

Hydrologic Reconnaissance of Wetland Bird Habitat in Areas With Potential to be Influenced by Water Produced During Coalbed Methane Production in the Northern Powder River Basin, MT

Steve Custer, Earth Sciences, Montana State University, Bozeman, MT 59717-3480, uessc@montana.edu

Richard S. Sojda, USDI-Geological Survey, Northern Rocky Mountain Science Center, Montana State University, Bozeman, MT 59717-3942, sojda@usgs.gov

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1. Location

2. Problem

3. Map Methods



CBM Produced Water

- Withdrawal decline in water level
- Disposal increase in water level
- Change in water quality
- Change in hydroperiod
- Effect on wetland bird habitat



Criteria:

- Palustrine emergent wetlands
- Large enough to meet wetland bird life history requirements
- High potential for CBM development
- Accessible for field reconnaissance



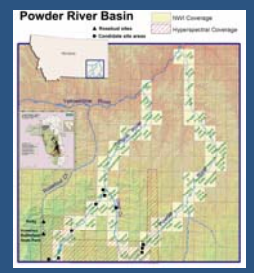
Review Digital Video Tape for 655 Miles of Flood Plain:

- Otter Creek
- Powder River
- Stump Creek
- Tongue River



Results:

- 29 candidate sites for field reconnaissance
- <http://swan.msu.montana.edu/cbm/>



4. Field Methods and Initial Reconnaissance

Criteria:

- Wetland bird observations
- Aquatic plant observations
- Assess elevation above river
- Assess salinity with refractometer
- Check criteria for wetland type
- Observe wetland extent

Observations:

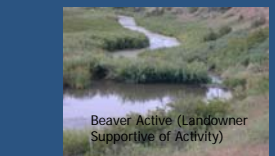
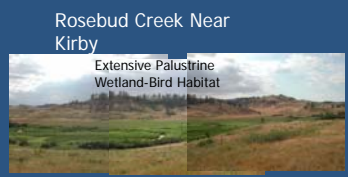
- Almost no wetland birds
- Facultative plants primarily
- Inundation infrequent
- Stream flow dilute produced waters
- Observed TDS sometimes high (30,000 ppm)
- Palustrine wetland extent small
- Oxbow cutoffs not currently productive for wetland birds



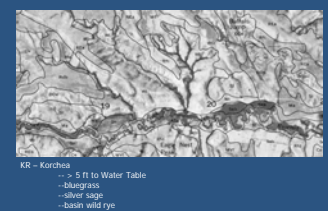
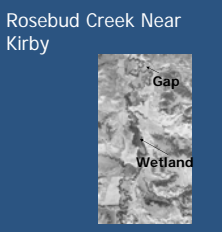
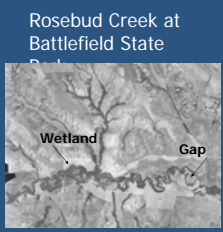
5. Field Results: Rosebud

Field Reconnaissance Adjacent to Investigated Area Reveals More Potential for Wetland Bird Habitat

Habitat
Rosebud Creek at Battlefield State Park



Wetland Bird Habitat Is Discontinuous



KR - Korchica
--> 5 ft to Water Table
--bluegrass
--sage slope
--sash wild rye

ATC - Alluvial Land
--Water Table 1-5 ft
--sedge
--yellow
--reed canary grass
--cattail

Terraces, Mead (Ma) Farnuf (F, Fb)
Grail (Gr) Savage (Sd)

Colluvial footlopes:
Farnuf-Doney complex (FD)
Grail (Go)
Cherry (Co)
Savage (Seb, Sea)

Sedimentary uplands:
Doney (Doe, DOB) (shaley)
Midway-Thedaland complex (MVT)
Reeder-Regent Complex (RC)
Reeder Series (Rib)
Regent Series (Ric, Rig)
Brinkley-Doney complex (BD)
Searing-Ringling complex (SR)
Wayden-Regent complex (WR)

- Are wetlands associated with beaver persistent?
- Are these palustrine wetlands controlled by
 - incision
 - geomorphic factors which control position
 - or landowners who accept presence of beaver?

6. Conclusions

Wetland bird habitat is rare in the area studied. Beaver play a wetland bird habitat role. Wetlands are discontinuous. Controls on wetland gaps need further investigation. Magnitude and distribution of wetlands like those along the Rosebud need documentation. Effects of coalbed methane produced water are unclear but may include:

- increased stream permanence, which could, in turn, increase potential for beaver and wetland bird habitat
- water quality changes may affect habitat quality
- factors that influence habitat continuity need biologic/geologic/hydrologic investigation
 - geomorphologic/geologic controls
 - channel incision
 - channel gradient
 - role of beaver
 - water-vegetation-beaver feedback loop
 - human-beaver interaction
 - water quality, beaver, vegetation, wetland bird interaction

