

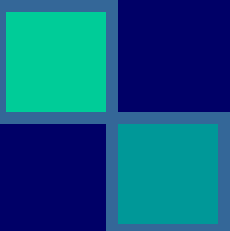

# AQUATIC BIOTA MONITORING

## Aquatic Task Group



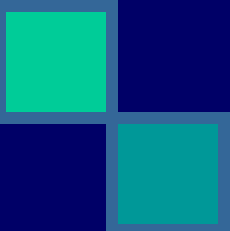



# BASIC QUESTION

- 
- What effect does (or will) CBNG produced water have on aquatic biota and their habitats?
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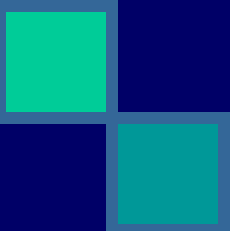



# Objectives

- 
- Establish **baseline** conditions for aquatic biota and their habitat
  - Evaluate existing or potential effects of CBNG water discharge on aquatic life
- 



# Sub-Task Monitoring Plans

- 
- Aquatic/Riparian Habitat
  - Fish
  - Macroinvertebrates
  - Amphibians (Herps)
  - Research
- 



# Watersheds to be monitored


*Data on current biotic conditions will be benchmark against which subsequent monitoring data will be compared to assess CBNG effects.*

- Rosebud Creek (MT): 3 sites
  - Tongue River (MT & WY): 18 MT/3WY
  - Powder River (MT & WY): 6MT/8WY
  - Belle Fourche River (Wyoming): 8 sites
  - Cheyenne River (Wyoming): 8 sites
- 



# Stream segment sampling Reach



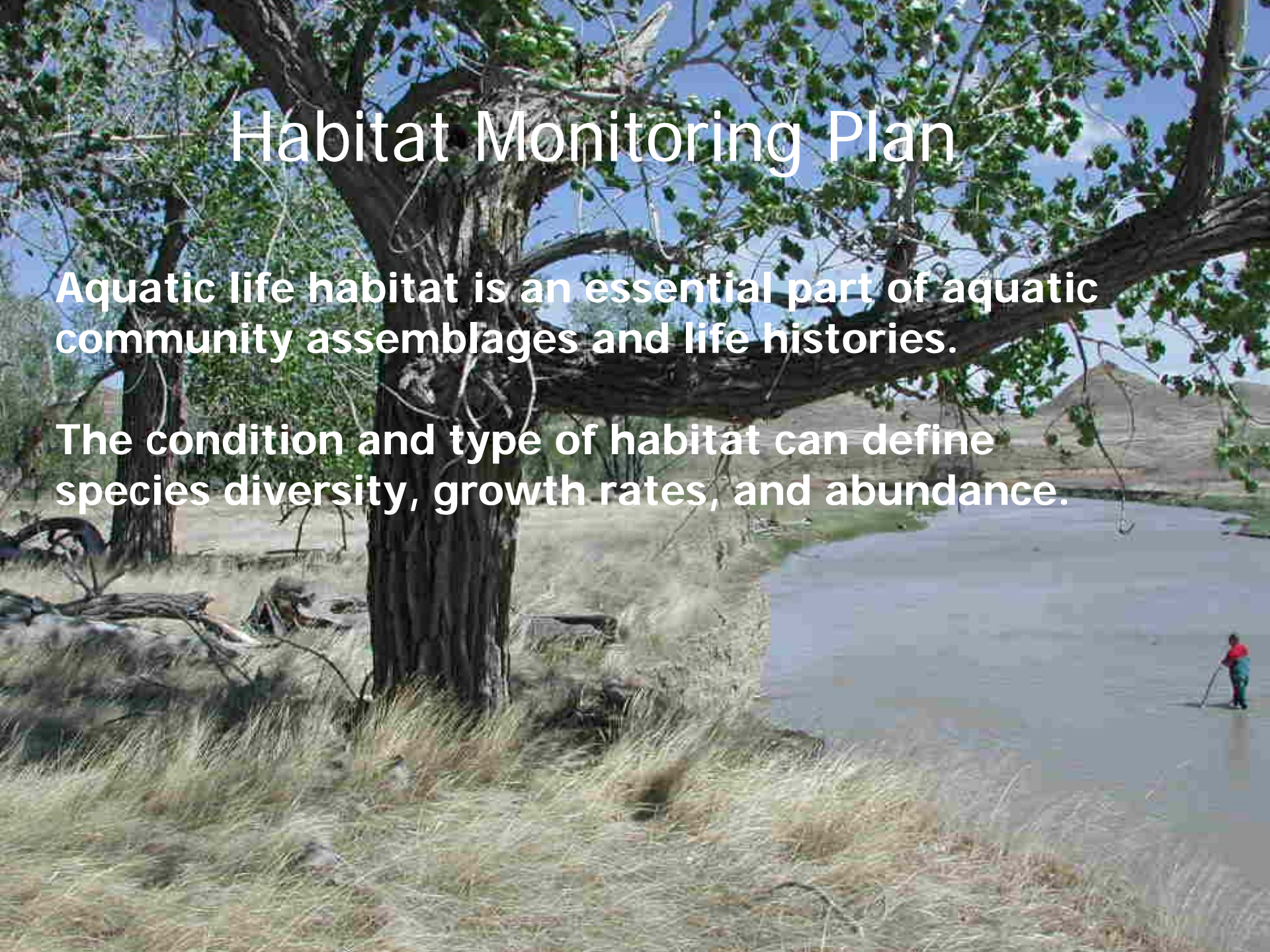
- 2 Meander lengths\*; 20 bank full channel widths; or 500 meters --- whichever is greater.
  - \*Larger streams (Tongue or Powder): length may change to capture all habitat types (esp. for fish).
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# Habitat Monitoring Plan

**Aquatic life habitat is an essential part of aquatic community assemblages and life histories.**

**The condition and type of habitat can define species diversity, growth rates, and abundance.**






# Habitat Monitoring

Each site once per year for 3 years



- Current type of aquatic habitat available
  - Assess changes over time
  - Determine if changes are due to CBNG
  - Develop mitigation measures
- 



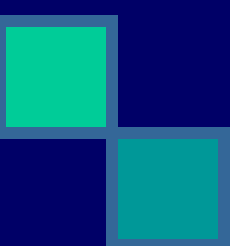

# Fish Monitoring Plan

**Determine native and introduced species composition and distribution (temporally and spatially) relative to their available habitat**





# Fish Monitoring

- 
- 3 times per site per year  
(Pre and post runoff and late season)
  - Repeat annually for 3 years to establish baseline condition
  - Protocols still being evaluated (MT, WY, EMAP, NAWQA)
- 



# Macroinvertebrate (bugs) Monitoring Plan

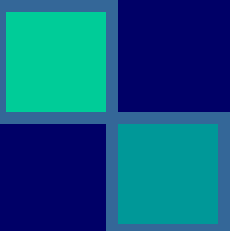



**Use measures of macroinvertebrate community composition and tolerance to assess impacts of CBNG development on aquatic life**



# Macroinvertebrate Monitoring

Once each year per site during summer/fall low water period

- 
- Semi-qualitative sample (relative abundance within fast flowing habitat)
  - Qualitative multi-habitat sample
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Species ID and quantification to be done through existing BLM contract



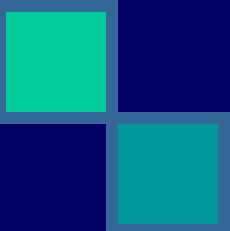

# Amphibians and Aquatic Dependent Reptiles (Herps) Monitoring Plan



- Recommended for development - See research proposal



# Research Proposals

- 
- A. Literature review and study plan development to assess effects of CBNG activities on fish assemblages.
  - B. Development of a prairie fish index of biotic integrity for streams in WY and MT.
  - C. Impacts to amphibians and reptiles in relation to effects from CBNG production.
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# Estimated Costs

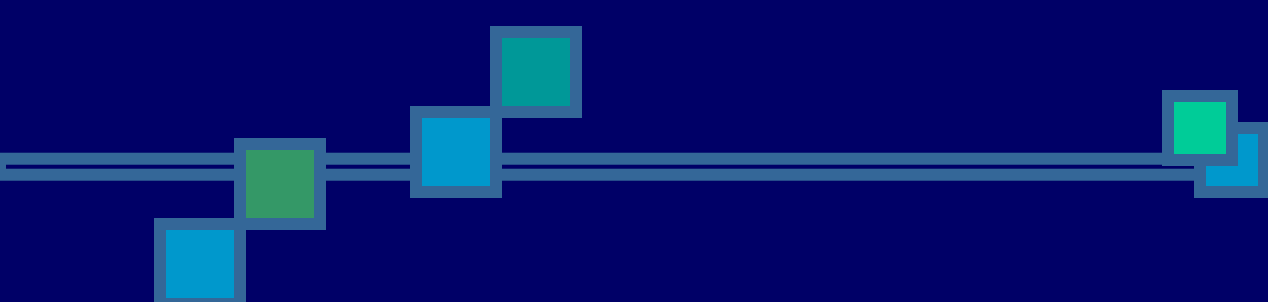
Based on hiring additional GS-level personnel w/in the BLM (2 field crews of 3 seasonal techs and 1 FTE fishery biologist)

## Monitoring


- Per station: \$2,895
  - Total: \$217,530 annually (\$108,765 per state)
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## Research

- \$433,400 (one-time cost)



# Limitations and unresolved issues

- No sampling sites to specifically monitor aquatic biota or habitat within CBNG discharge. Proposed sampling is to establish baseline.
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# Other issues for IWG to consider

- Sentinel fish monitoring
- Periphyton
- Ephemeral and intermittent stream channels
- Below, within, and above CBM discharge point monitoring (after baseline?)
- Database to link all groups information
- Standing water effects on biota – esp. Herps
- Literature search and compilation for all TGs

An aerial photograph of a large, circular impact crater in a desert environment. The crater's rim is visible as a dark, irregular line, and the interior floor is a lighter, sandy expanse. The surrounding terrain is arid and textured. The text "How much deeper do we look to find answers?" is overlaid in white, centered on the image.

How much deeper do we look  
to find answers?



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