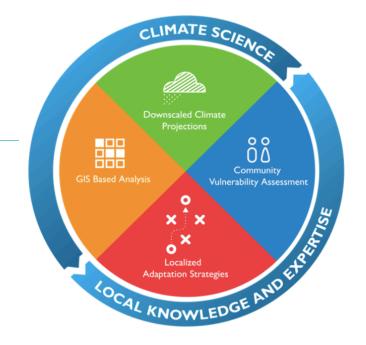


# Lessons from the Project

- Collaboration with Partners was key in developing the Plan
- Strong Participation from Tribal Staff helped:
  - Ground-truth Western science,
  - Incorporate Traditional Knowledge, and
  - Customize adaptation actions.









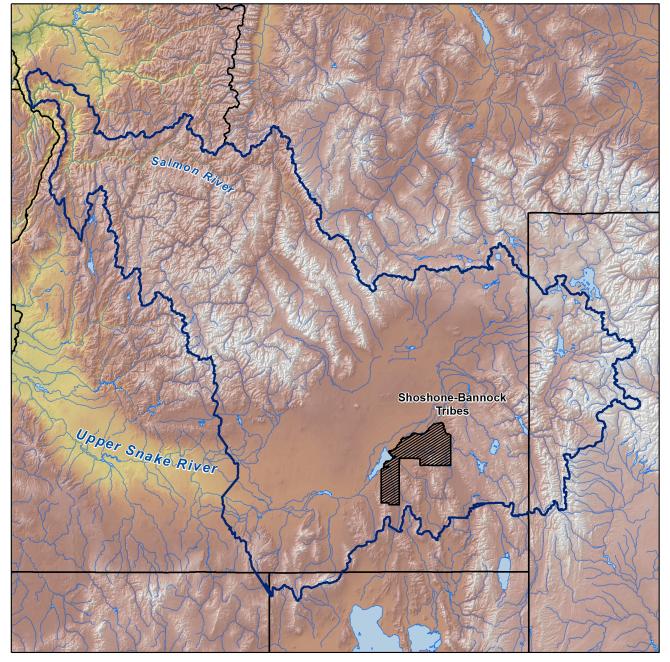
# Project Overview



# Project Area

45,431

square miles







Start by Selecting Key Concerns



#### Selected Plant and Animal Species for the Assessment

#### **Plant Species (10)**

Noxious weed: Thistle

Cirsium arvense

Noxious weed: Spotted Knapweed *Centaurea maculosa* 

Invasive weed: Cheat Grass "Downy Brome". *Bromus* 

Invasive species: Russian
Olive Tree *Elaeagnus*angustifolia

tectorum

Wyoming Sage Artemisia tridentata

Saskatoon Amelanchier alnifolia

Coyote Willow Salix exigua

Pinyon Pine *Pinus* monophylla

Rubber rabbitbrush

Ericameria nauseosa

Yampah *Perideria Gairdneri* "wild carrots"

#### **Animal Species (10)**

Yellowstone Cutthroat Trout

Oncorhynchus clarkii bouvieri

Sage Grouse Centrocercus urophasianus

Yellow-Billed Cuckoo Coccyzus americanus

Bald Eagle Haliaeetus leucocephalus

Northern Leopard Frog *Lithobates* pipiens

Pacific Lamprey Entosphenus tridentatus

Gopher snake Pituophis catenifer

Mallard Duck Anas platyrhynchos

Moose Alces alces

Mountain Lion Puma concolor

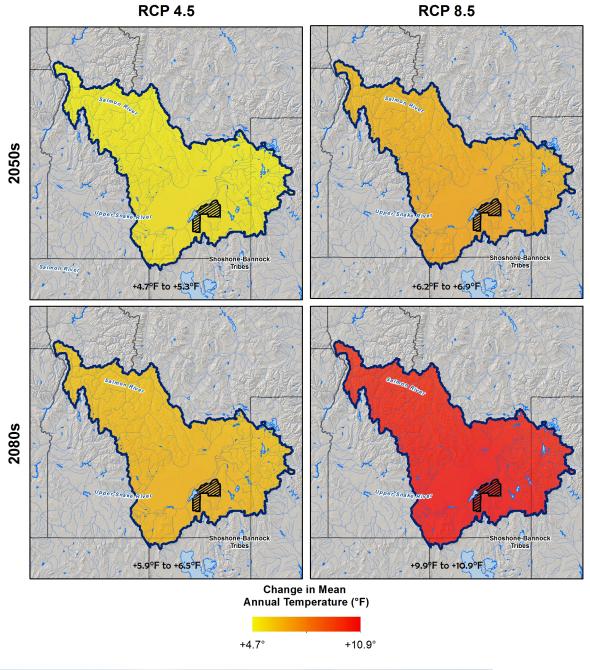








# Temp Projections

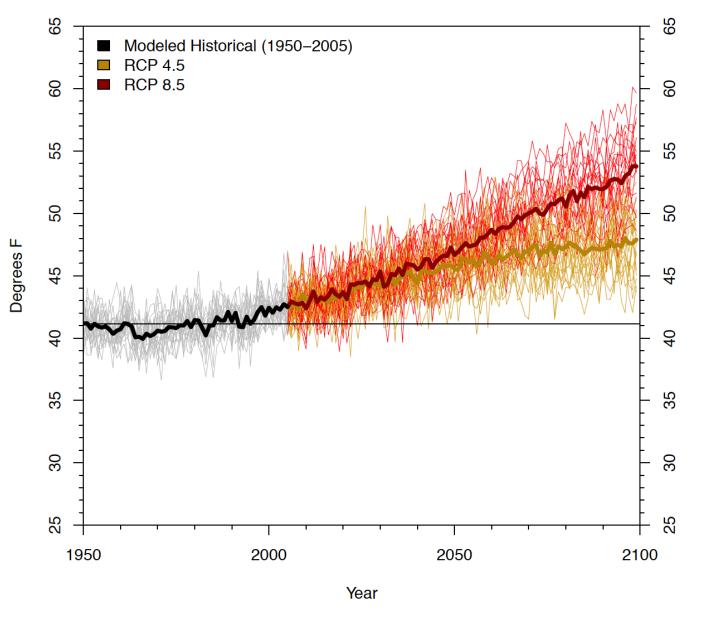






# Temperature Projections

#### **South Subdomain Average Annual Temperature**

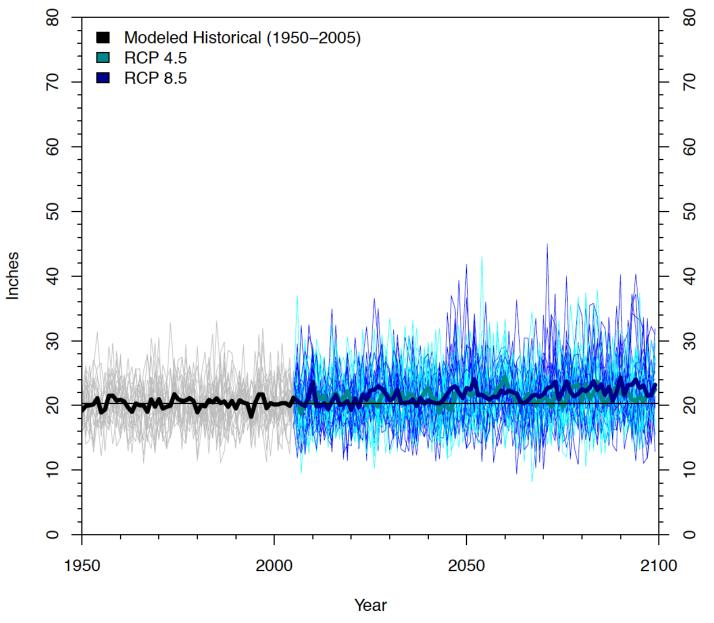






## Precipitation Projections

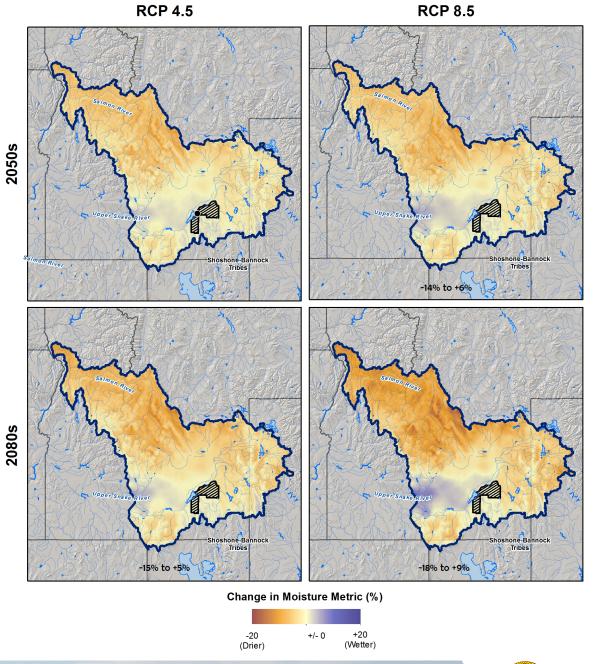
#### **South Subdomain Total Annual Precipitation**







# Changes in Moisture







# Vulnerability Assessment



### Relative Vulnerability (2050s – Higher Climate Scenario- RCP8.5)

VULNERABILITY

HIGH

- Bald Eagle\*
- > Cheatgrass
- Coyote Willow
- Gopher Snake
- > Mallard
- Mountain Lion
- Spotted Napweed
- > Thistle
- Yellow-billed Cuckoo
- > American Beaver
- > Chokecherry
- Geyer's Willow
- > Golden Eagle
- Redoiser Dogwood

- Single Leaf Pinyon\*
- Rubber Rabbitbrush
- Russian Olive
- Service Berry\*

- Moose
- Northern Leopard Frog
- Wyoming Sage\*

- Pacific Lamprey\*
- > Sage-Grouse\*
- Yellowstone Cutthroat Trout\*

- Big Sagebrush
- Black Cottonwood\*
- Mule Deer\*
- Quaking Aspen\*

- Black-Tailed Jackrabbit
- > Elk

- Bull Trout
- Chinook Salmon\*
- ColumbiaSpotted Frog
- > Redband Trout
- > Steelhead





## Results: CCVI Overall Vulnerability Rankings

EV = Extremely Vulnerable

HV = Highly Vulnerable

MV = Moderately Vulnerable

LV = Less Vulnerable

Common Name	Taxon	Habitat	2050s RCP4.5	2050s RCP8.5	2080s RCP4.5	2080s RCP 8.5
Greater Sage-Grouse	Bird		EV	EV	EV	EV
Black-tailed Jackrabbit	Mammal		MV	HV	HV	HV
Wyoming Sage*	Plant	Sagebrush	HV	EV	EV	EV
Big Sagebrush	Plant	Steppe	MV	HV	HV	HV
Rubber Rabbitbrush*	Plant		MV	HV	HV	HV
Cheatgrass*	Plant		LV	LV	LV	LV
Bald Eagle	Bird		MV	MV	MV	HV
Yellow-billed Cuckoo	Bird		LV	LV	LV	LV
American Beaver	Mammal		LV	LV	LV	LV
Black Cottonwood	Plant	Riparian	MV	MV	MV	HV
Redosier Dogwood	Plant		LV	LV	LV	LV
Geyer's Willow	Plant		LV	LV	LV	LV
Coyote Willow	Plant		LV	LV	LV	LV
Moose	Mammal		MV	HV	EV	EV
Quaking Aspen	Plant	Coniferous Forest	LV	MV	MV	MV
Single-leaf Pinyon*	Plant	rorest	MV	EV	EV	EV
Mallard	Bird		LV	LV	LV	LV
Northern Leopard Frog	Amphibian		HV	HV	HV	HV
Columbia Spotted Frog	Amphibian		EV	EV	EV	EV
Pacific Lamprey	Fish	Aquatic	EV	EV	EV	EV
Bull Trout	Fish	Aquatic	EV	EV	EV	EV
Chinook Salmon	Fish		EV	EV	EV	EV
Steelhead	Fish		EV	EV	EV	EV
Yellowstone Cutthroat Trout	Fish		EV	EV	EV	EV
Mountain Lion	Mammal		LV	LV	LV	LV
Elk	Mammal		MV	HV	HV	HV
Mule Deer	Mammal		LV	MV	MV	MV
Golden Eagle	Bird		LV	LV	LV	LV
Gopher Snake	Reptile	Generalists	LV	LV	LV	LV
Saskatoon*	Plant	Generalists	LV	MV	MV	MV
Common Chokecherry	Plant		LV	LV	LV	LV
Thistle*	Plant		LV	LV	LV	LV
Spotted Napweed*	Plant		LV	LV	LV	LV
Russian Olive*	Plant		LV	MV	MV	MV

# Adaptation Actions









## Key concerns prioritized for Adaptation Planning

#### **Sagebrush Steppe**

Sage Grouse

Wyoming Sage

#### **Aquatic**

Yellowstone Cutthroat Trout

Pacific Lamprey

Chinook Salmon

#### **Riparian**

**Bald Eagle** 

**Black Cottonwood** 

#### **Coniferous Forest**

Pinyon Pine

Aspen

#### **Habitat Generalists**

Service Berry

Mule Deer

Sho-Ban specific issues

USRT assessed issues





# **Example from Adaptation Workbook**

	A	В	С	D
1	Climate Change Concerns	ADAPTATION OBJECTIVES	ADAPTATION STRATEGIES	ADAPTATION ACTIONS
2				
		Objective 1: Plan and prepare for increases in		Incorporate climate change into fire-management plans (wildfire projections); anticipate more opportunities to use wildfire for resource benefit.
4		frequency and severity of	SAGE-1: Plan and prepare for greater area	Identify areas important for Wyoming Sage in situ gene conservation (quantifiable measurement) to provide a baseline for measuring fire impacts and informing post-fire planting/rehabilitation.
5				Increase production of native plants for post-fire plantings (reduce the potential for anthropogenic impacts).
6			lyegetation by reducing hazardous fuels and	Increase interagency communication of shared fire risk (between tribes and other natural resource managers in the region).
7				Consider climate change in post-fire rehabilitation and determine where native seed may be needed for post-fire planting. Enhance plans for post-fire responses for large fires (i.e., limiting cheatgrass spread, looking at burn severity, replant when needed, keeping cattle out of burned area).
8			fire management.	Monitor post-fire regeneration to determine what can be expected after large fires and to inform emergency stabilization and long term restoration efforts.
9				Experiment with planting native species to compete with invasive species post-fire.





# **Outreach Materials**



Climate Change Assessment and Adaptation Plan for the Shoshone-Bannock Tribes

Greater Sage Grouse



Greater sage grouse once enjoyed a massive range across the intermountain west, abundant in virtually every major river basin with good sagebrush stands. every major river uson with grow observation source.

As a sage brush obligate species, the sustainability of this bird depends on our ability to conserve and appropriately manage the remaining shrub-steppe อนุทั่งคาแนงที่ y เหล่า และ กระเนลาแหล่ง จำกับของอนุทั่ง habitats. This bird is native to the Reservation and holds a culturally significant place in Tribal traditions that include dances honoring the bird and regalia made from their feathers. These upland birds were hunted for subsistence by the Tribes, however, populations are dwindling and recent surveys show breeding grounds, or "leks," with no birds present.



Greater Sage Grouse Climate Change Vulner

Relative vulnerability rankings were determined by combining the best ( netarive sumercomy rainings were getermined by combining me best climbth the local and traditional knowledge of the Shoshone-Bannock Trib. offent are surparated to the surpression of the sur to the projected changes. The higher climate change scenario (RCP 8.5 to the projected changes. The higher chimate change scenario (NCP 4.5) is labeled "Less Warming" the lower current change scenario (NOF a.g.) is labelled "Less warming emissions over a longer time will lead to more severe impacts from clin



Climate Change Assessment and Adaptation Plan Climate Change Assessment and Adaptation Plan for the Shoshone-Bannock Tribes for the Shoshone-Bannock Tribes

Chinook Salmon



Chinook salmon have always been central to the Shot Uninook saimon have always been central to the Shot culture. They are one of the Tribes' First Foods and he them to all parts of the landscape—from the mountain Chinook salmon return to the stream where they were eggs. Thus, for the Shoshone-Bannock people, consi not only provided a critically important source of nutri that they would never be lost and always able to return

While Tribal members are able to utilize their Treaty ri White Hibra Hernoers are able to utilize their ready rule. Chinook salmon throughout the Columbia River basing Columbia River Power System and downriver harvest those opportunities. The contemporary river system of to less than one third of the historical range in the Sni Salmon returns have decrease more than 95% since of the Columbia River basin hydrosystem. Saving salf or the Columbia Hiver basin hydrosystem, saving sain been a priority for the Shoshone-Bannock Tribes, who over a priority for the onositione-bannock tribes, with management actions to ensure these fish will continu on the landscape for future generations.

Chinook Salmon Climate Change Vulne

Medium Vulnerability

Relative vulnerability rankings were determined by combining with the local and traditional knowledge of the Shoshone-Ban climate change projections, species-specific sensitivities, and to the projected changes. The higher climate change scenario the lower climate change scenario (RCP 4.5) is labeled "Less une lower unitage craining ocertains (POP-4-3) is libered (1992) emissions over a longer time will lead to more severe impacts

Pinyon Pine and the Shoshone-Bannock Tribes

Pinyon pine are an important cultural species for the Shoshone-Bannock Tribes due to its subsistence and medicinal properties. The nuts from pinyon pine are harvested and are an important fatty food source. A single tribal member can gather as many as 30,000 calories per day. The needles have medicinal properties in the form of salves. The particular species of pinyon pine that grows within the assessment area is unique in that it is the northern-most range of any pinyon pine. Trees can take up to seventy-five years to mature and are susceptible to large scale wildfires, Further, competition from juniper has been & management concern in the past decade.

Single Leaf Pinyo

Single Leaf Pinyon Pine Climate Chang

Less Warming Scenario

LOW VULNERABILITY

Relative vulnerability rankings were determined by combining relative vulnerability rankings were determined by combining with the local and traditional knowledge of the Shoshone-Ban with the local and discinction in homeograph of the ornoring country climate change projections, species-specific sensitivities, and to the projected changes. The higher climate change scenario to the projected changes. The higher cumare change scenario the lower climate change scenario (RCP 4.5) is labeled "Less The lower cumate change scenario (PLV 4.5) is labeled. Less i emissions over a longer time will lead to more severe impacts.

Aspen

Quaking Aspen and the Shoshone-Bannock Tribes Quaking aspen provide a key forest habitat for a variety of species important to the Shoshone-Bannock Tribes. They provide one of the most diverse habitats in all of southeastern Idaho, frequently include springs or seeps, and provide ortical habitat for ruffed grouse as well as a variety of other birds and mammals. Aspen stands are prone to invasion from competing conifers and susceptible to grazing after wildfires from domestic livestock and wildlife, Aspen are important to the Tribes as a source of fireWood and for their maintenance of sustainable wildlife populations.

Quaking Aspen Climate Change Vulnerability

Less Warming Scenario

Medium Vulnerability

Relative vulnerability rankings were determined by combining the best 4 with the local and traditional knowledge of the Shochone-Bannock Trips with the sucal and manufact and environments of the change projections, species-specific sensitivities, and the ability to the projected changes. The higher climate change scenario (RCP 8.5) the lower climate change scenario (RCP 4.5) is labeled "Less Warming" the lower climate change scentaro (nur 4.9) is labered. Less warrants of emissions over a longer time will lead to more severe impacts from climit

Climate Change Assessment and Adaptation Plan Climate Change Assessment and Adaptation Plan for the Shoshone-Bannock Tribes for the Shoshone-Bannock Tribes

Bald Eagle

Bald Eagle and the Shoshone-Bannock Tribes

Bald eagles have a unique spiritual value to the Shoshone Date eagles have a unique spiritual value to the shoenone and Bannock peoples. Eagle feathers and other materials are used in ceremonies and traditional practices; often the materials from an eagle are viewed as a gift from the treater Baid eagles use lands on the Reservation as wintering areas, residing and feeding in the Fort Hall Bottoms, Cottonwood trees along the Snake River real borrons. Coronwood trees along the onlake river provide roosting areas and bald eagles are often seen on Provide rousing areas and date eagles are otter seen on Reservation lands near the mouths of Spring Creek, Clear Creek, Portneuf River, and Bannock Creek, Protecting and providing roosting areas and riparian habitat on and proviously recovering areas and repaired specification of Reservation lands is ortifical to promoting the resilience of bald eagle populations, and the overall vulnerability of the species is low due to their high mobility.

Bald Eagle Climate Change Vulnerability in the 2050s

LOW VULNERABILITY Relative vulnerability rankings were determined by combining the best available climate change science

Relative vulnerability rankings were determined by combining the best available climate change science with the local and traditional knowledge of the Shoshone-Bannock Tribes. These rankings are based on with the local and traditional knowledge of the Shoshone-Bannock Tribes. These rankings are based on locate change projections, species-specific sensitivities, and the ability of species to adapt and response to the projections, species-specific sensitivities, and the ability of species to adapt and response to the projection of the kinker placets change season in USDs. It is inhabited to be a sensitivities of the projection of the proje climate change projections, species-specific sensitivities, and the ability of species to adapt and respond to the projected changes. The higher climate change scenario (RCP 8.5) is labeled "More Warming" and the projected changes. The higher climate change scenario (RCP 8.5) is labeled "More warming" and the projected changes the higher climate change scenario (RCP 8.5) is labeled and Warmings". Generally more resources and the scenario (RCP 8.5) is labeled and Warmings". to the projected changes. The higher climate change scenario (RCP 8.5) is labeled "More Warming" and the lower climate change scenario (RCP 4.5) is labeled "Lecs Warming". Generally, more greenhouse gas an appropriate to be a longer time and the labeled programments to be a longer time and the labeled programments to be a longer time. the lower climate change scenario (HCL\* 4.3) is labelled. "Less warming "Generally." If emissions over a longer time will lead to more severe impacts from climate change.

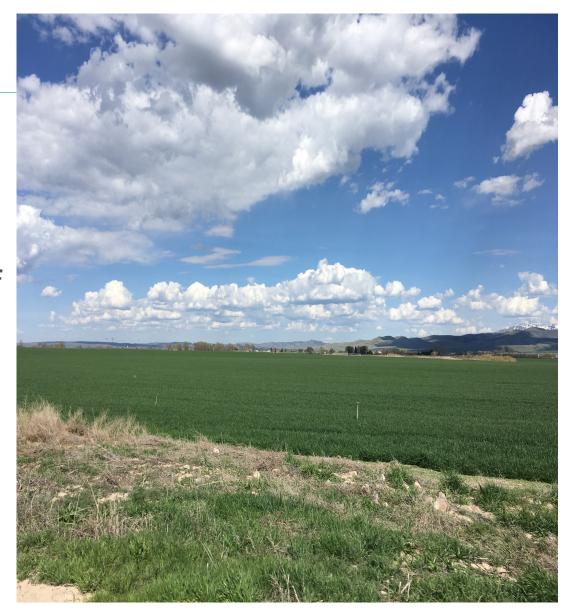






## Lessons

- Collaboration with Partners was key in Developing the Plan
- Strong participation from Tribal Staff helped:
  - Ground-truth Western science,
  - Incorporate Traditional Knowledge,
  - Customize Adaptation Actions.







# Thank You!

Shoshone Bannock Tribes

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#### **Adaptation International**

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The Shoshone-Bannock Tribes would like to acknowledge and thank the U.S. Department of the Interior, Bureau of Indian Affairs, for their generous funding contributions to this project. The Fish and Wildlife Department would also like to acknowledge and thank its Climate Change Core Team Members for their time and dedication to this project. Their efforts have helped ensure that this Plan builds climate resilience for the Tribes.



# Climate Science Back-up



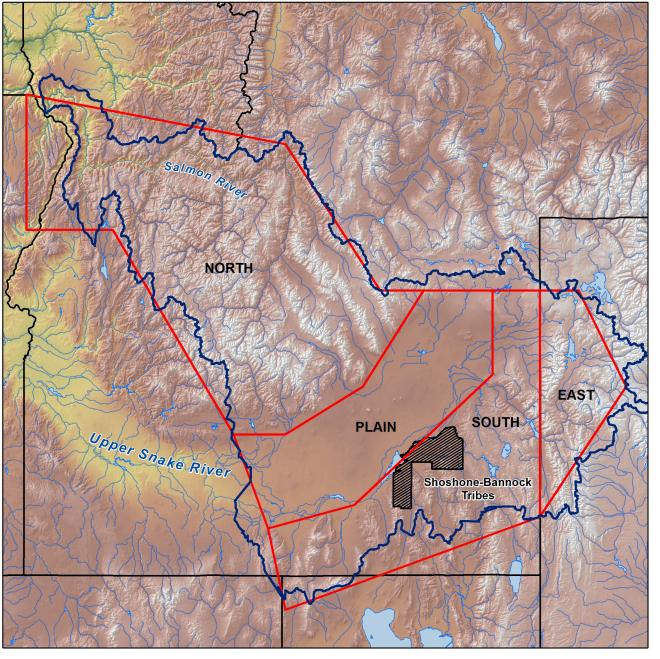
# Key Findings

- 1. Substantially longer frost-free season
- 2. Declining snowpack at mid-elevations
- 3. Earlier peak streamflow, more variability in winter
- 4. Loss of some fish habitat in warming streams
- 5. Heat waves in places not accustomed to them
- 6. More heavy (> 1"/day) precipitation events





# Subdomains

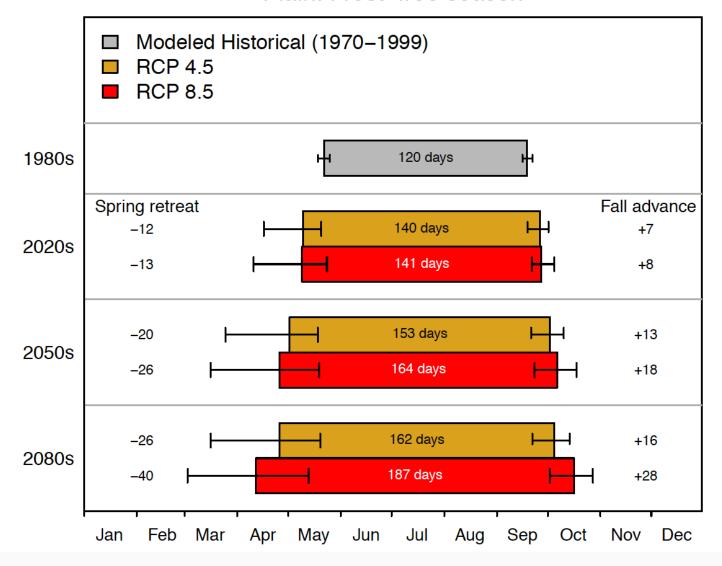






# 1. Lengthening of frost-free season

#### Plain: Frost-free season



Frost-free season lengthens by 35% & 56% (RCP4.5 & RCP8.5, late 21st century)

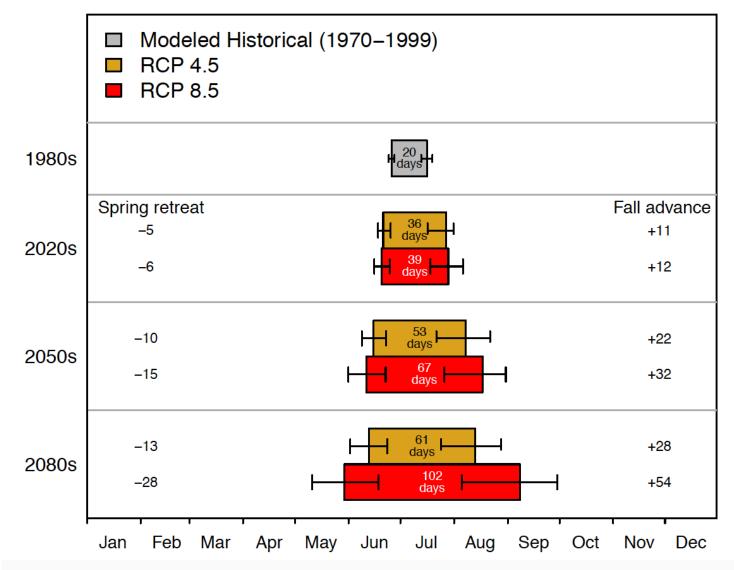
Spring retreating faster than fall advancing





# 1. Lengthening of frost-free season

#### East: Frost-free season



Frost-free season lengthens by factors of 3 & 5 (RCP4.5 & RCP8.5, late 21st century)

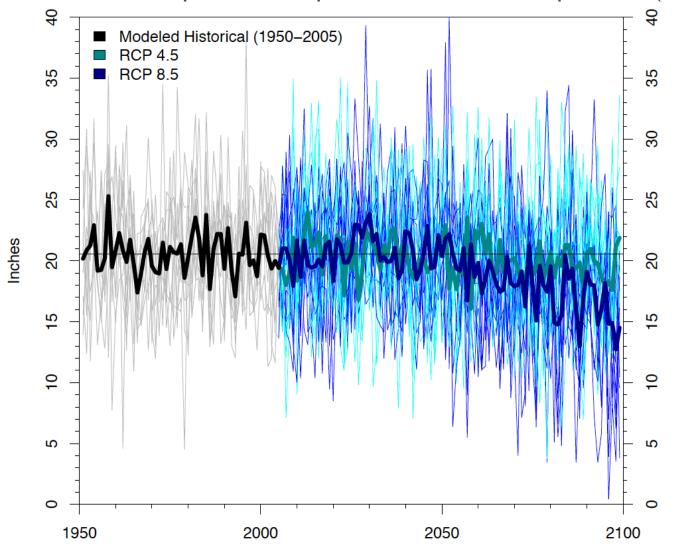
Fall advancing faster than Spring retreating





# 2. Declining snowpack

#### East subdomain April 1st snowpack as snow water equivalent (SWE)



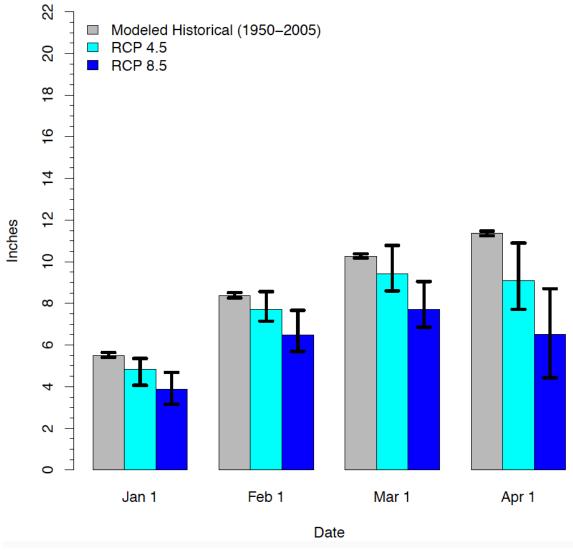
In high elevation East subdomain, snowpack persists through mid-century, small (RCP4.5) to moderate (RCP8.5) declines by late century





# 2. Declining snowpack

#### **North** subdomain snowpack (SWE) by 2080s



April1<sup>st</sup> snowpack in North subdomain declines by 20% & 40% (RCP4.5 & RCP8.5, late 21<sup>st</sup> century)

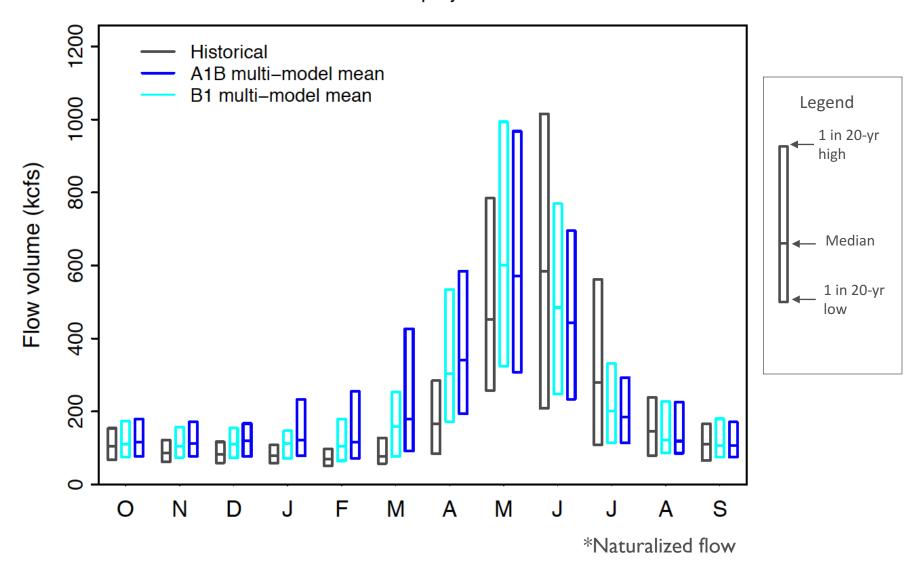
April 1<sup>st</sup> snowpack no longer useful index of maximum snowpack (larger snowpack March 1<sup>st</sup>)





# 3. Change in Annual Hydrograph

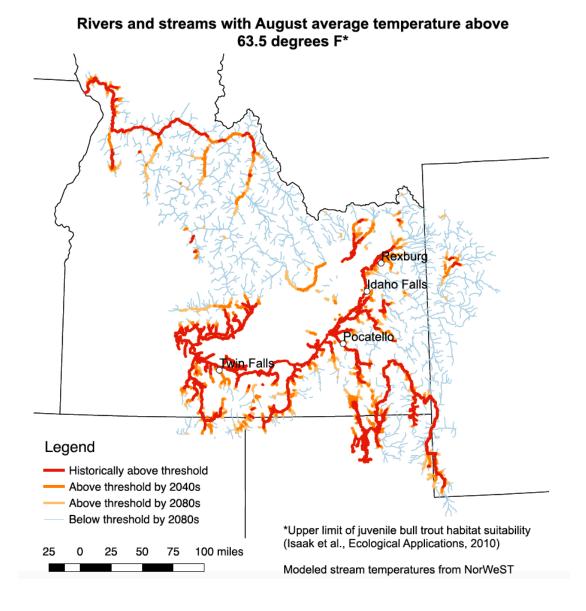
#### 5, 50, and 95th-%ile monthly flow at Snake nr Irwin 2080s A1B and B1 projections







# 4. Warmer Streams in Summer

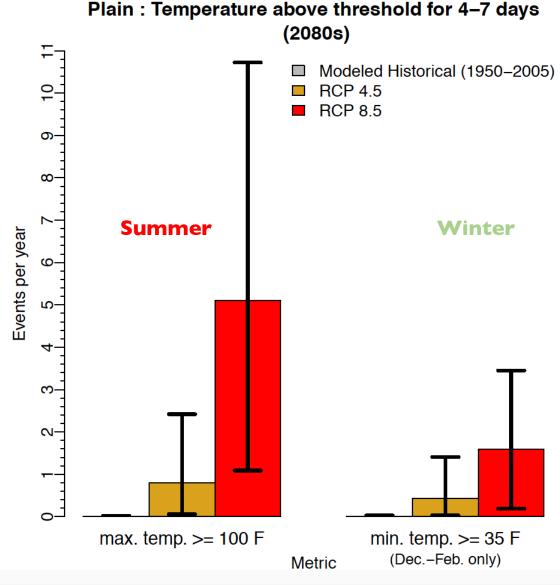


Loss of potential juvenile bull trout habitat on main stem, South Fork, Middle Fork and Little Salmon Much of Snake R. already inhospitable





# 5. Changing Frequency of Heat Waves



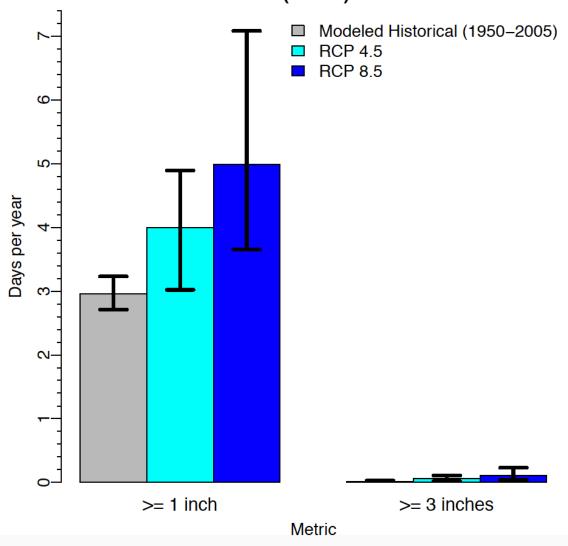
Summer heat waves become common in Upper Snake River Plain under RCP8.5 (~5 per summer) Heat waves occur but remain rare under RCP4.5 (~0 per year to ~1 per year, late 21st century)





# 6. Changing Frequency of Extreme Precipitation

## East : Frequency of daily precipitation above threshold (2080s)



In East subdomain, # of Days > 1" increases by ~33% & 66% (RCP4.5 & RCP8.5, late 21st century)

Precipitation > 3" remains very rare





# CCVI backup



#### Sho-Ban Selected Resource Issues and Habitats

Resource Issues (2)

**Gay Mine Restoration** 

**Traditional Foods** 

**Meadow Hay** 

Cattle

Wildfire

Asthma/Human Health

Traditional Medicines

Habitats (3)

Conifers

Reservoirs

Aspen

Sagebrush Steppe

Riparian

Springs/Seeps

Sho-Ban specific issues

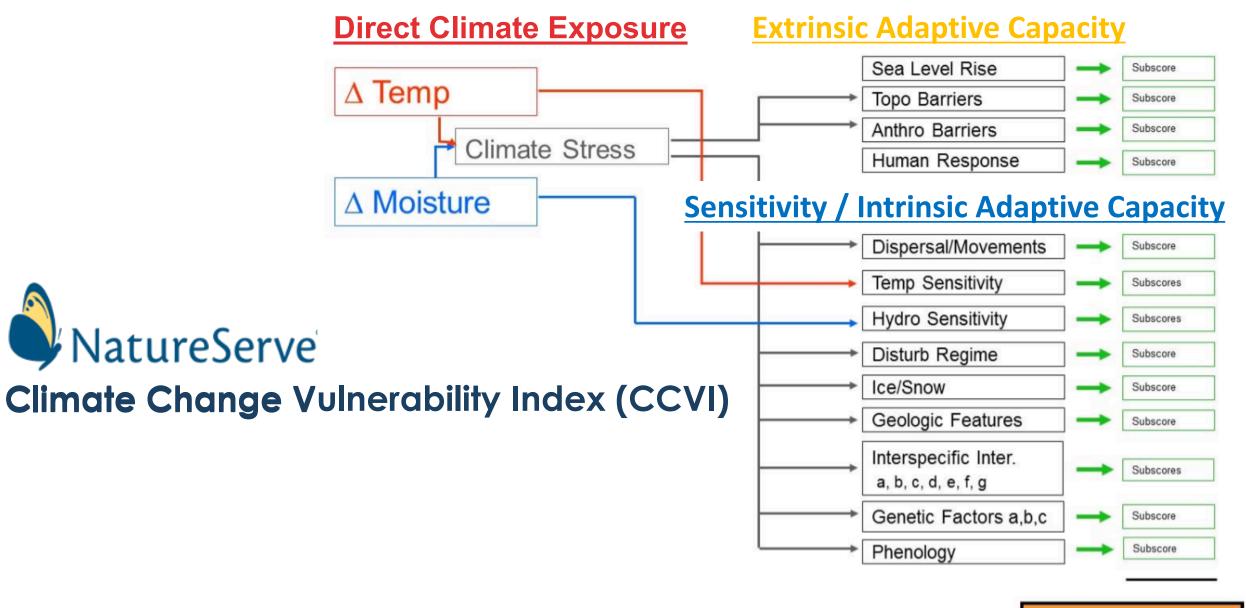
USRT assessed issues





# Results: Qualitative Habitat Analysis

Qualitatively As Habitats		ssec	k
All sensitivites are ranked out of 7. With 7 being highly sensitive, and 0 being not sensitive.	Temperature Changes	<b>Precipitation Changes</b>	Indirect Factors
Habitat Type			
Sagebrush Steppe	3	3	5
Coniferous Forest	5	4	4
Riparian	5	4	4
Aspen	6	7	6



Σ = Overall Score





# CCVI sensitivity and vulnerability rankings

### Sensitivity categories

- (1) Greatly Increase Vulnerability (GI)
- (2) Increase Vulnerability (Inc)
- (3) Somewhat Increase Vulnerability (SI)
- (4) Neutral (N)
- (5) Unknown (U)

### Vulnerability categories

- (1) Extremely Vulnerable (EV)
- (2) Highly Vulnerable (HV)
- (3) Moderately Vulnerable (MV)
- (4) Less Vulnerable (LV)
- (5) Insufficient Evidence (IE)





## Results: CCVI Sensitivity Scores

			Historical thermal niche	Historical hydrol. niche	Physiol. thermal niche	Physiol. hydrol. niche	Dependence on disturbance	lence on ice/snow	Physical habitat features	Other species for habitat	Dietary specificity	Pollinator specificity	Other species for dispersal	Pathogens/enemies	tition	Other species interaction	Dispersal/Movement	Genetic variation	Genetic bottleneck	Reproductive system	Phenological response	Documented response	le	Natural barriers	Anthropogenic barriers	Climate change mitigation	2050s; RCP4.5	2050s; RCP8.5	2080s; RCP4.5	2080s; RCP8.5
		Historic	Historic	Physiol	Physiol	Depend	Dependence	Physica	Other s	Dietary	Pollina	Other s	Pathog	Competition	Other s	Dispers	Genetic	Genetic	Reprod	Phenol	Docum	Sea leve	_	_		2050s;	2050s;	2080s;	2080s;	
English Name	Group	Habitat						;	Sens	itivit	у						ı	Intrir	nsic . Capa			•		Ada	insic ptive acity	•	Index			
Greater Sage-Grouse	Bird		N	N	N	SI	Inc	N	N	Inc	Inc	N/A	N	Inc	SI	N	N	SI	N/A	N/A	U	U	N	Inc	Inc	SI	EV	EV	EV	EV
Wyoming Sage	Plant	Sagebrush	N	N	N	N	SI	N	N	N	N/A	N	N	U	SI	N	GI	U	U	U	U	U	N	N	Inc	SI	HV	EV	EV	EV
Rubber Rabbitbrush	Plant	Steppe	N	N	SI	N	N	N	N	N	N/A	N	N	U	SI	N	N	U	N	N/A	U	U	N	N	Inc	SI	MV	HV	HV	HV
Cheatgrass	Plant		N	N	N	N	N	N	N	N	N/A	N	SI-N	U	N	N	N	N	N/A	N/A	U	U	N	N	N	N	LV	LV	LV	LV
Bald Eagle	Bird		N	N	N	SI	SI	N	N	N	N	N/A	N	Inc	N	N	N	N	N/A	N/A	U	U	N	N	N	SI	MV	MV	MV	HV
Yellow-billed Cuckoo	Bird	Riparian	N	N	N	SI	N	N	N	N	N	N/A	N	U	U	N	N	U	U	U	U	U	N	N	SI	N	LV	LV	LV	LV
Coyote Willow	Plant		N	N	N	SI	N	N	N	N	N/A	N	N	N	N	N	N	U	U	U	U	U	N	N	N	N	LV	LV	LV	LV
Moose	Mammal	Coniferous	N	N	Inc	Inc	N	N	N	N	N	N/A	N	SI	N	N	N	U	U	U	U	U	N	N	SI	N	MV	HV	EV	EV
Single-leaf Pinyon	Plant	Forest	N	N	N	N	SI	SI	Inc	N	N/A	N	N	SI	SI	N	N	N	N/A	N/A	N	U	N	N	SI	N	MV	EV	EV	EV
Mallard	Bird		N	N	N	SI-N	N	N	N	N	N	N/A	N	SI	N	N	N	U	U	U	U	U	N	N	N	N	LV	LV	LV	LV
Northern Leopard Frog	Amphibian	Aquatic	N	N	SI	Inc	N	N	N	N	N	N/A	N	SI	SI	N	N	U	U	U	U	U	N	SI	SI	N	HV	HV	HV	HV
Pacific Lamprey	Fish		N	N	GI	GI	Inc	N	N	N	N	N/A	N	U	U	N	N	U	U	U	SI	U	N	N	Inc	N	EV	EV	EV	EV
Yellowstone Cutthroat	Fish		N	N	SI-N	GI	Inc	N	N	N	N	N/A	N	Inc	Inc	N	N	Inc	N/A	N/A	U	U	N	GI	GI	N	EV	EV	EV	EV
Mountain Lion	Mammal		N	N	N	N	N	N	N	N	N	N/A	N	U	N	N	N	N	N/A	N/A	U	U	N	N	SI	N	LV	LV	LV	LV
Gopher Snake	Reptile		N	SI	N	N	N	N	N	N	N	N/A	N	N	N	N	N	U	U	U	U	U	N	N	SI	N	LV	LV	LV	LV
Saskatoon	Plant	Generalists	N	N	Inc	N	N	N	N	N	N/A	N	N	U	N	N	N	U	U	U	U	U	N	N	N	N	LV	MV	MV	MV
Thistle	Plant		N	N	N	SI	N	N	N	N	N/A	N	N	U	U	N	N	N	N/A	N/A	U	U	N	N	N	N	LV	LV	LV	LV
Spotted Napweed	Plant		N	N	N	N	N	N	N	N	N/A	N	N	U	N	N	N	U	U	U	U	U	N	N	N	N	LV	LV	LV	LV
Russian Olive	Plant		N	N	SI	SI	N	N	N	N	N/A	N	N	SI	N	N	N	U	N	N/A	U	U	N	N	N	N	LV	MV	MV	MV

Adaptive Capacity/Sensitivity

GI = Greatly Increase Vul.

Inc = Increase Vulnerability

SI = Somewhat Increase V.

N = Neutral

U = Unknown

#### **Overall Scores**

EV = Extremely Vulnerable

HV = Highly Vulnerable

MV = Moderately Vulnerable

LV = Less Vulnerable





# Species in the Sho-Ban Region

Quantitatively (	CCVI) As	sse	SS	ed	Sp	eci	es																										
		Sea level	Natural barriers	Anthropogenic barriers	Climate change mitigation	Dispersal/Movement	Historical thermal niche	Physiol. thermal niche	Historical hydrol. niche	Physiol. hydrol. niche	Dependence on disturbance	Dependence on ice/snow	Physical habitat features	Other species for habitat	Dietary specificity	Pollinator specificity	Other species for dispersal	Pathogens/enemies	Competition	Other species interaction	Genetic variation	Genetic bottleneck	Reproductive system	Phenological response	Documented response	2050s; RCP4.5	2050s, RCP 8.5	2080s; RCP4.5	2080s, RCP 8.5				
English Name	Group																									Index							
Columbia Spotted Frog	Amphibian	N	SI	SI	N	SI	N	N	N	Inc	U	N	N	N	N	N/A	N	Inc	N	N	Inc	N	U	N	U	HV	EV	EV	EV				
Bull Trout	Fish	N	N	Inc	SI	N	N	GI	N	GI	Inc	N	N	N	N	N/A	N	Inc	Inc	N	Inc	N/A	N/A	U	U	EV	EV	EV	EV				
Chinook Salmon	Fish	N	N	Inc	SI	N	N	GI	N	GI	Inc	N	N	N	N	N/A	N	Inc	SI	N	SI	N/A	N/A	Inc	U	EV	EV	EV	EV				
Steelhead	Fish	N	N	Inc	SI	N	N	GI	N	GI	Inc	N	N	N	N	N/A	N	Inc	SI	N	N	N/A	N/A	U	U	EV	EV	EV	EV				
Golden Eagle	Bird	N	N	N	SI	N	N	N	N	N	U	N	N	N	N	N/A	N	SI	N	N	N	N/A	N/A	N	U	LV	LV	LV	LV				
American Beaver	Mammal	N	N	SI	N	N	N	N	N	SI	N	N	N	N	N	N/A	N	N	N	N	N	N/A	N/A	U	U	LV	LV	LV	LV				
Black-tailed Jackrabbit	Mammal	N	N	SI	SI	N	N	N	N	N	Inc	N	N	N	N	N/A	N	SI	N	N	U	U	U	U	U	MV	HV	HV	HV				
Elk	Mammal	N	N	SI	N	N	N	N	N	SI	N	N	N	N	N	N/A	N	SI	SI	N	Inc	N/A	N/A	U	U	MV	HV	HV	HV				
Mule Deer	Mammal	N	N	SI	N	N	N	N	N	SI	N	N	N	N	N	N/A	N	SI	SI	N	N	N/A	N/A	N	U	LV	MV	MV	MV				
Big Sagebrush	Plant	N	N	N	SI	GI	N	N	N	N	SI	N	N	N	N/A	N	N	U	N	N	N	N/A	N/A	U	U	MV	MV	HV	HV				
Black Cottonwood	Plant	N	N	N	N	SI-N	N	N	N	SI	SI	N	SI	N	N/A	N	N	SI	N	N	N	N/A	N/A	U	U	MV	MV	MV	HV				
Common Chokecherry	Plant	N	N	N	N	N	N	N	N	SI	N	N	N	N	N/A	N	N	SI	N	N	U	N	N/A	U	U	LV	LV	LV	LV				
Geyer's Willow	Plant	N	N	N	N	N	N	N	N	SI	N	N	N	SI-N	N/A	N	N	SI	N	N	U	U	N	U	U	LV	LV	LV	LV				
Quaking Aspen	Plant	N	N	N	N	SI	N	SI	N	N	N	N	N	N	N/A	N	N	SI	N	N	N	N/A	N/A	U	U	LV	MV	MV	MV				
Redosier Dogwood	Plant	N	N	N	N	N	N	N	N	SI	N	N	N	N	N/A	N	N	U	N	N	U	U	N	U	U	LV	LV	LV	LV				



