

# Bird Conservation Region 11 - Prairie Potholes MBMG

## Montana Geology 30 x 60 Minute Quadrangles

| <b>Age Class</b> | <b>Lithology</b> | <b>Formation</b>                                  | <b>Acres in BCR 11</b> | <b>Percent of BCR</b> |
|------------------|------------------|---|------------------------|-----------------------|
| Cretaceous       | Igneous          | Kam Adel Mountain Volcanics                       | 40.00                  | 0.0002                |
| Cretaceous       | Sedimentary      | Kb Bearpaw Shale                                  | 3,621,946.00           | 17.6260               |
|                  |                  | Kjr Judith River Formation                        | 2,753,684.00           | 13.4006               |
|                  |                  | Kmk Marias River Formation, Kevin Member          | 1,052,533.00           | 5.1221                |
|                  |                  | Kcl Claggett Shale                                | 849,927.00             | 4.1361                |
|                  |                  | Ke Eagle Formation                                | 644,180.00             | 3.1349                |
|                  |                  | Khc Hell Creek Formation                          | 463,387.00             | 2.2550                |
|                  |                  | Ktc Telegraph Creek Formation                     | 175,997.00             | 0.8565                |
|                  |                  | Kfh Fox Hills Formation                           | 173,539.00             | 0.8445                |
|                  |                  | Kmf Marias River Formation, Ferdig Member         | 160,962.00             | 0.7833                |
|                  |                  | Khfh Hell Creek Formation and Fox Hills Formation | 103,160.00             | 0.5020                |
|                  |                  | Kbb Blackleaf Formation, Bootlegger Member        | 74,087.00              | 0.3605                |
|                  |                  | Kmc Marias River Formation, Cone Member           | 49,170.00              | 0.2393                |
|                  |                  | Kmfl Marias River Formation, Floweree Member      | 45,564.00              | 0.2217                |
|                  |                  | Kbt Blackleaf Formation, Taft Hill Member         | 40,383.00              | 0.1965                |
|                  |                  | Ktca Telegraph Creek through Carlile Formations   | 32,404.00              | 0.1577                |

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|-------------------------------------|-----------|---|-----------------|----------------|
|                                     |           | Kblf Blackleaf Formation, Flood Member                | 29,626.00       | 0.1442         |
|                                     |           | Kk4 Kootenai Formation, Informal fourth member        | 29,283.00       | 0.1425         |
|                                     |           | Kbv Blackleaf Formation, Vaughn Member                | 24,791.00       | 0.1206         |
|                                     |           | Ktcm Telegraph Creek and Marias River Formations      | 21,651.00       | 0.1054         |
|                                     |           | Kmfr Mowry through Fall River Formations, undivided   | 15,324.00       | 0.0746         |
|                                     |           | Kvi Virgelle Formation                                | 13,589.00       | 0.0661         |
|                                     |           | Kgrb Greenhorn Formation, Belle Fourche Shale         | 11,198.00       | 0.0545         |
|                                     |           | Kmr Marias River Formation                            | 8,206.00        | 0.0399         |
|                                     |           | Kbl Blackleaf Formation                               | 7,738.00        | 0.0377         |
|                                     |           | Kk5 Kootenai Formation, Informal fifth member         | 7,658.00        | 0.0373         |
|                                     |           | Kks Kootenai Formation, Sunburst Sandstone Member     | 4,712.00        | 0.0229         |
|                                     |           | Kk Kootenai Formation Informal second member          | 4,023.00        | 0.0196         |
|                                     |           | Ket Eagle and Telegraph Creek Formations, undivided   | 3,595.00        | 0.0175         |
|                                     |           | Kk2 Kootenai Formation                                | 2,624.00        | 0.0128         |
|                                     |           | Ktf Thermopolis and Fall River Formations             | 1,027.00        | 0.0050         |
|                                     |           | Ktcb Telegraph Creek through Belle Fourche Formations | 951.00          | 0.0046         |
|                                     |           | Kkc Kootenai Formation, Cutbank Sandstone Member      | 678.00          | 0.0033         |
|                                     |           | Km Mowry Shale  | 427.00          | 0.0021         |
|                                     |           | Kbfl Belle Fourche Shale, Lower member                | 188.00          | 0.0009         |
|                                     |           | Ktm Two Medicine Formation                            | 86.00           | 0.0004         |
| Cretaceous and Jurassic Sedimentary |           |   |                 |                |
|                                     |           | KJm Morrison Formation                                | 446.00          | 0.0022         |

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|------------------|------------------|---|------------------------|-----------------------|
| Current          | Current          |   |                        |                       |
|                  |                  | af Artificial fill - large dams, freeway interchanges | 232.00                 | 0.0011                |
| Jurassic         | Sedimentary      |   |                        |                       |
|                  |                  | Je Ellis Group, undivided                             | 2,330.00               | 0.0113                |
|                  |                  | Js Sedimentary rocks, undivided                       | 310.00                 | 0.0015                |
|                  |                  | Jsw Swift Formation                                   | 113.00                 | 0.0005                |
|                  |                  | Jr Rierdon Formation                                  | 16.00                  | 0.0001                |
| Mississippian    | Sedimentary      |   |                        |                       |
|                  |                  | Mm Madison Group, undivided                           | 1,091.00               | 0.0053                |
| Quaternary       | Sedimentary      |   |                        |                       |
|                  |                  | Qal Alluvium  | 1,328,707.00           | 6.4661                |
|                  |                  | Qg Glacial deposit                                    | 1,253,311.00           | 6.0992                |
|                  |                  | Qac Alluvium and colluvium                            | 913,587.00             | 4.4459                |
|                  |                  | Qgtw Glacial till                                     | 433,272.00             | 2.1085                |
|                  |                  | Qsg Sand and gravel                                   | 362,960.00             | 1.7663                |
|                  |                  | Qgt Glacial till                                      | 252,042.00             | 1.2265                |
|                  |                  | Qgl Glacial lake deposit                              | 225,613.00             | 1.0979                |
|                  |                  | Qao Alluvium  | 135,640.00             | 0.6601                |
|                  |                  | Qgto Glacial till                                     | 75,541.00              | 0.3676                |
|                  |                  | Qat Alluvium  | 51,022.00              | 0.2483                |
|                  |                  | Qls Landslide deposit                                 | 41,707.00              | 0.2030                |
|                  |                  | QTatg Alluvium  | 28,116.00              | 0.1368                |

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|            |             | Qpg Pediment gravel deposit                    | 22,391.00       | 0.1090         |
|            |             | Qgr Gravel                                     | 19,151.00       | 0.0932         |
|            |             | Qe Eolian deposit                              | 13,166.00       | 0.0641         |
|            |             | Qgi Glacial ice-contact deposit                | 11,189.00       | 0.0545         |
|            |             | Qlk Lake deposit                               | 6,892.00        | 0.0335         |
|            |             | Qgsg Glacial sand and gravel deposit           | 3,593.00        | 0.0175         |
|            |             | Qgac Gravelly sheetwash alluvium and colluvium | 2,993.00        | 0.0146         |
|            |             | Qc Colluvium                                   | 2,243.00        | 0.0109         |
|            |             | QTatc Alluvium                                 | 1,063.00        | 0.0052         |
|            |             | Qglb Glacial lake bar deposit                  | 92.00           | 0.0004         |
|            |             | Qge Glacial esker deposit                      | 55.00           | 0.0003         |
|            |             | Qgk Glacial kame deposit                       | 28.00           | 0.0001         |
| Quaternary | Sedimentary | QTat Alluvium                                  | 1,952.00        | 0.0095         |
|            |             | QTab Alluvium                                  | 1,831.00        | 0.0089         |
|            |             | QTgr Gravel                                    | 1,087.00        | 0.0053         |
| Tertiary   | Igneous     | Tmv Mafic volcanic rocks                       | 132,088.00      | 0.6428         |
|            |             | Tfv Felsic volcanic rocks                      | 29,306.00       | 0.1426         |
|            |             | Tl Latite and porphyritic latite               | 22,904.00       | 0.1115         |
|            |             | Tss Shonkinite and syenite                     | 16,002.00       | 0.0779         |
|            |             | Tsyp Syenite porphyry                          | 12,537.00       | 0.0610         |

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|           |             | Tdip Diorite porphyry                            | 8,117.00        | 0.0395         |
|           |             | Tfpy Felsic pyroclastic rocks                    | 7,571.00        | 0.0368         |
|           |             | Tmo Monzonite                                    | 7,511.00        | 0.0366         |
|           |             | Tphm Phonolite, mafic                            | 4,311.00        | 0.0210         |
|           |             | Ttp Trachyte porphyry                            | 3,945.00        | 0.0192         |
|           |             | Tmop Monzonite porphyry                          | 1,662.00        | 0.0081         |
|           |             | Tsy Syenite                                      | 875.00          | 0.0043         |
|           |             | Tmpy Mafic pyroclastic rocks                     | 423.00          | 0.0021         |
|           |             | Tphi Phonolite, mafic, intrusive                 | 248.00          | 0.0012         |
|           |             | Tla Lamprophyre                                  | 114.00          | 0.0006         |
|           |             | Tfb Felsite breccia                              | 44.00           | 0.0002         |
|           |             | Ti Intrusive rocks                               | 2.00            | 0.0000         |
| Tertiary  | Metamorphic | Tbp Biotite pyroxenite                           | 535.00          | 0.0026         |
| Tertiary  | Sedimentary | Tftr Fort Union Formation, Tongue River Member   | 1,493,548.00    | 7.2683         |
|           |             | Tfle Fort Union Formation, Lebo Member           | 657,609.00      | 3.2002         |
|           |             | Tf Flaxville Formation                           | 557,504.00      | 2.7131         |
|           |             | Tsg Sand and gravel                              | 540,359.00      | 2.6296         |
|           |             | Tft Fort Union Formation, Tullock Member         | 283,824.00      | 1.3812         |
|           |             | Tfu Fort Union Formation                         | 157,002.00      | 0.7640         |
|           |             | Tfsb Fort Union Formation, Sentinel Butte Member | 97,976.00       | 0.4768         |
|           |             | Tw Wasatch Formation                             | 6,104.00        | 0.0297         |

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|           |           | Tatt Alluvium  | 4,065.00        | 0.0198         |
|           |           | Tatb Alluvium  | 2,892.00        | 0.0141         |
|           |           | Tat Alluvium   | 1,563.00        | 0.0076         |
|           |           | Tsh Shonkinite | 452.00          | 0.0022         |
| Water     |           | W Water        | 11,152.00       | 0.0543         |