Bridger-Teton National Forest Amphibian Workshop

Version 4

Wednesday, 06/25/14

Teton County Search and Rescue Training Facility, Jackson, WY

Located just barely west of Jackson on Highway 22 towards Wilson – sharp hair-pin turn to the north before the first light
Please share transportation and car pool – parking is limited.

Time	Presenter(s)	Topic	[Desired Outcome] By The End Of The Topic We Will…	Notes
9:15 - 9:30	Pam Bode	Coffee and treats	Have shaken off the road dust and settled in to our seats, ready to start on time.	Plan to arrive before the meeting is scheduled to begin – there is tourist traffic on the roads.
9:30 to 9:35	John Kuzloski	Get it Started	Have started the meeting.	
9:35 - 9:45	Clint Kyhl	Welcome, Introductions and Leader's Intent	Know who is at the meeting and understand what Clint wants us to accomplish today.	Ensure the appropriate staff is invited to this meeting.
Where We Are and How We Got Here				
9:45 - 10:15	Lee Jacobson and Cynthia Tait	Regional Status of Amphibians	Understand the status of amphibians concerning sensitive species listing, population trends and potential for TES listing by USFWS from a regional perspective.	
10:15 – 10:45	Wendy Estes-Zumpf	B-T Status of Amphibians	Understand the current state of knowledge about amphibians on the B-T NF and the Amphibian Monitoring Plan we are implementing this year	
10:45 - 11:00	Gary Hanvey	B-T NF SSQO's	Understand the B-T NF sensitive species quantifiable objectives development process and the status of the amphibian conservation assessment.	
A Look at the Science				
11:00 - 12:30	Don DeLong	Draft Amphibian Conservation Assessment	Be aware of the science supporting the need for a minimum of 70% retention of herbaceous vegetation near breeding sites.	
12:30 - 13:00	All	Brown Bag Lunch	Have nourished ourselves and regained our ability to focus.	Bring your lunch! We will start on time at 1300 after a short 30 minute break.
13:00 – 13:15	Gary Hanvey	Other Amphibian Science	Be aware of other science provided from R2 and its applicability to B-T NF.	

13:15 - 13:45	John K.	Facilitated Discussion	Have discussed the science presentations and listened to each other's perspectives about opportunities and concerns.	
Practical Applications				
13:45 - 14:00	Rob Hoelscher	Sherman Grazing Decision Settlement Agreement	Understand the amphibian related decisions in the ROD, the appeal and the settlement agreement. We will also understand the outcome of the permittee's request for a new decision and the district plans for amphibian related monitoring this summer and the future.	
14:00 - 14:15	Kerry Murphy	Implications for the Future Upper Green Grazing Decision	Understand the results of summer 2013 monitoring in the Upper Green Allotments concerning the relationship between 50% key herbaceous use and 70% all herbaceous retention.	
14:15 – 14:30	All	Break	Be refreshed.	
14:30 – 14:45	Gary Hanvey	Ongoing Research Efforts	Be aware of the research and other amphibian related projects the FS and others are performing on the B-T NF this summer.	
14:45 - 15:15	John Kuzloski	Facilitated Discussion	Have discussed the afternoon presentations and listened to each other's perspectives about opportunities and concerns.	
Next Steps				
15:15 – 15:45	John K. and Clint	Strategizing	Have determined whether or not we have met Clint's intent for this workshop and know what follow-up actions or meetings (if any) are needed.	John will develop a bin or "further action" list during the meeting.
15:45	All	Adjourn	Travel home!	

Bridger-Teton National Forest Amphibian Workshop

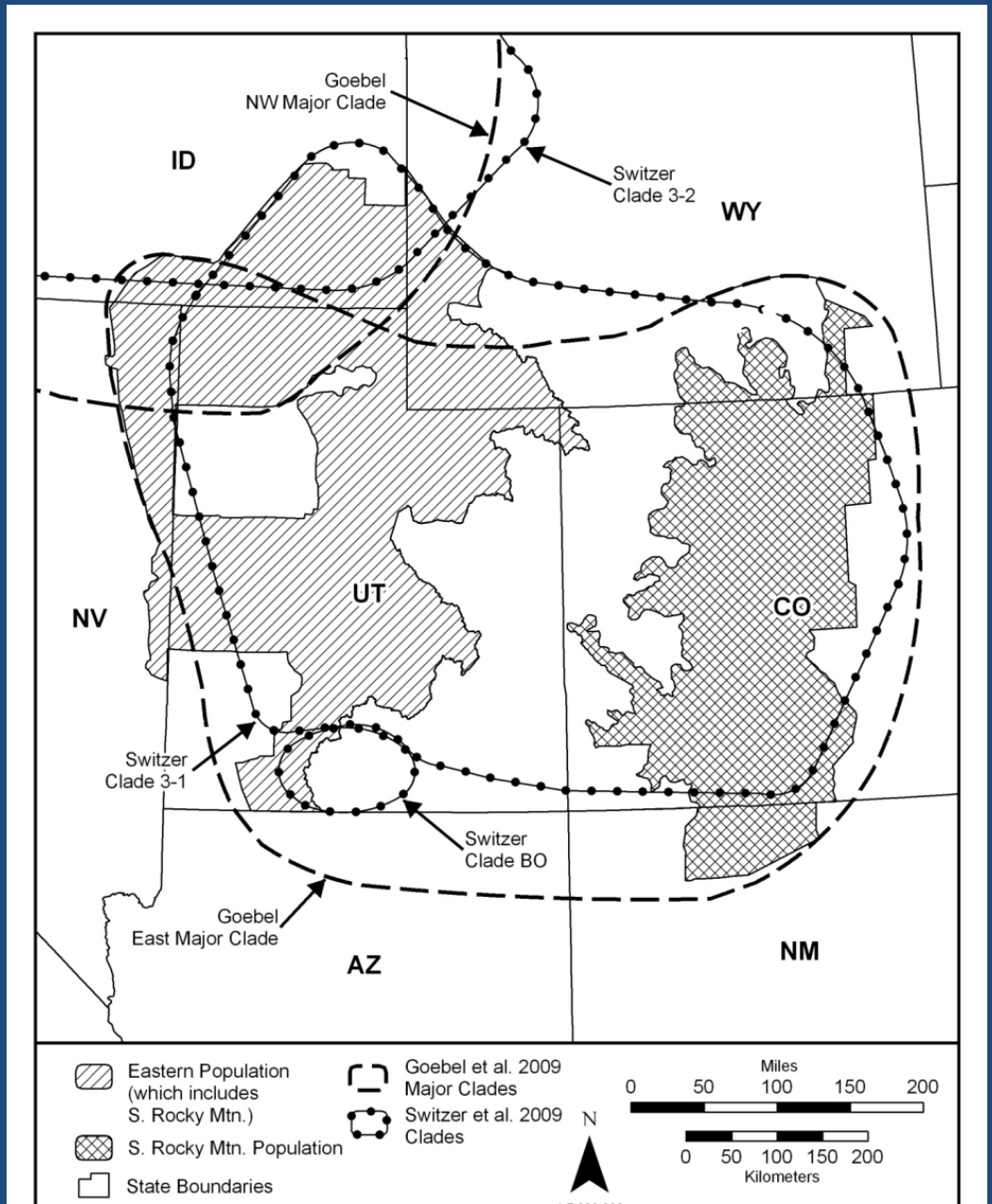
Version 4

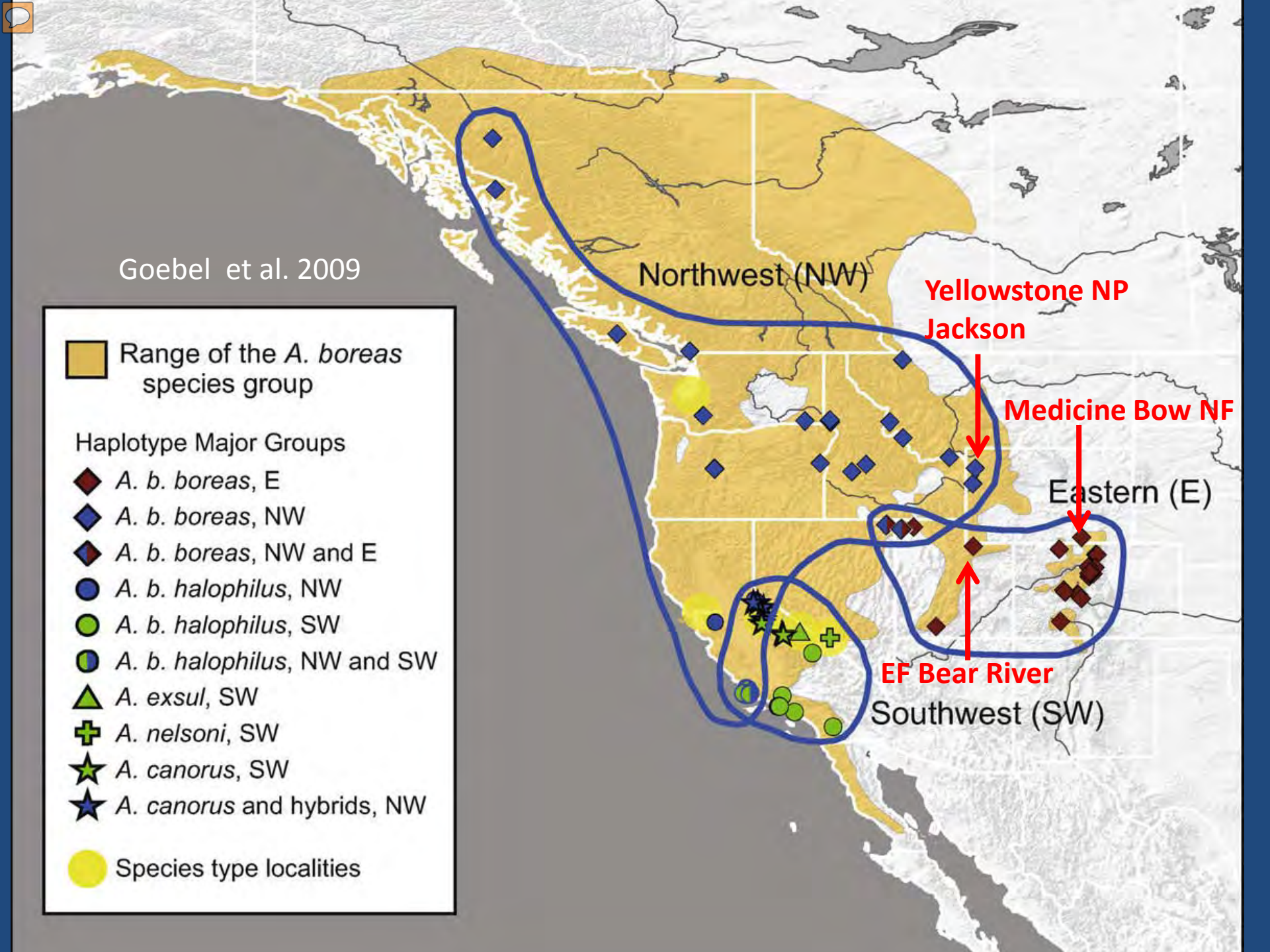
Attendees: Clint Kyhl, Jose, Castro, Pam Bode, Michael Schrotz, Gary Hanvey, John Kuzloski, Lee Jacobson, Cynthia Tait, Wendy Estes-Zumpf, Don DeLong, Rob Hoelscher, Kerry Murphy, Adriene Holcomb, Richard Raione, Dale Deiter, Tom Matza, Dave Cottle, Paul Archual, Brian Goldberg, Dave Booth, Matt Anderson, Barb Franklin, Trevi Robertson, Anita DeLong, Ann Roberts, Gary Dean, Tammy ? from Caribou-Targhee

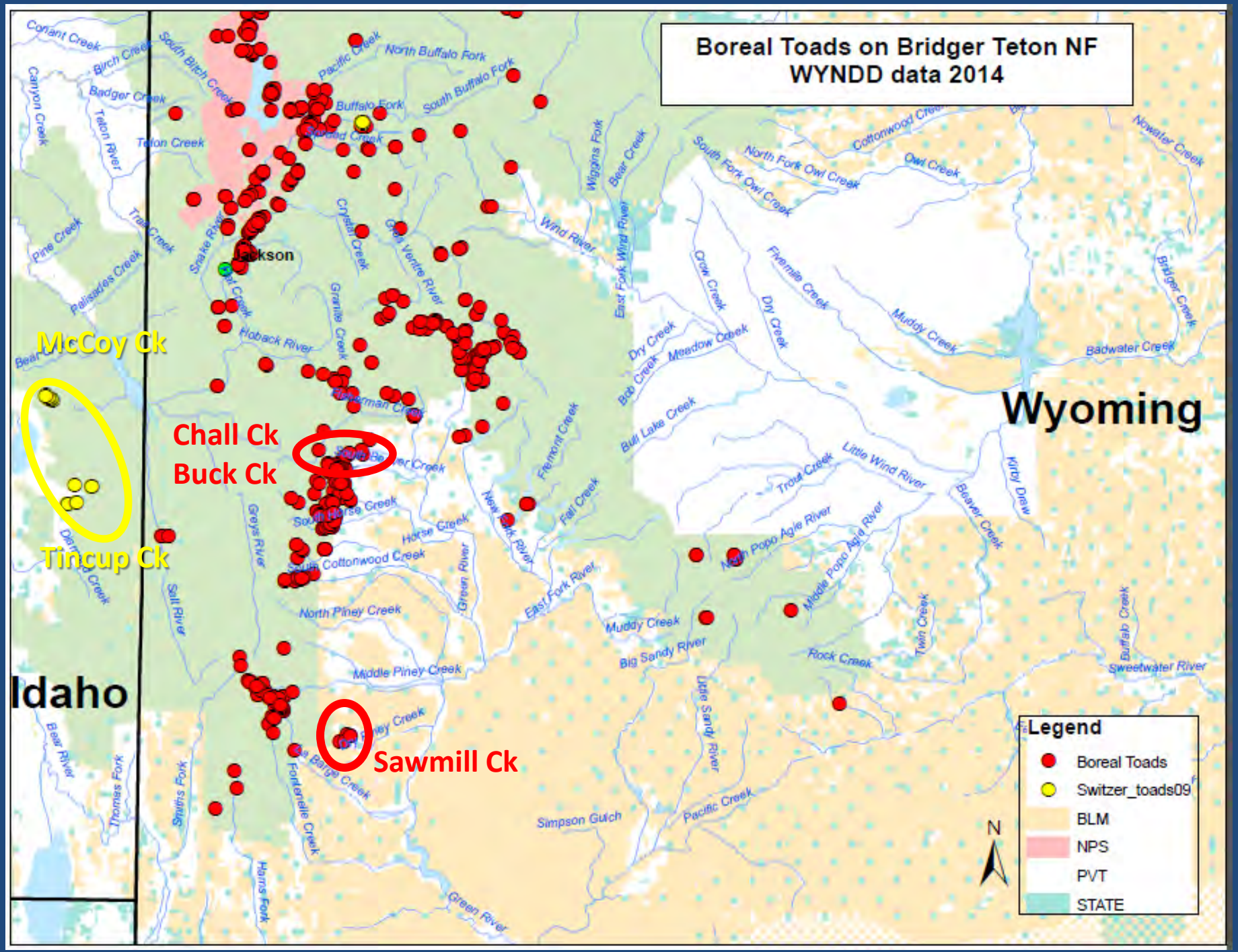
BOREAL TOAD STATUS & POTENTIAL for LISTING by USFWS

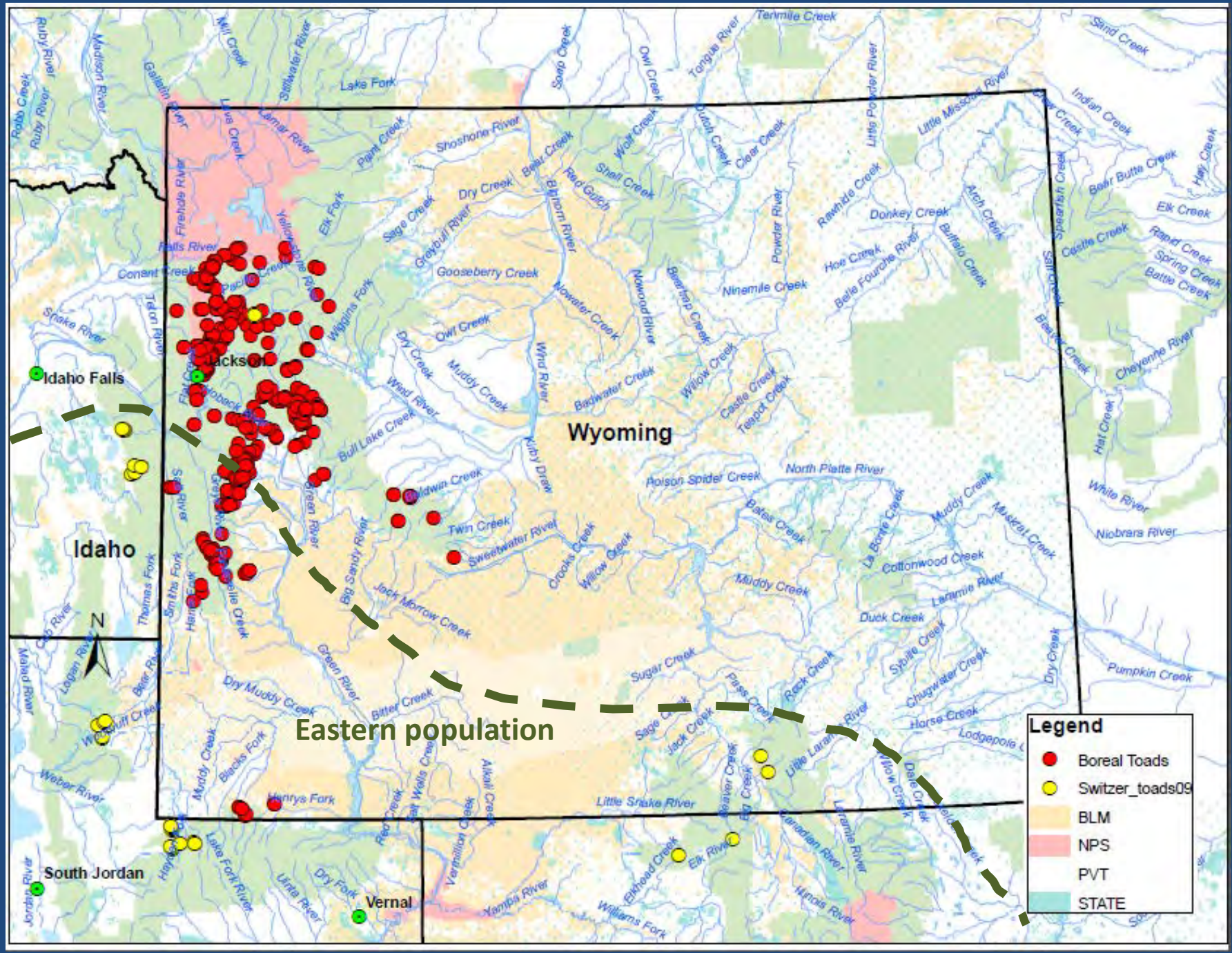
Lee Jacobson, Regional T & E Biologist
Cynthia Tait, Regional Aquatic Ecologist

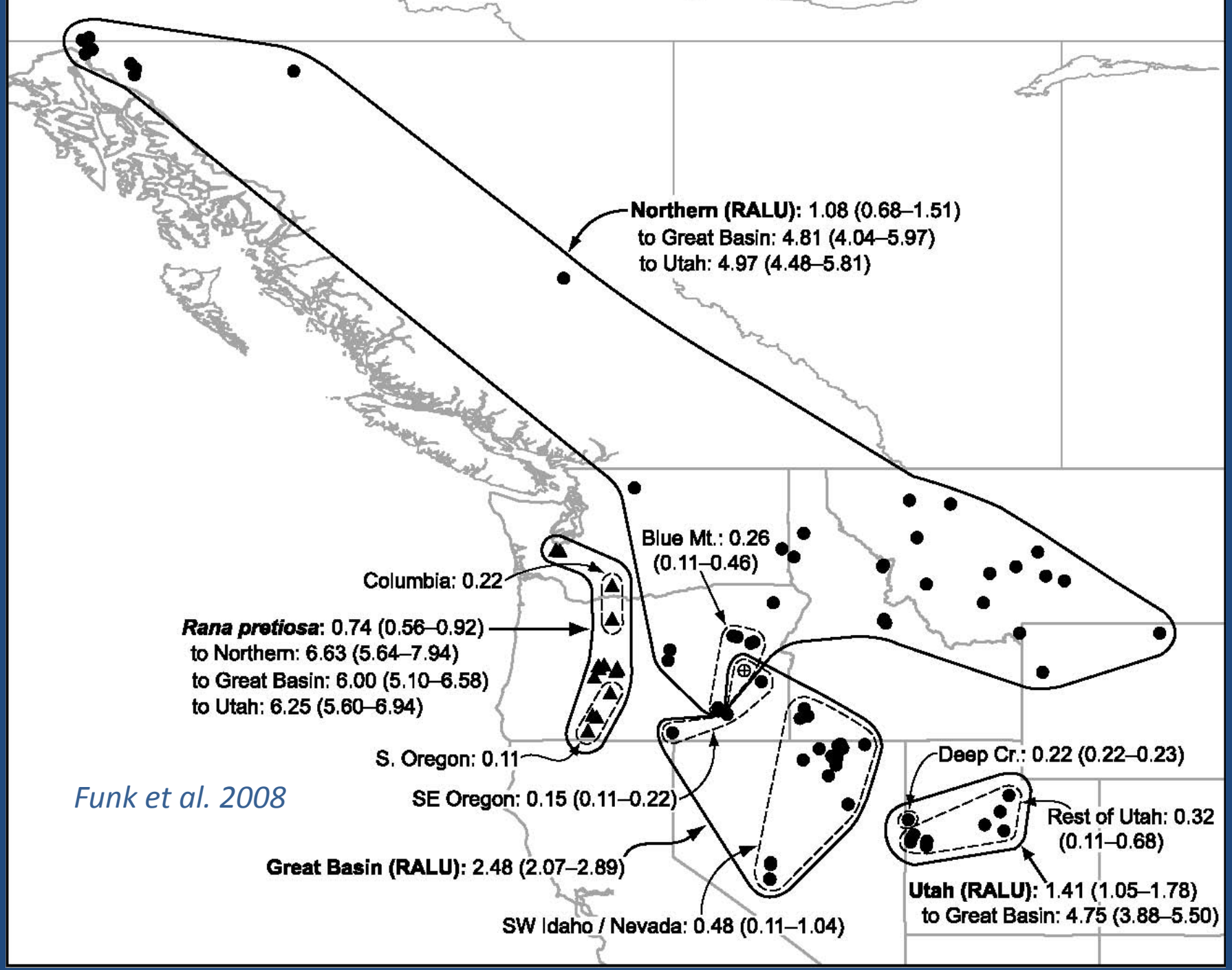
The Eastern population and southern Rocky Mountain subset of the Eastern population.




Goebel et al. 2009
Range of the A. boreas species group
Haplotype Major Groups
A. b. boreas, E
A. b. boreas, NW
A. b. boreas, NW and E
A. b. halophilus, NW
A. b. halophilus, SW
A. b. halophilus, NW and SW
A. exsul, SW
A. nelsoni, SW
A. canorus, SW
A. canorus and hybrids, NW
Species type localities
Northwest (NW)
Yellowstone NP
Jackson
Medicine Bow NF
Eastern (E)
EF Bear River
Southwest (SW)


Boreal Toads on Bridger Teton NF
WYNDD data 2014
McCoy Ck
Chall Ck
Buck Ck
Tincup Ck
Sawmill Ck
Wyoming
Idaho
Jackson
Legend
Boreal Toads
Switzer_toads09
BLM
NPS
PVT
STATE
N


Wyoming
Idaho
Jackson
Idaho Falls
South Jordan
Vernal
Eastern population
N
Legend
Boreal Toads
Switzer_toads09
BLM
NPS
PVT
STATE



Funk et al. 2008

Designated Status of the Boreal Toad

- The Boreal Toad is considered a sensitive species on Forests in Utah, Wyoming and Southern Idaho (2010) and has the following NatureServe state ranks: Idaho (S4), Nevada (S4), Utah (S2S3), Wyoming (S1) (S1 indicates it is considered critically imperiled in that geographic area.)

- In 2012, the FWS found that designating the Eastern population of the boreal toad as a threatened designated population segment may be warranted and the toad is currently under 12 month status review (due date is September 2017).

- After the status review is complete, The FWS will determine whether to propose adding the eastern population as a DPS to the Federal lists of threatened or endangered wildlife and plants.

- The Eastern population occurs in portions of Colorado, Idaho, New Mexico, Nevada, Utah, and Wyoming.

Identified Threats to Boreal Toads

- The principal threats are die-offs associated with chytrid fungus (*Batrachochytrium dendrobatidis*) infections;
- habitat destruction and degradation from water retention projects, spring and developments;
- predation by and competition with native and non-native species, and fishery management activities.
- FS authorized livestock grazing is coming under increasing scrutiny as toad numbers decline. The principal concerns with grazing are:
  - potential trampling of individuals and egg masses;
  - water developments; and
  - degradation of breeding sites and loss of vegetative cover.

Management Requirements for Sensitive Species

FSM 2670.22 – Objectives for Sensitive Species.

1. Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions.
2. ***Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands.***
3. Develop and implement management objectives for populations and/or habitat of sensitive species.

FSM 2670.32 - Sensitive Species Policy

1. Assist States in achieving their goals for conservation of endemic species.
2. As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.
3. ***Avoid or minimize impacts to species whose viability has been identified as a concern.***
4. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. (***The line officer, with project approval authority, makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward Federal listing.)***
5. Establish management objectives in cooperation with the States when projects on National Forest System lands may have a significant effect on sensitive species population numbers or distributions. Establish objectives for Federal candidate species, in cooperation with the FWS or NMFS and the States.

Management Requirements for Sensitive Species

FSM 2672.1 - Sensitive Species Management.

Sensitive species of native plant and animal ***species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing. There must be no impacts to sensitive species without an analysis of the significance of adverse effects on the populations, its habitat, and on the viability of the species as a whole.*** It is essential to establish population viability objectives when making decisions that would significantly reduce sensitive species numbers.

FSM 2670.45 - **Forest Supervisors**. The Forest Supervisors:

1. Ensure that legal and biological requirements for the conservation of endangered, threatened, and proposed plants and animals are met in Forest land and resource management planning; ensure compliance with procedural and biological requirements for sensitive species.
2. Develop quantifiable recovery objectives and develop strategies to effect recovery of threatened and endangered species. ***Develop quantifiable objectives for managing populations and/or habitat for sensitive species.***
3. ***Determine distribution, status, and trend of threatened, endangered, proposed, and sensitive species and their habitats on Forest lands.***
4. Coordinate Forest programs with other Federal agencies, States, and other groups and individuals concerned with the conservation of threatened, endangered, proposed, and sensitive species.

Management Requirements for Sensitive Species

Bridger-Teton Forest Plan Direction

- The existing BT Forest Plan was developed under the 1982 Planning Regulations. Specific direction concerning **viability** is provided in the 1982 NFMA implementing regulations at 36 CFR 219.19:

"Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. *For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.*" (36 CFR 219.19).

- Having said that, because the 1982 planning rule does not exist, we are advised that technically we are held accountable to language in our exiting plans.

Management Requirements for Sensitive Species

Bridger-Teton Forest Plan Direction

Goal 3.3: Sensitive species are prevented from becoming a federally listed Threatened species in Wyoming.

Objectives: 3 3(a) - Protect National Forest Service Intermountain Regional Sensitive plant and animal species and provide sustainable and adequate amounts of habitat to ensure that activities do not cause (1) ***long-term or further decline in population numbers or habitats supporting these populations***, and, (2) trends towards federal listing.

Sensitive Species Management Standard:

1. Quantifiable objectives will be developed to Identify and improve the status of Sensitive species and eliminate the need for listing.
2. **Crucial habitats of priority I, II, and III species listed by Wyoming Game and Fish and the Intermountain Region Sensitive Species list will be protected and maintained.**
3. The Forest Service will cooperate with Wyoming Game and Fish on management programs when needed to maintain population objectives of these species, especially with species which have been identified as needing immediate attention and active management to ensure a significant declines in breeding populations do not occur.
4. Information collected and interpretive programs will promote the conservation of these species and their habitats.
5. **National Forest managers will participate in species and habitat surveys and monitoring programs needed to gather necessary data to determine population status.**

Management Requirements for Sensitive Species

Bridger-Teton Forest Plan Direction

Fish, Wildlife and Threatened, Endangered, and Sensitive Species Standard :

1. Range improvements, ***management activities, and trailing will be coordinated with and designed to help meet fish and wildlife habitat needs***, especially on key habitat areas such as crucial winter range, seasonal calving areas, riparian areas, sage-grouse leks, and nesting sites.
2. Special emphasis will be placed on helping to meet the needs of Threatened, Endangered, and Sensitive species.

Diversity of Wildlife Habitat Guideline:

1. Diverse wildlife habitat types should be maintained within each watershed.
2. ***Sufficient habitat should be provided to maintain Wyoming Game and Fish Department population objectives and distributions of native wildlife*** including non-game, small game, big-game, fish, threatened, endangered, and sensitive species.

Process for Designating Sensitive Species

FSM 2672.11 - Identification of Sensitive Species. Regional Foresters shall identify sensitive species occurring within the Region. They shall examine the following sources as possible candidates for listing as sensitive species:

1. Fish and Wildlife Service or National Marine Fisheries Service candidates for Federal listing (categories 1 and 2) under Federal Register Notice of Review.

2. State lists of endangered, threatened, rare, endemic, unique, or vanishing species, especially those listed as threatened under State law.

3. Other sources as appropriate in order to focus conservation management strategies and to avert the need for Federal or State listing as a result of National Forest management activities.

Process for Designating Sensitive Species

Region 4 Uses the Following six criteria to designate a species:

- **Nature Serve rankings**
- **Abundance**
- **Range/Distribution**
- **Trend**
- **Protection of Occurrence**
- **Threats**
- **Fragility/Habitat Specificity**

- **The Sensitive Species List is periodically updated to reflect species status changes and to add or remove species.**

- **Before a species is added to the list all Forests are requested to provide input and if they concur. Ultimately it is an RF decision if a species is added or removed form the list.**

- **Forest may request the addition or removal of a s**pecies from the list.

Bridger-Teton Sensitive Species (41)

Boreal Toad
Columbia spotted frog

Bighorn Sheep
Fisher
Spotted bat
Townsend's Western Big-Eared Bat
Grey Wolf

Bonneville cutthroat trout
Colorado River cutthroat trout
Northern Leatherside Chub
Yellowstone cutthroat trout

Bald eagle
Boreal owl
Common loon
Flammulated owl
Great gray owl
Greater sage-grouse
Harlequin duck
Northern goshawk
Peregrine falcon
Three-toed woodpecker
Trumpeter swan

Black and purple sedge
Creeping twinpod
Greenland primrose
Meadow milkvetch
Naked-stemmed parrya
Narrow-leaf goldenweed
Payson bladderpod
Payson's milkvetch
Pink agoseris
Rockcress draba
Seaside sedge
Soft aster
Starvling milkvetch
Sweet-flowered rock jasmine
Weber's saussurea
Whitebark pine
Woolly daisy
Wyoming tansymustard

State of Knowledge of Amphibians on the Bridger-Teton National Forest

Important Questions

- **What amphibian species occur on the forest?**
- **Where do they occur?**
- **How are they doing?**

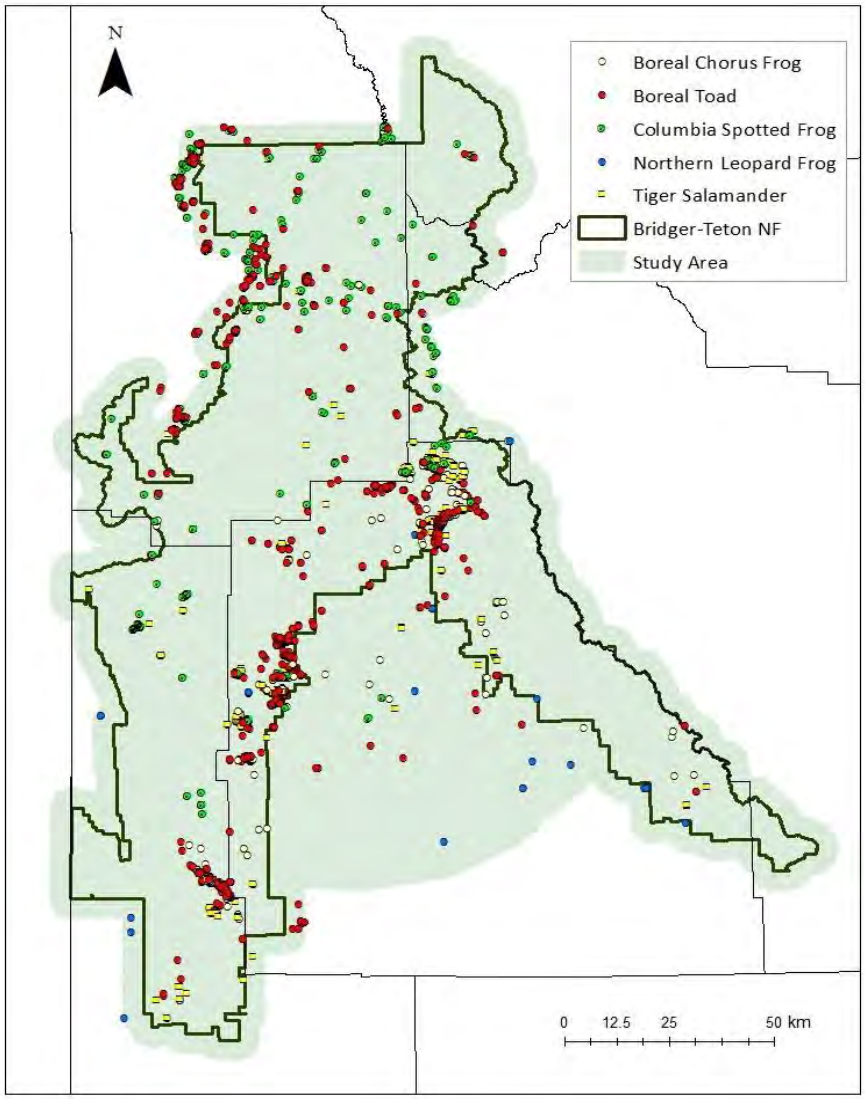
Important Questions

- **What amphibian species occur on the forest?**
  - Known
- **Where do they occur?**
  - In progress
- **How are they doing?**
  - Largely unassessed

Where do they occur?

Challenges:

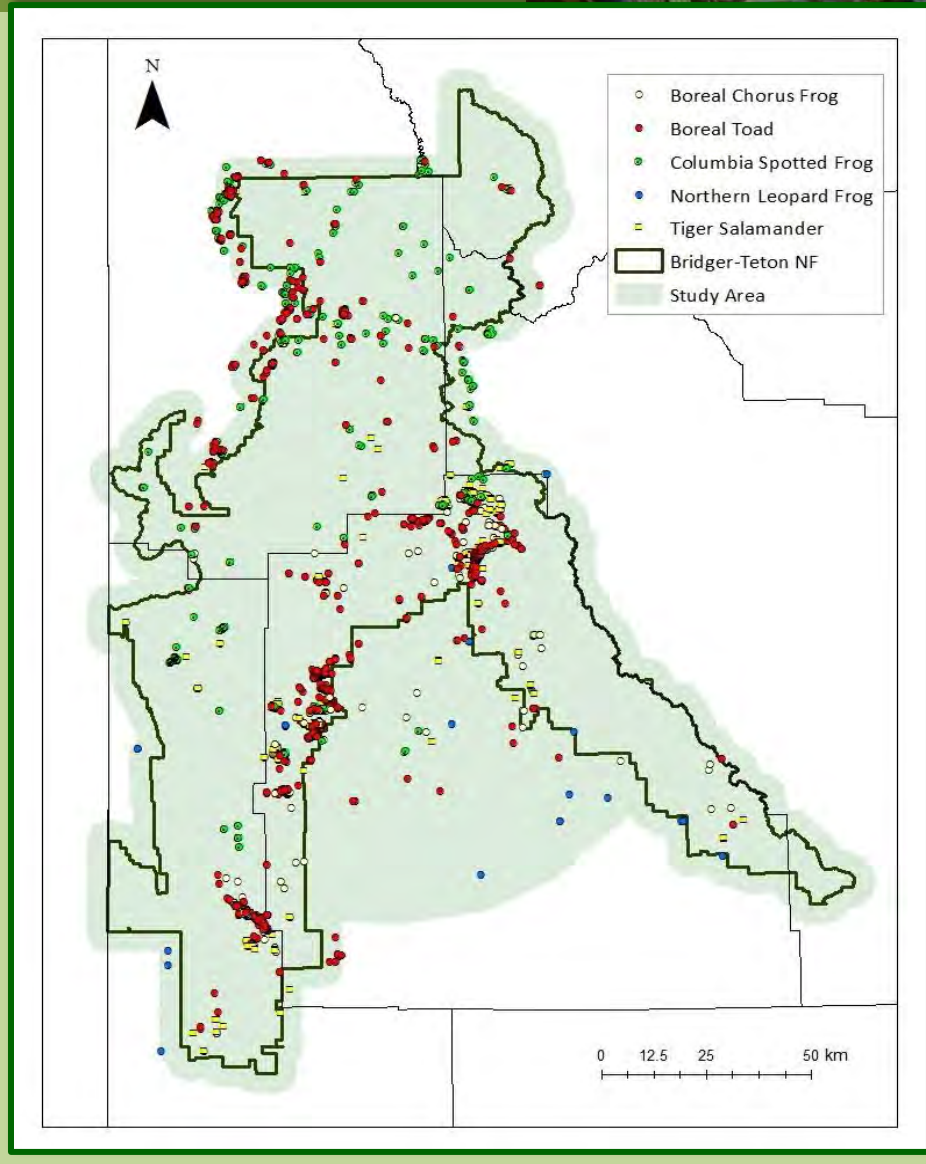
- Large area
- Rugged & difficult to access
- Distributions may have changed



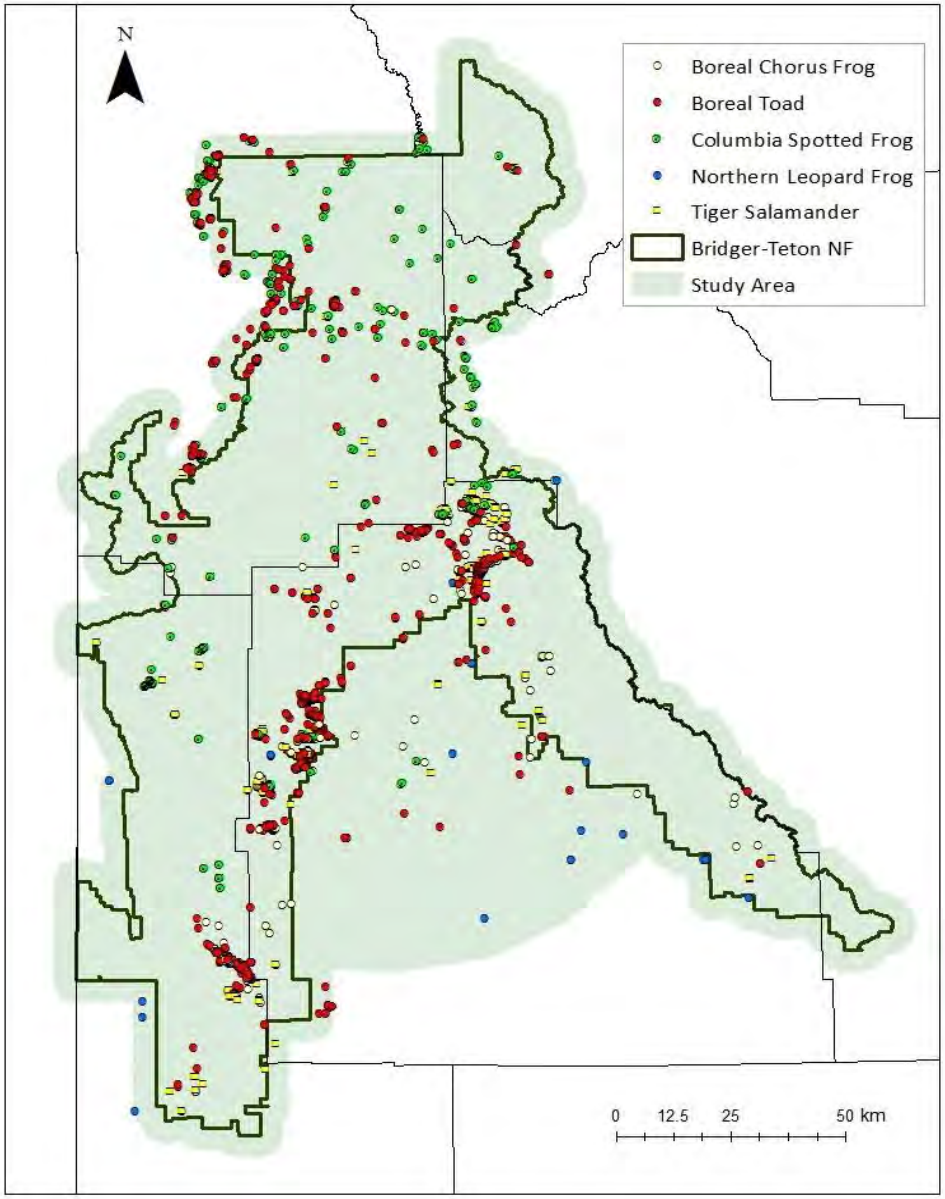
Where do they occur?

Recent Efforts:

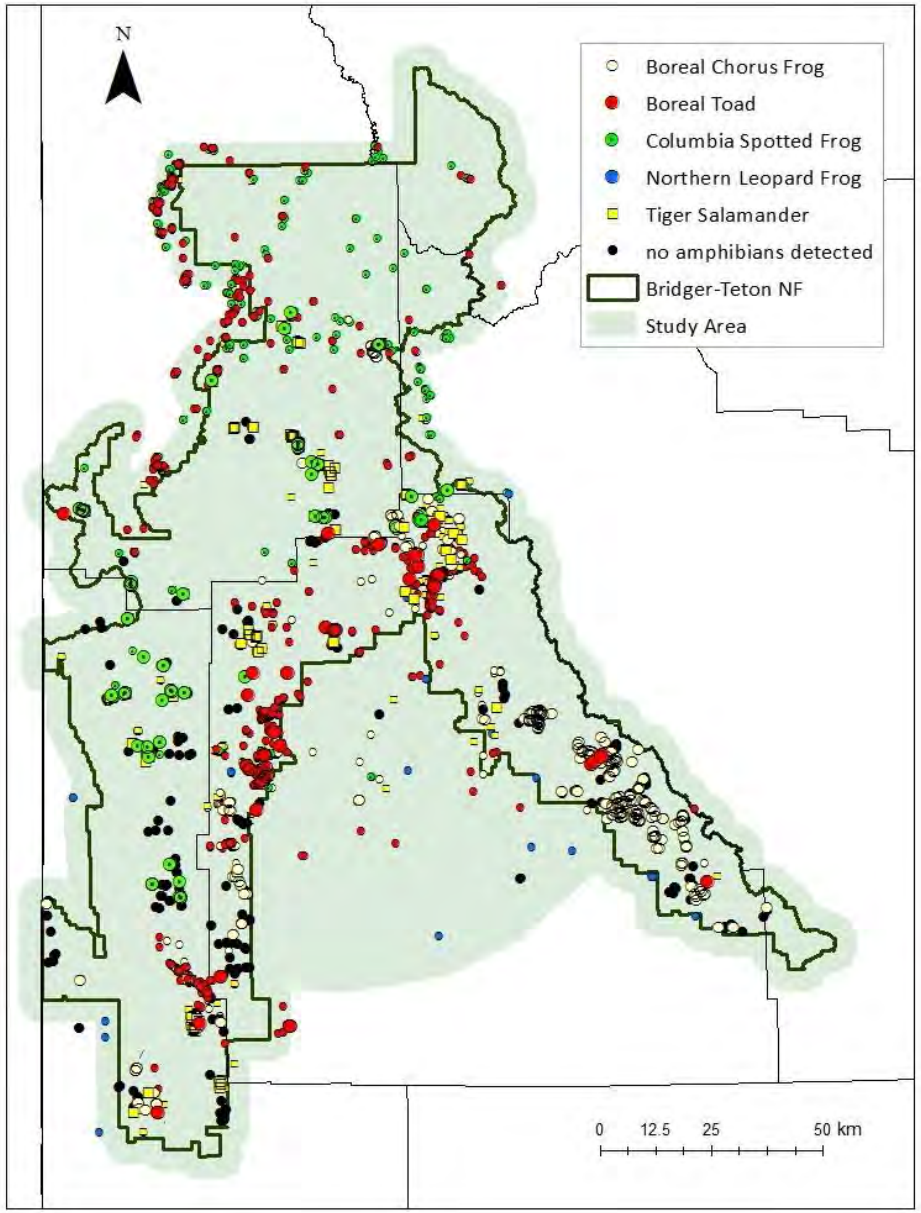
- Collaborative inventory
  - Bridger-Teton NF
  - WYNDD
  - WGFD
- 2012-2013
- Target previously unsurveyed areas
- Revisit historic breeding sites



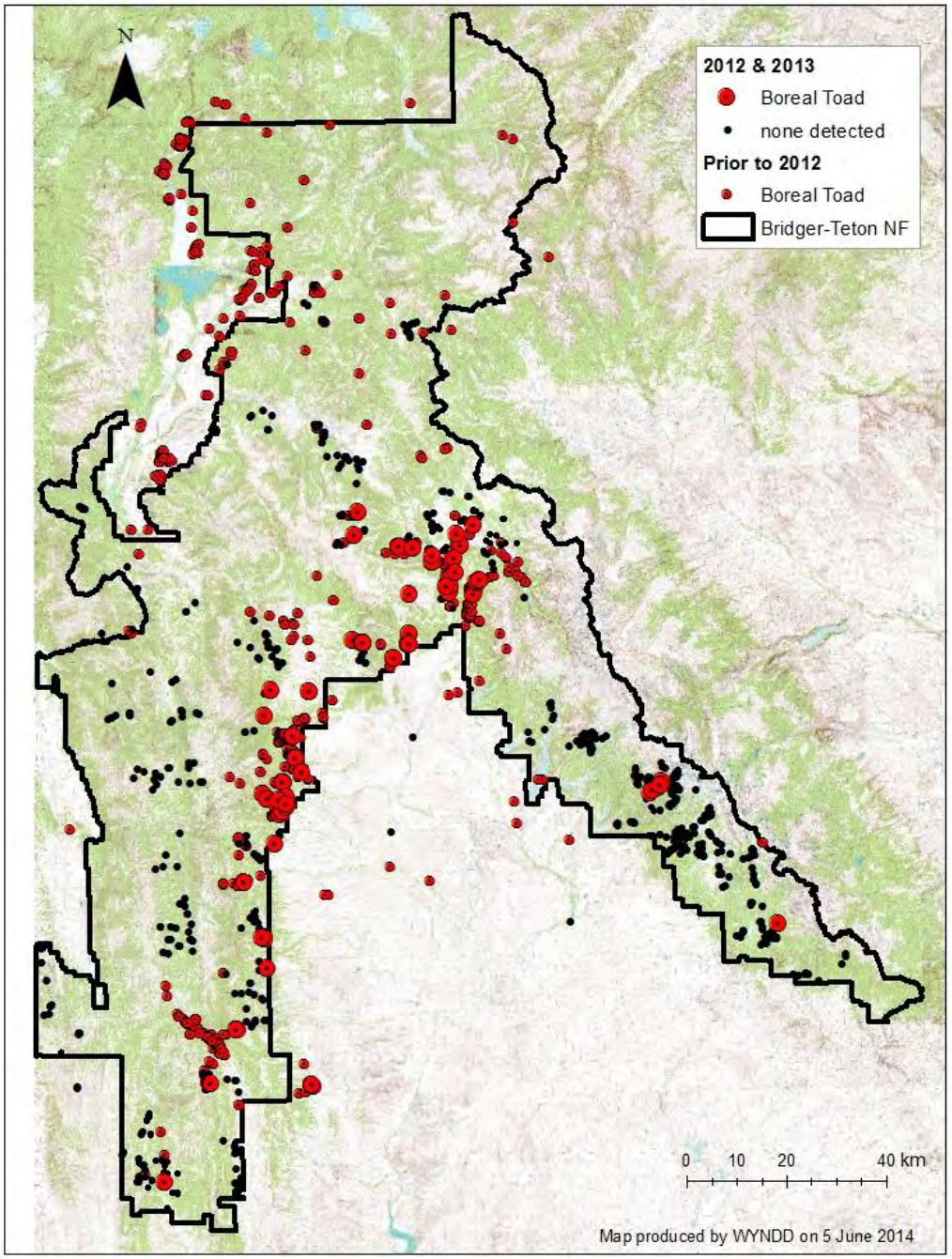
Prior to 2012



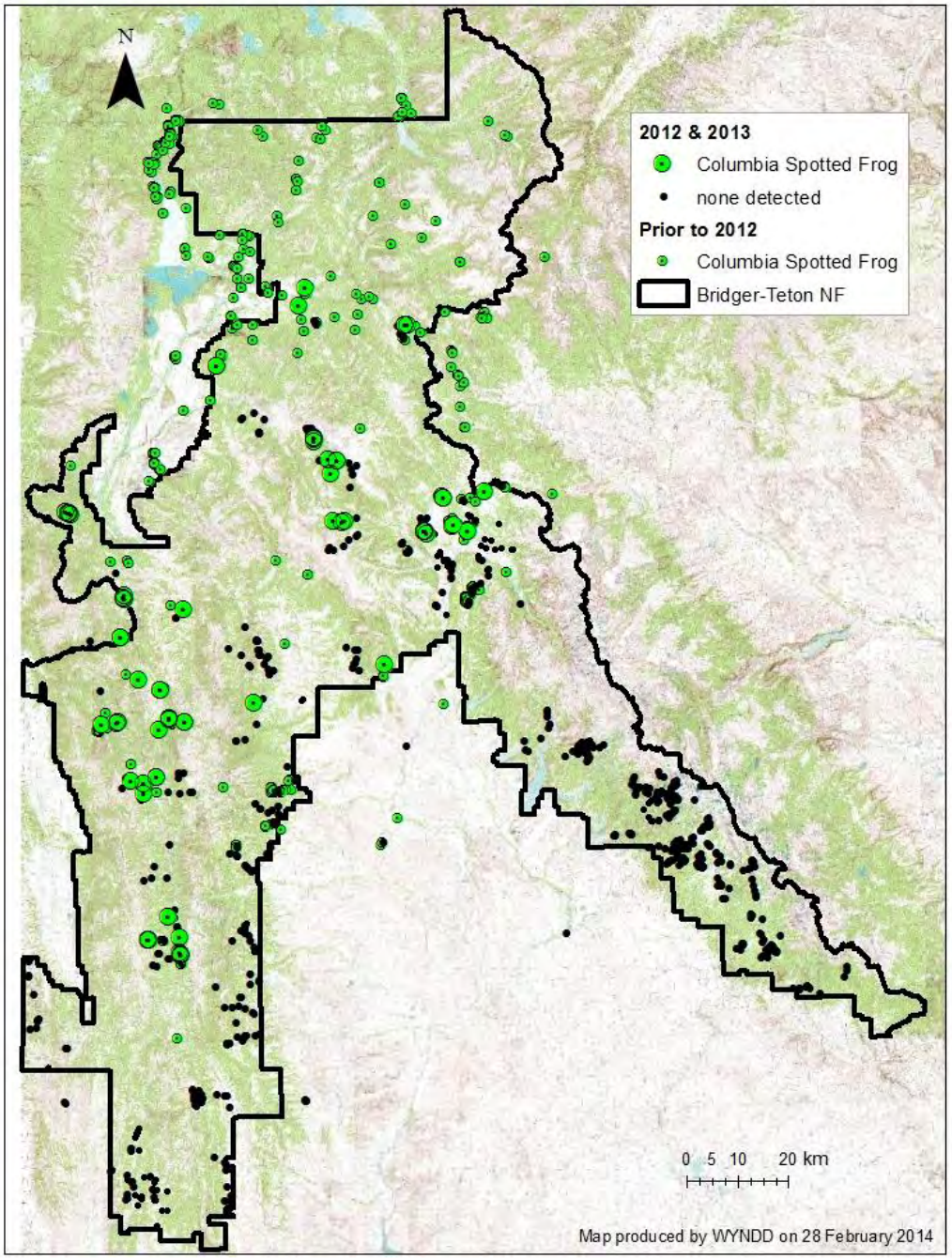
As of 2013



Boreal Toad


N
2012 & 2013
Boreal Toad
none detected
Prior to 2012
Boreal Toad
Bridger-Teton NF
0 10 20 40 km
Map produced by WYNDD on 5 June 2014

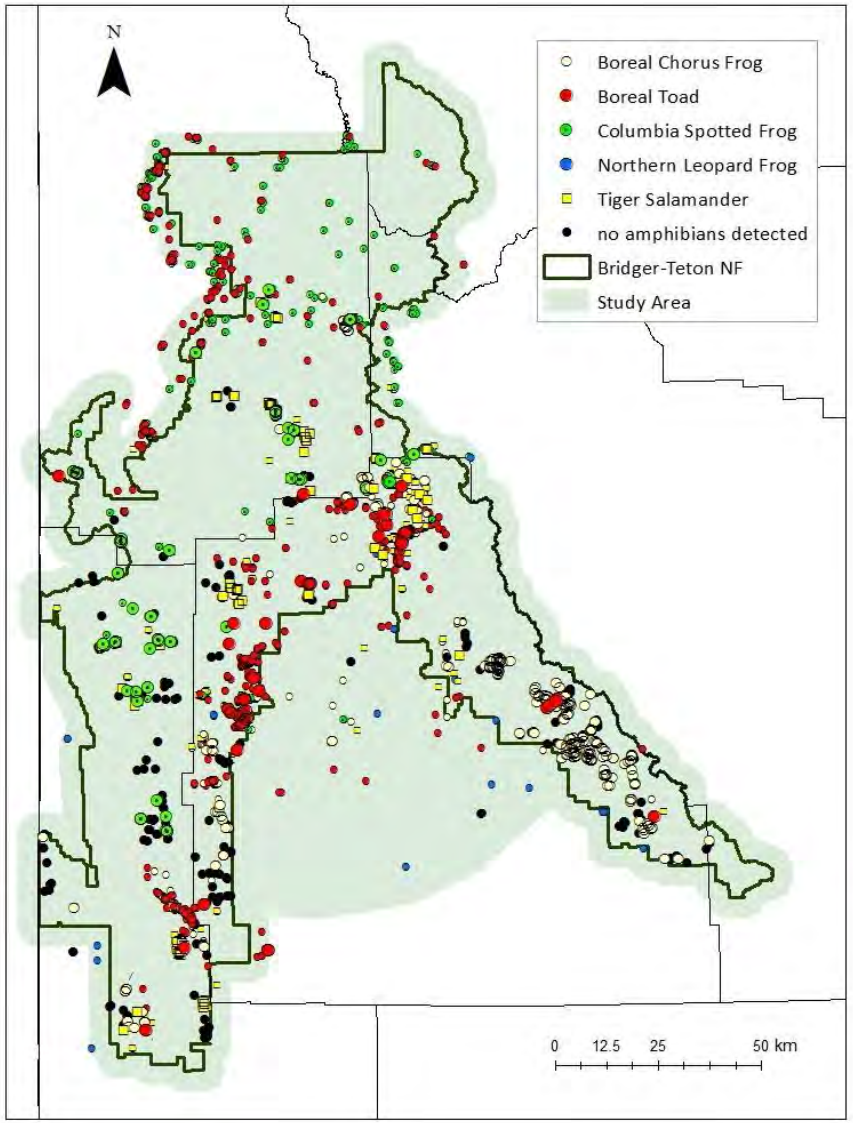
Columbia Spotted Frog



How are they doing?

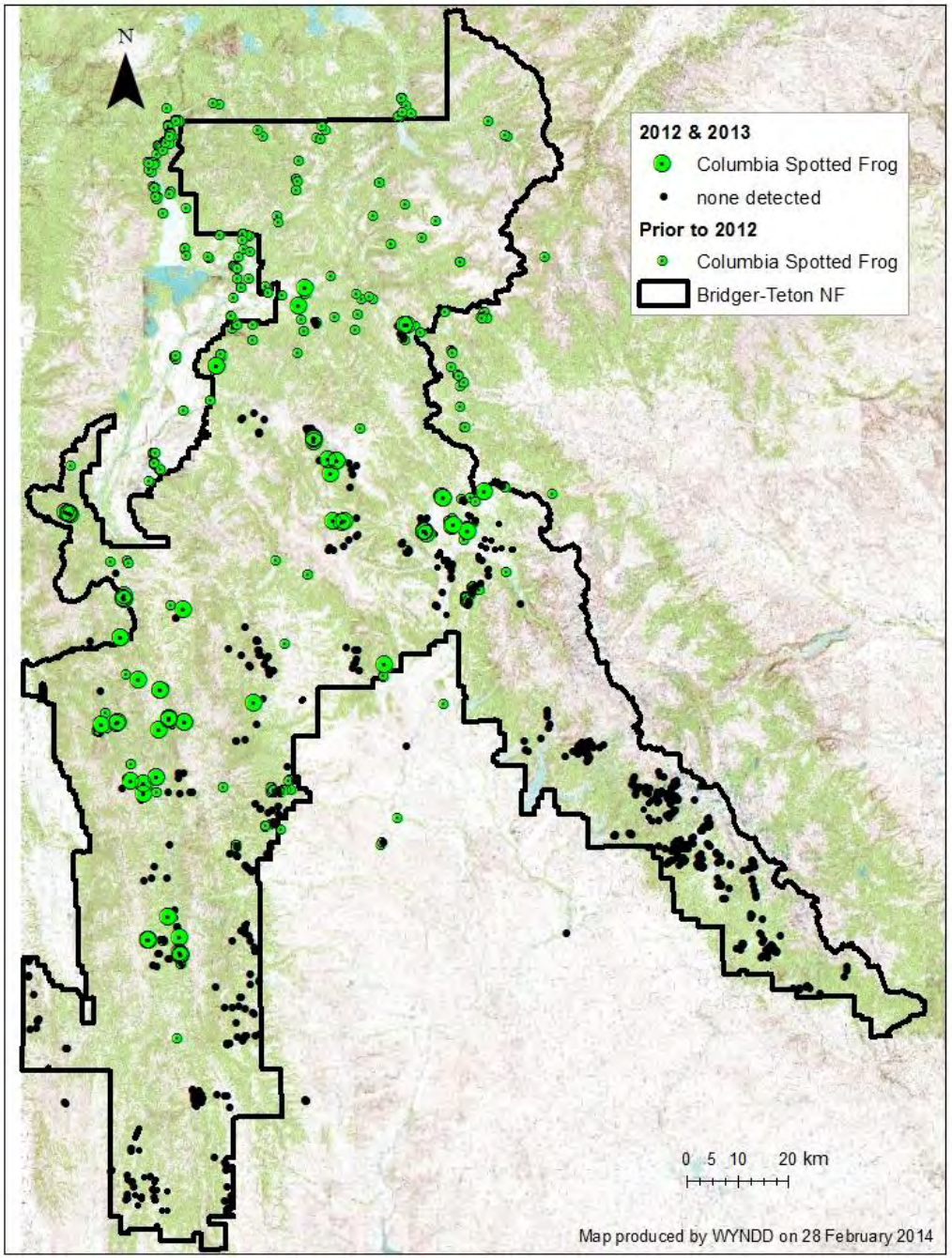
Largely unassessed

- Unable to assess distribution changes in many areas
  - Has the Wind River Range always had few species?
  - Did Boreal Toads used to occur in the Winds?



Columbia Spotted Frog

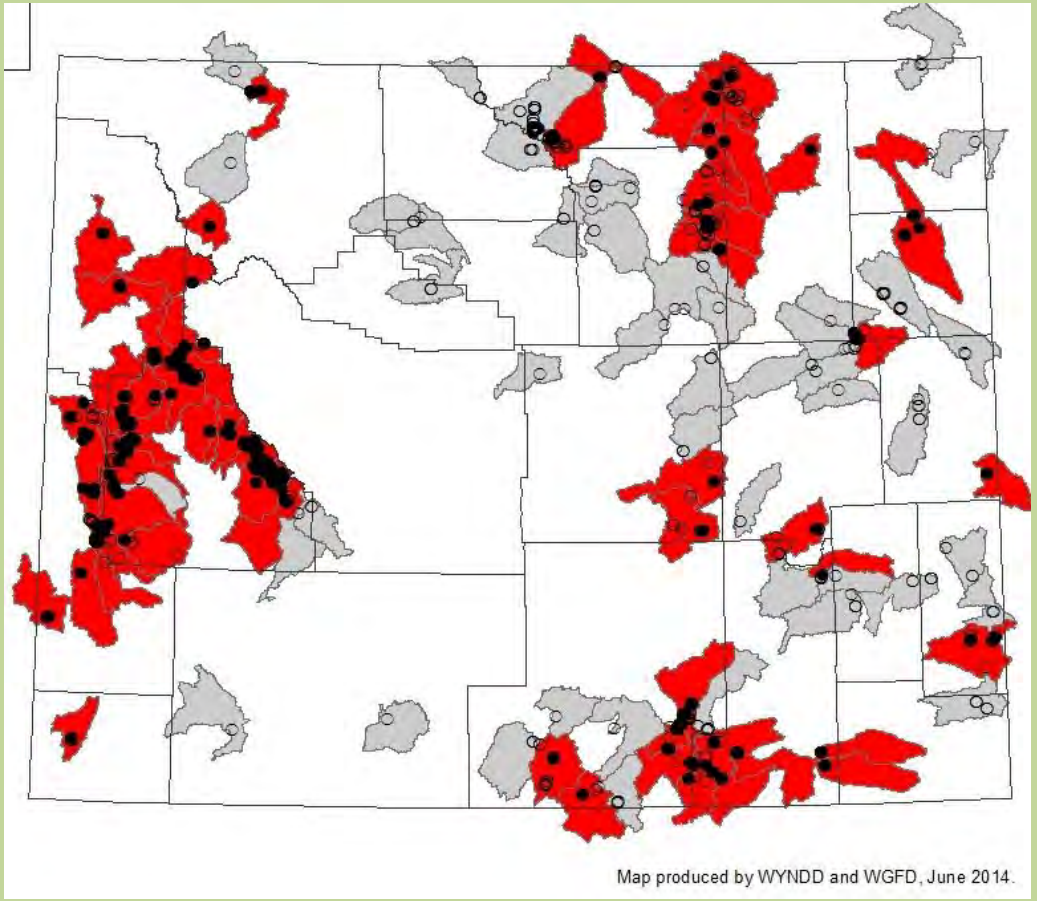
- Not detected in many previously occupied drainages on the east slope of the Wyoming Range
- No data between 2003 and 2012



How are they doing?

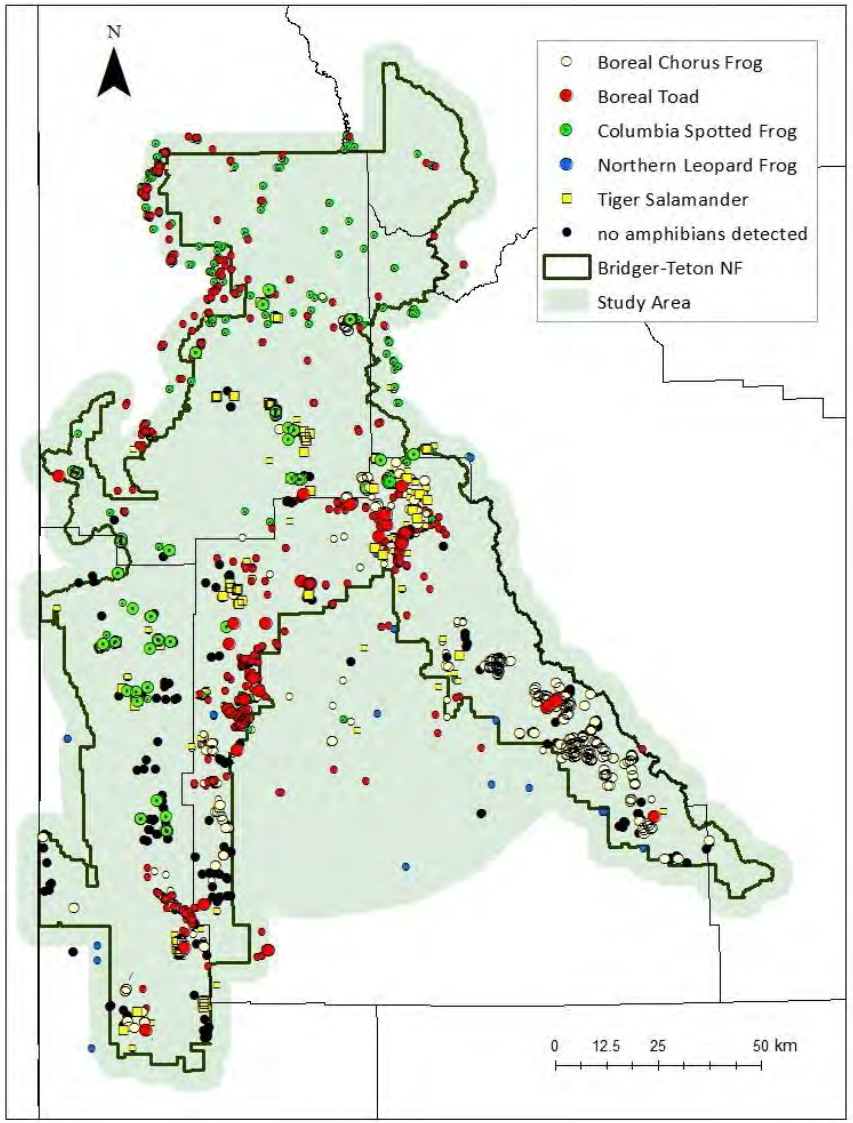
Threats

- Diseases
  - Chytrid fungus
  - Ranavirus
- UV radiation
- Altered habitat
- Introduced non-native species
- Environmental contaminants
- Climate change (e.g., drier conditions, reduced wetland hydroperiod)



How are they doing?

- Some monitoring on the forest
- Limited data on population trends
- Monitoring amphibians is difficult



Monitoring Amphibians on the Bridger-Teton National Forest

Amphibian Declines

Worldwide amphibian declines

- Most threatened vertebrate group (IUCN)
- 32% threatened with extinction or extinct (Stuart et al. 2004)
- 3 species listed or have been petitioned for listing in WY
- Declines discovered too late

Assessing Population Trends

What we need:

- Long-term systematic monitoring data

What we tend to have:

- Project-specific inventory & monitoring
- Opportunistic occurrence records

Assessing Population Trends

- Challenges to assessing amphibian population trends
  - Detection varies
  - Annual variation in breeding effort (due to drought, physiology, etc.)
  - Natural population fluctuations
- Need to assess trends over multiple years, not just a snapshot in time

Amphibian Research & Monitoring Initiative (ARMI)

- Occupancy-based approach (Corn et al. 2005)
- Model presence/non-detection instead of abundance
- Incorporates detection probability (prob. of detecting a species when present)
- ≥ 2 surveys needed to estimate detection probability
- Provides valuable framework for monitoring amphibians

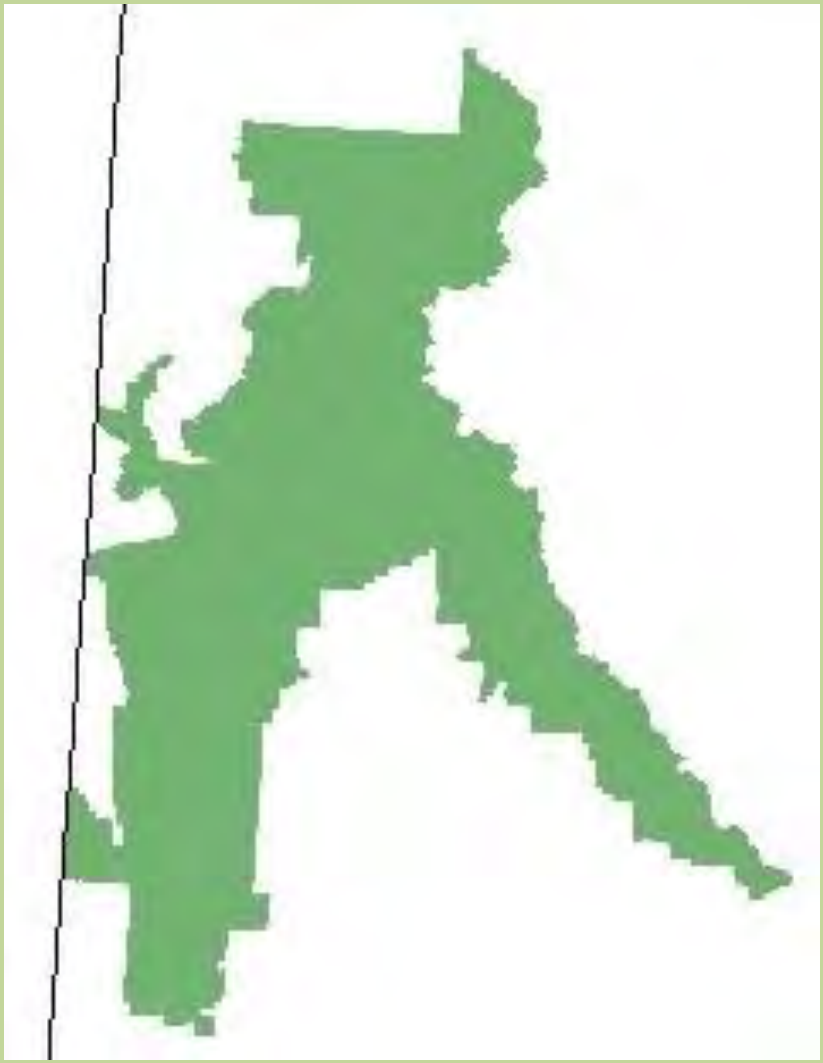
USGS
science for a changing world

Goal

Collaborate with regional state and federal agencies to develop a sustainable and effective plan for monitoring amphibians

Amphibian Monitoring on the Bridger-Teton NF

- Amphibian monitoring meeting in January
  - Bridger-Teton NF
  - WGFD
  - WYNDD
- Outline data needs
- Outline limitations (time & funding)
- Prioritize needs given limitations
- Determine scope of interest



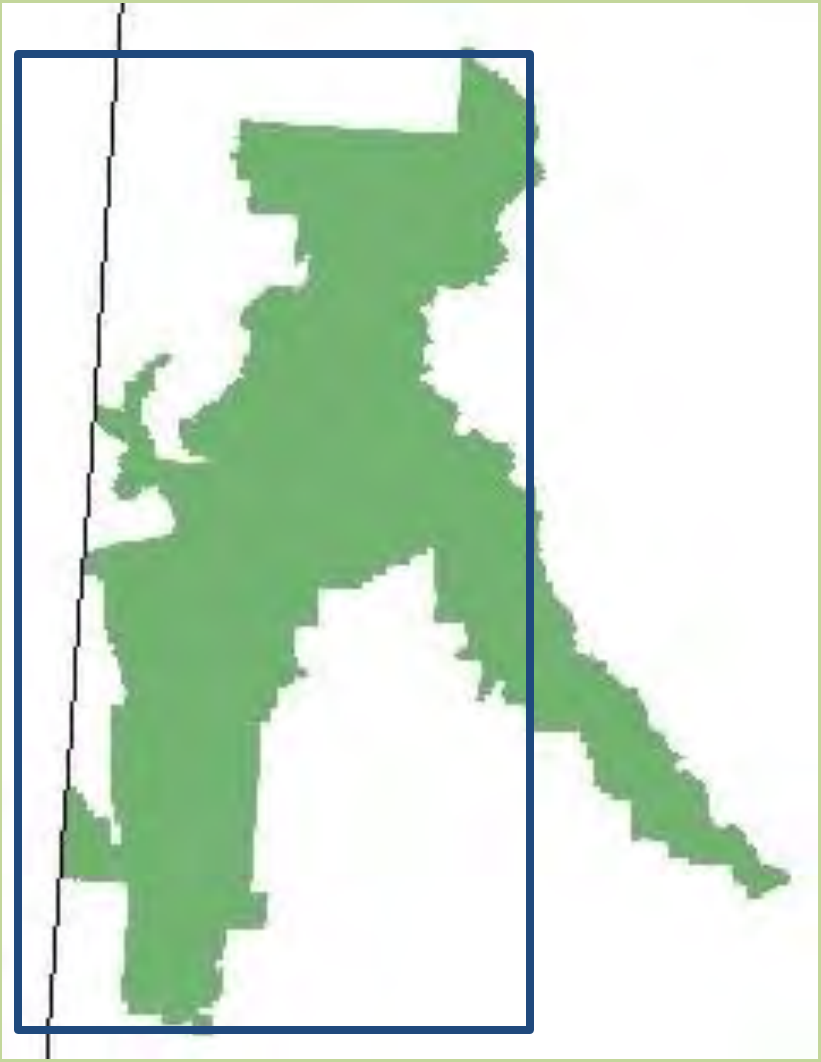
Amphibian Monitoring on the Bridger-Teton NF

Priorities:

1. Trend data for species
2. Assess effects of management activities

Scope of Inference:

- Forest-wide but excluding (or reduced effort in) Wind River Range



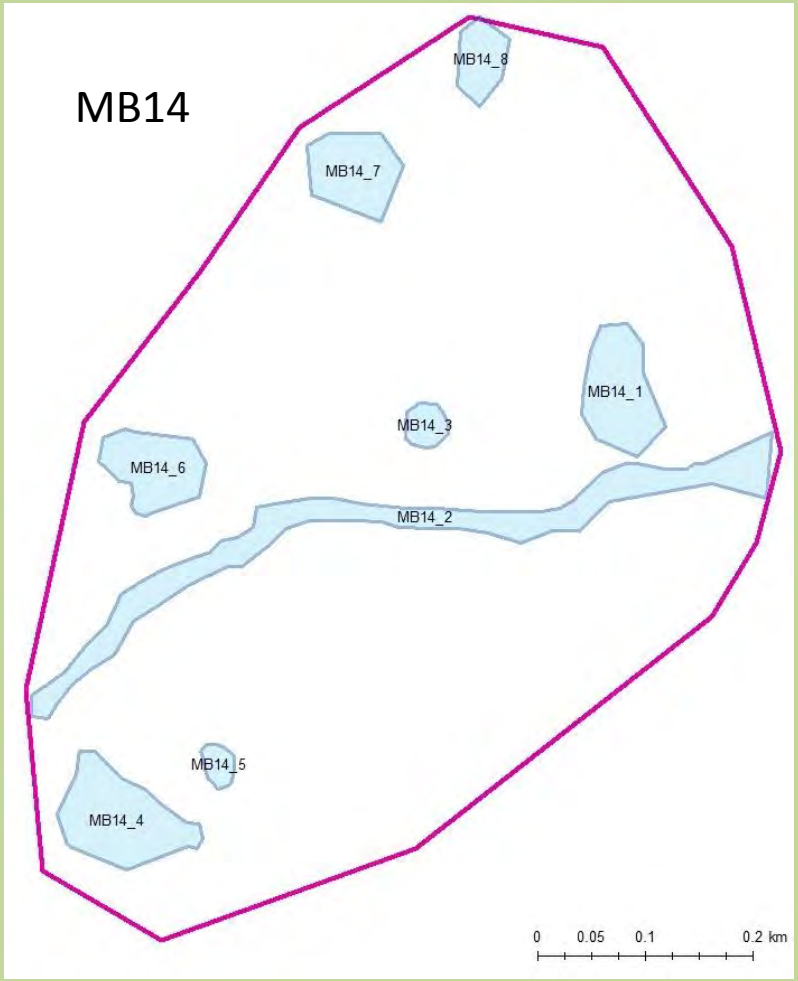
Amphibian Monitoring on the Bridger-Teton NF

- Based on ARMI monitoring plan
- Occupancy-based but also provides data on abundance and breeding status
- Multi-species
- Can investigate effects of habitat on occupancy*

*Power may be limited due to potentially small sample sizes

Survey Methods

- Based on ARMI monitoring plan
- **Catchment** – primary sample unit encompassing a cluster of waterbodies (sites)
- **Site** – individual aquatic feature with amphibian habitat
- Allows for small shifts in breeding sites & annual variation in available habitat
- Survey all amphibian habitat within a catchment



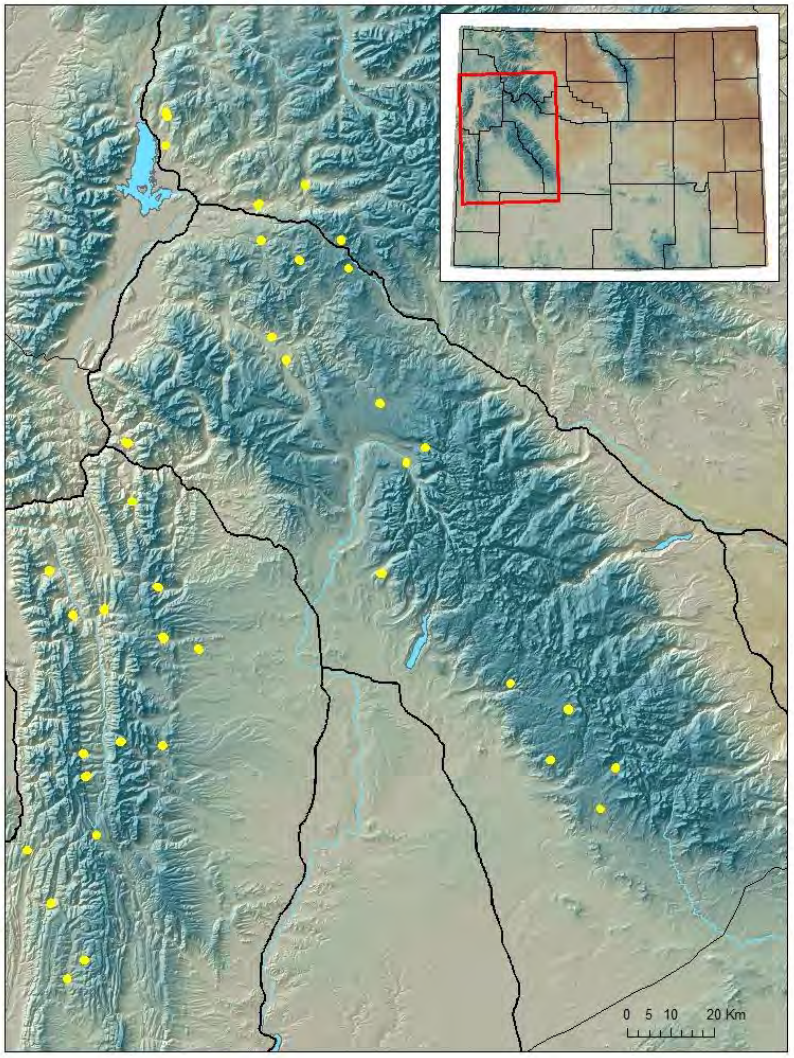
Survey Methods

- Visual Encounter Surveys
- Dual-observer method (allows estimation of detection probability)
- Record:
  - **All** species detected
  - Life stage (assess breeding)
  - Survey, weather, & habitat conditions (e.g. air temp, cloud cover, water temp, water pH)
- Swab for amphibian chytrid fungus

Amphibian Monitoring on the Bridger-Teton NF

Proposed Plan

- 36 catchments
  - 28 in main study area
  - 8 in Wilderness Areas
- Stratified random sample across ‘good’ potential habitat on the forest
  - Stratified by ranger district, elevation, wilderness status, and distance from roads or trails
- 2014 is first year
- Meet, evaluate, modify in fall



Rocky Mountain Amphibian Monitoring

Related Efforts

- 3rd year of monitoring on the Medicine Bow and Routt National Forests
- ARMI – similar methods allow for combining data and assessing trends at regional levels
- Citizen science amphibian monitoring plan currently being tested

Sensitive Species Quantifiable Objectives (SSQOs)

Development Process Overview

R4 Sensitive WL/Fish Species on the BTNF (Designated by the R4 Regional Forester)

Phase I * [7]
Trumpeter Swan
Greater Sage Grouse (Candidate for Listing under ESA)
Boreal Toad (In 12 Month Review Status)
Columbia Spotted Frog
Colorado R. Cutthroat Trout
Yellowstone/Snake R Fine-spotted Cutthroat Trout
Northern Leatherside Chub
Phase II * [7]
Boreal Owl
Great Gray Owl
Northern Goshawk
Three-toed Woodpecker
Bonneville Cutthroat Trout
Spotted Bat
Townsend's Western Big-eared Bat
Phase III * [10]
Gray Wolf
Big Horn Sheep
Fisher
Wolverine (Proposed for Listing under ESA)
Bald Eagle
Peregrin Falcon
Flammulated Owl
Harlequin Duck
Common Loon
Yellow-billed Cuckoo (Proposed for Listing under ESA)

Basis for development of management objectives for Sensitive Species

- ✓FSM (2670)
- ✓NFMA (Forest Plans)

Sensitive Species Management Standard (FP Chapter 4, pp 126)

- **Quantifiable objectives will be developed to identify and improve the status of Sensitive species and eliminate the need for listing.** Crucial habitats of priority I, II and III species as listed by Wyoming Game & Fish and the Intermountain Region Sensitive Species List will be protected and maintained. The Forest Service will cooperate with Wyoming Game and Fish on management programs when needed to maintain population objectives of these species, especially with species which have been identified as needing immediate attention and active management to ensure a significant decline in breeding populations do no occur. Information collection and interpretive programs will promote the conservation of these species and their habitats. National Forest managers will participate in species and habitat surveys and monitoring programs needed to gain necessary data to determine population status.

SSQO Objectives

(as approved by the FLT and Forest Supervisor on September 13, 2013)

DEVELOP SENSITIVE SPECIES ASSESSMENTS

- **OBJECTIVE 1 -** By December 30, 2014, prepare conservation assessments for each designated Sensitive Fish and Wildlife Species on the Forest that summarize known or suspected species status at Forest and Regional scales, habitat requirements, risk factors, potential conservation actions, suitable habitat maps based on modeling, and survey/ monitor needs to address status data gaps.

IDENTIFY EXISTING STATUS of SENSITIVE SPECIES and INCORPORATE in ASSESSMENTS

- **OBJECTIVE 2 -** By December 30, 2014, collect known and historic Sensitive Species observation and habitat data and identify and disclose the known existing status of each Sensitive Species; maintain these data in the appropriate corporate database.

- **OBJECTIVE 3 -** By December 30, 2015, complete initial modeling and mapping of capable/suitable habitat for each Sensitive Species at the Forest Plan level; initiate habitat modeling validation at the project/zone level and modify modeling parameters/habitat maps as appropriate and necessary.

- **OBJECTIVE 4 -** By June 30, 2015, identify gaps in existing data and create an inventory protocol.

- **OBJECTIVE 5 -** By July 1, 2015, begin prioritizing, testing, and applying inventory protocols to collect additional occurrence and habitat data identified in Objective #3 above.

IMPROVE the STATUS of SENSITIVE SPECIES and UPDATE ASSESSMENTS

- **OBJECTIVE 6** - By December 30, 2014, develop and initiate implementation of monitoring plans for Sensitive Species on the Forest to evaluate occurrence and habitat condition trends over time.
-
- **OBJECTIVE 7 –** As inventory and monitoring data are collected, use what is learned to update conservation assessment, including the sections on species status, habitat requirements, risk factors, potential conservation actions, suitable habitat maps, and survey/monitoring.

- **OBJECTIVE 8 -** By December 30, 2014, coordinate management programs with Wyoming Game and Fish Department and other partners to maintain and/or improve habitat and population objectives of Sensitive species.

- **OBJECTIVE 9 -** By December 30, 2014, disseminate Sensitive Species information through Forest Service program areas to better inform resource management and to increase public awareness

Conservation Assessment Template

1 - Intro

- ✓ Short statement of document intent and description of primary literature used for review.

2 - Species Status

- ✓ Range and status at the course scale (National and/or Regional levels)
- ✓ Range and status at the fine scale (Forest level)
- ✓ Identification/Discussion related to any special designations related to ESA (history of proposed listing and FWS findings)
- ✓ Identification/Discussion related to designations assigned by WGFD
- ✓ Identification/Discussion related to designations assigned by Nature Serve

3 - Species Habitat Requirements

- ✓ Search for and utilize most recent and relevant literature (Conservation Assessments, Research Papers, WGFD 2010 State Wildlife Action Plan, etc….) and provide a sufficient discussion of habitat use and selection requirements for the species that can: 1) inform objective development; 2) identify risk factors; and 3) provide recommendations to guide management actions (conservation measures).

4 - Risk Factors

- ✓ Identify and summarize risk factors to conservation of the species and their habitats by Resource Area
- ✓ Resource Areas include (but may not be limited to): 1) Timber Harvest; 2) Transportation Systems (Roads/Trails construction and management); 3) Wildfire, Prescribed Fire and Fuels; 4) Livestock Grazing; 5) Oil, Gas and Minerals; 6) Herbicides, Pesticide, and Other Chemicals; 7) Introduced Species; 8) Recreation; and 9) Other Site Specific and/or Species Specific Factors such as Wetland Protection, Disease, Disturbance Impacts, etc….

5 - Management Objectives for the Species

- ✓ Develop and define Objectives for conserving the species by risk factor.
- ✓ Identify and define Conservation Measure(s) that provide the means and ability to measure Objective achievement

6 – Occurrence/Observation and Suitable Habitat Mapping

- ✓ Where available, utilize existing data bases (from WYNND, NRIS, WGFD [WOS], ect….) to identify and map crucial habitats (eg… hibernacula, breeding ponds, winter ranges, nest sites, ect….) and occurrence/observation locations. Data bases are available on the BTNF at the SO.
- ✓ Using guidance provided in Species Habitat Requirements (#3 above), define suitable/capable habitat for the species and develop habitat modeling parameters suitable for GIS mapping.

7 - Survey/Monitoring

Identify and develop a draft survey and monitoring plan to address achievement of Objectives identified above

Send Draft Assessments out for Professional Review

Topic 2

Literature Review and Other Science

The Boreal Toad and Columbia Spotted Frog Draft Conservation Assessment incorporated a review of ?? papers, which is likely one of the most complete and detailed literature reviews ever conducted for these species*.

*Draft Reviewers from WYNDD – Wendy Estes-Zumpf, PhD. & Doug Keinath

Boreal Toad (*Bufo boreas boreas*)
A Technical Conservation Assessment

Prepared for the USDA Forest Service,
Rocky Mountain Region,
Species Conservation Project

May 25, 2005

Doug Keinath1 and Matt McGee1
with assistance from Lauren Livo2

1Wyoming Natural Diversity Database, P.O. Box 3381, Laramie, WY 82071
2EPO Biology, P.O. Box 0334, University of Colorado, Boulder, CO 80309

Peer Review Administered by
Society for Conservation Biology

Keinath & Mcgee 2005 (page 44)

The desired future condition for boreal toad habitats can be generally achieved by implementing the following practices in boreal toad habitat where livestock grazing occurs:

- Maintain vegetative cover requirements necessary to meet the recovery needs of boreal toads (see “Habitat” section).
- Maintain riparian areas and wetlands in proper functioning condition by conserving adequate vegetation, landform, or debris
- Maintain water quality and quantity at Clean Water Act standards as a minimum.
- Locate toad movement corridors and protect them from the impacts of livestock grazing.
- Minimize incidences of trampling by livestock by fencing critical habitat areas.

Keinath & Mcgee 2005 (page 44)

Standard practices intended to maintain healthy riparian areas, as related to livestock grazing, will protect boreal toad habitat. The average height of *Carex* spp. should not drop below 3 to 4 inches in spring use pastures and 4 to 6 inches in summer/fall use pastures. A minimum of 75 percent of the streambank or shoreline should be maintained in stable condition with adequate vegetation or rock/channel characteristics to prevent erosion.

Topic 3

Ongoing and Planned Amphib Studies on the BTNF

USGS/ U of MT Research Project
Black Rock

- researching general decline of amphibians in the west
- Monitoring breeding site at BR- finding this a relatively stable population
- 4 Amphibians, come to the ponds and oxbow to breed, then disperse in summer: Chorus Frogs, Spotted Frogs, Tiger Salamanders, Boreal Toad.
- Multi-year effort; WYDOT research granted 3 years of work

WYDOT Wetland Mitigation in Project Gravel Pit – Black Rock

- 1st phase wetland, completed 6+ years ago has been a very popular breeding site. This 4 acre+ site hosted the Amphibs in 2011 when the river breached into the oxbow, thus dropping the water temperature and running the Amphibs out of that breeding area.

- The remaining 17 acre wetland was completed Fall 2013.
- Site being monitored (USGS)

Planned Project – Southern Portions of the BTNF

- **Title:** Boreal toad habitat selection and survival in relation to grazing intensity and disease prevalence

- **Principle Investigators:** Dr. Annika Walters and Dr. Anna Chalfoun, Wyoming Cooperative Fish and Wildlife Research Unit & Zachary Walker, WGFD. BTNF will be a cooperating partner.

- **Goal:** To develop a better understanding of boreal toad habitat use and quality in relation to grazing management practices.

Specific Objectives:

1. Assess boreal toad movement and macro- and micro-habitat selection across a gradient of livestock grazing intensity.
2. Estimate adult survival of toads in relation to habitat and grazing regimes.
3. Evaluate the potential impact of multiple stressors (grazing and disease caused by chytrid fungus) on toad survival and habitat selection

Suggested Approach: Master's student in the Department of Zoology and Physiology at the University of Wyoming under the supervision of Dr. Walters and Dr. Chalfoun in cooperation with Zachary Walker and Mark Smith of the WGFD.

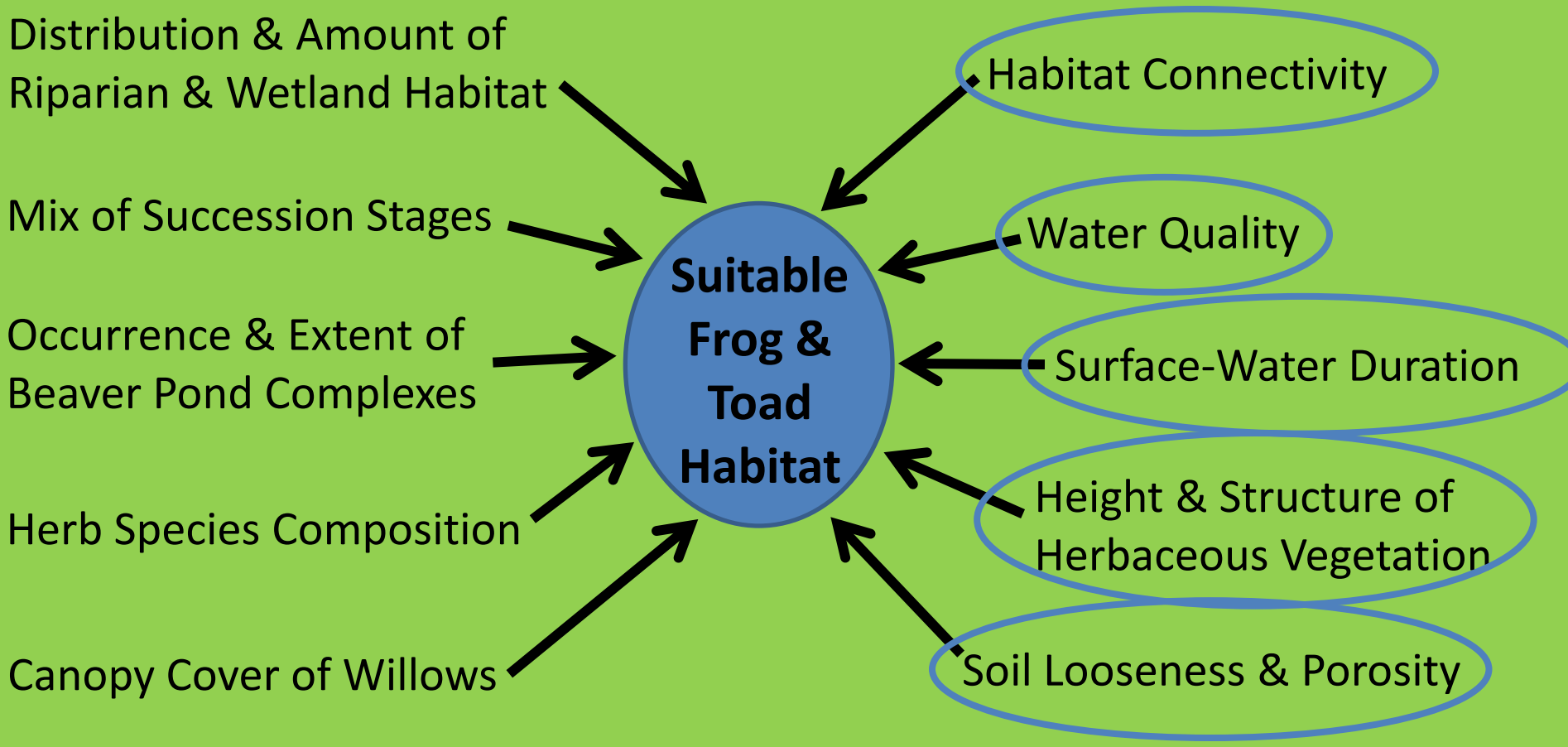
Development of Desired Retention Levels for Amphibians on Livestock Allotments, Bridger-Teton National Forest

by: Don DeLong, Greys River & Kemmerer RDs

June 25, 2014

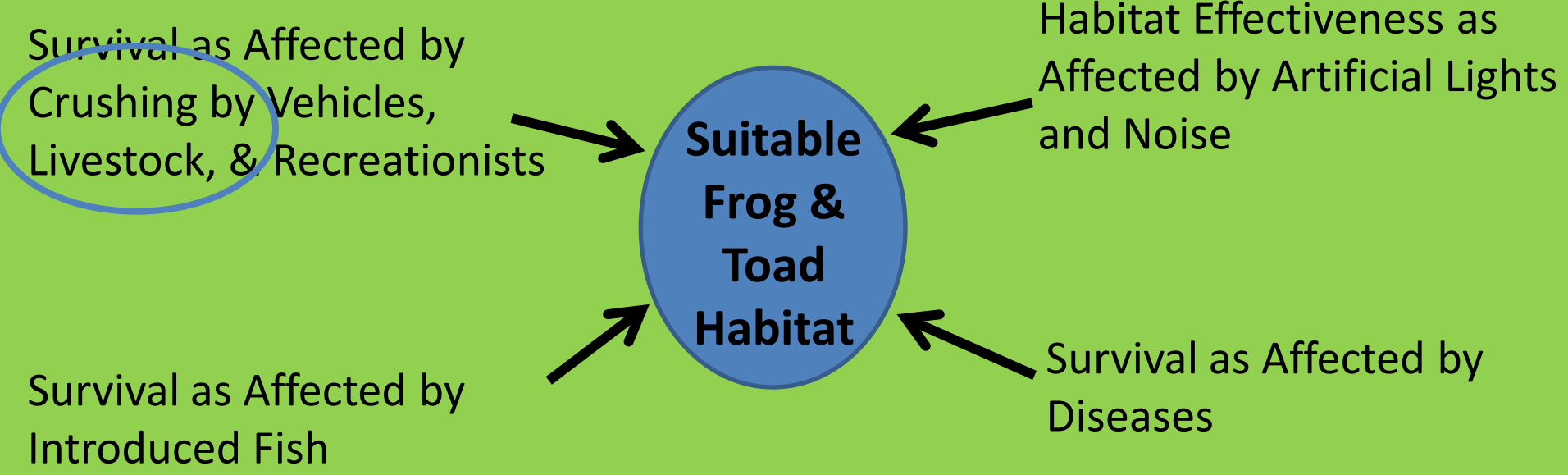
Broad-Level Habitat & Survival Elements of the Spotted Frog and Boreal Toad Conservation Assessment

Coarse-filter Elements



Broad-Level Habitat & Survival Elements of the Spotted Frog and Boreal Toad Conservation Assessment

Other Important Elements



Major Sections for Each Element

- Suitable Conditions & Objectives
- Risk Factors & Restoration Factors
- Recommended Conservation Actions
- Measures and Indicators

Purpose of Presentation

To outline the scientific basis of 70% retention* as a habitat threshold *and indicator* to meet Forest Plan and regulatory requirements for:

- Providing an adequate amount of suitable habitat for SFs & BTs.
- Retaining an adequate amount of forage and cover for SFs & BTs.
- Protecting spotted frogs and boreal toads.

→ Ultimately, to prevent any further reductions in habitat and populations that may be caused by livestock grazing use, and to minimize the extent to which this activity compounds the effects of disease, climate change, and other factors.

In other words, to meet requirements of:
- *FSM 2670.22.1*
- *Forest Plan Objectives 3.3(a) and 4.7(d)*
- *Sensitive Species Mgt. Standard*

Ultimately → NFMA

* 70% retention of total herbaceous vegetation.

Outline

I. Status & Habitat Use

II. Some Basic Concepts

III. Forest Plan & Other Direction

IV. Suitable Herbaceous Retention and Relationship to Range Management & Wildlife Community as a Whole

V. Suitable Meadow Habitat Characteristics: conditions under which native wildlife-communities formed

VI. Scientific Basis for 70% Threshold

I. Status and Habitat Use

Status

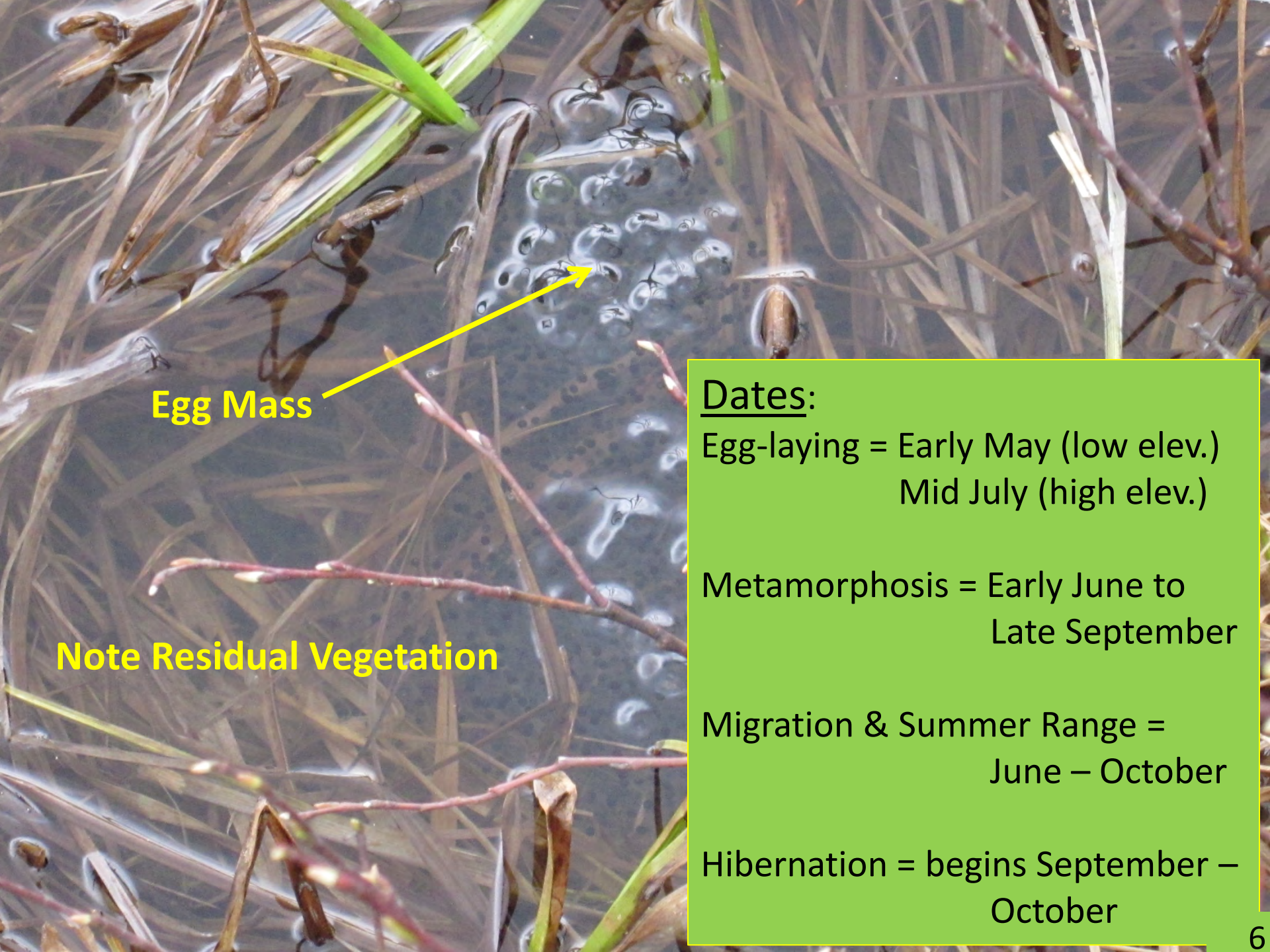
Spotted Frog

- R4 Sensitive Species
- Wyo. Species of Special Concern
- Formerly widespread & common
  (Patla and Keinath 2005, Reaser and Pilliod 2005)
- Unknown extent of decline
- Down-graded from "apparently secure" to "vulnerable" (mod. risk of extinction) between 2005 and 2010 in Wyoming.

Boreal Toad

- R4 Sensitive Species
- Wyo. Species of Special Concern
- Formerly widespread & common
  (Corn 2000, Carey et al. 2005, Keinath and McGee 2005, Muths 2005)
- Declines:
  - 95% decline in UT, NM, CO *(USFWS 2012)*
  - Major decline in MT *(Maxell & Hokit 1999)*
  - Unknown extent of decline in WY
- Rating in Wyoming = "critically imperiled" (very high risk of extinction).
- USFWS:
  - 12-month finding is pending
- Eastern vs. Northwestern "subspecies"

No population data to show population status or trend.



Dates:

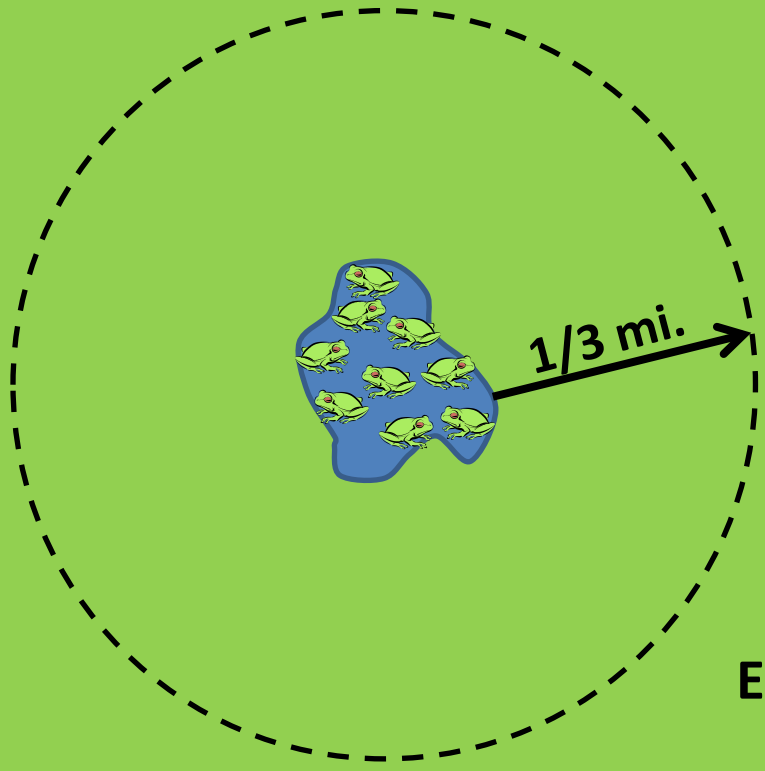
Egg-laying = Early May (low elev.)
Mid July (high elev.)

Metamorphosis = Early June to
Late September

Migration & Summer Range =
June – October

Hibernation = begins September –
October

Movement Distances



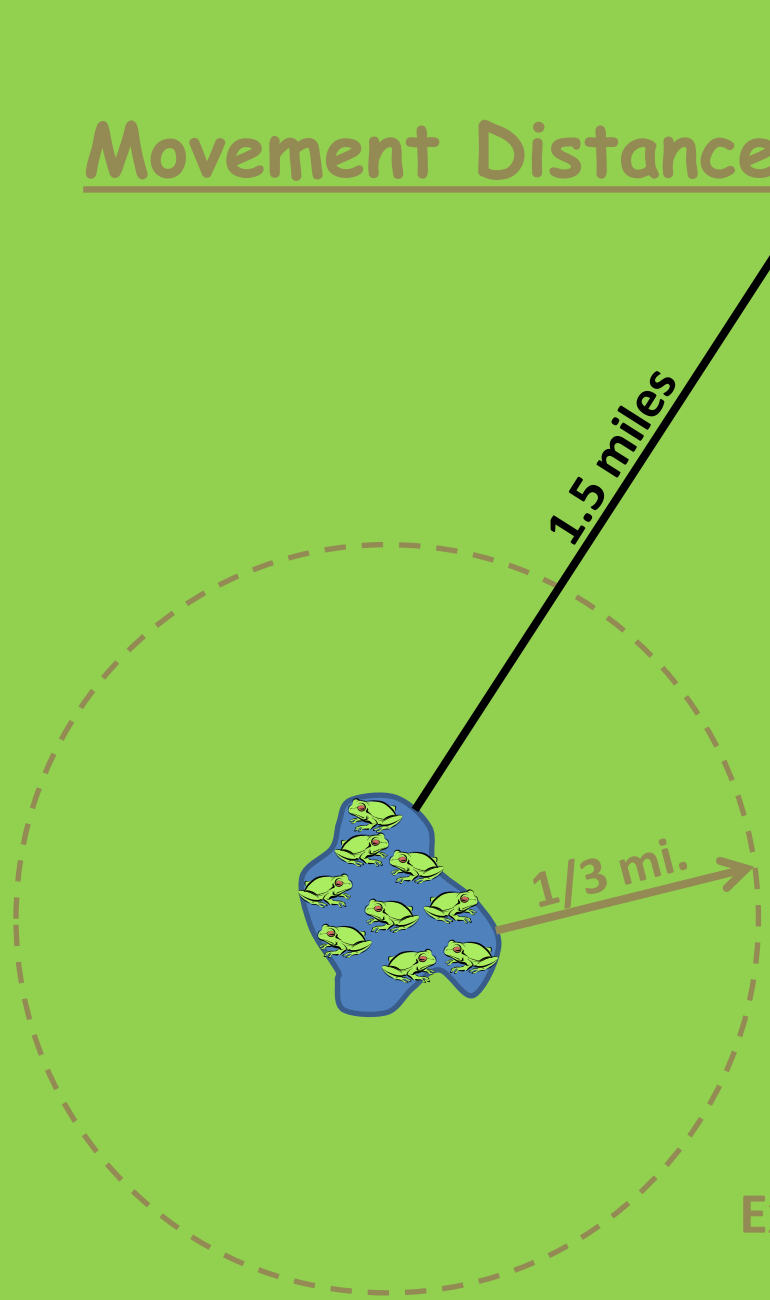
75 – 100% of SF's & BT's stay within 1/3 mile:

(Turner 1960, Hollenbeck 1974, Bull and Hayes 2001, Pilliod et al. 2002, Muths 2003, Bartelt et al. 2004)

Except >50% BT's move >1/3 mi. in many areas:

(Bull 2006, Schmetterling & Young 2008, Bull 2009 Browne and Paszkowski 2010)

Movement Distances



Nearly 100% of SF's & BT's stay within 1½ mi.

(Turner 1960, Hollenbeck 1974, Bull & Hayes 2001, Pilliod et al. 2002, Muths 2003, Bartelt et al. 2004, Schmetterling & Young 2008, Browne & Paszkowski 2010)

- Some studies: small % moved 1/3 to 1½ mi.
- Some studies: large % moved 1/3 to 1½ mi.

Up to 25% of BT's move >1½ mi.

(Bull 2006, Schmetterling & Young 2008, Bull 2009)

75 – 100% of SF's & BT's stay within 1/3 mile:

(Turner 1960, Hollenbeck 1974, Bull and Hayes 2001, Pilliod et al. 2002, Muths 2003, Bartelt et al. 2004)

Except >50% BT's move >1/3 mi. in many areas:

(Bull 2006, Schmetterling & Young 2008, Bull 2009 Browne and Paszkowski 2010)

Terrestrial Habitat

- Historically, biologists focused on aquatic breeding sites.
- Increasing recognition is being given to the importance of terrestrial habitat and conservation of terrestrial habitat.

  (Marsh and Trenham 2001, Pilliod et al. 2002, Wind and Dupuis 2002, Bull 2006, Bull 2009, Moore et al. 2011, Keinath and McGee 2005, Patla and Keinath 2005, Pierce 2006, Smith and Green 2005, Browne et al. 2009, Browne and Paszkowski 2010, Bishop et al. 2014)

- "Exclusively pond-based studies generally lead to pond-based explanations for patterns of abundance and persistence."

  (Marsh and Trenham 2001)

- Boreal toads are terrestrial, but they reproduce in aquatic habitat.

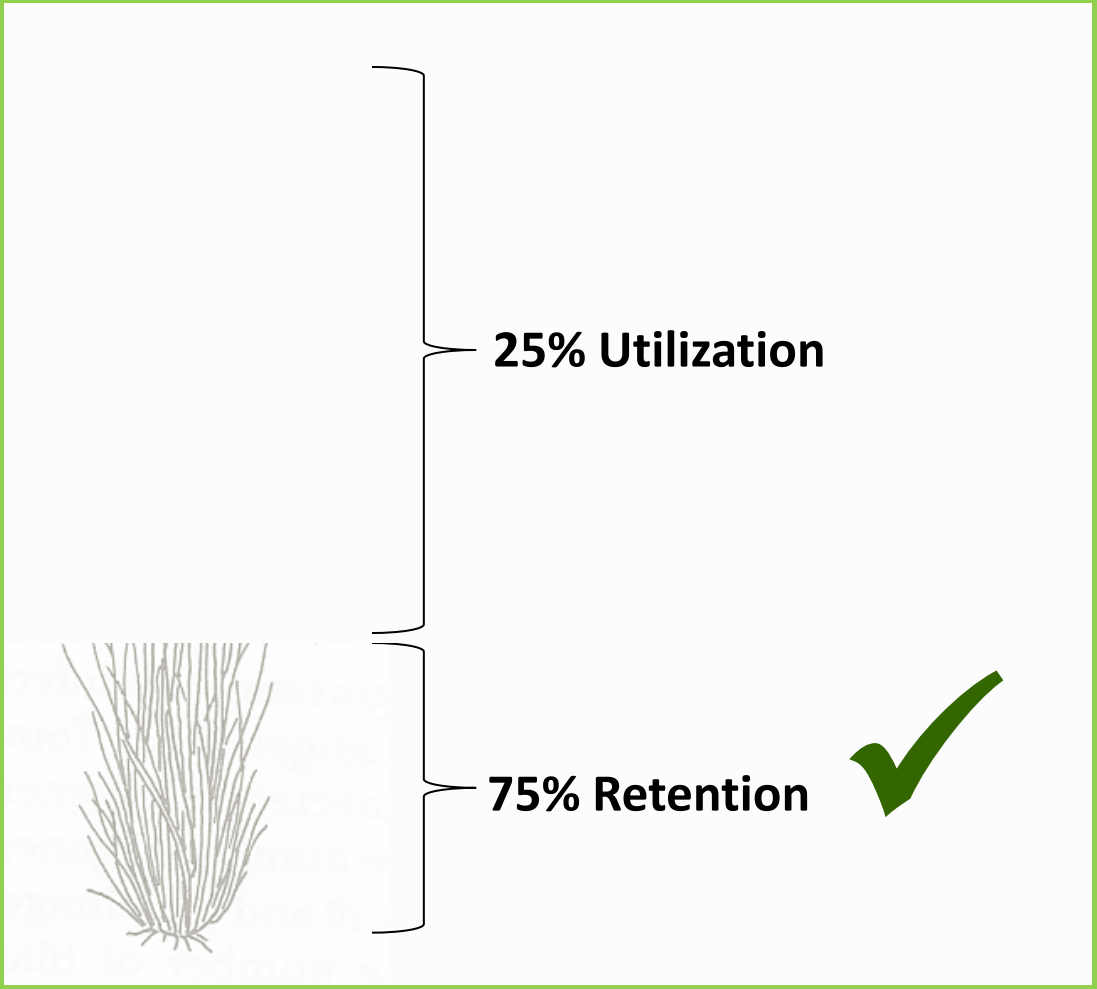
  (Hammerson 1982, Bartelt 2000, Wind and Dupuis 2002, Bartelt et al. 2004, Brazier and Whelan 2004, Keinath and McGee 2005, Bull 2006, Pierce 2006, Schmetterling and Young 2008, Bull 2009, Browne and Paszkowski 2010)

- Spotted frogs are semi-aquatic, but feed on many terrestrial invertebrates and regularly travel across terrestrial habitat.

  (Turner 1960, Hollenbeck 1974, Bull and Hayes 2001, Pilliod et al. 2002, Patla and Keinath 2005, Reaser and Pilliod 2005)

II. Some Basic Concepts

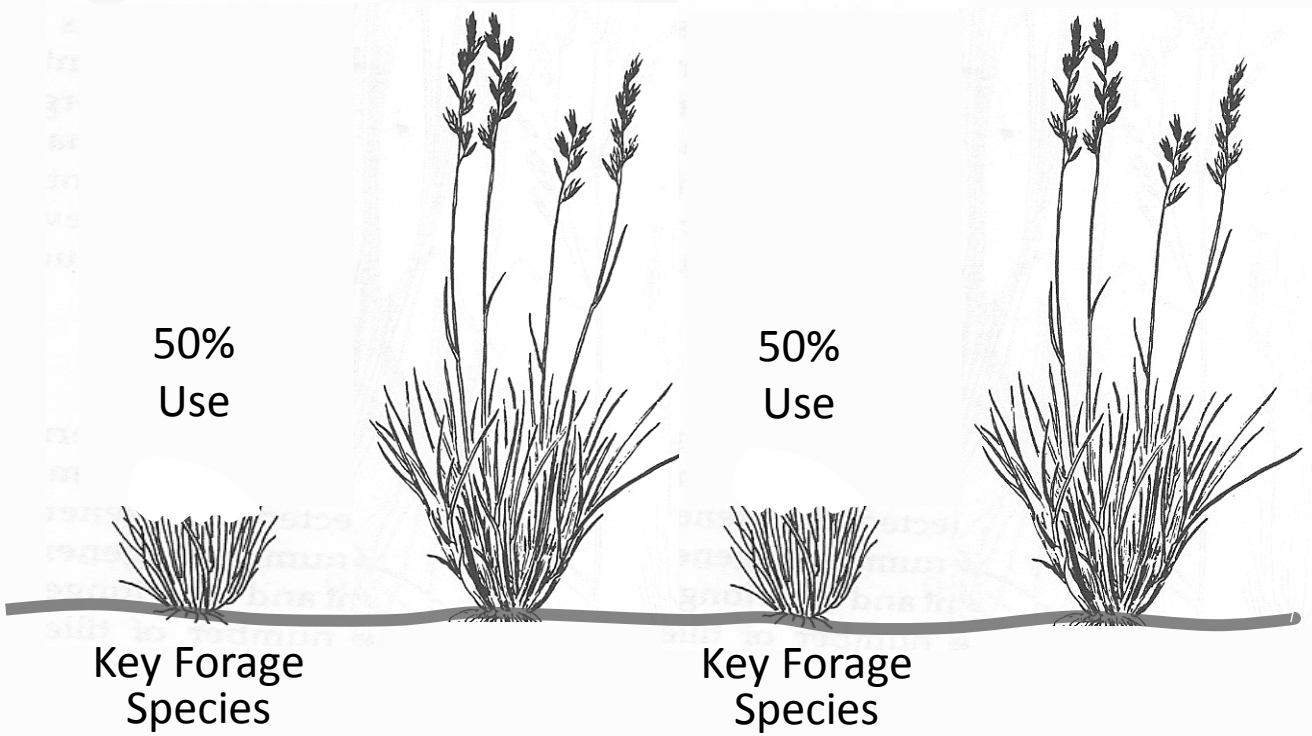
Retention vs. Utilization (by WEIGHT)



Plant Height vs. Plant Weight

Note: the lowest 10% of height contributes little or nothing to cover for many species, but it constitutes substantial weight.

Retention of
Total Herbaceous Veg. vs. Key Forage Species



What is retention of key forage species? 50%

What is retention of total herbaceous vegetation? 75%

III. Forest Plan & Other Direction

Management Direction

Forage Utilization Standard:

During AMP revision, ID Team & permittees will prescribe site-specific utilization levels needed to meet Forest Plan objectives.

Site-specific utilization levels on key wildlife ranges will be established by IDT.

"Chapter 90" (FSH) calls for developing allowable-use limits to achieve Forest Plan objectives.

Applicable Forest Plan Objectives:

Objective 3.3(a) — Protect sensitive species and provide suitable and adequate habitat to ensure activities do not cause declines in habitat or populations or trends toward federal listing.

Objective 4.7(d) — Retain an adequate amount of suitable forage and cover for wildlife.

Coarse-filter / Fine-filter Approach

(2012 Planning Rule)

1. Coarse-filter — Conditions under which native wildlife-communities developed.

2. Fine-filter — Adjustments to meet the needs of species of conservation concern where coarse-filter conditions are insufficient or would negatively impact these species.

"…a well-developed concept in the scientific literature and has broad support from the scientific community…" *(USFS 2012)*

Supporting literature: *Diamond (1981), Reid and Miller (1989), Keystone (1991), Noss and Cooperider (1994), Hunter (1996), Aplet and Keeton (1999), Everett and Lehmkuhl (1999), Haufler (1999), Hughes et al. (2000), Cooperrider (2002), Samways (2005)*

→ This was one process used to identify suitable conditions for amphibians.

Coarse-filter / Fine-filter Approach

(2012 Planning Rule)

ALSO → adjustments were made to accommodate several uses (e.g., roads, livestock grazing, recreation).

- Key question for each habitat element: How far down can the low-end threshold be drawn to still ensure that suitable conditions are provided for spotted frogs and boreal toads?
- E.g., how many roads can exist near breeding sites (and how close) while still providing suitable conditions for spotted frogs and boreal toads?
- E.g., how intensively can livestock be grazed and still provide suitable conditions for them?

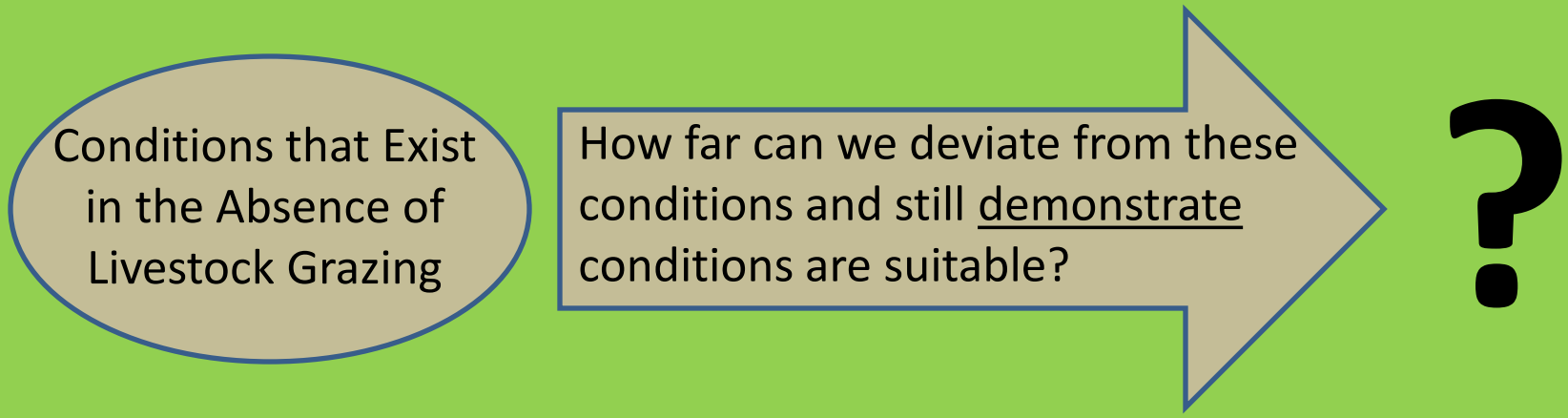
In defining suitable conditions for habitat elements affected by a given activity (e.g., livestock grazing):

The burden of proof is on demonstrating that deviations

from conditions without livestock grazing

to conditions with x-level of livestock grazing

….will still be suitable.



This approach is consistent with a growing body of ecological literature.

(Barrett and Raffensperger 1999, Fisher et al. 2006, Walshe et al. 2007)

Retention

100%

90%

80%

70%

60%

50%

40%

30%

How Far Down Can we Demonstrate that Suitable Conditions are Retained?

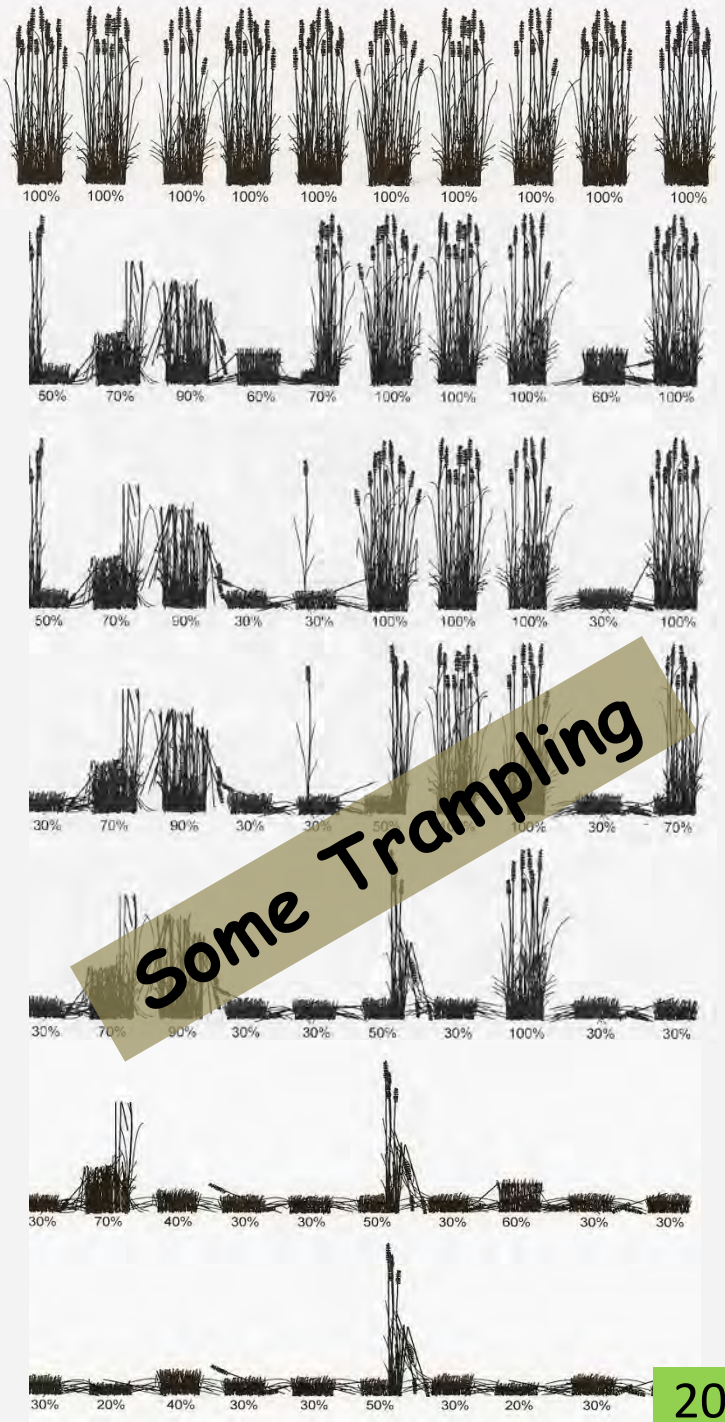
?

?

?

?

?



Why start with near 100% retention?

- Complete exclusion is a widely recognized way to protect amphibians from livestock grazing use and to provide suitable conditions.

  (Bartelt 2000, Maxell 2000, Engle 2001, Patla 2001, Keinath and McGee 2005, Patla and Keinath 2005, Shovlain 2006, Schmutzer et al. 2008)

- Coarse-filter conditions equate to conditions without livestock use.

  (*2012 Planning Rule* and large volume of supporting literature)

- We have an affirmative requirement to protect sensitive species and to provide suitable conditions for them.

  Requirements are not stated in the negative

  → *There are no requirements to prove that suitable conditions are not met before changing management to protect sensitive species.*
  (Obj's 3.3(a) & 4.7(d), Sens. Species Mgt. Standard, USFS 1990b, FSM 2670.22)

IV. Suitable Herbaceous Retention

and Relationship to Range Management & Wildlife Community as a Whole

Suitable Herbaceous Vegetation Conditions for Spotted Frogs and Boreal Toads

1. 70% of the weight of herbaceous vegetation is retained in the area encompassed within a perimeter 10 feet beyond the high water mark of known breeding wetlands.

2. 70% of the weight of herbaceous vegetation is retained on ≥80% of the acreage of each major vegetation type used by spotted frogs and boreal toads within 1/3 mile of known breeding sites, except:

    - Retention can be as low as 50% in nonnative bluegrass and smooth brome communities where they do not dominate large areas.

- These apply to rangelands & riparian areas in functioning condition.
- Assumes canopy cover of relatively-intact herb veg. remains above about 60%.

Large Amt. of Science Showing:

Mod. Amt. of Science Showing:

Limited Science Showing:

No Science Showing:

Retention

near-100%

90%

80%

70%

60%

50%

40%

30%

Suitable Conditions Retained

Suitable Conditions Not Retained

Suit. Cond's Not Ret.

Suit. Cond's Ret.

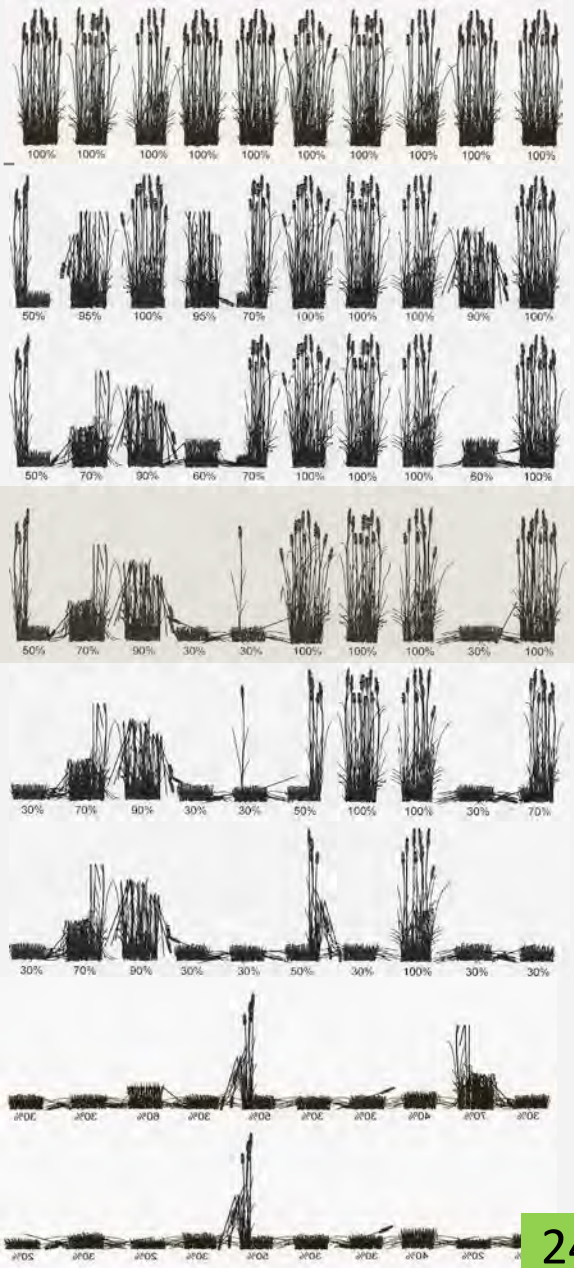
Suit. Cond's Not Ret.

Suit. Cond's Ret.

Suitable Conditions Not Retained

Suitable Conditions Retained

>300 papers & books were reviewed



Coarse-filter Conditions

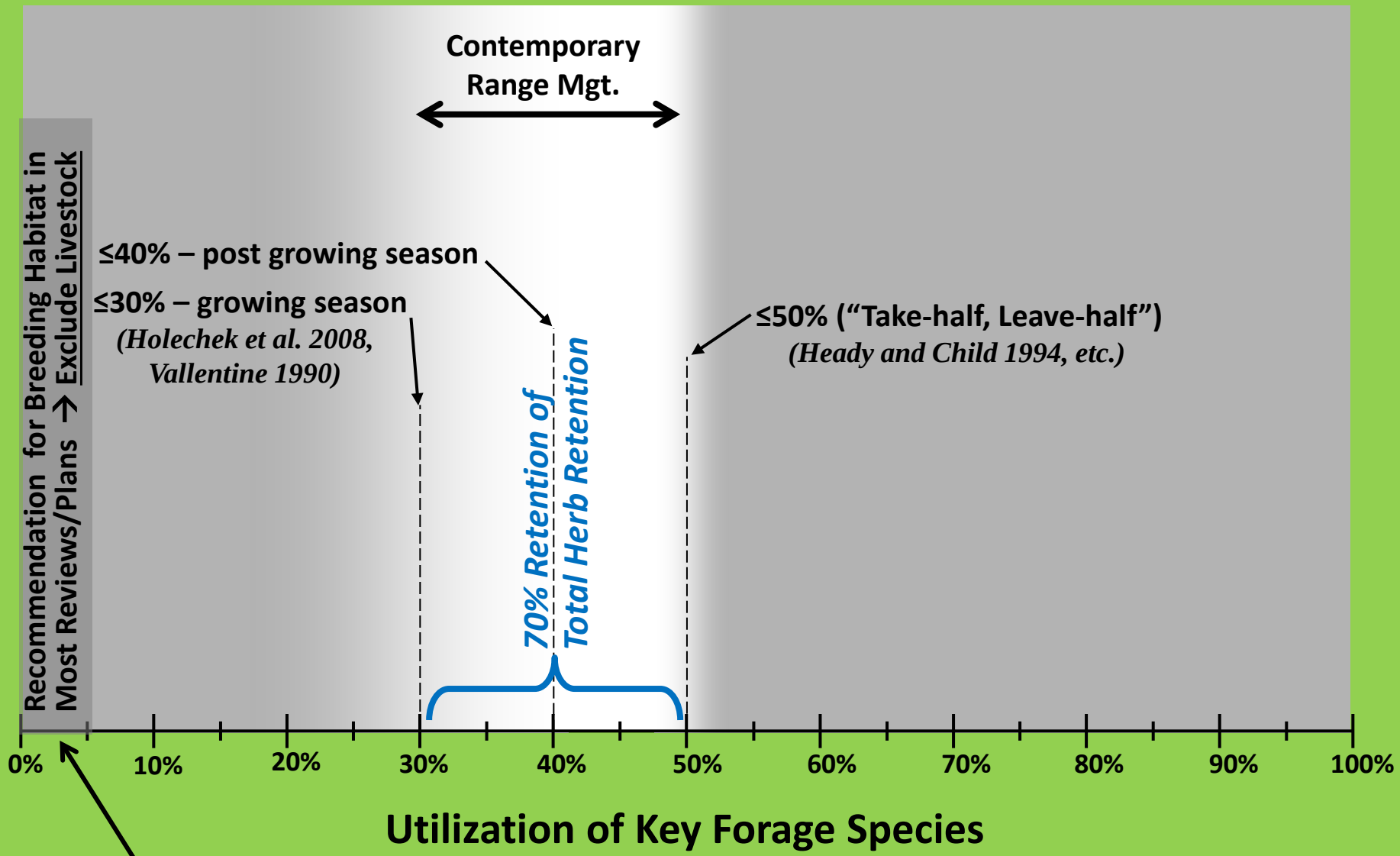
Any Fine-filter Adjustments Needed to Meet the Needs of Frogs & Toads?

- No scientific info. was found showing a need for any fine-filter adjustments.

Any Adjustments Needed to Accommodate Livestock Grazing?

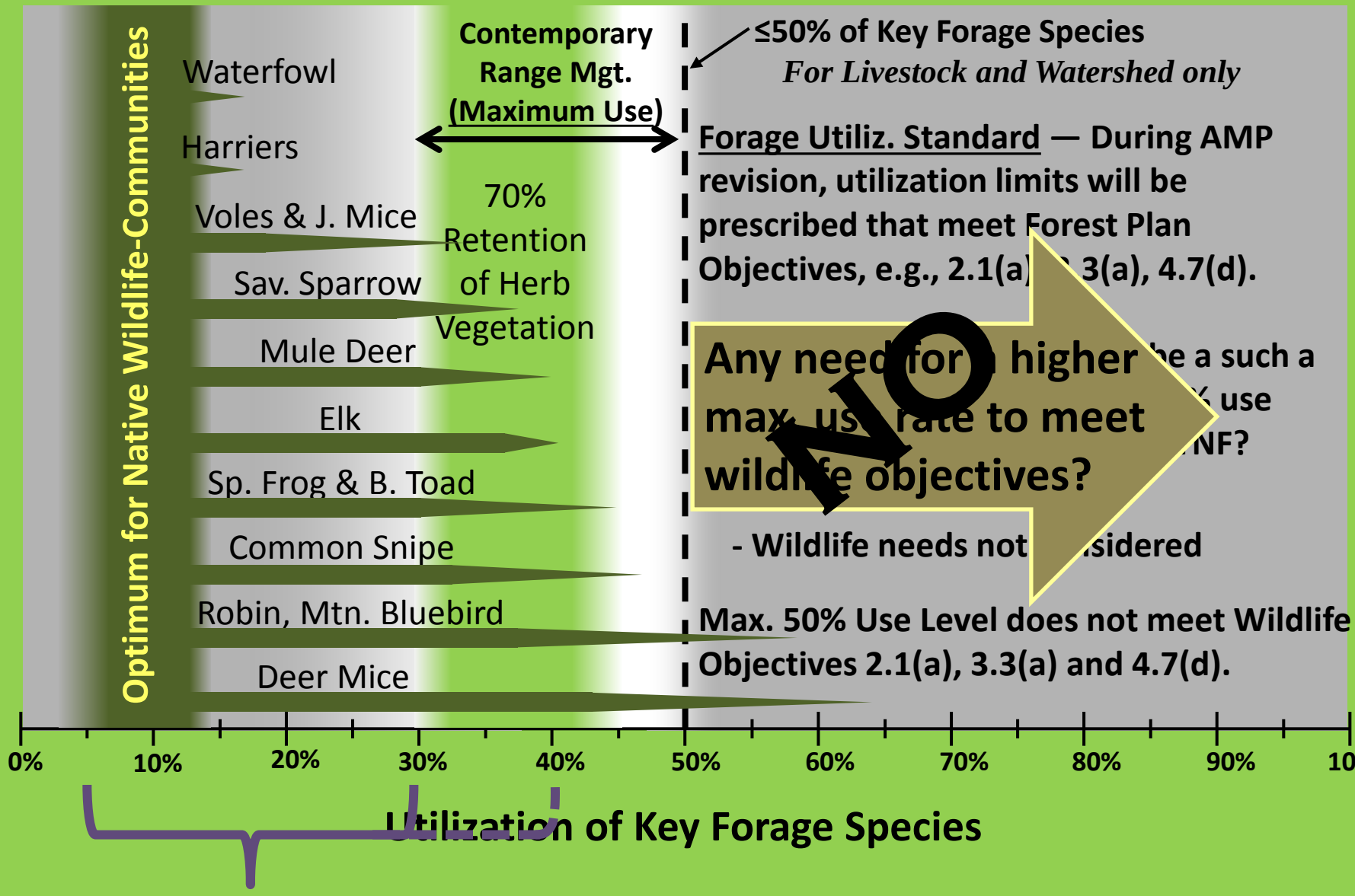
- Yes, based on Forest Plan, NFMA.
- Scientific info. shows coarse-filter conditions can be adjusted down-ward as far as 70% retention.

Relationship to Range Management



(e.g., Bartelt 2000, Maxell 2000, Engle 2001, Patla 2001, Keinath and McGee 2005, Patla and Keinath 2005, Shovlain 2006, Schmutzer et al. 2008)

Relationship to Native Wildlife-Community



Presentations

— on the Basis of 70% Retention for Wildlife —

Powerpoint (**Wildlife as a Whole**) Presented to:

- 10-2009 — Wyo. Chapter, The Wildlife Society
- 02-2010 — RO, Wildlife & Range Programs (BTNF Bios. on conf. call)
  → this followed an overview conference call in 2009
- 02-2011 — IDT for cattle allotments, Greys River RD
- 07-2011 — Alma Winward (retired Regional Veg. Ecologist)
- 07-2011 — BTNF and WGFD Biologists, at SO
- 08-2011 — Mike Smith, University of Wyoming
- 11-2011 — 18 Greys River RD permittees & Mike Smith, UW
- 06-2012 — BTNF Rangers

Sensitive Amphibian Report Reviewed by:

- 01-2013 — WNDD and WGFD (and earlier by RO Aquatic Ecologist)

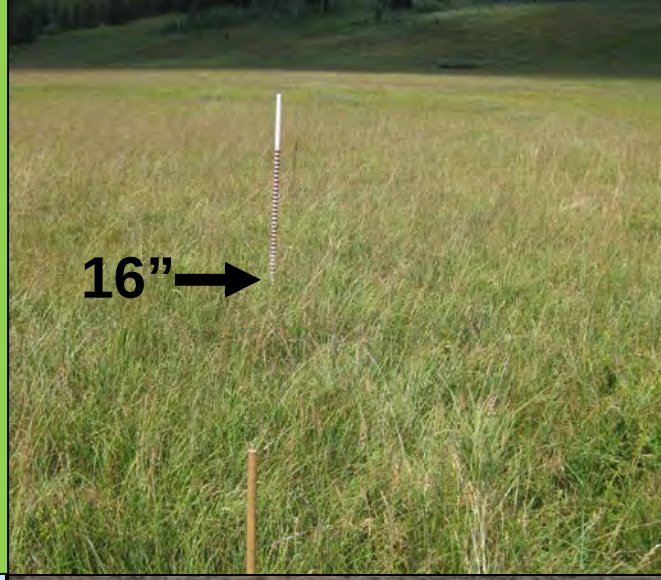
V. Meadow Habitat Characteristics

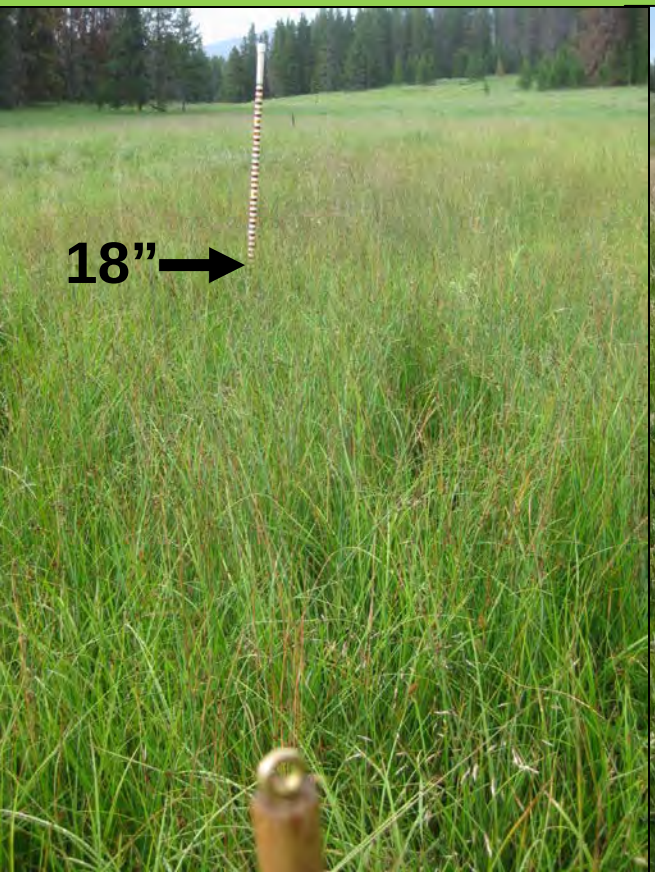
Conditions under which Native Wildlife-Communities Formed

Wet and Moist Meadows, Greys River RD

— June through November —

Grazing is a natural process, but...

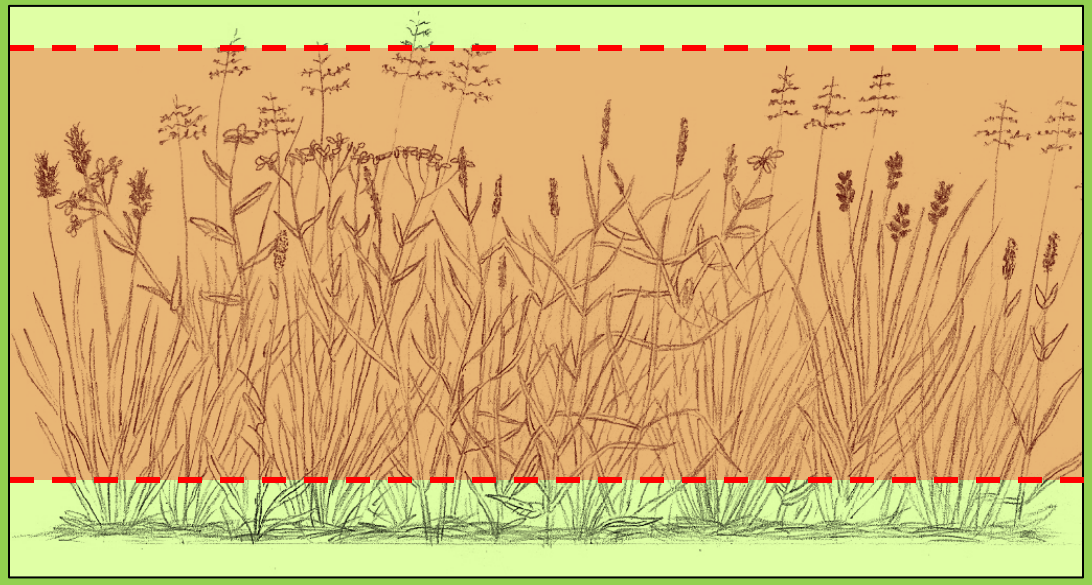




Note: Herbaceous vegetation naturally does not cover 100% of wetlands & other habitats.

But, where this vegetation occurs it has characteristics that native wildlife-communities became dependent upon…

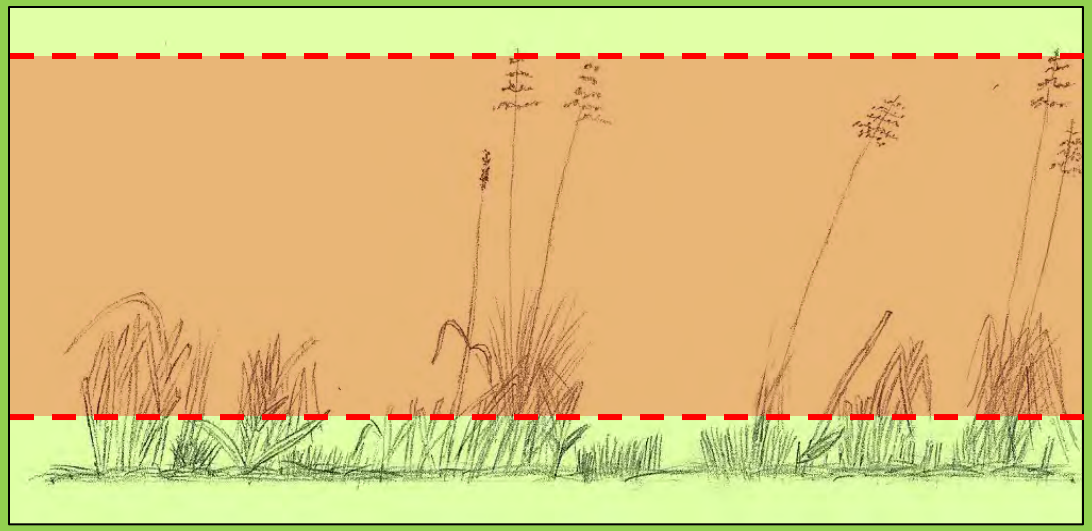
Near-100% Ret.



Upper & Middle Layers

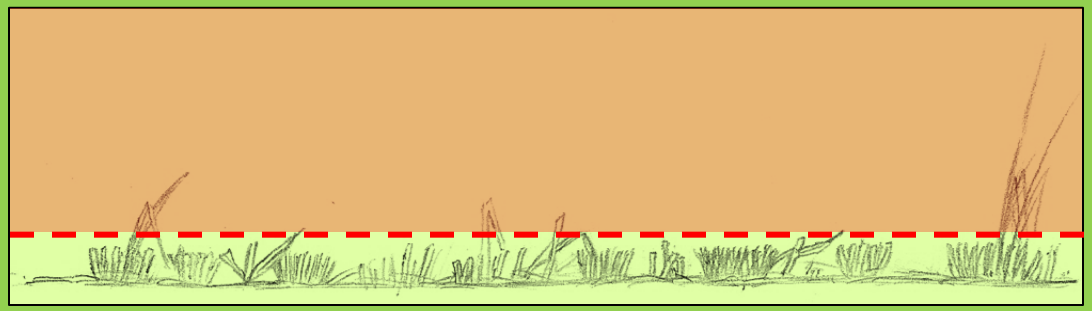
- Mod. humidity retention
- Mod. temp. moderation
- Mod. wind reduction
- Mod. shade
- Mod. to high hiding cover
- Large Invertebrate diversity

50% Ret.



- Ambient humidity
- Ambient temp. (or higher)
- Ambient wind
- Negligible shade
- Negligible hiding cover
- Low Invertebrate diversity

30% Ret.



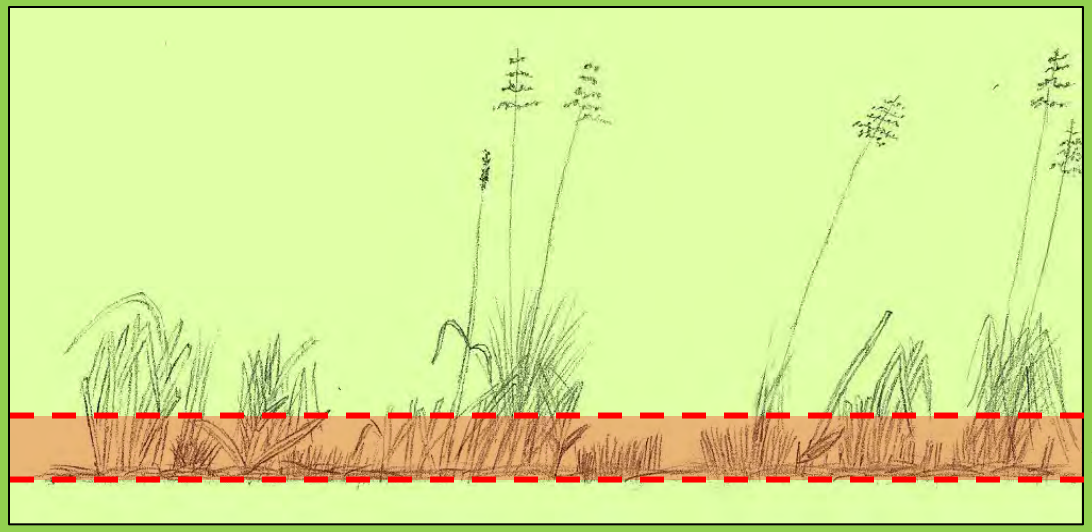
- Ambient humidity
- Ambient temp. (or higher)
- Ambient wind
- No shade
- No hiding cover
- Negl. Invertebrate diversity

Near-100% Ret.

Bottom Layer (≤2”)

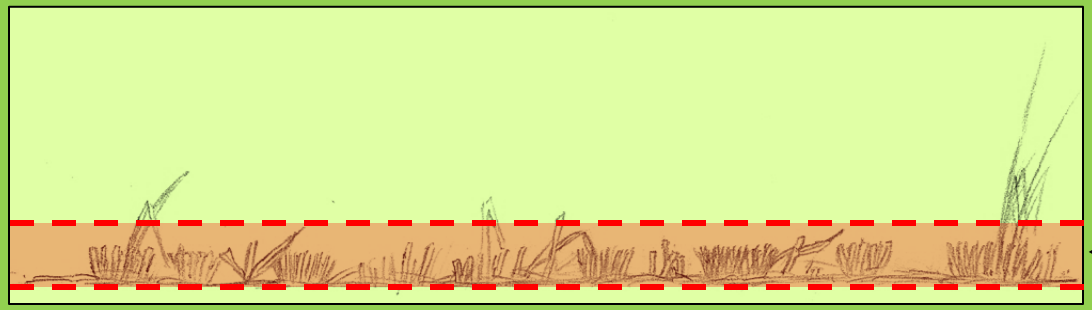
- High humidity retention
- Temperature moderated
- No wind
- Deep shade
- Major hiding cover
- Well dev. litter layer

50% Ret.

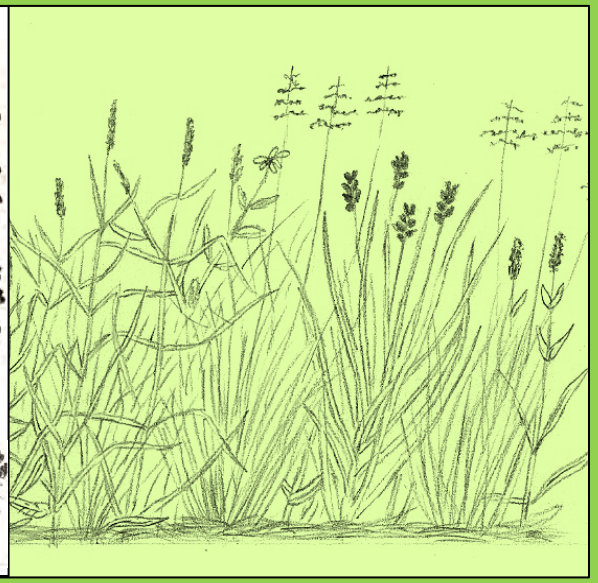


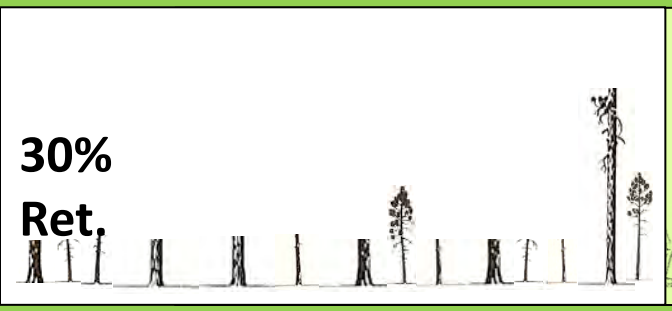
- Near ambient humidity
- Near ambient temp.
- Near ambient wind
- Low - Moderate shade
- Low hiding cover
- Moderate litter layer

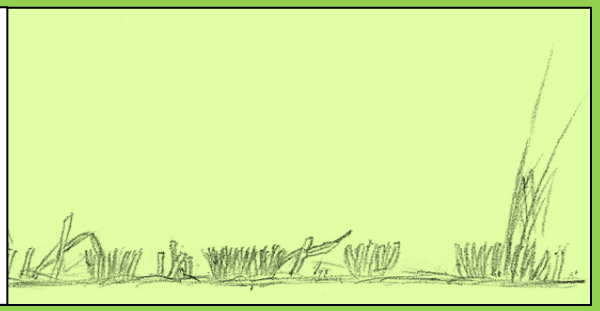
30% Ret.



- Ambient humidity
- Ambient temp. or higher
- Ambient wind
- Negligible shade
- Negligible hiding cover
- Low litter layer







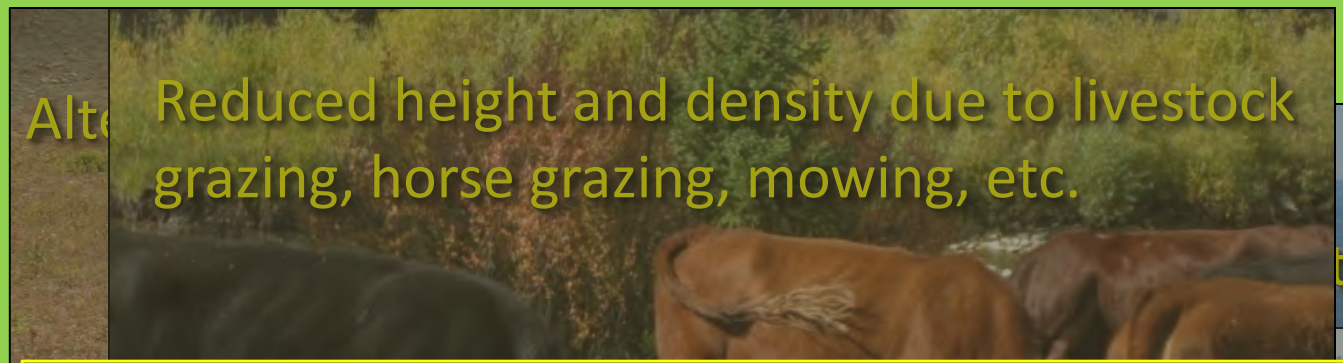
Implications to Wildlife

- Wildlife diversity is representative of native meadow-communities

- Few of meadow habitat attributes remain
- Greatly diminished number of wildlife species & abund.

- Virtually no meadow habitat attributes remain
- No semblance of meadow wildlife diversity

Herbaceous Communities & Vegetation are Underrepresented



Implication → Remaining areas of herbaceous habitats are important.

Also, there are no wildlife species on the BTNF that depend on heavy grazing and there are many wildlife species that depend on relatively tall, dense herbaceous vegetation in wetlands, meadows, etc.