

# Montana Natural Heritage Program

## 2006 Activities Report

- Transfer to University – July 1, 2006
- Added 21,000 observation records to POD/MBD
- Cleaned & assigned spatial precision to 33,000 observation records
- Completed structural updates to MBD database (still needs a lot of cleaning work on Non-SOC)
- Completed EO processing for ~ ½ SOC (3X previous)
- Updating element article files
- Completed Stream Observation Database (SOD)
- Adding all Heritage photos to Portfolio
- Natural Heritage Information Portal (NHIP) website
- Completed update to SOC List

# Heritage Funding Situation

## MTNHP Current Annual Core Funding & Proposed Goals for FY 08-09 Biennium

### Annual MSL Contract Funding

RIT: \$160,000  
 DEQ: \$36,000  
 FWP: \$28,000  
 GenFund: \$28,000  
 DNRC: \$20,000  
 University System: \$18,000  
 MDT: \$13,000

### Supplemental Core Funding

BLM: \$55,000  
 USFS: \$16,000  
 BPA: \$5,000  
 MT-Dept of Ag: \$7,500  
 TNC: \$10,000  
 MFWP: \$23,000  
 USFWS: \$5,000  
 NatureServe: \$5,000 - \$15,000

Current Annual Funding,  
MTNHP Core Services:  
*Approx. \$430,000*

**Amount Needed for  
Full Core Funding:  
\$668,000**

**Additional Need:  
\$240,000**

**Current MSL Contract: \$303,000**

**Goal: \$453,000**  
*(Additional \$150,000 requested)*

**Current Suppl \$: about \$125,000**

**Goal: \$215,000**  
*(Additional needed: about \$90,000)*

#### Notes:

- o \$10,000 retained by MSL for agency expenses
- o Figures represent 41% of all sources to overall NRIS funding of \$742,000
- o Reflects \$18,750 reduction from funding level in FY02-03 biennium.

# **MOU for Montana Bird Distribution**

- **Audubon, Bird Records Committee, FWP, NHP**
- **Governs collection, management, and dissemination of bird observation information**
- **Election of Executive Committee**
- **Develop annual and multi-year action plans and task assignments for MBD partnership products**
  - **Montana Bird Distribution Database**
  - **P.D. Skaar's Montana Bird Distribution**
  - **Montana Bird Distribution Data on Heritage Website**
- **Signed by all partners – February, 2007**

# Heritage and FWP MOU on Data Acquisition, Management, and Dissemination

- **Standard Data Acquisition Roles**

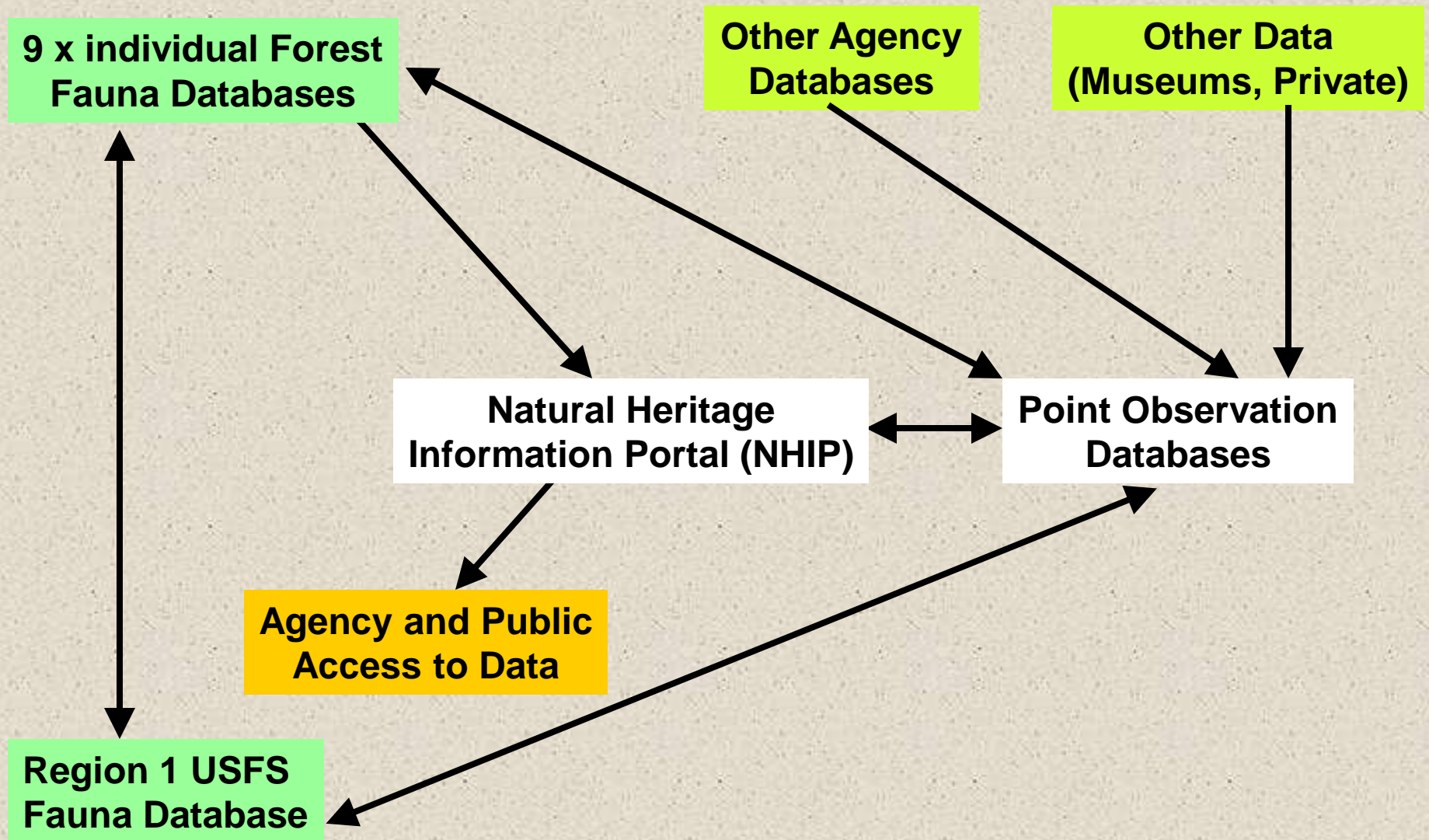
<b>Data Category</b>	<b>Data Subcategory</b>	<b>MFWP Role</b>	<b>MNHP Role</b>
<b>Monitoring data</b>	<b>Collectors Permits and Managed Game Species</b>	<b>Lead</b>	<b>Ancillary</b>
	<b>Managed Nongame Species</b>	<b>Lead</b>	<b>Assist</b>
	<b>Unmanaged Nongame Species</b>	<b>Assist</b>	<b>Lead</b>
<b>Miscellaneous Observations</b>	<b>MFWP Agency Data</b>	<b>Lead</b>	<b>Assist</b>
	<b>Other State Agencies</b>	<b>Assist</b>	<b>Lead</b>
	<b>Federal Agency Data</b>	<b>Assist</b>	<b>Lead</b>
	<b>Public Data</b>	<b>Assist</b>	<b>Lead</b>

- **Data management roles for about 30 different animal databases**
- **Roles for data dissemination and tracking requirements on data use**
- **Structure for coordination of efforts**

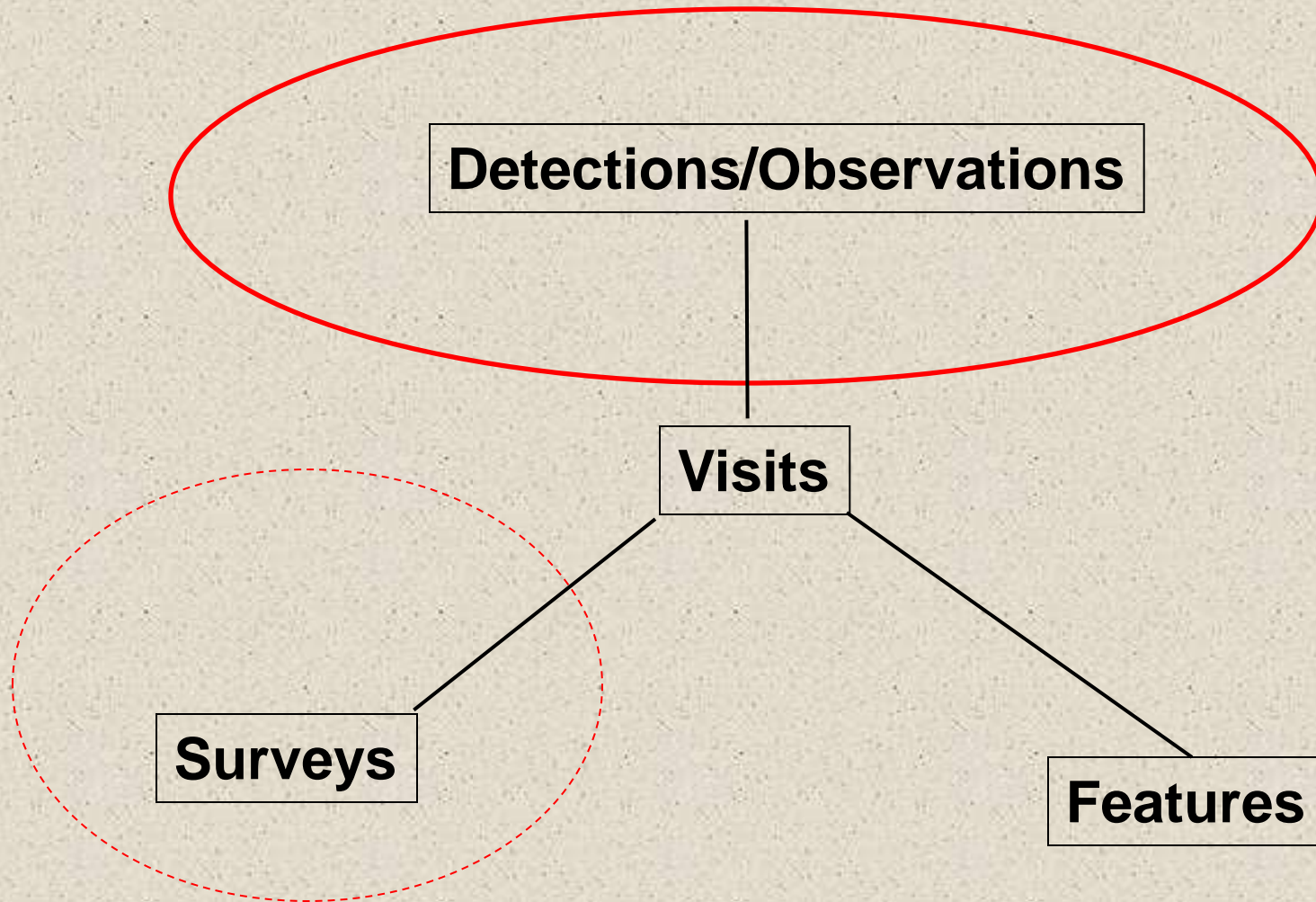
# Digital Data Exchange Basics

- Central databases are typically simplistic flat table structures with widely used data fields while monitoring databases have more complex structures and information completely unique to that database
  - Exchange on common data fields
  - Data fields not held in common can either not be exchanged or can be loaded into memo fields
  - Link on data source and unique record ID for that data source to allow for data updates between databases as well as addition of new records
  - Exchange data on annual, semiannual, or other appropriate time schedule
- \* Please email [bmaxell@mt.gov](mailto:bmaxell@mt.gov) for POD data structure and data entry forms

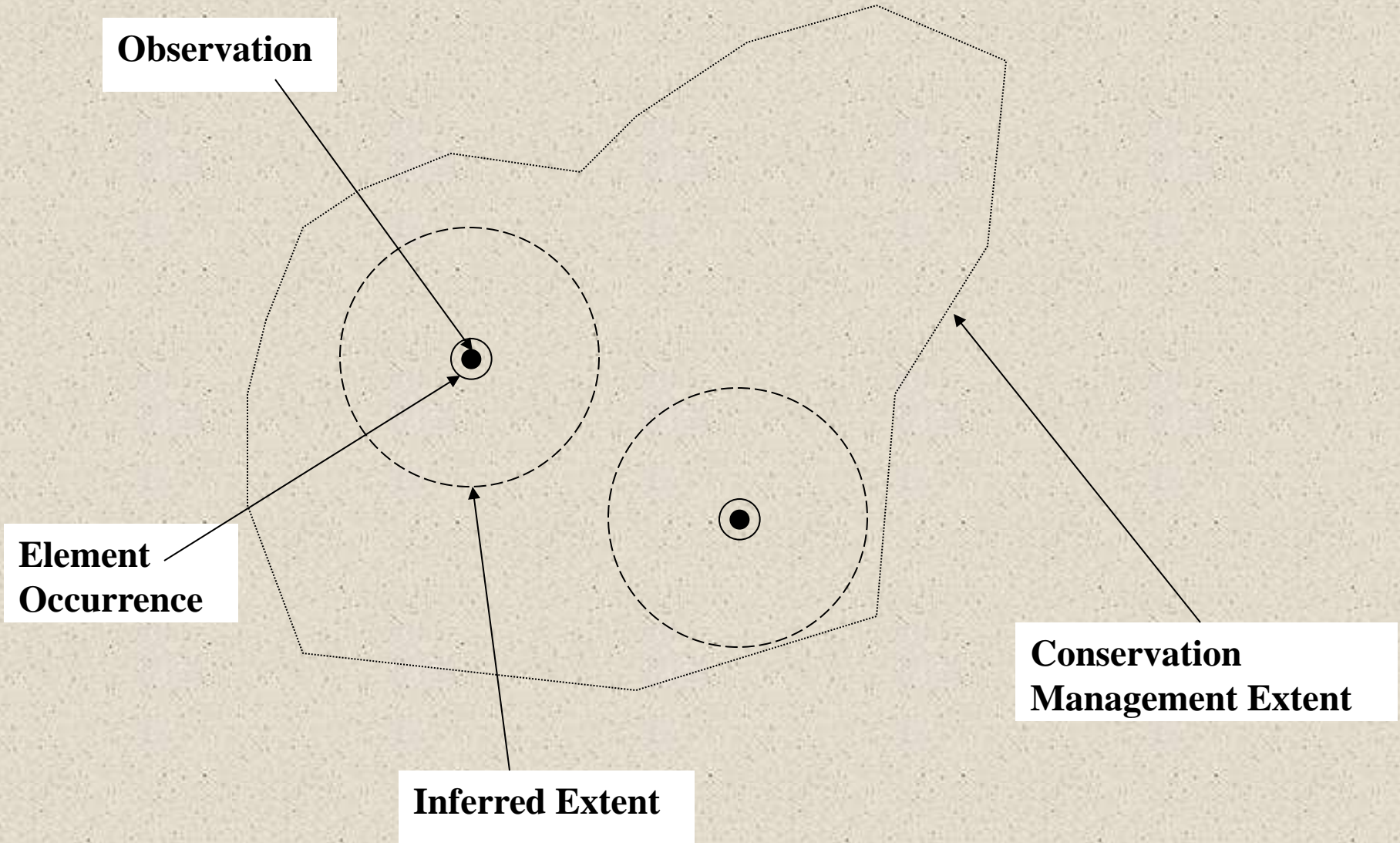
# USFS Fauna and Montana Natural Heritage Program



# Fauna Structure

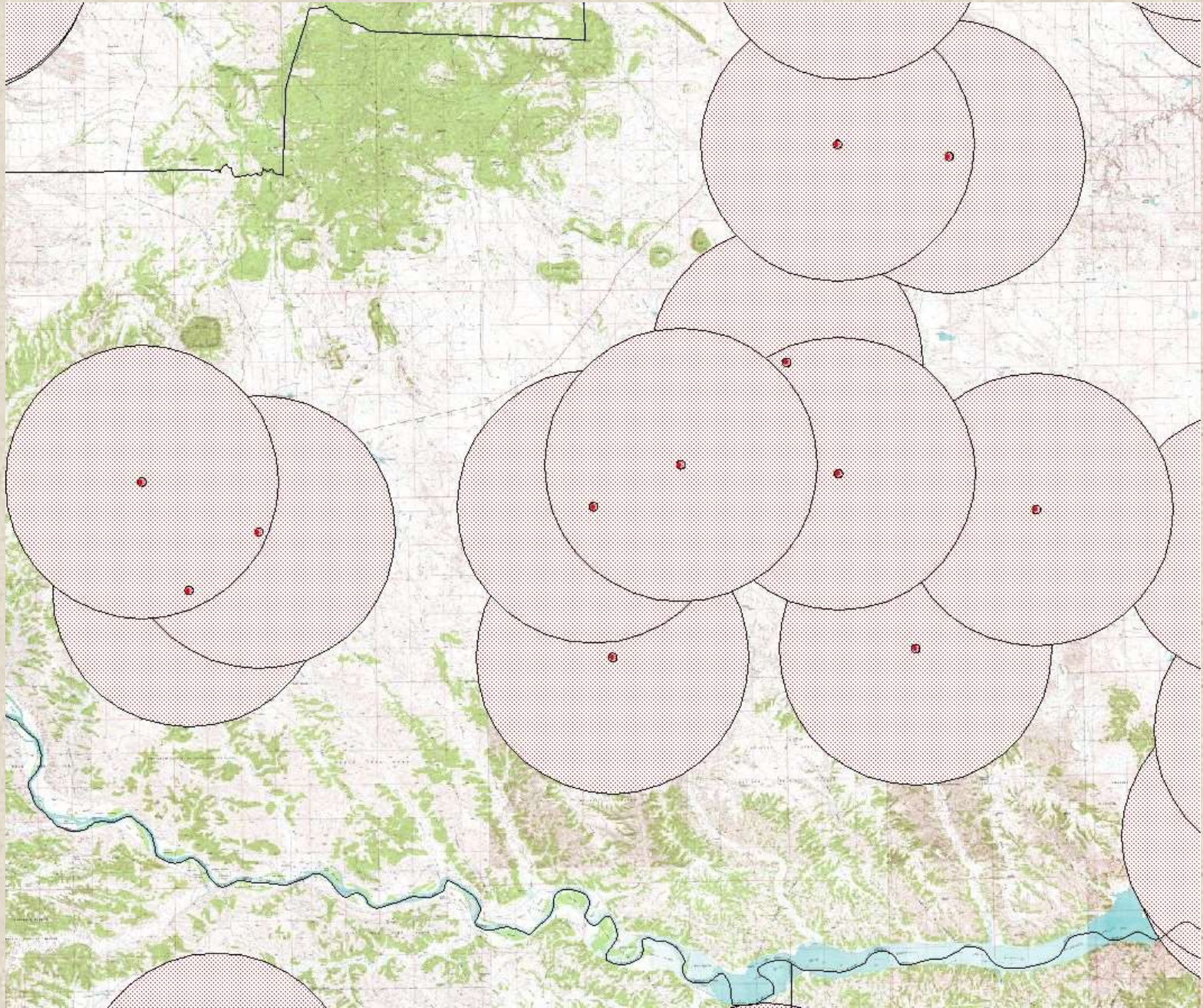


# Graphic Example

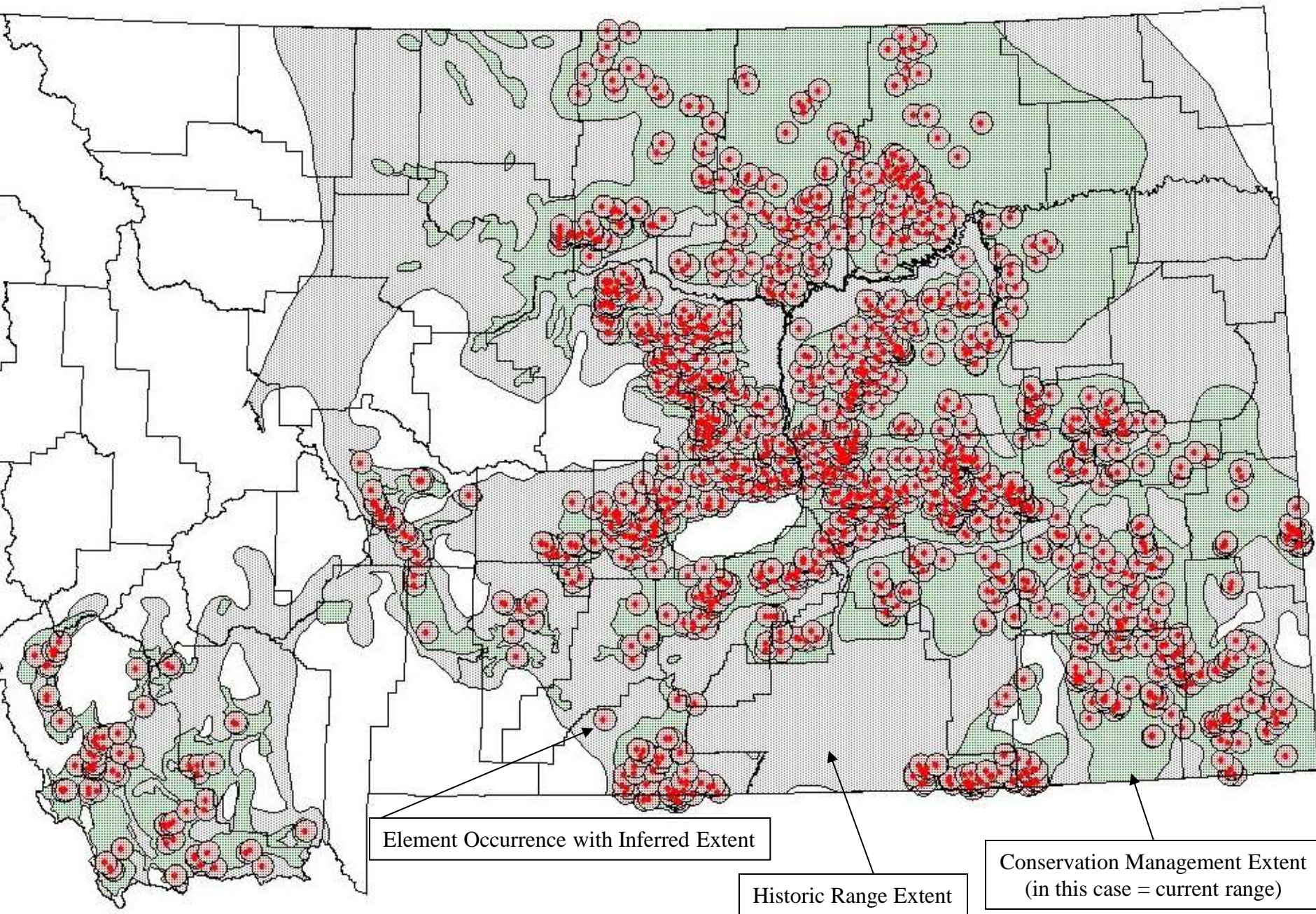




# EOs and IEs for Greater Sage Grouse



# Conservation Units For Greater Sage Grouse



# 2006 Species of Concern Report Updates

- Dropped 5 previously listed species due to invalid taxonomy
- Moved 1 species to PSOC list because of recent surveys
- Added the following species to the SOC list
  - Idaho Giant Salamander
  - 1 freshwater sponge
  - Lake Trout
  - 2 slugs
  - Short-tailed Shrew
  - 1 crayfish
  - Western Spotted Skunk
  - 8 millipedes
  - 6 insects

## SPECIES TOTALS BY ANIMAL GROUP

### Species of Concern

Mammals .....	29
Birds .....	60
Reptiles .....	9
Amphibians .....	6
Fish .....	19
Invertebrates .....	73

### Potential Species of Concern

Mammals .....	8
Birds .....	18
Fish .....	8
Invertebrates .....	56

## HABITAT ASSOCIATION SUMMARY FOR ALL

### SPECIES OF CONCERN AND POTENTIAL SPECIES OF CONCERN

Streams/Rivers/Lakes .....	27%
Wetlands .....	20%
Sagebrush/Grassland .....	14%
Conifer Forest .....	13%
Riparian Forest .....	7%
Other/Generalist .....	6%
Alpine .....	5%
Rock Outcrop .....	5%
Caves .....	3%

# 2006 Species of Concern Report Updates

## Fish

Mountain Streams/Rivers/Lakes.....44%  
Prairie Streams/Rivers/Lakes.....56%

## Invertebrates

Streams/Rivers/Lakes.....29%  
Wetlands.....28%  
Conifer Forest.....15%  
Alpine.....6%  
Caves.....6%  
Other/Generalist.....5%  
Rock Outcrop.....5%  
Sagebrush/Grassland.....5%  
Riparian Forest.....1%

## Reptiles

Rock Outcrop.....44%  
Streams/Rivers/Lakes.....22%  
Other/Generalist.....22%  
Wetlands.....12%

## Amphibians

Wetlands.....83%  
Streams/Rivers/Lakes.....17%

## Mammals

Sagebrush/Grassland.....38%  
Riparian Forest.....16%  
Conifer Forest.....11%  
Rock Outcrop.....11%  
Wetlands.....11%  
Alpine.....5%  
Other/Generalist.....5%  
Caves.....3%

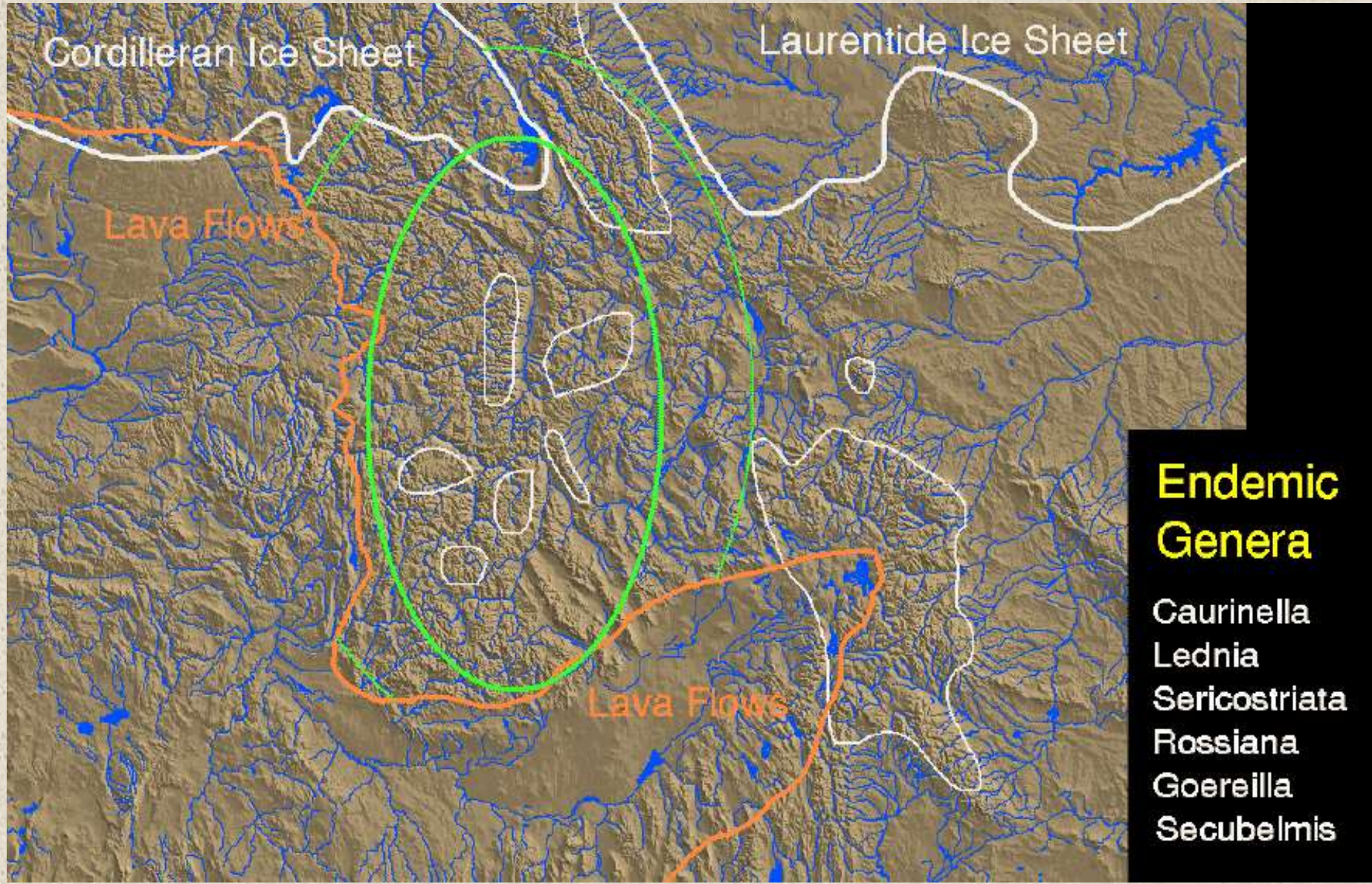
## Birds

Sagebrush/Grassland.....27%  
Conifer Forest.....15%  
Riparian Forest.....15%  
Wetlands.....15%  
Streams/Rivers/Lakes.....13%  
Other/Generalist.....10%  
Alpine.....5%

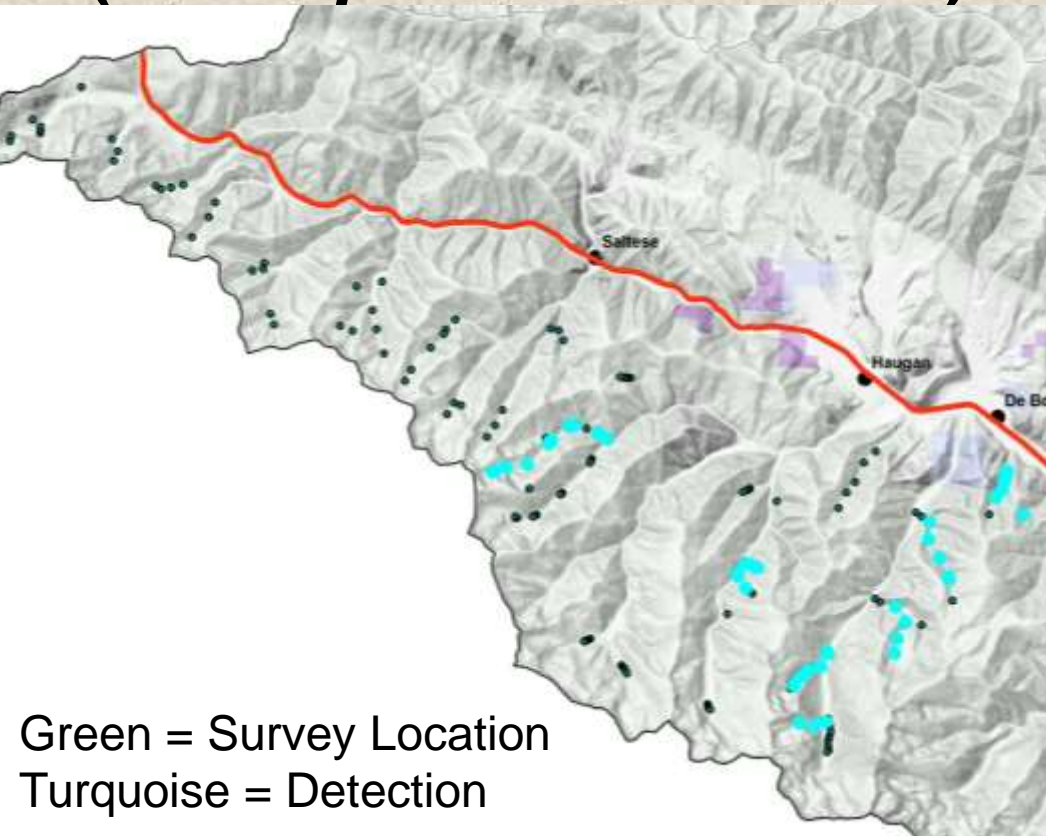
# Goals for Montana's Nongame Wildlife

- Assess statewide status and distribution
- Monitor status and distribution statewide over time in conjunction with a variety of covariates that may or may not be affected with management actions
- Eventually want to set a priori management triggers
- How to assess status?
  - population size (abundance estimators)
  - population growth rates
  - viability measured as a probability of persistence over a certain period of time
  - percent of habitat patches occupied
- Tradeoff – spatial inference vs. strength of inference

# Northern Rocky Mountain Refugium (NRMR) (Gustafson 2001)

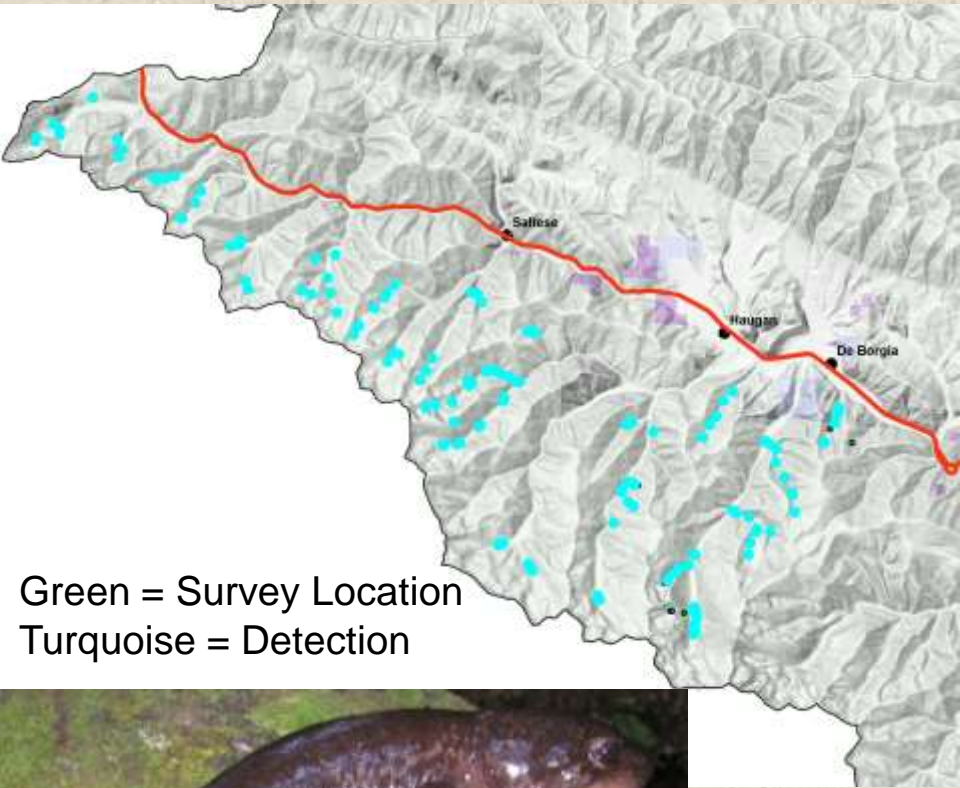


# Idaho Giant Salamander (*Dicamptodon atterimus*)



- Only 1 previous detection
- 450 animals detected in 2006
- 15 different tributaries
- 4 different watersheds

# Rocky Mountain Tailed Frog

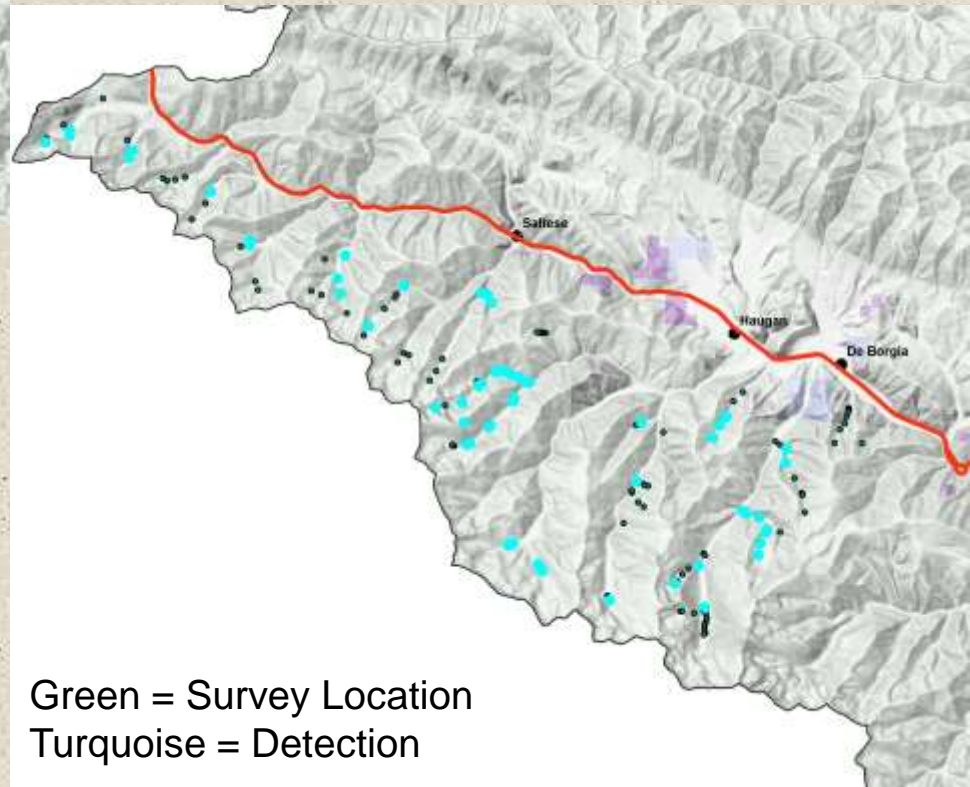


- Rocky Mountain Tailed Frogs detected at over 95% of sample locations
- Easily out number and out weigh fish

Green = Survey Location  
Turquoise = Detection



# Westslope Cutthroat Trout



Green = Survey Location  
Turquoise = Detection



# Globally Rare Land Snails on R1 Forests

- Selway Forestsnail (*Allogona lombardi*) (ID) G1
- Dry Land Forestsnail (*Allogona ptychophora solida*) (ID)? G5T2T3
- Nimapuna Tigersnail (*Anguispira nimapuna*) (ID) G1
- Chrome Ambershell (*Catinella rehderi*) (MT, ID?) G1G2Q\*
- Salmon Oregonian (*Cryptomastix harfordiana*) (ID)? G3G4
- Mission Creek Oregonian (*Cryptomastix magnidentata*) (ID)? G1
- Oregonian (*Cryptomastix mullani blandi*) (ID)? G4T1
- River of No Return Oregonian (*Cryptomastix mullani clappi*) (ID) G4T1
- Kingston Oregonian (*Cryptomastix sanburni*) (ID)? G1
- Lake Disc (*Discus brunsoni*) (MT)? G1
- Marbled Disc (*Discus marmorensis*) (ID) G1G3
- Striate Disc (*Discus shimekii*) (MT, ID?) G5
- Salmon Coil (*Helicodiscus salmonaceus*) (ID) G1G2
- Alpine Mountainsnail (*Oreohelix alpina*) (MT) G1
- Bitterroot Mountainsnail (*Oreohelix amariradix*) (MT) G1G2
- Keeled Mountainsnail (*Oreohelix carinifera*) (MT) G1
- Carinate Mountainsnail (*Oreohelix elrodi*) (MT) G1
- Seven Devils Mountainsnail (*Oreohelix hammeri*) (ID) G1
- A Land Snail (Hells Canyon) (*Oreohelix idahoensis baileyi*) (ID) G1G2T1
- Costate Mountainsnail (*Oreohelix idahoensis idahoensis*) (ID)? G1G2T1T2
- Deep Slide Mountainsnail (*Oreohelix intersum*) (ID)? G1
- Boulder Pile Mountainsnail (*Oreohelix jugalis*) (ID)? G1
- Berry's Mountainsnail (*Oreohelix strigosa berryi*) (MT) G5T2
- Striate Mountainsnail (*Oreohelix strigosa goniogyra*) (ID) G5T1Q
- Whorled Mountainsnail (*Oreohelix vortex*) (ID)? G1G3
- Lava Rock Mountainsnail (*Oreohelix waltoni*) (ID)? G1G3
- Gallatin Mountainsnail (*Oreohelix yavapai mariae*) (MT) G4T1
- Robust Lancetooth (*Haplotrema vancouverense*) (MT, ID) G5
- Western Flat-whorl (*Planogyra clappi*) (ID) G3G4
- Humped Coin (*Polygyrella polygyrella*) (MT, ID) G2G3
- Northern Tightcoil (*Pristiloma arcticum*) (MT, ID?) G3G4\*
- Thinlip Tightcoil (*Pristiloma idahoense*) (ID) G2G3
- Fir Pinwheel (*Radiodiscus abietum*) (MT, ID) G3

## SUMMARY

- 31 Species G1-G3 so USFS SOC
- 2 Species G5, but S1-S3 so USFS SOI

2006 Report on Heritage Website

# Globally Rare Land Snails - Examples



**Fir Pinwheel (*Radiodiscus abietum*)**



**Nimapuna Tigersnail (*Anguispira nimapuna*)**



**Selway Forestsnail (*Allogona lombardii*)**



**Humped Coin (*Polygyrella polygyrella*)**

# Globally Rare Slugs on R1 Forests

- Marbled Jumping-slug (*Hemphillia danielsi*) (MT) G2G3
- Pale Jumping-slug (*Hemphillia camelus*) (MT, ID) G3G4
- Pygmy Slug (*Kootenaia burkei*) (MT, ID) G1G2
- Magnum Mantle-slug (*Magnipelta mycophaga*) (MT, ID) G3
- Reticulate Taildropper (*Prophysaon andersoni*) (MT, ID) G5
- Blue-gray Taildropper (*Prophysaon coeruleum*) (ID) G4
- Papillose Taildropper (*Prophysaon dubium*) (ID) G4
- Smoky Taildropper (*Prophysaon humile*) (MT, ID) G2
- Lyre Mantleslug (*Udosarx lyrata lyrata*) (MT, ID) G2T2
- Russell Mantleslug (*Udosarx lyrata russelli*) (MT)? G2T1
- Sheathed Slug (*Zacoleus idahoensis*) (MT, ID) G3G4

## SUMMARY

- 8 Species G1-G3 so USFS SOC
- 3 Species G4-G5, but S1-S3 so USFS SOI

# Globally Rare Slugs - Examples



Pale Jumping-Slug (*Hemphillia camelus*)



Lyre Mantleslug (*Udosarx lyrata lyrata*)



Smoky Taildropper (*Prophysaon humile*)

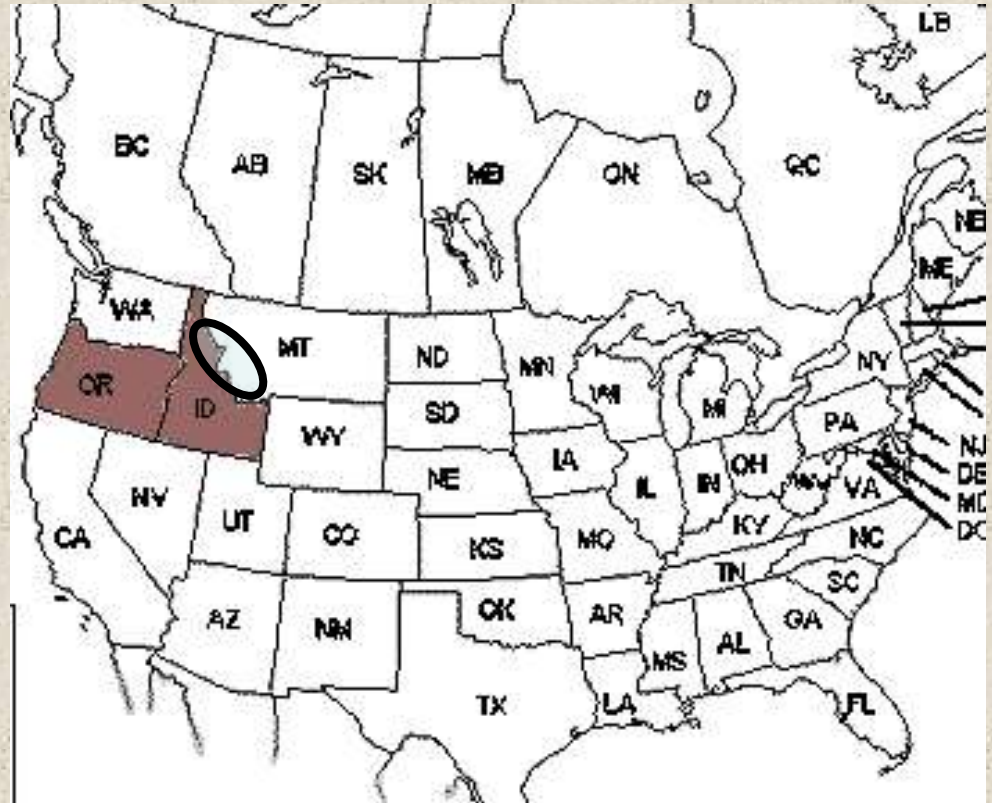


Magnum Mantleslug (*Magnipelta mycophaga*)

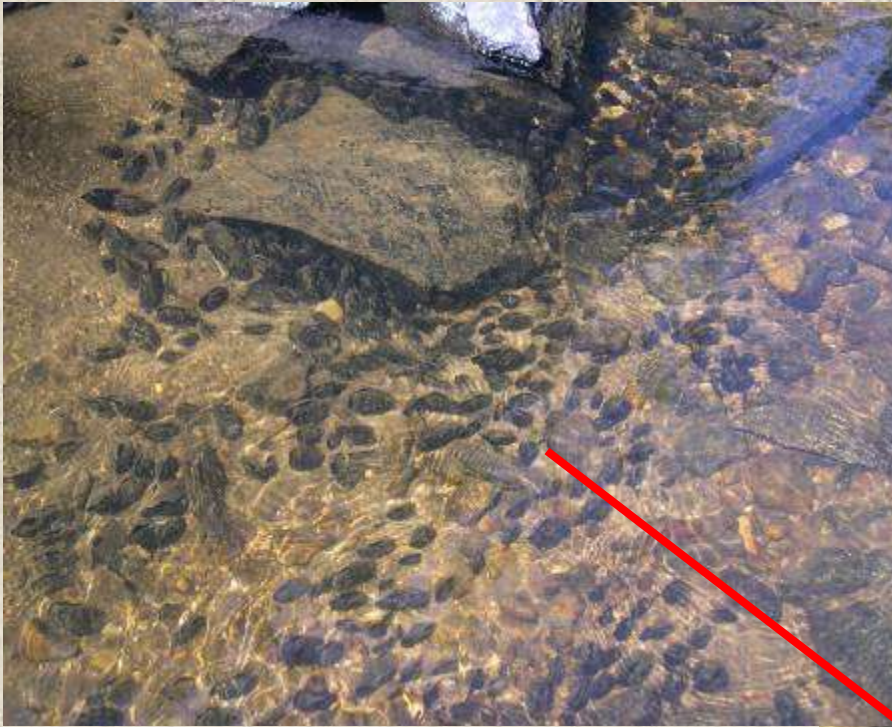
# Globally Rare Macroinvertebrates

\*G1-G3 - 28 species in Montana

\*8 species are endemic to the  
NRM Refugia Area



**Margaritifera falcata - Species-of-Interest (CFWS T1)**



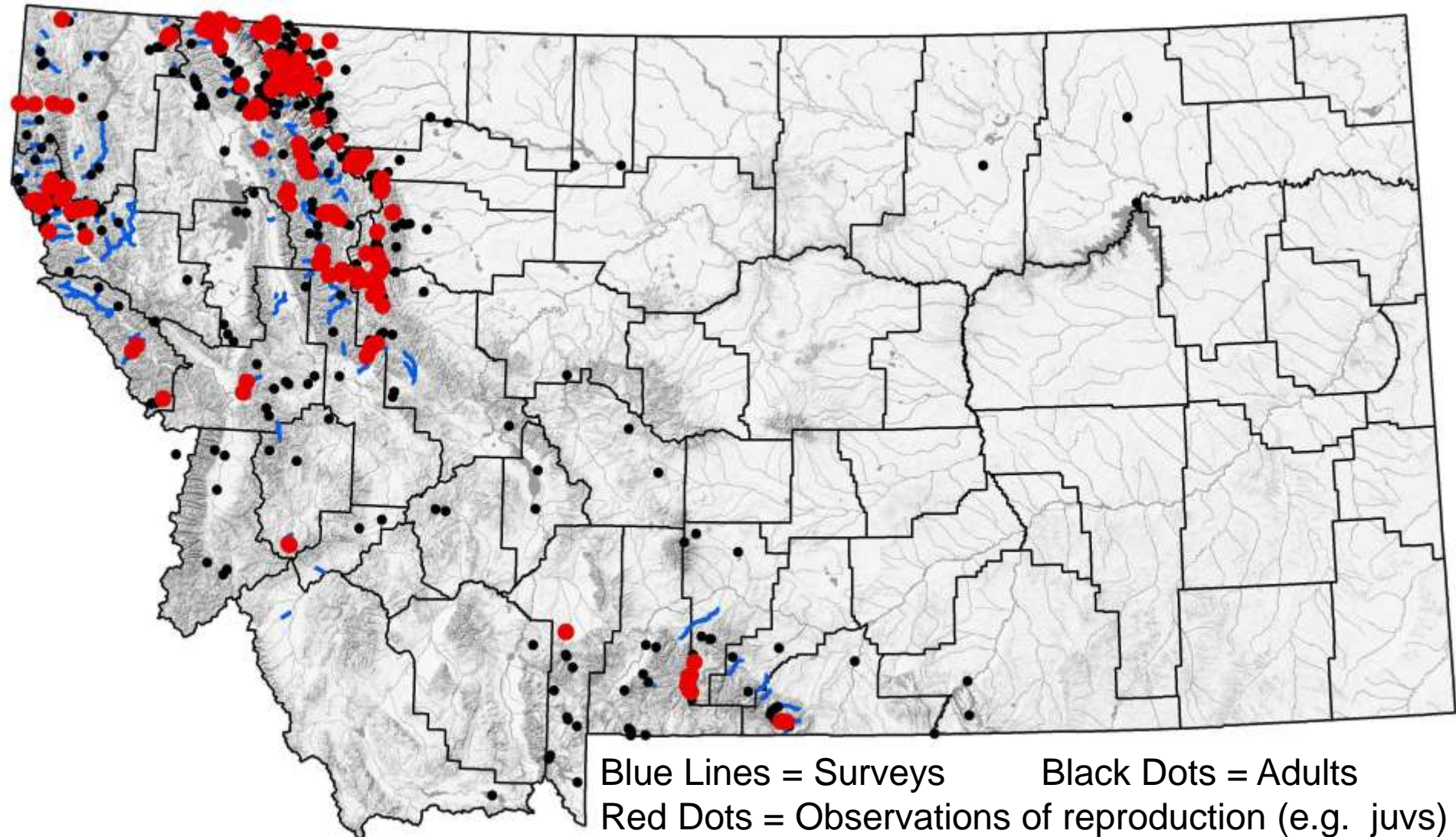
***Super abundant in Idaho, huge beds, declining in MT.***



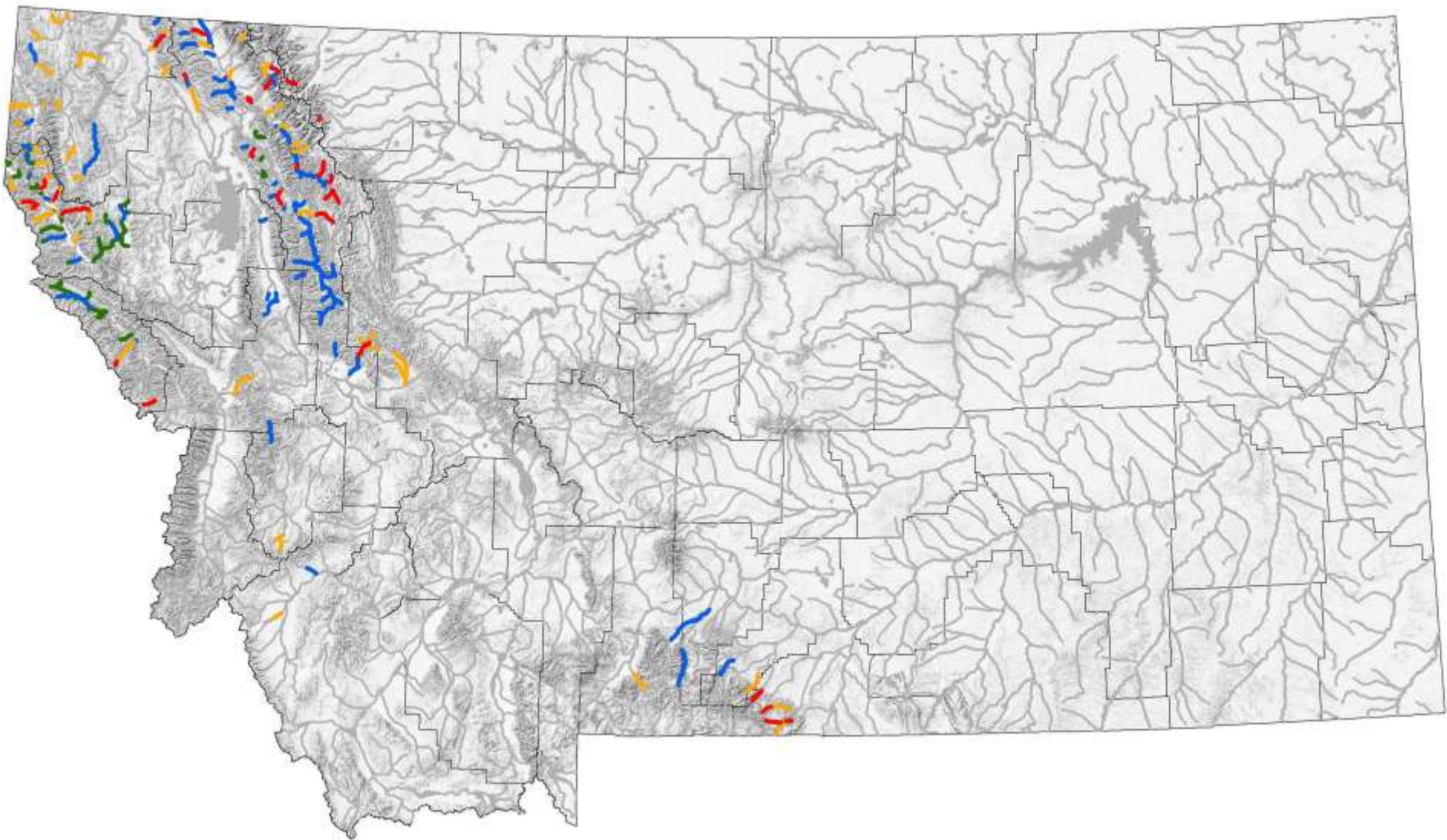
***G4, Unranked in Idaho, S2S4 in MT***

# Summary of Harlequin Duck Surveys

- Created new Stream Observation Database (SOD) for Non-MFish Species
- Contains all MT surveys except GNP, recent East Front, and recent Beartooth
- Tracks both negative and positive survey information



# Harlequin Duck Surveys by Time Period



**Green = pre-1990**

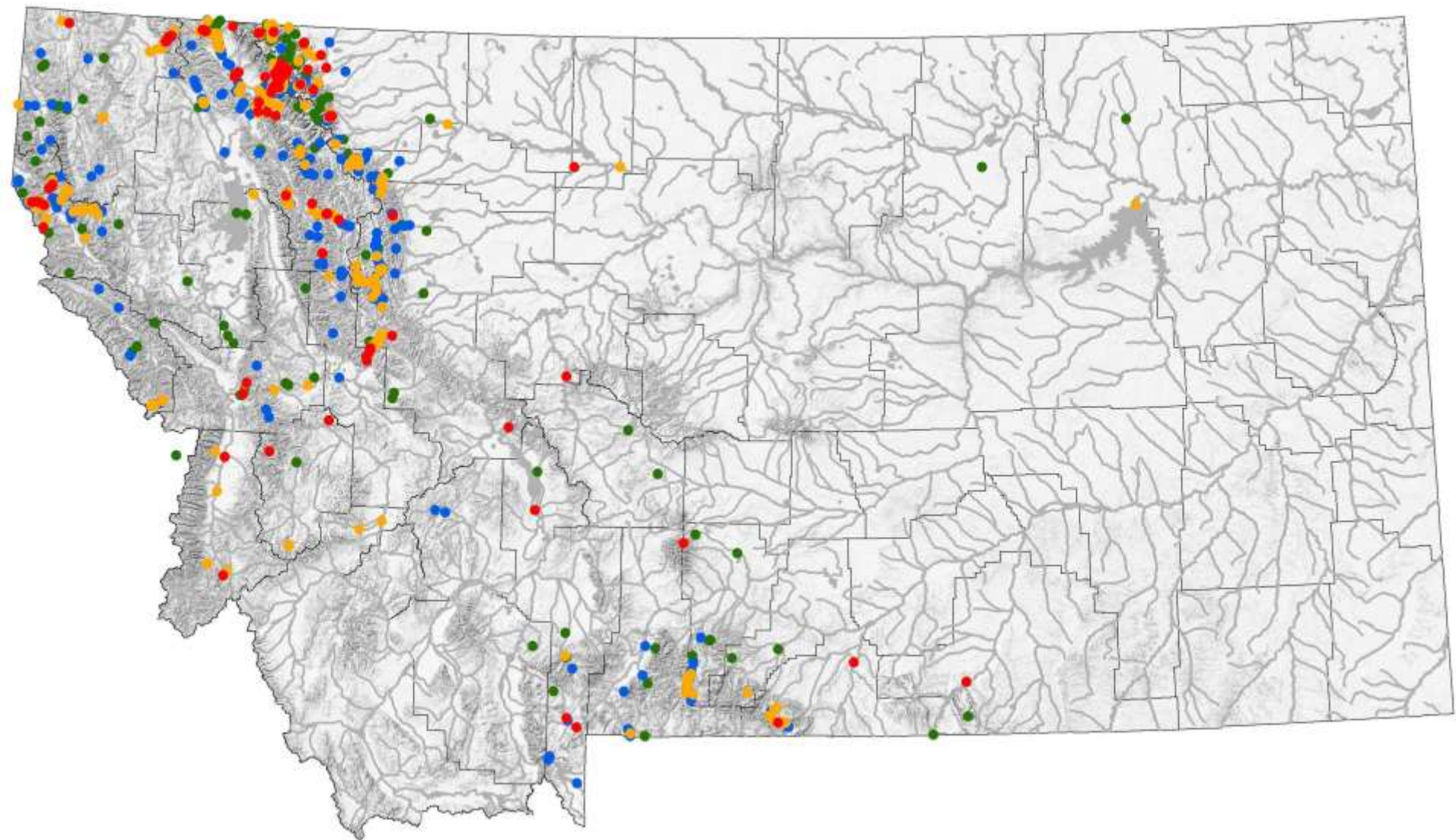
**Blue = 1990-1994**

**Orange = 1995-1999**

**Red = 2000-2005**



# Harlequin Duck Observations by Time Period



Green = pre-1990

Blue = 1990-1994

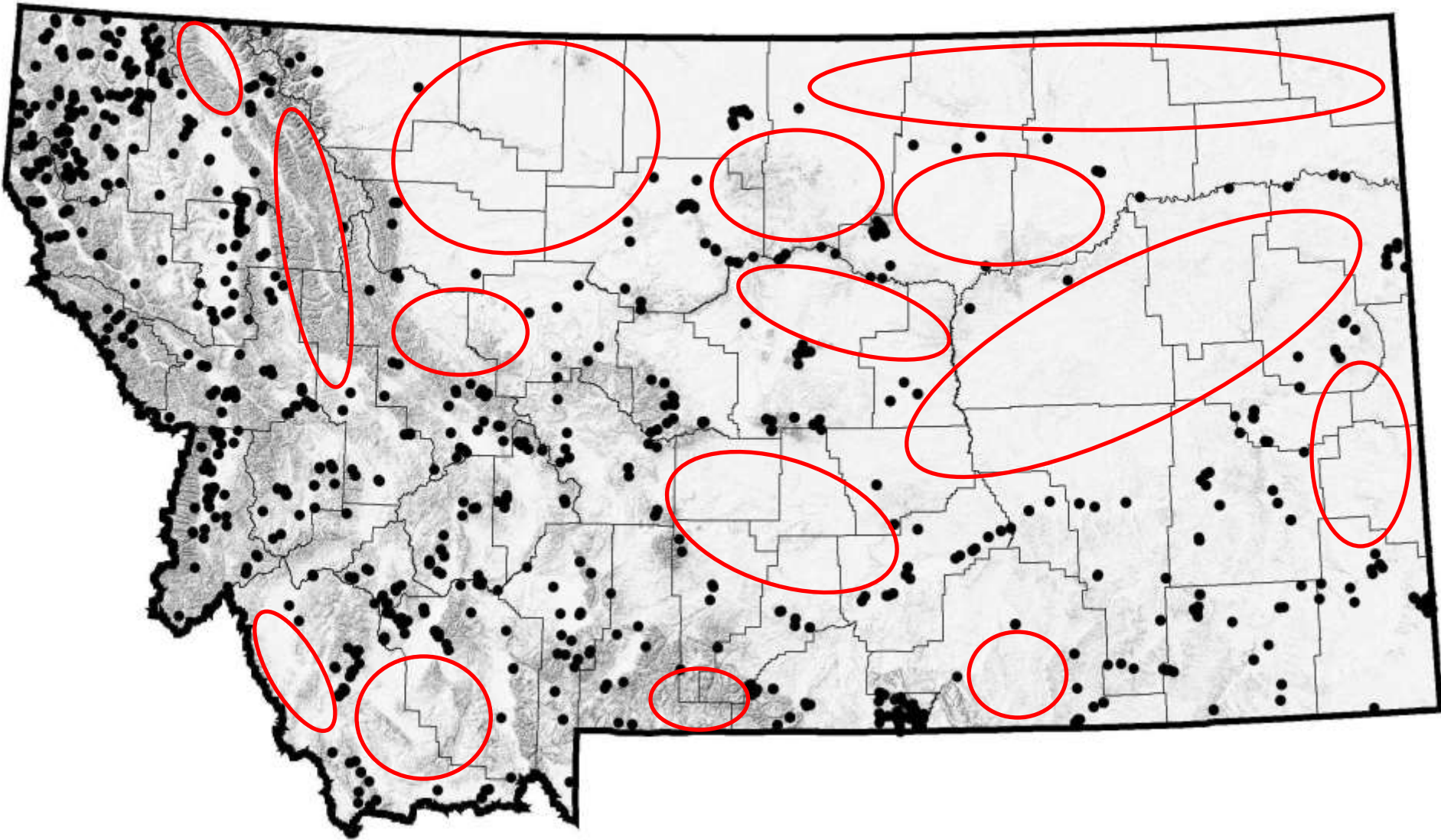
Orange = 1995-1999

Red = 2000-2005

# Montana Bat Species

<b>Little Brown Myotis</b>	<i>Myotis lucifugus</i>	<b>G5/S4</b>		
<b>Yuma Myotis</b>	<i>Myotis yumanensis</i>	<b>G5/S3S4</b>		
<b>Long-eared Myotis</b>	<i>Myotis evotis</i>	<b>G5/S4</b>		
<b>Fringed Myotis</b>	<i>Myotis thysanodes</i>	<b>G4G5/S3</b>	<b>SOC</b>	<b>BLM Sensitive</b>
<b>Long-legged Myotis</b>	<i>Myotis volans</i>	<b>G5/S4</b>		
<b>California Myotis</b>	<i>Myotis californicus</i>	<b>G5/S4</b>		
<b>Western Small-footed Myotis</b>	<i>Myotis ciliolabrum</i>	<b>G5/S4</b>		
<b>Northern Myotis</b>	<i>Myotis septentrionalis</i>	<b>G4/S2S3</b>	<b>SOC</b>	<b>BLM Sensitive</b>
<b>Silver-haired Bat</b>	<i>Lasionycteris noctivagans</i>	<b>G5/S4</b>		
<b>Big Brown Bat</b>	<i>Eptesicus fuscus</i>	<b>G5/S4</b>		
<b>Eastern Red Bat</b>	<i>Lasiurus borealis</i>	<b>G5/S2S3</b>	<b>SOC</b>	
<b>Hoary Bat</b>	<i>Lasiurus cinereus</i>	<b>G5/S3S4</b>		
<b>Spotted Bat</b>	<i>Euderma maculatum</i>	<b>G4/S2</b>	<b>SOC</b>	<b>USFS/BLM Sensitive</b>
<b>Townsend's Big-eared Bat</b>	<i>Corynorhinus townsendii</i>	<b>G4/S2</b>	<b>SOC</b>	<b>USFS/BLM Sensitive</b>
<b>Pallid Bat</b>	<i>Antrozous pallidus</i>	<b>G5/S2</b>	<b>SOC</b>	<b>USFS/BLM Sensitive</b>

# Montana Bat Data Through 2006 Field Season



# Bat Species Richness Data by USFS District

page 1

<b>FOREST</b>	<b>DISTRICT</b>	<b>Predicted # of Species</b>	<b>All Data as % of Predicted</b>
<b>Beaverhead/Deerlodge</b>	<b>Dillon *</b>	<b>10</b>	<b>80%</b>
	<b>Pintler (Philipsburg/Deer Lodge)</b>	<b>11</b>	<b>73%</b>
	<b>Jefferson</b>	<b>10</b>	<b>70%</b>
	<b>Butte *</b>	<b>10</b>	<b>70%</b>
	<b>Madison</b>	<b>10</b>	<b>20%</b>
	<b>Wisdom</b>	<b>10</b>	<b>10%</b>

<b>Bitterroot</b>	<b>Sula *</b>	<b>11</b>	<b>45%</b>
	<b>Darby</b>	<b>11</b>	<b>45%</b>
	<b>Stevensville</b>	<b>11</b>	<b>18%</b>
	<b>West Fork</b>	<b>11</b>	<b>9%</b>

<b>Custer</b>	<b>Beartooth *</b>	<b>12</b>	<b>100%</b>
	<b>Ashland</b>	<b>12</b>	<b>75%</b>
	<b>Sioux</b>	<b>11</b>	<b>73%</b>

<b>Flathead</b>	<b>Tally Lake *</b>	<b>11</b>	<b>55%</b>
	<b>Swan Lake *</b>	<b>11</b>	<b>45%</b>
	<b>Hungry Horse</b>	<b>11</b>	<b>18%</b>
	<b>Spotted Bear</b>	<b>11</b>	<b>9%</b>

<b>Gallatin</b>	<b>Bozeman *</b>	<b>10</b>	<b>70%</b>
	<b>Big Timber</b>	<b>11</b>	<b>50%</b>
	<b>Livingston</b>	<b>11</b>	<b>18%</b>
	<b>Hebgen Lake</b>	<b>10</b>	<b>10%</b>
	<b>Gardiner</b>	<b>10</b>	<b>4%</b>

# Bat Species Richness Data by USFS District

page 2

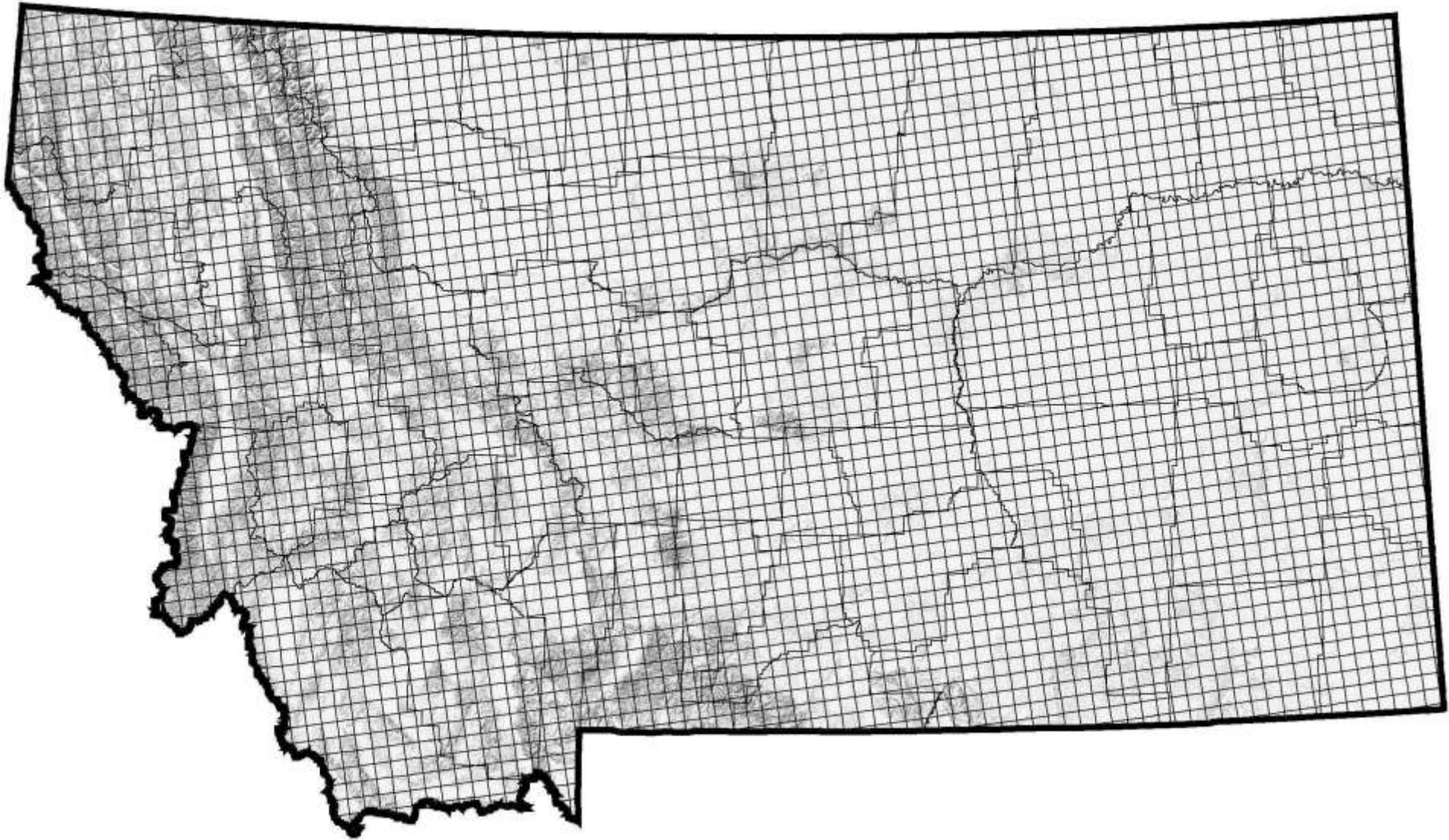
<b>FOREST</b>	<b>DISTRICT</b>	<b>Predicted # of Species</b>	<b>All Data as % of Predicted</b>
<b>Helena</b>	<b>Townsend *</b>	<b>11</b>	<b>91%</b>
	<b>Helena *</b>	<b>11</b>	<b>82%</b>
	<b>Lincoln *</b>	<b>11</b>	<b>55%</b>

<b>Kootenai</b>	<b>Libby *</b>	<b>11</b>	<b>100%</b>
	<b>Cabinet</b>	<b>11</b>	<b>91%</b>
	<b>Rexford</b>	<b>11</b>	<b>82%</b>
	<b>Fortine *</b>	<b>11</b>	<b>73%</b>
	<b>Three Rivers</b>	<b>11</b>	<b>73%</b>

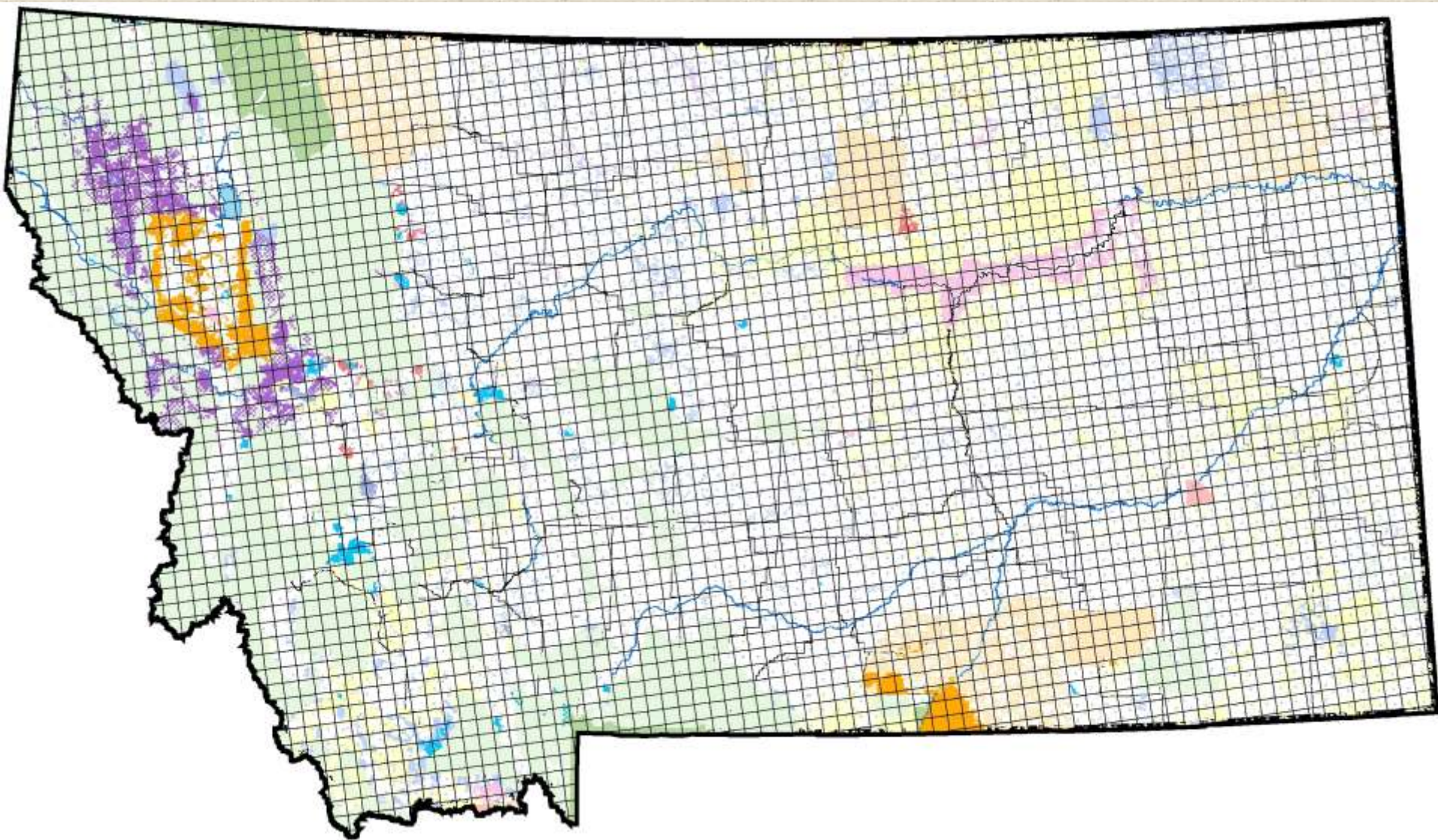
<b>Lewis and Clark</b>	<b>Judith *</b>	<b>10</b>	<b>70%</b>
	<b>Musselshell</b>	<b>10</b>	<b>70%</b>
	<b>Rocky Mountain</b>	<b>10</b>	<b>60%</b>
	<b>White Sulphur Spring</b>	<b>10</b>	<b>30%</b>
	<b>Belt Creek</b>	<b>10</b>	<b>10%</b>

<b>Lolo</b>	<b>Superior *</b>	<b>11</b>	<b>82%</b>
	<b>Missoula</b>	<b>11</b>	<b>55%</b>
	<b>Plains/Thompson Falls</b>	<b>11</b>	<b>45%</b>

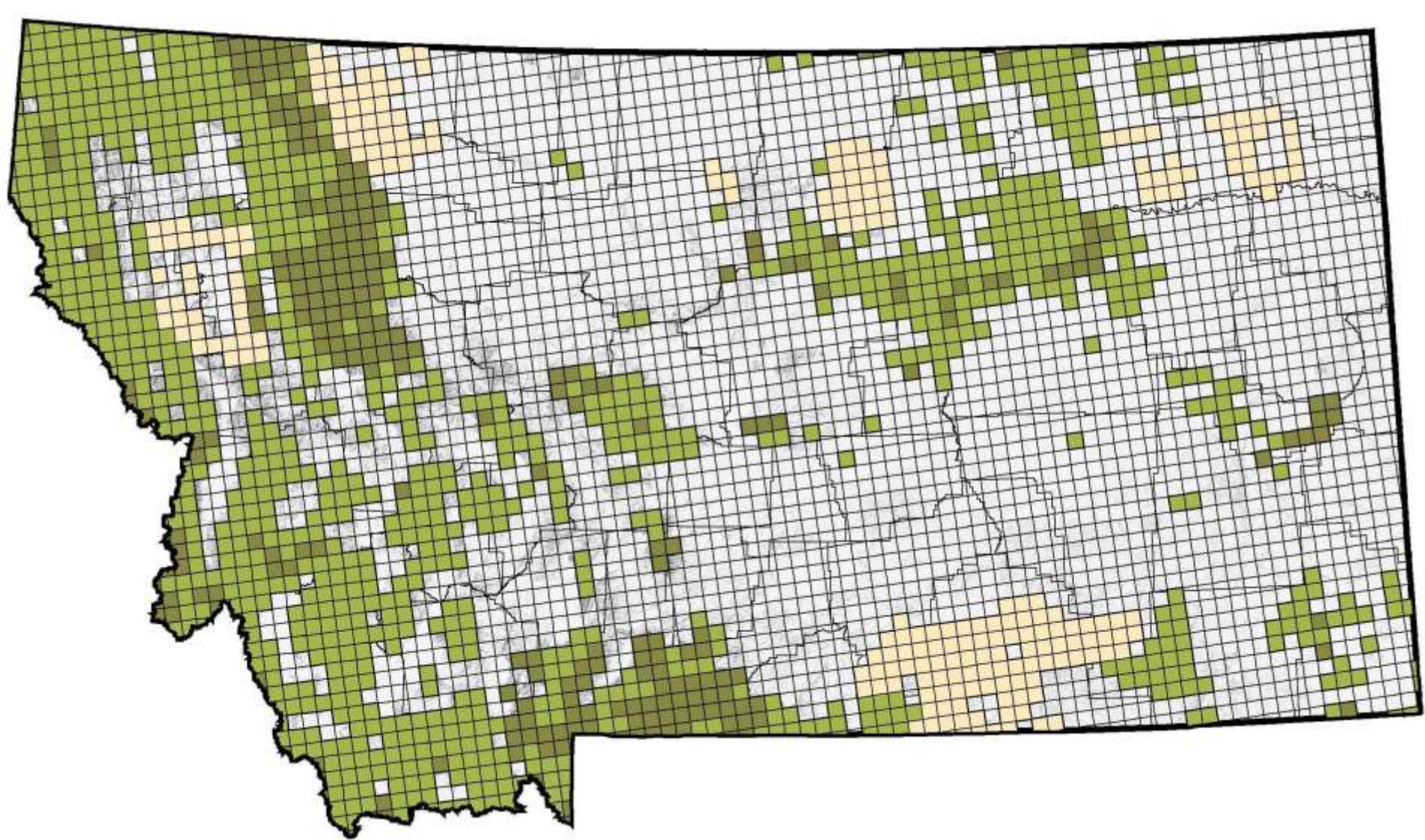
# USFS Wildlife Grid



# USFS Wildlife Grid – Land Ownership



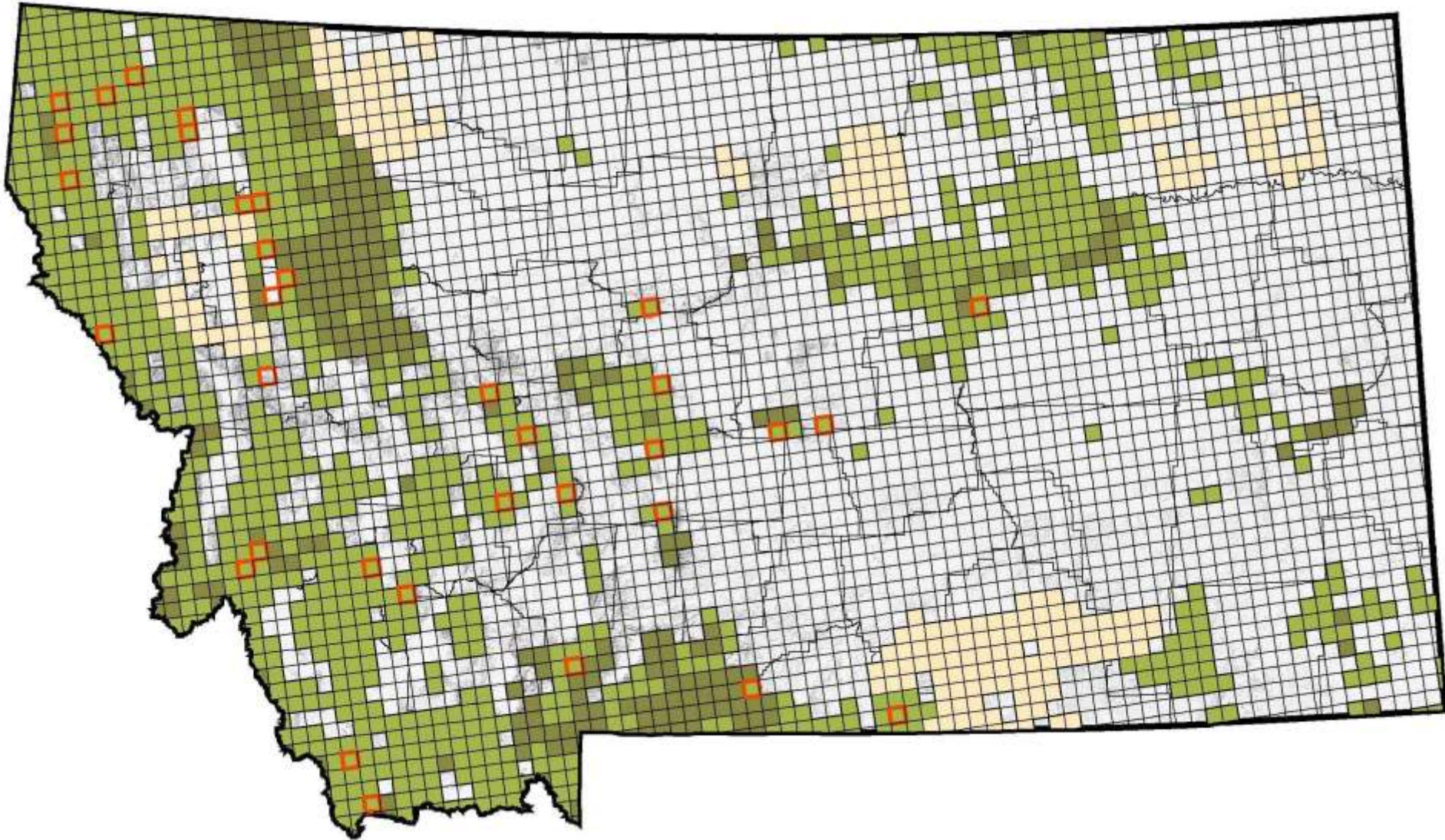
# Montana Bat Sampling Scheme



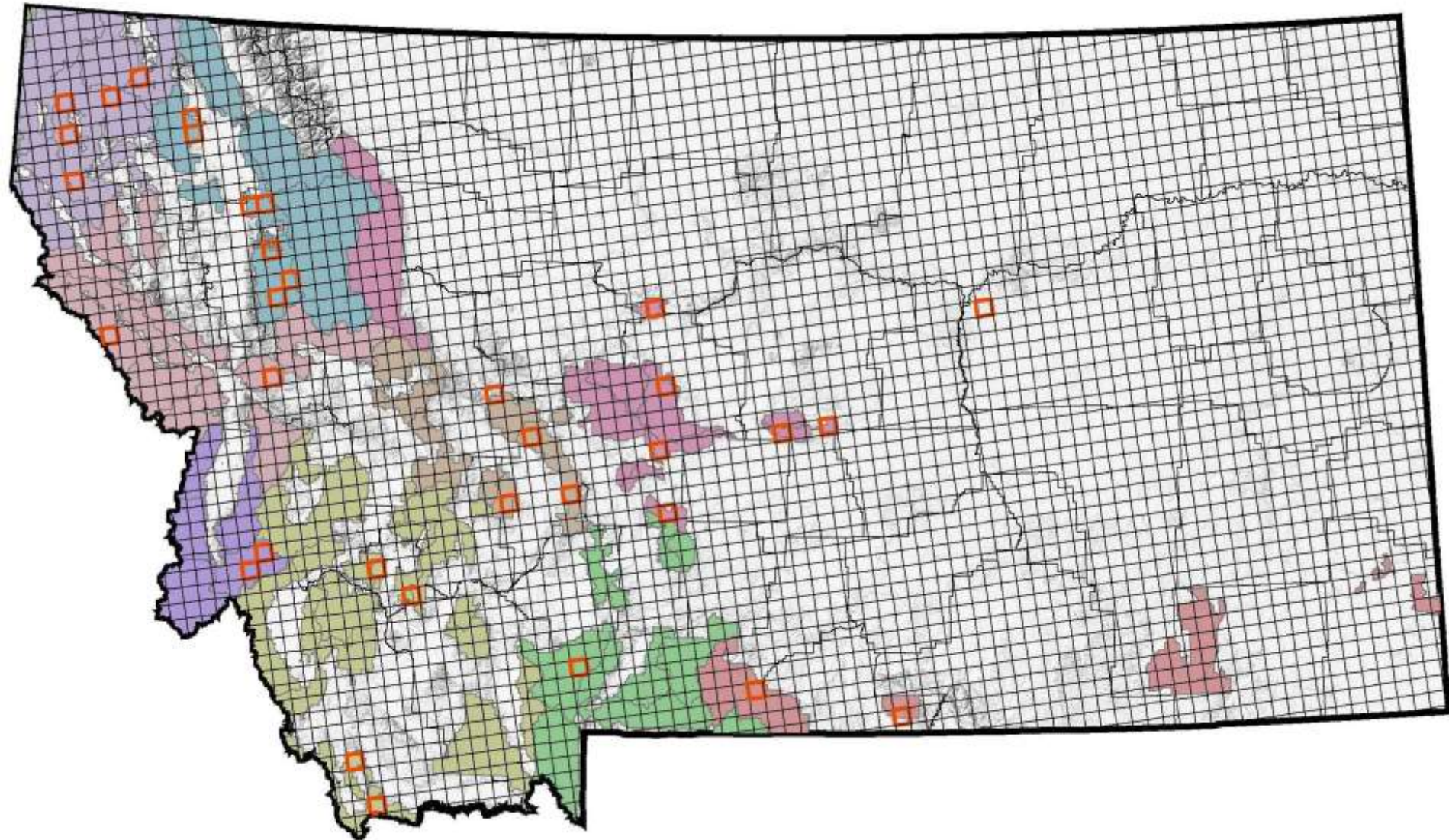


# Grid Cells With Multiple Surveys

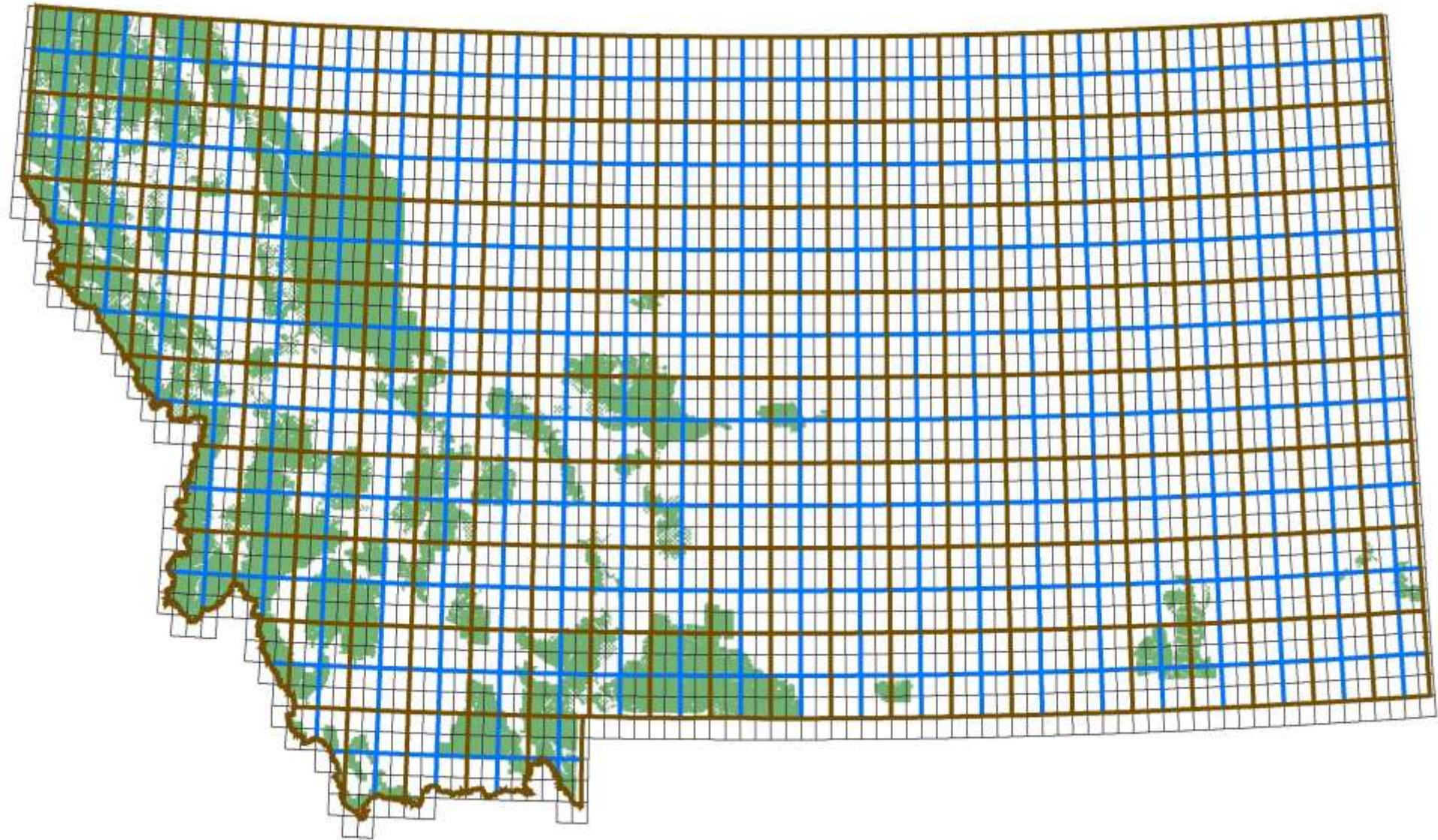
(Calculate Detection Probability and Site Occupancy Rates?)



# Grid Cells With Multiple Surveys by Forest



# Nested Latilong Grid Cells for Montana



# Multiple Survey Data by USFS District

<b>FOREST</b>	<b>DISTRICT</b>	<b>Predicted Number of Species</b>	<b>All Data as % of Predicted</b>	<b>Multiple Surveys as % of Predicted</b>
<b>Custer</b>	<b>Beartooth</b>	12	100%	<b>92%</b>
<b>Helena</b>	<b>Townsend</b>	11	91%	<b>91%</b>
<b>Kootenai</b>	<b>Libby</b>	11	100%	<b>73%</b>
<b>Lewis and Clark</b>	<b>Judith</b>	10	70%	<b>70%</b>
<b>Helena</b>	<b>Helena</b>	11	82%	<b>64%</b>
<b>Beaverhead/Deerlodge</b>	<b>Butte</b>	10	70%	<b>60%</b>
<b>Beaverhead/Deerlodge</b>	<b>Dillon</b>	10	80%	<b>60%</b>
<b>Gallatin</b>	<b>Bozeman</b>	10	70%	<b>60%</b>
<b>Flathead</b>	<b>Tally Lake</b>	11	55%	<b>55%</b>
<b>Lolo</b>	<b>Superior</b>	11	82%	<b>55%</b>
<b>Flathead</b>	<b>Swan Lake</b>	11	45%	<b>45%</b>
<b>Bitterroot</b>	<b>Sula</b>	11	45%	<b>36%</b>
<b>Helena</b>	<b>Lincoln</b>	11	55%	<b>27%</b>
<b>Kootenai</b>	<b>Fortine</b>	11	73%	<b>27%</b>

# Number of Cells Per Forest

<b>FOREST</b>	<b>Cell Count</b>	<b># of Cells with Multiple Surveys</b>	<b>% of Total</b>
<b>Beaverhead-Deerlodge</b>	<b>151</b>	<b>4</b>	<b>3%</b>
<b>Bitterroot</b>	<b>60</b>	<b>2</b>	<b>3%</b>
<b>Custer</b>	<b>50</b>	<b>3</b>	<b>6%</b>
<b>Flathead</b>	<b>104</b>	<b>6</b>	<b>6%</b>
<b>Gallatin</b>	<b>86</b>	<b>1</b>	<b>1%</b>
<b>Helena</b>	<b>43</b>	<b>5</b>	<b>12%</b>
<b>Kootenai</b>	<b>114</b>	<b>5</b>	<b>4%</b>
<b>Lewis and Clark</b>	<b>79</b>	<b>6</b>	<b>8%</b>
<b>Lolo</b>	<b>95</b>	<b>1</b>	<b>1%</b>
<b>TOTAL</b>	<b>782</b>	<b>33</b>	<b>4%</b>

# Detection Rates for Acoustic versus Mist Netting Surveys

SPECIES	OVERALL PERCENT DETECTION RATE	
	ACOUSTIC	MIST-NET
Little Brown Myotis ( <i>Myotis lucifugus</i> )	76.9	14.5
Western Long-eared Myotis ( <i>Myotis evotis</i> )	58.9	32.2
Fringed Myotis ( <i>Myotis thysanodes</i> )	15.3	4.8
Long-legged Myotis ( <i>Myotis volans</i> )	17.9	32.2
California Myotis ( <i>Myotis californicus</i> )	5.1	8.0
Western Small-footed Myotis ( <i>Myotis ciliolabrum</i> )	33.3	8.0
Silver-haired Bat ( <i>Lasionycteris noctivagans</i> )	30.7	28.9
Big Brown Bat ( <i>Eptesicus fuscus</i> )	33.3	18.8
Hoary Bat ( <i>Lasiurus cinereus</i> )	71.7	18.8
Spotted Bat ( <i>Euderma maculatum</i> )	7.6	0.0

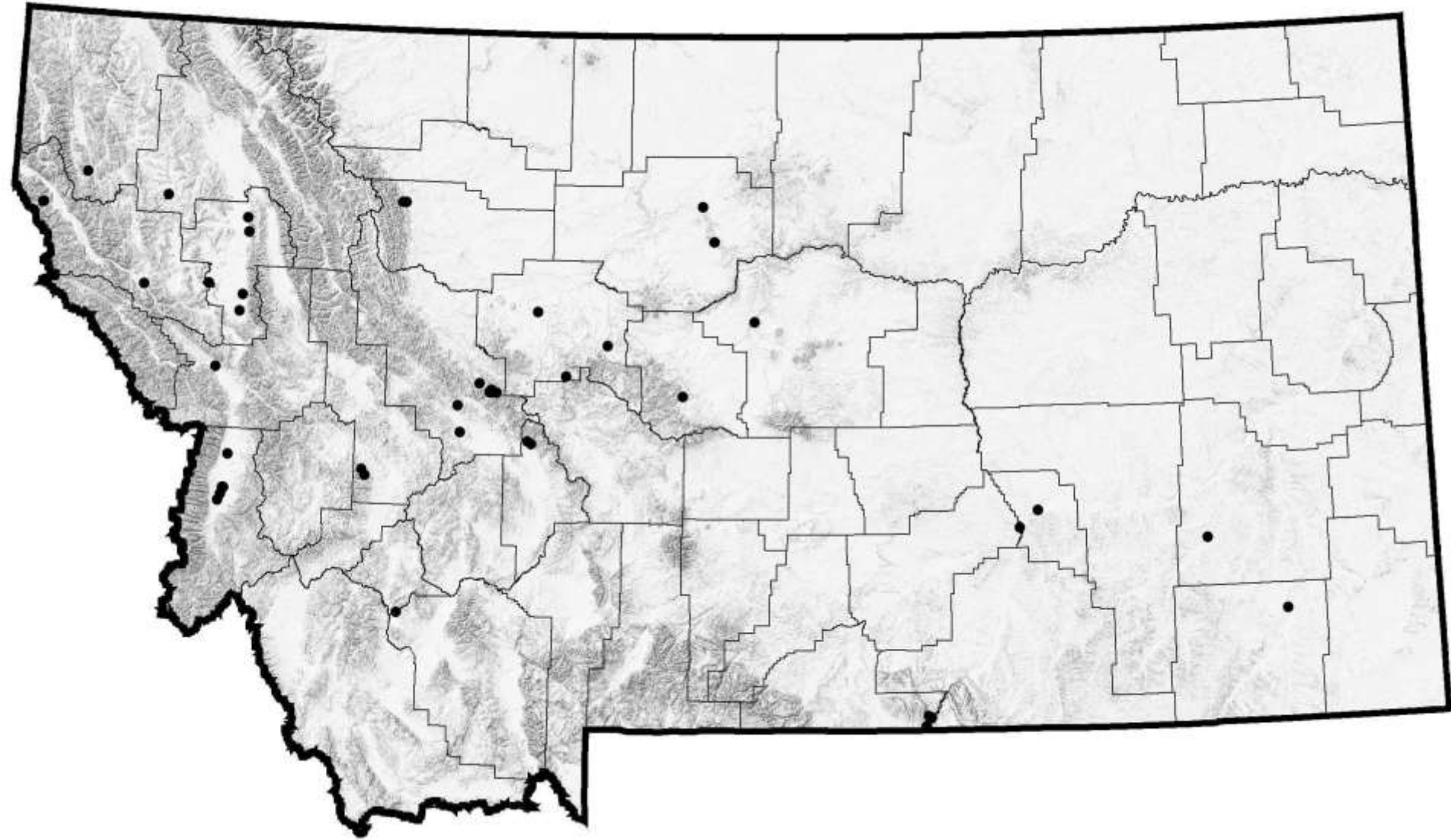
Overall percent capture rate for species during acoustic versus mist-netting surveys on eight Region 1 National Forests in Montana, 2 July – 28 September, 2006.

Thirty-nine acoustic surveys and 62 mist-netting surveys were conducted across 74 sites.

# Next Steps

- Calculate detection probabilities with existing data
- Examine confidence intervals and determine sample size needed for future grid cell surveys
- Fill in data holes
- Targeted surveys for USFS SOC species
- Targeted surveys of roost sites for management of roost habitat (e.g., bridge surveys – MDT project)
- Extend grid sampling (probably latilong based grid) across Montana with all partners (BLM, FWP/SWG)

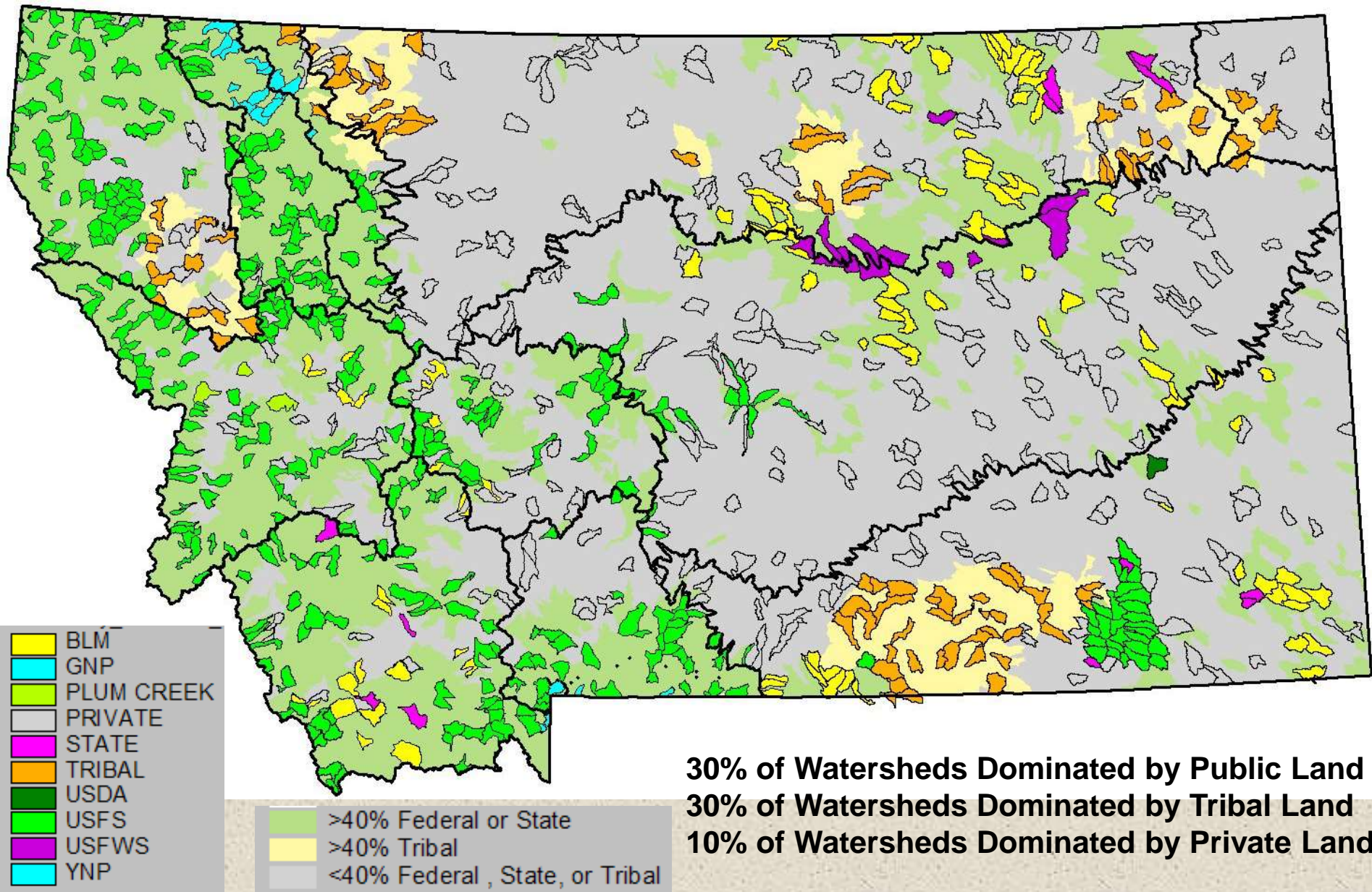
# Yuma Myotis Data...????



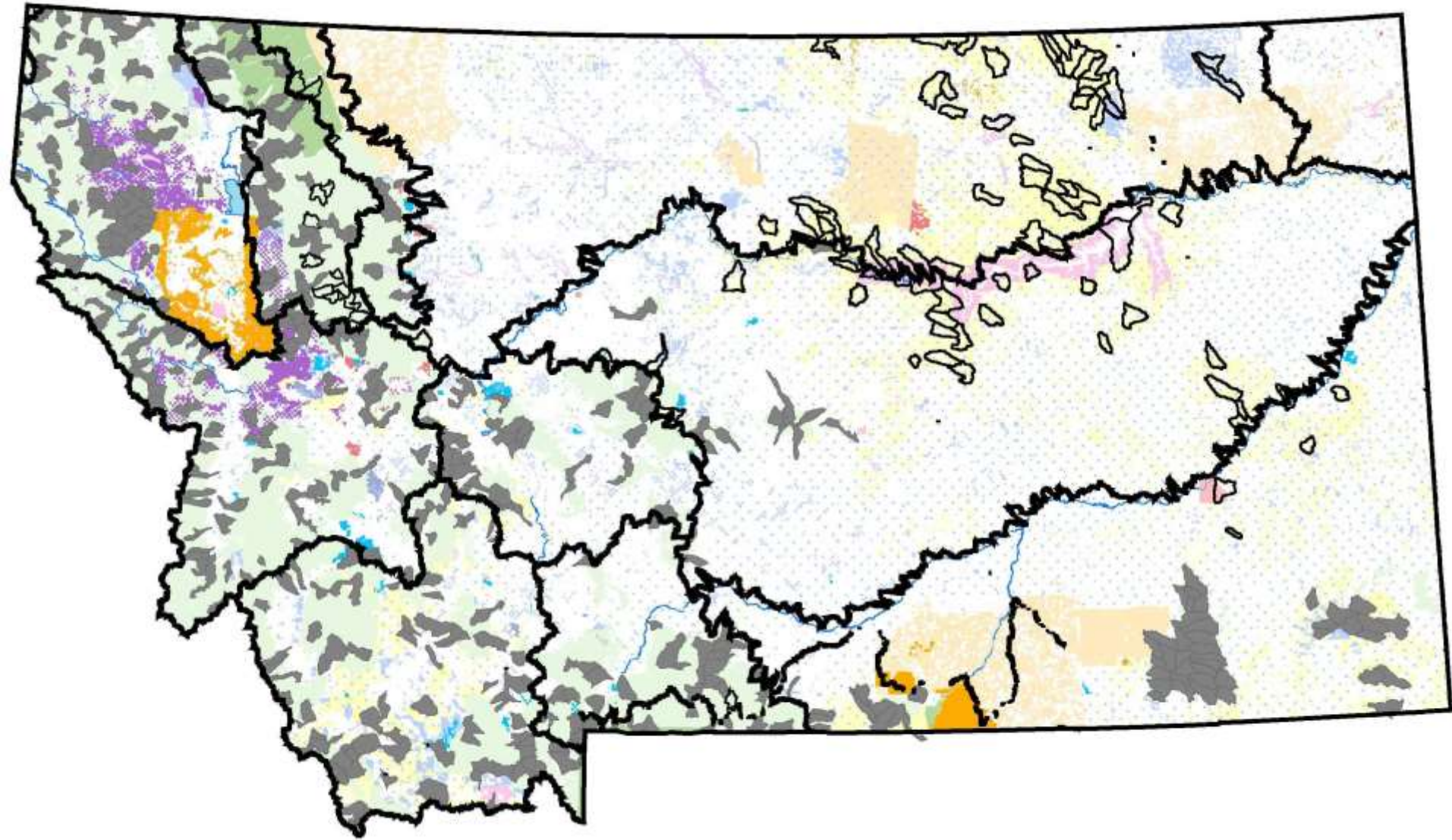


# Montana Amphibian Inventory Sampling Scheme

Geographic Strata – Ownership Strata – Randomly Selected Watersheds

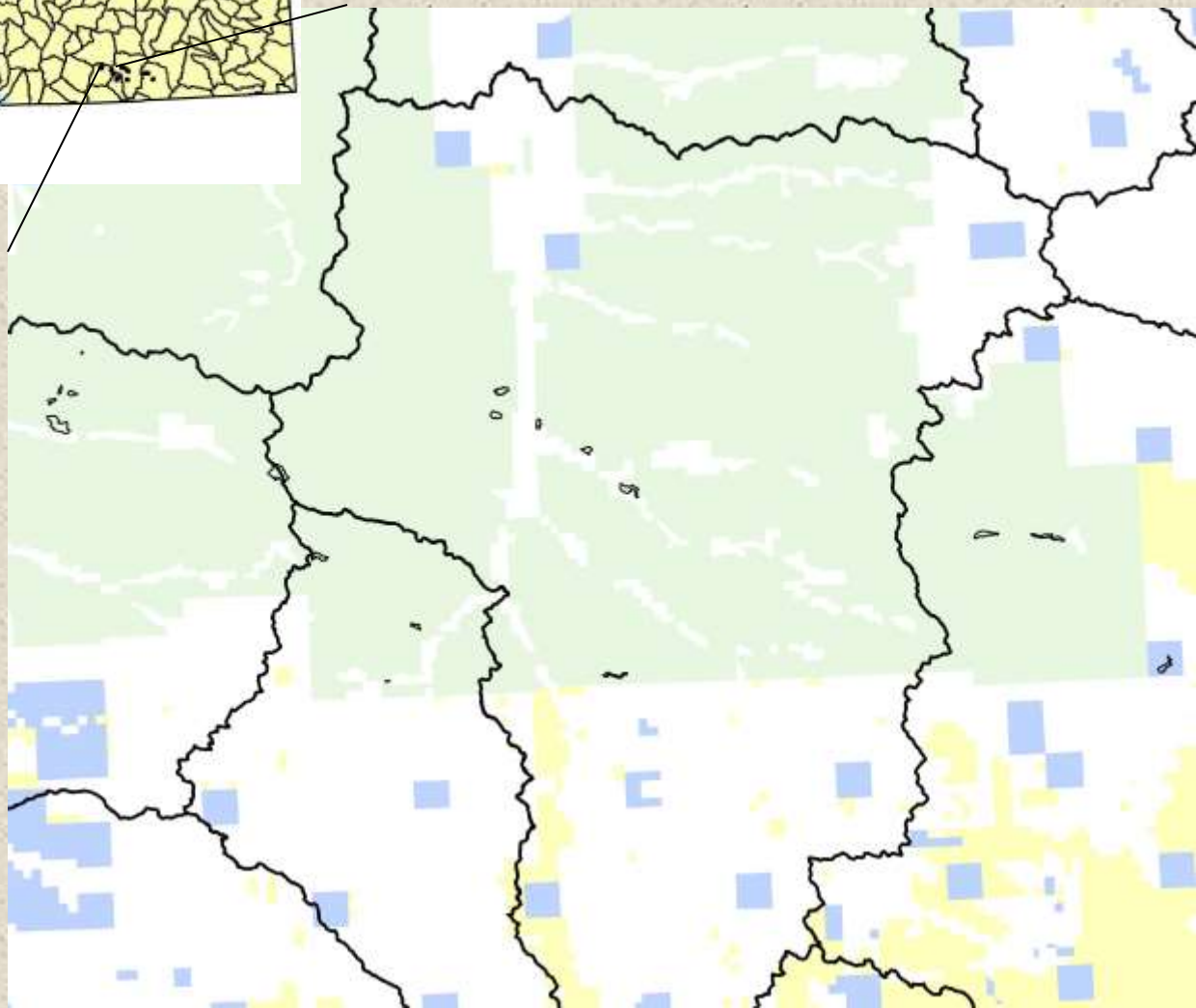
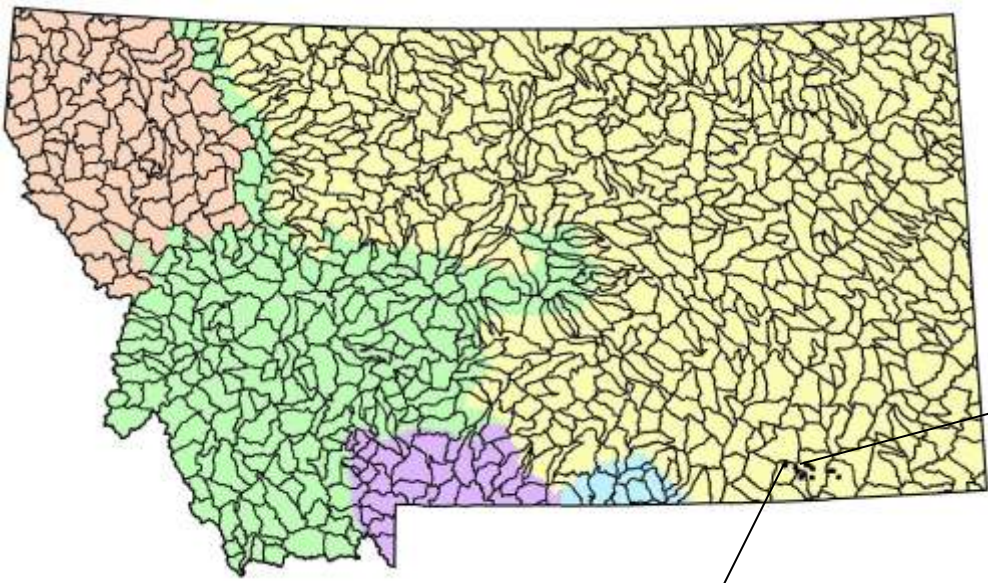


# Montana Amphibian Inventory Status



- 8,000 standing water bodies surveyed
- 7,500 species records
- 2 years of surveys remain in NE Montana
- Rapid wetland assessment
- Wetland photos posted on NHIP
- Non-target observations (pika, h-marmot)

# Reptile Surveys Statewide Scheme



# **Inventory Highlights Through Fall 2006**

- **Surveys of 520 watersheds and >8,200 sites**
- **8,230 new species locality records**
- **Established new state high elevation records for 12 species**
- **Extended known geographic ranges for 10 species**
- **Statistically valid assessment of status for majority of amphibian species**
- **Produced 9 reports, data used in book projects, and nearing completion of amphibian and reptile conservation plans for Montana.**
- **5 multiple day training workshops given to agency biologists and numerous presentations at meetings**
- **Extensive bibliographic database for access to primary literature**
- **Fencing off rare upland wetlands from cattle trampling on the Custer and Beaverhead-Deerlodge Forests**
- **Beaver reintroduction for lentic breeding site creation on Custer and Beaverhead-Deerlodge Forests**
- **Protection of amphibian populations from fish stocking on Bitterroot and Gallatin Forests**
- **ID of distribution of amphibian disease (chytrid) and need to decontaminate equipment**
- **Protection of remaining breeding populations of rare species (e.g., Western Toad)**
- **Proactive management of lentic wetlands in Forest Management Plans**
- **Heightened awareness of needs of amphibians and lentic wetlands by USFS and other agency personnel**

# Ex. Information on Apparent Occupancy and Breeding Rates for Regional Status

Species	Number and Percent of Watersheds That Were Occupied <sup>3</sup> (N = 21)	Number and Percent of Watersheds Where Breeding Was Detected <sup>3</sup> (N = 19)	Number and Percent of Sites Containing Water That Were Occupied <sup>4</sup> (N = 205)	Number and Percent of Sites Containing Water Where Breeding Was Detected <sup>4</sup> (N = 205)
Long-Toed Salamander ( <i>Ambystoma macrodactylum</i> )	15 71% (95% CI = 55% - 88%)	15 79% (95% CI = 63% - 95%)	59 29% (95% CI = 23% - 35%)	59 29% (95% CI = 23% - 35%)
Rocky Mountain Tailed Frog <sup>5</sup> ( <i>Ascaphus montanus</i> )	5 24% (95% CI = 8% - 40%)	4 21% (95% CI = 5% - 37%)	10 4.9% (95% CI = 1.9% - 7.8%)	6 3% (95% CI = 0.6% - 5.2%)
<b>Western Toad</b> ( <i>Bufo boreas</i> )	8 38% (95% CI = 20% - 56%)	2 10.5% (95% CI = 0% - 23%)	8 3.9% (95% CI = 1.3% - 6.6%)	3 1.5% <u>(95% CI = 0% - 3.1%)</u>
Pacific Treefrog <sup>6</sup> ( <i>Pseudacris regilla</i> )	2 9.5% (95% CI = 0% - 20%)	2 10.5% (95% CI = 0% - 23%)	2 1% (95% CI = 0% - 2.3%)	2 1% (95% CI = 0% - 2.3%)
Columbia Spotted Frog ( <i>Rana luteiventris</i> )	18 86% (95% CI = 73% - 99%)	15 79% (95% CI = 63% - 95%)	96 47% (95% CI = 40% - 54%)	52 25% (95% CI = 19% - 31%)
Terrestrial Gartersnake <sup>7</sup> ( <i>Thamnophis elegans</i> )	11 52% (95% CI = 34% - 71%)	NA	27 13% (95% CI = 9% - 18%)	NA
Common Gartersnake <sup>7</sup> ( <i>Thamnophis sirtalis</i> )	7 33% (95% CI = 16% - 51%)	NA	33 16% (95% CI = 11% - 21%)	NA
Non-indigenous <sup>7</sup> Salmonid Fishes	13 68% (95% CI = 51% - 86%)	NA	39 19% (95% CI = 14% - 24%)	NA

# Carpp Creek - (HUC ID = 4\_028 & ICBEMP HUC ID =170102021002)

## Map Legend

Black Cross = Potential lentic sites surveyed, but providing no breeding or overwintering habitat and not worth future survey due to reasons indicated in notes.

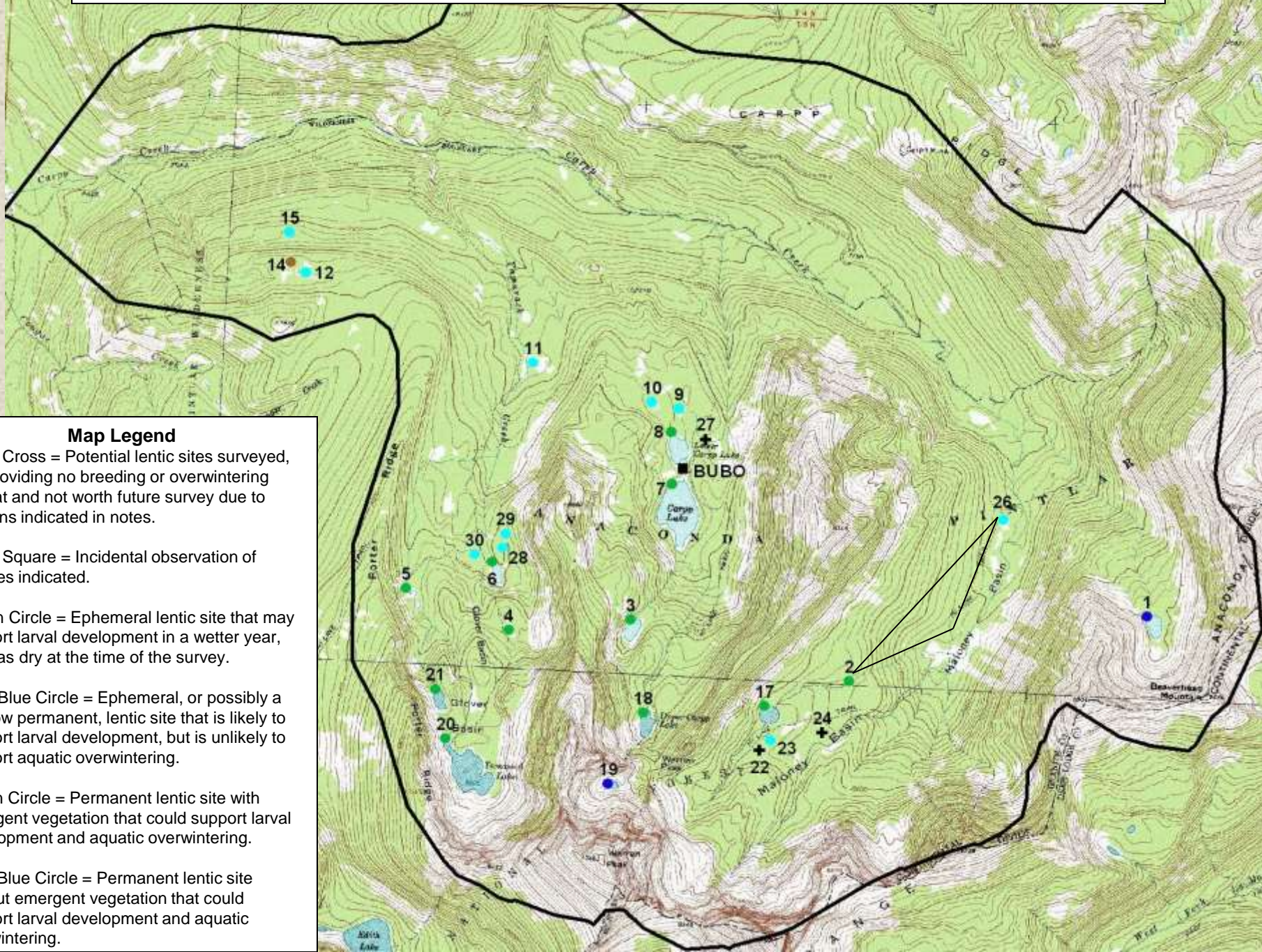
Black Square = Incidental observation of species indicated.

Brown Circle = Ephemeral lentic site that may support larval development in a wetter year, but was dry at the time of the survey.

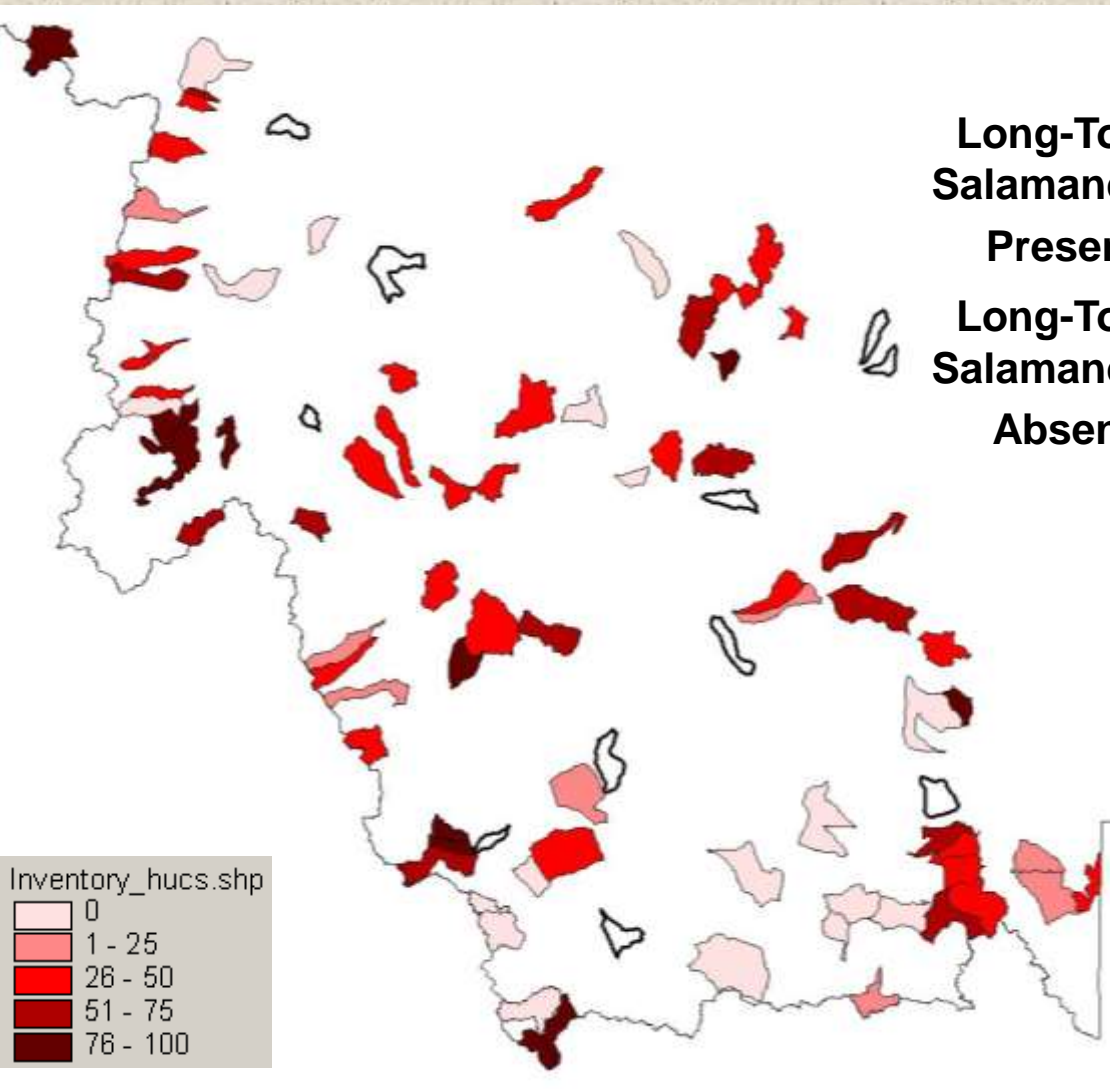
Light Blue Circle = Ephemeral, or possibly a shallow permanent, lentic site that is likely to support larval development, but is unlikely to support aquatic overwintering.

Green Circle = Permanent lentic site with emergent vegetation that could support larval development and aquatic overwintering.

Dark Blue Circle = Permanent lentic site without emergent vegetation that could support larval development and aquatic overwintering.



# Regional Fish Stocking and Impacts on Fish



Long-Toed Salamanders Present  
 Long-Toed Salamanders Absent

Fish Detected

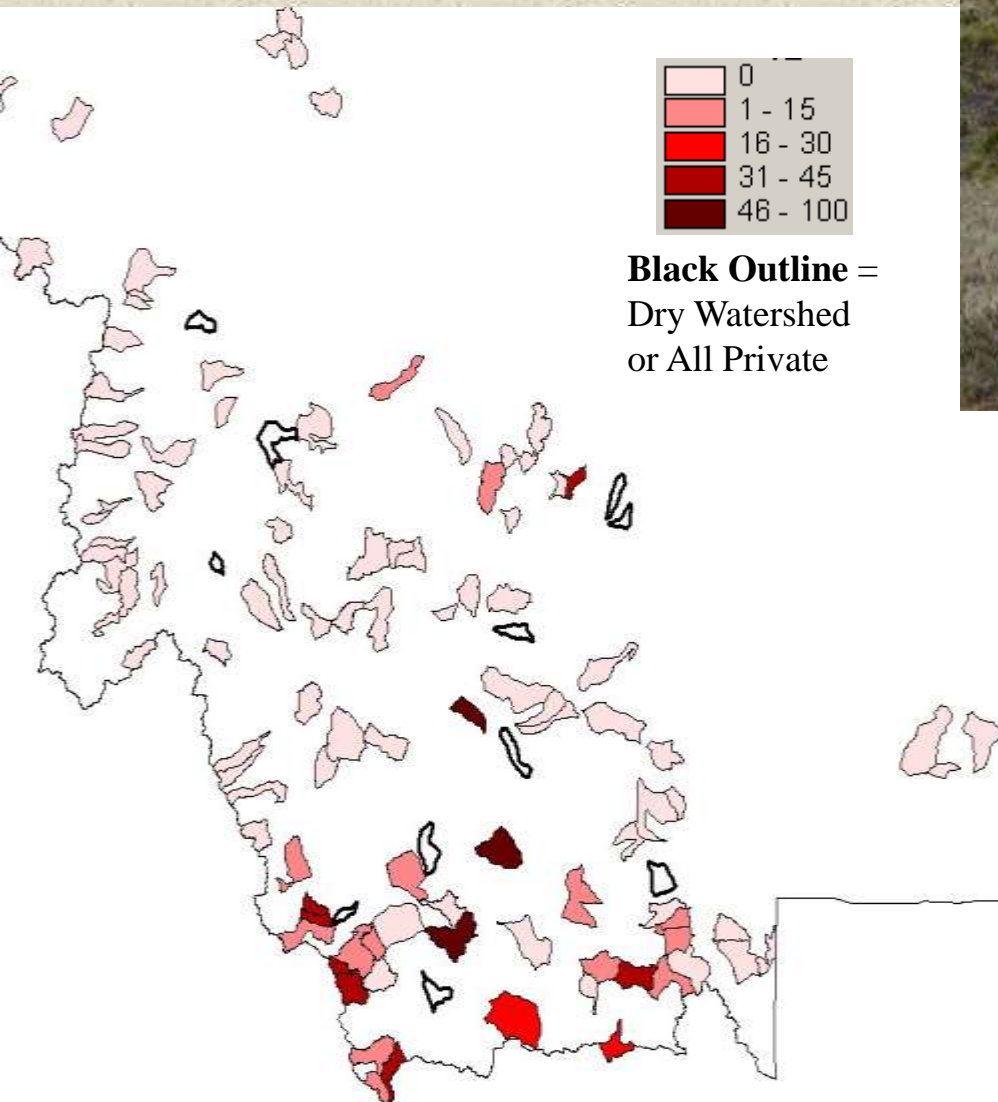
Fish Not Detected

8	92
97	350



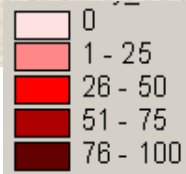
**Black Outline =**  
 Dry Watershed  
 or All Private

# Percent of Lentic Sites Capable of Supporting Amphibian Reproduction Heavily Impacted by Cattle

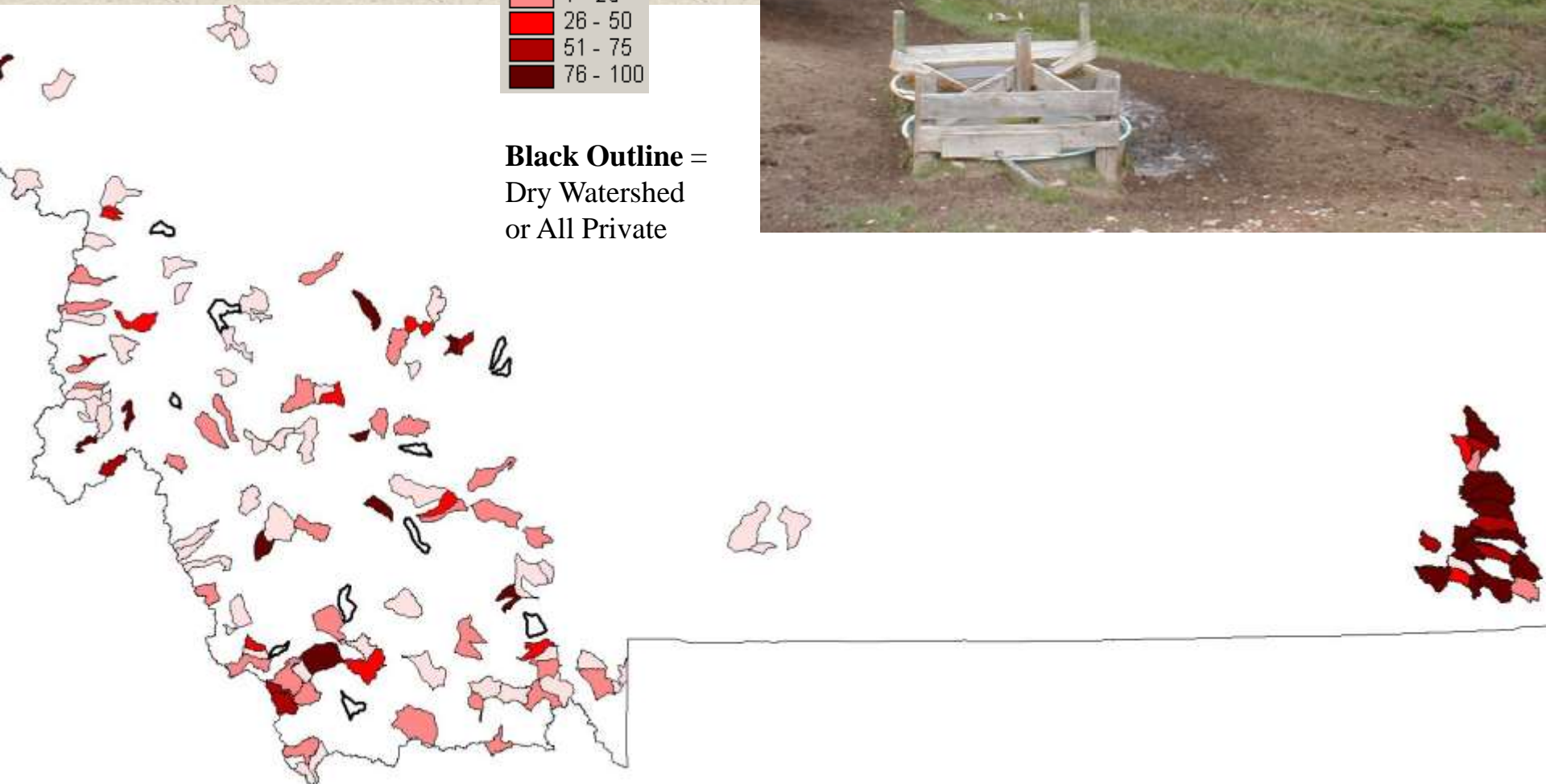




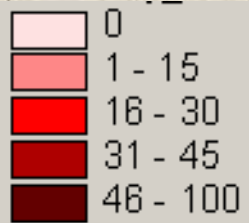
# Percent of Lentic Sites Capable of Supporting Amphibian Reproduction with Water Dammed or Diverted



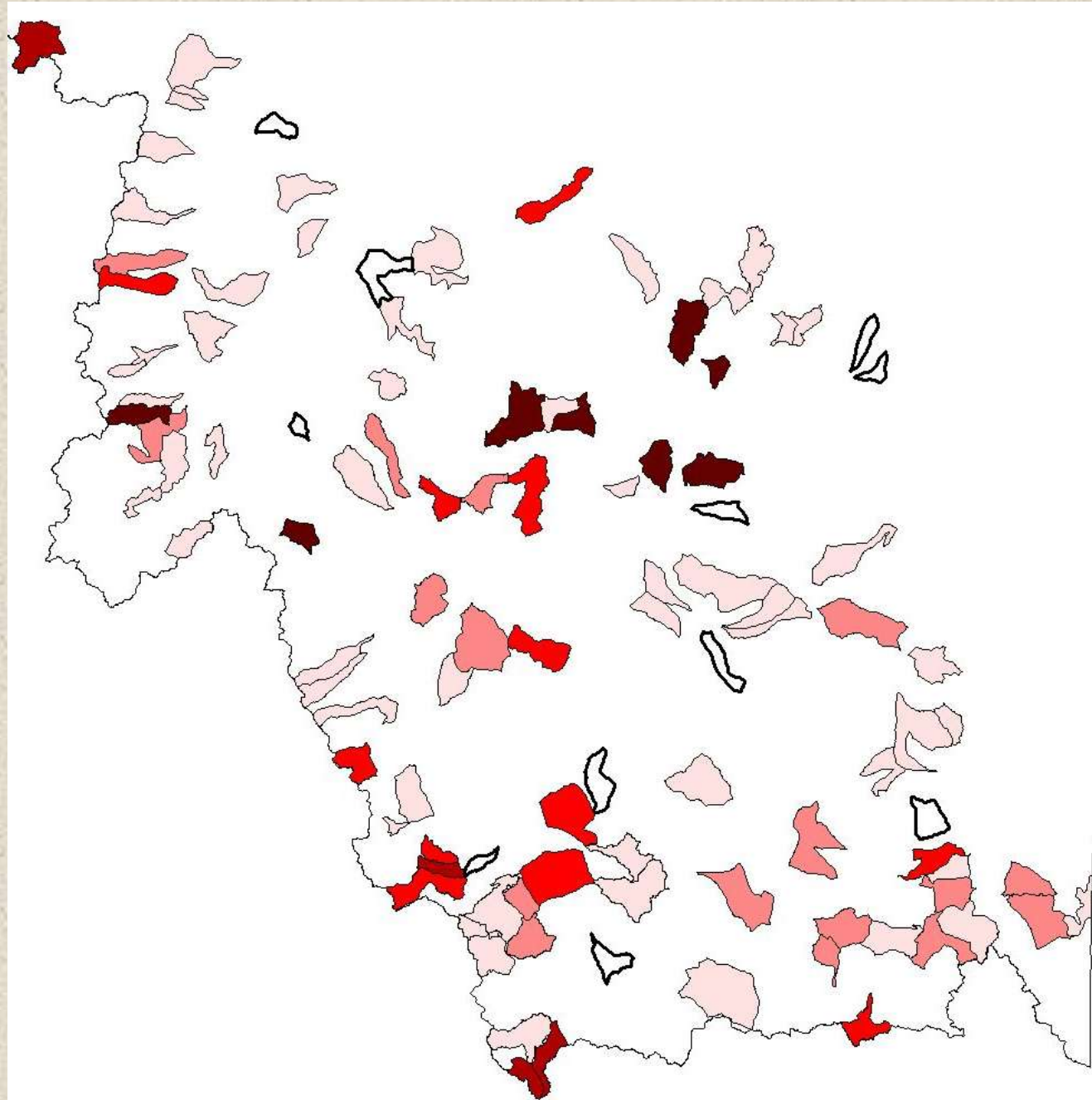
**Black Outline =**  
Dry Watershed  
or All Private



# Percent of Lentic Sites Created By Beaver



**Black Outline =**  
Dry Watershed  
or All Private







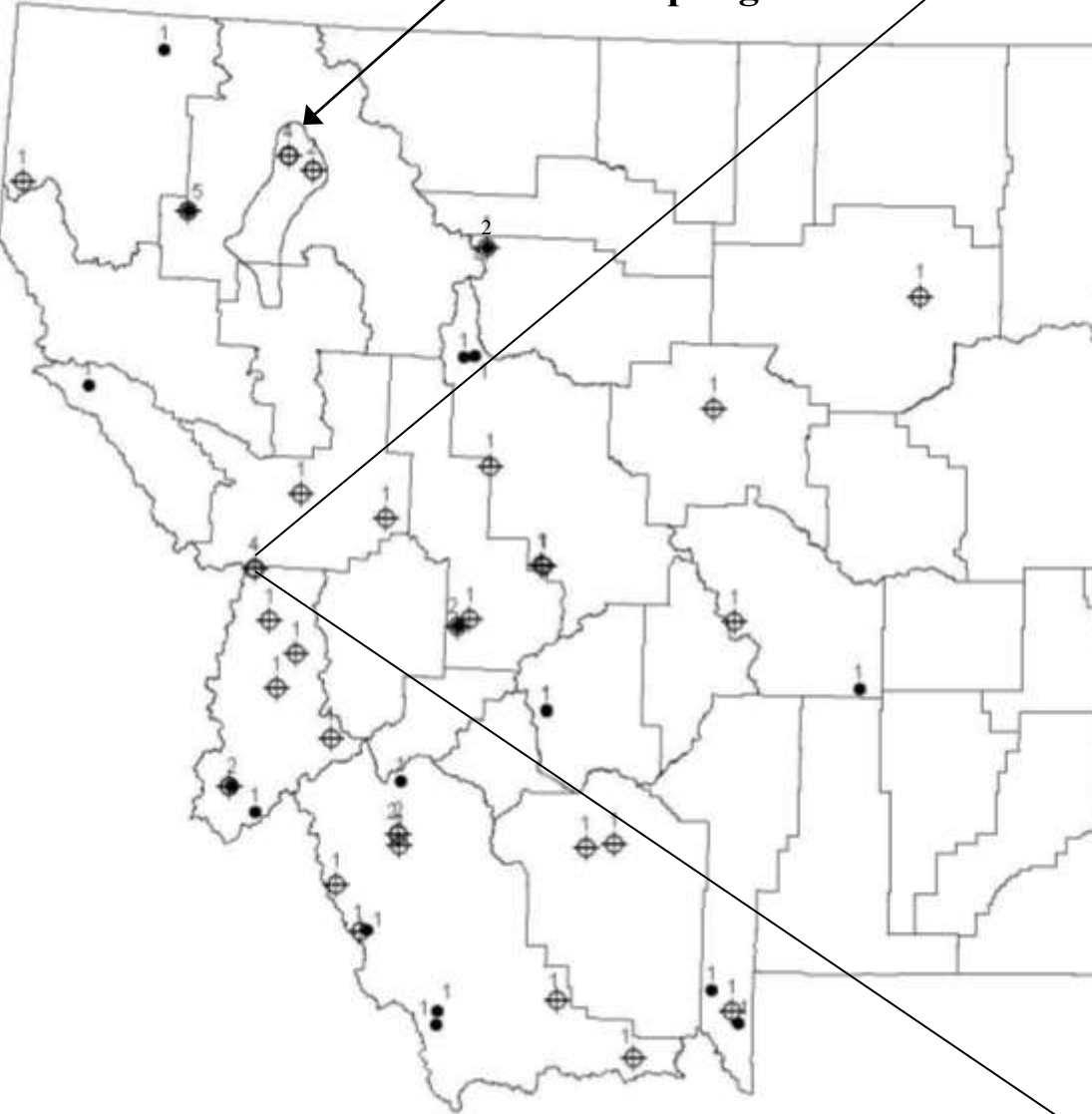


# Spatial Distribution of Tissues Tested for *B. dendrobatidis*

Positive = ●

Negative = ⊕

1970's Sampling Area



Mass mortalities at breeding site in Bitterroot Mountains tested negative



# Amphibian and Reptile Conservation Plans