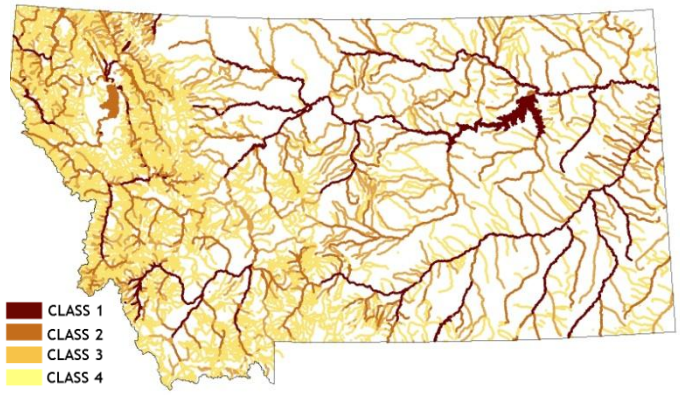
FISH NATIVE SPECIES RICHNESS



SUMMARY: Ecologists have frequently proposed that habitats high in species richness are more functionally diverse, and this natural diversity produces an increase in ecological stability, resiliency and maintenance of food web dynamics. To account for native biodiversity as an important aquatic resource value, we created a species richness layer using a count of native fishes present in waterbodies and stream reaches within eight aquatic ecoregions in Montana.

MEASUREMENT UNIT: River segments for flowing water and entire waterbody for lakes/reservoirs. River segments are uniquely identified by river mile and latitude/longitude.

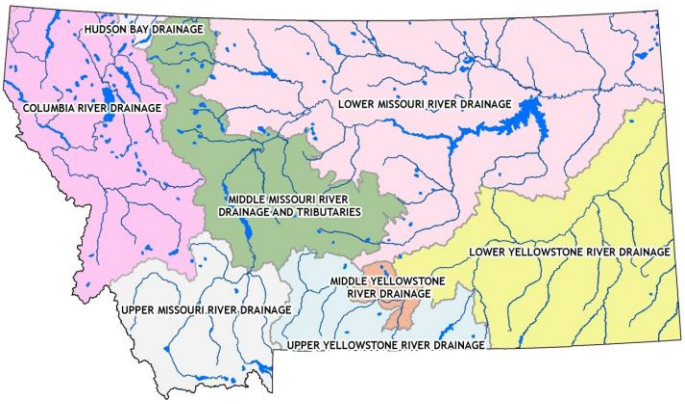
DATA SOURCE(S) / QUALITY: The Montana Fisheries Information System (MFISH) (http://fwp.mt.gov/fishing/mFish/) was the source of most data utilized in this assessment. Fish distribution data were extrapolated by local fisheries biologists from fisheries surveys conducted by Montana Fish, Wildlife & Parks (FWP) and collector permit holders from state and federal agencies and non-governmental organizations, 1998 - present.

DATA SOURCES
- ☑ Survey data – counts or estimates
- ☑ Survey data – categorical (e.g. presence/absence)
- ☑ Expert opinion based on observation

DATA EXTRAPOLATION TECHNIQUE USED
- ○ None
- ○ Modeling of habitat-species associations (deductive)
- ○ Statistical modeling (inductive)
- ☑ Extrapolation to habitat unit (e.g. stream section)
- ☑ Extrapolation based on expert opinion

METHODS: We created a species richness layer based on a count of native fishes present in waterbody reaches within eight aquatic ecoregions in the State. Ecoregions were based on the intersection of major watershed (4th Code HUC) boundaries and generalized species composition (warm vs coldwater) . Ecoregions were evaluated separately for their species richness because large differences in species richness are inherently associated with drainage patterns, geographical extents, and inherent differences in productivity.

Montana Fish, Wildlife & Parks
Crucial Areas Assessment



Native fish species distributions were extrapolated by local biologists from fisheries surveys conducted by Montana Fish, Wildlife & Parks (FWP) and collector permit holders from state and federal agencies and non-governmental organizations, 1998 - present. Species distributions were reviewed with biologists and regional FWP staff and extrapolated to to the nearest 0.1 miles. The numbers of unique native fish species within a stream segment or waterbody were counted, regardless of rarity.

Aquatic ecoregions used to categorized species richness

FINAL CATEGORIZATION: Four categories, representing a gradient of diversity from high to low, were created based on breaks that differed between ecoregion. Categorical designations (n=4), were created using Jenks' natural breaks methodology for each of the eight aquatic ecoregions in Montana.

CLASS	RANGE OF VALUES	RIVER MILES	# LAKES
1	100 - ~90 % of max species count within an ecoregion	2144	7
2	~70 - 90 % of max species count within an ecoregion	5620	34
3	~30 - 70 % of max species count within abn ecoregion	8863	80
4	<30 % of max species count within an ecoregion	22145	229

CONTACT: Bill Daigle – Data Services Section; 406.444.3737 bdaigle@mt.gov

DATE MODIFIED: March 22, 2010 – Version 1.0