

County	Richland	Upstream River Mile	27.8
Classification	PCM/I: Partly confined meandering/islands	Downstream River Mile	13.5
General Location	To Fairview	Length	14.30 mi (23.01 km)

Narrative Summary

Reach D14 is located upstream of Fairview. The reach is a 14.3 mile long Partially Confined Meandering with Islands (PCM/I), indicating some valley wall influence, and a meandering main thread with cutoff channels through meander cores forming persistent forested islands.

There is just over a mile of bank armor in the reach, including 3,900 feet of rock riprap and 2,500 feet of flow deflectors. Most of the rock riprap was constructed between 2001 and 2011 (2,300 feet).

Prior to 1950, 3,600 feet of side channel was blocked in the reach at RM 23L.

Similar to many reaches in the Lower Yellowstone Valley, the river channel in Reach D14 has gotten smaller since 1950. The channel contracted by about 309 acres in this reach since 1950, and about 460 acres of riparian vegetation has encroached into old channel areas. This pattern has been consistent in the lower river, and relates primarily to a reduction in flows due to human development. Floodplain turnover rates have dropped from 14.4 acres per year pre-1976 to 6.1 acres per year post-1976. There has also been a major loss of open bar habitat area in the channel; between 1950 and 2001, there was a loss of 510 acres of mid-channel bar area, which can be important habitat to certain species such as least tern.

Land use is predominantly agricultural, with just over a thousand acres of pivot irrigation development since 1950. Development in the reach included conversion of 1,063 acres of 1950s riparian area to other land uses (mostly irrigated agriculture); that represented 36 percent of the entire 1950s riparian footprint. There are 93 acres of pivot irrigated land and 113 acres of urban/exurban development within the Channel Migration Zone (CMZ), making these areas especially susceptible to river erosion. At RM 26L there are three drill pads within the CMZ.

Several dump sites have been mapped on the banks: RM 25R, RM 24.3L, RM 17L, RM 15.8L, and RM 15.8R.

There is one pipeline crossing in Reach D14 at RM 27. It is an 8-inch crude oil pipeline that has been Horizontally Directionally Drilled.

About 41 percent of the historic 5-year floodplain has become isolated, primarily due to flow alterations.

One ice jam was reported in the reach. It was a break-up flood event on March 17, 2011.

There are about 36 acres of mapped Russian olive in the reach.

Reach D14 was sampled as part of the avian study. A total of 30 bird species were identified in the reach. Two bird species identified by the Montana Natural Heritage Program as Potential Species of Concern (PSOC) on the Yellowstone River were found, the Ovenbird and the Plumbeous Vireo. Reach D14 has seen a decrease in the forested area that is at low risk of cowbird parasitism since 1950. At that time, there were 25.6 acres per valley mile of such forest, and that number dropped to 19.6 acres per valley mile by 2001.

CEA-Related observations in Reach D14 include:

- Flow alteration impacts on floodplain access

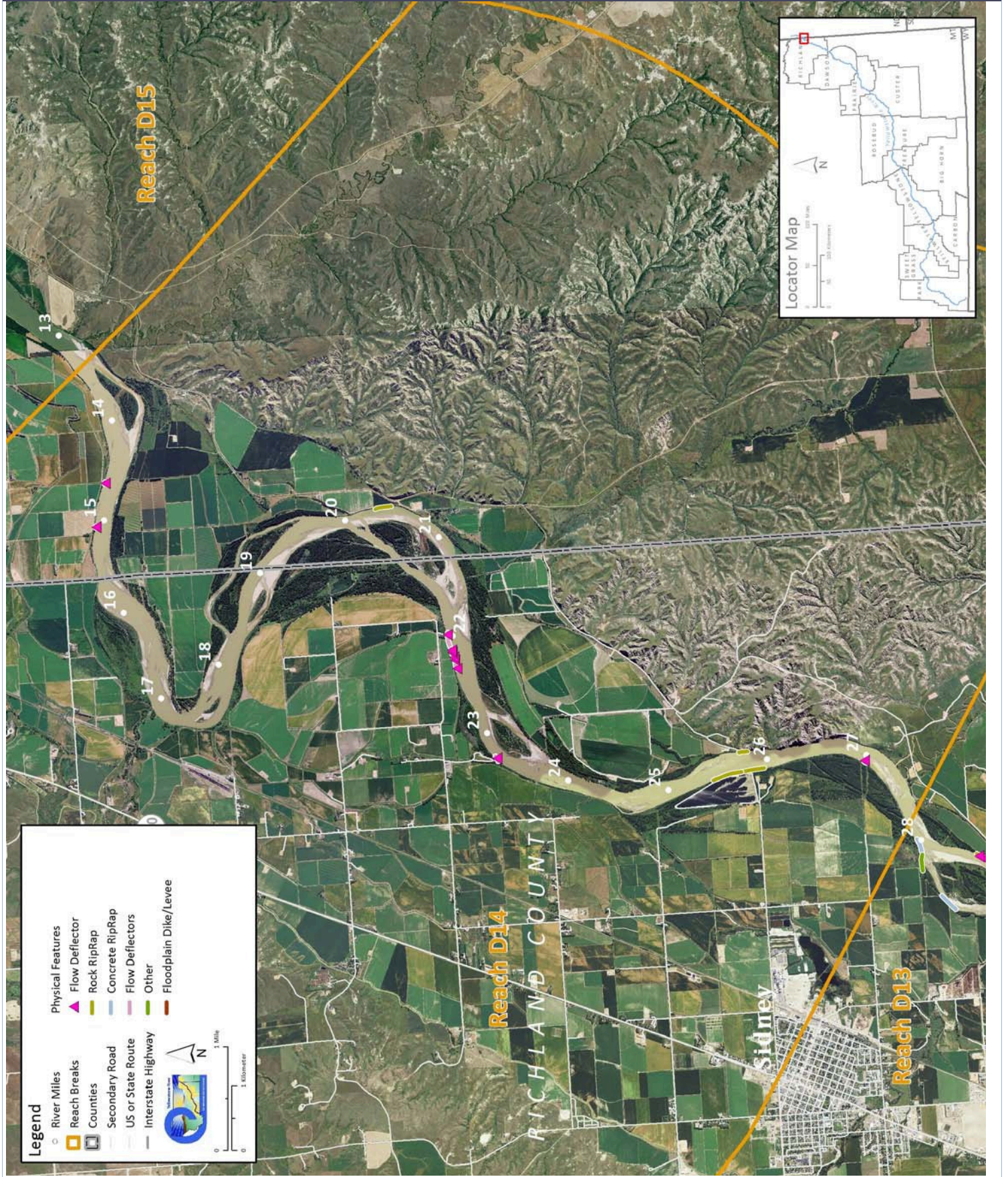
Recommended Practices (may include Yellowstone River Recommended Practices--YRRPs) for Reach D14 include:

- Solid waste removal at dump sites at RM 25R, RM 24.3L, RM 17L, RM 15.8L, and RM 15.8R.
- Side channel reactivation at RM 23L
- Pipeline crossing Management at RM 27.
- Russian olive removal

The following table summarizes some key CEA results that have been used to describe overall condition and types of human influences affecting the river. The values are specific to this single reach. Blanks indicate that a particular value was not available for this area. This information is consolidated from a large dataset that is presented in more detail in the full reach narrative report.

Discharge	Undev.	Developed	% Change	"Undeveloped" flows represent conditions prior to significant human development, whereas "developed" flows reflect the current condition of both consumptive and non-consumptive water use.		
2 Year (cfs)	69,900	54,300	-22.3%			
100 Year (cfs)	143,000	134,000	-6.3%			
Bankfull Channel Area (Ac)	1950	1976	1995	2001	1950-2001	Bankfull channel area is the total footprint of the river inundated at approx. the 2-year flood.
	2,206.2	2,091.0	1,933.5	1,896.8	-309.4	
Physical Features	2011 Length (ft)	% of Bankline	2001-2011 Change	There are additional types of bank armor such as car bodies and steel retaining walls, but they are relatively minor.		
Rock Riprap	3,906	2.6%	2,293			
Concrete Riprap	0	0.0%	0			
Flow Deflectors	2,505	1.7%	273			
Total	6,411	4.2%	2,566			
Length of Side Channels Blocked (ft)	Pre-1950s	Post-1950s	Numerous side channels have been blocked by small dikes.			
	3,595	0				
Floodplain Turnover	1950 - 1976	1976 - 2001	1950-2001 In-channel riparian encroachment (negative number indicates retreat)	The rate of floodplain turnover reflects how many acres of land are eroded by the river. Turnover is associated with the creation of riparian habitat.		
Total Acres	375.2	152.5				
Acres/Year	14.4	6.1				
Acres/Year/Valley Mile	1.1	0.5	459.11 acres			
Open Bar Area	Point Bars	Bank Attached	Mid-Channel	Total	The type and extent of open sand and gravel bars reflect in-stream habitat conditions that can be important to fish, amphibians, and ground-nesting birds such as least terns.	
Change in Area '50 - '01 (Ac)	9.8	94.4	-510.3	-406.1		
Floodplain Isolation	Acres	% of FP	Floodplain isolation refers to area that historically was flooded, but has become isolated do to flow alterations or physical features such as levees.			
5 Year	1,046.3	41%				
100 Year	1,450.6	17%				
Restricted Migration Area	Acres	% of CMZ	Channel Migration Zone restrictions refer to the area and percent of the CMZ that has been isolated by features such as bank armor, dikes, levees, and transportation embankments.			
	160.9	3%				
Land Use	1950	2011	1950	2011	Changes in land use reflect the development of the river corridor through time. The irrigated agricultural are is a sub-set of the mapped agricultural land.	
Agricultural Land (Ac)	8,402.4	8,078.6	Flood (Ac)	3,832.7	3,990.2	
Ag. Infrastructure (Ac)	49.0	153.3	Sprinkler (Ac)	0.0	0.0	
Exurban (Ac)	0.0	161.4	Pivot (Ac)	0.0	1,003.3	
Urban (Ac)	0.0	0.0				
Transportation (Ac)	65.0	73.2				
1950s Riparian Vegetation Converted to a Developed Land Use (ac)	To Irrigated	To Other Use	Total Rip. Converted	% of 1950s Rip.	Changes in the extents of riparian vegetation are influenced by land use changes within the corridor.	
	940.2	123.1	1,063.3	36.0%		
National Wetlands Inventory	Acres	Acres per Valley Mi	Total Wetland Acres	Wetlands units summarized from National Wetlands Inventory Mapping include Riverine (typically open water sloughs), Emergent (marshes and wet meadows) and Shrub-Scrub (open bar areas with colonizing woody vegetation).		
Riverine	8.1	0.6	289.5			
Emergent	137.1	10.9				
Scrub/Shrub	144.3	11.5				
Russian Olive (2001) (Appx. 100-yr Floodplain)	Acres	%	Russian olive is considered an invasive species and its presence in the corridor is fairly recent. Its spread can be used as a general indicator of invasive plants within the corridor.			
	35.7	0.8%				
Riparian Forest at low risk of Cowbird Parasitism (Ac/Valley Mile)	1950	1976	2001	Change 1950-2011	Cowbirds are associated with agricultural and residential development, displacing native bird species by parasitizing their nests.	
	25.6	38.1	19.6	-5.9		

PHYSICAL FEATURES MAP (2011)



CHANNEL MIGRATION ZONE MAP

