



# Climate Change Assessment and Adaptation Plan

May 2017

A collaborative assessment conducted by the Shoshone-Bannock Tribe Fish and Wildlife Department, Adaptation International, the University of Washington's Climate Impact Group, and Oregon State University's Oregon Climate Change Research Institute.



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**Cover Photo:** Legacy Springs. Scott Hauser, 2016.

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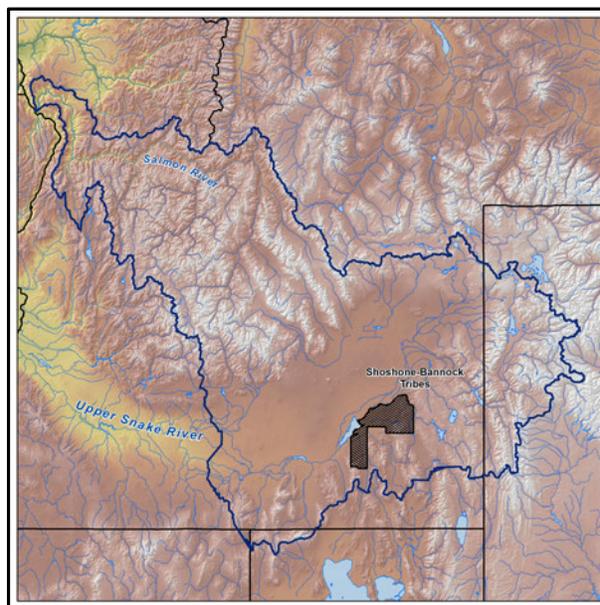
## Executive Summary

The Shoshone-Bannock Tribes, comprised of many bands of Shoshone and Bannock peoples whose very culture and history is intertwined with the lands in which they live, have historically subsisted through hunting and gathering. The Snake River Watershed, in present-day Idaho, continues to sustain the Tribes' cultural, spiritual, dietary, and economic needs. Climate change presents a threat to critical cultural resources, thereby also threatening the lifeways and wellbeing of the Tribes. This creates an urgent need to build climate resilience to protect and preserve these resources for future generations.

This climate change vulnerability assessment and adaptation plan outlines a collaborative 12-month project wherein a Climate Change Core Team of Tribal Staff (hereafter "Core Team") worked collectively with outside consultants (hereafter "project consultants") to assess climate vulnerability and identify adaptation actions for critical plant and animal species and their habitats. This project lays a foundation for building resilience among the Shoshone-Bannock Tribes and enhancing the resilience of natural resources that are an integral part of their culture. This report includes a summary of downscaled *future climate projections* for the project area, a detailed description of the *vulnerability assessment process and outcomes*, discussion of the Tribes' *adaptation planning process*, and a listing of the *adaptation actions* developed for the plant and animal species assessed.

### Future Climate Projections

Across the entire project area, average annual temperatures are projected to increase under two future climate scenarios through the 21<sup>st</sup> century. Projected changes to water availability and seasonal streamflows in the Upper Snake River system are primarily due to warming air temperatures and declining snowpack. These changes will have direct and indirect effects on Shoshone-Bannock Tribes and the plant and animal species on which they rely.



*Figure 1: Project boundaries for the Shoshone-Bannock Tribes' Vulnerability Assessment and Adaptation Plan are shown in dark blue. Total area encompasses 45,431 square miles and includes important natural resources both inside and outside the reservation boundaries. The Reservation is shown with hash mark shading.*

### Vulnerability Assessment Process and Outcomes

Through a series of in-person meetings, the Core Team identified 35 plant and animal species, seven resource issues, and four habitats of concern for inclusion in this assessment. Thirty-four species were assessed quantitatively using NatureServe's Climate Change Vulnerability Index (CCVI); one additional species of concern was not analyzed due to lack of adequate data. In a one-day workshop, the project consultants and Core Team worked collaboratively to vet preliminary CCVI results and integrate local and traditional knowledge (as appropriate), which ultimately resulted in changes to some species' vulnerability rankings. Final CCVI results are shown below,

where Extremely Vulnerable=(EV); Highly Vulnerable=(HV); Moderately Vulnerable=(MV); and Less Vulnerable (LV).

Table 1: Vulnerability rankings for the 34 plant and animal species assessed quantitatively using the CCVI. Results are shown by species (rows) and for the two different climate scenarios (RCP 4.5 and RCP 8.5) for two different time periods (2050s and 2080s). Species with an asterisk (\*) do not currently have available spatial data layers for species ranges. For these species, the project team assumed that the distribution of these species spans the entire assessment area. This assumption was vetted by Shoshone-Bannock tribal staff, and was determined to be appropriate except for Single-leaf Pinyon, which is confined to a small area in the southern portion of the domain.

Common Name	Taxon	Habitat	2050s RCP4.5	2050s RCP8.5	2080s RCP4.5	2080s RCP 8.5
Greater Sage-Grouse	Bird	Sagebrush Steppe	EV	EV	EV	EV
Black-tailed Jackrabbit	Mammal		MV	HV	HV	HV
Wyoming Sage*	Plant		HV	EV	EV	EV
Big Sagebrush	Plant		MV	HV	HV	HV
Rubber Rabbitbrush*	Plant		MV	HV	HV	HV
Cheatgrass*	Plant		LV	LV	LV	LV
Bald Eagle	Bird	Riparian	MV	MV	MV	HV
Yellow-billed Cuckoo	Bird		LV	LV	LV	LV
American Beaver	Mammal		LV	LV	LV	LV
Black Cottonwood	Plant		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	Coniferous Forest	MV	HV	EV	EV
Quaking Aspen	Plant		LV	MV	MV	MV
Single-leaf Pinyon*	Plant		MV	EV	EV	EV
Mallard	Bird	Aquatic	LV	LV	LV	LV
Northern Leopard Frog	Amphibian		HV	HV	HV	HV
Columbia Spotted Frog	Amphibian		EV	EV	EV	EV
Pacific Lamprey	Fish		EV	EV	EV	EV
Bull Trout	Fish		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	Generalists	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		LV	LV	LV	LV
Saskatoon*	Plant		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 Planning Process and Actions

The final phase of the project focused on developing strategies and actions to increase the resilience of the habitats within which the 34-assessed species live. Given time and budget constraints, a subset of 11 focus species and their associated habitats were selected for adaptation planning. Due to the interconnected nature of the ecosystems and habitats on which these species depend, the focus of adaptation planning was on developing strategies and actions that would strengthen the climate resilience of habitats, thereby supporting the needs of the individual species. For example, actions that help protect, preserve, or restore Sagebrush Steppe habitat may increase the climate resilience of both Sage Grouse and Wyoming Sage. Sample actions to build resilience for Sagebrush Steppe habitat are shown below.

*Table 2: Select adaptation actions for Sagebrush Steppe habitat, which supports both Sage Grouse and Wyoming Sage, two species important to the Shoshone-Bannock Tribes.*

<b>Climate Concern</b>	<b>Select Adaptation Action</b>	<b>Timeframe</b>
Wildfire	Incorporate climate change into fire-management plans (include wildfire projections if possible); anticipate more opportunities to use wildfire for resource benefit.	Immediate
Wildfire	Identify areas important for Wyoming Sage in situ gene conservation to provide a baseline for measuring fire impacts and informing post-fire planting/rehabilitation.	Medium-Term
Species Range Shifts	Coordinate among/across states and their federal counterparts to protect habitat core areas to promote large-scale, continuous sage grouse habitat that would be protected from further development.	Immediate
Increase in Invasive Species	Rehabilitate burned areas for using native plant materials or introduced materials, that encourage the long-term sustainability of native species, and as approved by Resource Managers.	Immediate
Reduce Non-Climate Stressors	Install fence markers or remove fences where sage-grouse mortality due to collision with fences is documented or likely to occur due to new fence placement (avoid new fences within 0.5 mile of a lek).	Immediate
Outreach and Education	Develop and expand education efforts for the public regarding invasive species impacts, such as improving identification of non-native species, encouraging the use of native species, and promoting the use of strategies to prevent and remove invasive species.	Immediate

## Conclusions

The Shoshone-Bannock Tribes are already experiencing the impacts of climate change on their natural resources, landscapes, and people. By engaging in efforts to identify adaptation strategies and actions to minimize the negative effects of climate change, the Tribes have demonstrated their continued commitment to protecting their vital natural resources. The Tribes will continue to implement projects across landscapes in the near term and utilize the information in this report to plan long-term strategies and projects to build resilience. These efforts, will help ensure that culturally significant natural resources are preserved for future generations.