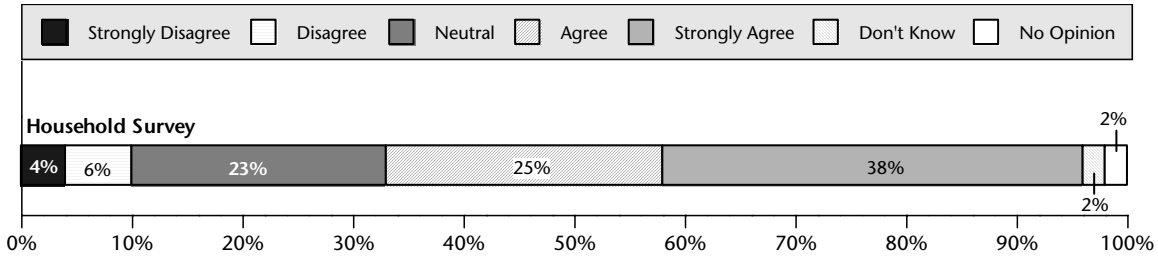
Newer businesses more often thought that seasonal residents are very important to the community (23 percent) than older businesses (10 percent). More summer-oriented companies also more often thought seasonal residents important to the community. Economics might also be at play here.

Summary of population groups social and cultural importance. Residents and businesses perceive ranchers and longtime residents to be inseparable from the social and cultural fabric of Park County. Tourists, new permanent residents, river-related businesses and other tourist-related businesses are also positively recognized by residents and businesses for their social and cultural contributions. Residents and businesses perceive spring creek-related activities and seasonal residents to have impacts that are unknown or moderate on the social and cultural environment in the Park County.

Value statements. BBC presented residents and businesses with several questions and statements that probed their social value sets. The results are presented below.

The quality of the visitor experience is important. BBC asked residents whether they agreed that the quality of the visitor experience on the river is important to the well being of Park County, and they overwhelmingly agreed — 63 percent either agreed or strongly agreed with this statement (see Exhibit 4-9). It is clear that visitors who use and enjoy the Upper Yellowstone River — and the cultures, customs and insights they bring — are vital to the community in Park County, helping it grow and change with the times.

Exhibit 4-9.
The quality of the visitor experience on the river is very important to the well being of Park County.

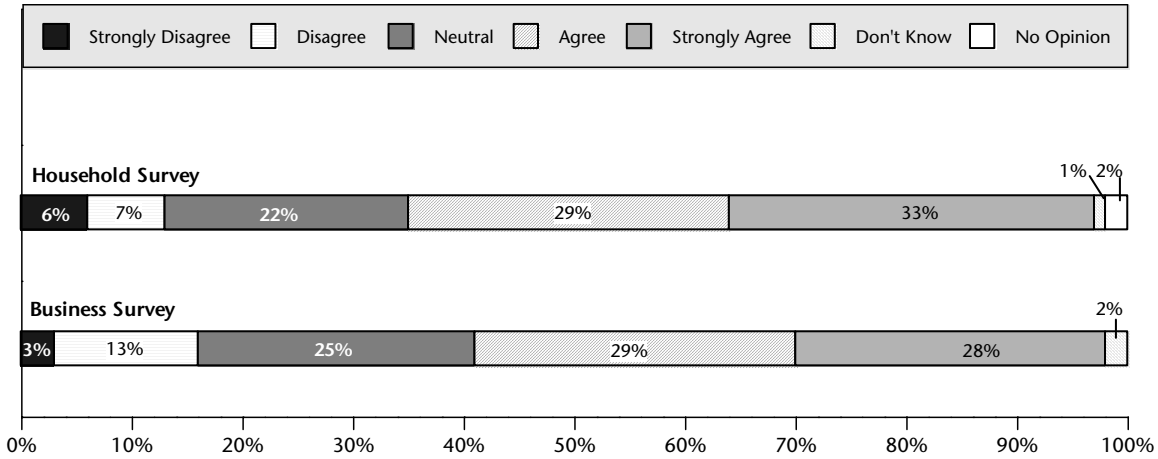


Source: BBC Research and Consulting.

Residents whose parents had not lived in Park County more often agreed or strongly agreed that the visitor experience is important to Park County (69 percent) than did residents whose parents *did* live in Park County (54 percent). This result suggests that newer residents appreciate more the social and cultural contributions that tourists bring to the community. There were no other significant differences in response patterns from other resident subgroups.

Fishing is important to quality of life. When BBC asked residents and businesses whether the fishing in the Upper Yellowstone was a major component of the quality of life of Park County residents and labor force, the majority of both groups agreed or strongly agreed. There is a robust appreciation for the contribution that the Upper Yellowstone's fishing makes to the community here.

Exhibit 4-10.
Fishing in the Upper Yellowstone is a major component of the quality of life of Park County residents [and labor force].



Source: BBC Research and Consulting.

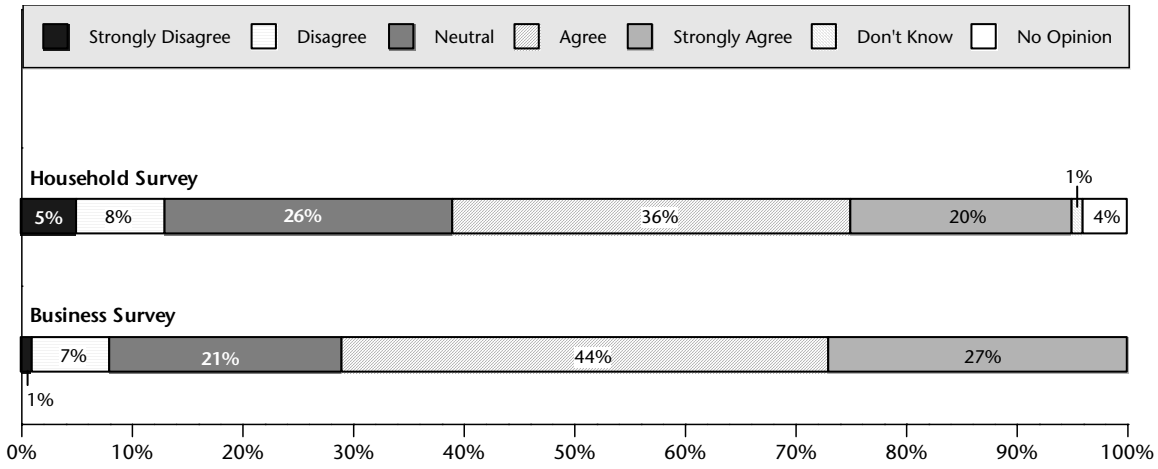
Longer-time residents were far more split on the issue of fishing as a major component of the quality of life here comparable with newer residents. Longer-time residents more often disagreed or strongly disagreed with this idea (15 percent) than newer residents did (4 percent); however, longer-time residents also strongly agreed with fishing as a major component of the quality of life here more often

(35 percent) than newer residents (26 percent). There is apparently some resistance to this idea among old-timers in the community. There were no other notable differences in response patterns from other subgroups of the resident survey population.

Older businesses were also more resistant to the idea that fishing is a major component of the quality of life here compared with newer businesses. Older businesses more often disagreed or strongly disagreed with this idea (22 percent) than newer businesses (10 percent). On the other hand, the most river-dependent businesses most agreed that fishing is important to the quality of life here (72 percent) versus less river-oriented companies (57 percent).

Other river-related recreational activities are important to quality of life. BBC asked residents and businesses whether they agreed that other river-related recreational activities were important components of the quality of life for Park County resident and labor force, and both groups overwhelmingly agreed, though businesses agreed more often than resident. Clearly, river recreation (i.e., rafting, floating and swimming) is a major reason why people enjoy living and working in Park County.

Exhibit 4-11.
Other river-related recreational activities are important components of the quality of life of Park County residents [and labor force].



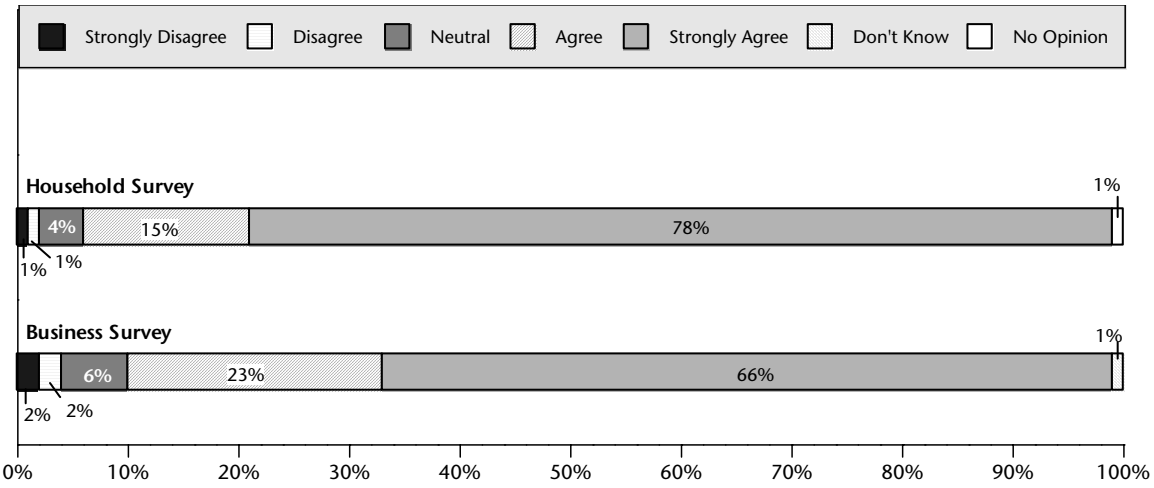
Source: BBC Research and Consulting.

Longer-time residents did not favor other river-related recreational activities as important components of their quality of life as much as newer residents. In fact, longer-time residents disagreed or strongly disagreed with this idea 16 percent of the time, while newer residents felt the same way only 4 percent of the time. Longer-time residents are not as enamored with the river for recreation as newer residents. There were no other notable differences in response patterns for other resident subgroups.

Though older and newer businesses responded similarly, the most river-oriented businesses tended to agree or strongly agree that other river-related recreational activities were important components of the quality of life here (88 percent) than less river-dependent businesses (62 percent).

Beauty of the river is important to quality of life. When BBC asked residents and businesses whether they agreed that the beauty of the Upper Yellowstone River was an important component of the quality of life for Park County residents and labor force, they overwhelmingly agreed — in fact, 78 percent of residents and 66 percent of businesses strongly agreed with this idea. The beauty of the river is obviously centrally important to the people of Park County.

Exhibit 4-12.
The beauty of the Upper Yellowstone River is an important component of the quality of life of Park County residents (and labor force).



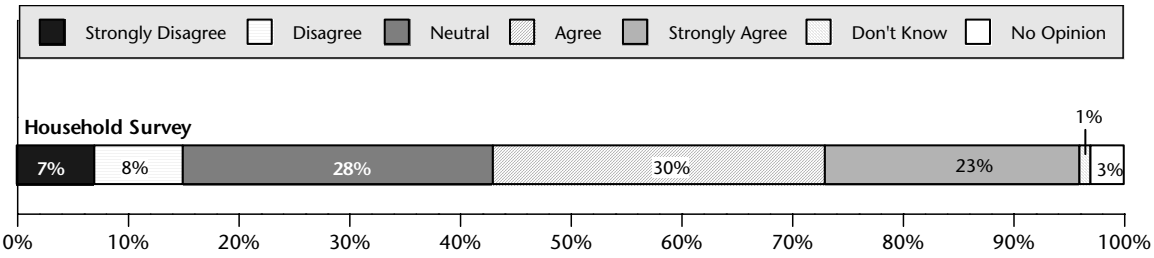
Source: BBC Research and Consulting.

Ranching residents were not as concerned with the beauty of the river as part of their quality of life as the general resident survey population — 73 percent agreed or strongly agreed with this idea while 93 percent of the general population felt the same way. Livingston residents were also somewhat less interested in the beauty of the river than non-Livingston residents were. About 92 percent of Livingston residents agreed that the beauty of the river is important to the quality of life here, while 100 percent of non-Livingston residents felt the same way.

The beauty of the river was most important to the most summer-oriented companies, as well. About 91 percent of the most summer-oriented businesses strongly agreed that the beauty of the river was an important component of the quality of life here, while only 51 to 68 percent of less summer-dependent businesses felt the same.

The river is the lifeblood of the county. BBC inquired whether residents agreed that the Upper Yellowstone River is the lifeblood of Park County, and the majority agreed or strongly agreed with this idea. A significant portion of residents (28 percent) was neutral with this statement, however, and some 15 percent disagreed or strongly disagreed. The river is vital to this area, but residents are divided as to whether they would call it the single strongest force influencing this community. BBC asked this same question of businesses for the Task 3 report.

Exhibit 4-13.
The Upper Yellowstone River is the lifeblood of Park County.



Source: BBC Research and Consulting.

Ranching residents agreed or strongly agreed that the Upper Yellowstone River is the lifeblood of the county less often (36 percent) than the general resident survey population (53 percent). Livingston residents also agreed or strongly agreed with this idea less often (51 percent) than non-Livingston residents (63 percent), perhaps reflecting rural residents' greater appreciation for the role the Upper Yellowstone River plays in the community here.

A Summary of Observations About Park County Social and Cultural Values

BBC offers a summary of study area residents' and businesses' cultural and social values below:

- Ranchers and longtime residents are perceived to be the most important groups contributing to the Park County social and cultural conditions. Tourists, new permanent residents, and river-related and other tourist-related businesses are also viewed as making important contributions.

- Residents appreciate the contribution tourists make to the community through their patronage of local activities, arts, and cultural enterprises, and also through the cultures and customs they bring with them.

- The beauty of the Upper Yellowstone River is paramount in its contributions to Park County quality of life.

- Fishing and other river-related recreational activities, like rafting and floating, are very important components of the quality of life here in Park County.

- Even though the river contributes much to the quality of life here through recreation and creating a beautiful place in which to live, residents are divided as to whether it is the single most important physical element of the community.

Task 5a.
Local Economic Trends in the Upper Yellowstone River Region

Introduction

In this Task 5a report, BBC characterizes local economic and demographic trends, public services and facilities, and displacement of ranches in Park County. Park County economic and demographic data is believed to be representative of the study area since almost all of the human activity in Park County occurs in the Upper Yellowstone River Valley. This descriptive report is based on secondary data from government sources, as well as interviews with local experts in planning, agriculture, economics and real estate. With the assistance of economist Jeff Blend with Montana's Department of Environmental Quality, BBC collected and organized demographic, economic and agricultural statistics to paint a picture of the current economic conditions in Park County. BBC then completed this picture with input and verification from local government and private sector representatives. This economic portrait lends context to Park County residents', businesses' and visitors' economic and social/cultural values presented in the Tasks 2, 3 and 4 reports.

All of the historical monetary data in this report are expressed in constant, Year 2000 dollars. This will facilitate year-to-year comparisons.

Demographic Trends

This first section outlines changes in the demographic profiles of Park County and the city of Livingston from 1970 to 2000.

Population. Montana experienced a 30 percent increase in population in the same period (see Exhibit 5-1 on the following page). Population growth has been steady in Park County since 1970; 1970 to 2000 saw a 40 percent increase in its population (see Exhibit 5a-2 on the following page). Though Montana went through a period of significant growth in the 1970s, followed by stagnation in the 1980s and significant growth again in the 1990s, Park County's growth was generally continuous throughout the past three decades.

It is important to note that decennial population counts do not tell the whole story of Park County's population. Local experts explained that in the mid-1980s, Park County experienced a significant decline in population following the closure of the railroad shops. After that closure, the influx of members of the Church Universal and Triumphant in the mid- and late 1980s contributed to the decade's overall population growth. Growth continued strongly through 1997, but the population leveled off over the next five years to 2002.

Park County's population bulge of young people in the 1970s has moved through the past three decades so that by 2000 the largest concentration of people was between 30 and 50 years old. It appears that out-migration of young people is relatively modest compared with other rural areas of the west.

Exhibit 5a-1.
Montana Population

Source:
US Census Bureau.

Year	Population	% Increase
1970	694,409	
1980	786,690	13%
1990	799,065	2%
2000	902,195	13%

Exhibit 5a-2.
Park County Population and Age/Sex Distributions

	1970	1980	1990	2000 [1]
Total	11,197	12,660	14,562	15,694
% increase		13%	15%	8%
Gender				
Male	5,476	6,317	7,100	7,745
Female	5,662	6,343	7,462	7,949
Age				
0-9 Years	1,692	1,870	2,156	1,880
10-19	2,185	1,922	1,809	2,159
20-29	1,099	1,984	1,410	1,470
30-39	1,135	1,784	2,786	2,152
40-49	1,421	1,247	2,080	2,984
50-59	1,411	1,360	1,352	2,050
60-69	1,137	1,237	1,379	1,266
70-79	745	852	1,025	1,085
80 and over	372	404	565	648

Note: [1] For the 2000 Census, the population numbers were adjusted slightly to account for a new ''benchmark' in how population is tallied. After the 2000 Census was released, adjustments were made nationwide in population numbers to account for a slight undercount in the 1990 Census. The result was revised population estimates back to 1990 (including inter-censal numbers) to account for the adjustment. These revised numbers are the benchmark numbers.

Sources:
1) US Census, Population Estimates Branch, Census 1970, 1980, 1990 and 2000.
2) Population by Age found at: 1990 Census of Population and Housing, Summary Tape File 1A. Also found at US Census Bureau American Factfinder, Summary File 1, 100-Percent data, 1990 and 2000.
3) 1970 and 1980 Census of Population, General Population Characteristics.
4) Montana CEIC, Demographics, Historical Population Data.
5) Components of Change found at: US Census Bureau, Population Division, Population Estimates Program.
6) Dave Martin, Montana CEIC.

Livingston experienced almost flat population levels from 1970 to 2000 (see Exhibit 5a-3 below). Again, there is a concentration in the 30 to 50 age cohorts compared with the younger or older age cohorts in the year 2000.

Exhibit 5a-3.
City of Livingston Population and Age/Sex Distributions

	1970	1980	1990	2000 [1]
Total	6,883	6,994	6,701	6,851
Gender				
Male	3,277	3,377	3,180	3,337
Female	3,606	3,617	3,521	3,514
Age				
0-9 years	987	971	967	783
10-19	1,304	999	867	944
20-29	691	1,051	640	726
30-39	638	921	1,060	934
40-49	858	649	815	1,183
50-59	832	786	589	759
60-69	743	701	724	523
70-79	N/A	N/A	627	567
80 and over	830	916	412	432

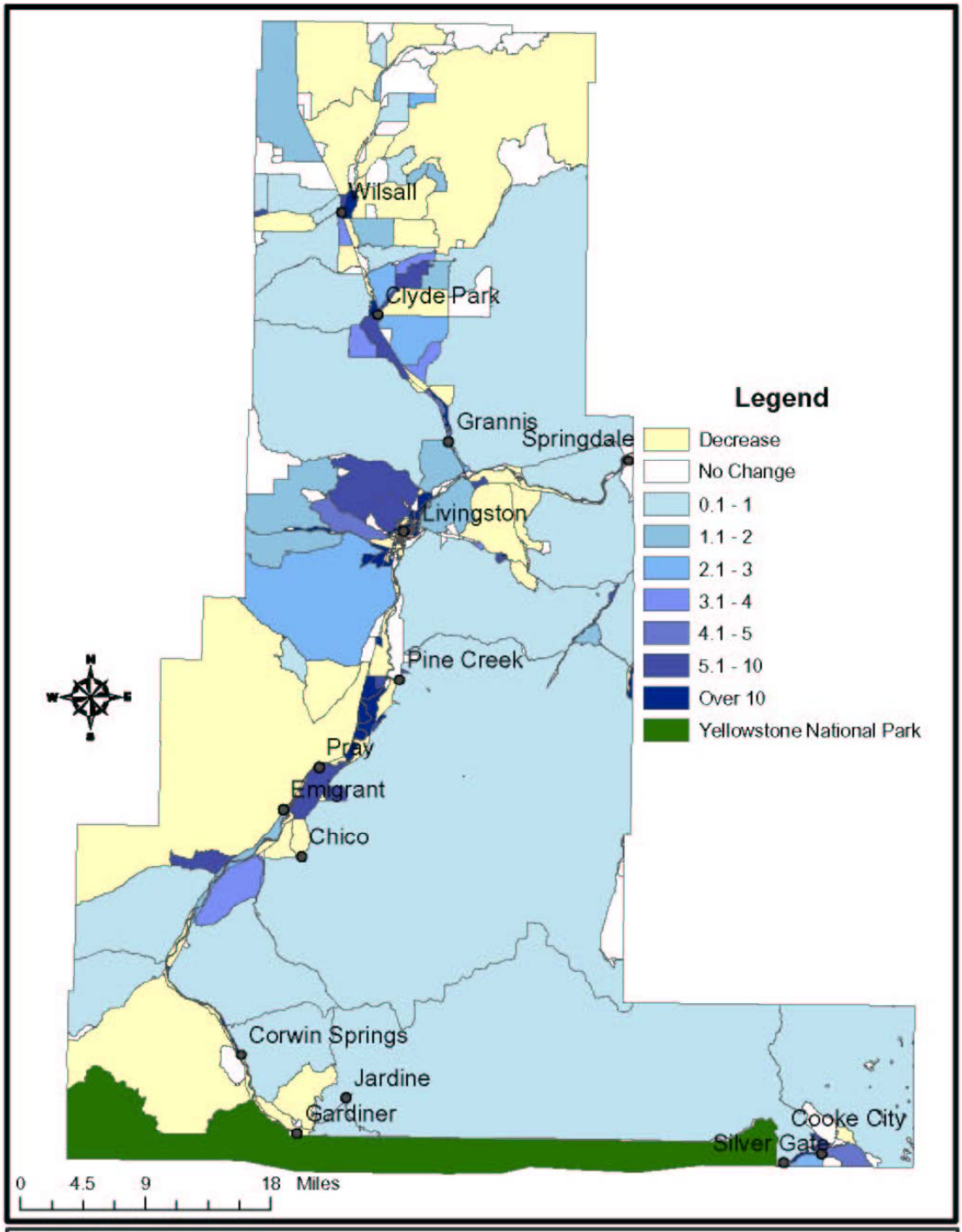
Note: [1] For the 2000 Census, the population numbers were adjusted slightly to account for a new ''benchmark' in how population is tallied. After the 2000 Census was released, adjustments were made nationwide in population numbers to account for a slight undercount in the 1990 Census. The result was revised population estimates back to 1990 (including inter-censal numbers) to account for the adjustment. These revised numbers are the benchmark numbers.

[2] For Livingston in 1970 and 1980, the 70-79 and '80 and over' categories are grouped into one category that includes everything above 70 years of age, since that is how the data was reported for those years.

Sources:
1) US Census, Population Estimates Branch, Census 1970, 1980, 1990 and 2000.
2) Population by Age found at: 1990 Census of Population and Housing, Summary Tape File 1A. Also found at US Census Bureau American Factfinder, Summary File 1, 100-Percent data, 1990 and 2000.
3) 1970 and 1980 Census of Population, General Population Characteristics.
4) Montana CEIC, Demographics, Historical Population Data.
5) Components of Change found at: US Census Bureau, Population Division, Population Estimates Program.
6) Dave Martin, Montana CEIC.

Comparing Livingston's population trends with Park County's over the past thirty years reveals that the county's population growth has occurred almost entirely in rural and smaller-town locales throughout the county. A map created by the Park County planning office that shows population growth in census blocks from 1990 to 2000 confirms this trend (see Exhibit 5a-4 on the following page). Furthermore, the map indicates that areas in the river corridor experienced the fastest rates of growth in the 1990s.

Exhibit 5a-4.
Change in Population Density from 1990 to 2000 in Park County (persons per square mile)



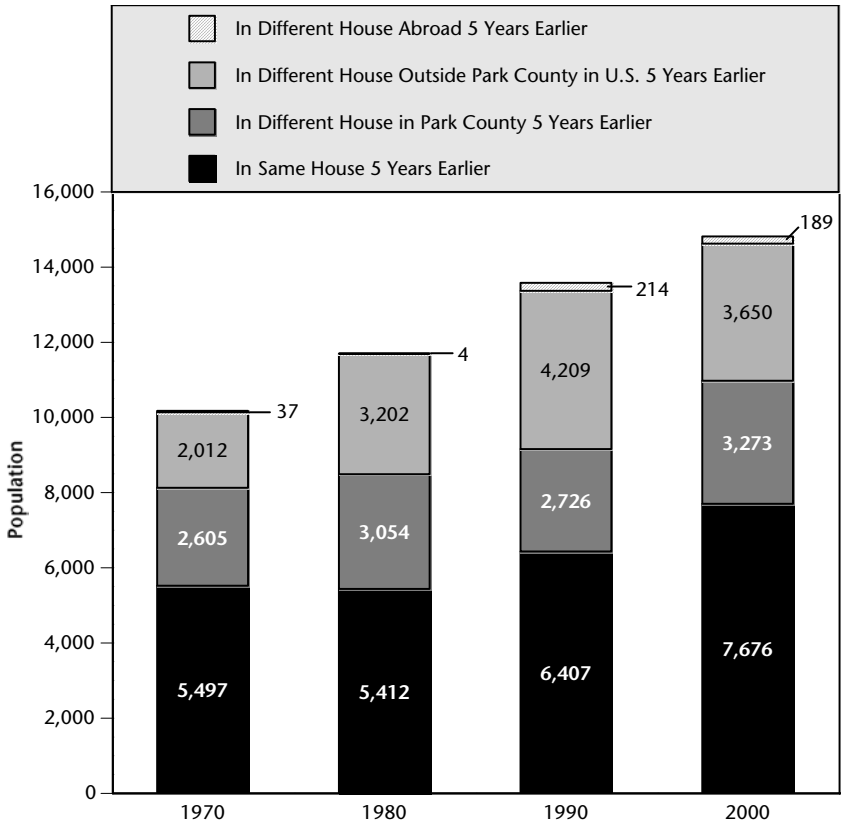
Created By: Carrie Harapat, Park County Planning, 2002

Park County, Montana, population change in persons per square miles. This data was derived from the 1990 and 2000 Census and population counts. Polygons were created based on similiar areas of 1990 and 2000 census tracts. Population change was calculated by taking the 2000 census total population county for all census tracts in each polygon and subtracting the total population counts from all the 1990 census tracts. Change per square mile was calculated by taking the change in total population counts between 1990 and 2000 and dividing by the area in square miles by each polygon.

BBC collected Park County migration statistics for the 1960s, 70s, 80s and 90s, as displayed below in Exhibit 5a-5. The data indicate that roughly 20 percent of residents in 1970 had moved to Park County within the past five years (i.e., since 1965). Roughly, 28 percent of residents had moved to Park County in the five years before the 1980 census, about 33 percent did the same in the five years before the 1990 census, and 26 percent of residents moved into Park County in the five years before the 2000 census. These ratios suggest that in-migration was most significant in the 1970s and 1980s but has been a major demographic influence for 30 years.

Exhibit 5a-5.
Park County Migration Statistics, Individuals 5 Years of Age and Over

Source:
US Census Bureau.



Components of population change. Data for births, deaths and net migration point out the importance of net migration. This term is defined as the difference between people moving into less people moving out of Park County over a ten-year period between the Census. Between 1980 and 1990, there was a net migration to Park County of 1,071 persons, or two thirds of total growth during that period. The remaining one third was accounted for by natural population growth, or the excess of births over deaths (1,928 vs. 1,384). Between 1990 and 2000, net Park County migration amounted to 1,038 or about 63 percent of the period's growth. The remaining 608-person increase was attributable to natural population growth.

Households. Park County experienced steady growth in its number of housing units and households over the past three decades, as shown in Exhibit 5a-6. Vacancy rates have held steady, and all types of housing units have grown in keeping with total housing unit increases. Renter-occupied

households have increased somewhat more rapidly than owner-occupied households, and one-unit households have increased most rapidly, as well. The average number of persons per household is declining.

Exhibit 5a-6.
Selected Data for Park County Households, 1970 to 2000

	1970	1980	1990	2000
Total Housing Units [1]	**4,648**	**5,966**	**6,926**	**8,247**
Vacant Housing Units	**701**	**1,042**	**1,307**	**1,419**
For Seasonal, Rec use	N/A	N/A	740	793
Homeowner Vacancy Rate	2.3%	1.6%	2.5%	2.3%
Rental Vacancy Rate	N/A	11.3%	9.8%	7.4%
Type of Housing (occupied)				
1 Unit	3,638	3,901	4,966	5,877
2 or more units	695	921	770	1,047
Mobile home	178	651	1,190	1,307
Number Households	**3,947**	**4,924**	**5,619**	**6,828**
Owner Occupied	2,661	3,517	3,724	4,536
Renter Occupied	1,286	1,407	1,895	2,292
Total Persons per Household	**2.84**	**2.54**	**2.46**	**2.27**

Note: [1] Housing units include all occupied and vacant structures. Households include all occupied housing units.

Sources: 1) Compiled by US Bureau of Census, 1990 Census of Population and Housing, Summary Tape File 1A.
2) Detailed housing data found at: 1990 Census of Population and Housing, Summary Tape File 1A.
3) US Census Bureau American Factfinder, Summary File 1, 100-Percent data, 1990 and 2000.
4) 1970 and 1980 Census of Housing, General Housing Characteristics.

Livingston has experienced similar trends in households and housing units over the past three decades (see Exhibit 5a-7 on the following page), though growth in all sectors of housing has been much slower in the city than for the county as a whole. For Livingston in 1970, 1,941 homes were one unit, which included both detached and attached units; 533 housing units were two units or more. Most housing development has occurred in outlying rural areas of the county.

Exhibit 5a-7.
Selected Data for Livingston Households, 1970 to 2000

	1970	1980	1990	2000
Total Housing Units [1]	**2,539**	**3,120**	**3,137**	**3,360**
Type of Housing (occupied)				
1 Unit	1,941	2,366	2,373	2,468
2 or more units	533	659	630	750
Mobile home	65	78	134	148
Vacant Housing Units	**295**	**277**	**275**	**276**
For Seasonal, Rec use	N/A	N/A	16	28
Homeowner Vacancy Rate	N/A	1.6%	2.4%	1.8%
Rental Vacancy Rate	N/A	10.6%	1.07%	7.3%
Number Households	**2,244**	**2,843**	**2,862**	**3,084**
Owner Occupied	1,499	1,902	1,780	1,870
Renter Occupied	745	941	1,082	1,214
Total Persons per Household	**2.80**	**2.24**	**2.28**	**2.16**

Note: [1] Housing units include all occupied and vacant structures.

Sources: 1) Compiled by US Bureau of Census, 1990 Census of Population and Housing, Summary Tape File 1A.
2) Detailed housing data found at: 1990 Census of Population and Housing, Summary Tape File 1A.
3) US Census Bureau American Factfinder, Summary File 1, 100-Percent data, 1990 and 2000.
4) 1970 and 1980 Census of Housing, General Housing Characteristics.

Economic Trends

This next section describes the changes in economic profiles for Park County over the past three decades.

Income. Park County has experienced consistent increases in personal incomes since 1970 (see Exhibit 5a-8 on the following page). Essentially all of the increases have come from nonfarm incomes, while farm income has been flat. Park County's current ratio of farm to nonfarm incomes is roughly the same as the State's ratio. Per capita level of income has also risen, though average earnings per job have declined. Dividends, interest, rent and transfer payments all play much larger roles in income now than they did in 1970. Only half of Park County personal income is from earnings compared with two thirds for the State of Montana. Park County residents also derive more of their income from retirement and medical payments than residents of Montana as a whole. These findings confirm the influence of wealthy residents in the study area.

Exhibit 5a-8.
Park County and Montana Personal Incomes, by Sources (Millions of Year 2000 Dollars)

	Park County					Montana	
	1970	1980	1990	2000	Percent Total	2000	Percent Total
Total Personal Income	$165	$243	$252	$313		$20,337	
Nonfarm personal income	$147	$239	$248	$309	99%	$20,083	99%
Farm income	$18	$4	$4	$4	1%	$254	1%
Per Capita Personal Income	$14,504	$18,606	$17,228	$19,883		$22,518	
Average Earnings per Job	$24,454	$25,341	$18,494	$18,431		$23,653	
Total Personal Income by Sources	$165	$243	$252	$313		$20,337	
Earnings by place of work	$115	$160	$123	$165	53%	$13,307	65%
Proprietors' income	$30	$18	$28	$34	11%	$2,014	10%
Farm proprietors' income	$14	($1)	$2	$2	1%	$100	0%
Nonfarm proprietors' income	$16	$19	$26	$32	10%	$1,914	9%
Dividends, interest, rent	$35	$60	$74	$87	28%	$4,623	23%
Transfer payments	$18	$29	$51	$56	18%	$3,275	16%
Retirement and disability	$9	$15	$31	$30	10%	$1,546	8%
Medical payments	$3	$6	$11	$16	5%	$1,052	5%
Supplemental Social Security	$0	$0	$1	$1	0%	$57	0%
Unemployment insurance	$1	$2	$1	$2	1%	$71	0%
Adjustments	$3	($6)	$5	$5	2%	($869)	-4%

Note: Adjustments include adjustments for residence and personal contribution for social insurance.
Source: Regional Economic Information System, Bureau of Economic Analysis.

Earnings. Park County earnings have risen over the past three decades (see Exhibit 5a-9 below). From 1970 to 2000, total earnings increased more than 40 percent. Today's Park County economy differs somewhat from the Montana economy based on personal earnings. The following industries generate relatively more earnings at the county level than at the state level: construction, retail trade, finance, insurance and real estate, and services. Within the retail trade and services sectors, Park County has disproportionately high earnings in automotive dealers and service stations, eating and drinking places and hotels and other lodging places. Mining, manufacturing, wholesale trade and government all generate less earnings at the county level than at the state level, possibly reflecting Park County's greater dependence on the tourism and seasonal economy and lesser dependence on the more extractive and production-oriented industries. Construction of second homes and residential developments and high levels of retail trade and professional and personal services are indicators of a tourism/seasonally-dependent economy.

Exhibit 5a-9.
Earnings in Park County and Montana by Economic Sector (Millions of Year 2000 Dollars)

	Park County					Montana	
	1970	1980	1990	2000	% Total	2000	% Total
Farm	$18	$4	$4	$4	2%	$254	2%
Ag services, forestry, fish	$1	$1	$1	$2	1%	$134	1%
Mining	$0	$1	$6	$1	1%	$297	2%
Construction	$5	$7	$8	$16	10%	$992	7%
Manufacturing	$7	$12	$8	$10	6%	$943	7%
Transportation and public utilities	$33	$66	$12	$13	8%	$1,039	8%
Railroad transportation	$28	$56	$6	$5	3%	N/A	
Wholesale trade	$1	$2	$3	$4	2%	$653	5%
Retail trade	$16	$18	$19	$23	14%	$1,527	11%
Automotive dealers and service stations	$5	$5	$4	$6	4%	$312	2%
Eating and drinking places	$3	$4	$5	$7	4%	$376	3%
Finance, insurance and real estate	$5	$6	$5	$11	7%	$827	6%
Services	$15	$24	$37	$54	33%	$3,701	28%
Hotels and other lodging places	N/A	N/A	$7	$13	8%	$164	1%
Amusement and recreation services	$0	$1	$2	$2	1%	$154	1%
Health services	$6	$8	$13	$17	10%	$1,388	10%
Government	$14	$19	$20	$25	15%	$2,939	22%
Total	**$115**	**$160**	**$123**	**$163**		**$13,306**	

Source: Regional Economic Information System, US Bureau of Economic Analysis.

Employment. As shown in Exhibit 5a-10 below, employment in Park County has grown in the 1990s; 2001 unemployment statistics for the county roughly matched those of the State.

Exhibit 5a-10.
Employment, Yearly Averages for Park County and Montana

	Park County					Montana
	1990	1999	2000	2001	March, 2002	2001
Work Force	7,703	10,413	10,281	9,488	8,770	465,223
Employment	7,288	9,834	9,723	9,040	8,255	443,904
Unemployment	415	579	558	448	515	21,319
Unemployment Rate	5.4%	5.6%	5.4%	4.7%	5.9%	4.6%

Note: Unemployment refers to those unemployed workers actively looking for a job.
1999, 2000 and 2001 numbers are annual averages as calculated by MT Dept. of Labor and Industry.

Sources: MT Dept of Labor and Industry, Research and Analysis Bureau.
MT Employment and Labor Force Trends, MT Dept of Labor and Industry, Research and Analysis Bureau.

These data from the State of Montana differ from the federal data sources below.

Park County's employment by sector has grown steadily over the past three decades (see Exhibit 5a-11 below) according to federal data sources. The fastest growing industries have been agricultural services, forestry and fishing, construction, wholesale and retail trade, and services. Retail trade and services together account for over half of Park County employment. More workers proportionally are employed in retail trade and services in Park County than at the state level, again characteristic of a tourist-oriented economy. More workers are self-employed, or "proprietors," in Park County than in the state as a whole, as well.

Exhibit 5a-11.
Park County and Montana Employment Totals and Employment by Sector

	Park County					Montana	
	1970	1980	1990	2000	% Total	2000	% Total
Total full time and part time	4,692	6,301	6,656	8,931		562,600	
Proprietors' employment	1,248	1,528	2,299	2,896	32%	145,681	26%
Farm proprietors' employment	416	373	393	465		25,571	
Nonfarm proprietors' employment	832	1,155	1,906	2,431		120,110	
Farm	630	523	505	609	7%	32,501	6%
Agricultural Services	47	70	128	195	2%	10,026	2%
Mining	L	14	126	30	0%	6,567	1%
Construction	156	294	382	722	8%	35,288	6%
Manufacturing	295	415	350	443	5%	29,219	5%
Transportation/Public Utilities	744	1,371	322	371	4%	27,464	5%
Wholesale Trade	37	55	134	206	2%	20,440	4%
Retail Trade	872	1,060	1,250	1,868	21%	105,934	19%
Finance, Insurance and Real Estate	357	405	462	577	6%	37,461	7%
Services	998	1,423	2,248	3,083	35%	171,889	31%
Government	555	671	749	827	9%	85,811	15%

Note: (L) Less than 10 jobs, but the estimates for this item are included in the totals.
Source: US Bureau of Economic Analysis, Regional Economic Information System.

Commuting patterns. Data from the 1970 through 2000 censuses reveal that a higher percentage of workers are commuting out of the county for work in 2000 compared to 1970 (see Exhibit 5a-12 below). Based upon interviews with Park County residents, data suggest that Park County residents are commuting to the Bozeman area in neighboring Gallatin County in increasing numbers.

Exhibit 5a-12.
Park County Commuting Patterns

	Park County			
	1970	1980	1990	2000
Total Workers Commuting	4,260	5,206	6,288	7,712
Worked in Park County	3,946	4,761	5,539	6,108
Worked outside of Park County	314	445	749	1,604
Worked outside of Park County (percent)	7.4%	8.5%	11.9%	20.8%
Worked outside of Park County but in MT	121	208	363	1,056
Worked outside of Park County but in MT (percent)	2.8%	4.0%	5.8%	13.7%
Worked in Gallatin County	100	135	278	N/A
Worked in Gallatin County (percent)	2.3%	2.6%	4.4%	N/A
Worked outside of state	193	237	386	548
Worked outside of state (percent)	4.5%	4.6%	6.1%	7.1%

Source: US Census Bureau.

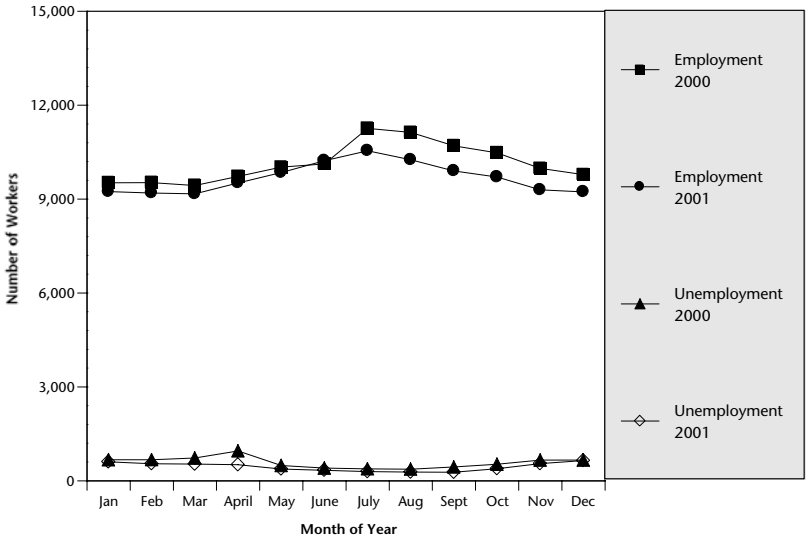
The Tourism Industry

The stakeholder interviews (Task 2) and surveys of residents, businesses and visitors (Tasks 3 and 4) revealed that Park County perceives its tourism industry as vitally important to the economy. BBC sought to examine the validity of this perception through objective secondary data from state and federal government sources.

Employment. Exhibit 5a-13 below shows that Park County's employment is somewhat seasonal, slowly ramping up in the number of jobs from January to the peak in July, and then employment slowly falls off again from August through December. The inverse pattern with unemployment is evident. This seasonality of employment in part reflects an economic dependence upon tourism and likely reflects strong summer-oriented construction and agriculture sectors, as well.

Exhibit 5a-13.
Monthly Employment and Unemployment for Park County, 2000 and 2001

Source:
Montana Department of Labor and Industry.



Gross business sales. Data on sales for Park County are available from the Economic Census (see Exhibit 5a-14 on the following page). The most important sectors to Park County are: retail trade, manufacturing, accommodation and foodservices, wholesale trade, and healthcare and social assistance, in that order. For Montana, on the other hand, the most important sectors were retail trade, wholesale trade, manufacturing, construction, and healthcare and social assistance, in that order. The retail trade and accommodation and foodservices sectors contribute greatly to county gross business sales, offering further potential evidence of Park County's orientation toward touristic enterprises.

Visitors and seasonal residents. Another source of data on the role of tourism and seasonal residents in the Park County economy and community is statistics on visitation and seasonal residents. Sources of visitation data to Park County include the National Park Service, the US Forest Service, and the Institute for Tourism and Recreation Research (ITRR) at the University of Montana in Missoula. The source for seasonal resident data comes from the property assessment database at the State of Montana.

Exhibit 5a-14.
Selected Park County and Montana Economic Data by Sector, 1997 (Thousands of Year 1997 Dollars)

NAICS	Sector	Park County Employers' Establishments	Sales	Park County Nonemployers' Establishments	Sales	Montana Employers' Establishments	Sales	Montana Nonemployers' Establishments	Sales
11	Forestry, fishing, hunting, and agricultural support	n/a	n/a	69	$2,251	n/a	n/a	2,846	$96,247
21	Mining	n/a	n/a	D	D	294	$1,297,707	536	$24,288
22	Utilities	n/a	n/a	D	D	215	$949,275	89	$1,765
23	Construction	n/a	n/a	267	$7,787	3,452	$2,262,701	9,475	$376,478
31-33	Manufacturing	36	$63,337	53	$1,967	1,160	$4,866,279	1,859	$46,831
42	Wholesale trade	23	$33,903	22	$747	1,574	$7,596,802	1,288	$68,959
44-45	Retail trade	111	$102,670	183	$5,058	5,042	$7,779,112	9,278	$292,769
447	Gasoline stations	15	$13,930	D	D	570	$753,867	69	$13,126
45392	Art dealers	6	$1,253	D	D	45	$10,642	79	$2,379
48-49	Transportation/warehousing	n/a	n/a	46	$2,369	967	$948,929	2,561	$157,747
51	Information	n/a	n/a	16	$579	568	$1,061,739	507	$10,521
52	Finance and insurance	n/a	n/a	37	$1,376	1,553	N	2,485	$86,187
53	Real estate and rental and leasing	28	$6,223	111	$3,997	1,186	$353,421	5,165	$251,362
54	Professional, scientific and technical services	46	$7,432	184	$4,559	2,127	$794,160	9,120	$201,423
55	Management	n/a	n/a	n/a	n/a	112	$58,585	n/a	n/a
56	Administrative, support, waste management	21	$2,240	63	$884	968	$312,431	2,831	$36,229
61	Educational services	2	D	14	$124	165	$24,554	931	$6,895
62	Healthcare and social assistance	31	$13,757	94	$1,923	2,725	$2,368,996	5,142	$98,181
71	Arts, entertainment and recreation	26	$4,281	108	$2,468	784	$346,024	3,002	$56,483
72	Accommodation and foodservices	111	$33,953	37	$745	3,280	$1,199,251	1,079	$44,964
721	Accommodations	44	$18,496	26	$561	682	$337,854	477	$21,670
72111	Hotels and motels	32	$14,101	n/a	n/a	487	$284,694	n/a	n/a
722	Foodservices and drinking places	67	$15,457	11	$184	2,598	$861,397	602	$23,294
81	Other services	35	$9,141	202	$3,759	2,167	$620,726	8,993	$168,894
	Total	**470**	**$276,937**	**1,506**	**$40,593**	**28,339**	**$32,840,692**	**67,187**	**$2,026,223**
	Total Employment for Park County	**1,976**	**Total Sales for Park County**		**$317,530**				
	Total Employment for Montana	**95,526**	**Total Sales for Montana**		**$34,866,915**				

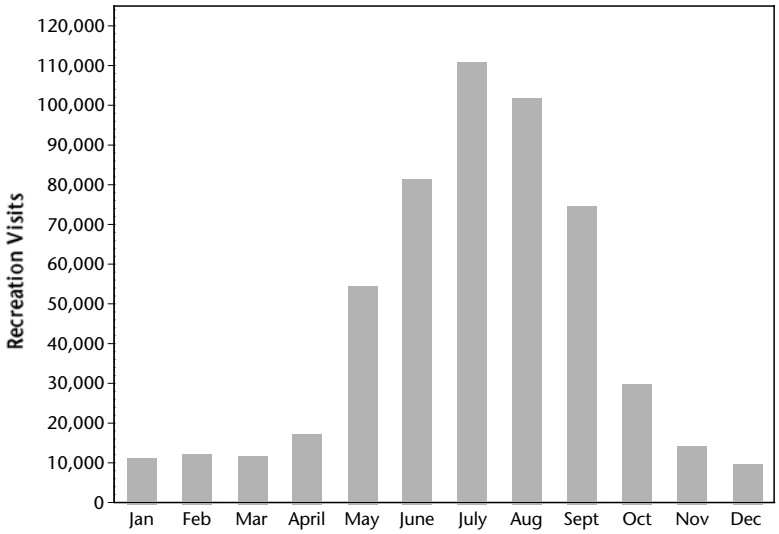
Notes: (D) Data not disclosed to maintain anonymity.
(n/a) Data not available.
A nonemployer establishment is one that does not have any official employees. The only workers in such establishments are typically owners and family members.

Source: US Census Bureau, Economic Census 1997.

Visitation statistics. According to the National Park Service, Yellowstone National Park admitted 529,471 visitors through its gates in Gardiner in 2001. Of those visitors, more than 50 percent came in the summer months of June, July and August (see Exhibit 5a-15 below). Total Yellowstone visits through Gardiner have been remarkably stable throughout the past decade, with nearly 530,000 visits in 1992, the same in 2001, and a peak of 589,000 in 1995. That means that on average, 550,000 visitors drove through Park County to reach Yellowstone National Park and may have contributed to the local economy on their way.

Exhibit 5a-15.
Recreation Visits through the North Entrance of YNP, 2001

Source:
US National Park Service, 2002.



Travel Montana (the state tourism bureau) estimated that there are 1,182 rooms in hotels, motels, bed and breakfasts, resorts and lodges within the Emigrant, Gardiner, Livingston and Pray areas. This estimate does not include campgrounds, RV parks, or other lodging facility types, so it is necessarily an undercount of transient locations. With an ITRR estimated average 2001 occupancy rate of 58 percent, and a BBC estimated 2 persons per room, these rooms on average held 1,370 visitors per day in 2001, or a total of 500,000 visitors for the year.

One part of visitors' impact on the Park County economy is the lodging tax revenues for the State of Montana. From 1988 to 2001, these tourism-generated revenues have more than doubled, from $159,000 to over $400,000. These numbers have been affected by room charge increases, lodging tax rate increases and an increase in rooms in the county, but they still reflect tourism's sizeable impact on the Park County economy.

The US Forest Service was unable to provide visitor statistics for its districts of the Gallatin National Forest located in Park County. The Montana Board of Outfitters was able to provide some angler use data, however, for the Yellowstone River (the entire stretch from Gardiner downstream to the Montana-North Dakota border). Yellowstone River nonresident user days rose from 3,317 in 1995 to 4,534 in 2001, and they peaked in 2000 at 5,456 nonresident user days.[1] Montana's Fish, Wildlife and Parks Department's biannual angling use survey also provided some indication of angling use. The survey estimated that angling use days on the Upper Yellowstone River in Park County have increased from about 46,000 in 1982 to over 76,000 in 1999.

[1] Montana Board of Outfitters, telephone conversation, 6 September 2002.

In 1997, ITRR performed a case study of the impacts of tourism on the Livingston economy. Black and Nickerson estimated that without visitors to Livingston, 500 people would lose their jobs (combined fulltime, part-time and seasonal). The county would also lose $129,000 in property tax revenues from roughly 50 companies driven out of business by the loss of tourism, and the school system would lose some 45 students. Community and school groups may lose up to $18,000 in donations, and all levels of government would be impacted.[2] Clearly, even with these estimates that researchers admitted were conservative, tourism is a strong force in the Park County economy.

Seasonal residents. Though it is difficult to actually track seasonal residents' economic contributions in Park County, BBC endeavored to document the scale of seasonal residency in the county and study area. Using county assessor data maintained at the State of Montana, BBC estimates that at some point in 1997 (the year reassessments were conducted), there were approximately 1,400 seasonal residents in Park County. Seasonal residents were determined to be those property owners with mailing addresses outside Montana. BBC then reduced the list of seasonal residents to include only those owning property in sections adjacent to the river. The number of seasonal residents in this proxy for the study area was more than 800. Some 1,400 seasonal residents, in addition to the county's 15,694 residents in 2000, account for roughly eight percent of the population.

The Ranching Economy and Displacement

The ranching industry has a long and important social and economic history in Park County. Data from the Bureau of Economic Analysis, from the US Department of Agriculture, and from local experts in agriculture and land use lend credence to the analysis of the economic contribution of ranching and the concerns many have that ranchers are being displaced in the study area.

Ranching in the economy. As shown in earlier exhibits 5a-8, 5a-9 and 5a-10, ranching, agricultural services, and forestry and fishing account for roughly 3 percent of earnings and 9 percent of employment in Park County. These figures include net proprietors' income and employee earnings. These statistics are comparable with the State of Montana's.

As shown in Exhibit 5a-16 below, Park County agriculture expended $30 million in production expenses and received $21 million in cash receipts in 2000. This activity compares with more than $100 million in gross sales by the Park County retail trade sector discussed earlier. Historical trends in the Park County ranching economy point to a declining level of cash receipts but a continuing disproportionately high level of production expenses. Obviously, agricultural operations are under financial pressure with such market conditions.

[2] Rita Black and Norma Nickerson, *Visitor Impacts: Livingston Case Study*, Institute for Tourism and Recreation Research, February 1997.

Exhibit 5a-16.
Agricultural Contributions to the Park County and Montana Economies (Millions of Year 2000 Dollars)

	Park County				Montana
Park County	1970	1980	1990	2000	2000
Total cash receipts from marketings	$46	$41	$27	$21	$1,815
Cash receipts: livestock	$40	$33	$22	$17	$1,141
Cash receipts: crops	$6	$8	$5	$4	$674
Other income	$7	$4	$6	$14	$732
Total production expenses	$40	$47	$32	$30	$2,328
Total value of inventory change	$1	$1	$1	($3)	($115)

Source: Regional Economic Information System, Bureau of Economic Analysis.

The inventory change shown in Exhibit 5a-16 equals the change in value of livestock plus the change in value of crops. "Other income" is imputed income, such as gross rental value of dwellings and value of home consumption, and other farm-related income components, such as machine hire and custom work income, rental income, and income from forest products. This other income has likely risen over time as Park County ranchers increasingly depend on other sources of income, such as spring creeks, outfitting or lodging. The biggest jump in this portion of farm incomes came in the 1990s.

Exhibit 5a-17 on the following page shows that though the number of ranches has increased since 1969, the average size of ranches in Park County has fallen, even below the state average. Acreage in cropland, irrigated cropland and rangeland also declined since 1969. The total acreage in ranching is falling. Especially noteworthy is the steady reduction in irrigated cropland, which is now only five percent of total land in agriculture. In contrast, hay acres and output are increasing, suggesting that more dryland hay production is occurring. The number of cattle, but especially pigs and sheep, is declining.

Exhibit 5a-17.
Park County and Montana Agricultural Statistics

		Park County				Montana
	Units	1969	1978	1992	1997	1997
Farms	(Number)	397	376	385	420	24,279
Average size	(Acres)	2,161	2,268	2,020	1,784	2,414
Total land in farms/ranches	(Acres)	857,888	852,951	777,803	749,103	58,507,778
Total cropland	(Acres)	136,177	128,855	146,987	131,730	17,629,001
Irrigated cropland	(Acres)	52,073	57,099	41,813	38,664	1,994,484
Farms with irrigated land	(Number)	284	272	225	205	9,050
Total woodland	(Acres)	58,426	44,272	54,284	104,956	2,059,427
Total rangeland	(Acres)	663,285	673,046	567,051	483,400	37,974,465
Cattle and Calves inventory	(Number)	56,605	55,363	48,932	46,265	2,618,319
Farms with cattle	(Number)	341	306	255	258	14,215
Hogs and pigs	(Number)	2,431	2,307	1,385	207	177,740
Farms with hogs, pigs	(Number)	65	44	15	8	827
Sheep and lamb	(Number)	9,924	3,903	6,110	3,281	N/A
Farms with sheep and lamb	(Number)	83	52	51	36	N/A
Major Crops harvested in Park County						
Wheat for grain	(Farms)	155	80	57	47	7,832
Wheat for grain	(Acres)	16,798	16,020	14,519	10,428	5,602,338
Wheat for grain	(Bushels)	486,104	502,889	606,921	386,996	172,214,482
Barley for grain	(Farms)	N/A	124	73	58	4,423
Barley for grain	(Acres)	N/A	10,199	9,054	7,811	1,093,414
Barley for grain	(Bushels)	N/A	431,631	460,994	415,376	85,236,980
Oats for grain	(Farms)	N/A	51	21	27	1,251
Oats for grain	(Acres)	N/A	1,951	838	951	86,331
Oats for grain	(Bushels)	N/A	132,582	58,110	57,859	3,501,869
Hay	(Farms)	324	292	261	282	13,536
Hay	(Acres)	47,902	46,672	45,820	58,568	2,528,517
Hay	(Tons, dry)	91,354	93,334	108,607	134,787	4,745,598

Source: US Department of Agriculture, 1997,1992, 1978, and 1967 Censuses of Agriculture, Montana State and County Data, Voulme 1, Geographic Area Series, Part 26, March 1999.

Displacement of ranching.[3] There is a concern that wealthy, out-of-state seasonal residents and second home residential development are displacing ranchers and their ranches in the study area. BBC explored this question through data and interviews with local agricultural and real estate experts.

The data support this observation. Exhibit 5a-18 on page 17 and Exhibit 5a-17 above show that the number of ranches in Park County is increasing while the average size of ranches is decreasing. Local experts explained that this situation likely means that smaller ranches have been subdivided, reducing the average ranch size and taking some land out of productive agriculture. Larger ranches have mostly remained intact or grown larger, but ranchers *are* slowly selling these larger ranches at high prices to out-of-state landowners.

[3] All information in this section on displacement of ranching, with the exception of US Department of Agriculture data in Exhibit 5a-17, comes from personal interviews with Marty Malone, Park County Extension Agent, Ellen Woodbury, Park County Planner, Jim Woodhull, Livingston City Planner, Dave Viers, Realtor, Marcy Hertz, Realtor, and Hebbard Blesins, Realtor, in September 2002.

Land prices have escalated substantially in Park County; the average value of ranches is now almost double that of the State average, even though the average Park County ranch is smaller than the average Montana ranch. High land values prompt ranchers to sell their property to reap the financial gains for retirement or for relocating their ranches to cheaper locales. The number of Park County cattle has fallen too — which local experts say reflects the fact that seasonal, out-of-state ranch owners often run fewer cattle. They typically run cattle only to cover the expenses of the ranch and not for a major contribution to their incomes.

Some 23 percent of ranches in the county generate less than $2,500 in sales, not nearly enough income to run a working, fulltime ranch (see Exhibit 5a-18 on the following page). These ranches are considered hobby farms. More than 250 ranchers worked fulltime on ranches in Park County, but almost half as many worked more than 200 days off the ranch — probably hobby ranchers and part-time ranch hands.

The hobby rancher and ranch displacement phenomenon is simple, the experts say. The study area and Paradise Valley are very attractive places in which to live and work. As such, land prices both in the valley and along the river have skyrocketed. Riverside land prices have far outpaced other rural acreage. Riverfront acreage has become prime for residential development and subdivision, some of which resulted in a loss of ranching land. Although land has been subdivided, there are not currently significant numbers of new subdivisions. Older subdivisions are steadily being filled in as demand for second homes dictates.

As riverside land has been developed, rural land prices in the study area have also risen, making ranches large and small very valuable — oftentimes more financially valuable than the ranching operations themselves. As such, the opportunity costs for ranchers to *not* sell their property and move their operations to less valuable areas (or to retire) have risen greatly, creating a strong financial incentive for ranchers sell their Park County lands. Those who have stayed see other noneconomic values for their lands and their place in the community that outweigh the opportunity costs of staying to ranch in Park County.

For those who sold, most of the large ranches have been sold intact or combined with others. Almost all ranch buyers have been out-of-state landowners who have generally maintained ranching as a way to cover expenses of the property and to avoid any out-of-pocket operating expenditures. The same is generally true of smaller ranches, though the new owners more often cease ranching to return the land to its "natural" state for attracting wildlife or lease their rangeland for grazing to nearby working ranches. The average selling price of agricultural land is somewhere near $25-35,000 per animal unit in the Paradise Valley; ranchers can afford maybe $2,000 per animal unit to make a living. These economics make buying ranches only to ranch unfeasible.

Displacement implies that someone or something is forcing ranchers out of Paradise Valley. Ranchers are not being taxed out, since these lands continue to be classified as agricultural. There is no one compelling ranchers to leave. The market for Park County's agricultural products (primarily beef cattle) has never made ranching here easy or very profitable. In the past, a rancher had to expand to become more economically viable, increasing his herd and ranch. Land values in Park County mean this is no longer affordable. Those same high land values make it economically favorable for ranchers

Exhibit 5a-18.
Park County and Montana Ranching Statistics (Monetary Figures in Year 1997 Dollars)

	Park County					Montana	
	1969	1978	1992	1997	% Total	1997	% Total
Total number of farms	397	376	385	420		24,279	
Average value land, buildings, equipment per farm	$691,000	$1,435,000	$872,000	$1,178,000		$776,000	
Total Value of Park County Farms	$274,327,000	$539,560,000	$335,720,000	$494,760,000		$18,840,504,000	
Total number of farms	397	376	385	420		24,279	
Number of farms with harvested crops	349	304	279	299	71%	17,854	74%
Number of farms with irrigated crops	284	272	260	251	60%	9,058	37%
Farms with less than $2,500 sales	60	35	79	97	23%	4,996	21%
Number of farms with cattle and cows	341	306	266	258	61%	14,216	59%
Persons whose principle occupation is farming	370[1]	267	250	256		15,703	
Persons who worked 200 or more days off farm	78	81	95	116		6,322	

Note: (') Reported as 'Farm operators by place of residence' rather than 'principle occupation is farming'.

Source: 1997, 1992, 1978, and 1969 Censuses of Agriculture, Volume 1 Geographic Area Series, Table 1. County Summary Highlights: 1997." 1978 Census of Agriculture, Part 26, Volume 1, State and County Data, Montana. 1969 Census of Agriculture, Part 38, Volume 1, Area Reports, Section 1. County Data.

to sell their land to expand their operations into a new location. The financial incentives point most ranchers to selling. Those who have stayed have typically added other ventures, like outfitting or lodging, to their income portfolios to maintain the quality of life they seek.

Strictly speaking, ranching is not being displaced because the new landowners buying ranches in Park County typically still run cattle on the ranches to cover expenses. It is true that some land is being removed from agricultural production, and there are fewer cattle running the ranges now than 30 years ago.

In sum, ranchers *are* choosing to leave Park County, but no outside force is forcing them to go. Instead, they are responding to the driving force of wealth and economics by relocating of their own free will and taking advantage of their opportunity to ranch elsewhere, where land prices are cheaper. They then can reap the financial rewards of selling their valuable rural acreage in Paradise Valley.

Public Services and Facilities

This component of Task 5a addresses public facilities and services within the study region, focusing on the relationship of those public facilities and services to the Yellowstone River. A brief description of each is provided below along with a discussion of flood flows and other issues associated with changing water levels on the Yellowstone River.

Water providers. Although most of the Park County residents are served by individual water wells, the City of Livingston has a regional water system that includes six groundwater wells located throughout the city. The system has a production rate of 480 gallons per minute. Water distribution lines have recently been replaced and improved. The older water mains will also need to be upgraded further. Water storage comes from three tanks or reservoirs amounting to approximately a 3,000,000-gallon capacity. Water supplies and the water system generally are capable of meeting present and future needs, although new wells will need to be drilled and storage will need to be added over time. Growth south of the city will require further expansion.[4]

Sewerage. Almost all of Park County outside of Livingston is served by septic tanks; the exception is the City of Livingston, which has a sewage collection and treatment system, and Gardiner, which also has a small sewer system. The Livingston sewage treatment plant is a 2 million gallon per day capacity plant that operates at an average daily flow rate of 850,000 gallons. The 40-year old plant discharges into the Yellowstone River. It is in compliance with all permit requirements. This utility recently completed a comprehensive study related to plant expansion and replacement, concluding that collection lines did need replacing.

High flows on the Yellowstone have in the past caused a problem for the Livingston sewage treatment utility. During the floods of the late 1990s, sandbagging was required to protect the integrity of the plant, and an emergency bypass was used to discharge into a swamp during the flooding period.[5]

[4] City of Livingston and Park County, The Comprehensive Plan, Livingston Planning Area, 1998, pp. 29-30.

[5] Interview with Steve Briggs, Livingston Sewage Treatment Plant Operator, June 2002.

Little is known about sewage treatment issues outside of Livingston in Park County. The county sanitarian is not aware of septic seepage issues into the Yellowstone River.[6] Gardiner's small sewage system, which serves 2,000 people, has not reported any major problems.

Police protection. Park County is served by the Park County Sheriff Department and the Livingston Police Department.

The Livingston Police Department consists of 12 officers relying upon the sheriff's department jail, a 20-cell facility. The jail is substandard but where to build and how to finance a new jail is uncertain at this time. The Livingston Police Chief believes the department is understaffed by one to two officers. There was an upward trend of police incidents during the 1990s with the influx of more people in the county, but the number of incidents has been stable for the last two to three years. Part of the demand for law enforcement services in Livingston and Park County comes from the fact that it is a community with transients, dependent upon a tourist economy. Although police incidents do go up in the summer, that is not necessarily attributable to tourists as much as it is people simply moving through the community. The Police Chief does not believe that the Yellowstone River has added to or determined the demand for law enforcement services in Park County. The proximity of Interstate 90 and Yellowstone Park are probably the main driving elements behind law enforcement demand in Park County. The flooding of the Yellowstone River was not a particular problem for law enforcement although the flooding created a traffic control problem and there were security issues associated with guarding private property.[7]

Fire protection. Park County is served by the Park County Rural Fire District and the Livingston Fire Department, as well as Paradise Valley Fire Service and the Gardiner Hose Company.

The Park County Rural Fire Department is a volunteer department which might be going to a partially paid department in the future. There are 30 volunteers, two engines, four wildland rigs and assorted other equipment and facilities. Water comes from hydrants or the river whenever it is accessible. The Rural Fire District responds to roughly 180 calls a year — up from about 100 calls a year 10 years ago. During the recent floods, the Rural Fire Department did sandbag to protect private property, especially in the Emigrant area. They carefully monitored events and did some rescue work. The issue for the Rural Fire Department is access to fire department calls during flooding. For example, during the floods of the 1990s, the 9th Street Island Bridge and other places were cutoff from road access.[8]

The Livingston Fire Department consists of 14 fulltime and 6 part-time firefighters. The department has two pumpers, one ladder truck, four ambulances and two support vehicles. They operate on three-man crews but would prefer four-man crews. The fire insurance rating of Livingston is a four ISO, which is relatively favorable. Equipment is up to the minimum standards but roughly 25 years old. The Livingston Fire Chief would like to have more firefighting pumping capacity. Fire calls have been gradually increasing with population, and visitors cause a spike in emergency medical services during May through October. The city generally does not rely on the Yellowstone River water,

[6] Interview with Randy Taylor, Park County Sanitarium, June 2002.

[7] Interview with Darren Ramey, Livingston Police Chief, June 2002.

[8] Interview with Bob Frye, Fire Chief, Park County Rural Fire Department Fire District No. 1, June 2002.

depending rather on the city hydrant system. During the recent floods, the fire department completed flood-related rescues. There was a constraint to ambulance service when the bridge was threatened by a flood.[9]

Park County social services. Social services in Park County consist primarily of food stamps, family services and other assorted counseling. The Public Health Nurse is responsible for home visits, parenting advice, high-risk pregnancy advice, child abuse prevention and other rural nursing needs. Mental health counseling is provided separately through the county health department. The public health nurse was unaware of any effect of flooding or relationship between the Yellowstone River and the social service needs of Park County.[10]

Health care. Livingston Memorial Hospital is a 45-bed facility with four ICU beds and 85 fulltime employees. The hospital itself is sufficient to meet current needs, although some replacement of facilities and remodeling would be desirable. In terms of health care professionals, the hospital and the county are served by three internal medicine specialists, five family practitioners, one pediatrician, one general surgeon, two OBGYN, three nurse practitioners and one physician's assistant. Unlike most rural areas, recruitment is not much of a problem for Park County because of the local quality of life. In this sense, the Yellowstone River is an asset to the healthcare system in that it attracts and keeps healthcare professionals in the community. The hospital experienced no direct effects from recent flooding. One physician clinic was sandbagged, however.[11]

Summary of Local Economic Trends

Several observations about Park County's demography and economy are offered.

- Park County's population is growing, but almost all growth is occurring in smaller towns (Emigrant, Pray, Gardiner, Wilsall, Clyde Park) and in the rural areas of the county.

- Middle-aged individuals comprise a population bulge in Park County. Outmigration of young people is less than most rural areas.

- Park County and Livingston have both experienced steady growth in the housing stock, in part due to the influx of seasonal residents. The average number of people per household is smaller now than 30 years ago. Vacancy rates are relatively low.

- Personal incomes have risen in the past 30 years; most growth has occurred in the nonfarm sectors. The greatest increase has come from dividends, interest, rent and transfer payments, which are all disproportionately high in Park County.

- Earnings have generally increased since 1970, especially in tourism-related sectors.

[9] Interview with Bob Brown, Livingston Fire Chief, June 2002.

[10] Interview with Suzanne Brown, Park County Public Health Nurse, June 2002.

[11] Interview with Sam Pleshar, Director, Livingston Memorial Hospital, June 2002.

- Tourism also dominates the employment picture. Unemployment has been relatively low and fairly steady throughout the 1990s, and Park County's number of jobs has nearly doubled in the past 30 years.

- The number of workers commuting outside Park County for work, probably to Gallatin County, has doubled in the last 10 years.

- Tourism is clearly the strongest element of the Park County economy, generating sales, jobs and income for the majority of residents and businesses.

- Accounting for nine percent of the total, seasonal residents are a notable presence in the county.

- Ranching is still important to Park County, generating income and earnings for hundreds of ranchers and their employees and spreading secondary effects of local spending throughout the area.

- Ranchers and ranching are not being displaced, but longtime ranchers are freely leaving the county, which may prompt concern on the part of local residents who value ranchers' contributions to the community and history of the area.

Task 5b.
Land Use Trends in the Upper Yellowstone River Study Area

Introduction

BBC has analyzed land use trends in the Upper Yellowstone River study area as summarized in this task report. First, we have described local government goals and approaches to land use planning. Second, BBC offers an analysis of land use changes over the past 30 years to reveal trends in residential development and agriculture, with particular emphasis on the evolution of land uses along the river.

Land Use Planning in the Upper Yellowstone River Study Area

Park County.[1] Park County and 300 of its citizens drafted the current Park County Comprehensive Plan in 1998. They reviewed data on the economy, government, environment, wildlife, history, public services, transportation, schools and land use. The Plan defined six planning areas throughout the County: Clyde Park, Wilsall, Springdale, Paradise Valley, Gardiner and Cooke City. Only the last four are relevant to the study area under consideration here. At the time of publication, no map of these planning areas was available. The Plan included the following planning recommendations for those areas:

Springdale

- Preserve the area's rural character and quality of life while protecting the air, water, soils, forests, grasslands, wildlife and scenic beauty.
- Limit development that undermines agriculture, but curb government regulations to the minimum needed to protect the area's values.
- Prevent subdivided lots (5-, 10-, 20-acre plots) and promote concentrated development in the Springdale neighborhood.
- Encourage innovative land development and conservation practices while strictly enforcing subdivision regulations with regard to septic systems and restricted floodplain development.

[1] This section based upon *Park County, Montana, Comprehensive Plan*, March 1998, and upon interviews with Ellen Woodbury, Park County Planner, summer and fall 2002.

Paradise Valley

- Preserve historic sites and support the area's agricultural base.
- Encourage commercial development in existing commercial areas that brings in working wage jobs.
- Develop plans for multiple uses on federal lands.
- Maintain current levels of county services, including education, roads and fire/police protection and encourage developers to contribute to these services as good faith gestures toward the community.
- Protect surface and groundwater quality by preventing development in inappropriate areas in riparian areas, floodplains and wetlands.
- Encourage a balance between human and wildlife habitat by educating residents on wildlife behavior and measures to prevent problem interaction and by encouraging voluntary conservation easements on residential and agricultural lands.
- Maintain biological diversity of fisheries and scenery in the riparian corridor.
- Promote open space and preserve agricultural landscapes by encouraging cluster development and involving the community in new development plans.

Gardiner

- Support efforts to diversify the economy within the supportable bounds of existing infrastructure and human resources.
- Support the survival of agricultural land uses and development of locally owned and operated businesses.
- Encourage residential development to serve housing needs while maintaining open space by clustering development and adding residential capacity in areas already served by public services.
- Develop a way to charge developers for increased public service costs.
- Protect the environment while preserving private property rights by developing better information about the area's environment so residents can make less affective decisions.
- Educate residents on potential conflicts with wildlife to preserve both the diversity of wildlife and private property rights.
- Protect riparian areas and fisheries.
- Encourage new development in Gardiner and Corwin Springs and limit yard and street lighting to preserve the rural feel of the area.

Some common themes appeared among the county's planning areas. Protection of quality of life by preserving environmental quality, encouraging concentrated development and maintaining quality community services were on everyone's lists of important goals. Residents and businesses across the county recognized the value of both development/growth and preservation of the environment and cultural heritage. As part of achieving those goals, two communities in the study area have chosen to become county zoning districts.

The Mission/West Boulder Zoning District, created in 2001, established the area east of Livingston through to Springdale and south of the Yellowstone River as an Agricultural Exclusive District. Agricultural pursuits, any grandfathered land uses, and commercial uses not viewed as detrimental to the area are the only land uses now allowed in this district. Establishment of the district was to maintain the rural character and environmental integrity of the area, while protecting agricultural property values and preventing urban encroachment.

The East Yellowstone Zoning District (1997) established the area east of Livingston through to Springdale and just north of the Yellowstone River as a district aiming also to preserve its rural character and environmental quality. It does so by limiting growth and subdivision and encouraging home occupations. Both zoning districts have similar aims as the overall County Comprehensive Plan, but these communities wanted control of their areas to be in their hands.

Park County's only other major elements of planning with regard to the Upper Yellowstone River are floodplain and subdivision regulations. The County drafted its floodplain regulations in 1987, and the regulations affect land in the 100-year floodplain. Any bank stabilization projects or structures in that area are regulated. The regulations intend to prevent new development that would raise the flood elevation in that area by more than six inches. As of Fall 2002, the County is also waiting on a designated floodway from the USGS; the floodway would prohibit any building whatsoever in that area.

The County originally drafted its subdivision regulations in the 1970s and last revised them in 2001. The regulations require newly subdivided lots to have at least one acre outside the 100-year floodplain. Septic systems must also be at least 100 feet from the 100-year floodplain line. Any structures built in newly subdivided lots need to be at least 150 feet from the high water mark of the river. Typically, the County does not let new subdivision owners build structures in the floodplain, though that regulation is not in writing.

Livingston.[2] Livingston's first comprehensive plan, covering the city limits and the four and one half mile jurisdictional area around the city (the Livingston Donut), was drafted in 1967. No map of the Livingston donut was available at the time of this publication. The City's layout, demography and economy changed significantly in the intervening 30 years, and the City drafted an updated version of this plan in 1995. The City presented revised data on history, cultural resources, population, housing stock, the economy, parks, public services, transportation, the environment and land use to better plan for Livingston's development needs into the 21st century.

[2] This section based upon *The Comprehensive Plan: Livingston Planning Area*, March 1995, and upon interviews with Jim Woodhull, Livingston City Planner, summer and fall 2002.

The City asserted that the fastest growing portion of Park County is in the Livingston Donut, the four and one half mile planning zone surrounding Livingston's city limits.[3] Census data presented in the Task 5a report confirmed that all population growth in Park County has occurred outside the City of Livingston. Park County's population density change map (Task 5a report, Exhibit 5a-3) further revealed that much of the county's population growth from 1990 to 2000 did indeed occur near Livingston. The following comprehensive plan recommendations specifically refer to the Donut, revealing the City's plans for managing this area as part of the picture of Park County land use:

- Preserve the historic character of Livingston by protecting historic districts, inventorying historic buildings, and promoting public awareness of historic resources.
- Maintain the area's cultural heritage, especially with regard to agriculture and tourism.
- Eliminate substandard housing with improvements to structures and energy efficiency.
- Develop additional multifamily housing units for all income levels.
- Stimulate creative solutions to housing needs.
- Build up undeveloped city lots to increase housing density and reduce infrastructure costs.
- Encourage residential development where infrastructure extensions are already available or feasible.
- Encourage development of a retirement home or apartment complex within city limits.
- Promote sustainable economic growth by encouraging expansion and retention of existing businesses, providing areas for business and industrial growth and encouraging clean industry to locate in the area.
- Provide adequate space for residents to recreate by planning for future parkland acquisitions and preserving open space in the Upper Yellowstone River floodplain.
- Maintain schedules for current capital improvement plans.
- Discourage building in the floodplain and encourage clustered developments.
- Develop subdivision and zoning regulations that protect riparian areas and other important wildlife habitats.

[3] At the time of publication, a map of the Livingston Donut was not available.

- Anticipate that agricultural lands in the Donut will remain agricultural in ranches of 20+ acres. Any residential development that does occur will be in parcels no smaller than one acre until the city can extend water and sewer services into these outlying areas.

- Limit commercial "strip development" along US Highway 89 south of Livingston through zoning and controlled annexations/extensions of public services.

The City of Livingston strives to maintain its residents' quality of life by preserving historic and cultural values; by encouraging re-development and in-development to keep a high density of housing, businesses and services; by recognizing the need for room to grow and accommodating that growth through steady annexations and extensions of services; and by preserving open space and floodplain viewsheds for recreation and aesthetic enjoyment.

Land Use Changes, 1970 to 1993

BBC documented changes in land use in the Upper Yellowstone River study area from 1970 to 1990. Knowledgeable local planners and real estate representatives contributed to this task in personal interviews. The Park County planning office provided BBC data on septic tanks in the county from 1967 to 2001. Finally, a graduate student at the University of Missouri performed a comprehensive study of land ownership changes in the Mill Creek watershed from 1950 to 1999, which BBC used to derive some observations about land use changes from 1970 to 1990.

Local input and septic tank data.[4] Local planners and real estate representatives indicated that the study area has always had many small rural land parcels. From settlement in the late 1800s, many homesteaders in Paradise Valley, a major portion of the study area, had smaller parcels (less than 1,000 acres) for their ranching operations or mining claims. Those parcels remained small, and some were subdivided further, throughout the 1970s and 1980s. Subdivision was a popular trend in the 1970s, according to both a real estate representative and a local agricultural expert. Data from the Park County Sanitarian on new septic systems installed from 1970 to 1993 verify this trend (see Exhibit 5b-1 on page 7). Landowners in the Paradise Valley, Livingston and the Donut, Emigrant, Gardiner, North and South Glastonbury, and Cooke City/Silvergate built more than 1,500 new residences that required new septic systems from 1970 to 1993. These areas as defined by the Park County sanitarian serve as a close proxy to the Upper Yellowstone River study area with regard to subdivisions and septic tanks.

New septic systems were installed in these areas each year from 1970 to 1980, with a peak in 1979 at 81 new septic tanks. The data indicate that residential development occurred in the 1970s, with an average of 66 new septic systems in the study area per year. Not all these septic system installations recorded here were for newly subdivided parcels, however. Some of them were for parcels subdivided before the year the septic systems were installed.

[4] This section is based upon personal interviews with Dave Viers, David Viers and Associates, Marcy Hertz and Hebbard Blesins, Maverick Realty, Ellen Woodbury, Park County Planner, Jim Woodhull, Livingston City Planner, and Marty Malone, Park County Extension Agent, summer and fall 2002.

Most growth in the 1970s took place in the Paradise Valley and Livingston Donut, roughly split between the two. Gardiner and Emigrant also saw a few new systems each year. The Paradise Valley's contribution to new septic tank installations increased into the late 1970s. It is important to note that the Valley's relative contribution to residential growth began to outpace the Livingston Donut in the late 1970s and kept this position throughout 2001. In fact, according to Park County sanitarian data, more residential development has occurred in the Paradise Valley than in any other part of the study area.

According to both local planners and the septic system data in Exhibit 5b-1, growth continued through the 1980s. Development was distinctly slower in the 80s than in the 70s, however, which follows locals' observations that residential growth in the study area follows national economic trends. The 1980s included a national recession, and growth was slower in the study area.

The year 1989 was an anomaly for the study area, with 134 new septic systems that year. This jump in septic installations reflected the arrival of the Church Universal and Triumphant. The Church bought large tracts of land in the early 1980s, and by 1989 was subdividing often in its new residential developments in North and South Glastonbury to the west of Emigrant. Growth in North and South Glastonbury was considerable for six years, from 1985 through 1990.

It is not accurate to conclude that this residential development in the 1970s and 1980s resulted in significant changes in land use acreages. Most land, previously subdivided in Park County, is still considered agricultural. Indeed, many landowners who have smaller parcels run cattle or horses or lease their land for grazing by neighboring ranchers.

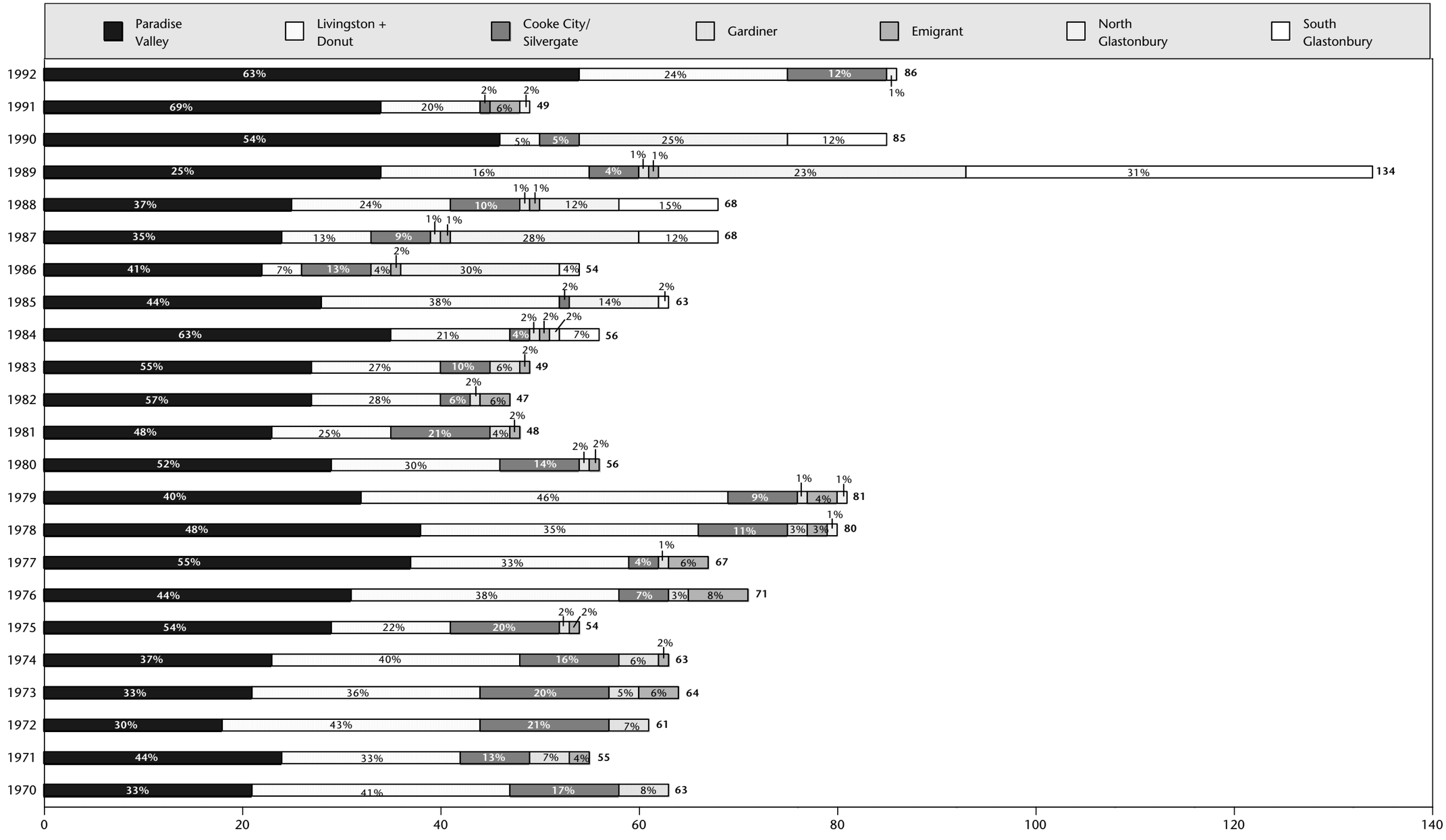
Study of land ownership change.[5] Eric Compas of the University of Missouri at Columbia in 2001 drafted a report analyzing land ownership changes in the Mill Creek area from 1950 to 1999. Mill Creek is one part of the Paradise Valley in the study area. By looking at deeds recorded with Park County, Compas tracked land ownership changes for over 300 parcels in his 62 square-mile study area. He made some interesting observations relevant to land use changes in 1970 to 1990:

- There are relatively few subdivisions near US Forest Service land. This observation contradicts one real estate representative's remark that much recreational residential development is occurring in this frontier area. The Mill Creek/US Forest Service ownership line is relatively inaccessible to roads or other services, however, which may explain this surprising finding.

- The smallest and most concentrated subdivided parcels occur along the Upper Yellowstone River. Somewhat larger subdivided parcels center on East River Road and Mill Creek. The largest parcels were spread in between the roads and rivers. A BBC examination of parcel maps from the State of Montana revealed that this trend of subdivided parcels proximate to infrastructure centered on infrastructure is true throughout the BBC study area.

[5] This section is based on Eric Compas' study, *Land Ownership Changes on the Upper Yellowstone River Valley, Montana: A Geographic Analysis*, July 2001.

Exhibit 5b-1.
New Septic Tank Systems in the Study Area, 1970-1992



Source: Park County septic tank installation data, 2002.

- About one-third of the Mill Creek study area's parcels and one-third of the area's acreage last changed owners in the 1970s or 1980s. Out-of-state buyers bought fewer parcels and less land (i.e. larger parcels) in the 1970s than in-state buyers did. Out-of-state buyers bought more parcels and more acreage in the 1980s that in-state buyers did.

- More than 60 percent of acreage sold in the Mill Creek study area in the 1970s, 80s and 90s was sold to out-of-state buyers.

There were significant sales of property in the 1970s and 1980s. This fact indicates that interviewees' observations and septic tank installation data regarding growth in that period were accurate. Residential development occurred and increased the focus of land use in the Upper Yellowstone River study area on rural residential and away from strict agricultural uses.

Land Use Changes, 1990s

After all the changes in land use from 1970 to 1992, land use in the Upper Yellowstone River study area continued to evolve throughout the 1990s. BBC collected maps documenting land uses across the study area for 1985-1995 and for 1999. BBC also asked local real estate, agriculture and planning experts about changes in the 1990s and collected data from the Park County planning office. Finally, some observations from Compas' report lent insights into land use in this decade.

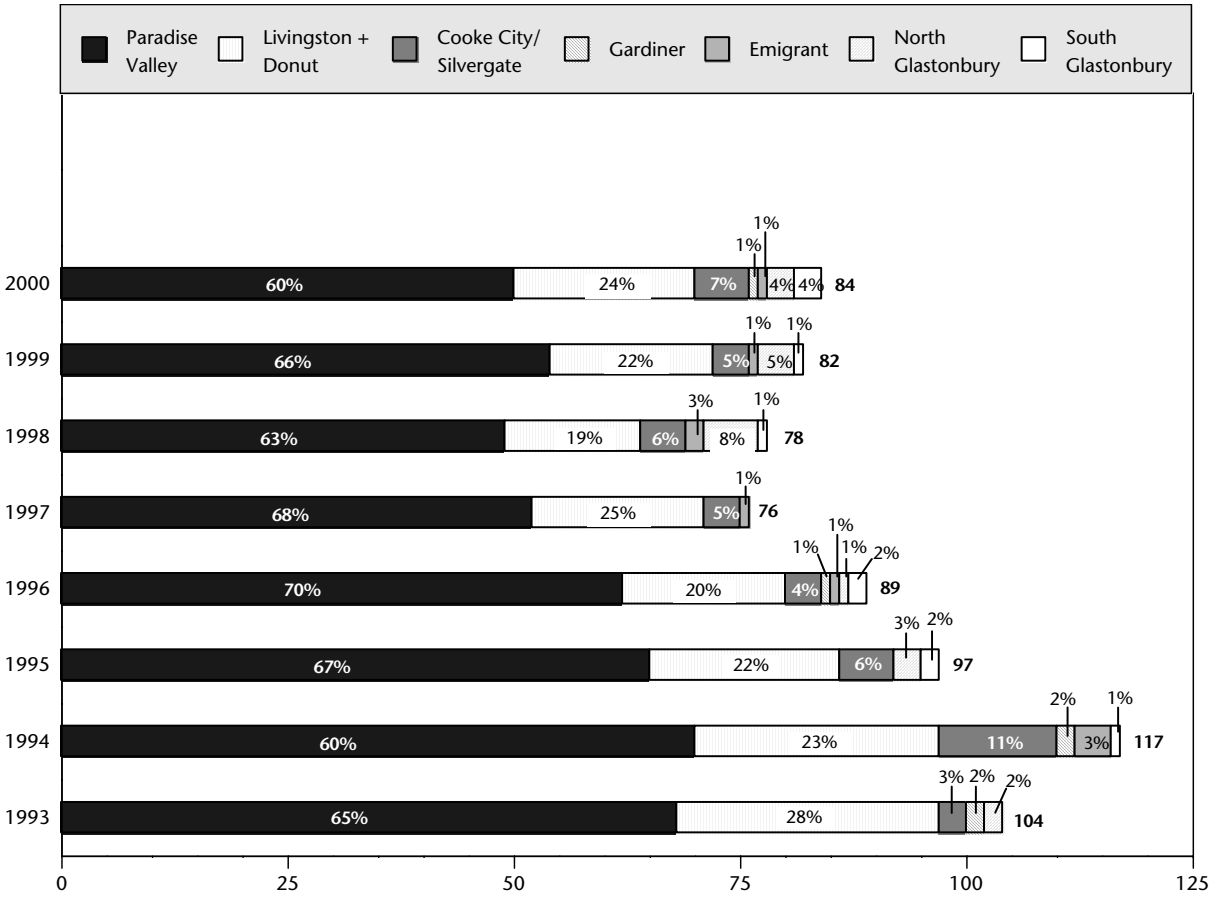
Local input and septic tank/subdivision data.[6] According to knowledgeable locals, Park County experienced a boom in rural residential growth in the 1990s with the nation's robust economy. Data on new subdivision lots and on new septic system installations from 1993 to 2000 indicate that this observation was accurate in the study area (see Exhibits 5b-2 and 5b-3 on the following pages).

The Upper Yellowstone River study area added, on average, 91 new septic systems and 69 newly subdivided lots between 1993 and 2000. Residential growth in the 1990s outpaced development in both the 1970s and 1980s. In the 1990s, growth in the Paradise Valley outpaced all other sectors of the study area as measured by new septic tank installations. Paradise Valley even outpaced its own growth in the 1970s and 1980s and has clearly become the center of development for the study area.

In terms of newly subdivided lots, the developments of North and South Glastonbury together accounted for the majority of growth in the late 1990s. According to the Park County planner, this growth in subdivided lots does not reflect much actual growth, however. The septic system data reflects this development's real growth, which was rather modest. This increase in subdivided lots instead reflects a resubdividing effort to partition larger parcels into smaller parcels for multiple landowners who had previously resided on the larger parcels as owners-in-common. This growth in newly subdivided lots in North and South Glastonbury is not expected to continue.

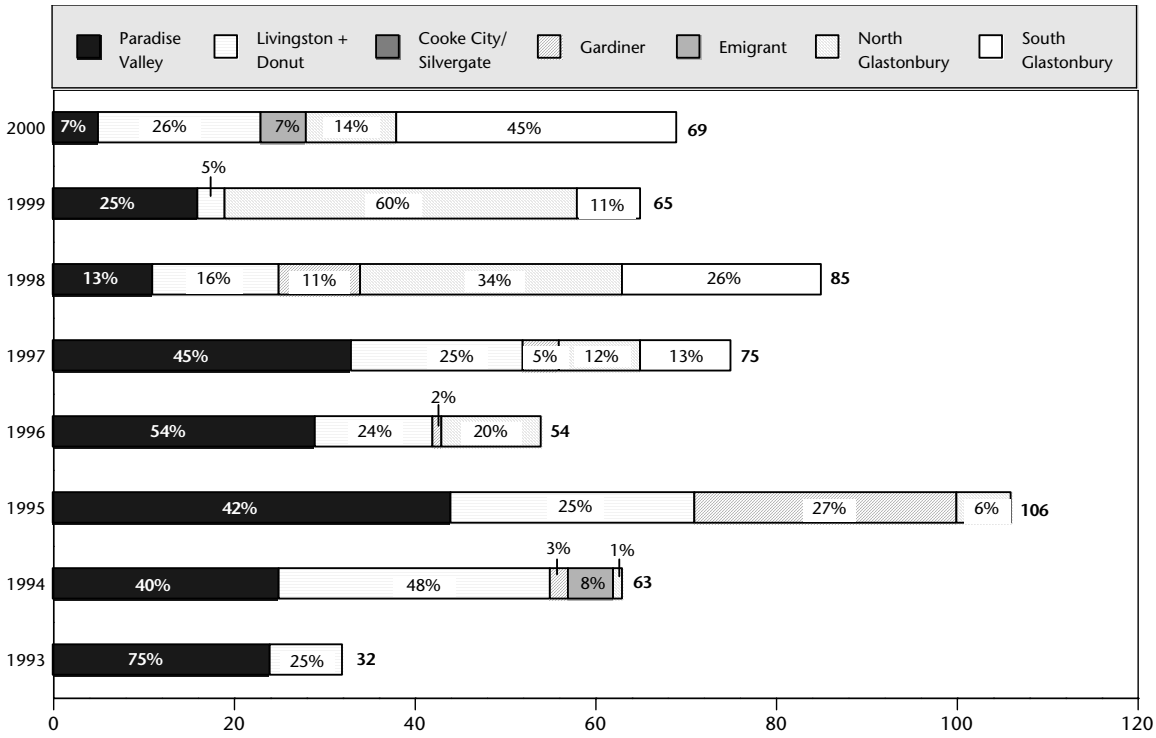
[6] This section is based upon personal interviews with Dave Viers, David Viers and Associates, Marcy Hertz and Hebbard Blesins, Maverick Realty, Ellen Woodbury, Park County Planner, Jim Woodhull, Livingston City Planner, and Marty Malone, Park County Extension Agent, summer and fall 2002.

Exhibit 5b-2.
New Septic Tank Systems in the Study Area, 1993-2000



Source: Park County septic tank installation data, 2002.

Exhibit 5b-3.
Newly Subdivided Parcels, 1993-2000



Source: Park County subdivision data, 2002.

Local experts assert and the historical data confirm that much of the growth in the 1990s occurred on parcels that were subdivided before that period. The data in Exhibits 5b-2 and 5b-3 show that even though there were on average some 90 new septic systems installed, only 70 newly subdivided lots were created.

Though subdivisions are only a small percentage of land throughout the study area, there are many subdivided lots throughout the study area as of 2002, especially concentrated along the river. Some of those existing parcels were subdivided in the 1970s and 1980s, while others were subdivided more recently. Some of those existing parcels divided in the 70s and 80s were also developed in those periods, while others have awaited development until the 1990s.

Local experts assert that market forces have dictated which parcels landowners subdivide and which parcels are eventually developed. If the demand materializes for large-scale subdivision development in the study area, then it has historically occurred. In periods of low demand, growth has been slower. Creating new subdivided parcels now, however, is more difficult than it once was. Previous county subdivision regulations required county review of subdivisions of less than 20 acres per parcel. New regulations now require county review for subdivisions of less than 160 acres.

Local experts speculate that growth will not be dictated solely by demand anymore. The new county subdivision regulations should make growth somewhat more restrictive than it once was. In the end, though, some locals still contend that someday, when demand for second homes in Park County is great enough, all undeveloped subdivided parcels will be developed, and new subdivided parcels may be created and built upon until there is no room left for growth.

Study of land ownership change.[7] Compas' study provided several insights on land use changes in the 1990s. First, in the Mill Creek study area, more than one-half of parcels and acreages last changed hands in the 1990s, indicating a high level of real estate activity in this past decade. Second, parcels and acreage sold in the Mill Creek study area were roughly split between out-of-state and in-state buyers. Out-of-state buyers bought slightly fewer parcels but more acreage, indicating that their parcels were likely somewhat larger than in-state buyers' parcels were.

Finally, Compas discovered that, as of 1999, large Montana landowners still own the majority of land (44 percent) in the Mill Creek study area. Another 30 percent of land is owned by large-parcel out-of-state landowners, meaning that most land is still held in larger parcels (more than 100 acres). This finding backs observations of local experts that though there are hundreds of subdivided lots throughout the study area, most land is still held in larger parcels. Land is steadily being sold to out-of-staters, but in-staters still hold much of it.

Land use map, 1999.[8] BBC created a land use map from data used in the Upper Yellowstone River Mapping Project collected in August 1999. River discharges at the time were between 3,330 and 3,440 cubic feet per second. This project focused primarily on identifying different types of riparian and wetland habitats for a wetlands inventory, but they also classified upland land uses. This focus on wetlands, however, does possibly introduce some bias in the way in which land uses were categorized.

Kevin Bon, of the US Fish and Wildlife Service, classified land uses in the study area using aerial photography interpretation, followed by field-testing, cartographic confirmation and quality control. He did not estimate his level of accuracy in the report.

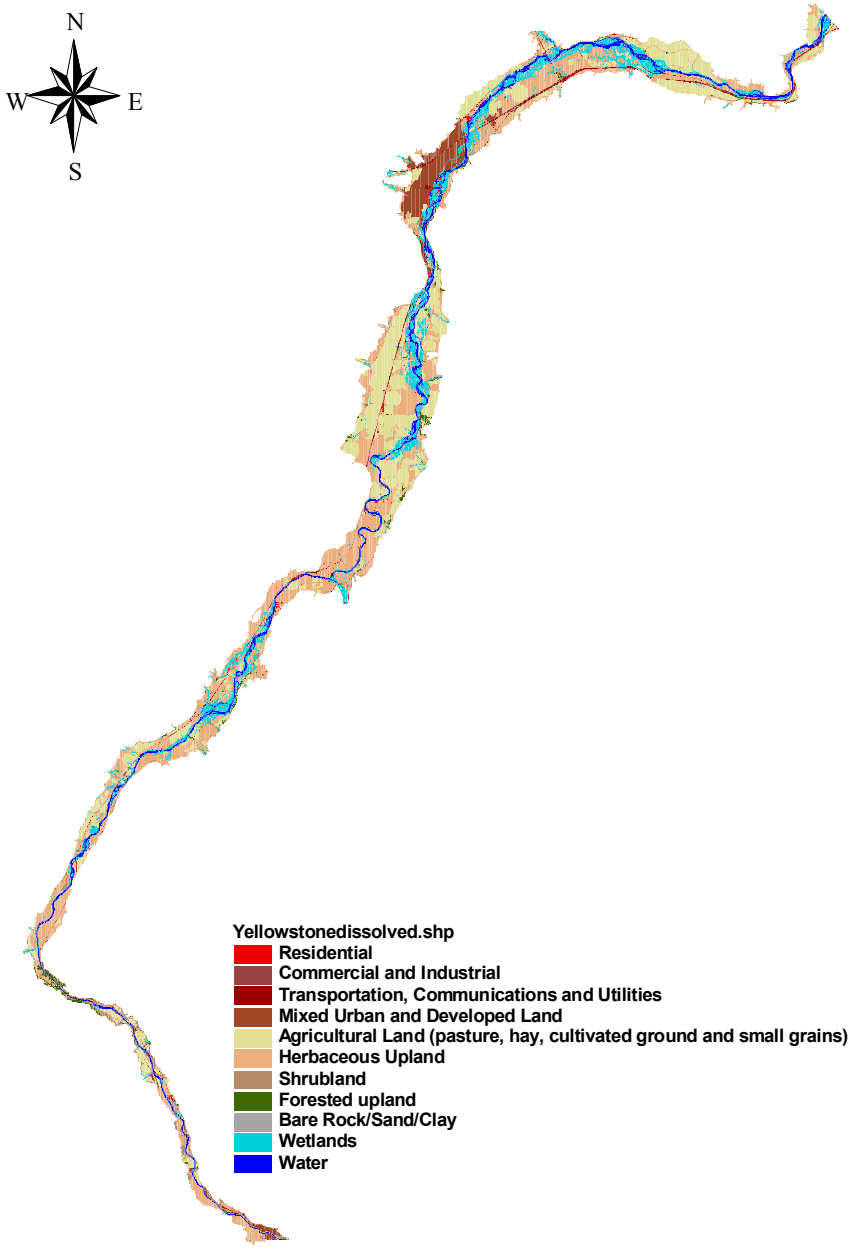
Bon used a combination of US Fish and Wildlife Service and USGS land use classification categories. There were many categories, especially in the riparian and riverine zones, so BBC collapsed several of these categories into just 11 categories as seen on the map in Exhibit 5b-6 on page 5b-13.

As shown in Exhibit 5b-6 on page 5b-13, the predominant land use categories in 1999 were herbaceous uplands (38 percent), agricultural land (29 percent), wetlands (12 percent) and water (7 percent). Urban residential, commercial, industrial and transportation lands together accounted for about 10 percent of land use in the study area in 1999.

[7] This section is based on Eric Compas' study, *Land Ownership Changes on the Upper Yellowstone River Valley, Montana: A Geographic Analysis*, July 2001.

[8] This section is based upon data and a report by Kevin W Bon, US Fish and Wildlife Services, *Upper Yellowstone River Mapping Project*, July 2001.

Exhibit 5b-4.
Land Use Map, 1999



Source: US Fish and Wildlife Service, 2001.

Exhibit 5b-5.
Land Use Acreages and Percentages, 1999

Source:
US Fish and Wildlife Service, 2001.

Land Use Type	Acres	Percentage of Study Area
Commercial and Industrial	248	0.46%
Transportation, Communications and Utilities	1,971	3.64%
Residential	404	0.75%
Mixed Urban and Developed Lands	2,668	4.92%
Agricultural Land	15,537	28.68%
Herbaceous Upland	20,730	38.27%
Shrubland	1,291	2.38%
Forested Upland	692	1.28%
Bare Rock/Sand/Clay	176	0.32%
Wetlands	6,398	11.81%
Water	4,056	7.49%
Total	**54,170**	**100.00%**

Changes in Land Use, 1990s Exhibit 5b-6 shows that the greatest changes in population density, with increases of 5-10 persons per square mile, occurred in the following portions of the study area:

- Livingston and the Livingston Donut
- Trail Creek Road, up off the river
- From Pine Creek down to Mill Creek Road, along the west side of the river between the river and US 89
- From Pray to Emigrant, along the east side of the river between the river and East River Road
- Glastonbury area
- Corwin Springs corridor, along the east side of the river between the river and US Forest Service land

Exhibit 5b-6.
Land Use Mapping Study Results, 1985-1999

Land Use Type	1985 sq km	1999 sq km	Net change (sq km)	Net change (%)	Reliability of change estimate
Urban/Built-up	30.8	46.8	16.0	51.8	High
Agriculture	101.3	481.2	380.0	375.2	High
Rangeland/Grassland	5726.2	5264.1	(462.1)	(8.1)	High
Forest	7130.7	7336.5	205.8	2.9	Low
Lakes/Rivers	271.4	291.4	20.0	7.4	Low
Rock	1725.1	1844.7	119.5	6.9	Very Low
Tundra	709.9	430.7	(279.2)	(39.3)	Very Low

Source: Richard Aspinall and Diane Pearson, "Integrated geographical assessment of environmental condition in water catchments: Linking landscape ecology, environmental modeling and GIS," *Journal of Environmental Management*, v59, n4, August 2000, pages 299-319.

BBC analyzed these same portions of the study area in the land use map (Exhibit 5b-5). There was a notable trend that more residential and mixed urban and developed lands were catalogued in these areas. Because of the mathematical incompatibility of the maps and their data, it was not possible to quantify the percentage of developed land in the census blocks that experienced the most growth in population density from 1990 to 2000 (Exhibit 5b-7). Visually, however, BBC confirmed that there was proportionally more developed land (Exhibit 5b-5) in the areas of highest population density growth (Exhibit 5b-7).

According to Exhibit 5b-7, other notable areas of growth in the study area that experienced increases in population density of 2-5 people per square mile included:

- Wineglass area
- Area south of Chico to the Dome Mountain Wildlife Management Area, along the east side of the river between the river and Sixmile Creek Road

Further study of patterns of population growth and land use change in Park County would be helpful to better understand past and future trends in rural residential development. Other ongoing studies of historic changes in land use may offer further insight.

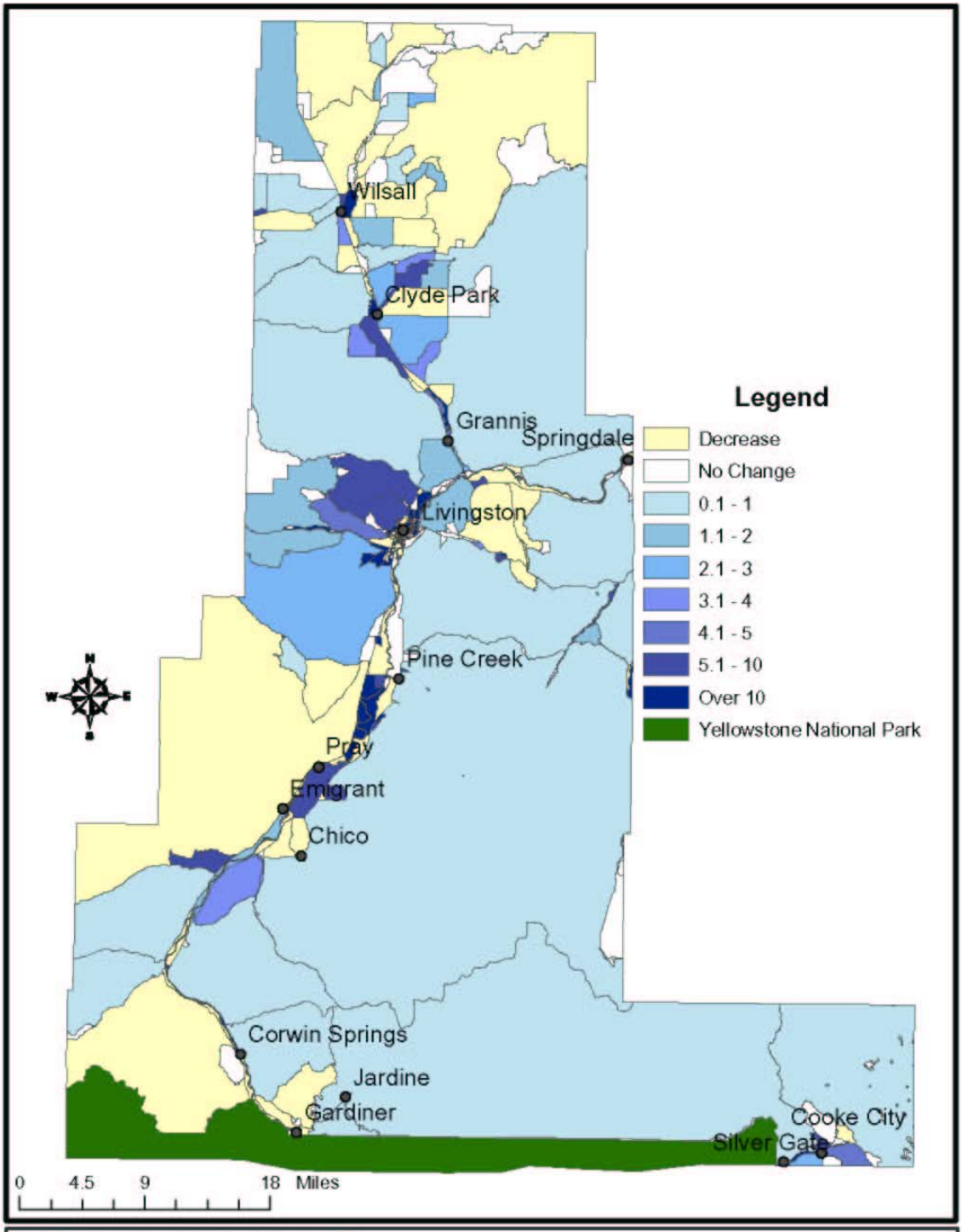
Land use mapping study, 1985-1999.[9] Aspinall and Pearson performed a study of land uses in the Upper Yellowstone River catchment, or watershed, using LANDSAT 5 data from 1985 compared with LANDSAT 7 data from 1999. This catchment includes much of Yellowstone National Park, most of Park County except the Shields Valley, and parts of Sweetgrass County to the east of Springdale. This land use study area is comparable to the Task Force's NRCS landuse mapping study area.

The results of this watershed-level land use study are presented in Exhibit 5b-8 below. Of the most reliably estimated changes in land use, agriculture experienced the largest jump in acreage in the watershed from 1985 to 1999 — land in agriculture increased more than three fold. Urban and built-up land area also increased by more than half in that 14-year period. Rangeland/grassland declined as it was converted to agriculture or urban areas or was afforested. The other land use types were less reliably estimated for the late 1980s and 1990s, but it is important to note that only tundra saw a marked change in land cover. Rock and tundra are easily misclassified with each other in high alpine areas, however, so this low reliability in change estimates is expected.

This land use study indicates that the Upper Yellowstone River catchment experienced marked urban growth and development, as well as increased agricultural intensification, in the late 1980s and 1990s. These findings reinforce the belief many hold that the Upper Yellowstone River study area in Park County is undergoing significant land use changes and may continue to do so into the future. It is important to note, however, that the growth in urban and agricultural land uses was experienced

[9] This section refers to: Richard Aspinall and Diane Pearson, "Integrated geographical assessment of environmental condition in water catchments: Linking landscape ecology, environmental modeling and GIS," *Journal of Environmental Management*, v59, n4, August 2000, pages 299-319.

Exhibit 5b-7.
Park County Population Density Change, 1990 to 2000 (persons per square mile)



Created By: Carrie Harapat, Park County Planning, 2002

Park County, Montana, population change in persons per square miles. This data was derived from the 1990 and 2000 Census and population counts. Polygons were created based on similiar areas of 1990 and 2000 census tracts. Population change was calculated by taking the 2000 census total population county for all census tracts in each polygon and subtracting the total population counts from all the 1990 census tracts. Change per square mile was calculated by taking the change in total population counts between 1990 and 2000 and dividing by the area in square miles by each polygon.

across the watershed, including Yellowstone National Park and parts of Sweetwater County. It is likely safe to assume that most of this change occurred in the Task Force study area in Park County, but some change almost certainly occurred in other parts of the watershed, as well.

Land Use Changes, Beyond 2000

The data reveal, and local experts confirm, that Park County and the Upper Yellowstone River study area have experienced changes in land use patterns in the past 30 years. Wealthy, out-of-state landowners are replacing Montana ranchers. Large land parcels are remaining intact or growing larger, while some smaller parcels have been subdivided to make room for 5-, 10-, 20- and 40-acre parcels for residential development. Subdivisions have centered on the Upper Yellowstone River, on the river's tributaries, and along local infrastructure such as roads and communications lines. This development has supplanted some shrublands, grasslands and forestlands.

The Park County planner, in conjunction with land parcel maps from the State of Montana, provided some ideas on where future growth might occur. The river corridor clearly has the greatest potential for growth, as there exist undeveloped subdivided parcels in large numbers there. From Springdale through to Gardiner, development will occur wherever there are grandfathered subdivided parcels that will not require one acre outside the floodplain in order to be built upon. The other areas of greatest growth potential are the previously established subdivided areas. The Park County planner believes that the review process for new subdivisions of less than 160 acres will curtail some potential future growth on previously unsubdivided land.

Areas of concentrated growth might potentially include: the Indian Hills subdivision near Suce Creek; the Windy Hills subdivision off Trail Creek Road south of Livingston; the Mill Creek/Pray area; Glastonbury North and South; the Avalon community in Emigrant; Chico Peak Estates and the Dailey Lake area; the Tom Miner Basin; and the Corwin Springs corridor.

The entire study area has some growth potential depending upon infrastructure development, according to local planners and real estate representatives. Knowledgeable locals and Compas believe that infrastructure is a major limiting factor. Currently infrastructure is limited, with only two major paved roads through the study area and few major lines of communications or electricity. Major improvements in infrastructure could open vast areas of the study area to affordable development.

Local experts also contend that national and local economic conditions will drive development. If the economy booms again, there will be increased demand for second homes in the study area. If the economy slows down, residential growth will slow or stop, as well.

TASK 6.
Historic and Current River Management

In the context of this study, historic and current river management refers to the ways in which the native flows, watercourse or other characteristics of the Upper Yellowstone River system have been modified to serve human purposes in the study area. This Task 6 Report first describes the institutional and philosophical framework through which numerous federal, state and local agencies regulate activities affecting the Upper Yellowstone River. Bank stabilization projects which have been undertaken in the study area are then analyzed. The third portion of this section describes the development of water rights in the study area which allow waters to be diverted from the Yellowstone and its tributaries or, in cases of instream flow rights, effectively limit potential future diversions in specified locations. Finally, this section concludes with a discussion of agriculture and agricultural water uses in the study area.

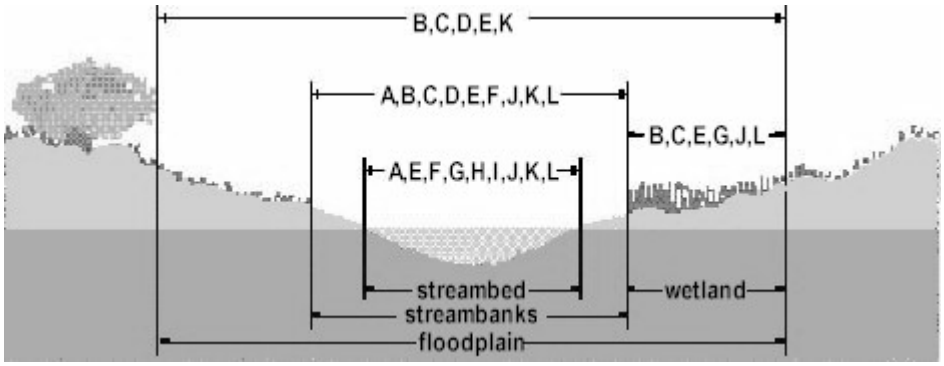
Institutional and Philosophical Framework and Overview of Upper Yellowstone River Management

No single agency or entity has full responsibility for the management of the flow, streamcourse or floodplain of the Upper Yellowstone River. Instead, responsibilities are divided amongst a number of federal, state and local agencies. In some cases, the roles and responsibilities of these agencies have evolved over recent decades.

The following discussion attempts to provide a summary level description of the mission, organization, responsibilities and historic changes in role of the agencies most central to river management at each level of government. A large number of agencies at all levels of government play direct or indirect roles in managing the river or the lands adjacent to it. For example, the U.S. Department of Interior Bureau of Land Management and the U.S. Department of Agriculture Forest Service both manage lands adjacent to the river and its tributaries. The following discussion, however, focuses primarily on the agencies that have specific, regulatory permitting roles in managing the river and activities along its banks and in its floodplain.

Additional (and more specific) information can be found in *A Guide to Steam Permitting in Montana*, a document collaboratively developed by federal and state agencies and published on the Montana Department of Natural Resources and Conservation's web-site: http://www.dnrc.state.mt.us. The following graphic (Exhibit 6-1), borrowed from *A Guide to Stream Permitting in Montana*, provides a sense of the sometimes overlapping permit requirements for activities related to the river, its banks and floodplain.

Exhibit 6-1.
How to Use a Guide to Stream Permitting in Montana



Source: *A Guide to Steam Permitting in Montana*. Cooperatively developed and funded by the Montana Association of Conservation Districts, Montana Department of Natural Resources and Conservation, U.S. Environmental Protection Agency, Montana Department of Environmental Quality, Montana Department of Fish, Wildlife and Parks, and Montana Watercourse. September 2000.

The Guide reads, "Using the diagram above, determine where your project will take place: streambed, streambanks, wetlands or floodplain. The letters in the diagram refer to the required permits listed below (A through L) and described on the following pages. Permits that may be necessary:

A. Montana Natural Streambed and Land Preservation Act (310 Permit)

B. Montana Stream Protection Act (SPA 124 Permit)

C. Montana Flooplain and Floodway Management Act (Floodplain Development Permit)

D. Federal Clean Water Act (404 Permit)

E. Federal Rivers and Harbors Act (Section 10 Permit)

F. Short-Term Water Quality Standard for Turbidity (318 Authorization)

G. Montana Land Use License or Easement on Navigable Waters

H. Montana Water Use Act (Water Right Permit and Change Authorization)

I. Montana Water Use Act (Water Reservations)

J. Stormwater Discharge General Permits

K. Streamside Management Zone Law

L. Other Laws that May Apply"

U.S. Army Corps of Engineers (USACE)[1]

Mission. The stated, overall mission of the USACE is as follows:

- USCAEs' mission is to provide quality, responsive engineering services to the nation including:
  - Planning, designing, building and operating water resources and other civil works projects. (Navigation, Flood Control, Environmental Protection, Disaster Response, etc.)
  - Designing and managing the construction of military facilities for the Army and Air Force. (Military Construction)
  - Providing design and construction management support for other Defense and federal agencies. (Interagency and International Services)
- The USACE also articulates specific environmental missions, including the following:
  - Ecosystem restoration — including both small projects throughout the country and large efforts such as the effort to restore the hydrologic regime in the Everglades in Florida.
  - Environmental stewardship -— including environmental and natural resource management at USACE projects, compliance measures to meet environmental requirements, pollution prevention, conservation and preservation.

Organization. USACE headquarters in Washington, DC creates policy and plans future directions for all USACE organizations. Below the headquarters level, the USACE is organized geographically into 8 divisions in the U.S. and 41 subordinate districts throughout the U.S., Asia and Europe. Divisions and districts are defined by watershed boundaries. In addition, the USACE also has laboratories and other organizations which provide support across the entire organization.

USACE activities in the Upper Yellowstone basin fall under the jurisdiction of the Northwest Division, Omaha District.

Specific responsibilities and processes. Perhaps the USACE areas of responsibility most relevant to this study stem from the agency's regulatory role. For the Upper Yellowstone Basin, this role includes two key authorities, Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

The original authority for USACE regulatory action under Section 10 comes from the Rivers and Harbors Act of 1899. This authority applies only to federally designated, navigable waterways. The Yellowstone, below Emigrant, is one of three such waterways in Montana, along with the Missouri River and the Kootenai River. Section 10 requires permits be obtained for the placement of structures and/or dredge and fill activity and other types of work affecting the channel of navigable waters. This authority applies to the streamcourse and banks of the river up to the ordinary high water mark.

[1] Information regarding the USACE's management activities and institutional background was developed from information published on the USACE web-site and personal communications with Alan Steinle, USACE (title), Billings, MT, September 2002.

The Clean Water Act of 1972 broadened the USACE's role by giving the agency authority over dredging and filling throughout the waters of the United States, including wetlands. This authority specifically requires permitting for the discharge of dredge and fill material, including some types of trash. Unlike Section 10, described earlier, Section 404 applies to the tributaries of the Upper Yellowstone (up to the ordinary high water mark in those watercoures) and to wetland areas adjacent to these tributaries and the mainstem, as well as to the mainstem of the river itself.

Typically, the USACE's regulatory actions begin when an applicant notifies the agency of their intentions to undertake an activity falling under the authority of Section 10 or Section 404. Nationally, there are two types of authorization that can be considered: authorization under a general permit or authorization under a more specific, individual permit. General permit authorization is a streamlined process, allowing applicants planning relatively low impact activities to benefit from generalized, nationwide or regionwide authorizations issued previously by the USACE. For reasons described later, individual permit authorization is more applicable in the Upper Yellowstone Basin. This type of authorization involves public notification (not required under general permits) and closer regulatory scrutiny.

In making decisions on whether to grant or deny permit applications, District commanders are required to consider "all factors in the public interest," including economic development and environmental protection.

Historical changes in mission and/or methods. Like many federal agencies, environmental management and protection have become an increasingly important part of the USACE's mission in the past few decades. Particular milestones in this growing emphasis have included the passage of the National Environmental Protection Act, in 1969, and legislation passed in 1990 that established environmental protection as one of the primary missions of water resource projects, along with navigation and flood control.

On March 26, 2002, Lt. General Robert Flowers, Commander and Chief of Engineers for the USACE, announced the following Environmental Operating Principles to guide the Corps in its work[2]:

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.
- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.
- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
- Continue to accept corporate responsibility and accountability under the law for activities and decisions under USACEs' control that impact human health and welfare and the continued viability of natural systems.

[2] USACE web-site, 8/28/2002.

- Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.
- Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
- Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

Specifically with regard to the Upper Yellowstone River, in recent years the USACE has become more highly attuned to the potential cumulative impacts of river management actions. The USACE does authorize activities on the Upper Yellowstone under the more streamlined and less rigorous general permit process, but the Corps also requires individual permit review and authorization for some large bank stabilization projects. The Special Area Management Plan (SAMP) process for the Upper Yellowstone River (of which this study is one element) also speaks to the USACE's recognition of environmental concerns in the area. While SAMPs are authorized under 1986 legislation to provide guidance for regulation of management of US waters, they are time and resource intensive and seldom undertaken. This SAMP is believed to be the first undertaken in the state of Montana.

Interaction with other river management agencies. The USACE interacts closely with other federal, state and local agencies involved in river management activities. The Montana Joint Application, which can be found on the Montana Department of Natural Resources and Conservation's web-site, was developed by the Montana Department of Natural Resources and Conservation with cooperation by USACE and other agencies to provide a common entry point for applicants needing permits and to share information between the agencies. Once a month, USACE staff attend interagency meetings with other federal and state agencies — including Montana DEQ; Montana DNRC; Montana FWandP; the U.S. Fish and Wildlife Service and the Environmental Protection Agency — to jointly review new applications. At the local level, the USACE interacts with the Park Conservation District and local Floodplain Managers on a case-by-case basis.

Soil Conservation Service/Natural Resources Conservation Service[3]

Historically the Soil Conservation Service/Natural Resources Conservation Service (SCS/NRCS) has assisted the agricultural community with technical and financial assistance. When the agency was organized, its main mission was soil erosion, which was the main concern after the "Dirty 30s". Later, as the agency and country expanded in the post-WWII era, more and more work was done on water control and erosion. Today the agency's mission is to protect the nation's natural resources, mainly on private lands. The knowledge base of information, culture, economics, and environmental issues have expanded the technical knowledge, so technical staff work well beyond the original soil and water issues. NRCS staff now address soil, air, water, plants, animals, and human issues on various resource bases.

[3] Information regarding SCS/NRS was provided by Jim Suite, State Conservation Engineer, USDA, NRCS, Montana State Office, December 18, 2002.

In the Upper Yellowstone River Watershed, SCS/NRCS staff have provided assistance to farmers and ranchers with streambank erosion problems. The staff provided technical assistance, ideas, and sets of drawings illustrating how to protect a particular piece of property. Oftentimes, this work was done in conjunction with the Agricultural Stabilization and Conservation Service/Farm Service Agency (ASCS/FSA). In the past, the ASCS/FSA had the Agricultural Conservation Program (ACP), which provided cost-share financial assistance to local cooperators. The ACP program was restricted to activities promoting conservation, which included, but was not limited to, upgrading existing irrigation operations, vegetative seeding, and bank stabilization projects (rip rapping and dikes). The NRCS 216 or Emergency Watershed Program (EWP) was another program used to assist the communities and private landowners with their flooding and/or erosion problems; problems typically resulting from large storm events. These programs were/are cyclic (often on an 11-year cycle), which corresponds to the typical, long-term wet/dry periods. Projects funded under the 216 Program had to benefit the public, not just an individual landowner.

As the priorities of the nation changed, the funding and direction of the federal and state programs changed to reflect the desires of Congress and the population they represented. At one time, food and fiber production was a high priority and environmental issues were not as important as they are today. The public and technical staff are more informed and educated on cause-and-effect issues, such as stream restoration and erosion control of the nation's rivers and streams

Information provided by:

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5242 Highway 89 South
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Montana Department of Natural Resources and Conservation (MTDNRC)[4]

Mission. MTDNRC's mission is:

- To help ensure Montana's land and water resources provide benefits for present and future generations.

More specific elements of MTDNRC's responsibilities, in terms of this study, include "sustaining and improving the benefits derived from our water, soil, and rangeland ... The department is also responsible for promoting the stewardship of Montana's water, soil, forest and rangeland resources and for regulating forest practices."[5]

[4] Information regarding the MTDNRC's management activities and institutional background was developed from information published on the MTDNRC web-site and personal communications with Tim Bryggman, Economist, Water Management Bureau, October 2002.

[5] MTDNRC web-site, 8/28/2002.

Organization. MTDNRC is organized into seven divisions. The seven divisions are:

- Centralized Services
- Conservation and Resource Development
- Forestry
- Oil and Gas Conservation
- Reserved Water Rights Compact Commission
- Trust Land Management
- Water Resources

Specific responsibilities and processes. Each of the seven divisions directly or indirectly plays a role in managing resources within the Upper Yellowstone River Basin, but certain divisions play a larger role directly relevant to current river management. Key divisions in terms of managing the river and streamside areas, and their roles central to this study, include:

- Conservation and Resource Development — includes coordination, supervision and assistance to Montana's 58 conservation districts. Statewide, 14 conservation districts hold water rights reservations in the Yellowstone River Basin, including the Park Conservation District which holds approximately 1,100 acre-feet of active water rights permitted for irrigation in the Upper Yellowstone Basin. This division also administers grants and loans for water and wastewater-related projects throughout the state, including water and wastewater system developments and improvements, dam and diversion rehabilitation, technical assessments, etc.

- Forestry — administers the Montana Streamside Management Zone Law, prohibiting specified timber harvest practices within 50 feet of any stream, lake or other body of water, unless exceptions are approved by MTDNRC.

- Trust Land Management — Special Use Management Bureau, in Helena, makes determinations on Montana Land Use License or Easement on Navigable Waters applications (Form DS-432). This license or easement applies to anyone who proposes a project on lands below the low water mark on navigable waters. Particular activities requiring a permit include the construction, placement or modification of a structure or improvements in, over, below or above a navigable stream.

- Water Resources — implements the Montana Water Use Act, which requires permits for those wishing to acquire new or additional water rights or to change an existing water right. Water Resources also provides technical assistance to the Montana Water Court in the general adjudication of all existing water rights in the state. Among other activities, the duties of the Water Operations Bureau within the Water Resources Division include floodplain management.

Historical changes in mission and/or methods. MTDNRC is a relatively new agency, resulting from legislative reorganization of the state's natural resource and environmental agencies in 1995, both of which had existed for years in roughly the same forms as they are now together in MTDNRC. This reorganization consolidated existing functions into a new and larger department.

Interaction with other river management agencies. As noted above, MTDNRC interacts with various other governmental agencies. In particular, the Conservation and Resource Development Division supervises and assists local conservation districts — such as the Park Conservation District. The Water Operations Bureau, within the Water Resources Division, assists local floodplain management programs — such as the Park County Floodplain Manager and City of Livingston Floodplain Manager. MTDNRC coordinates with other agencies, such as USACE, in permitting and permit reviews.

Montana Fish Wildlife and Parks

Mission. Montana Fish, Wildlife and Parks (MTFWandP) articulates their vision for the 21st Century as:

- Montana Fish, Wildlife and Parks will provide the leadership necessary to create a commitment in the hearts and minds of people to ensure that, in our second century, and in partnership with many others, we will sustain our diverse fish, wildlife and parks resources and the quality of recreational opportunities that are essential to a high quality of life for Montanans and our guests.[6]

The mission of MTFWandP is stated as:

- Montana Fish, Wildlife and Parks, through its employees and citizen commission, provides for the stewardship of the fish, wildlife, parks and recreational resources of Montana, while contributing to the quality of life for present and future generations.

Organization. Montana Fish, Wildlife and Parks policies and programs are established by the Commission, working with the Directors Office. Division administrators serve in a staff role for program development and policy decisions. The divisions of MFWandP include:

- Conservation Education
- Enforcement
- Field Services
- Fisheries
- Legal Unit
- Parks
- Responsive Management
- Wildlife

[6] From Montana Fish, Wildlife and Parks web-site, 8/30/2002.

Regional supervisors handle implementation of programs and policies at the local level. The Upper Yellowstone River Basin is within Region Three, based out of Bozeman.

Specific responsibilities and processes. Among other activities, MTFWandP is responsible for reviewing applications for SPA124 Permits. The SPA124 permit is similar to the 310 permit, administered locally by the Park Conservation District, except that the SPA124 requirements apply to governmental entities proposing activities modifying the bed or banks of the stream, while the 310 requirements apply to private entities undertaking similar modifications.

As discussed later in this report, MTFWandP also applied for and obtained large fish and wildlife instream flow water rights in the study area as part of the 1970s water reservation process. These rights effectively preserve streamflows in certain locations within the study area against future, more junior efforts to divert more water from the Yellowstone River.

Montana Department of Environmental Quality[7]

Mission. The stated mission of Montana Department of Environmental Quality is:

- The Department of Environmental Quality's mission is to protect, sustain, and improve a clean and healthful environment to benefit present and future generations.

Organization. MTDEQ is organized into the directors office and five divisions, these divisions include:

- Centralized Services Division
- Enforcement Division
- Permitting and Compliance Division
- Planning, Prevention and Assistance Division
- Remediation Division

The most direct regulatory functions of MTDEQ with respect to the Upper Yellowstone River are located within the Water Protection Bureau, one of five bureaus within the Permitting and Compliance Division. This Bureau is further subdivided into the Water Permitting Section and the Subdivision Section.

The Planning, Prevention and Assistance Division is responsible for carrying out implementation of state and federal regulations, such as the Source Water Assessment Program under the 1996 amendments to the Safe Drinking Water Act and the development of total maximum daily load (TMDL) plans to return watercourses to compliance with water quality standards. TMDLs set limits for effluent discharge of certain water pollutants. In these roles, this division has substantial interaction with local watershed stakeholder groups.

[7] Information regarding the MTDEQ's management activities and institutional background was developed from information published on the MTDEQ web-site and personal communications with George Mathieus, Yellowstone Coordinator for MTDEQ, October 2002, as well as information provided in *Montana Stream Permitting: A Guide for Conservation District Supervisors and Others*, Conservation Districts Bureau, Montana Department of Natural Resources and Conservation.

Specific responsibilities and processes. The objectives of the Water Permitting Section include the effective management, through permitting, of the discharge of materials into state waters in order to ensure appropriate protection of public health and the environment. The permitting processes MTDEQ uses to carry out this objective include the Short-term Turbidity Standard, or 318 Permit, and the Montana Point Discharge Elimination System Stormwater Permit, or MPDES.

318 permits are required of any person or entity, public or private, who plans to undertake an activity that may cause short-term violations of state surface water quality standards. In practice, this applies largely to sediments and turbidity caused by construction activity.

MPDES permits are required of any entity proposing an activity that will discharge stormwater to Montana waters and to construction that will disturb more than one acre within 100 feet of streams, rivers or lakes.

Historical changes in mission and/or methods. The specific role of MTDEQ continues to evolve with changes in federal and state legislation. Passage and amendments to laws such as the Safe Drinking Water Act and the Montana Environmental Policy Act have added to the requirements and role of MTDEQ.

Interaction with other river management agencies. As noted earlier, some MTDEQ roles and processes, such as the development of TMDLs, involve collaborative processes with local watershed groups and representatives of other agencies. Montana DEQ also assisted, along with other agencies, in the development of the *Montana Joint Application* and *A Guide to Stream Permitting in Montana*.

Park Conservation District.[8]

Mission. The mission of the Park Conservation District (PCD) is stated as follows:

- The Park Conservation District Supervisors' goal, in partnership with the NRCS, is to guide the District in the conservation and management of soil, water, cropland, grazing lands, weeds, and small acreages by providing leadership in conservation planning, technical assistance, educational resources and resource management tools and inventories.

Organization. Conservation districts throughout the United States are political subdivisions of state government. The PCD, one of 58 such districts in Montana, has five elected members of its Board of Supervisors, including the elected Chairperson. The PCD has one paid employee who has the title of District Administrator.

Specific responsibilities and processes. The bulk of the PCD's work involves administration of the Natural Stream Bed and Land Preservation Act, also known as the 310 permit. These permits are required for any private, non-governmental person or entity that proposes to work on any activity that physically alters or modifies the bed or immediate banks of a perennially flowing stream.

[8] Information regarding the Park Conservation District was developed from the District's web-site, personal communications with Dave Haug, District Chairperson and Task Force member, September 2002 and from *Montana Stream Permitting: A Guide for Conservation District Supervisors and Others*, Conservation Districts Bureau, Montana Department of Natural Resources and Conservation.

The PCD reviews applications for 310 permits in terms of criteria such as impacts on riverbank vegetation, fisheries, erosion, sedimentation, and upstream and downstream users. Local conservation districts, such as the PCD, are empowered to interpret the statewide regulations and permitting requirements in light of local circumstances. The PCD meets to review applications once per month and must approve or deny individual applications within 30 days of filing.

The PCD's other responsibilities and processes include:

- Assisting and coordinating watershed planning activities and coordinated resource management efforts;
- Being the local contact for the control of non-point source pollution;
- Providing education in terms of riparian management;
- Working with NRCS to assist in agricultural conservation;
- Providing conservation education;
- Pooling expertise in regard to urban conservation;
- Promoting sustainable forest management;
- Assisting community led rural development efforts; and
- Other projects to assist their local constituents.

Historical changes in mission and/or methods. After the floods in the 1990s, the PCD experienced a large number of applications for riprap and other river changes, but the volume of flood control-related applications has tapered off in the past few years. The recent drought has led to an increase in irrigation-related applications.

The PCD is perhaps more critical in reviewing applications and applying a greater level of scrutiny than in the past. It is seeking to improve the projects as proposed and minimize their impacts. The PCD also has a more proactive perspective now than in the past.

Interaction with other river management agencies. The PCD's 310 permits are often the first application of those proposing to conduct an activity along the river. The PCD lists other agencies and permitting requirements on their application and assists applicants in identifying other permits they may require.

Local Floodplain Managers

There are two floodplain managers within the Upper Yellowstone River Valley study area, the Park County Floodplain Administrator and the City of Livingston Floodplain manager.

Mission.[9] The stated intent of the Park County Floodplain Administrator is to comply with the Montana Floodplain and Floodway Management Act and to ensure compliance with the requirements for Park County's participation in the National Flood Insurance Program. More specific purposes of regulations adopted by Park County are to:

[9] Specifics of the mission of the Park County Floodplain Administrator were developed from *Park County Floodplain Regulations, 1991 Revision.*

- Guide development of the 100-year floodplain areas of the county by recognizing the right and need of water courses to periodically carry more than the normal flow of water.
- Participate in coordinating efforts of federal, state and local management activities for 100-year floodplains.
- Ensure that the regulations and minimum standards adopted balance the greatest public good with the least private injury, in so far as possible.

More specifically, regulations are intended to:

- Restrict or prohibit uses which are dangerous to health, safety or property in times of flood, or cause increased flood heights or velocities;
- Require that uses vulnerable to floods, including public facilities which serve uses, be flood protected at the time of initial construction;
- Utilize information which identifies lands which are unsuited for certain development purposes because of flood hazards;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Ensure that potential buyers are notified that property is within a 100-year floodplain and subject to provisions of these regulations; and
- Ensure that those who occupy 100-year floodplains assume responsibility for their actions.

The City of Livingston Floodplain Manager follows a generally similar mission and performs generally similar functions in reviewing proposed development activities within the portions of the 100-year floodplain that fall within the city limits.

Organization. The Park County Floodplain Administrator is jointly shared by two individuals who are jointly designated by the County Commissioners: the Park County Planner and the Park County Sanitarian. The City of Livingston Floodplain Manager normally is fulfilled by two building permit reviewers who report to the City Manager.

Specific responsibilities and processes. The Park County Floodplain Administrator enforces county regulations by reviewing applications for Floodplain Development Permits. The administrator is also charged with assuring that all necessary permits have been obtained from other agencies — such as 404 permits from the USACE and Section 310 permits from PCD.

In reviewing applications, the administrator must determine whether the proposed activity meets the requirements and standards of the Montana Floodplain and Floodway Management Act (Act). The administrator is also charged with evaluating other factors including any increase in flood danger, susceptibility of the proposed facility to flood damage, importance of the proposed facility to the community, whether the facility must be located in the floodplain or not, compatibility of the proposed use with other land uses in the area and other factors consistent with the Act and the National Flood Insurance Program.

In practice, projects are not allowed to raise floodplain elevations in the vicinity of the project by more than six inches. Proposed projects seeking permits are advertised in the local paper for public comment. The administrator must render judgment within 60 days of receiving the completed application from the permittee.[10]

Proposed developments within the portion of the 100-year floodplain in the City of Livingston must obtain building permits through the City Floodplain Manager. In practice, this requirement primarily affects proposed additions to existing structures within about one-half of the southeast section of the city. The manager connects proposed permittees to surveyors who can provide them with elevation certifications and work with them to figure out how to elevate the proposed development. The lender then determines whether the permittee will need flood insurance.[11]

Historical changes in mission and/or methods. Both the County Floodplain Administrator and the City Floodplain Manager indicated some changes have occurred since the late 1990s floods. The administrator noted that they are more zealous in their enforcement of floodplain regulations since the floods. The manager noted that there is now more pressure to get more accurate maps of the floodplain and that an effort to do so is underway between the City, the County and the United States Geological Survey.

Interaction with other river management agencies. As noted earlier, the County Floodplain Administrator is tasked with ensuring that applicants for Floodplain Development Permits have also obtained necessary permits from other state and federal agencies. The administrator indicated that other interactions primarily relate to consultation on applications for bank stabilization permits. The City Floodplain Manager indicated that they primarily interact with the County Floodplain Administrator.

Bank Stabilization Projects

In 1998, a physical features inventory of the Upper Yellowstone River, between Gardiner and Livingston, was completed at the request of the Upper Yellowstone River Task Force and the Park Conservation District. This work, conducted by the USDA Natural Resources Conservation Service and the Montana Department of Environmental Quality, provides a cumulative view of bank stabilization activity in the study area at a relatively recent point in time. The extent of bank stabilization activity in the late 1980s to late 1990s can also be seen from this work by comparing its results to a similar effort conducted in 1987 and published in 1989 by the Water Quality Bureau of the Montana Department of Health and Environmental Sciences.[12]

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[10] Information derived from *Park County Floodplain Regulations, 1991 Revision* and personal communication with Ellen Woodbury, Park County Floodplain Manager, September 2002.

[11] Information provided through personal communication with Jim Woodhull, City of Livingston Floodplain Manager, September 2002.

[12] For further information, see *Yellowstone River Physical Features Inventory, Gardiner to Springdale*. Prepared for the Upper Yellowstone River Task Force and the Park Conservation District by USDA Natural Resources Conservation Service and Montana Department of Environmental Quality. Published in October 1998. See also *Yellowstone River Inventory, Reach II, Gardiner to Livingston*. Prepared for the Montana Department of Health and Environmental Services Water Quality Bureau by Grover Hendrick, WRD. Published in December 1989.

To supplement the information provided by the two physical features inventories, data on 404 permits and Section 10 permits issued by the U.S. Army Corps of Engineers, as well as 310 permits issued by the Park Conservation District for recent years, were obtained and analyzed by the study team. The data from the USACE on 404 permits spanned the period 1992 to 2002, while the data from PCD was only available from 1998 to present.

Cumulative bank stabilization to the present. The 1998 Inventory provides detailed information on the extent of bank stabilization features over a little more than 96 miles (1,023,000 linear feet of stream bank when both sides are taken into account) of main and side channels from Gardiner to the Springdale Bridge.

In total, about 91,340 feet (approximately 9 percent) of the stream bank was covered with blanket rock riprap. One hundred and six rock jetties were identified, along with 32 car bodies, 108 rock barbs and 20 "other alterations" (primarily bridge abutments). Along the 96 miles stretch of the river included in the inventory, 127,195 feet (12 percent) of river bank were characterized as eroding and an additional 25,285 feet (2 percent) were characterized as exhibiting bank mass wasting. 20,350 feet of barren, non-eroding banks were identified.[13]

Structures in place by sub-area and type. The 1998 Inventory divided the length of the Yellowstone River through the study area into 13 segments. Segments 0 through 9 cover the portions of the river from Gardiner to the Park Clinic access in Livingston. The portions of the river included in these segments were also surveyed in the 1987 inventory. Segments 10 through 13 of the 1998 inventory cover the stretches of the river downstream from Livingston to the Springdale Bridge. These portions of the river were not surveyed in 1987.

Exhibit 6-2, reproduced from the 1998 Inventory, summarizes bank stabilization activities and bank conditions by segment.

Exhibit 6-2.
Upper Yellowstone River Physical Features Inventory

Segment Number	Total Bank Length (Ft.)	Blanket Rock Riprap (Ft.)	Rock Jetty (No.)	Car Bodies (No.)	Rock Barbs (No.)	Other Alterations (No.)*	Eroding Banks (Ft.)	Bank Mass Wasting (Ft.)	Barren Non-Eroding Banks (Ft.)
0	39,250	0	0	0	0	3	2,000	800	0
1	48,900	600	0	0	0	0	150	4,090	400
2	62,010	1,620	2	10	1	1	2,770	3,020	500
3	37,400	8,770	0	0	0	1	0	0	0
4	73,440	650	2	2	0	1	8,800	0	0
5	137,380	9,295	30	12	4	2	27,745	1,450	1,450
6	123,150	1,800	1	0	5	2	17,525	975	2,975
7	68,100	5,370	10	0	27	1	1,850	1,650	2,250
8	82,340	13,050	22	0	45	0	20,200	6,800	0
9	46,920	11,965	14	2	2	3	3,200	0	0
10	22,048	6,070	3	0	5	2	1,600	0	525
11	76,032	10,300	1	2	8	3	8,405	1,800	550
12	97,312	8,875	21	0	11	0	27,100	2,700	0
13	108,936	12,975	0	4	0	1	5,850	2,000	11,700
Total	**1,023,218**	**91,340**	**106**	**32**	**108**	**20**	**127,195**	**25,285**	**20,350**

* Bridge abutments unless otherwise noted.
Source: *Yellowstone River Physical Features Inventory, Gardiner to Springdale*, U.S.D.A. Natural Resources Conservation Service and Montana Department of Environmental Quality, April 1998.

[13] *Yellowstone River Physical Features Inventory,* 1998.

For 9 of the 13 stretches inventoried in 1998 that were also inventoried in 1987, it is possible to compare the extent of bank stabilization activity as well as the condition of the river banks. Exhibit 6-3 on the following page, also reproduced from the 1998 Inventory, provides comparative data by stream segment for 1998 and 1987.

The 1998 Inventory also provided a narrative summary of findings, and changes, by reach. This narrative perhaps provides more insight than the data alone and indicates that the bulk of bank stabilization activity, and most of the changes between 1987 and 1998, have occurred between Emigrant and Livingston. The following are some of the highlights from that summary, focusing on the nine segments that were surveyed in both 1987 and 1998:

- Segment 0 — Mouth of Gardiner River to McConnel access. *No major changes were observed relative to the 1987 inventory. In general, this segment is very stable.*

- Segment 1 — McConnell access to Corwin Springs. *No major changes relative to the 1987 inventory. In general, this segment is fairly stable during normal flows. Most of the unstable features noted appear accelerated by high water as the river has little floodplain available in which to dissipate energy.*

- Segment 2 — Corwin Springs access to Yankee Jim access. *Bank alterations to protect development increase over upper segments. Additional rock riprap has been added. This segment has the second highest number of car bodies in the river, although now five (33 percent) less than recorded for this segment in 1987.*

- Segment 3 — Yankee Jim access to Carbella access. *Other than about 500 lf of riprap, (apparently due to scale differences between photos), there has been practically no change in physical features. The main change observed is in the lower mile or so where substantial homesite development has occurred in upland areas.*

- Segment 4 — Carbella access to gravel pit access. *This segment has relatively few channel and bank alterations. Eroding banks have more than doubled since 1987. These features appear to be the result of recent flood events. Practically no alterations have occurred since 1987.*

- Segment 5 — Gravel pit access to Emigrant access. Change in the number and extent of alterations has not been significant, however a few small areas of bank protection appear to have failed. Bank riprap accounts for about 7% of total bank length, a 2 percent increase from 1987. The majority of alterations were placed to protect roads and homes. Fairly extensive channel changes (2400 lf) have occurred apparently as a result of the flooding. The number of actively eroding banks has more than doubled as well, to about 20% of the total bank length. A significant number of new homes have been built adjacent to the river.

- Segment 6 — Emigrant access to Loch Leven access. *The bulk of noted channel change and erosion occurs in this section. About 14% of the channel banks are eroding, again primarily in the several miles below the bridge, representing a 44 percent increase since 1987. Not much change in the amount of rock riprap was recorded. Most bank protection has been placed to protect the highway and pasture land. However, the amount of channel change is significant and likely represents the loss of some bank previously counted as riprapped.*

Exhibit 6-3.
Comparison of 1987 to 1998 Physical Features by Segment

1987 Segment Number	Total Length* (Ft.)	Stream Channel Change (Ft.)		Bank Rock Riprap (Ft.)		Rock Jetty (No.)		Car Bodies (No.)		Rock Barb (No.)		Eroding Bank (Ft.)		Bank Mass Wasting (Ft.)	
		1987	1998	1987	1998	1987	1998	1987	1998	1987	1998	1987	1998	1987	1998
0	39,250	0	0	250	0	0	0	0	0	0	0	2,800	2,000	0	800
1	48,900	0	0	0	600	0	0	1	0	0	0	4,550	150	0	4,090
2	62,010	0	0	1,075	1,620	4	2	15	10	0	1	5,010	2,770	1,250	3,020
3	37,400	0	0	8,250	8,770	0	0	0	0	0	0	0	0	75	0
4	73,440	0	2,400	650	650	0	2	2	2	0	0	3,080	8,800	0	0
5	137,380	0	3,400	9,095	9,295	32	30	11	12	0	4	12,925	27,745	0	1,450
6	123,150	0	7,600	2,040	1,800	2	1	1	0	0	5	12,140	17,525	0	975
7	68,100	0	0	925	5,370	2	10	0	0	0	27	9,065	1,850	4,134	1,650
8	82,340	1,610	8,800	12,780	13,050	5	22	6	0	0	45	14,935	20,200	4,675	6,800
9	46,920	0	0	9,200	11,965	2	14	53	2	0	2	2,905	3,200	0	0
Total	**718,890**	**1,610**	**22,200**	**44,265**	**53,120**	**47**	**81**	**89**	**26**	**0**	**84**	**67,410**	**84,240**	**10,134**	**18,785**

* Total for left and right bank.

Source: *Yellowstone River Physical Features Inventory, Gardiner to Springdale*, U.S.D.A. Natural Resources Conservation Service and Montana Department of Environmental Quality, April 1998.

- Segment 7 — Loch Leven access to Pine Creek bridge. *About 8% of total bank length is armored. A considerable amount (4445') of rock riprap and 35 rock barbs/jetties have been placed since the previous inventory primarily to protect agricultural land. This represents a 480 percent increase in rock riprap from 1987 to 1998.*

- Segment 8 — Pine Creek Bridge to Carters Bridge. *This section contained the greatest overall bank and channel features recorded. Below Pine Creek are located long, high mass wasting banks. This segment contains the greatest percent of such features (8.3%). About 16% of the bank length has rock riprap placed. Some of the original riprap has failed and is now classified as eroding bank. About 62 more rock barb and jetty structures were counted than present in 1987. Six car bodies are no longer present. Although dikes and other features that modify the flood plain were not recorded earlier, there are now about 9,000 lf of dikes in place along the west (left) side of this segment.*

- Segment 9 — Carters Bridge to Park Clinic access. *The stream begins to come into contact with the town where extensive alterations have been made to the west (left) side of the channel. This segment contains the second greatest amount — 26% of banks protected by riprap. About 2,765 feet of rock bank protection and 14 rock barb/jetty structures have been added since 1987, a 30 percent increase in riprap. About 20 percent of the west bank channel length has been diked to protect developed areas. The large number of cars once found in this segment (53) are now down to only 2 observed.*

Permit data. Exhibit 6-4 summarizes the 404 permits issued by the USACE for activities on the Yellowstone River from 1975 through 2002. USACE assumed jurisdiction under Section 10 on the Yellowstone River from its mouth upstream to Emigrant in 1975. The Corps assumed jurisdiction on the river under Section 404 in 1976. As noted in the exhibit, USACE has issued 156 404 and Section 10 permits since 1975 on the Upper Yellowstone River. Slightly less than one-third of these permits are known to have been issued for bank stabilization purposes, with the remainder issued for other purposes such as maintenance of existing structures, flood repairs, etc.

Of the 156 permits issued from 1975 to 2002, 134, or more than 85 percent, were issued since 1990. Over 45 percent were issued in just the three years 1996, 1997 and 1998. 1996 and 1997 were the years of the back-to-back 100-year floods; the data clearly indicate that those major flood events triggered a sudden increase in permits to stabilize banks. Twenty-four permits alone, or 15 percent of all permits in the 27-year period, were issued in 1996 for bank stabilization specifically.

Numbers of permits in any one year are affected by environmental conditions, such as drought and floods. The floods of 1996 and 1997 are testament to that idea: those years together resulted in nearly half of all permits issued since USACE assumed jurisdiction over the Yellowstone River in 1975. The years since the flood, which have brought drought to the area, have experienced a dramatic decrease in permits issued. It should also be noted that there was no USACE regulatory office in Montana until 1984, which may have affected the number of permits issued up to that point.

Historical permit authorization data by type suggest that nationwide and individual permit data comprise the large majority of permits issued by the Corps on the Upper Yellowstone River. When examined by type of permit action, one quarter of the permits issued during the 1990's were for bank stabilization; none were issued between 2000 and 2002.

Exhibit 6-4.
U.S. Army Corps of Engineers 404 and Section 10 Permits on the Upper Yellowstone River, 1975-2002

	Number of Permits		
Year	Bank Stabilization	Other*	Total
1975			1
1976			2
1977			6
1978			3
1979			3
1980			0
1981			1
1982			1
1983			1
1984			0
1985			0
1986			1
1987			2
1988			
1989			1
1990			5
1991			2
1992			3
1993			9
1994			4
1995			8
1996	9	10	19
1997	24	14	38
1998	6	9	15
1999	2	2	4
2000	0	17	17
2001	1	6	7
2002	0	3	3
Total	**42**	**61**	**156**

* Includes utility line, temporary fill, minor discharges and dredging, maintenance of existing structures outfall approved by DEQ, boat ramp, flood repairs and scientific measuring device.

Source: BBC analysis of 404 and Section 10 data provided by USACE, December 2002.

The Park Conservation District has issued a large number of 310 permits over years from 1998 to the present, but relatively few of the permits are related to activities on the mainstem of the Upper Yellowstone River. The study team was not able to secure permit data in a usable form prior to 1998. Since 1998, a total of forty-nine 310 permits have been issued for activities on the Yellowstone. As shown in 6-5, 23 of these forty-nine 310 permits issued on the Upper Yellowstone River were for

bank stabilization or bank protection, five were for rip/rap and three were for barbs. The remaining eighteen 310 permits issued on the Upper Yellowstone since 1998 were for other activities such as flood plain maintenance, riparian restoration, etc.

Exhibit 6-5.
Park Conservation District 310 Permits on the Upper Yellowstone River, 1998-2002

	Number of Permits				
Year	Bank Protect Stabilization	Rip/Rap	Barbs	Other*	Total
1998	4	5	3	7	19
1999	10	0	0	2	12
2000	6	0	0	3	9
2001-02	3	0	0	6	9
Total	**23**	**5**	**3**	**18**	**49**

* Includes permits for flood plain maintenance, irrigation related work, riparian restoration, fish habitat, pump sites, mineral exploration, etc.

Source: BBC analysis of 310 permit data provided by PCD, October 2002.

Using the same geographic breakdown described earlier, it is evident that most of the 310 permits issued for bank stabilization, rip/rap and barbs since 1998 reflect activities in the Paradise Valley portion of the Upper Yellowstone River. Twenty permits for such purposes were issued in the Paradise Valley segment, compared with eleven in the portions of the river near Livingstone and none in the upper Yankee Jim Canyon portions of the river. This geographic breakdown is reflected in Exhibit 6-6.

Exhibit 6-6.
Park Conservation District 310 Permits on the Upper Yellowstone River, 1998-2002

Source:
BBC analysis of 310 permit data provided by PCD, October 2002.

	Bank Stabilization, Rip/rap and Bar Permits by Location		
Year	Yankee Jim Canyon	Paradise Valley	Livingston
1998	0	9	3
1999	0	5	5
2000	0	3	3
2001-02	0	3	0
Total	0	20	11

Water Rights Development

As noted earlier, the Montana Department of Natural Resources and Conservation, Water Resources Division, manages the use of the state's waters through the permitting and administration of water rights. Montana, like most western states, operates under the doctrine of prior appropriation, or "first in time, first in right."

Database. To examine water rights development in the study area, the study team obtained the complete electronic database of active water rights in Park County from MTDNRC.[14] We then filtered this dataset to focus only on surface water rights in the Upper Yellowstone River Basin, excluding both groundwater and the large volume of surface water rights in the more northerly Shields River Basin. Finally, we eliminated duplicated rights resulting from multiple ownership. As discussed later, where relevant, a small degree of duplication remains as a few rights are permitted for more than one type of use.

Caveats regarding quantification. In analyzing water rights, key questions often revolve around the volume of permitted uses by type of use and location. In the Upper Yellowstone River Basin (as well as other areas), however, quantitative analyses of water rights volumes must be interpreted with caution for several reasons:

- *Water rights in Montana are not fully quantified.* In particular, many rights pre-dating the Montana Water Use Act of 1973 have no specified maximum volume associated with them. The 1973 Act initiated the water use permitting process to change or establish new water rights, but the adjudication of earlier rights is the responsibility of the Montana Water Court. The court is precluded in statute from setting volume limits on pre-1973 water rights.

- *Some water rights are for instream uses.* As described later, the largest water rights in the Upper Yellowstone River Basin are for instream, fish and wildlife purposes. Such water rights essentially act to protect the flow of the river at a given location from future diversions by others but do not themselves represent a diversion from the stream.

- *Return flows and multiple uses are also special cases.* In most types of use where water is diverted from the stream, some of that water eventually returns to the stream. In the case of irrigation, a portion of the water diverted ultimately becomes a return flow to the river at a later point in time. In the case of municipal use, a portion of the water diverted ultimately returns to the stream as treated wastewater. Diversions cannot simply be added up and assumed to deplete the amount of flow in the river by that amount.

- *Where they are quantified, water rights describe maximum allowable uses.* Actual use will often be less either because the water right holder does not require the full volume or because the available supply is insufficient to meet the needs of all water right holders.

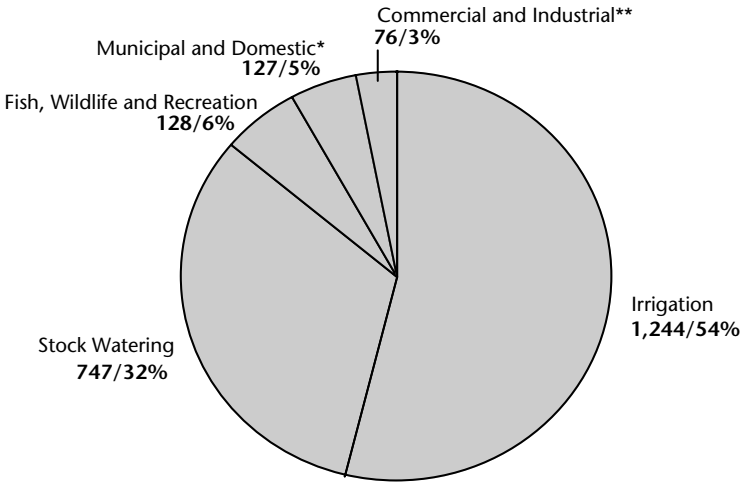
[14] We wish to acknowledge the helpful assistance of Jim Kindle of MTDNRC who provided data to us and patiently responded to our questions regarding interpretation of the database. Any errors and omissions are, however, entirely BBC's responsibility.

- *Timing is critical.* Water rights often reflect the water users' needs at certain, specific times of the year. For example, demand for irrigation water occurs during the irrigation season and demands during the winter may be minimal. Similarly, municipal water demands are typically larger during the summer, when lawns and gardens are watered, than during the wintertime. Consequently, even if the total cumulative volume of existing water rights is far less than the amount of flow in the stream system, differences in the timing of maximum flows in the river and maximum demands for various uses can mean that little or no additional water supply is available for future diversions.

With the foregoing caveats, the following describes the study team's analysis of water rights in the study area portions of the Upper Yellowstone River Basin.

Water rights by type of use and volume. There are 2,277 active surface water rights in the study area. Since a few water rights are for multiple uses, there are a total of 2,322 distinct water right/type of use authorizations in the study area. As illustrated in Exhibit 6-7, the largest number of water rights in the Upper Yellowstone Basin are for agricultural purposes: 1,244 (54%) rights are for irrigation use and 747 (32%) are for stock watering; 127 rights (5%) are permitted for fish, wildlife and recreational purposes; 97 rights are for domestic use; two rights are for multiple domestic use; and 24 rights are permitted for "lawn and garden" use (a combined total of 5%). An additional 44 rights (2%) are for mining purposes; 15 rights are for power generation and two rights are for industrial purposes (a combined total of less than 1%). Twelve rights are for commercial use. Only four rights are for municipal use. Three rights are for fire protection.

Exhibit 6-7.
Number of Water Rights in the Study Area by 2002 — By Type of Use



* Includes multiple domestic and lawn and garden rights.

** Includes fire protection rights.

Source: BBC analysis of data provided by MTDNRC, 2002.

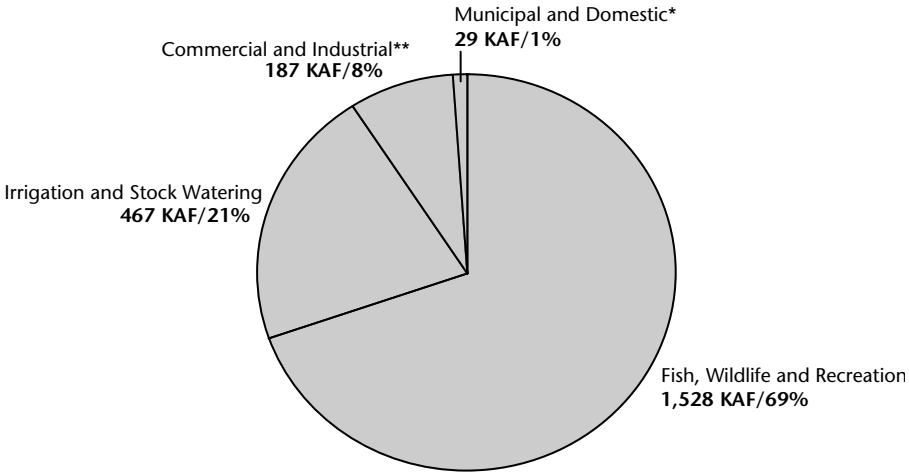
As discussed previously, many rights are not specifically quantified — especially those with earlier priority dates. Less than half or 1,027 out of 2,322 water rights, have specific maximum quantities associated with them. The extent of quantification, however, varies considerably by type of use. Most non-agricultural consumptive uses — domestic, municipal, commercial, industrial and power

generation — are completely, or nearly completely, quantified (151 of 156 cases). More than half, or 762 of 1,244 irrigation rights (61%) are quantified, but less than half, 19 of 44 mining rights are quantified. The least quantified type of use is stock watering, at 36 out of 747 cases. Many of the wildlife and recreational uses are also unquantified (56 of 128 have specified maximum volumes).

More recent water rights are more likely to be quantified than older rights; 95% of water rights with appropriation dates after 1974 are quantified. Only 56% of rights with appropriation dates between 1950 and 1974 are quantified, and less than 40% of rights with appropriation dates before 1950 are quantified.

Exhibit 6-8 provides a breakdown of the cumulative volume of quantified water rights in the study area by type of use. The total maximum volume among quantified rights is a little over 2.2 million acre-feet per year. The largest portion of this volume, 1.53 million acre-feet, are rights permitted for fish, wildlife purposes and recreational purposes. These rights are held by a mix of private and public owners, but about 90 percent of the acre-feet permitted for these types of use is accounted for by two large 1970 rights on the mainstem of the Yellowstone River held by the Montana Department of Fish, Wildlife and Parks. These are instream flow water rights that were established with special approval of the legislature, known as "Murphy Rights."

Exhibit 6-8.
Maximum Annual Use in the Study Area Among Quantified Rights — By Type of Use (In Thousands of Acre-Feet)



* Includes multiple domestic and lawn and garden rights.

** Includes fire protection rights.

Source: BBC analysis of data provided by MTDNRC, 2002.

Among the remaining 760,000 acre-feet of quantified uses, irrigation accounts for about 467,000 acre-feet (61%). The average maximum use, per quantified irrigation right, is about 611 acre-feet. While most stock watering rights are not quantified, the 36 stock watering rights with specific volumes average only 6 acre-feet per right, or a total of 205 acre-feet in all.

Among the 294,000 acre-feet of quantified uses outside of fish, wildlife, recreation and agriculture, power generation is the largest use, followed by mining and municipal use. The 15 power generation rights in the study area, all of which are quantified, total 147,000 acre-feet, or an average of about 9,800 acre-feet per right. All of these rights are located on tributaries to the Yellowstone, none are on

the mainstem, and they represent small-scale hydroelectric generation activities. The 19 quantified mining rights (out of 44 total mining rights) total 29,000 acre-feet, or an average of about 1,540 acre-feet per quantified right. The four municipal rights (all quantified) also total approximately 29,000 acre-feet, or an average of 7,240 acre-feet per right.

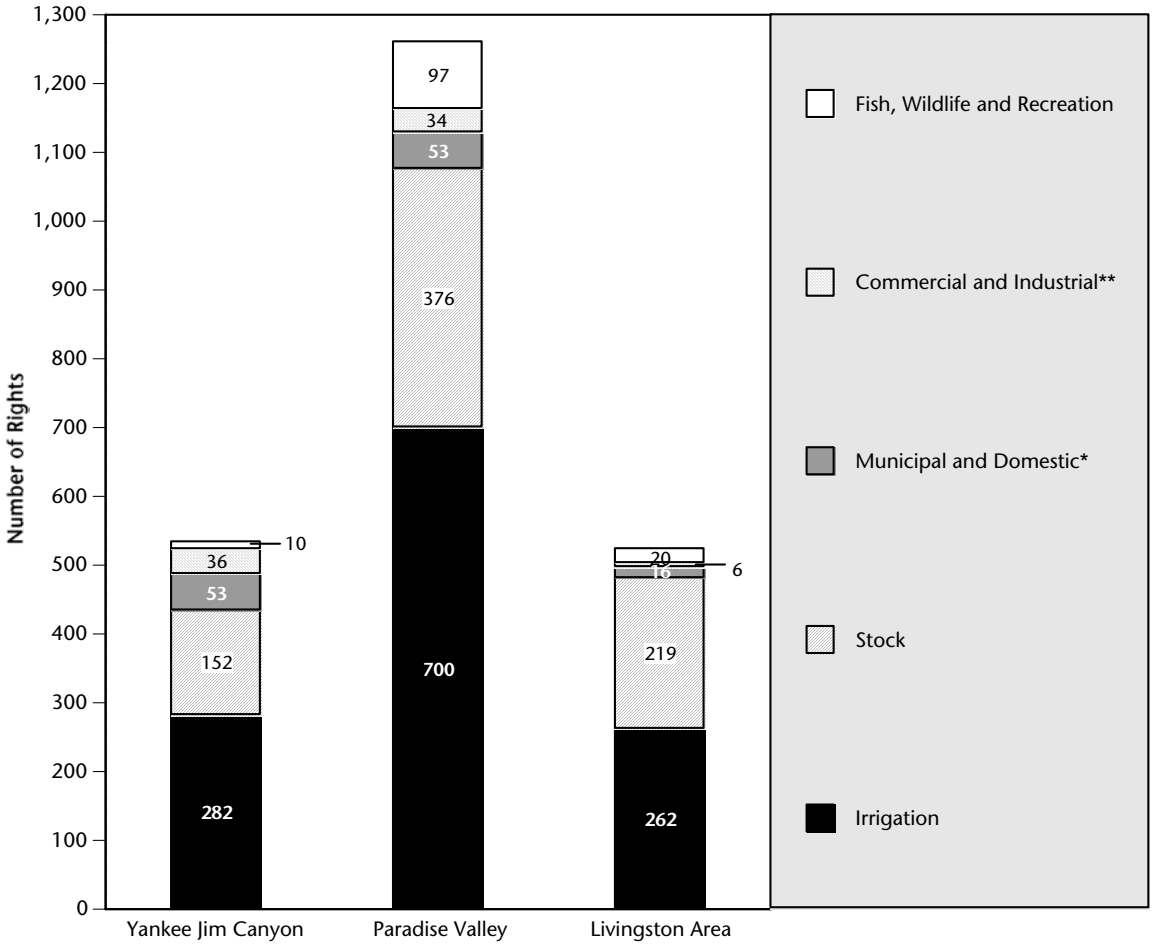
Remaining quantified uses include 12 commercial rights totaling about 9,200 acre-feet, or 765 acre-feet per right and 118 domestic, multiple domestic and lawn and garden rights totaling 485 acre-feet, or about 4 acre-feet per right. Three fire protection rights total 987 acre-feet and two industrial rights total 277 acre-feet.

Water rights by sub-area. To look at any potential geographic differences within the study area, the study team divided the river into three reaches. The upstream reach, referred herein as Yankee Jim Canyon, extends from the state border near Gardiner to the bottom of Yankee Jim Canyon. The middle reach, referred to as Paradise Valley, extends from just below Yankee Jim Canyon to just south of the Livingston city limits. The lower reach, referred to as Livingston, extends through Livingston to the Springdale bridge. These areas are depicted in Exhibit 6-9.

Exhibit 6-9.
Selected Upper Yellowstone River Basin Reaches

As shown in Exhibit 6-10, the largest number of rights on the Yellowstone and its tributaries are located in the middle, Paradise Valley, reach. The number of existing water rights in each of the upper and lower reaches is similar, at about 550 rights in each area. There are fewer rights in the lower and upper reaches combined than in the Paradise Valley reach by itself.

Exhibit 6-10.
Water Rights by Location and Type of Use by Reach in the Study Area (Number of Rights)



* Includes multiple domestic and lawn and garden rights.

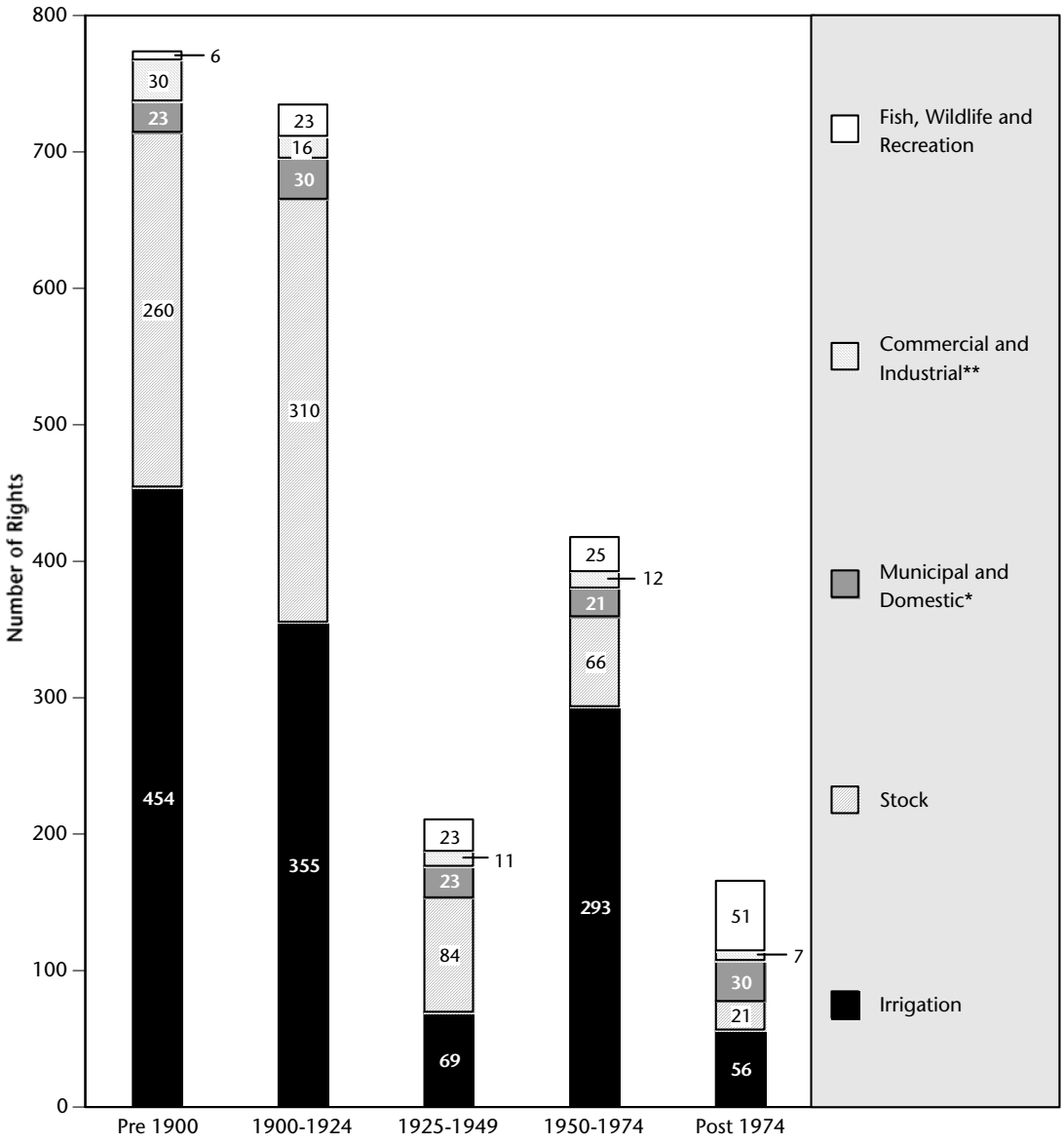
** Includes fire protection rights.

Source: BBC analysis of data provided by MTDNRC, 2002.

In all three reaches, irrigation and stock water rights are far and away the most common type of use. The Livingston reach has the smallest number of municipal, domestic, commercial and industrial water rights — likely because such uses in that area are typically served by the public water supply system. The largest number of fish, wildlife and recreation related rights is located in the Paradise Valley reach.

Historical water rights development. A little more than 1/3rd of the water rights in the study area (773 of 2,277) have pre-1900 priority dates. About 1/3rd of the rights (732 of 2,277) were developed between 1900 and 1925. The remaining 1/3 of the rights (772 of 2,277) have been developed over the past 77 years. Exhibit 6-11 depicts the number of water rights by priority date and type of use.

Exhibit 6-11.
Water Rights by Priority Date and Type of Use in the Study Area (Number of Rights)



* Includes multiple domestic and lawn and garden rights.

** Includes fire protection rights.

Source: BBC analysis of data provided by MTDNRC, 2002.

An active recent period during the past 77 years, in terms of developing new rights, was between 1950 and 1974, when 414 rights were developed. A total of 208 rights were developed between 1925 and 1949, while only 129 rights have been developed since 1975.

The geographic distribution among the most recently developed water rights (post 1975) is similar to the overall geographic distribution of water rights in the study area regardless of date. Nearly half (62 of 129) are located in the Paradise Valley reach. The remaining half are approximately evenly split, with 34 newer rights in the upper reach and 33 new rights in the lower reach.

Irrigation and stock watering rights comprise a smaller share of the most recently developed rights in the study area and other uses are more prominent among the most recently developed rights than among rights developed in earlier periods. In particular, 51 of the 165 newer rights (30%) are for fish, wildlife and recreational purposes, though these types of rights comprise only 5% of all existing rights regardless of priority date. To put this in another perspective, about 40% of the rights for fish, wildlife and recreational purposes have been developed during the past 27 years, while only 7% of overall water rights for all purposes have been developed in the most recent era.

Irrigation Uses

Irrigated agriculture is an important part of the history, culture and lifestyle of the Upper Yellowstone River Valley. As indicated in the preceding portion of this report, irrigation also accounts for the majority of water rights in the study area and — excluding the large, but junior, in-stream water rights held for fish and wildlife by Montana Fish, Parks and Wildlife — irrigation accounts for the majority of water use from the Upper Yellowstone River and its tributaries.

Overview of agriculture and irrigation in the study area. County-wide statistics do suggest a number of trends concerning agriculture in Park County:

- The total number of farms has increased since 1978. Census of Agriculture Data indicates 420 farms in 1997, compared to 376 farms in 1978.
- Total land in farms has decreased since 1978. According to the Census of Agriculture, total Park County land in farms/ranches has declined by about 100,000 acres, from about 850,000 acres to just under 750,000 acres.
- Average farm size is decreasing. In view of the preceding statistics, average farm size in the county has diminished. The average Park County farm/ranch in 1997 included about 1,800 acres, compared to about 2,300 acres for the average farm in 1978.
- The total amount of irrigated cropland in Park County has reportedly declined by about 20,000 acres from the late 1970s, from about 60,000 acres in 1978 to about 40,000 acres by the end of the 1990s. The 60,000 acres reportedly irrigated in 1978 was roughly comparable to the 63,000 acres reported under irrigation in the State Engineer's 1951 survey of Park County. Fewer farms now have irrigated land (only 205/420 in 1997 versus 272/376 in 1978).
- The number of reported full-time farmers in the county is quite stable over the past two decades.
- The rest of the Park County economy has grown, but agricultural output has not. With approximately the same earnings ($4 million per year), agriculture has declined from being more than 10% of the economy in 1970 to being less than 3% today.
- More than 2/3 of the market value produced by Park County farms comes from livestock production, as opposed to the sale of crops.
- About 70 percent of harvested cropland is irrigated.

- Of crops grown under irrigation, hay (mostly alfalfa) predominates (85%), with the remainder mostly in barley, oats and wheat. Barley is the most commonly grown grain crop, with more acres than oats and wheat combined.

- Virtually all statistics covering agriculture in the study area are published at the county-level and include the Shields River Basin as well as the Upper Yellowstone River Basin study area. Although county-wide statistics may provide some useful insight into the characteristics of farming and ranching operations in the study area and trends in those characteristics, these statistics (on an absolute basis) may be misleading because of differences between the two basins. To gain further insight into the specific characteristics of agriculture in the Upper Yellowstone River Basin, the study team also conducted interviews with knowledgeable local officials.[15]

Interviews and data from the 1951 Survey allow some comparisons of the study area to Park County as a whole and provide more specific indicators for the study area:

- The Shields Valley is larger and has more tillable acreage than the agricultural areas of the Upper Yellowstone River Basin within the study area (primarily the Paradise Valley). Reportedly the Shields Valley produces about 2/3 of the cattle and hay in Park County.[16]

- Almost all of the small grain production in Park County occurs in the Shields Basin. Lands within the study area produce hay and cattle almost exclusively.[17]

- Ranches in the study area tend to be about one-half the size of ranches in the Shields Basin.[18]

- With about the same total number of farms/ranches in both areas, there are fewer full-time ranchers in the study area than in the Shields Basin. There may be more opportunities for doing other things with the land in the study area, such as spring creeks, fishing and angling outfitters, bed and breakfasts, etc.[19]

- A larger portion of the agricultural lands in the study area are irrigated than in the Shields Valley. Though the Shields Valley has more total land in irrigation, probably more than half of all irrigated lands in the county are located within the study area. The 1951 Survey indicated that 54 percent of irrigated lands in the county were within the portions of the county comprising the study area. Assuming these proportions are still representative, there would currently be between 20,000 and 25,000 acres under irrigation within the study area.

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[15] The study team interviewed Marty Malone, Park County Extension Agent and Scott Compton, MTDNRC Regional Water Resource Manager in September 2002. We also gathered additional information from these individuals including *Water Resources Survey, Park County Montana, Part I*, published by the State Engineers Office in December 1951 and *State Water Conservation Projects*, published by MTDNRC's Water Resources Division in March 1977.

[16] Personal communication with Marty Malone, Park County Extension Agent, September 2002.

[17] Ibid.

[18] Ibid.

[19] Ibid.

Irrigation in the study area. Interviews with the County Extension Agent and the Regional Water Resources Manager provide insight into irrigation practices within the study area.

- The consumptive irrigation requirement for hay, the primary irrigated crop within the study area, averages about 25 inches per year.[20]

- In years of average flows on the Yellowstone and its tributaries, most ranchers in the study area can obtain sufficient supplies to meet their crops' full watering requirements, though some ranchers are reliant on more junior rights and/or using less efficient irrigation technology (e.g., flood irrigation) and may not be able to fully supply their crops.[21]

- In dry years, most farmers served by water rights on the mainstem and its canals may still receive a full supply of water for their crops. Farmers with rights on the tributaries, however, are more likely to be water short.[22]

- Many ranchers in the study area have endeavored to conserve water and stretch their supplies further. It is estimated that one-half or more of the ranchers in the study area now irrigate with pivot and sideroll sprinklers, as opposed to the former contour flooding technique. In the late 1980s, NRCS assisted ranchers off Mill Creek in replacing their ditch with a pipe that could provide pressure for sprinklers.[23]

- Exact efficiencies of on-farm irrigation and the conveyance systems in the study area are not known. In general, sprinklers/sideroll irrigation in the area is estimated to have an efficiency of about 65 percent, compared to perhaps 35 percent for flood irrigation. Average efficiency for study area conveyance systems (e.g. canals and ditches) may be about 50 percent.[24]

Based on the foregoing estimates, it may be reasonable to assume an average of about 50 percent for on-farm efficiency — e.g. 50 percent of the water supplied to the farm/ranch is actually taken up by the root zone of the crop. Applying the similar estimate of 50 percent conveyance efficiency — 50 percent of water diverted from the source actually reaches the farm — it would appear likely that approximately four acre-feet of water are typically diverted from the source for every one acre foot actually consumed by the hay crop. Given our previous estimate of approximately 20,000 to 25,000 acres under irrigation, and a consumptive irrigation requirement of 25 inches, total water diversions for irrigation would appear likely to average about 200,000 acre-feet per year.

[20] Personal communications with Marty Malone, Park County Extension Agent and Scott Compton, MTDNRC Regional Water Resource Manager in September, 2002.

[21] Ibid.

[22] Ibid.

[23] Ibid.

[24] Ibid.

Summary

Numerous government agencies play a variety of roles in managing the Yellowstone River. Physical modifications to the course of the river are primarily regulated by a combination of the USACE (at the federal level), MTDNRC (at the state level) and PCD (at the local level). The volume of water and diversions from the river, are principally regulated by state district courts through water commissioners. Floodplain development and modifications are regulated primarily by local floodplain managers implementing state and federal requirements while considering local circumstances.

Bank stabilization projects were recorded in a 1998 inventory and a less complete version in 1987. As of 1998, nine percent of the stream bank was riprapped, and there were more than 100 rock barbs and an additional 100 rock jetties. Eroding banks were estimated at 12 percent of the total. The changes in rock jetties and barbs was substantial between 1987 and 1998, although riprap also increased somewhat. Some stretches recorded little change in that period, but the largest change occurred from Pine Creek Bridge to Carters Bridge.

Water rights were mostly quantified after 1974, rendering full, accurate quantification elusive at this time. There are 2,277 active water rights in the study area, and agriculture and stock watering account for 86 percent, while fish, wildlife and recreation purposes account for 5 percent of the rights granted. The total quantified rights amount to 2.2 million acre-feet per year and of this, 1.53 million are dedicated to fish, wildlife and recreational purposes mostly held by Montana Fish Wildlife, and Parks Department. BBC made rough estimates of unquantified rights, which would suggest potentially 2.7 million acre-feet of total water rights.

Irrigation water uses have been traditionally important to the Valley. The number of farms have increased but size of farm has declined — reflecting the gains in "hobby" farms. Irrigated acreage held steady from the 50's to the late 70's, but it has declined since then. The economic contribution from agriculture has held steady while other sectors have grown. Much of Park County agriculture is outside the study area in the Shields Valley. Ranchers are smaller and there are less full-time ranchers in the study area compared with the Shields Valley.

Consumptive use for hay is about 25 inches per acre per year. A total of four acre-feet must be diverted to supply an acre-foot of consumptive use to study area crops.

Task 7a.
Social Assessment: Quality of Life

Introduction

BBC analyzed potential secondary by-products of growth and change in the study area in this Task 7a report. "Growth" implied residential development, population growth and displacement of local people and/or ranching. "Change" entailed alterations to the river for flood management. This report summarizes the perceptions various stakeholder groups hold with regard to elements of quality of life in the study area that are potentially affected by this growth or change.

BBC gathered perceptions of important components of quality of life from stakeholders in extended interviews for Task 2. Additional perceptions were derived from the extensive surveys of residents, businesses and visitors to Park County collected for Tasks 3 and 4. Stakeholders identified scenery and river-related recreation (fishing, rafting, floating) as the most important aspects of the river that contributed to their quality of life. The broader survey of residents, businesses and visitors confirmed this finding. Stakeholders did not identify noise as a concern they had as a component of quality of life, and visitors agreed that noise did not negatively affect their visitor experiences.

Stakeholders also identified out-migration and ranch displacement as land use/demographic areas of concern for their quality of life. Residents and businesses agreed that ranchers are important to the economy and community, and visitors found ranching to be a positive part of their visitor experiences. Residents and businesses also agreed that residential development threatens the river and their quality of life. Interviewees valued newer residents less than they valued longer-term residents in terms of economic and social contributions, but they did believe the latter were important nonetheless.

Recreation

Stakeholders, residents, businesses and visitors almost universally expressed that recreation was an important component of the quality of life and quality of the visitor experience in Park County. Every stakeholder group, from ranchers to outfitters to realtors, mentioned recreation as some element of the important issues they perceived with regard to use of the river (see Exhibit 2-5 in the Task 2 report). Fishing and other river-related recreation activities were important components of the quality of life to more than 55 percent of both residents and businesses (see Exhibits 4-10 and 4-11 in the Task 4 report). For those visitors who fished in Park County, more than 60 percent thought that fishing was somewhat positive or very positive for their visitor experiences (see Exhibit 3-32 in the Task 3 report). For those visitors who experienced the whitewater in their use of the river, more than 70 percent thought the whitewater somewhat positively or very positively affected their visitor experiences (see Exhibit 3-33 in the Task 3 report).

Recreation is indeed an important part of life in the study area. The Montana Board of Outfitters indicated that from 1995 to 2001, nonresident angler days on the Yellowstone River rose from 3,317 to 4,534. Resident angler days rose, too, from 442 to 598. In the surveys for Tasks 3 and 4, residents,

businesses and visitors to Park County all indicated strong interest in and support for river-related recreation, including fishing, rafting, floating and other activities. BBC field experience also revealed intense use of recreational facilities, including river accesses, trailheads and campgrounds.

Aesthetics/Scenery

Stakeholders, residents, businesses and visitors overwhelmingly communicated that the aesthetics and scenery of the Upper Yellowstone River are essential elements of the quality of life in Park County. Every stakeholder group, from government officials to spring creek owners to businessowners, mentioned the aesthetics of the river as important with regard to use of the river (see Exhibit 2-5 in the Task 2 report). The beauty of the Upper Yellowstone River was an important component of the quality of life in the study area to more than 80 percent of residents and businesses (see Exhibit 4-12 in the Task 4 report). More than 50 percent of visitors to Park County thought that the scenery on or near the river and the wild and undeveloped nature of the river very positively affected their visitor experiences (see Exhibits 3-34 and 3-35 in the Task 3 report).

Scenery, too, is indeed an important part of the quality of life in the study area. The surveys for Tasks 3 and 4 revealed that residents, businesses and visitors all strongly appreciate the river's contribution to the scenery and feel of the study area. BBC did not find any other studies, however, as of October 2002 to document this appreciation for scenery along the Upper Yellowstone River.

Noise

Noise did not appear to be an important component of the quality of life to stakeholders, residents, businesses or visitors to Park County. More accurately, the level of unnatural/manmade noise in the study area did not seem to be significant enough to warrant mentioning it as an important issue with regard to use or management of the river. No stakeholder groups mentioned noise in their lists of important issues. Visitors, too, thought that noise was not an important issue. About 36 percent of visitors thought that the level of unnatural/manmade noise on the river somewhat positively or very positively affected their visitor experiences. Only 17 percent felt that the level of noise somewhat negatively or very negatively affected their visitor experiences (see Exhibit 3-36 in the Task 3 report).

The reality of noise along the Upper Yellowstone River is that there is not much of it. Aside from noise of traffic along US Highway 89, East River Road and Interstate 90, the only major sources of manmade noise are construction of new homes and other structures, airplanes passing overhead, trains running into Livingston and people talking or yelling while recreating on the river. Noise does not appear to be a major concern for the study area.

Development and Land Use Change

Rural residential development and its accompanying land use changes were clearly prominent concerns for stakeholders, residents and businesses in the study area. Six stakeholder groups mentioned overdevelopment in their lists of threats to the river (see Exhibits 2-5 and 2-6 in the Task 2 report). More than 50 percent of residents and businesses disagreed or strongly disagreed that property owners should continue to have a right to subdivide and build in the floodplain (see Exhibit 3-16 in the Task 3 report). More than 80 percent of residents and businesses thought that riverbank vegetation is important to the river experience (see Exhibit 3-27 in the Task 3 report).

Visitors in the summer of 2002 were not negatively affected by growth, by and large. Only 24 percent of visitors surveyed thought that residential development along the river very negatively or somewhat negatively affected their visitor experiences. Another 24 percent thought the opposite, that development somewhat positively or very positively affected their visitor experiences (see Exhibit 3-17 in the Task 3 report). Visitors did reinforce the importance of riverbank vegetation on the river experience, however. More than 60 percent of visitors felt that the amount of riverbank vegetation had somewhat positively or very positively affected their visitor experiences (see Exhibit 3-27).

Rural residential development and changes in land use have occurred at a moderate pace thus far. According to Park County Sanitarian data, roughly 2,350 new residential structures with new septic systems have been installed in the study area from 1967 to 2001, or less than 70 units per year. The study area also experienced roughly 600 newly subdivided lots in the 1990s, or 60 per year. Most of these developments have occurred outside the areas of Livingston and the surrounding area. With this development has come an increase in rural residential property and smaller parcels throughout the study area. Some land has been removed from productive agriculture, but much of the remaining ranching land still runs cattle.

Ranching and Displacement

Ranching and those who do it were important to stakeholders, residents, businesses and visitors to Park County. One stakeholder group indicated that agriculture contributes to the river experience (see Exhibit 2-5), and about 31 percent of visitors agreed, saying that cattle or ranching activities had somewhat positively or very positively affected their visitor experiences (see Exhibit 3-38). More than 75 percent of surveyed residents and businesses believed that ranchers were important or very important to the Park County economy (see Exhibit 3-7). Over 70 percent of residents and businesses also felt that ranchers were important or very important to the social and cultural environment of Park County.

A general concern for the displacement of ranchers was expressed in the socioeconomic assessment process, though no particular stakeholder groups, residents, businesses or visitors mentioned this issue specifically. Instead, three stakeholder groups indicated that newcomers appreciate the river for its recreation and the area's related quality of life (see Exhibit 2-5), which some claim has raised property values and displaced ranchers. The rising tide of newcomers, and not the displacement of ranchers, concerns more groups.

The reality of ranching and displacement is two-fold. First, ranching is still an important part of the economy here, but it is becoming dwarfed by tourism. Ranching accounts for roughly three percent of personal income, and earnings and 9 percent of employment in Park County. Park County agriculture expended more than $29 million in production expenses and received more than $21 million in cash receipts, but this activity compares with more than $100 million in gross sales by the Park County retail trade sector alone. Ranching's relative economic influence is less than it once was.

Second, ranching and ranchers have been and remain vital parts of the Park County community. Land values are on the rise, and the profitability of ranching is on the decline. The economic incentives to realize the profit of selling land in Park County and to ranch where it is cheaper are very high. Ranchers are slowly leaving and are being displaced by economic factors out of their control.

Movement and Displacement of People

Stakeholders, residents and businesses alike recognized the power the Upper Yellowstone River has in making the study area a quality place in which to live. Two stakeholder groups mentioned that the river is vital in attracting people to the area (see Exhibit 2-5), and the survey of residents and businesses confirmed this. More than 65 percent of residents thought that the river is an important reason why people move here and stay here (see Exhibit 3-22). About 53 percent of businesses agreed or strongly agreed that the river is important in attracting and retaining employees (see Exhibit 3-23).

The river's importance in attracting new people to the area has raised mixed feelings about in-migration and the potential for locals being displaced by the economic changes surrounding an influx of wealthy, often seasonal residents. One stakeholder group believed newcomers are not as committed to the area's values and interests in the river. Another stakeholder group countered, however, that newcomers also appreciate the river. Surveyed residents and businesses overall were in favor of new and seasonal residents. More than 50 percent of residents and businesses believed new permanent residents are either important or very important to the Park County economy. Over 40 percent of residents and businesses also thought new permanent resident were important or very important to the social and cultural environment of the area. About 35 percent of residents and more than 60 percent of businesses expressed that seasonal residents are important or very important to the economy. About 21 percent of residents and 39 percent of businesses thought seasonal residents were important to the social and cultural environment of Park County.

It is unclear whether a substantial number of people are out-migrating from Park County. Census data revealed that proportionally more people in 2000 had moved to Park County from different homes outside Park County five years prior than occurred from 1965 to 1970, indicating an increase in *in-migration*. The data indicate, too, that the 1980s saw the largest *in-migration* of people of the four decades from 1960 to 2000. Out-migration was not tracked per se and, based on the data, does not appear to be substantial.

Summary

This task report brings together other elements of the socioeconomic study into a quality of life assessment for the study area. Aesthetics, scenery and recreation are widely recognized as central elements of the Upper Yellowstone River Valley quality of life, and the river itself plays an indispensable part. Noise is not a negative aspect of the local quality of life. Residential development and land use change in the river valley is considered somewhat of a threat to the quality of life, but visitors do not see it as a detraction yet. In fact, change has been rather slow historically. The displacement of ranching and others is also a moderate concern, and it is also proceeding slowly.

The matrix below summarizes the perceptions afforded the quality of life issues addressed in this section:

Exhibit 7a-1.
QOL Matrix

Issue	Stakeholders	Residents	Business	Visitors
Recreation	Important	Important	Important	Important
Aesthetics/Scenery	Very Important	Very Important	Very Important	Very Important
Noise	Unimportant	Unimportant	Unimportant	Unimportant
Development/Land Use Theory	Important	Important	Important	Unimportant
Ranching and Displacement	Very Important	Very Important	Important	Important
Movement and Displacement of People	Important	Important	Important	Important

Source: BBC Research and Consulting.

Task 7b.
404 Permit Process and No-Action Scenario

As required in the workscope, BBC documented the Corps' existing 404 permit process and projected general social and economic conditions in the study area in 2025 assuming that the Corps' regimen of river management remains unchanged. This report serves to demonstrate how the Corps currently manages the regulatory program that assesses landowner proposals to stabilize riverbanks or manage the Upper Yellowstone River for flooding. Separately, the study team forecasts what the economy and community of the area might look like 25 years from now if this approach to river management were to remain constant. No linkage between economic and social conditions and river management actions are necessarily assumed here; these projections only assume continuation of the status quo.

Corps' Existing 404 Permit Process

Section 404 of the Clean Water Act requires that the Corps review permit applications to discharge dredged or fill material into waters of the United States. In reviewing applications, the Corps must consider these activities' impacts on conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

To enhance permit approval efficiency, Section 404 authorizes the Corps to issue general permits at the state, regional or national level for specified activities in certain waterways. If the Corps issues such a general permit, however, it must consider both separate environmental impacts of each proposed activity, as well as the cumulative environmental impacts of all proposed activities authorized under that general permit. All nationwide general permits and the Regional General Permit for fish habitat structures are available for use on the Upper Yellowstone River.

Any discharge of dredged or fill material into waters of the US that may result from any of the following activities is not prohibited by or otherwise subject to regulation under Section 404: (1) normal farming, silviculture and ranching activities; (2) maintenance of currently serviceable structures; (3) construction and maintenance of stock ponds and irrigation ditches, and maintenance of drainage ditches; (4) construction of temporary sedimentation basins on a construction site; and (5) construction and maintenance of farm, forest or mining roads.[1] Violations of this law are punishable by fines and/or a prison sentence, and the Corps shares enforcement authority with the Environmental Protection Agency (EPA). Applicants can typically appeal permit denials to the Corps for review.

[1] Any of these "normal" activities that involve discharge of toxic pollutants as listed in Section 307 of the Clean Water Act will be regulated by both Section 307 and 404 and will require permits.

The Corps seeks to work cooperatively with the EPA, US Fish and Wildlife Service, US Forest Service, National Park Service and other federal, state and local agencies as much as possible to achieve efficient outcomes in the 404 permitting process.

For more information, see the following internet links to Corps webpages:

- http://www.usace.army.mil/inet/functions/cw/cecwo/reg/sec404.htm
- http://www.usace.army.mil/inet/functions/cw/cecwo/reg/33cfr323.htm
- http://www.usace.army.mil/inet/functions/cw/cecwo/reg/33cfr330.htm
- http://www.usace.army.mil/inet/functions/cw/cecwo/reg/enfmoa.htm
- http://www.usace.army.mil/inet/functions/cw/cecwo/reg/eng4345a.pdf
- http://www.usace.army.mil/inet/functions/cw/cecwo/reg/33cfr331.htm

No-Action Scenario

BBC projected social and economic conditions in the Upper Yellowstone River study area in 2025. The only assumption used for this projection was that construction on the Upper Yellowstone River that will require a Corps permit or the denial of a permit in that 23-year period will be roughly comparable with construction and permits in the recent past. As such, the 1990s offered a representative historical decade for demographic and economic data projections, for four reasons. First, the Corps applied or implemented its currently existing regulatory strategy in this decade. Second, this decade saw six years of normal river flows, two years of flood flows and two years of drought flows, which covered a wide range of effects the river might have had on the economy and demography of the area. Third, those variable river flows also would have created an environment for a diverse and sizeable number of construction and permit projects on the river for stabilization or flood control. Fourth, data from the 1990s was readily available and more complete than in other decades, rendering a more comprehensive projection to 2025. It should be reiterated that no-action is a point-of-comparison scenario for subsequent action scenarios under NEPA. Additional scenarios have not been developed nor has a decision to proceed with NEPA been made. This set of projections is preliminary, subject to refinement with more sophisticated economic models and forecasting in the next phase of the study. All monetary figures in these projections, including the historical data from 1990 through 2000, are in nominal dollars to allow for inflation in projections.

Demographic projections. Based on 1990s trends in population and housing, BBC has made the following predictions for the 23-year no-action scenario period in Park County (see Exhibit 7b-1 below). BBC projects that population will grow by 8 percent each ten years, based on 1990 to 2000 growth. Persons per housing unit is assumed to be 1.9, the year 2000 ratio, which is applied to population to derive housing unit projections. BBC projects an additional 100 seasonal housing units per decade, based on the trend observed from 1990 to 2000. Population and housing unit increases over the next 23 years are projected under no action to increase by about 21 percent.

Exhibit 7b-1.
Projected Park County Population and Housing Units

Source:
US Census Bureau and BBC Research and Consulting.

Year	Population	Housing Units
1990	14,562	6,926
2000	15,694	8,247
2010	17,000	9,000
2020	18,300	9,700
2025	19,000	10,100

Economic projections. Based on data from the 1990s, BBC made the following economic projections over the 23-year no-action scenario period for Park County.

Income and earnings. Data from the 1990s indicate that total personal income will grow by roughly 50 percent every ten years (see Exhibit 7b-2 on the following page). These figures include an assumed three percent annual inflation rate. Total personal income is projected to approximate $810 million by 2025.

Exhibit 7b-2.
Projected Park County Personal Income (000's)

	Park County				
	1990	2000	2010	2020	2025
Total Personal Income ($000)	$191,470	$312,580	$492,200	$673,000	$811,500
Earnings by place of work	$93,430	$164,609	$295,000	$425,000	$513,000
Dividends, interest, rent	$55,871	$86,574	$115,000	$145,000	$175,000
Transfer payments	$38,596	$56,308	$75,000	$93,000	$111,000
Adjustments	$3,573	$5,089	$7,200	$10,000	$12,500
Per Capita Personal Income	$13,076	$19,883	$29,000	$36,800	$42,700
Average wage per job	$14,545	$19,387	$26,100	$35,100	$40,700

Source: Bureau of Economic Analysis, Regional Economic Information System, and BBC Research and Consulting.

Total earnings for Park County residents are anticipated to rise by more than 200 percent over the next 23 years under the no-action scenario, but individual industry sectors will grow at different rates. The services and retail trade sectors will grow further in relative importance.

Employment. BBC projects, based on data from the 1990s, that employment in Park County will continue to steadily rise through 2025 (see Exhibit 7b-3 below). Assuming a constant unemployment rate of 5.4 percent, there will be roughly 12,500 jobs in the county.

Exhibit 7b-3.
Projected Park County Employment and Unemployment

	Park County				
	1990	2000	2010	2020	2025
Work Force	7,036	9,441	11,900	12,800	13,300
Employment	6,656	8,931	11,300	12,100	12,600
Unemployment	380	510	600	700	700
Unemployment Rate	5.4%	5.4%	5.4%	5.4%	5.4%

Source: US Bureau of Economic Analysis, Regional Economic Information System, and BBC Research and Consulting.

Employment is expected to increase the most in the retail trade and services sectors, as it did in the 1990s (see Exhibit 7b-4 on the following page). Employment in those two sectors will top 50 percent of the total by 2025.

Exhibit 7b-4.
Projected Park County Employment Totals and Employment by Sector

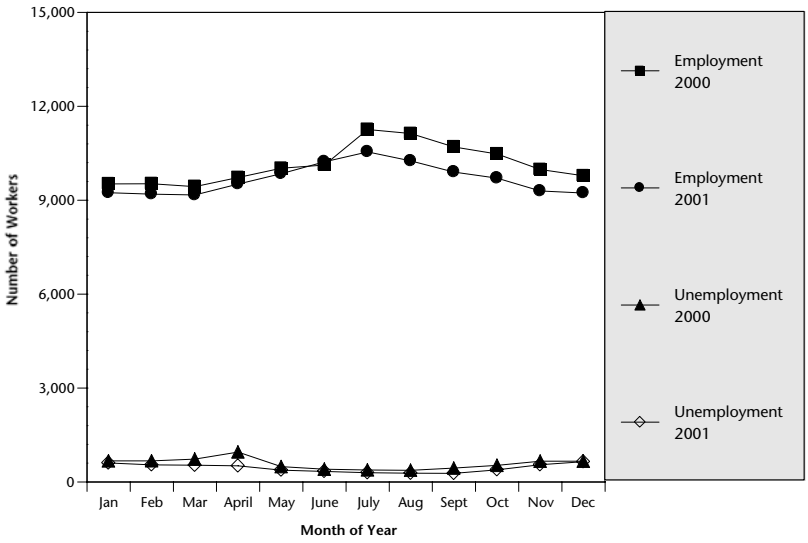
	Park County				
	1990	2000	2010	2020	2025
Total full time and part time	6,656	8,931	11,300	12,100	12,600
Farm	505	609	771	825	859
Agricultural Services	128	195	247	264	275
Mining	126	30	38	41	42
Construction	382	722	914	978	1,019
Manufacturing	350	443	561	600	625
Transportation/Public Utilities	322	371	469	503	523
Wholesale Trade	134	206	261	279	291
Retail Trade	1,250	1,868	2,363	2,531	2,635
Finance, Insurance and Real Estate	462	577	730	782	814
Services	2,248	3,083	3,901	4,177	4,350
Government	749	827	1,046	1,120	1,167

Source: Bureau of Economic Analysis, Regional Economic Information System, and BBC Research and Consulting.

Tourism. Similarly to the 1990s, BBC projects that tourism will continue to increase in economic importance in Park County through 2025. With that increase in tourism, BBC anticipates that employment will continue to be somewhat seasonal, as shown in Exhibit 7b-5 below. It is difficult to assess whether employment will become more seasonal than it was in the 1990s. If tourism increases in economic importance, however, it is reasonable to assume that employment will become at least somewhat more seasonal.

Exhibit 7b-5.
Monthly Employment and Unemployment for Park County, 2000 and 2001

Source:
Montana Department of Labor and Industry.



If the 1990s speaks to numbers of visitors, BBC might reasonably project that visitation to Yellowstone National Park in Park County will increase moderately throughout the next 25 years. Visitation may top out at 800,000 per year through the entrance gates in Gardiner by 2025, compared with 550,000 in 2002. The seasonality of visitation, with more than half of visitors coming in the summer months of June, July and August, is expected to persist.

BBC projects that Park County will continue to add lodging rooms to its inventory. The mix of new rooms — hotels, motels, bed and breakfasts, lodges, guesthouses — is difficult to predict. Much growth in lodging in the 1990s occurred in the non-hotel sector, however, so growth in lodges, BandB's and guesthouses is expected to continue.

Under the no-action scenario, visitor use of the Upper Yellowstone River for angling and rafting will probably continue to increase in the coming 25 years. Park County can also anticipate increased use of National Forest campgrounds and trailheads.

BBC anticipates that growth in the numbers of seasonal residents in Park County will continue through 2025. Though BBC does not offer an estimate of the numbers or percentages of seasonal residents by that time, it is expected that this sector of the population might be ten percent or more.

Agricultural projections. As in the 1990s, BBC projects that agriculture will have a continued presence in Park County over the next 25 years. Its economic importance will continue to decline slowly as other industries like tourism becoming increasingly important. Ranching will continue to see expenses that fall more slowly than sales and higher levels of other sources of income, unless cattle prices shift markedly upward.

BBC anticipates that ranches will continue to increase in number but decrease in size through 2025. Total cropland and land in ranching will also decline, along with numbers of cattle, hogs and sheep. The numbers of farms harvesting wheat and barley, and their amounts harvested, will continue to decline. Farms involved in oats and hay will increase in numbers and amount harvested.

BBC anticipates that the average value of ranches in Park County will continue to rise beyond inflation with land value increases. The number of ranches with less than $2,500 in sales will increase until it reaches over 40 percent of the total ranches in Park County by 2025. The number of ranches with cattle will continue to fall, and the number of fulltime ranchers, including fulltime ranch managers, will increase only slowly, while ranchers who work more than 200 days per year off the ranch will increase more quickly.

Projected agricultural trends indicate that the pattern of rancher displacement in the 1990s will continue through 2025. BBC makes no estimate of the number of longtime ranchers who will choose to move to different parts of the country or who will cease ranching in the next 25 years. BBC does anticipate, however, that ranching in Park County will become increasingly tourist or hobby-oriented rather than production-oriented. Ranches will become smaller as rural residential development continues. And land prices will continue to rise, encouraging mainly wealthy, out-of-area new residents to buy any property for sale in the rural study area.

Land use projections. Based on land use trends in the 1990s, BBC projects that land use change in the study area will persist through 2025. Rural residential development, primarily on formerly subdivided parcels, will continue. Most development will occur in the river corridor or in previously established subdivisions in other desirable parts of the study area. No additional development in the form of new subdivisions is anticipated in the floodplain, however, due to county regulations. Development will be influenced primarily by market demand, though restricted infrastructure may play a role in limiting some growth.

Social projections. BBC anticipates that Park County will continue to be a strong community through 2025. New residents will continue coming into the area, requiring social institutions to adjust and evolve. Longtime residents and ranchers will pass on or move away, replaced by younger generations, many of whom have not lived in Park County their entire lives. It is difficult to predict what kind of community the study area will be in coming years, but a few things are fairly certain:

- Longtime residents and ranchers will continue to have political and social influence;
- The role of the family unit will remain a vital part of the community in Park County, though it may experience challenges from shifting social influences;
- New residents will have an increasing impact on social structure; and
- Tourists will continue to influence the community through the arts and cultures they bring with them.

Summary

BBC offers the following summary of the projected social and economic conditions of the study area and Park County in 2025, assuming no change in river regulatory protocol and roughly the same amount and type of construction on the river as in the 1990s.

- Population and housing stock will continue to grow at a moderate pace.
- Incomes and earnings will rise more rapidly, with the retail trade and services sectors leading the way.
- The number of jobs in Park County will rise. Retail trade and services will be the most significant sectors for jobs.
- Tourism will continue its ascension to economic dominance in the Park County economy. Jobs, income, earnings and sales in tourism sectors will continue to rise, along with visitation and lodging accommodations.
- Agriculture will have an important but declining presence in Park County.
- Rancher displacement will continue slowly as land values rise, seasonal residents increase and the agriculture economy remain unfavorable.
- Land use will continue to change with rural residential development in the river corridor and in other desirable parts of the study area. Subdivision will continue in the river corridor under the no-action scenario.
- The social fabric of Park County will continue to change, as it always has. New residents will replace old, and new values will evolve. The separate influences of longtime residents, new residents and tourists will remain.

Task 9a. Public Participation

First Public Meeting, February 2002

Overview

The Governor's Upper Yellowstone River Task Force (Task Force) and BBC Research and Consulting hosted a public meeting at 7:00 p.m. on Monday, 25 February 2002, at the Best Western Yellowstone Inn in Livingston, Montana. The meeting was widely reported and advertised in newspapers and on the radio, including the *Livingston Enterprise*, *Bozeman Daily Chronicle*, and *Billings Gazette*, and KGLT radio. The purpose of the meeting was to announce the commencement of the socioeconomic portion of the Task Force's river studies and to gather input from the public on the issues and stakeholders surrounding the river. A total of 49 people attended, many of who contributed to the public input portion of the meeting. A list of attendees and their affiliations, the meeting agenda, and presentation materials are attached at the end of this meeting summary.

Welcome, Introductions, and Purpose, Context, and Overview of River Study

John Bailey of the Task Force opened the Socioeconomic Study Public Meeting. He introduced Task Force members and the Study Team including Ed Harvey and Andy Fritsch of BBC and Louise Forrest, a public participation specialist. Ed Harvey followed and discussed the purpose and context of the larger overall river study, with contributions by Duncan Patten. Ed then reviewed BBC's workplan for the socioeconomic portion of the river study and took questions from audience members. All of this was accompanied by a PowerPoint presentation prepared by BBC.

Public Input

The public input section of the meeting began at 7:45 p.m. and continued until 9:00 p.m. — the end of the meeting. Louis Forrest and Ed Harvey facilitated public input, which was recorded on large notepads at the front of the room. The input focused on these questions:

- What is your main concern/issue with regard to the river?
- With whom should we speak about the river? Who are the stakeholders?
- What suggestions might you have in performing our socioeconomic study?

The issues. The public suggested that the following issues were most important to them:

- Water availability was a concern for at least one resident:
  - Citizens were concerned that there will be enough water provided by the Yellowstone for all uses into the future.

- Many meeting participants raised water quality issues:
  - The public expressed concern over the Town of Gardiner's dumping of raw sewage into the river.
  - Movements of sewage from septic tanks needs to be better studied. Do neighboring septic tanks affect neighboring water supplies? And what about flows into the river watertable? More needs to be known. Sewage leaking from the water treatment plant was a concern.
  - Both Yellowstone National Park's (YNP) dumping of chemicals into the river, as well as the proximity of the Park's outhouses to the river at fishing accesses, were concerns.
  - A belief was expressed that overgrazing causes erosion along the riverbanks, which causes diminished water quality.
  - Another attendee suggested that forest fires in YNP and other areas cause erosion that deteriorates the quality of water in the river.

- Regarding access to the river, the following viewpoints surfaced:
  - The volume of visitors to the river is rising, which poses a threat of ecological damage as the river attempts to accommodate all the users.
  - Landowners along the river are liable for anything that happens to visitors who access the river through their land.
  - Visitors are leaving behind heaps of litter and refuse at river access points.
  - Rafters deposit refuse and other things into the river, which is not good for the river's health and should be screened.
  - Visitors are causing too much noise for those who live on the river.
  - Visitors' inconsideration for landowners and local residents is worse than ever.
  - There are too many users, which is ruining the "quality of the experience" on the river.

- Mineral rights issues were a concern for at least several participants:
  - Landowners and minerals companies should have access to the minerals in the area for excavating.
  - There are local mineral collectors who are very concerned that they continue to have access to good spots for mineral collection.

- Inclusion of other activities in "Best Uses" was also mentioned:
  - Most "best uses" are nonextractive, such as catch-and-release fishing and rafting, but other uses, such as water diversion, should be considered "best uses."

- Several persons at the public meeting spoke about the "unspoiled" feel of the river:
  - Visible land development along the river affects the aesthetics of the view and levels of noise and dust in the river corridor.
  - Residential development impairs the views of the natural river corridor.

- The "wild nature" of the river is one of its greatest gifts to the community and visitors.
- Different land uses have different effects on the river — pavement causes increased runoff, while ranching or meadows have less impact.

- Stream channelization was raised as an issue:
  - Stream channelization is really a matter of who gets flooded — ranching land or homes?
  - One way to improve the situation is to implement better ways in which to store water, to eliminate dikes, and to allow for trees in the floodplain.
  - Riprapping as a means of channelizing the river merely causes problems and forces others to spend money to fix things after water is ricocheted toward neighbors' lands from riprapped banks.
  - There are a number of river management techniques vying in the public's mind: irrigation versus dams versus channelization versus "wild flow."
  - There are pressures from outside the county to permit river management in certain ways, when the drivers of river management should primarily be local concerns and needs.
  - Bank stabilization projects should be better understood, especially the aspect of landowners' motivations. Why would a landowner wish to stabilize his bank? Why would other landowners object? Those considerations should be taken into account when making river management permits.
  - Instead of riprapping haphazardly, the Corps should strategically approve permits for riprapping in order to best protect property and maintain ecosystem health.

- Population growth and density were issues for at least some participants:
  - Riverfront and valley land values are on the rise as more and more people move into the area.
  - Land on the river is extremely valuable and expensive relative to other land in the area, and as such, ranchers have had great incentive to sell their riverfront property to developers, which has increased population and density in the area. Perhaps there is some way in which to make the land more valuable to the rancher than to the developers.

- Property rights were raised as a concern:
  - There is a political and economic tug of war between the "haves" and the "have nots" along the Yellowstone River — the "haves" have their land and homes and do not want others to get it, and the "have nots" want the benefits that come with more people and development.

- A number of participants raised concerns about jobs, income and related economic issues:
  - Regulations, such as environmental or river management rules, are pushing agriculture out of the region.
  - Agricultural productivity is essential to the future of ranching, and productivity depends upon water diversion, which is thus a major issue for local citizens.
  - Protecting the spring creeks is essential for ranchers' income, ecosystem health, and fish hatching.
  - Hunting brings in important income for ranchers and outfitters but requires habitat protection (both natural and agricultural landscapes) to succeed.
  - The economic climate is stagnating as the highpaying jobs from forestry, mining, and oil/gas production are leaving the areas, as well. It is all service jobs now.
  - There has been a move from highpaying, natural resource extraction jobs to lower paying tourism and service industry based jobs.
  - As tourism and recreation become the foci of the economy, the volume of users of the river becomes a major concern, because one must maintain the quality of the resource which is the driver for all activity — the river.
- Flooding-related issues were expressed:
  - Weeds
    - Flooding brings weeds, which are difficult to remove from important agricultural lands.
    - The weeds are often invasive species with which the ranchers need help in dealing.
  - Floods are a problem because they deposit gravel in new places, which changes riverflows and can threaten land on the riverbanks.
  - It is important to protect cultural and tribal sites along the river, both from flood and from erosion.
- Effects of activities in Yellowstone National Park were discussed:
  - Activities in YNP — forest fires, recreation, tourism — have great impacts on the Yellowstone River and should be better understood and quantified.
- Groundwater utilization was discussed:
  - The Corps might tap underground aquifers to replenish the Yellowstone when it's been depleted by water diversions.
  - Replenishing or supplementing riverflow with groundwater could greatly improve the economics of fishing and ranching in the area.
- At least one participant mentioned beavers and riparian vegetation loss:
  - Beavers on the river are causing serious riparian vegetation loss and should be dealt with.

The suggestions. The public had the following suggestions for the study team:

- Fight weeds after floods.
- Strategically riprap for potential washouts.
- Include local schools, especially teachers, in collecting data about the river and community.

The stakeholder groups. The public suggested that the following stakeholder groups existed in the area and should be contacted:

Exhibit 9a-1.
Stakeholder Groups

Group Name	
Everyone in the Watershed	Full-time Residents
Anglers	Corps of Engineers
Businessowners	Realtors
Local Outfitters	Indian Tribe
Minerals Groups	Hunters
Rafting Outfitters	Spring Creek Owners
Recreational Floaters	Mineral Collectors
Ranchers/Irrigators	Recreation Users
Landowners	Visitors/Tourists
Foresters	Seasonal Residents
Oil/Gas Producers	

Recap and Wrap-up

Finally, Louise Forrest and Ed Harvey summed up the meeting for everyone and adjourned. The next public meeting was announced to be sometime in August or September to review the study's preliminary results.

Attachment A. Public Meeting Agenda

PUBLIC MEETING AGENDA

February 25, 2002 – 7:00 PM

I. 7:00 PM: Welcome and Introductions (Ed Harvey and John Bailey)

II. 7:10 PM: Review of agenda (Louise Forrest) (10 minutes)

III. 7:20 PM: Purpose and Context of Upper Yellowstone River Study (Louise Forrest, others) (15 minutes)

a. Introduce Task Force (John Bailey, 4 minutes)
b. Upper Yellowstone River Study research overview (Duncan Patten, 4 minutes)
c. Introduce Socioeconomic Subcommittee (John Bailey, 2 minutes)
d. Introduce COE (Allan Steinle, 3 minutes)
e. Review meeting objectives (Ed Harvey, 2 minutes)

IV. 7:35 PM: Overview of work plan (Ed Harvey) (20 minutes)

V. 7:55 PM: Input from the audience (Ed Harvey and Louise Forrest) (30 – 50 minutes)

Sample questions to help spark discussion/input:

Questions and comments about the work plan?

What is your main concern with regard to the river?

Do you have feedback on how the study should be conducted and how to promote the best community involvement?

Who else should we talk to?

VI. 8:45 PM: Recap issues feedback (Louise Forrest) (10 minutes)

VII. 8:55 PM: Next steps, closing (Ed Harvey) (5 minutes)

VIII. 9:00 PM: Adjourn

Attachment B. Public Meeting Presentation

The Upper Yellowstone River Socioeconomic Assessment

First Public Meeting

Hosts

BBC Research & Consulting

The Governor's Upper Yellowstone River Task Force

U.S. Army Corps of Engineers

February 25, 2002

BBC Research & Consulting

WELCOME!

Introducing…

The BBC Team

U.S. Army Corps of Engineers Representatives

Governor's Upper Yellowstone River Task Force Representative

What Are We Doing Here Tonight?

Agenda Review

1. Welcome
2. Agenda Review
3. Purpose and context of the Upper Yellowstone River Socioeconomic Study
4. Overview of Work Plan
5. Audience Response
6. Recap
7. Next Steps

What's Our Point?

- Introduce ourselves
- Familiarize you with the study
- You identify issues and stakeholders

Meeting Format and Ground Rules

We Are Doing This Study Because We Need…

- Socioeconomic portrait of the study area
- Economic and social values relevant to the Yellowstone River
- Identification of critical socioeconomic issues
- Phase I is not about:
  1. Definition of development scenarios
  2. Impact analysis
  3. Initiation of a NEPA process

This Study Will Fit Into the Context Of...

- The Upper Yellowstone River Task Force, its Mission, and it's Cumulative Effects Investigation
- The U.S. Army Corps of Engineers Special Area Management Plan (SAMP) Process
- The Socioeconomic Committee/BBC Relationship

Summary of Task Objectives and Methods

1 Historical Social, Cultural Values	Archival data, libraries, newspapers, local groups
2 Stakeholder Groups	Secondary sources and key informant interviews
3 Current Social Values	Surveys
4 Current Cultural Values	Surveys
5a Local Economic Trends, Land Use, Public Services, Farm Displacement	Published sources, local business interviews
5b Current Cultural Values	Past studies, local government, physical inspection

Summary of Task Objectives and Methods (cont.)

6 River Management Background	Institutions, past projects, water rights, irrigation uses
7a Noise, Aesthetics Population Displacement	Task 3, 4 surveys, migration data
7b 404 Permitting Process, Future No-Action	Corps description, projected conditions, Task Force input
8 Preliminary Study Issues	Relevant to River management, other Yellowstone River studies
9 Public Participation	Designed from Task 2, two meetings planned

Task Relationship

Phase 1 Public Participation Plan

Purpose: Liaison between study team and public

Work efforts:

1) Designed with stakeholder profile in mind

2) Means for disseminating work products

3) Two public meetings anticipated

   - February 25, 2002 to introduce work, stakeholder input, information sources
   - August, September 2002 to review preliminary findings and get feedback, too early to set date or content

Phase 1 Completion Schedule

Deliverables and Milestones	Draft Completion Schedule (from point of project commencement)
Historical Data Analysis	Week 10
Key Stakeholder Profiles	Week 40
Social and Cultural Values Description	Week 44
Description of Economic Trends	Week 24
Description of Land Use Trends	Week 20
Water Management Background, No-Action Conditions and Other Social Issues	Week 36
Preliminary Study Issue Identification and Draft Report	Week 44
Monthly Progress Reports	15th of each month
Response to Public Comments	2 weeks following each public meeting
Draft Final Report	Week 44
Final Report	Week 48

Audience Participation

PLEASE SPEAK TO ANY OF THE FOLLOWING QUESTIONS:

1) Suggestions, possible data sources for the Study

2) Your issues with the River, it's past or it's future

3) Who are the stakeholder groups?

4) Please write down who we should talk with further

Attachment C. List of Attendees

Exhibit C-1.
List of Attendees

Attendee's Name	Attendee's Affiliations
Lee Anglin	Angler, Recreationist
Carol Anglin	Angler, Recreationist
Tom Arrandale	Member of the press
Roy Aserlind	Landowner
Jim Barrett	Angler, Environmentalist, Landowner, Recreationist
Bob Bergquist	Angler, Environmentalist, Landowner, Recreationist
Karl Biastoch	Angler, Recreationist
Jeff Blend	Government official
John Bosworth	New resident
Max Braune	Angler, Landowner, Recreationist
Steve Caldwell	Angler, Environmentalist, Recreationist
Ed Carrell	Other group (unspecified)
Paula Clawson	Member of the press
Rusty Collyer	Angler, Landowner, Recreationist
Andy Dana	Angler, Environmentalist, Landowner, Recreationist
Mandy Drysdale	Government official
Zena Ensign	Rancher, Recreationist
Judy Freeland	Recreationist
Rick Gibsen	Government official, Rancher
M.A. Goetz	None
Michelle Goodwine	Angler, Landowner, Recreationist
Matt Goras	Member of the press
Bruce Graham	Angler, landowner, Rancher, Recreationist
Dan Gutebier	Government official
J. Dwight Hines	Anthropologist

Exhibit C-1 (continued)
List of Attendees

Attendee's Name	Attendee's Affiliations
Peter Ismert	Government official
Terri Marceron	Government official
Charlotte Mizzi	Landowner, Church Universal and Triumphant
Bill Moser	Freeholder, Landowner
Jerry O'Hair	Landowner, Rancher
Brant Oswald	Angler, Environmentalist, Recreationist
Julia Page	None
Duncan Patten	Professor
Tom Pick	Government official
Mark Rehder	Recreationist
KC Rommer	Landowner
Ed Schilling	Government official
Rodney Schwartz	Government official
Dale Sexton	Angler, Businessowner dependent on river, Environmentalist, Landowner, Recreationist
Rod Siring	None
Allen Steinle	Government official
Larry Stephenson	Angler, Landowner, Recreationist
Cathy Stephenson	Angler, Landowner, Recreationist
John Usher	None
Ted Watson	Landowner, Rancher
Kathleen Williams	Angler, Recreationist
Bob Wiltshire	Angler, Recreationist
Jim Woodhull	None

Task 9b. Public Participation

Second Public Meeting, September 2002 and Final Task Force Presentation, November 5, 2002

This report describes the Second Public Meeting, and separately in an attachment, offers the presentation made to the Task Force, Corps and public on November 5, 2002.

Overview of Second Public Meeting

The Governor's Upper Yellowstone River Task Force (Task Force) and BBC Research and Consulting (BBC) hosted a public meeting at 7:00 p.m. on Wednesday, 18 September 2002, at the Best Western Yellowstone Inn in Livingston, Montana. The meeting was widely reported and advertised in newspapers and on the radio, including the *Livingston Enterprise*, *Bozeman Daily Chronicle*, and *Billings Gazette*, and KGLT and Yellowstone Public Radio. The purpose of the meeting was to review the preliminary findings of the socioeconomic assessment for the Task Force and Army Corps and to gather input from the public on the assessment findings and preliminary results. Additionally, BBC reviewed the process by which data was gathered and collected and asked for feedback about gaps in the data and additional areas needed for future study or consideration.

A total of 39 people attended, many of who contributed to the public input portion of the meeting. A list of attendees and their affiliations, the meeting agenda, and presentation materials are attached at the end of this meeting summary.

Welcome, Introductions, Purpose for Meeting and Preliminary Findings

John Bailey of the Task Force opened the Socioeconomic Assessment Public Meeting. He introduced the Study Team, including Ed Harvey and Andy Fritsch of BBC and Sara Flitner, the public participation specialist, of Flitner Communications. Allen Steinle of the Army Corps followed and discussed the Corp's role and interest in this study, emphasizing the Corp's ultimate desire to have an understanding of the broad range of issues affected by river management. Sara then reviewed the objectives and layout of the meeting, highlighting the desire for input on the assessment. Ed followed with a 40-minute summary of BBC's initial findings on social and economic values related to the issues surrounding the Upper Yellowstone River. All of this was accompanied by a PowerPoint presentation prepared by BBC.

Public Input

The public input section of the meeting began a little before 8:00 p.m. and continued until 8:45 p.m. — the end of the meeting. Sara Flitner and Ed Harvey facilitated public input, which was recorded on large notepads at the front of the room. Andy Fritsch responded to a number of detailed questions about the study. The input focused on these questions:

- Are the issues and concerns identified by the study so far valid?
- Are there issues that the study has missed?
- Where might the study team find the answers to the questions that you have?
- Are there additional needs for data collection and study that were not considered thus far?

The following table summarizes issues from public participation of the September meeting:

Exhibit 9b-1.
Issues and Follow Up

	Issue	Follow Up
Existing data	Does this study include visitor surveys from US Forest Service and National Park Service?	The Study Team was not able to uncover any surveys.
Existing data	Can the study consider UW Fish and Wildlife Services data from annual report on Yellowstone users exit survey?	BBC did not find that report.
Existing data	Does the study consider gross receipts and production expenses when characterizing the economic contributions of agriculture to the Park County economy?	BBC followed up on this suggestion in the final report.
Interpretation of existing data	Are viewpoints of gravel extraction, gold panning, mining and people who live opposite the levees on the river considered?	People who live on the river were interviewed.
Existing data? More data?	What are stakeholder views regarding the impact that river management has on the resource itself?	The study team did not specifically collect this data.
More data	Focus groups should be considered to gather additional input from residents, businessowners, and tourists.	BBC will suggest this approach for possible further study.
Application of study	How will these socioeconomic findings be prioritized in the decisionmaking process?	That decision is up to the Task Force and the Corps.
More data	Are there methods to reach past visitors who have not returned to the area because of negative river experience?	BBC did not collect this data, but this would be interesting to consider in a further study.
More data	What are the dollar values for each sector of the local economy?	BBC presented this data in its Task 5a report.
More data?	What are the links between the spring creeks and secondary effects on the Upper Yellowstone River system?	This is outside BBC's scope of work.
More data	How can more data from seasonal/absentee residents be gathered and considered?	Several approaches were attempted; more data from seasonal residents would be useful.
More data? Interpretation of existing data?	How does current and available data consider the difference in opinions about overuse between visitors and residents?	BBC's surveys captured this data (see Task 3 report).

Table 9b-1 (continued)
Issues and Follow Up

	Issue	Follow Up
Outside of study scope	What are appropriate ways to consider difference between prior flood management and effectiveness of flood management?	BBC did not collect this data.
Outside scope/more data	How will river management consider the impacts of potential coalbed methane development in the area?	BBC will identify coalbed methane in its preliminary issues for the Task Force and the Corps.

Recap of common themes. Meeting participants generally expressed a desire to proceed with data collection and ultimate decisionmaking about river management. They also felt strongly that the process should continue forward in an inclusive way and that all interests and stakeholders should be represented as alternatives for management are considered. Many expressed a desire to include additional existing data that could inform the study findings further. Some felt that additional study or deeper analysis of the data was important and further noted the importance of ensuring accuracy of quantifiable data in final report.

Next meeting date. Tuesday, 5 November 2002, 7:00 p.m., Livingston Depot Center.

Attachment A. Public Meeting Agenda

PUBLIC MEETING AGENDA

September 18, 2002 – 7:00 PM

I. 7:00 PM: Welcome and Introductions (John Bailey, Allan Steinle, Duncan Patten, Ed Harvey, Sara Flitner)

II. 7:10 PM: Review of agenda (Sara Flitner)

III. 7:20 PM: Overview of work plan, methodology, accomplishments to date (Ed Harvey, Andy Fritsch)

   a. Review each task, purpose, what has been done, which ones we will speak of in detail

   b. Present detailed findings about:

      1. Stakeholder viewpoints, survey results, and implications

      2. Local economic trends tied to (1)

      3. Land use trends tied to (1)

IV. 8:00 PM: Engender input from the audience (Ed Harvey and Sara Flitner)

V. 8:45 PM: Recap public feedback on study (Sara Flitner)

VI. 8:55 PM: Next steps i.e., schedule, Task Force meeting, etc., closing (Sara Flitner and Ed Harvey)

VII. 9:00 PM: Adjourn

Attachment B. Public Meeting Presentation

The Upper Yellowstone River Socioeconomic Assessment

Second Public Meeting

Hosts
BBC Research & Consulting
The Governor's Upper Yellowstone River Task Force
U.S. Army Corps of Engineers

September 18, 2002

WELCOME!

Introducing…

The BBC Team

U.S. Army Corps of Engineers Representatives

Governor's Upper Yellowstone River Task Force Representatives

What Are We Doing Here Tonight?

(Either going for the free coffee and perhaps a cookie, or…)

So you can…

- Find out what BBC has been doing
- Hear what they have learned and let them know if they got it right
- Or, if not, what's missing and where they can find it

Agenda Review and Meeting Format

7:00 p.m.	Welcome and Introductions (All)
7:10 p.m.	Meeting Agenda and Ground Rules (Sara)
7:20 p.m.	Study Progress, Methodology and Accomplishments (Ed)
8:00 p.m.	Public Response to Preliminary Findings (You!)
8:45 p.m.	Recap of Your Feedback (Sara)
8:55 p.m.	Next Steps (Sara and Ed)
9:00 p.m.	Adjourn, by 9 p.m. or Ed's to blame

Just to Remind You Why We Are Doing This Study

- Socioeconomic portrait of the study area
- Economic and social values relevant to the Yellowstone River
- Identification of critical socioeconomic issues
- Phase I is <u>not</u> about:
  1. Definition of development scenarios
  2. Impact analysis
  3. Initiation of a NEPA process

Progress to Date by Study Task

		Status
1	Historical, Social, and Cultural Values	Finished
2	Stakeholder Group Identification	Finished
3	Current Economic Values	Finished
4	Current Social and Cultural Values	Finished
5a	Local Economic Trends	Gathered Most of Data
5b	Land Use Trends	Gathered Most of Data
6	Historic and Current River Management Actions	Some Data Gathered
7a	Social Assessment	Gathered Most of Data
7b	Future No-Action Conditions	Not Yet Started
8	Preliminary Study Issue Identification	Ongoing to the End

Historical Overview of Study Area

- What a colorful story!
- Evolution of economic sectors
- Rich cultural heritage
- Yellowstone River a big deal from the get-go

Identify Stakeholders and Their Issues

Study Area Group	Completed
Local Government	6
Local Economic Development Agencies	4
Angling Outfitters and Organizers	3
Spring Creek Owners	4
Other Ranchers and Agriculturalists	4
Realtors	2
Businesses Dependent on River	3
Businesses Not Directly Dependent on the River	6
Riverbank Residents	2
Environmental Advocates	3
Total	36

Source: BBC Research & Consulting, 2002.

Stakeholders' Perception of Economic Effects of River Management

Stakeholder Group	Economic Effects
Angling Outfitters	Risk of income loss, potential loss of livelihood
Spring Creek Owners	Preservation of income, potential maintenance of livelihood
Ranchers and Agricultural Community	Preserves irrigation water and land
Realtors	Mixed effects on property values and quality of life
Businesses Not Directly Related to River	Only as it affects entire study area; healthy River means healthy economy; flood protection and quality of life important
Businesses Related to River	Fear of risking income loss
Environmental Advocates	Change to natural environment bad for economy
Riverbank Residents	Might be negative and positive

Source: BBC Research & Consulting, 2002.

Household, Business and Visitor Survey Methodology

	Households	Businesses	Visitors
Sample Size	364	176	288
Technique	Telephone	In-Person	In-Person
Time Period	June 2002 – September 2002	June 2002	June 2002 - August 2002
Confidence Level	95% ± 5%	Census-Based 90% ± 10%	90% ± 10%
Subject Matter	Social and Economic Values	Economic and Social Values	Perception of Visitor Experience

Observed Economic Value: Water levels are important when they are noticed, and droughts are viewed more negatively than flood flows.

- 42% of households and 47% of businesses believe drought has an effect on them
- 37% of residents and 34% of businesses believe flood flows have a negative effect on them
- Visitors positively viewed the water levels during summer 2002 and it was important to them

Observed Economic Value: Residents and businesses perceive the River to be vitally important to the economy, attracting and retaining residents and businesses and for its central role in visitor experience.

- 69% of households agree or strongly agree River is reason they came and stayed
- 55% of businesses agree or strongly agree River is important in attracting employees
- 62% of businesses believe quality of visitor experience in River is important to economic wellbeing
- Majority of businesses believe River is lifeblood of Park County
- Certain stakeholders believe River maintains high property values

Observed Economic Value: In pointing out important segments of the population and business community, households and businesses recognize tourism and ranching as vital business sectors.

	Percent Who Think Groups are Important or Very Important to the Economy	
	Households	Businesses
Tourists	84%	92%
Ranchers	90	89
Long-time Residents	88	87
New Permanent Residents	50	66
Seasonal Residents	35	62
Spring Creeks	35	37
Other River-Related Business	69	77
Other Tourist-Related Business	77	84

Observed Economic Value: Residents and businesses are anxious about overuse and degradation of the Yellowstone River, but visitors do not agree

- Almost all of the stakeholder interviews pointed to overuse of the Yellowstone as a threat
- 64% of residents and 43% of businesses believe that overuse of the River threatens the economic wellbeing of Park County
- Most visitors believed that:
  - Fishing was more positive than negative
  - Whitewater was more positive than negative
  - Scenery was positive or very positive (91%)
  - Wild nature of River was positive or very positive (74%)
  - Noise level, access, ranching along River all more positive than negative effect on experience

Observed Economic Value: Property rights issues cut different ways for different groups

- Almost all stakeholder groups indicated that property rights were a priority
- Households and businesses disagreed or strongly disagreed (59% and 66%, respectively) that property owners should have the right to build in the floodplains
- More households and businesses agree than disagree that a property owner should be able to protect his property with manmade structures
- Visitors take a contrary view:
  - Residential development along the riverbank is mostly neutral
  - More disagree than agree with a property owner's right to erect structures to protect property

Observed Economic Value: Management of the Upper Yellowstone River for flooding and erosion is the best thing for the overall economic and social wellbeing of Park County

- 55% of households agree or strongly agree
- 57% of businesses agree or strongly agree
- But only 11 percent of visitors agree it is in their interest!
- More households and businesses believe that prior River management has been ineffective and inconsistent than effective and consistent

Social/Cultural Value Observation: Ranchers and long-time residents are the most important groups comprising the social and cultural fabric of Park County, but even here, tourists are recognized

	Percent Believing Important or Very Important to Social Environment	
	Households	Businesses
Ranchers	78%	72%
Long-time Residents	87	87
New Permanent Residents	45	53
Seasonal Residents	21	33
Tourists	34	50
Spring Creek Activities	18	24
River-Related Businesses	47	56
Other Tourist-Related Businesses	44	49

Social/Cultural Value Observation: Park County quality of life stems from the beauty of the Yellowstone River above all, and secondarily, the recreational activities it offers

- About 9 out of 10 households and businesses agree or strongly agree that the beauty of the Yellowstone River is important to the residents' quality of life
- About 62% of households and 57 percent of businesses believe fishing contributes to the residents' quality of life
- Similar household and business survey results for the contribution of other recreational activities to locals' quality of life
- About 63 percent of households believe quality of visitor experience contributes to the local quality of life
- Although 53 percent of households agreed that the Yellowstone River was the lifeblood of the County, many were neutral or did not agree on that point

And the Best News Is …

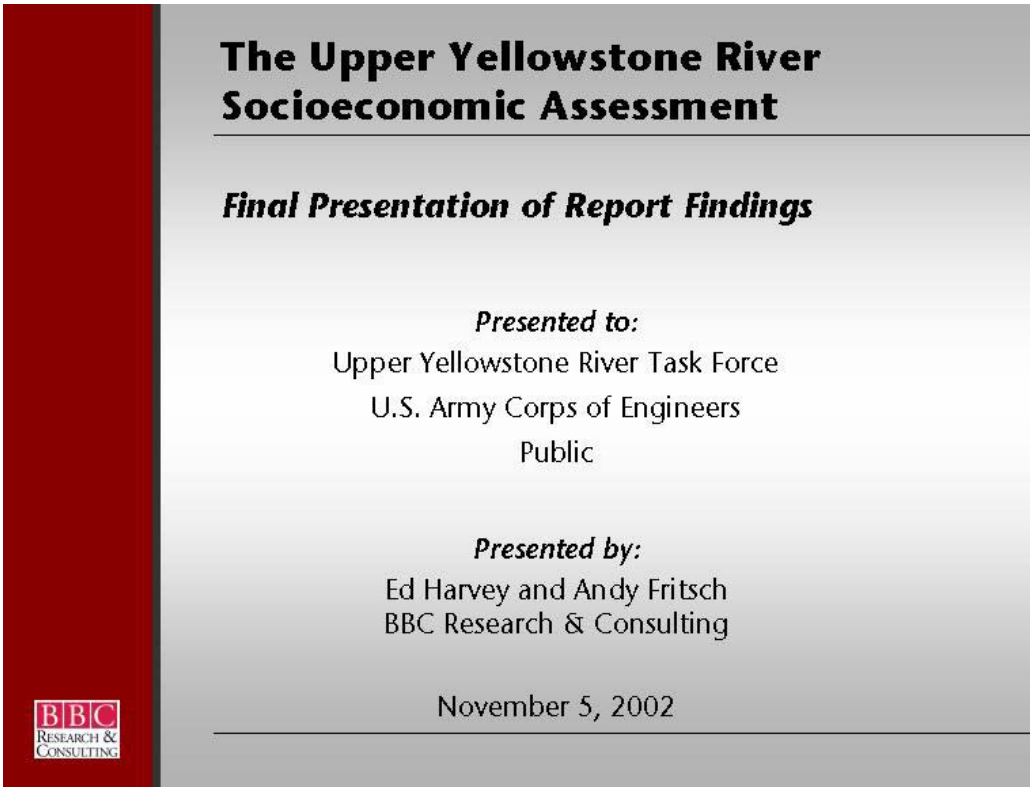
2/3 of visitors would stay longer in Park County if they could plan their trip over again.

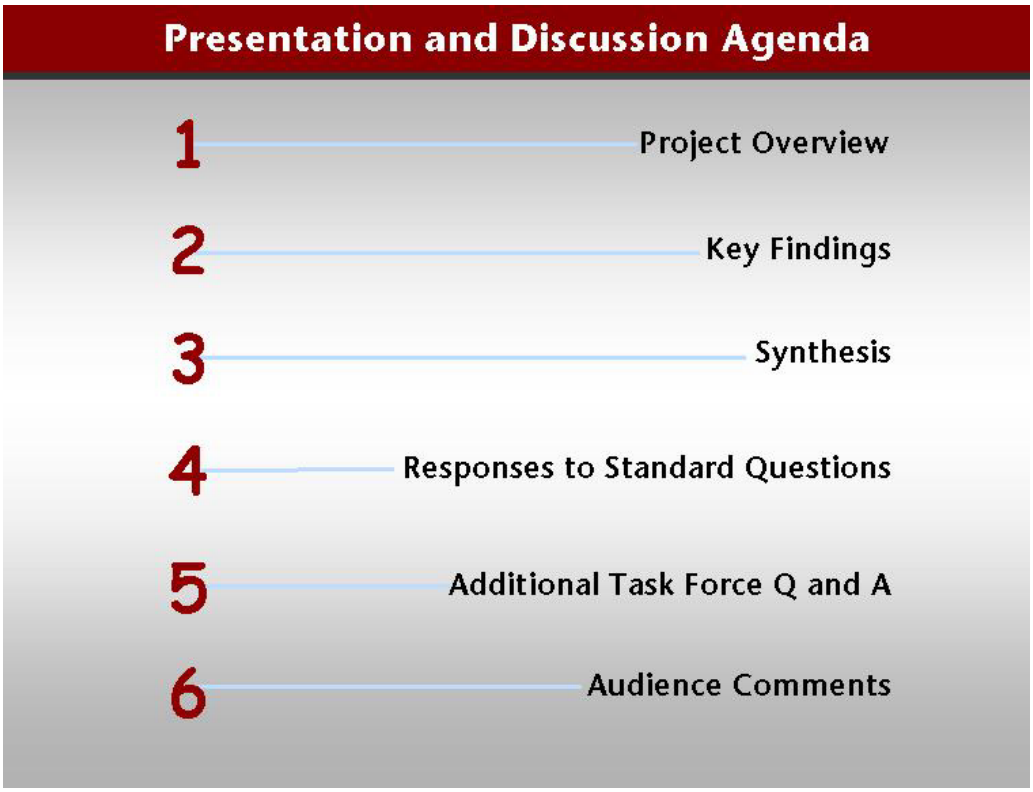
Attachment C. List of Attendees

Exhibit C-1.
List of Attendees

Attendee's Name	Attendee's Affiliations
Tom Arrandale	None
Roy Aserlind	Landowner
Jim Barrett	Environmentalist
Karl Biastoch	Citizen
Jeff Blend	Government official
Jerry Bonnell	None
Sheila Bonnell	None
Tim Bryggman	Government official
Steve Caldwell	Resident, Businessowner
Paula Clawson	None
Andy Dana	Task Force member
Dawn Drotos	Environmentalist
Mandy Drysdale	None
Doug Ensign	Landowner
Mike Gilbert	Government official
Hannah Gosnell Schneider	Academic researcher
Thomas J Hallin	Landowner
Dave Haug	Landowner
Ann Howe	Government official

Attachment D. The Upper Yellowstone River Socioeconomic Assessment





Overall Purpose of Socioeconomic Assessment

A social and economic portrait of the Upper Yellowstone River Basin, focusing on past trends and current circumstances

Specific topics selected by Corps and Task Force through the Socioeconomic Committee

Identification of critical socioeconomic issues

Began in early 2002, finished in October 2002

Project Overview

Work Plan Tasks

1. Identify Historical Social Values, Cultural Heritage and Resources
2. Identify Key Stakeholder Groups and Their Respective Interests
3. Identify Economic Values
4. Identify Social and Cultural Values

5a. Describe Local Economic Trends

5b. Describe Land Use Trends

6. Describe Historic and Current Management Actions, Including Bank Stabilization Projects, Water Rights and Irrigation Uses

7a. Provide a Social Assessment: Population-Displacement of People

7b. Provide a Social Assessment: Future No-Action Conditions

8. Identify Preliminary Study Issues, Synthesis of Findings

Project Overview

Socioeconomic Assessment Methodology

Primary Data	In-depth interviews with historians, stakeholders, local experts in planning, agriculture, economics and real estate at local, state, Federal levels
Primary Data	Surveys of residents (364 - 95% confidence level), businesses (176 - 90% confidence level), visitors (288 - 90% confidence level)
Secondary Data	Histories, government data on history, economics, demography, land use, river management
Analytical Techniques	Limited to descriptive tools, i.e., comparisons, percentages
Synthesis	Meaning from full complement of study data, past experience

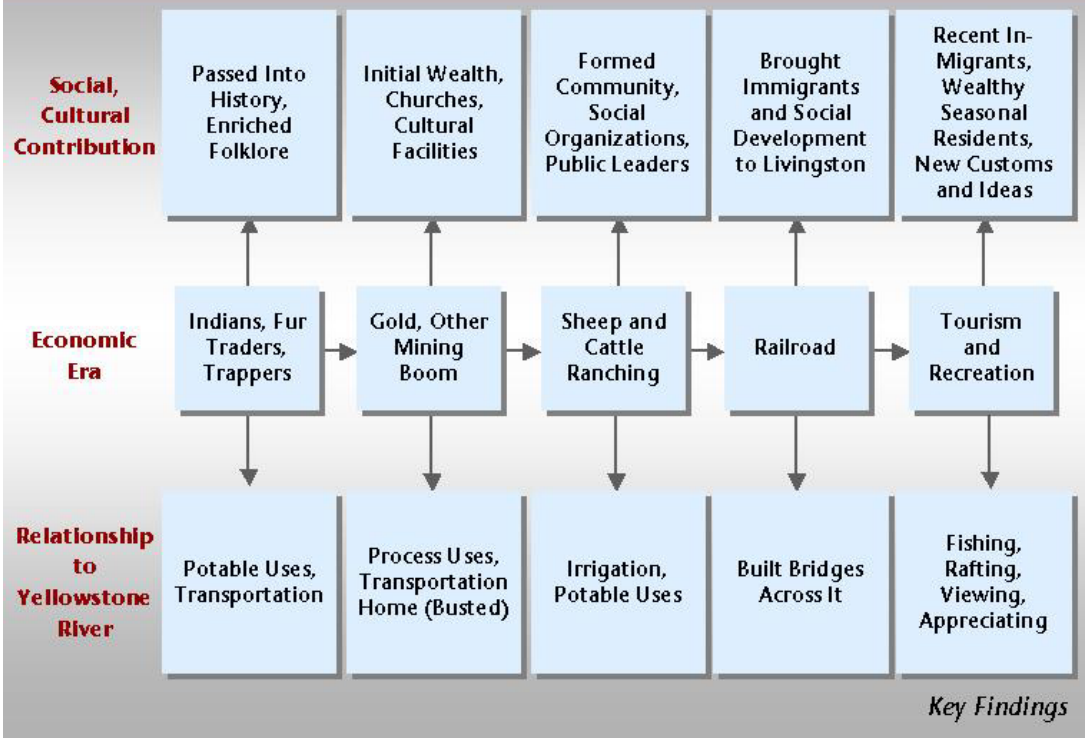
Project Overvie

Key Findings of Socioeconomic Assessment

- Format for key findings:
  - Historical overview, then
  - Issue by issue, with:
    - Stakeholder input
    - Survey results from residents, businesses, visitors
    - Economic/demographic data
    - Land use data
    - River management data
    - Socioeconomic projections to 2025

Key Findings

Simplified Historical Evolution of Park County



Key Findings

Observed Value: Lower or Higher Than Normal Water Levels Affect Businesses and Community

- 42% of households and 47% of businesses believe drought has a negative effect on them
- 37% of residents and 34% of businesses believe flood flows have a negative effect on them
- 44% of visitors positively viewed the water levels during summer 2002, and this was important to them
- 2002 was relatively "normal" year following 4 years of drought and 2 years of flooding

Key Findings

Observed Value: Households and Businesses Perceive Tourism and Ranching as Vital Business Sectors

	Percent Who Think Groups are Important or Very Important to the Economy	
	Households	Businesses
Tourists	84%	92%
Ranchers	90	89
Longtime Residents	88	87
New Permanent Residents	50	66
Seasonal Residents	35	62
River-Related Businesses	69	77
Other Tourist-Related Businesses	77	84
Spring Creeks	35	37

Key Findings

Observed Value: Ranchers and Long-Time Residents are Important Groups Comprising the Social and Cultural Fabric of Park County

	Percent Believing Important or Very Important to Social Environment	
	Households	Businesses
Ranchers	78%	72%
Long-time Residents	87	87
New Permanent Residents	45	53
Seasonal Residents	21	33
Tourists	34	50
Spring Creek Activities	18	24
River-Related Businesses	47	56
Other Tourist-Related Businesses	44	49

Key Findings

Observed Value: Ranching stable to declining economic influence, but what happens to community?

- 2 stakeholders claimed irrigation water vital to area survival
- 90% households, 89% businesses believed ranchers important or very important to economy
- 78% households, 72% businesses thought ranchers important or very important to community
- More than 35% visitors thought ranching activities along river positive for experience
- Ranching stable but small part of economy — 3% income/ earnings, 9% employment
- $20 million in total sales, $30 million in expenses, compared with $150 million sales in services sector, $100 million retail trade
- Ranching expected to continue slow decline

Key Findings

Observed Value: Tourism and Visitor Experience Vital to Area

- 63% residents, 62% businesses agreed visitor experience on river very important to economy and community
- 2/3 visitors would stay here longer next time if they could
- Statistically, tourism now most important economic sector
- Retail trade, accommodation/foodservices largest sectors, more than 30% total county sales; total services close to 40% total sales
- Average 550,000 visitors through gates to YNP in Gardiner each year, spending money, paying lodging taxes
- Tourism anticipated to increase in importance to more than half of total employment by 2025

Key Findings

Observed Value: River Important to Attracting and Keeping New People

- 3 stakeholders indicated new residents appreciate river and related quality of life; 2 said river vital to attract new people
- 69% households, 54% businesses agree river important in attracting new residents and employees
- 50% households, 66% businesses perceive new permanent residents as important or very important to economy
- 45% households, 55% businesses perceive new permanent residents as important or very important to community
- In-migration large part of population growth, seasonal residents about 8% of population
- More new permanent and seasonal residents expected

Key Findings

Observed Value: Park County Quality of Life Stems from the Beauty of the Yellowstone River and the Recreational Activities it Offers

- About 9 out of 10 households and businesses agree or strongly agree that the beauty of the Yellowstone River is important to the residents' quality of life
- About 62% of households and 57% of businesses believe fishing contributes to the residents' quality of life
- Similar household and business survey results for the contribution of other recreational activities to locals' quality of life
- Although 53 percent of households agreed that the Yellowstone River was the lifeblood of the County, many were neutral or did not agree on that point

Key Findings

Observed Value: River Losing "Wild Feel"

- 3 stakeholders indicate wildness of river important part of experience
- Another said floods are good for the river
- 74% visitors thought current wild and undeveloped nature of river positive for experience
- 16% of riverbank riprapped from Pine Creek to Carter's Bridge; from Carter's Bridge through Park Clinic Access, 26% riprapped; other stretches less
- Notable residential development in river corridor, rural areas
- Over 2,200 new septic tank systems in study area from 1967 to 2001, not all in river corridor
- Most growth in Paradise Valley (more than 50%)

Key Findings

Observed Value: Residents and businesses are anxious about overuse and degradation of the Yellowstone River, but visitors do not agree

- Almost all of the stakeholder interviews pointed to overuse of the Yellowstone as a threat
- 64% of residents and 43% of businesses believe that overuse of the River threatens the economic wellbeing of Park County
- Most visitors believed that:
  - Fishing was more positive than negative
  - Whitewater was more positive than negative
  - Scenery was positive or very positive (91%)
  - Wild nature of River was positive or very positive (74%)
  - Noise level, access, ranching along River all more positive than negative effect on experience

Key Findings

Observed Value: Subdivision and Building in Floodplain a Concern

- 3 stakeholders indicated overdevelopment threatens river experience
- 4 stakeholders said river itself or building near river keep property values high
- 59% households, 56% businesses disagreed with right to subdivide and build in floodplain
- 24% visitors positively affected by residential development along river; 52% neutral or don't know
- About 90% of growth/development occurring outside Livingston and in river corridor
- Most growth potential is in river corridor within existing subdivisions
- Market demand for second homes and rural lifestyles will drive further development

Key Findings

Observed Value: Property Rights Issues Cut Different Ways for Different Groups

- Almost all stakeholder groups indicated property rights a priority
- But households (59%) and businesses (56%) disagreed or strongly disagreed that property owners should have right to build in floodplains
- More households and businesses agree than disagree that a property owner should be able to protect his property with manmade structures
- 29% households, 30% businesses disagree with protection rights
- Visitors take a contrary view
  - Residential development along the riverbank is mostly neutral
  - More disagree than agree with a property owner's right to erect structures to protect property

Key Findings

Observed Value: Management of the Upper Yellowstone River for Flooding and Erosion is the Best Thing for the Overall Economic and Social Wellbeing of Park County

- 55% of households agree or strongly agree
- 57% of businesses agree or strongly agree
- But only 11 percent of visitors agree it is in their interest!

Key Findings

Observed Value: Flood/Erosion Management Structures a Concern

- Many stakeholders both for and against flood/erosion management structures
- Only 20% visitors negatively affected by manmade structures along river, such as riprap, levees, dikes, bridges; 25% thought them positive for their experience
- 9% of riverbank from Gardiner to Springdale riprapped, plus 100 barbs and 100 rock jetties
- 12% of riverbanks eroding
- Largest concentration of bank stabilization, and largest change in 1990s, on stretch from Pine Creek to Carter's Bridge

Key Findings

Observed Value: Prior Management Not Consistent or Effective

- 4 stakeholders see too many regulators, inconsistent or over-regulated
- 2 stakeholders say let nature manage river
- 32% households, 35% businesses thought prior management inconsistent and ineffective; 20% households, 16% businesses thought consistent and effective
- BBC identified 7 federal, state, local agencies that play major roles in managing Upper Yellowstone River
- There is currently no overall strategy for management

Key Findings

So, What are Park County Residents and Businesses Worried About?

Economic Change	Ranching threatened, tourism precarious, property values rising, dependent or transient residents
Social Change	Old time residents leaving, migrants don't have same stake, institutions could be less relevant to transient residents
Environmental Change	Land use is changing, degradation inevitable with more people, beauty of the area threatened
Change in the River	Flood control structure, overuse of river, floodplain development

Synthesis

What can we learn from the socioeconomic assessment about these change issues?

Apprehensions	Study Observations
Ranching Threatened	Economics Favor Ranching Elsewhere
Tourism Precarious	Long Established Destination; National Influences Temporary
Property Values Rising	Influx of Wealth Drives This; Will Continue
Dependent on Transients	No Reversal Envisioned
Old Time Residents Leaving	Slowly; and Many Kids Return
In-Migrants Have Little Stake	Many Recognize the Benefit of New Ideas, Customs
Institutions Less Relevant	Many Have Long Endured

Synthesis

What can we learn from the socioeconomic assessment about these change issues?

Apprehensions	Study Observations
Land Use Changing	Subdivision Already Happened, Future is a Choice
Environmental Degradation Inevitable	Perspectives vary by stakeholder group
Beauty of Area Threatened	Legitimate Worry; Don't Know When or How
Flood Control Structures	Mostly Increased; Need to Establish Socioeconomic Connection
Overuse of River	Relative Threshold; Not Well Understood
Floodplain Development	Undesirable to Residents and Businesses

Synthesis

What Socioeconomic Issues are Relevant to Task Force and Corps Decision-Making Regarding Flood Management on the Upper Yellowstone?

- Preservation of income sources from River or tributaries
  - Irrigation
  - Public access
  - Threat to fishing; whitewater experience
  - Gravel bank erosion
  - Beauty of river valley
  - Wild feel of river
- Property effects along river banks
  - Erosion prevention
  - Cattle grazing
  - Subdivision and development along banks, floodplain
  - Property values along banks, floodplain
  - Vegetation along banks
  - Weeds spread by floods

Synthesis

Recognizing your study's budget and time constraints, how comprehensive are your data relative to the Task Force study area of the Yellowstone River?

1. Certain historical data elements excluded
2. Stakeholder interviews and resident, business, visitor surveys quite comprehensive for study area
3. Most economic data for Park County, including Shields Valley
4. Current land use data for study area comprehensive, trends generalized
5. Bank stabilization and water rights data for study area comprehensive

Standardized Questions

Have you found significant differences in your results relative to different geomorphic sub-reaches of the Task Force study area of the Yellowstone River? Why? Why not?

1. Socioeconomic assessment focused on full study area, not sub-reaches
2. Bank stabilization most prevalent in reach from Emigrant downstream to Livingston
3. Most growth and subdivision activity took place outside Livingston in rural parts of study area

Standardized Questions

How important is the connectivity between the floodplain and river in the interpretation of your data?

- Socioeconomically, the right to protect private property and the land uses which occur in that floodplain are connected to the river (see Synthesis)

Standardized Questions

How have the resources you studied in the Upper Yellowstone River changed over the last 50-300 years?

1. Role of river has been consistently important
2. Nature of use has changed — drinking water, transportation, food, then recreation, scenery, irrigation
3. Economy evolved from hunting, trapping to mining, railroad, ranching, and tourism
4. Land use continually changes with development and economy. Seasonal residents now own some local ranches
5. Community constantly changes with newcomers, ranchers and oldtimers still very important

Standardized Questions

Are there any particular river conditions — natural or anthropogenic — that your results indicate are important stressors on the river processes that you studied?

1. Flood and drought both appear to negatively affect the economy and community
2. River conditions that affect aesthetics, white water, and fishing resources are important

Standardized Questions

Recognizing the short-term nature of your study, do you think that the condition of Upper Yellowstone River Watershed — for example, its vegetation cover, recent drought, altering events such as fires, timber cutting, grazing and residential development — have influenced your research results, relative to the river processes you studied?

1. Recollection of fires, drought and flooding likely affected household, business survey results; visitors unclear

Standardized Questions

What portion of your results do you see integrating with results of other Task Force studies?

1. Tangible, quantitative connection established between different river management activities and:
   - Aesthetics
   - Whitewater experience
   - Fishing experience
2. Vegetation studies

Standardized Questions

What other questions and conclusions were raised by your research?

1. Is coalbed methane development a concern for the Upper Yellowstone River?
2. Focus groups would help get more detailed information from stakeholders
3. How much visitation and river use must there be to significantly diminish the visitor experience?
4. What are the thresholds of aesthetic impact, overuse, flood management, riverbank land uses for the visitor?
5. What are the impacts on tourism if ranching eventually fades away?

Standardized Questions

Appendix A.
The Business Survey

An important component of the social and economic portrait of Park County is the perceptions and opinions of businessowners on how and why the Upper Yellowstone River is vital to the functioning of the economy and community. BBC performed a survey of businessowners and managers in June 2002, collecting input from over 175 businesses.

Methodology

BBC implemented a straightforward methodology in the business survey. Surveyors walked from door to door from business to business and approached businessowners and managers directly to solicit their input on the importance of the Upper Yellowstone River. BBC focused on all businesses in Livingston, Emigrant, Pray, Gardiner, and Paradise Valley. The only areas in the Task Force study area omitted from the survey for lack of business concentration and practical ability to survey were Springdale and the Tom Miner Basin. The Shields Valley communities, including Clyde Park and Wilsall, were also omitted, as they are not included in the Task Force's study area.

In order to assess whether BBC's survey was a representative sample of businesses in Park County, BBC collected data from the US Census Bureau's County Business Patterns (2000) and Nonemployer Statistics (1999) to understand how businesses are distributed throughout economic sectors. The numbers of businesses in the county by sector are presented in Exhibit A-1, followed by the number of businesses in the survey by sector.

Exhibit A-1.
Businesses by Sector in Park County

NAICS Code	Industry	Employer and Nonemployer Establishments 2000	Percentage of Total	Establishments in Survey	Percentage of Total
11----	Forestry, fishing, hunting, and agriculture support	90	4%	**0**	0%
21----	Mining	16	1%	**0**	0%
22----	Utilities	4	0%	**1**	1%
23----	Construction	424	18%	**7**	4%
31----	Manufacturing	85	4%	**7**	4%
42----	Wholesale trade	55	2%	**1**	1%
44----	Retail trade	286	12%	**65**	37%
48----	Transportation and warehousing	54	2%	**2**	1%
51----	Information	45	2%	**2**	1%
52----	Finance and insurance	53	2%	**6**	3%
53----	Real estate and rental and leasing	170	7%	**6**	3%
54----	Professional, scientific, and technical services	233	10%	**10**	6%
55----	Management of companies and enterprises	4	0%	**0**	0%
56----	Administration, support, waste management, remediation services	67	3%	**0**	0%
61----	Educational services	9	0%	**1**	1%
62----	Healthcare and social assistance	164	7%	**5**	3%
71----	Arts, entertainment, and recreation	152	6%	**16**	9%
72----	Accomodation and food services	140	6%	**32**	18%
81----	Other services (except public administration)	284	12%	**13**	7%
95----	Auxiliaries (except corporate, subsidiary, and regional management)	1	0%	**0**	0%
99----	Unclassified establishments	13	1%	**0**	0%
Total		**2,349**		**174**	

Note: Nonemployer establishments are those businesses that employ only the owners and the owners' family members.
BBC surveyed 176 businesses. The total here, 174, reflects that two businesses were unclassifiable with regard to their economic sector.

Source: US Census Bureau and BBC Research and Consulting.

Mild *under*-representations in the survey sample (percentages of total differ by less than 5 percent) include the forestry/fishing, mining, wholesale trade, information, real estate and rental and leasing, professional, scientific, and technical services, administration, support, waste management, and remediation services, healthcare and social assistance, other services, and unclassified establishments sectors. Major under-representations in the survey sample occurred in the construction sector. Mild *over*-representations in the survey sample include the utilities, finance and insurance, educational services, and arts, entertainment, and recreation sectors. Major over-representations occurred in the retail trade and the accommodation and food services sectors. The under- and over-representations were all explainable given the survey methodology.

The mild under- and over-representations were not of great concern; however, BBC looked at why the construction sector was so significantly under-represented in the survey while the retail trade and accommodation and food services sectors were considerably over-represented. The answer was simple: the survey was door-to-door. A door-to-door survey depends on a business to have a storefront or office operation. Many construction contractors and companies run their businesses out of homes or other unofficial locales, making them difficult to locate in a door-to-door survey effort. This fact is actually true for many of the sectors for which the survey had mild under-representations, too. Private parties often engage in professional, information, and personal services, as well as forestry and mining, without much public interaction. On the other hand, retail, accommodation, and food service businesses most commonly have storefront interfaces that would be easily captured by a door-to-door business survey. BBC went to further lengths to contact both the smallest (nonemployer) businesses, as well as those businesses not found readily in a door-to-door survey, but success was limited.

Though the business survey may not be quite representative in terms of distribution among economic sectors, it is a statistically significant survey. BBC completed 176 surveys within a population of 739 employer businesses and 1,610 nonemployer businesses, totaling 2,349 businesses.[1] This count of businesses is countywide, however, and includes the geographic areas that were not covered in this business survey. To approximate the number of businesses that would actually have been covered in the area in which BBC surveyed, BBC extracted from the 1999 County Business Patterns that 92 percent of businesses were found in the four zipcodes that constituted the area BBC surveyed, including: 59047 – Livingston, 59030 – Gardiner, 59027 – Emigrant, and 59065 – Pray. That means that there were roughly 2,161 businesses in the survey area, for which 176 completed surveys constitutes a statistically significant sample at 90 percent confidence and 6 percent precision. BBC's business survey was thus sufficient to be statistically significant.

Overview

BBC completed 176 surveys of businesses throughout the Task Force study area in June 2002. One BBC research associate, with the assistance of two paid interns from Carleton College, completed the business survey over six business days. The survey sample comprised many longer-lived companies that have been in Park County for more than 10 years (48 percent). To characterize the companies' types of sales, BBC asked interviewees about how much of their sales occur in the summer months, to Park County residents, and to sales dependent on the use of the Upper Yellowstone River. An average of 57 percent of sales came in the summer months, 49 percent of sales came from Park County

[1] Estimated from the 2000 County Business Patterns and 1999 Nonemployer Statistics.

residents, and 22 percent of sales were dependent on the use of the Upper Yellowstone River. These findings reveal that businesses are fairly seasonal and dependent upon tourists for their survival in Park County, but they are not as directly dependent on use of the river.

Surveyed businesses year-round employed on average nine people including owners and managers. Almost 40 percent of businesses employed two or fewer individuals, while only 10 percent of businesses employed 20 or more people. On average, businesses retained four summer employees, though almost 50 percent of businesses did not have any summer employees. Only 15 percent of businesses surveyed had actual facilities located on the banks of the Upper Yellowstone River.

Exactly 50 percent of respondents representing each business were women, and 50 percent were men. Roughly, 73 percent of businesses were located in Livingston, while 22 percent were in Gardiner, 2 percent were in Emigrant, and 4 percent were in the Paradise Valley. The businesses were spread through economic sectors in the following manner:

- 1 in utilities;
- 7 in construction;
- 7 in manufacturing;
- 1 in wholesale trade;
- 65 in retail trade;
- 2 in transportation and warehousing;
- 2 in information;
- 6 in finance and insurance;
- 6 in real estate and rental and leasing;
- 10 in professional, scientific, and technical services;
- 1 in education services;
- 5 in healthcare and social assistance;
- 16 in arts, entertainment, and recreation;
- 32 in accommodation and food services;
- And 13 in other services.

Results[2]

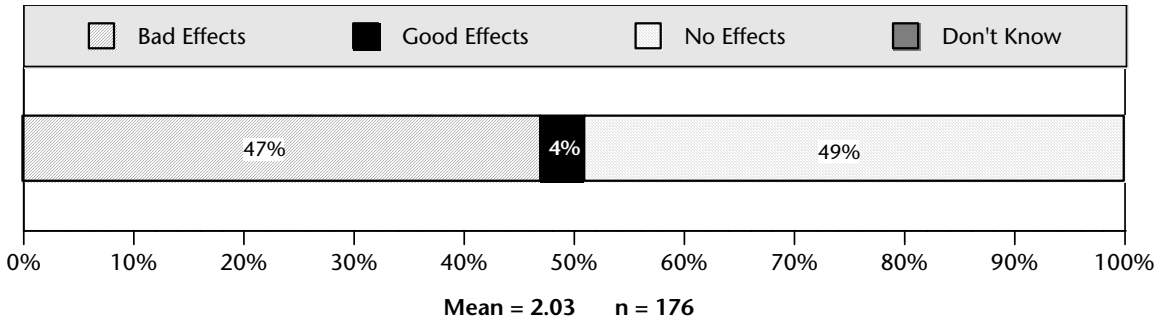
Following are the results of the business survey's substantive questions, with some cross tabulations examined to see if different segments of the surveyed population answered in different ways to the same questions.

[2] Please note that mean responses presented in the following tables were calculated with "don't know" and "no opinion" answers excluded. The "n," or number of responses, reported on those same tables does not reflect the removal of these "don't know" and "no opinion" responses because they were valid responses. Those responses simply could not be included to calculate an average knowledgeable/opinionated response.

Opinions about the effects of river flows. BBC inquired with businesses regarding three aspects of river flows: drought, normal flows, and floods. Respondents could answer that the flows had "good effects," "bad effects," or "no effects" on their businesses.

Droughts. When asked about the effects drought or low flows may have on their businesses, more businessowners answered that drought flows have no effect on their business than any other response; see the distribution of responses in Exhibit A-2 below. Of the businesses that felt impacts from drought flows, most of them experienced negative effects.

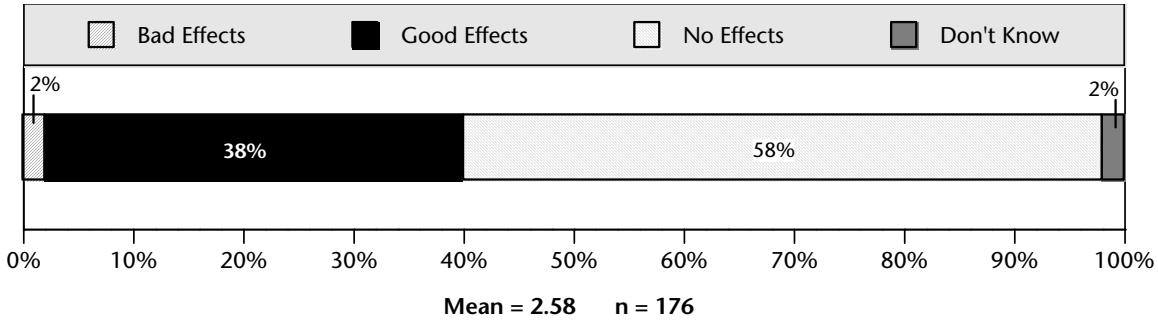
Exhibit A-2.
Do drought or low flows have good, bad, or no effects on your business?



Source: BBC Research and Consulting.

Normal flows. When asked about the effects normal flows by season may have on their businesses, more survey respondents answered that normal river flows by season have no effect on their business than any other response; see the distribution of responses in Exhibit A-3 below. Of the businesses that felt impacts from normal river flows, most experienced positive effects.

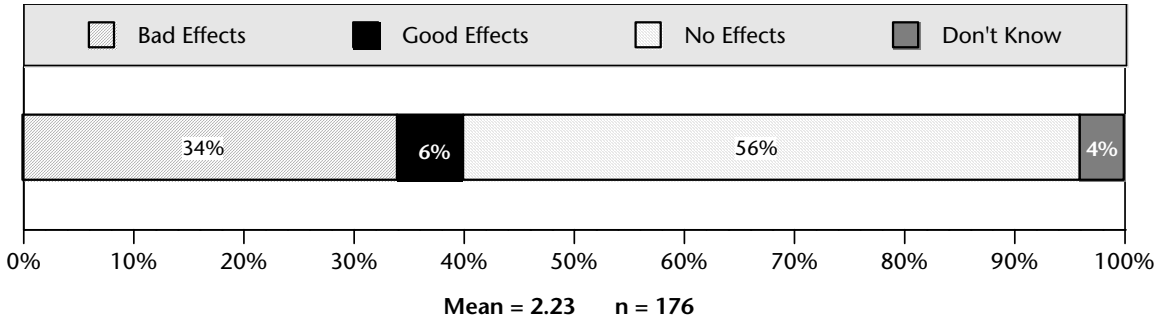
Exhibit A-3.
Do normal river flows by season (i.e., higher in the spring, lower in summer and autumn) have good, bad, or no effects on your business?



Source: BBC Research and Consulting.

Floods. When asked about the effects flood flows may have on their businesses, more survey respondents answered that flood flows have no effect on their business than any other response; see the distribution of responses in Exhibit A-4 below. Of the businesses that felt impacts from flood flows, most experienced negative effects.

Exhibit A-4.
Do flood flows have good, bad, or no effects on your business?

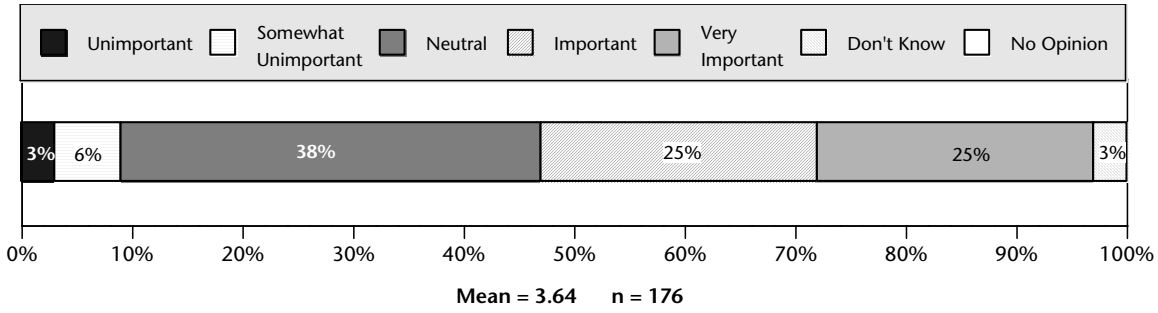


Source: BBC Research and Consulting.

Importance of different populations in the county. BBC questioned businesses about eight different populations in Park County, asking them to rate those groups' economic and social/cultural importance. The survey used a scales of 1 to 5, where 1 was "unimportant," 2 was "somewhat unimportant," 3 was "neutral," 4 was "important," and 5 was "very important." Respondents also could say they did not know or had no opinion.

Tourists' social/cultural importance. When asked how important tourists are socially and culturally to the community in Park County, respondents on average said that they rate somewhere between "neutral" and "important," and more respondents gave "neutral" as a response than any other answer (see Exhibit A-5 below).

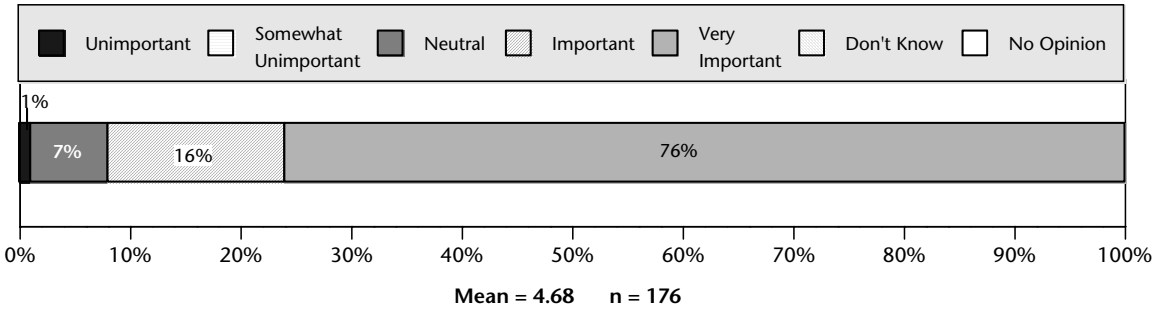
Exhibit A-5.
How important are tourists or other temporary visitors to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

Tourists' economic importance. When asked how important tourists are to the economy of Park County, respondents on average said that they rate near "very important," and more respondents gave "very important" as a response than any other answer (see Exhibit A-6 below).

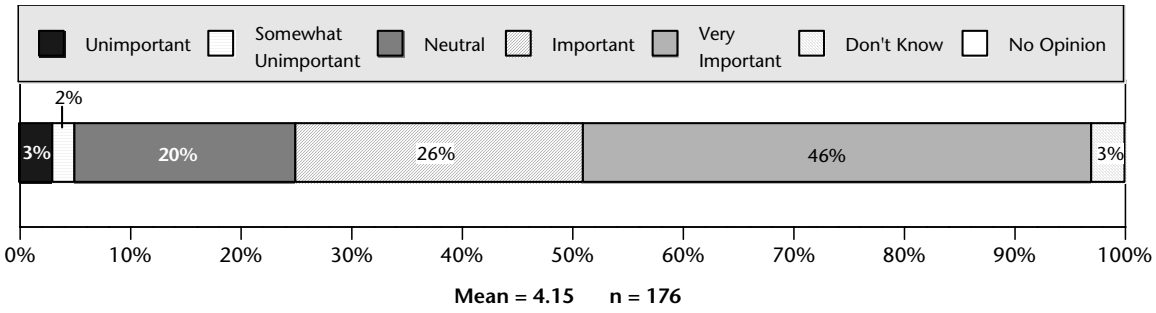
Exhibit A-6.
How important are tourists or other temporary visitors to the Park County economy?



Source: BBC Research and Consulting.

Ranchers' social/cultural importance. Survey respondents on average expressed that ranchers are somewhat more than "important" to the social and cultural environmental of Park County, while respondents most often answered that ranchers are "very important," as shown in Exhibit A-7 below.

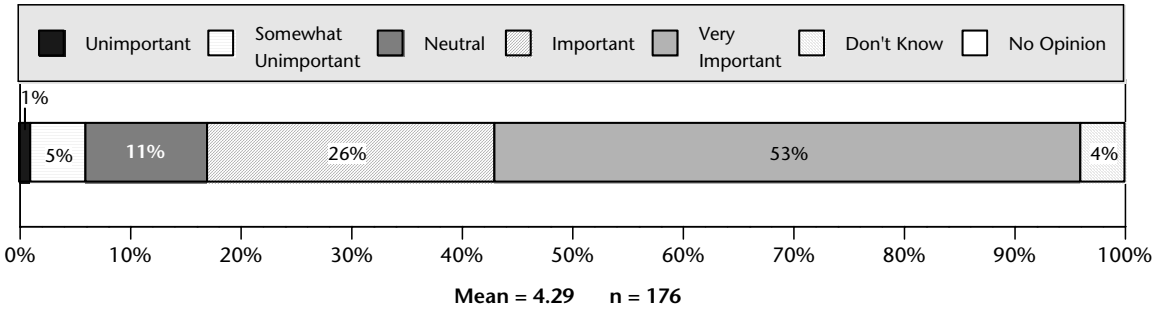
Exhibit A-7.
How important are ranchers to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

Ranchers' economic importance. When asked how important ranchers are to the Park County economy, respondents on average answered that they are somewhat more than "important," and they most often said that ranchers are "very important," as displayed in Exhibit A-8 below.

Exhibit A-8.
How important are ranchers to the Park County economy?

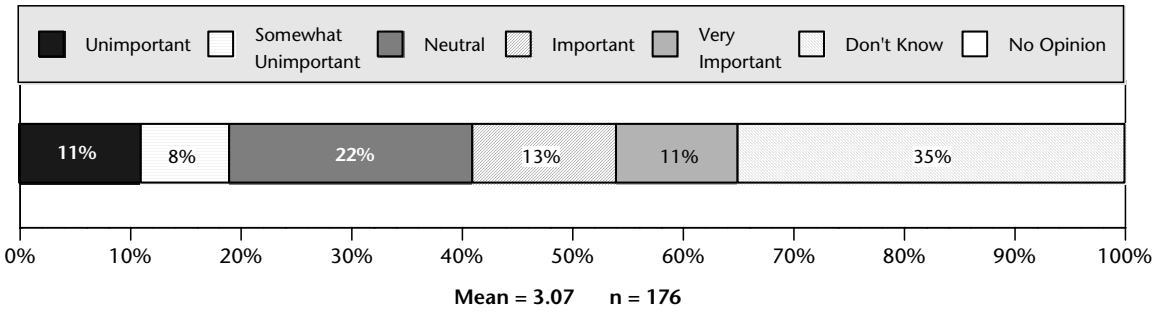


Mean = 4.29 n = 176

Source: BBC Research and Consulting.

Spring creeks' social/cultural importance. Survey respondents indicated that the spring creeks' importance to the social and cultural environment was just above "neutral," and "don't know" was the response most often recorded in the survey, as displayed in Exhibit A-9 below.

Exhibit A-9.
How important are spring creek-related activities to the social and cultural environment of Park County?

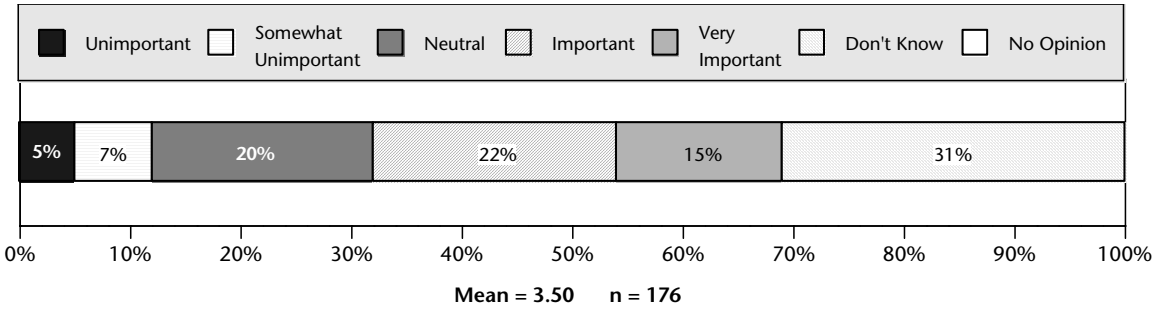


Mean = 3.07 n = 176

Source: BBC Research and Consulting.

Spring creeks' economic importance. Respondents expressed that they thought spring creeks more important to the economy than to the social and cultural environment of Park County, but on average, they expressed only marginally more importance as just over the "neutral" status. Respondents most often answered "don't know," however, as displayed in Exhibit A-10 below.

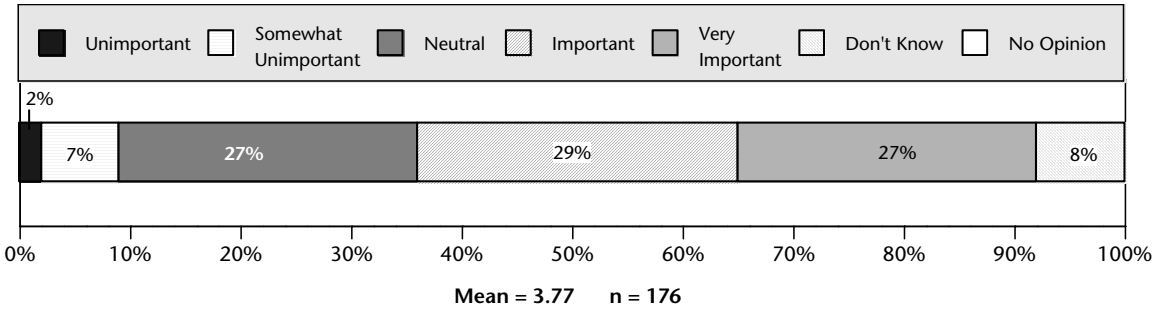
Exhibit A-10.
How important are spring creek-related activities to the Park County economy?



Source: BBC Research and Consulting.

River-related businesses' social/cultural importance. Survey respondents indicated that on average river-related businesses are nearing "important" to the social and cultural environment of Park County, and they most often tallied "important" as their response to that question, as displayed in Exhibit A-11 below.

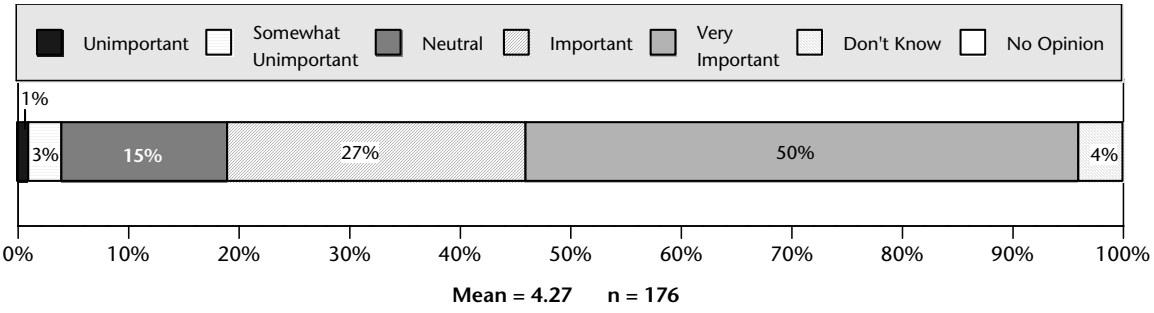
Exhibit A-11.
How important are river-related businesses to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

River-related businesses' economic importance. When asked how important river-related businesses are to the Park County economy, survey respondents answered on average that they are somewhat more than "important," though they most often responded with a "very important." See Exhibit A-12 below.

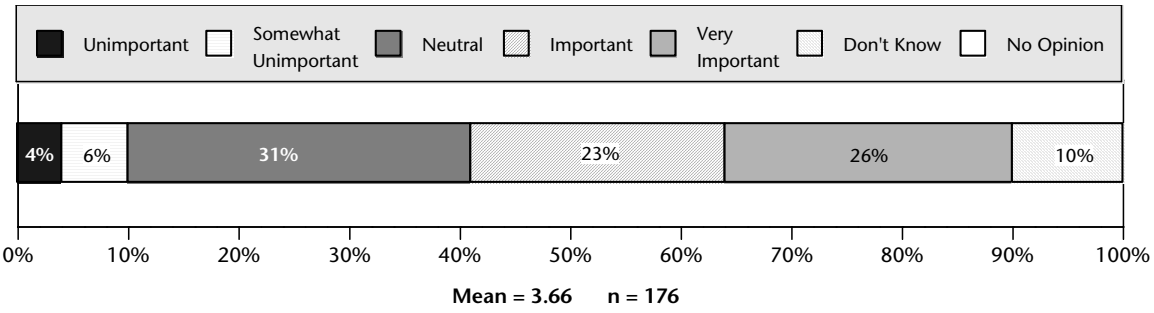
Exhibit A-12.
How important are river-related businesses to the Park County economy?



Source: BBC Research and Consulting.

Other tourist-related businesses' social/cultural importance. When asked how important other tourist-related businesses, such as hotels and souvenir shops, are to the social and cultural environment in Park County, respondents on average thought they were between "neutral" and "important," and they most often said "neutral," as displayed in Exhibit A-13 below.

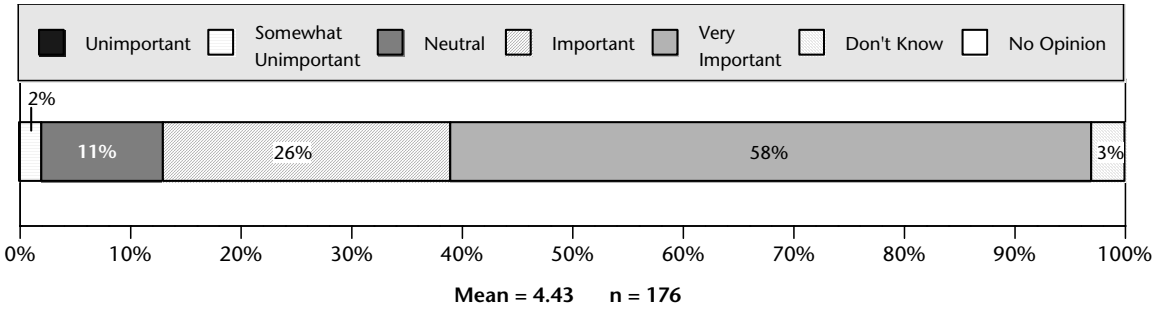
Exhibit A-13.
How important are other tourist-related businesses to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

Other tourist-related businesses' economic importance. Survey respondents indicated that on average they believe other tourist-related businesses are between "important" and "very important" to the economy of Park County, though they most often responded with "very important," as shown in Exhibit A-14 below.

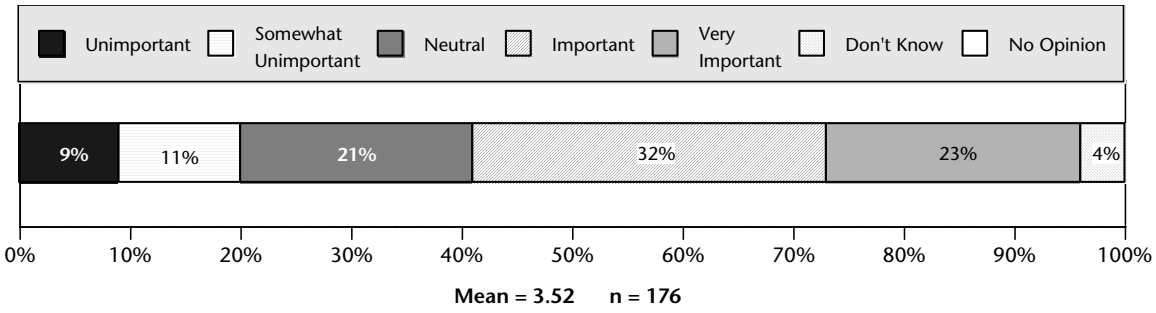
Exhibit A-14.
How important are other tourist-related businesses to the Park County economy?



Source: BBC Research and Consulting.

New permanent residents' social/cultural importance. When asked how important new permanent residents to Park County are to its social and cultural environment, on average respondents said they were between "neutral" and "important," though they most often responded with "important," as displayed in Exhibit A-15 below.

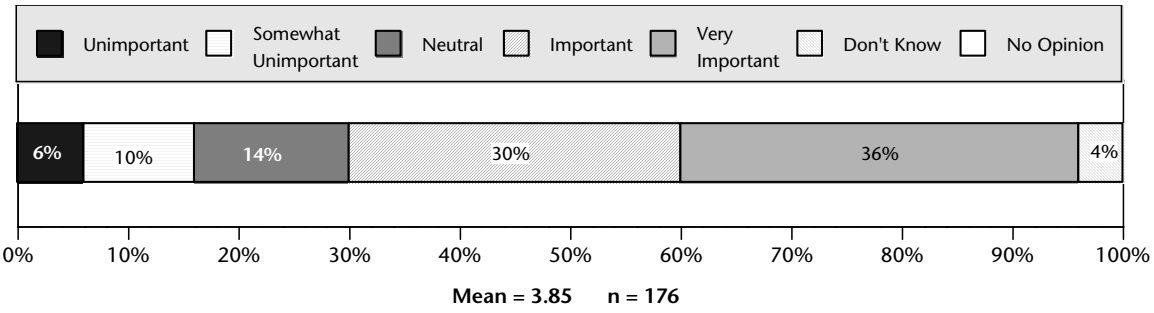
Exhibit A-15.
How important are new permanent residents who have moved here in the past five years to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

New permanent residents' economic importance. Businesses most mentioned new permanent residents as being "important" to the Park County economy, though they on average indicated that they are between "neutral" and "important." See Exhibit A-16 below.

Exhibit A-16.
How important are new permanent residents who have moved here in the past five years to the Park County economy?

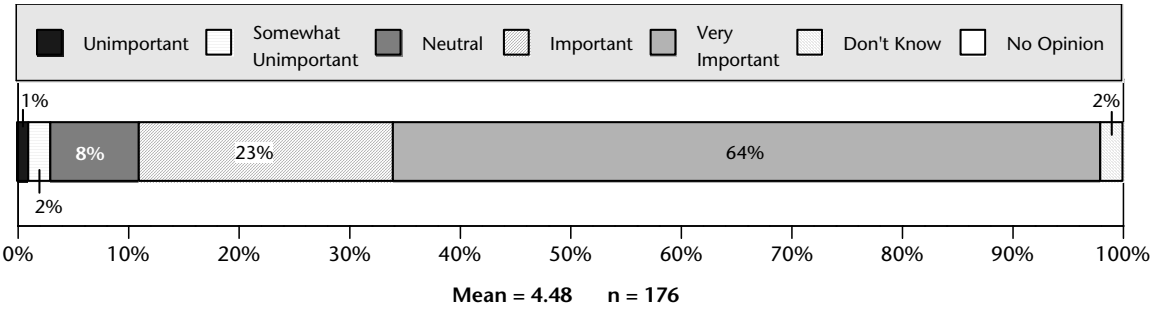


Mean = 3.85 n = 176

Source: BBC Research and Consulting.

Longtime residents' social/cultural importance. When asked about the importance of longtime residents to the social and cultural environment in Park County, respondents on average said they were between "important" and "very important." The most frequent response was "very important," as shown in Exhibit A-17 below.

Exhibit A-17.
How important are longtime residents to the social and cultural environment of Park County?

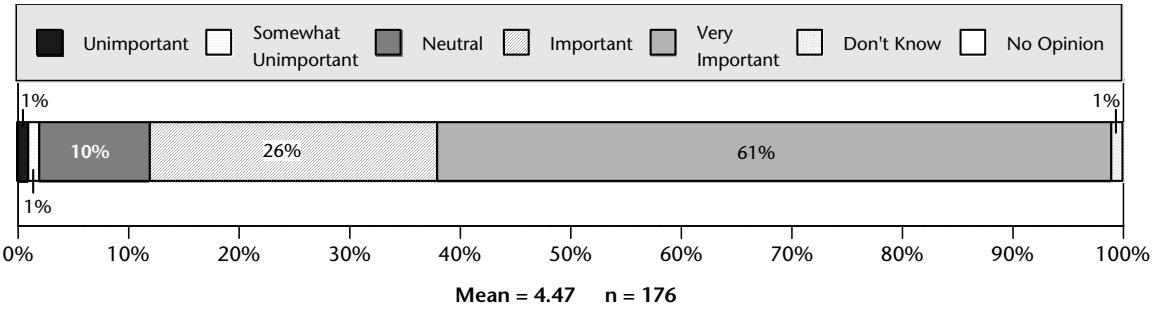


Mean = 4.48 n = 176

Source: BBC Research and Consulting.

Longtime residents' economic importance. When asked about the importance of longtime residents to the Park County economy, respondents on average answered almost exactly between "important" and "very important," though they responded most frequently with "very important," shown in Exhibit A-18 below.

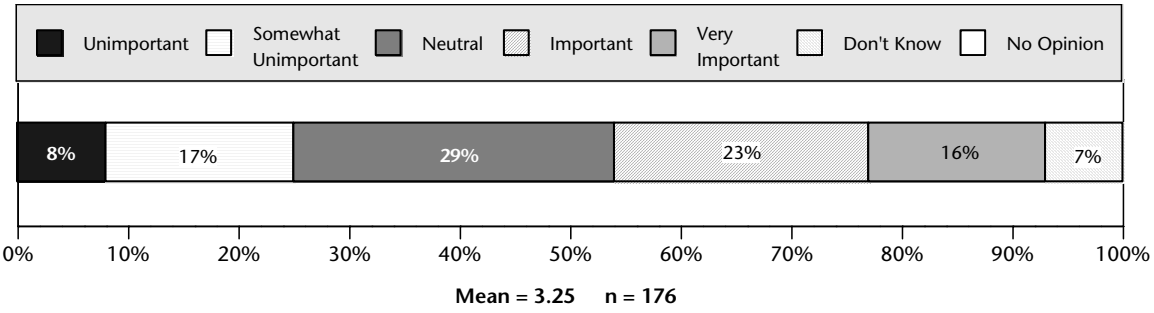
Exhibit A-18.
How important are longtime residents to the Park County economy?



Source: BBC Research and Consulting.

Seasonal residents' social/cultural importance. Survey respondents expressed on average that seasonal residents were just above "neutral" in importance to the social and cultural environment of Park County, and they also mentioned "neutral" in their answers most frequently, as displayed in Exhibit A-19 below.

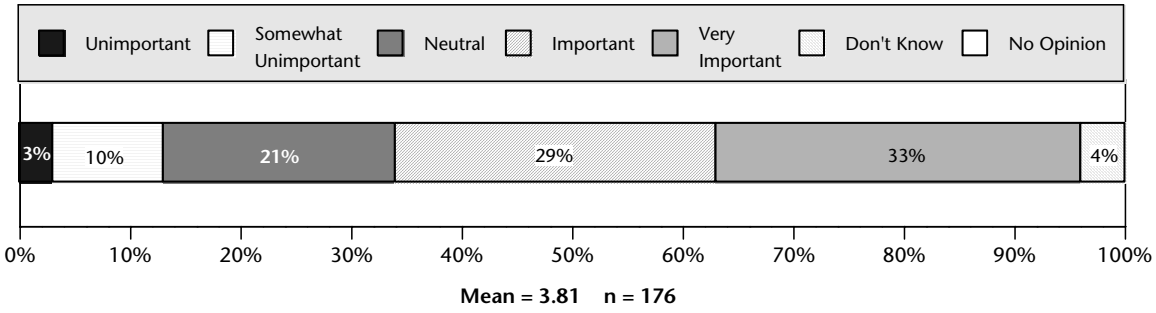
Exhibit A-19.
How important are seasonal residents to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

Seasonal residents economic. When asked about the importance of seasonal residents in the economy of Park County, the average answer was between "neutral" and "important," though respondents mentioned "very important" most frequently. See Exhibit A-20 below.

Exhibit A-20.
How important are seasonal residents to the Park County economy?



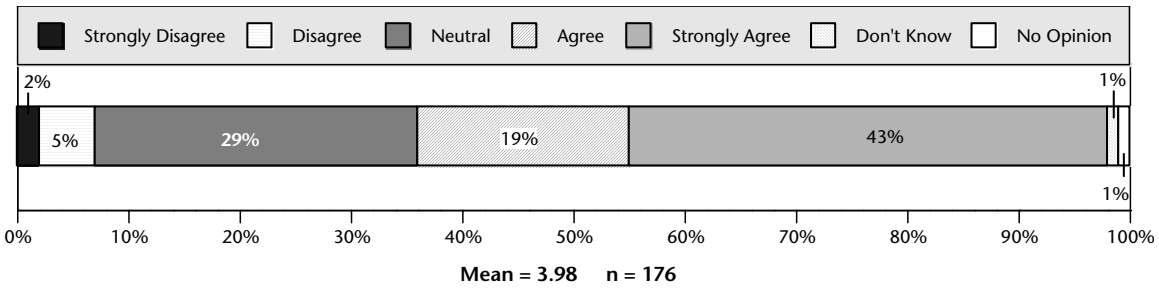
Mean = 3.81 n = 176

Source: BBC Research and Consulting.

Value statements. BBC presented to each survey respondent twelve value statements to which they responded on a scale of agreement. The survey used a scale of 1 to 5, where 1 was "strongly disagree," 2 was "disagree," 3 was "neutral," 4 was "agree," and 5 was "strongly agree." Respondents could also indicate that they did not know or had no opinion.

The visitor experience on the river is important. When asked whether they agree that the visitor experience on the river is very important to the economic wellbeing of Park County, respondents on average indicated that they nearly "agree" with that statement, while they most often said that they "strongly agree." See Exhibit A-21 below.

Exhibit A-21.
The quality of the visitor experience on the river is very important to the economic well being of Park County.

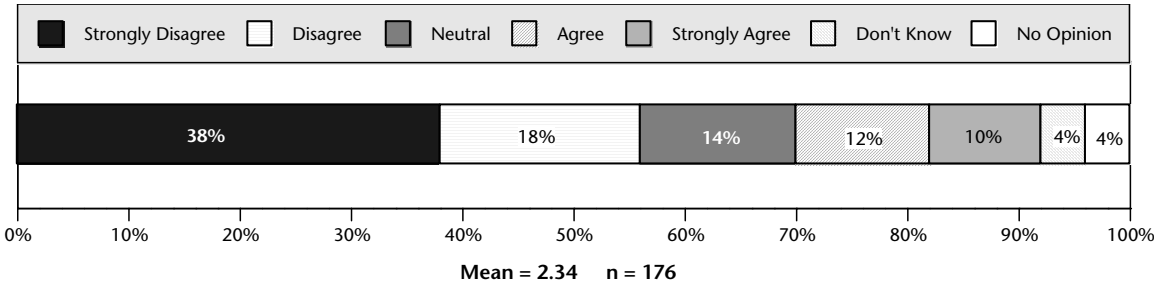


Mean = 3.98 n = 176

Source: BBC Research and Consulting.

Property owners should be able to subdivide in the floodplain. Businesses on average responded that they somewhere between "disagreed" and were "neutral" about the statement that property owners should have a right to subdivide and build in the floodplain. Most often businesses said that they "strongly disagreed" with that statement, however, as displayed below in Exhibit A-22.

Exhibit A-22.
Property owners should have a right to subdivide and build in the floodplain.

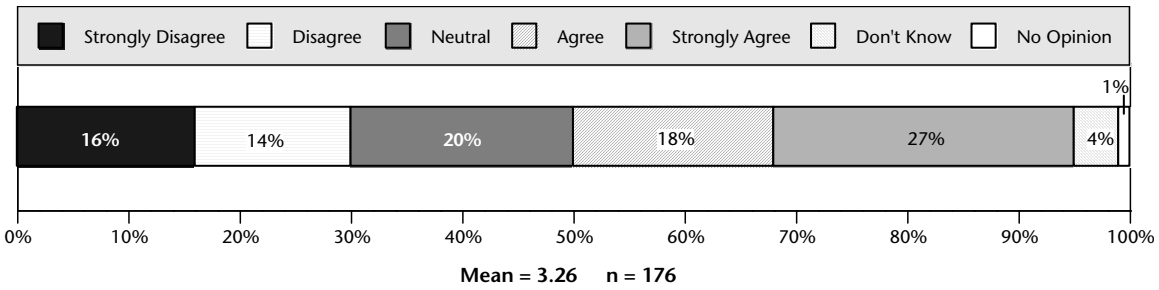


Mean = 2.34 n = 176

Source: BBC Research and Consulting.

Property owners should be able to protect property from floods. On average, businesses responded to the statement, "property owners should be able to protect their property from flooding with manmade structures, such as riprap, levees, or dikes," with between "neutral" and "agree." Companies most often indicated that they "strongly agree" with the statement, though, as shown in Exhibit A-23 below.

Exhibit A-23.
Property owners should be able to protect their property from flooding with manmade structures such as riprap, levees, or dikes.

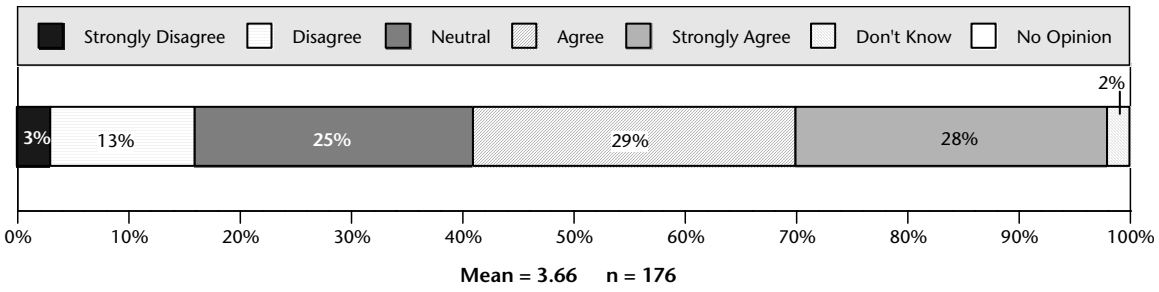


Mean = 3.26 n = 176

Source: BBC Research and Consulting.

Fishing is important to quality of life. According to businessowners in Park County, fishing as a major component of the quality of life for the Park County labor force is between a "neutral" and an "agreeable" statement. Businesses most often responded with an "agree" to this statement, as shown in Exhibit A-24 below.

Exhibit A-24.
Fishing in the Upper Yellowstone is a major component of the quality of life for the Park County labor force.

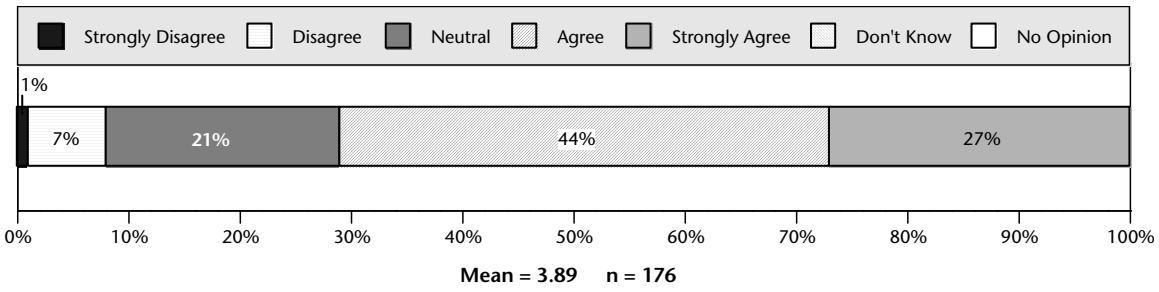


Mean = 3.66 n = 176

Source: BBC Research and Consulting.

Other river-related recreation is important to quality of life. When asked whether they agree that other river-related recreational activities are important components of the quality of life for the Park County labor force, businesses on average responded between "neutral" and "agree." Companies most often answered that they "agreed" with the statement (see Exhibit A-25 below).

Exhibit A-25.
Other river-related recreational activities are important components of the quality of life for the Park County labor force.

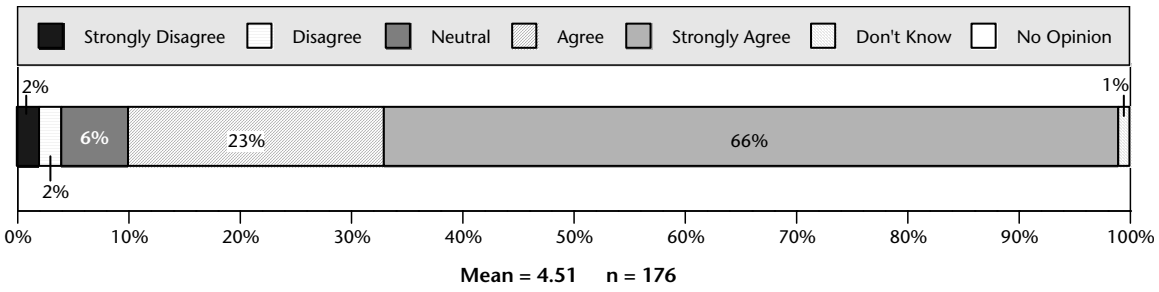


Mean = 3.89 n = 176

Source: BBC Research and Consulting.

The beauty of the river is important to quality of life. When asked whether the beauty of the Upper Yellowstone River is an important component of the quality of life for the Park County labor force, businesses on average responded between "agree" and "strongly agree," though they most often responded with "strongly agree." This distribution is shown in Exhibit A-26 below.

Exhibit A-26.
The beauty of the Upper Yellowstone River is an important component of the quality of life for the Park County labor force.

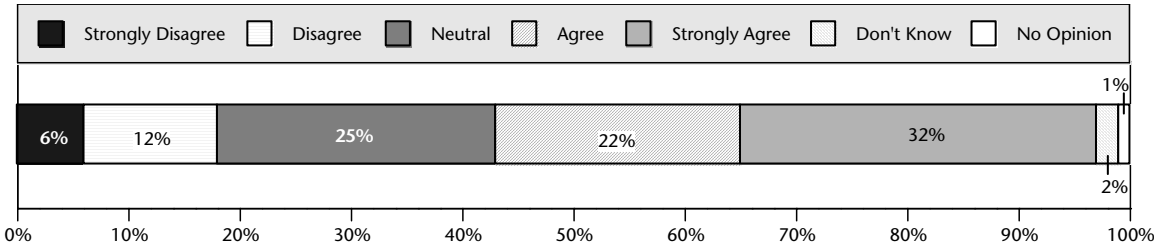


Mean = 4.51 n = 176

Source: BBC Research and Consulting.

The river attracts and retains employees. Businesses on average expressed between "neutrality" and "agreement" with the statement, the Upper Yellowstone River is important in attracting and retaining employees. They most often answered with "strongly agree" to this statement, as shown in Exhibit A-27 below.

Exhibit A-27.
The Upper Yellowstone River is important in attracting and retaining employees.

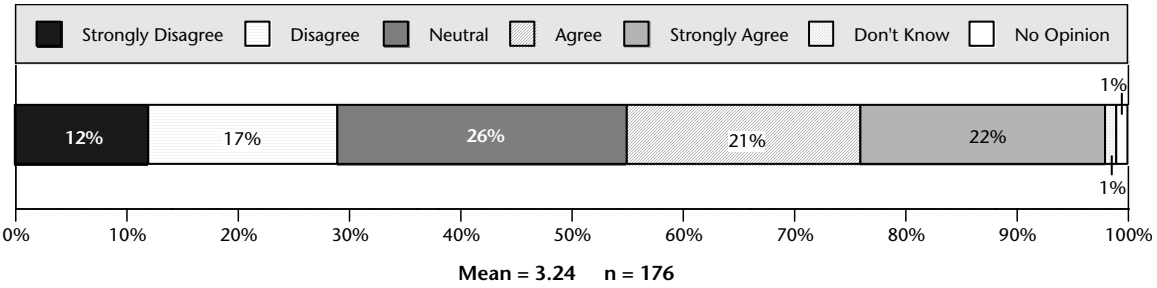


Mean = 3.65 n = 176

Source: BBC Research and Consulting.

Overuse of the river threatens the county. When asked whether overuse or overcrowding of the Upper Yellowstone River threatens the economic wellbeing of Park County, businesses on average replied between "neutral" and "agree," though they most often answered "neutral." See Exhibit A-28 below.

Exhibit A-28.
Overuse or overcrowding of the Upper Yellowstone River threatens the economic well being of Park County.

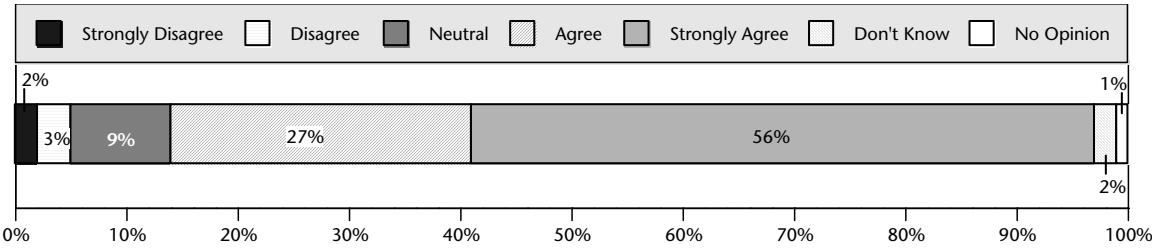


Mean = 3.24 n = 176

Source: BBC Research and Consulting.

Riverbank vegetation is important. On average, businesses responded to the statement that riverbank vegetation is important to the river experience with between "agree" and "strongly agree," and they most often answered with "strongly agree," as displayed in Exhibit A-29 below.

Exhibit A-29.
Riverbank vegetation is important to the river experience.

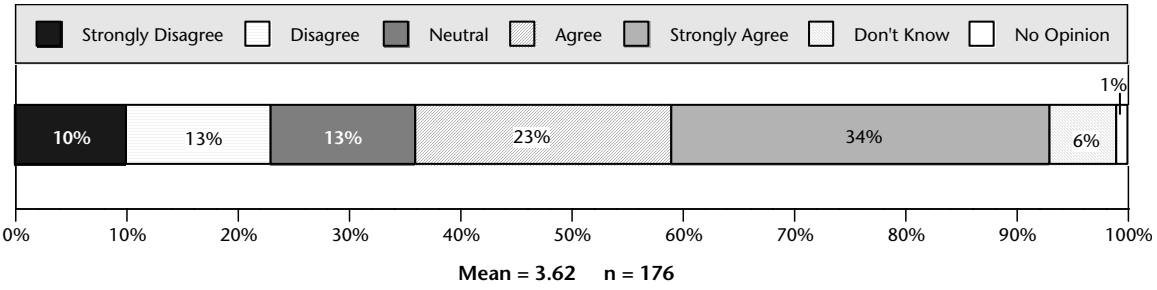


Mean = 4.35 n = 176

Source: BBC Research and Consulting.

A managed river is best. When asked whether a river that is managed to reduce flooding and erosion is in the best overall economic and social interest of Park County residents, businesses on average responded with between "neutral" and "agree," though they most often answered "strongly agree" (see Exhibit A-30 below).

Exhibit A-30.
A river that is managed to reduce flooding and erosion is in the best overall economic and social interest of Park County residents.

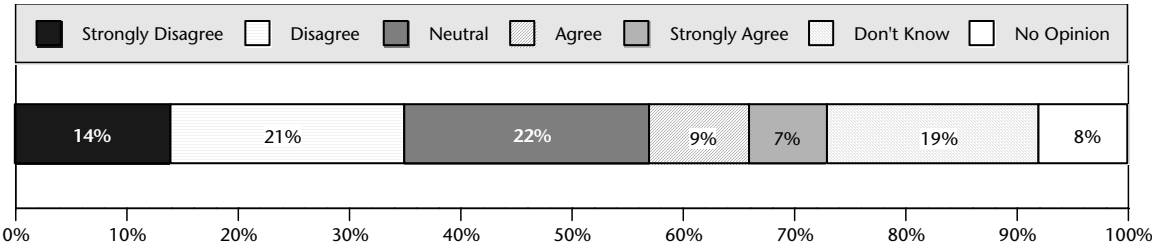


Mean = 3.62 n = 176

Source: BBC Research and Consulting.

Prior management has been consistent and effective. On average, businesses responded to the statement that prior management of the river has been consistent and effective with between "disagree" and "neutral." They most often answered "neutral," as shown in Exhibit A-31 below.

Exhibit A-31.
Prior management of the river has been consistent and effective.

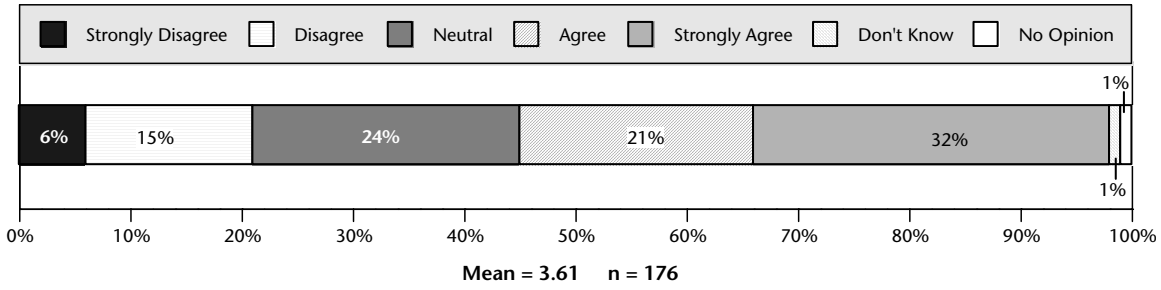


Mean = 2.66 n = 176

Source: BBC Research and Consulting.

The river is the lifeblood of the county. Survey respondents on average responded to the statement that the Upper Yellowstone River is the lifeblood of Park County with between "neutral" and "agree." Businesses most often answered with "strongly agree," as shown in Exhibit A-32 below.

Exhibit A-32.
The Upper Yellowstone River is the lifeblood of Park County.



Mean = 3.61 n = 176

Source: BBC Research and Consulting.

Appendix B.
The Visitor Survey

An important component of the social and economic portrait of Park County is the perceptions and opinions of thousands of visitors to the area on how and why the Upper Yellowstone River is important to them and their experience as a guest. BBC performed a survey of visitors to Park County in June through August 2002, collecting input from over 275 guests.

Methodology

BBC administered the visitor survey from 25 June through 5 August 2002 over a total 15 business days. One research associate at BBC, plus two summer interns from Carleton College, surveyed visitors with the help of local businesses. BBC completed the survey entirely in person, stopping at campsites, river accesses, lodging establishments, and local river-related companies. Sampling sites included:

- Big Sky Flies and Guides
- Carbella Fishing Access
- Carter's Bridge River Access
- DePuy Spring Creek
- Emigrant River Access
- Grey Owl River Access
- La Duke Springs Picnic Area
- Loch Leven River Access
- Mallard's Rest River Access and Campground
- Matthew Long Outfitting
- McConnell River Access
- Mile Marker 26 River Access
- Montana Whitewater
- O'Hair Spring Creek
- Osen's RV Park
- Paradise River Access
- Pine Creek KOA Campground
- Pine Creek River Access
- Pine Creek US Forest Service Campground and Trailhead
- Rocky Mountain Campground
- Snowbank Campground
- US Highway 89 Rest Area
- Wild West Rafting

- Yankee Jim Canyon US Forest Service Campground
- Yankee Jim US Forest Service Picnic Area and River Access
- Yellowstone Rafting Company
- Yellowstone RV Park
- And others.

To assess whether the visitor survey was a representative sample of visitors to Park County, BBC consulted several sources of visitation data for Park County, a wider area than the study area as defined. BBC documented that the county has accommodations for visitors distributed as displayed in Exhibit B-1 below. The hotel manager cited in Exhibit B-1 below also stated that average occupancy rates across the county in the summertime are 70-80 percent, while Price Waterhouse Coopers indicated that the national average occupancy rate for 2002 would likely be about 61 percent. With a BBC estimated average occupancy of two persons per room, and taking the local manager's estimate of a 75 percent occupancy rate in 1,300 rooms, that calculation equates to roughly 1,950 visitors per day. A similar occupancy rate in Travel Montana's estimated 1,182 rooms would equate to roughly 1,775 visitors per day.

Exhibit B-1.
Lodging Rooms in Park County

Location	Travel Montana	Hotel Manager
Livingston	534	650
Gardiner	494	350
Remainder of Park County	154	300
Total	**1,182**	**1,300**

Note:
Travel Montana's estimate includes only rooms in hotels, motels, bed and breakfasts, resorts, and lodges and excludes campgrounds, RV parks, and other types of accommodation. The hotel manager's estimate is similar but unspecified.

Source:
Travel Montana and Manager of Best Western Yellowstone Inn, Livingston, Montana.

According to the National Park Service, Yellowstone National Park admitted on average 2,718 visitors per day through the gates in Gardiner in June 2001, and 3,574 visitors per day in July 2001.[1] An Institute for Tourism and Recreation Research study found that in 1995, roughly 7,350 visitors per day on average over the entire year passed through Livingston.[2] Combining these statistics, BBC derived an estimated range of daily visitors in Park County at the time of the survey to be 4,650. With that population size over the 15 relevant business days on which the survey was conducted (70,000), 288 completed surveys represents a statistically significant sample population with 90 percent confidence in the results.

[1] Yellowstone National Park visitation statistics, http://www.nps.gov/yell/stats/index.htm.

[2] Neal Christensen and Norma Nickerson, Three Communities Explore Tourism, Institute for Tourism and Recreation Research, September 1996.

Overview

BBC completed 288 surveys of visitors throughout the Task Force study area in June through August 2002. The average length of stay for surveyed visitors was 2.6 days, though 20 percent of respondents stayed only one day in Park County, and 26 percent stayed seven days or longer. Roughly 58 percent of surveyees had been to Park County before, 25 percent of who visited annually. Another 27 percent of those who had been to Park County before visited more than once a year. Of those who had visited before, roughly 46 percent of them had noticed changes to the area that had affected their visitor experience.

The average visitor group size was 2.3, and 37 percent of respondents were in groups of one or two. Only 21 percent were in groups of six or more. The youngest group members were less than one year of age, whereas the oldest were in their eighties. Roughly 57 percent of respondents were male, and 40 percent were female, while 3 percent chose not to provide their gender. Respondents resided in 45 different states, with California (6 percent), Minnesota (7 percent), other Montana counties (14 percent), Billings (3 percent), Bozeman (4 percent), New York (3 percent), Texas (5 percent), and Washington state (5 percent) having the strongest showings.

BBC then asked visitors about the activities in which they had engaged in their time in Park County, and their responses were distributed as follows in Exhibit B-2 below.

Exhibit B-2.
Activities Visitors Engaged In While in Park County

Source:
BBC Research and Consulting.

Activity	Percentage of Respondents who Participated in this Activity
Scenic drives	63
Sightseeing	52
Camping	50
Fishing	49
Scenic walks	48
Wildlife viewing	47
Visiting Yellowstone National Park	46
Hiking	41
Whitewater rafting	34
Picnicking	29
Swimming	20
Floating	17
Horseback riding	13
Biking	12
Just passing through	12
Other	7
Tubing	4
Kayaking	2

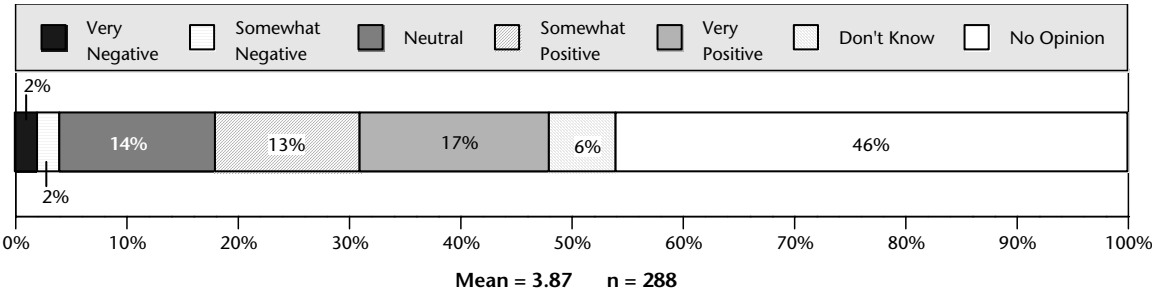
Results[3]

Following are the results of the visitor survey's substantive questions.

Opinions about effects of aspects of river on visitor experience. BBC asked visitors how various aspects of the river affected their experience as a visitor to Park County. The survey used a scale of "1" to "5", where "1" was a "very negative effect," "2" was a "somewhat negative effect," "3" was "neutral," "4" was a "somewhat positive effect," and "5" was a "very positive effect." Respondents could also say they did not know or had no opinion.

Quality of the fishing. When asked how the quality of the fishing in the river affected their visitor experience, survey respondents on average said somewhere between "neutral" and a "somewhat positive effect on my visitor experience." Respondents most often answered with "no opinion," as displayed in Exhibit B-3 below.

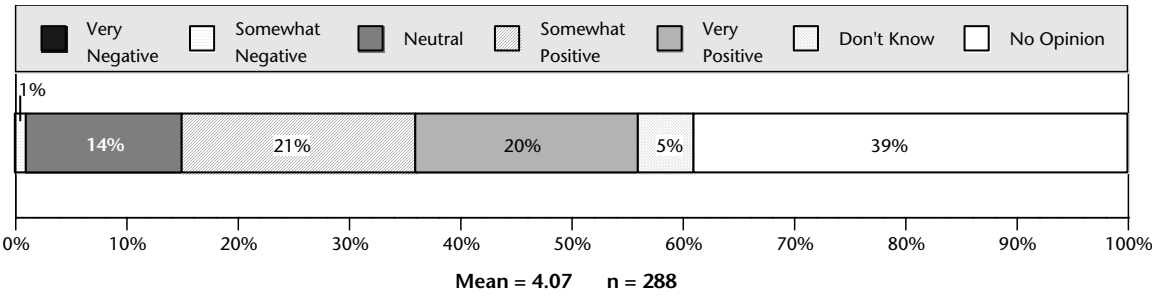
Exhibit B-3.
How would you rate the effect that the quality of the fishing in the river had on your experience?



Source: BBC Research and Consulting.

Quality of the whitewater. Respondents on averaged answered that the quality of the whitewater in the river had a "somewhat positive effect on my visitor experience," though the response most often give was that of "no opinion" (see Exhibit B-4 below).

Exhibit B-4.
How would you rate the effect that the quality of the whitewater in the river had on your experience?

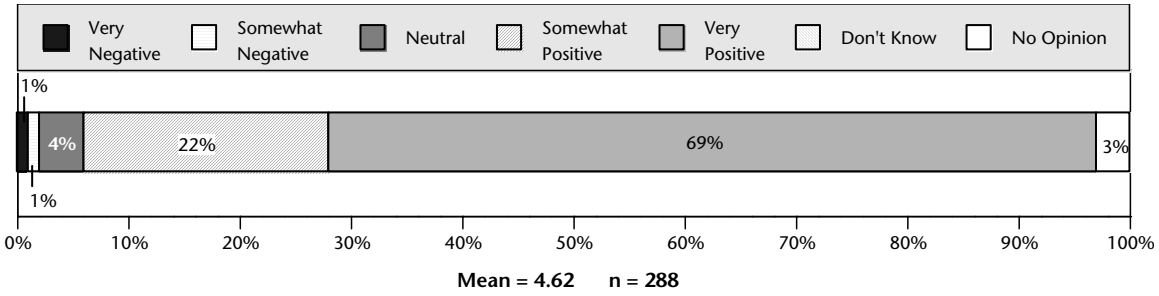


Source: BBC Research and Consulting.

[3] Please note that mean responses presented in the following tables were calculated with "don't know" and "no opinion" answers excluded. The "n," or number of responses, reported on those same tables does not reflect the removal of these "don't know" and "no opinion" responses because they were valid responses. Those responses simply could not be included to calculate an average knowledgeable/opinionated response.

Quality of the scenery. When asked how the quality of the scenery on or near the river affected their visitor experience, more survey respondents said it had a "very positive effect on my visitor experience" than any other response, though the average answer was between a "somewhat positive effect" and a "very positive effect." See Exhibit B-5 below.

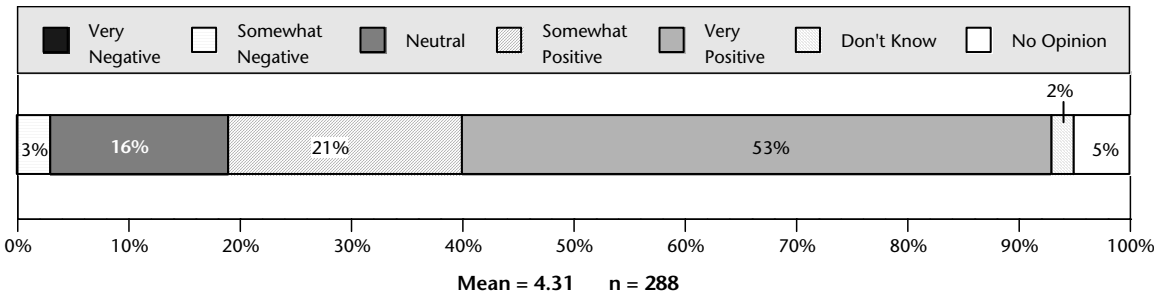
Exhibit B-5.
How would you rate the effect that the quality of the scenery on or near the river had on your experience?



Source: BBC Research and Consulting.

Wild and undeveloped nature of the river. Respondents on average answered that the wild and undeveloped nature of the river had between a "somewhat positive" and a "very positive" effect on their visitor experience. The most common answer was a "very positive effect," as shown in Exhibit B-6 below.

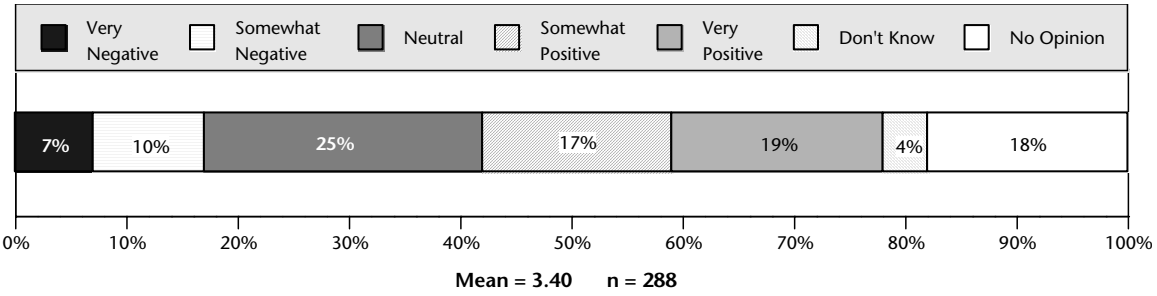
Exhibit B-6.
How would you rate the effect that the wild and undeveloped nature of the river had on your experience?



Source: BBC Research and Consulting.

Level of unnatural/manmade noise on the river. When asked how the level of unnatural/manmade noise on the river affected their visitor experience, more respondents said "neutral" than any other response, while the average answer was between "neutral" and a "somewhat positive effect," as displayed in Exhibit B-7 below.

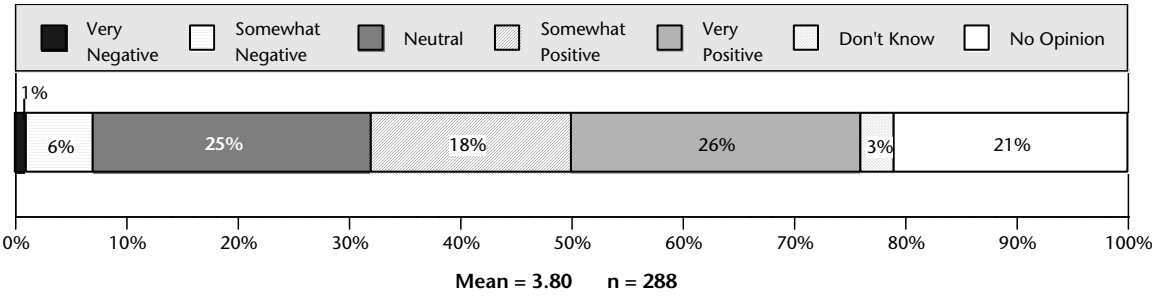
Exhibit B-7.
How would you rate the effect that the level of unnatural/manmade noise on the river had on your experience?



Source: BBC Research and Consulting.

How high the water in the river was. Survey respondents on average expressed that the effect of how high the water in the river was on their visitor experience was between "neutral" and a "somewhat positive effect." The most common answer was a "very positive effect" (see Exhibit B-8 below).

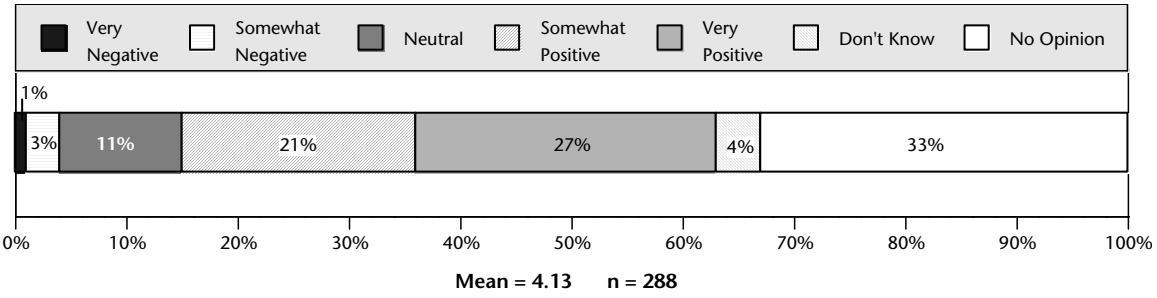
Exhibit B-8.
How would you rate the effect of how high the water in the river was on your experience?



Source: BBC Research and Consulting.

Public access to the river. When asked how public access to the river affected their visitor experience, respondents most often answered with "no opinion," though the average response was between "neutral" and a "somewhat positive effect." See exhibit B-9 below.

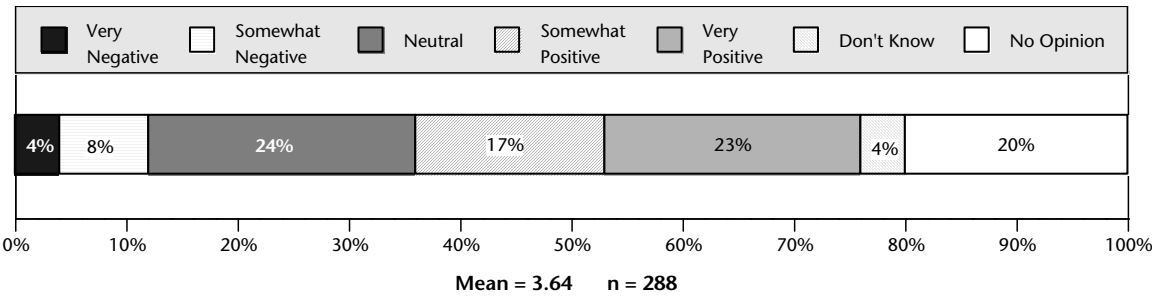
Exhibit B-9.
How would you rate the effect that public access to the river had on your experience?



Source: BBC Research and Consulting.

Overcrowding on the river. On average, respondents said that overcrowding on the river was between "neutral" and a "somewhat positive effect" on their visitor experience. Most often, surveyees answered with "neutral," as displayed in Exhibit B-10 below.

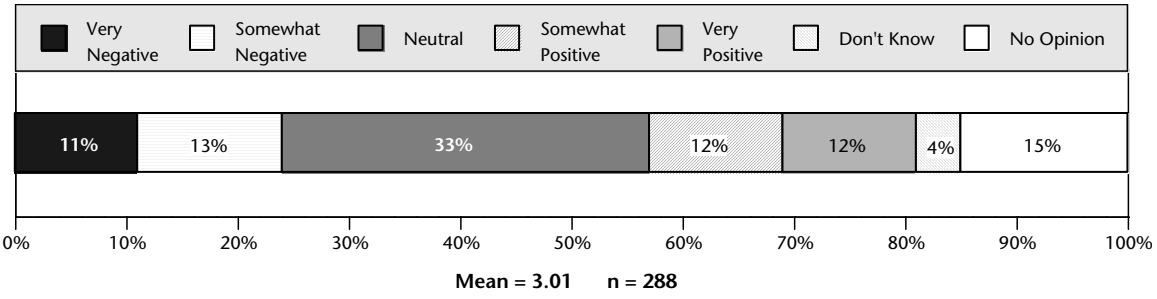
Exhibit B-10.
How would you rate the effect that overcrowding on the river had on your experience?



Source: BBC Research and Consulting.

Residential development along the river. When asked how residential development along the river affected their visitor experience, more respondents said "neutral" than any other response, and the average answer was "neutral," too (see Exhibit B-11 below).

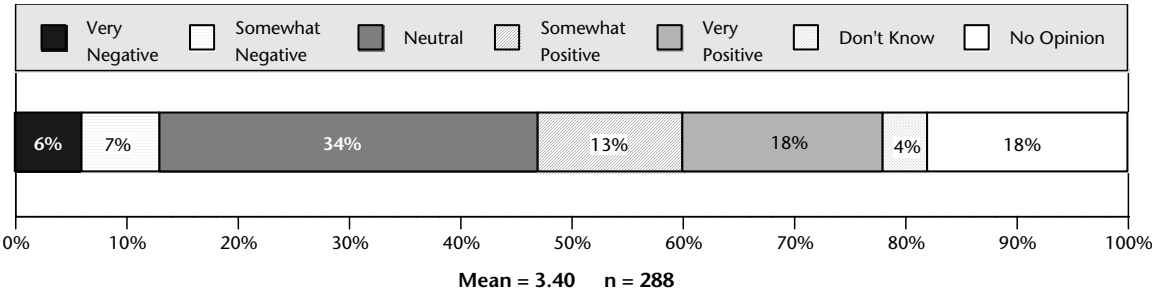
Exhibit B-11.
How would you rate the effect that residential development along the river had on your experience?



Source: BBC Research and Consulting.

Cattle or ranching activities along the river. Survey respondents on average said that cattle or ranching activities along the river had between a "neutral" effect and a "somewhat positive" effect on their visitor experience, though the most common answer was "neutral," as shown in Exhibit B-12 below.

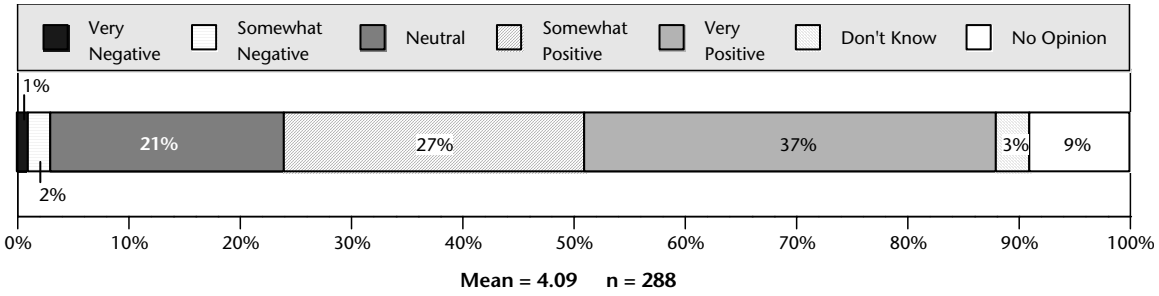
Exhibit B-12.
How would you rate the effect that cattle or ranching activities along the river had on your experience?



Source: BBC Research and Consulting.

Amount of natural vegetation along the riverbank. When asked how the amount of natural vegetation along the riverbank affected their visitor experience, more survey respondents said a "very positive effect" than any other response. The average answer was a "somewhat positive effect" on their visitor experience, as displayed in Exhibit B-13 below.

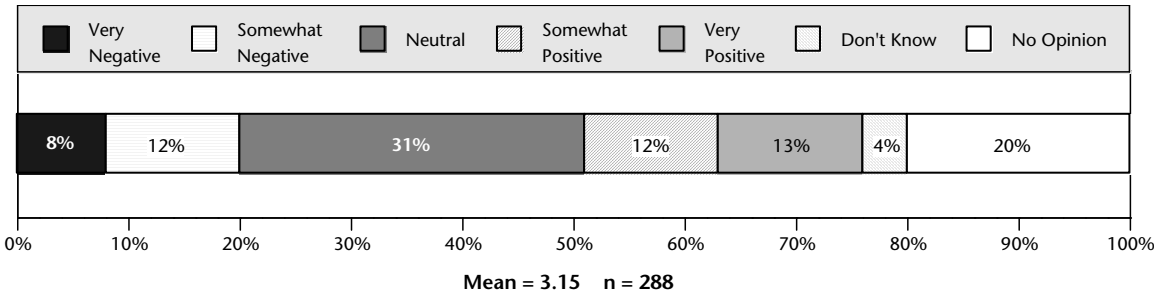
Exhibit B-13.
How would you rate the effect that the amount of natural vegetation along the riverbank had on your experience?



Source: BBC Research and Consulting.

Manmade structures on the river. Respondents on average said that manmade structures on the river such as riprap, barbs, levees, dikes and bridges, had between a "neutral" and a "somewhat positive" effect on their visitor experience, while the most common answer was "neutral" (see Exhibit B-14 below).

Exhibit B-14.
How would you rate the effect that manmade structures, such as riprap, barbs, levees, dikes, and bridges had on your experience?

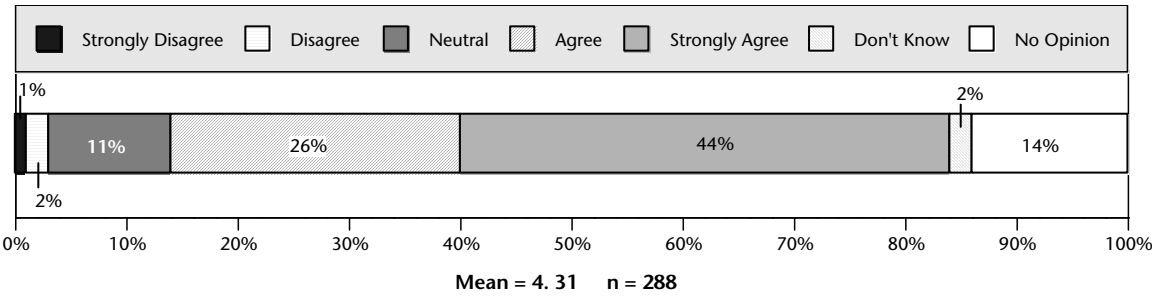


Source: BBC Research and Consulting.

Value statements. BBC presented to each survey respondent four value statements to which they responded on a scale of agreement. They survey used a scale of 1 to 5, where 1 was "strongly disagree," 2 was "disagree," 3 was "neutral," 4 was "agree," and 5 was "strongly agree." Respondents could also say they did not know or had no opinion.

Current water level. When they read the statement, "Given the current water level and depth of the river, the Upper Yellowstone River was as positive a part of my visitor experience as it could have been," more respondents said they "strongly agree" than any other response. The average answer was between "agree" and "strongly agree," as shown in Exhibit B-15 below.

Exhibit B-15.
Given the current water level and depth of the river, the Upper Yellowstone River was as positive a part of my visitor experience as it could have been.

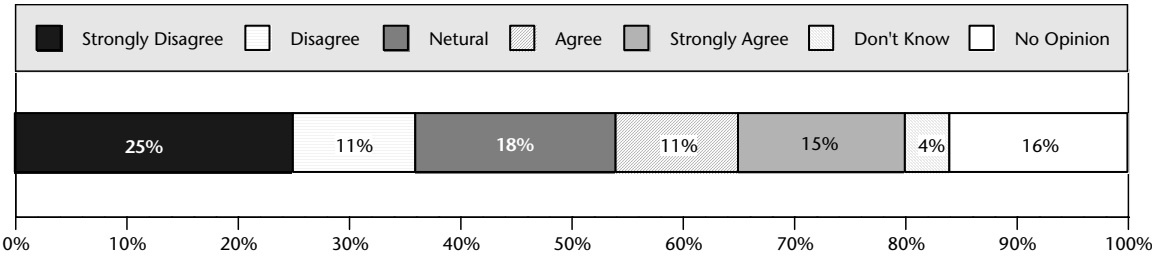


Mean = 4. 31 n = 288

Source: BBC Research and Consulting.

Property owners should be able to protect property from floods. On average, visitors expressed between "disagree" and "neutral" in response to the statement that property owner along the riverbanks should be able to protect their property from flooding with manmade structures along the riverbanks. The most common answer was "strongly disagree," as displayed in Exhibit B-16 below.

Exhibit B-16.
Property owners along the riverbanks should be able to protect their property from flooding with manmade structures along the riverbanks.

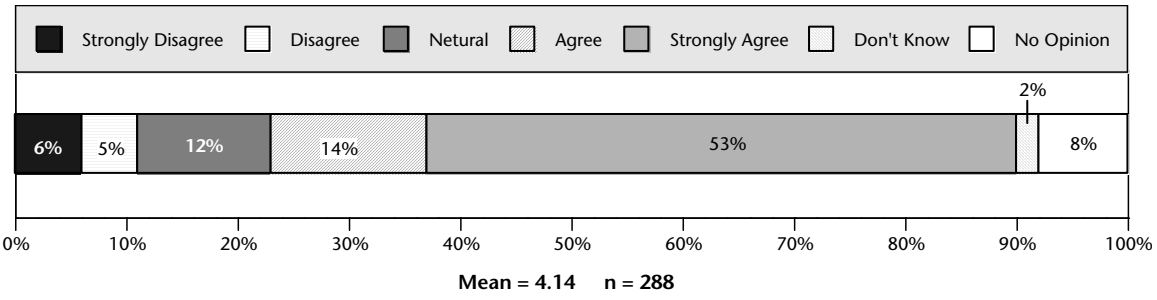


Mean = 2.77 n = 288

Source: BBC Research and Consulting.

An unmanaged river is best. According to visitors on average, they are between "agree" and "strongly agree" in response to the statement that an unmanaged, free-flowing river is in the best interest of the visitor to Park County. The most common response was "strongly agree" (see Exhibit B-17 below.

Exhibit B-17.
An unmanaged, free-flowing river is in the best interest of the visitor to Park County.

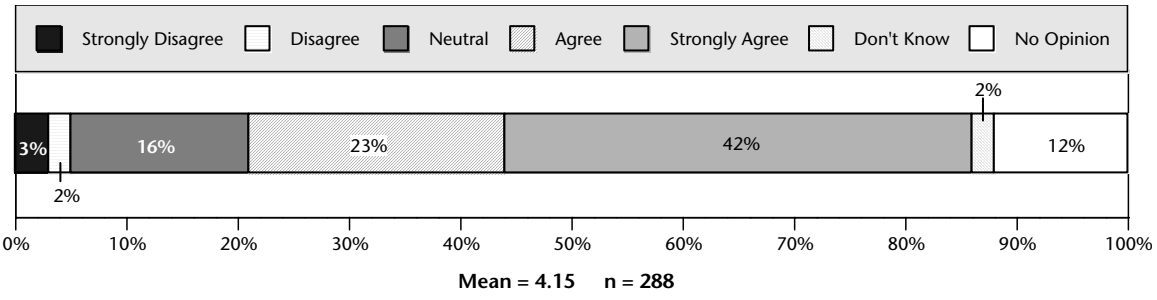


Mean = 4.14 n = 288

Source: BBC Research and Consulting.

Stay longer next time. When asked whether, if they could plan their trip to Park County over again, and after the experiences they had with the Upper Yellowstone River, they would stay longer next time, more respondents said they "strongly agree" than any other answer. The average response was between "agree" and "strongly agree," as shown in Exhibit B-18 below.

Exhibit B-18.
If you could plan your trip to Park County over again, and after the experiences you had with the Upper Yellowstone River, you would stay here longer next time.



Mean = 4.15 n = 288

Source: BBC Research and Consulting.

Appendix C.
The Resident Survey

BBC conducted a survey of 364 Park County residents, gathering their perceptions and opinions on how and why the Upper Yellowstone River is important to them. This survey occurred in June through September 2002.

Methodology

BBC administered the resident survey from 19 June through 5 September 2002 over a total 29 business days. One research associate at BBC, plus seven summer interns, surveyed residents using a phone list of over 4,000 local listed telephone numbers. BBC completed the survey entirely over the telephone generally from the hours of 3pm through 8:30pm, Sundays through Thursdays.

The resident survey represented a statistically significant sample population of the 6,828 households in Park County in 2000, with 95 percent confidence level.

Overview

BBC completed 364 surveys of residents throughout the Task Force study area in June through September 2002. Approximately 82 percent of respondents were from the Livingston/Clyde Park telephone exchanges (222 and 686), while 8 percent were from the Emigrant area (330 and 333) and 9 percent were from the Gardiner area (848). All respondents were confirmed or generally assumed to be over the age of 21. About 98 percent of interviewees were permanent residents, while only 2 percent were seasonal residents. Roughly 79 percent of respondents had lived in Park County more than 10 years, while only 7 percent were new residents of less than 4 years. Some 38 percent of respondents' parents lived or had lived in Park County. About 44 percent of respondents were male, and 53 percent were female, while 3 percent of genders went unrecorded.

About 3 percent of respondents were ranchers, while ½ of 1 percent had jobs outside Park County. A little over 4 percent worked in tourist-related businesses, but another 38 percent worked in non-directly tourist-related businesses. Nearly 9 percent of respondents worked in government, while another 44 percent were retired or on disability or Medicare. About 2 percent of interviewees were unemployed, students, or homemakers.

Approximately 6 percent of respondents' homes or property were along the Yellowstone Riverbank, while another 7 percent were in the Yellowstone River floodplain. About 27 percent of homes were outside the floodplain but near the river, and 23 percent were elsewhere in Park County. Almost 38 percent of homes or property were "in town" (primarily Livingston).

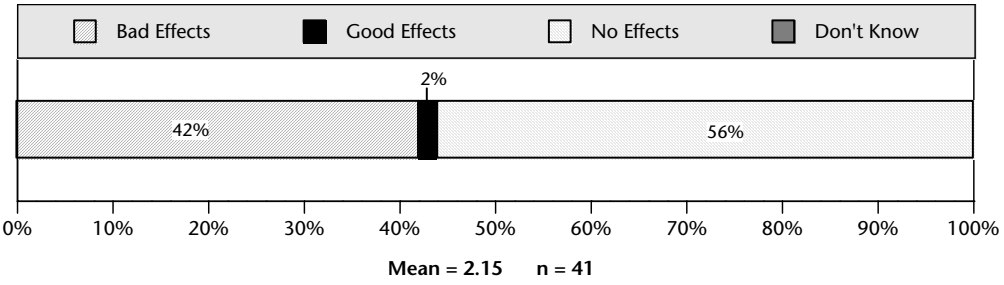
Results[1]

Following are the results of the resident survey's substantive questions.

Opinions about the effects of river flows. BBC inquired with residents whose homes were along the Yellowstone Riverbank or in its floodplain regarding three aspects of river flows: drought, normal flows, and floods. Respondents could answer that the flows had "good effects," "bad effects," or "no effects" on their businesses. Some residents said they "don't know."

Droughts. When asked about the effects drought or low flows may have on their households, more residents answered that drought flows have no effect on their households than any other response; see the distribution of responses in Exhibit C-1 below. Of the residents who felt impacts from drought flows, most of them experienced negative effects. Only 41 residents answered this question because the question was asked only of those households that were located on the riverbank or in the floodplain.

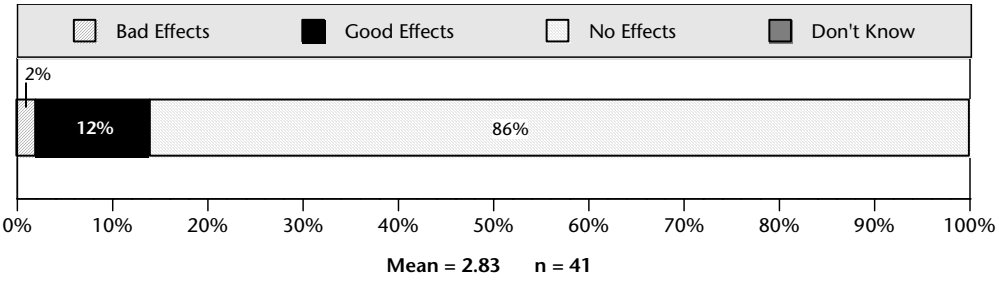
Exhibit C-1.
Do drought or low flows have good, bad, or no effects on your household?



Source: BBC Research and Consulting.

Normal flows. When asked about the effects normal flows by season may have on their households, more survey respondents answered that normal river flows by season have no effect on their households than any other response; see the distribution of responses in Exhibit C-2 below. Of the residents who felt impacts from normal river flows, most experienced positive effects.

Exhibit C-2.
Do normal river flows by season (i.e., higher in the spring, lower in summer and autumn) have good, bad, or no effects on your household?

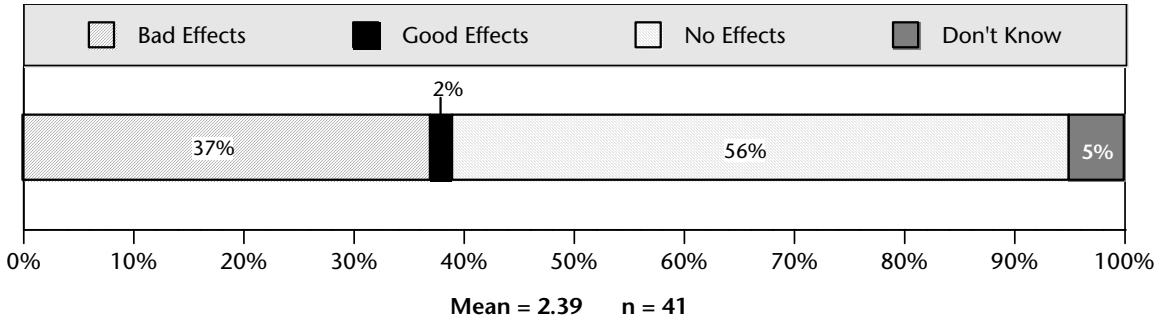


Source: BBC Research and Consulting.

[1] Please note that mean responses presented in the following tables were calculated with "don't know" and "no opinion" answers excluded. The "n," or number of responses, reported on those same tables does not reflect the removal of these "don't know" and "no opinion" responses because they were valid responses. Those responses simply could not be included to calculate an average knowledgeable/opinionated response.

Floods. When asked about the effects flood flows may have on their households, more survey respondents answered that flood flows have no effect on their household than any other response; see the distribution of responses in Exhibit C-3 below. Of the residents who felt impacts from flood flows, most experienced negative effects.

Exhibit C-3.
Do flood flows have good, bad, or no effects on your household?

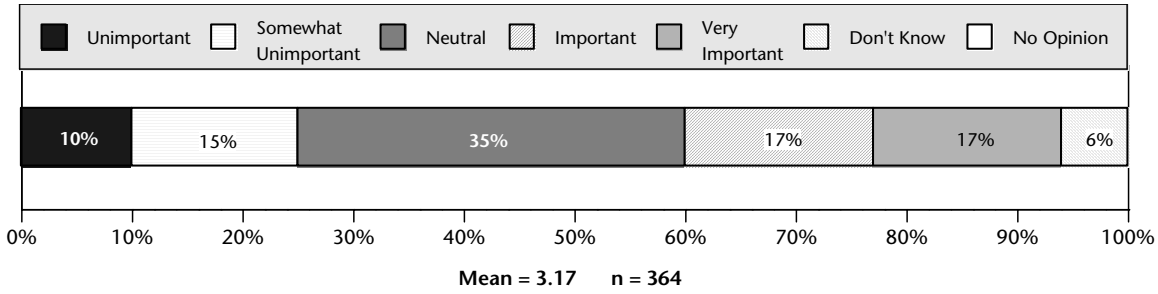


Source: BBC Research and Consulting.

Importance of different populations in the county. BBC questioned residents about eight different populations in Park County, asking them to rate those groups' economic and social/cultural importance. The survey used a scale of 1 to 5, where 1 was "unimportant," 2 was "somewhat unimportant," 3 was "neutral," 4 was "important," and 5 was "very important." Respondents also could say they did not know or had no opinion.

Tourists' social/cultural importance. When asked how important tourists are socially and culturally to the community in Park County, respondents on average said that they rate somewhere between "neutral" and "important," and more respondents gave "neutral" as a response than any other answer (see Exhibit C-4 below).

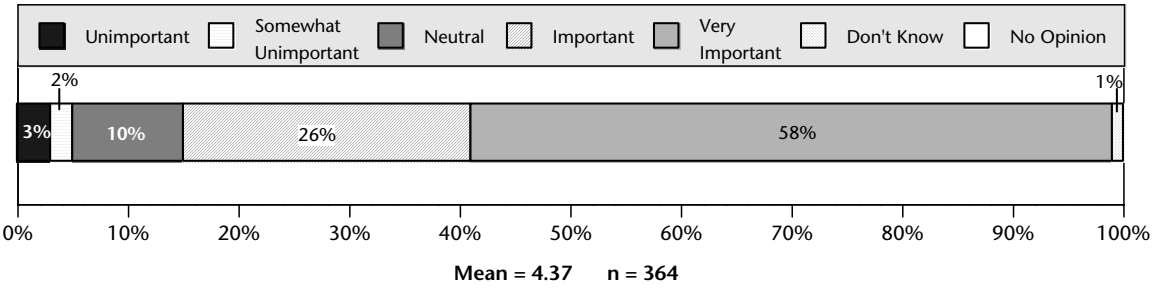
Exhibit C-4.
How important are tourists or other temporary visitors to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

Tourists' economic importance. When asked how important tourists are to the economy of Park County, respondents on average said that they rate between "important" and "very important," and more respondents gave "very important" as a response than any other answer (see Exhibit C-5 below).

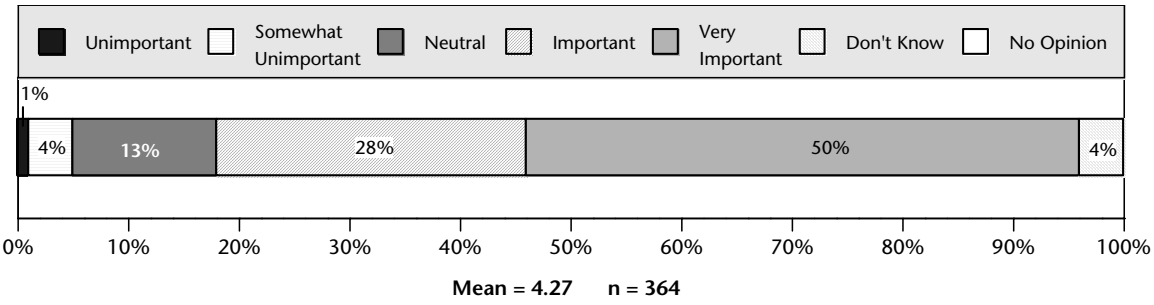
Exhibit C-5.
How important are tourists or other temporary visitors to the Park County economy?



Source: BBC Research and Consulting.

Ranchers' social/cultural importance. Survey respondents on average expressed that ranchers are somewhat more than "important" to the social and cultural environmental of Park County, while respondents most often answered that ranchers are "very important," as shown in Exhibit C-6 below.

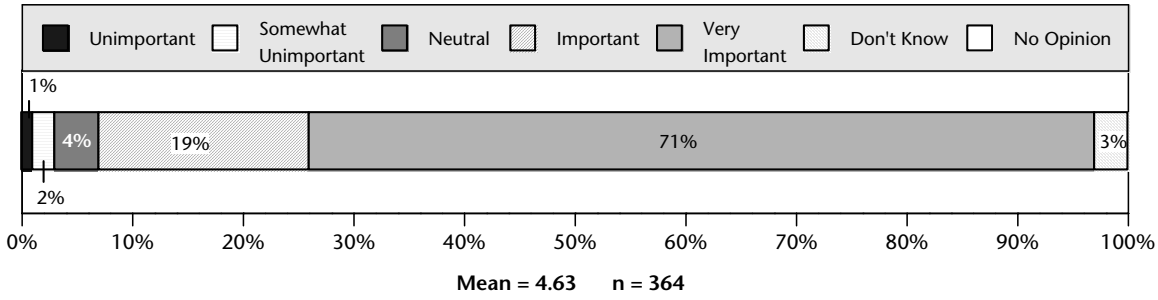
Exhibit C-6.
How important are ranchers to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

Ranchers' economic importance. When asked how important ranchers are to the Park County economy, respondents on average answered that they are between "important" and "very important," and they most often said that ranchers are "very important," as displayed in Exhibit C-7 below.

Exhibit C-7.
How important are ranchers to the Park County economy?

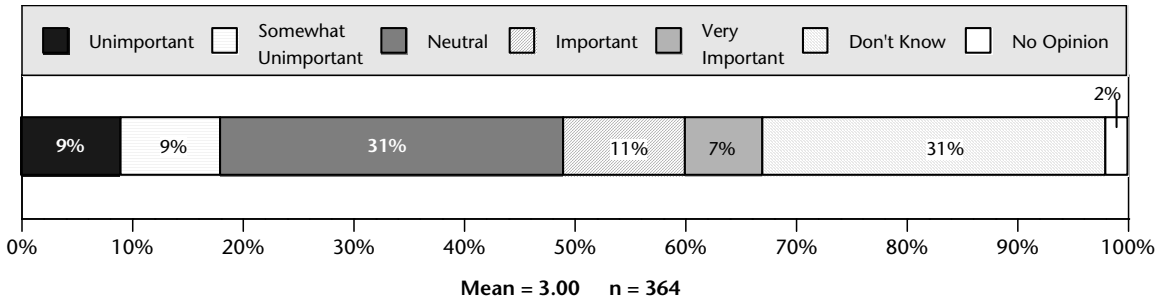


Mean = 4.63 n = 364

Source: BBC Research and Consulting.

Spring creeks' social/cultural importance. Survey respondents indicated that the spring creeks' importance to the social and cultural environment was on average exactly "neutral," which was also the response most often recorded in the survey, as displayed in Exhibit C-8 below.

Exhibit C-8.
How important are spring creek-related activities to the social and cultural environment of Park County?

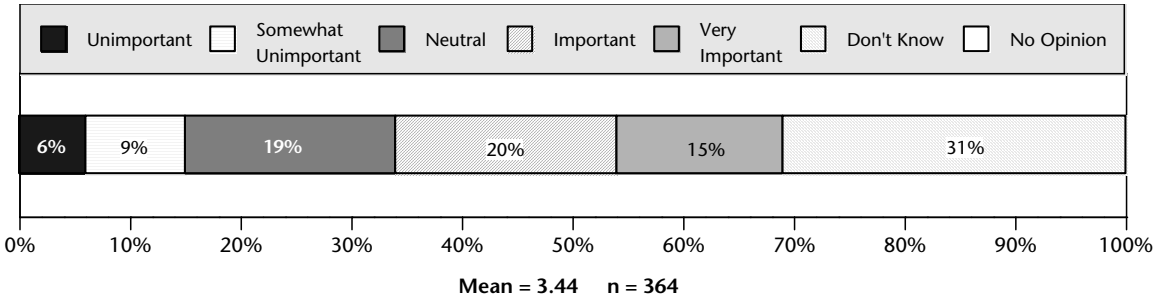


Mean = 3.00 n = 364

Source: BBC Research and Consulting.

Spring creeks' economic importance. Respondents expressed that they thought spring creeks more important to the economy than to the social and cultural environment of Park County, with an average response between "neutral" and "important." Respondents most often answered with "don't know," as displayed in Exhibit C-9 below.

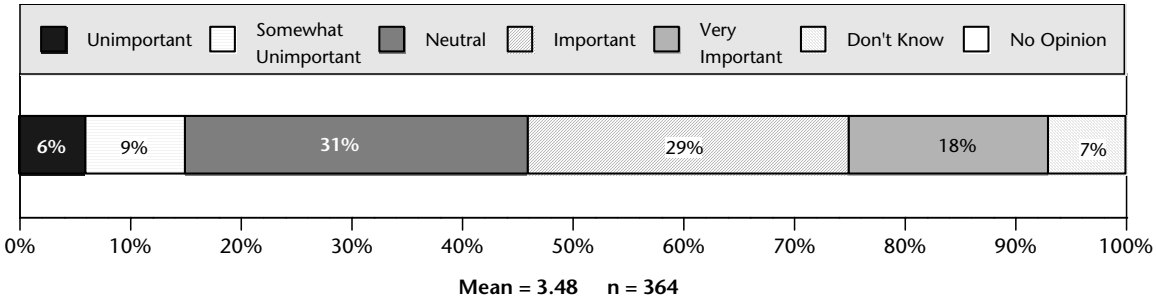
Exhibit C-9.
How important are spring creek-related activities to the Park County economy?



Source: BBC Research and Consulting.

River-related businesses' social/cultural importance. Survey respondents indicated that on average river-related businesses are between "neutral" and "important" to the social and cultural environment of Park County, and they most often tallied "neutral" as their response to that question, as displayed in Exhibit C-10 below.

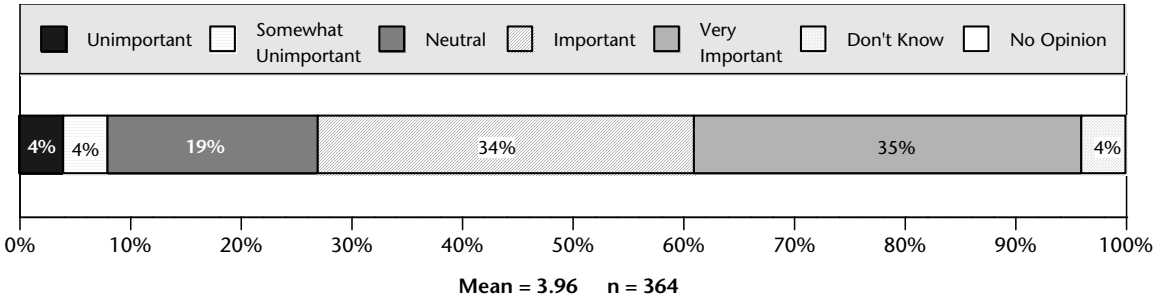
Exhibit C-10.
How important are river-related businesses to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

River-related businesses' economic importance. When asked how important river-related businesses are to the Park County economy, survey respondents answered on average that they were nearly "important," though they most often responded with "very important." See Exhibit C-11 below.

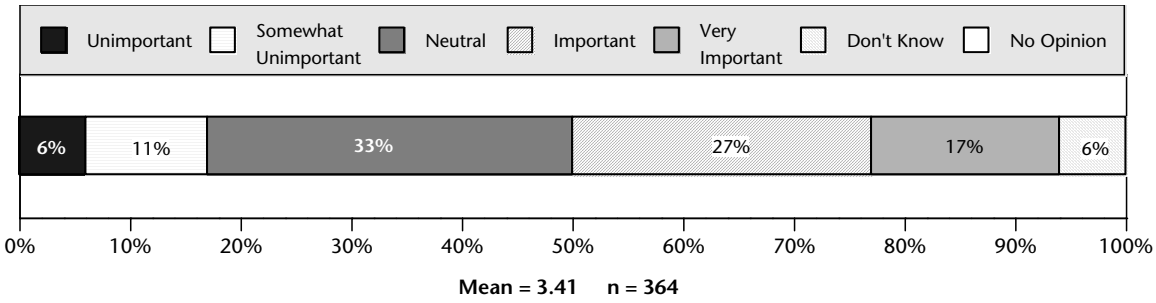
Exhibit C-11.
How important are river-related businesses to the Park County economy?



Source: BBC Research and Consulting.

Other tourist-related businesses' social/cultural importance. When asked how important other tourist-related businesses, such as hotels and souvenir shops, are to the social and cultural environment in Park County, respondents on average thought they were between "neutral" and "important," and they most often said "neutral," as displayed in Exhibit C-12 below.

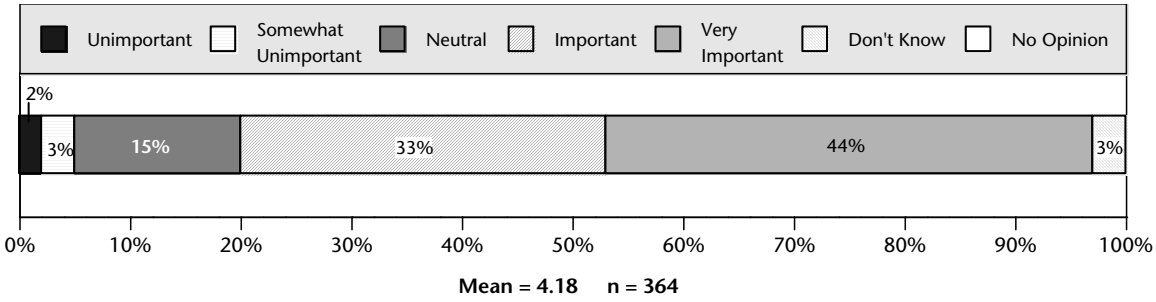
Exhibit C-12.
How important are other tourist-related businesses to the social and cultural environment of Park County?



Source: BBC Research and Consulting.

Other tourist-related businesses' economic importance. Survey respondents indicated that on average they believed other tourist-related businesses were between "important" and "very important" to the economy of Park County, though they most often responded with "very important," as shown in Exhibit C-13 below.

Exhibit C-13.
How important are other tourist-related businesses to the Park County economy?

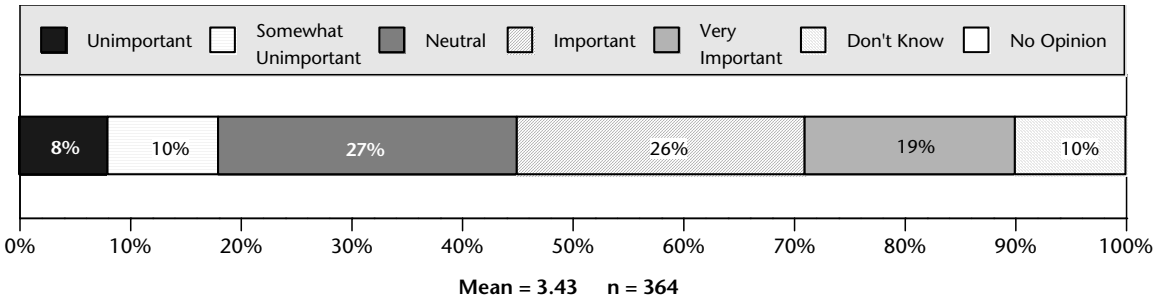


Mean = 4.18 n = 364

Source: BBC Research and Consulting.

New permanent residents' social/cultural importance. When asked how important new permanent residents in Park County are to the county's social and cultural environment, on average respondents said they were between "neutral" and "important," though they most often responded with "neutral," as displayed in Exhibit C-14 below.

Exhibit C-14.
How important are new permanent residents who have moved here in the past five years to the social and cultural environment of Park County?

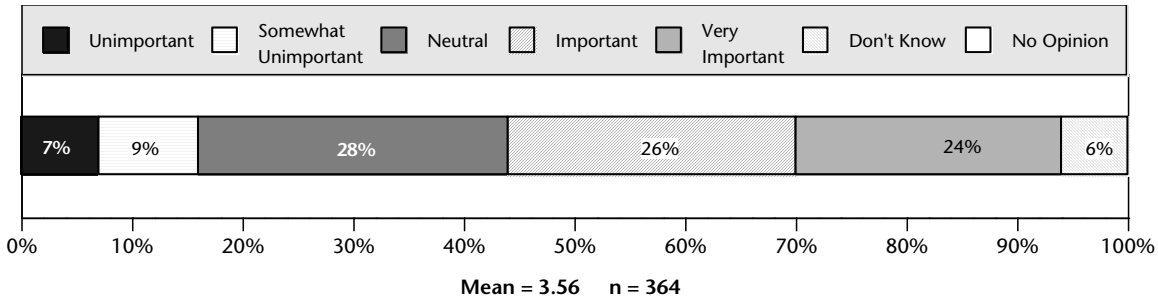


Mean = 3.43 n = 364

Source: BBC Research and Consulting.

New permanent residents' economic importance. Residents most mentioned new permanent residents as being "neutral" to the Park County economy, though they on average indicated that they were between "neutral" and "important." See Exhibit C-15 below.

Exhibit C-15.
How important are new permanent residents who have moved here in the past five years to the Park County economy?

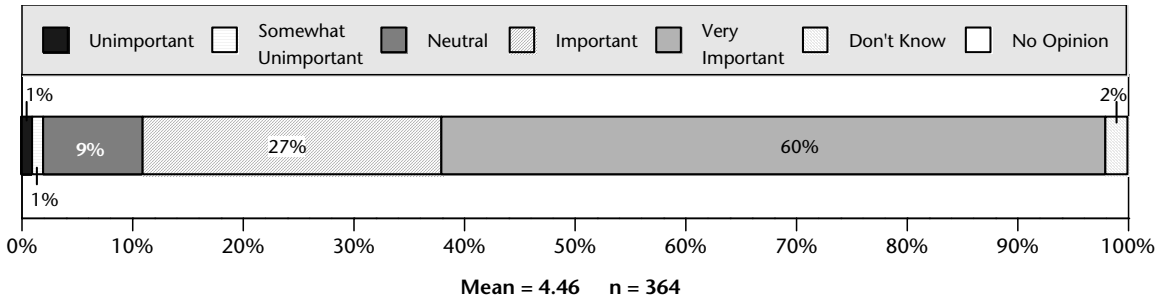


Mean = 3.56 n = 364

Source: BBC Research and Consulting.

Longtime residents' social/cultural importance. When asked about the importance of longtime residents to the social and cultural environment in Park County, respondents on average said they were between "important" and "very important." The most frequent response was "very important," as shown in Exhibit C-16 below.

Exhibit C-16.
How important are longtime residents to the social and cultural environment of Park County?

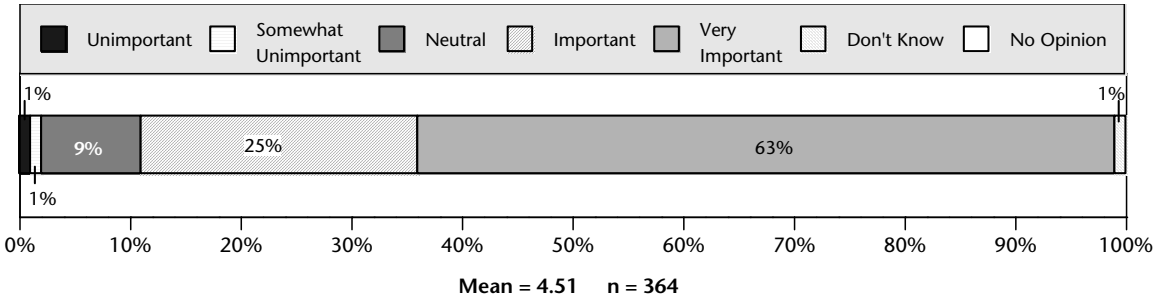


Mean = 4.46 n = 364

Source: BBC Research and Consulting.

Longtime residents' economic importance. When asked about the importance of longtime residents to the Park County economy, respondents on average answered almost exactly between "important" and "very important," though they responded most frequently with "very important," shown in Exhibit C-17 below.

Exhibit C-17.
How important are longtime residents to the Park County economy?

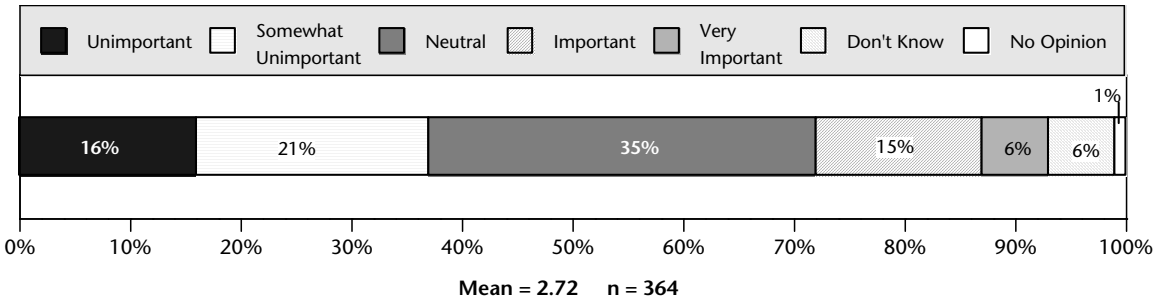


Mean = 4.51 n = 364

Source: BBC Research and Consulting.

Seasonal residents' social/cultural importance. Survey respondents expressed on average that seasonal residents were between "somewhat unimportant" and "neutral" in importance to the social and cultural environment of Park County, and they mentioned "neutral" in their answers most frequently, as displayed in Exhibit C-18 below.

Exhibit C-18.
How important are seasonal residents to the social and cultural environment of Park County?

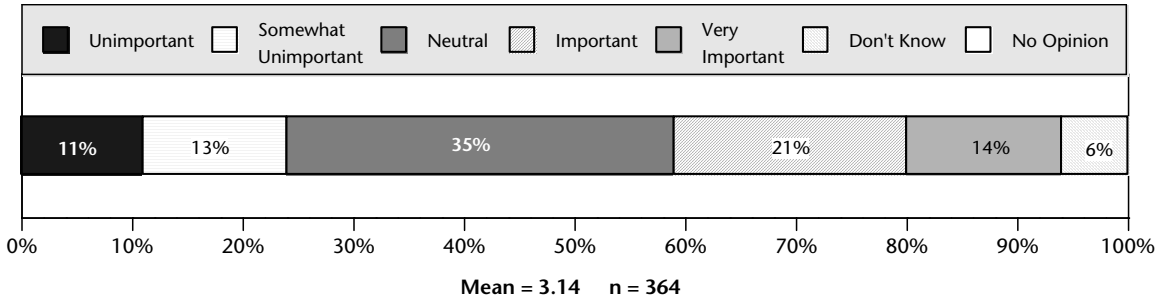


Mean = 2.72 n = 364

Source: BBC Research and Consulting.

Seasonal residents economic importance. When asked about the importance of seasonal residents in the economy of Park County, the average answer was between "neutral" and "important," though respondents mentioned "neutral" most frequently. See Exhibit C-19 below.

Exhibit C-19.
How important are seasonal residents to the Park County economy?

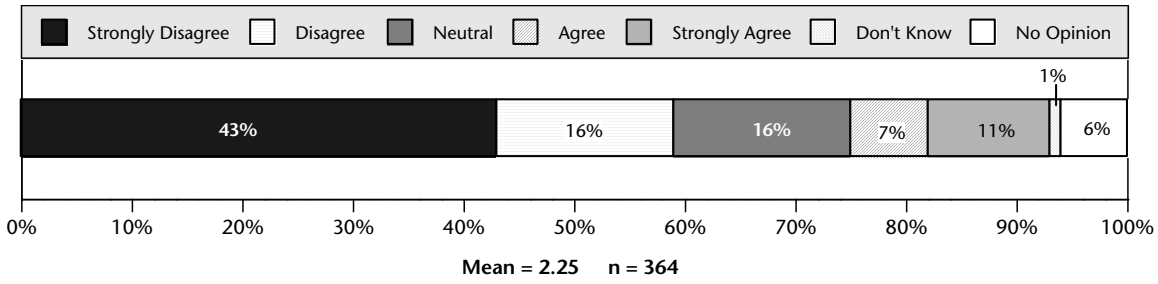


Source: BBC Research and Consulting.

Value statements. BBC presented to each survey respondent twelve value statements to which they responded on a scale of agreement. They survey used a scale of 1 to 5, where 1 was "strongly disagree," 2 was "disagree," 3 was "neutral," 4 was "agree," and 5 was "strongly agree." Respondents could also indicate that they did not know or had no opinion.

Property owners should be able to subdivide in the floodplain. Residents on average responded that they somewhere between "disagreed" and were "neutral" about the statement that property owners should have a right to subdivide and build in the floodplain. Most often residents said that they "strongly disagreed" with that statement, however, as displayed below in Exhibit C-20.

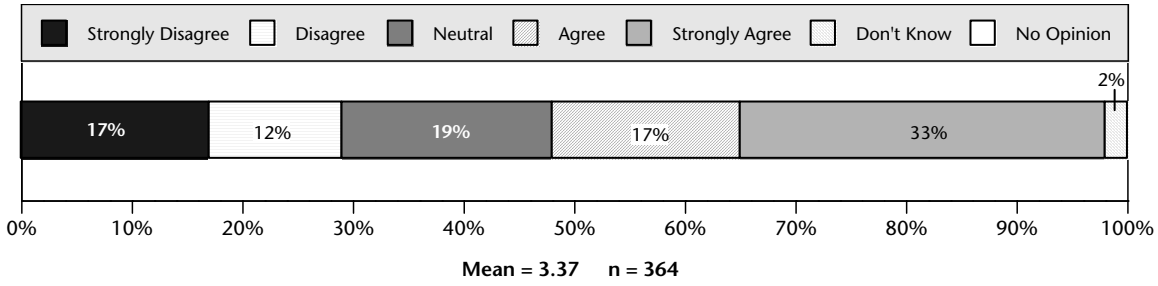
Exhibit C-20.
Property owners should have a right to subdivide and build in the floodplain.



Source: BBC Research and Consulting.

Property owners should be able to protect property from floods. On average, residents responded to the statement, "property owners should be able to protect their property from flooding with manmade structures, such as riprap, levees, or dikes," with between "neutral" and "agree." Residents most often indicated that they "strongly agree" with the statement, though, as shown in Exhibit C-21 below.

Exhibit C-21.
Property owners should be able to protect their property from flooding with manmade structures such as riprap, levees, or dikes.

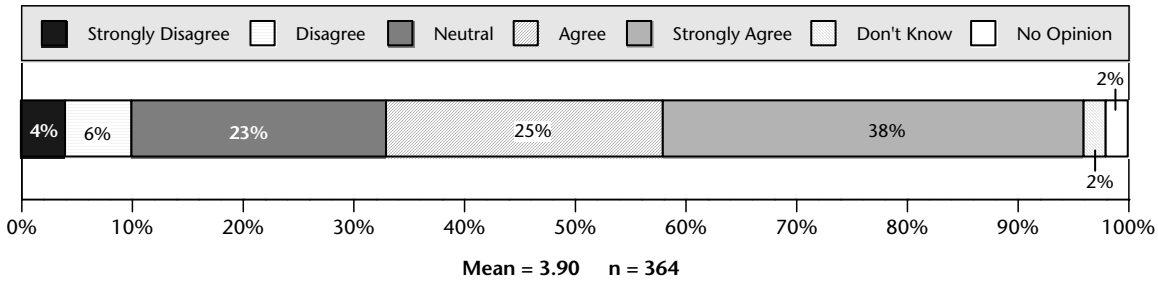


Mean = 3.37 n = 364

Source: BBC Research and Consulting.

The visitor experience on the river is important. When asked whether they agree that the visitor experience on the river is very important to the wellbeing of Park County, respondents on average indicated that they nearly "agree" with that statement, while they most often said that they "strongly agree." See Exhibit C-22 below.

Exhibit C-22.
The quality of the visitor experience on the river is very important to the well being of Park County.

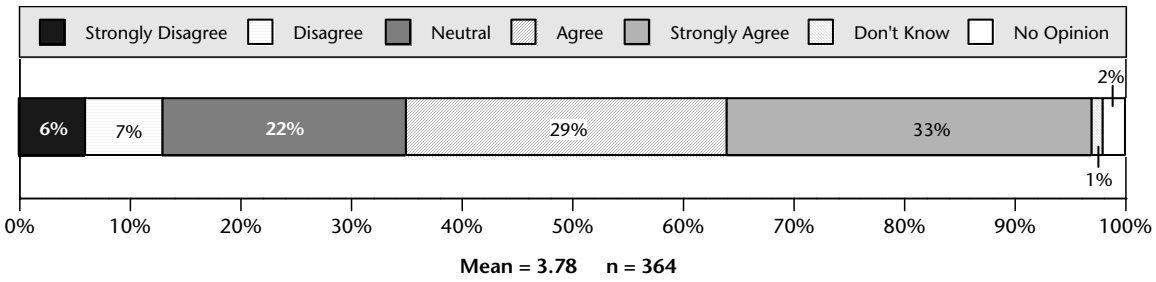


Mean = 3.90 n = 364

Source: BBC Research and Consulting.

Fishing is important to quality of life. According to residents in Park County, fishing as a major component of the quality of life for Park County residents is between a "neutral" and an "agreeable" statement. Residents most often responded with a "strongly agree" to this statement, as shown in Exhibit C-23 below.

Exhibit C-23.
Fishing in the Upper Yellowstone is a major component of the quality of life of Park County residents.

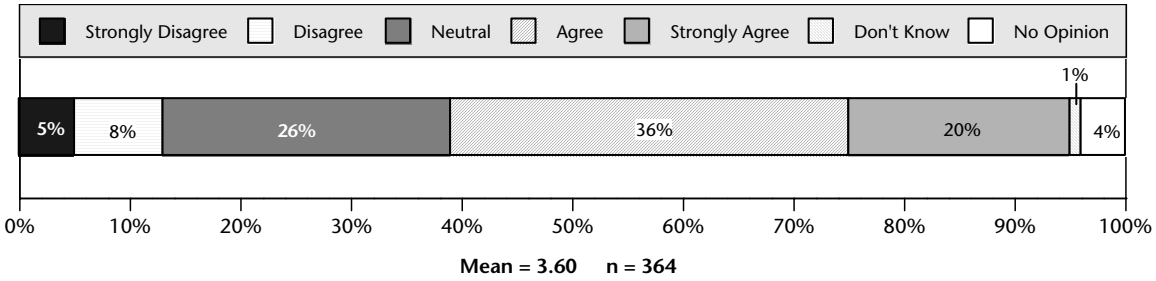


Mean = 3.78 n = 364

Source: BBC Research and Consulting.

Other river-related recreation is important to quality of life. When asked whether they agree that other river-related recreational activities are important components of the quality of life of Park County residents, residents on average responded between "neutral" and "agree." They most often answered that they "agreed" with the statement (see Exhibit C-24 below).

Exhibit C-24.
Other river-related recreational activities are important components of the quality of life of Park County residents.

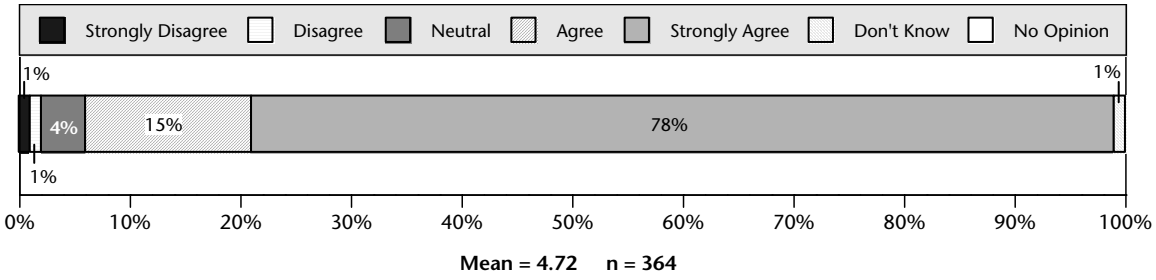


Mean = 3.60 n = 364

Source: BBC Research and Consulting.

The beauty of the river is important to quality of life. When asked whether the beauty of the Upper Yellowstone River is an important component of the quality of life of Park County residents, residents on average responded between "agree" and "strongly agree," though they most often answered with "strongly agree." This distribution is shown in Exhibit C-25 below.

Exhibit C-25.
The beauty of the Upper Yellowstone River is an important component of the quality of life of Park County residents.

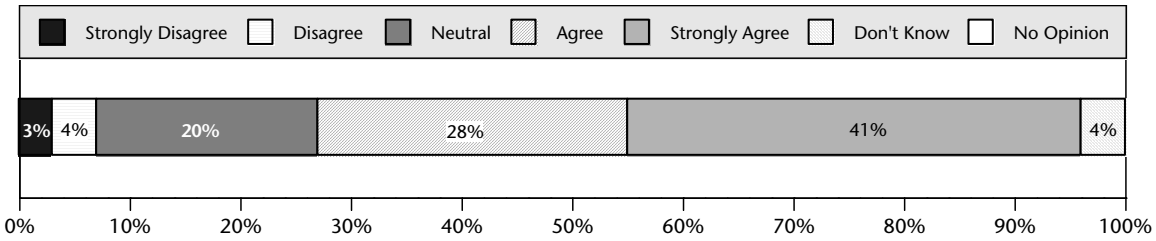


Mean = 4.72 n = 364

Source: BBC Research and Consulting.

The river is important in people moving and staying here. Residents on average expressed a little more than "agreement" with the statement, the Upper Yellowstone River is an important reason why people move here *and* stay here. They most often answered with "strongly agree" to this statement, however, as shown in Exhibit C-26 below.

Exhibit C-26.
The Upper Yellowstone River is an important reason why people move here *and* stay here.

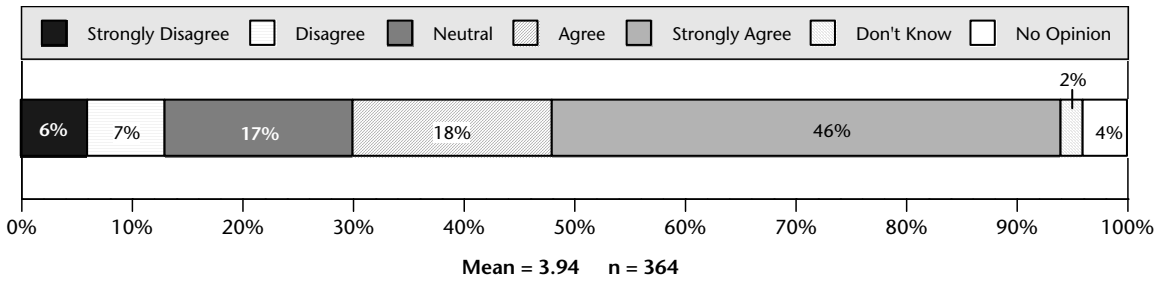


Mean = 4.05 n = 364

Source: BBC Research and Consulting.

Overuse of the river threatens residents. When asked whether overuse or overcrowding of the Upper Yellowstone River threatens the well being of Park County residents, respondents on average replied with nearly "agree," though they most often answered "strongly agree." See Exhibit C-27 below.

Exhibit C-27.
Overuse or overcrowding of the Upper Yellowstone River threatens the well being of Park County residents.

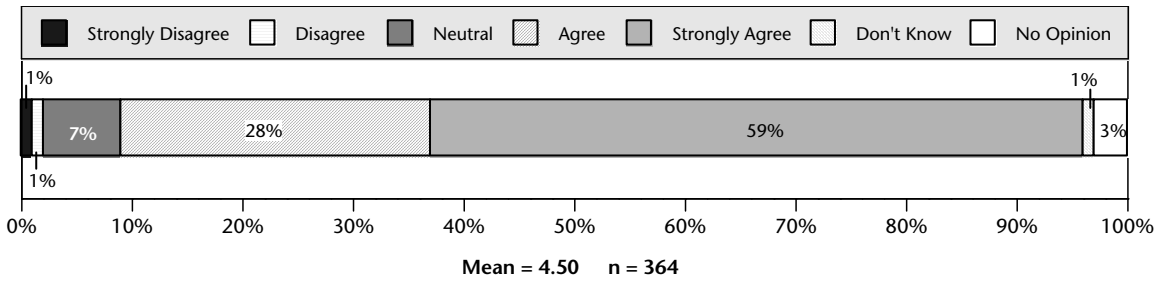


Mean = 3.94 n = 364

Source: BBC Research and Consulting.

Riverbank vegetation is important. On average, residents responded to the statement that riverbank vegetation is important to the river experience with exactly between "agree" and "strongly agree," and they most often answered with "strongly agree," as displayed in Exhibit C-28 below.

Exhibit C-28.
Riverbank vegetation is important to the river experience.

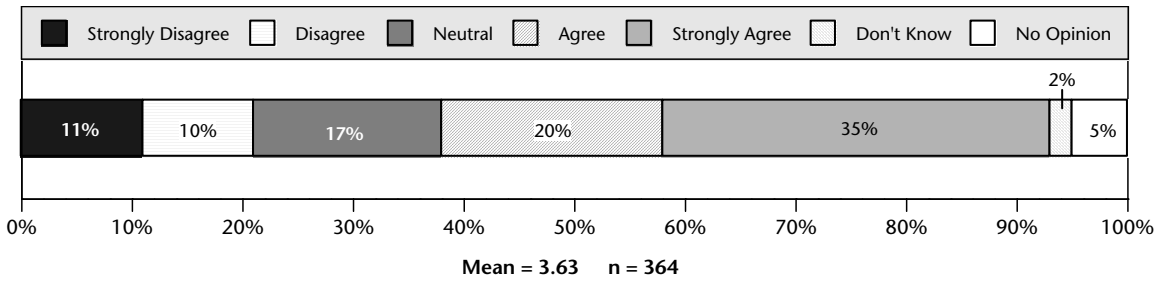


Mean = 4.50 n = 364

Source: BBC Research and Consulting.

A managed river is best. When asked whether a river that is managed to reduce flooding and erosion is in the best overall economic and social interest of Park County residents, residents on average responded with between "neutral" and "agree," though they most often answered "strongly agree" (see Exhibit C-29 below).

Exhibit C-29.
A river that is managed to reduce flooding and erosion is in the best overall economic and social interest of Park County residents.

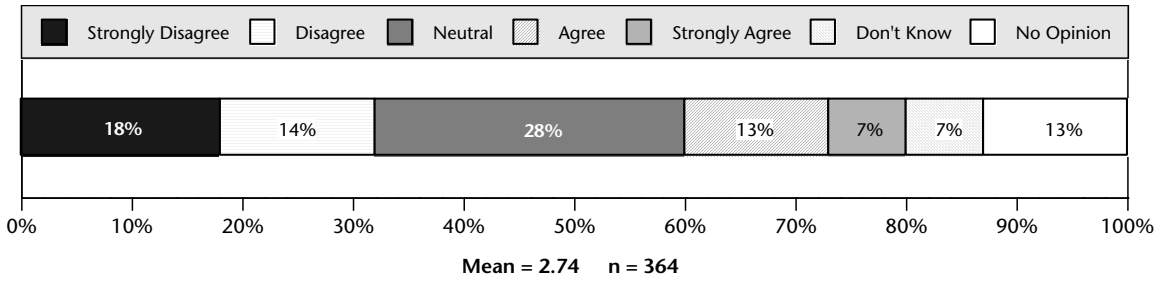


Mean = 3.63 n = 364

Source: BBC Research and Consulting.

Prior management has been consistent and effective. On average, residents responded to the statement that prior management of the river has been consistent and effective with between "disagree" and "neutral." They most often answered "neutral," as shown in Exhibit C-30 below.

Exhibit C-30.
Prior management of the river has been consistent and effective.

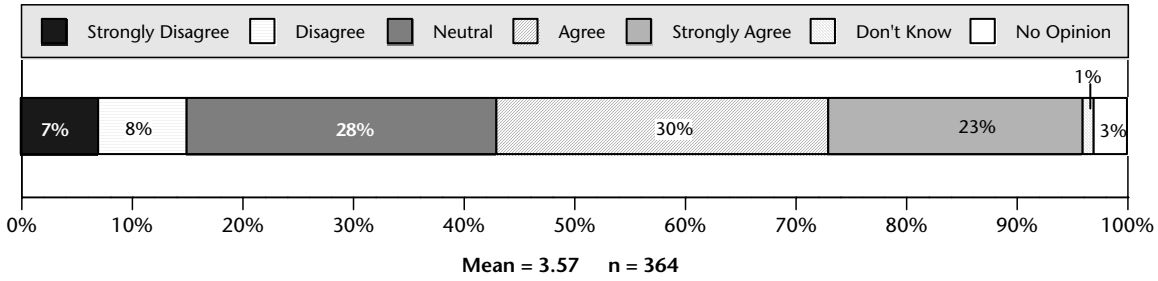


Mean = 2.74 n = 364

Source: BBC Research and Consulting.

The river is the lifeblood of the county. Survey respondents on average responded to the statement that the Upper Yellowstone River is the lifeblood of Park County with between "neutral" and "agree." Residents most often answered with "agree," as shown in Exhibit C-31 below.

Exhibit C-31.
The Upper Yellowstone River is the lifeblood of Park County.



Source: BBC Research and Consulting.