Adapting Recreation to a Changing Climate

Intermountain Region – Climate Assessment Workshop

May 22, 2018

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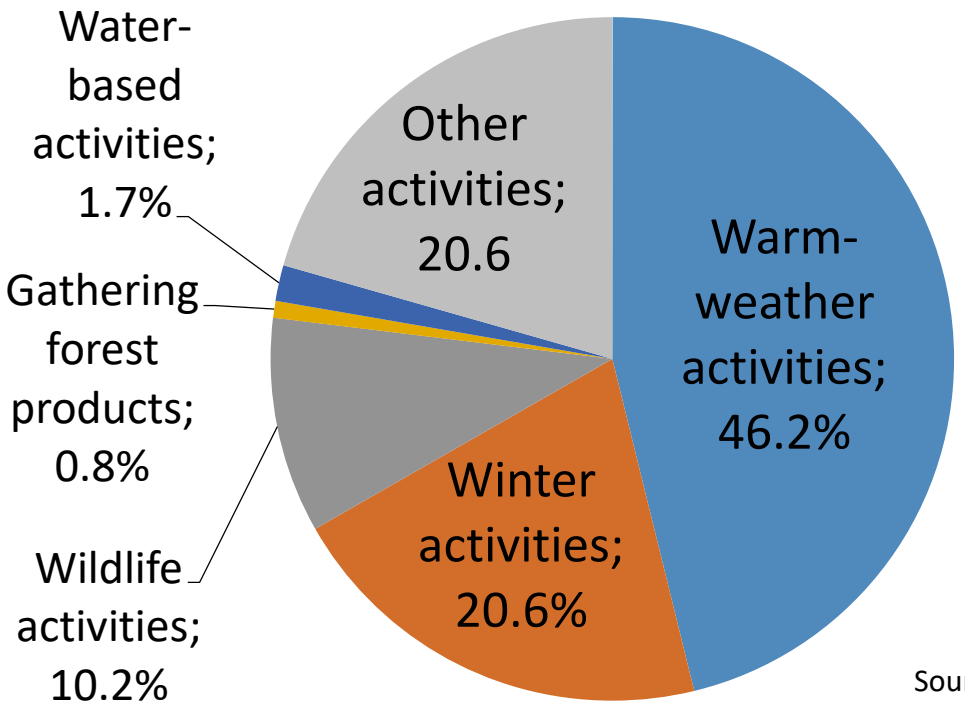
Recreation Activities in R4

- National Visitor Use Monitoring Survey estimates that there were 17,174,000 annual recreation visits to the R4 Forests.
- The Outdoor Industry Association estimates that $38 billion in direct yearly spending to support outdoor recreation in the four R4 states, supporting nearly 397,000 jobs.



Source: USDA FS

Adapting to change
Warm-weather activities

Warm-weather activities

- **Challenges:**
  - Warmer and drier weather patterns at lower elevations often leads to increased visitation at higher elevations
  - When recreationists are generally from the local area, even greater variation based on weather.
  - Increased use could lead to conflicts between types of uses.
  - Use restrictions based on road and trail conditions may be incompatible in drier and warmer spring and fall seasons.

Developed Facilities Management

- **Shoulder seasons:**
  - Forests are already experiencing spring and fall shoulder seasons that are beginning earlier, lasting later, and experiencing increased visitor demand for warm weather activities.
- **Challenges:**
  - Difficult to predict suitable opening and closing dates
  - Seasonal work force is not in place to manage recreation sites
  - Sites with flush toilets can not be opened due to freezing concerns
  - Contracts for dumpsters not active
  - REA fees cannot be adjusted for reduced services

Developed Facilities Management

- **Adaptation Strategies**
  - **Explore creative staffing and partnership opportunities.**
    - Develop partnerships with local governments, other agencies, tribes or other user or volunteer groups to help manage sites in shoulder seasons.
    - Use fire crews or other employees for site management that are traditionally in other roles.
    - Provide temporary trash containers and trash collection until dumpsters contracts begin.
    - Invest in one or two vault toilets for key sites with flush toilets.

Developed Facilities Management

- **Considerations for Concession operated sites**
  - Shoulder season management is often optional in prospectuses.
  - Conflict with concessionaires if FS wants to open a facility before the concession permit specifies site opening.
- **Adaptation Strategies:**
  - Include requirements for shoulder season management in the prospectus.
  - Provide provisions in the prospectus for Forest Service management during shoulder seasons.

Adapting to change: Snow-based winter activities

Snow-based winter activities

- **Ski areas:**
  - Ski season more variable, may have years when the resort has less terrain available.
  - Greater temperature variability increases avalanche danger and rain on snow events.
  - Greatest impact to “mom and pop” smaller resorts – fewer resources to utilize improved snowmaking technologies and four season opportunities
- **Adaptation strategies:**
  - Recognize the need for four season opportunities in operating plans.
  - Partner with ski areas to integrate their opportunities into Forest recreation master plans.
  - When evaluating water resources, consider the needs and impacts from snow making.

Snow-based winter activities

- **Trail based activities (snowmobiling, cross country skiing, etc.):**
  - Snow base appropriate to the various activities may have a shorter season, or occur at higher elevations.
  - When this occurs, developed trailheads and staging areas may be located at lower elevations with no access to snow.
  - Damage can occur to trails and vehicles without sufficient snow depth
  - Snowplowing contracts and agreements may not be sufficient to reach higher elevations

Snow-based winter activities

- **Adaptation strategies:**
  - Analyze location of trailheads and staging areas, locate alternative temporary or permanent parking areas at higher elevations
  - Identify potential partnerships and grant opportunities for multiple use trailheads at higher elevations that can serve needs for both winter and summer use
  - Work with partners and volunteers to monitor snow conditions, and post information about suitable locations for snowmobiling and other snow based activities
  - Identify funding opportunities or partnerships for increased plowing.

Adapting to change: Water-based activities

Water-based activities

- **Challenges:**
  - During periods of warmer and drier weather, popularity of water based recreation increases.
  - Lakes and streams may become less accessible due to dropping water levels, reduced water quality, toxic algal blooms, etc. Impacts to marinas, boat ramps, etc.
- **Adaptation Strategies:**
  - Plan for management strategies needed for increased use.
  - Develop a communication plan for sharing information about water levels and quality
  - Analyze developed recreation facilities and identify impacts from dropping water levels. Explore solutions for extending boat ramps, fishing piers, and beach access.

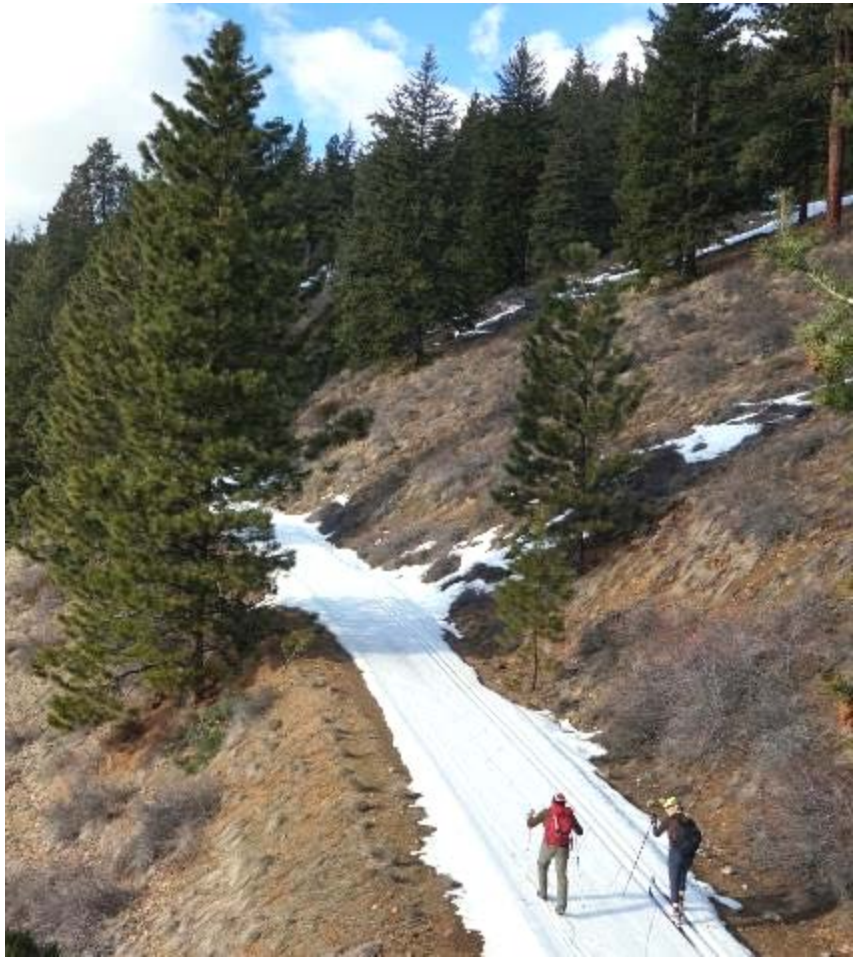
What we learned in 2014-15 (the winter without snow)

Recreationists are highly adaptable

- They found snow
- They switched to summer activities

Capacity of agencies to adapt was minimal

- But they understand how climate affects recreation patterns
- They have ideas for adapting to a warmer climate in the future



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Effects of Climate Change on Infrastructure

Intermountain Region – Climate Assessment Workshop

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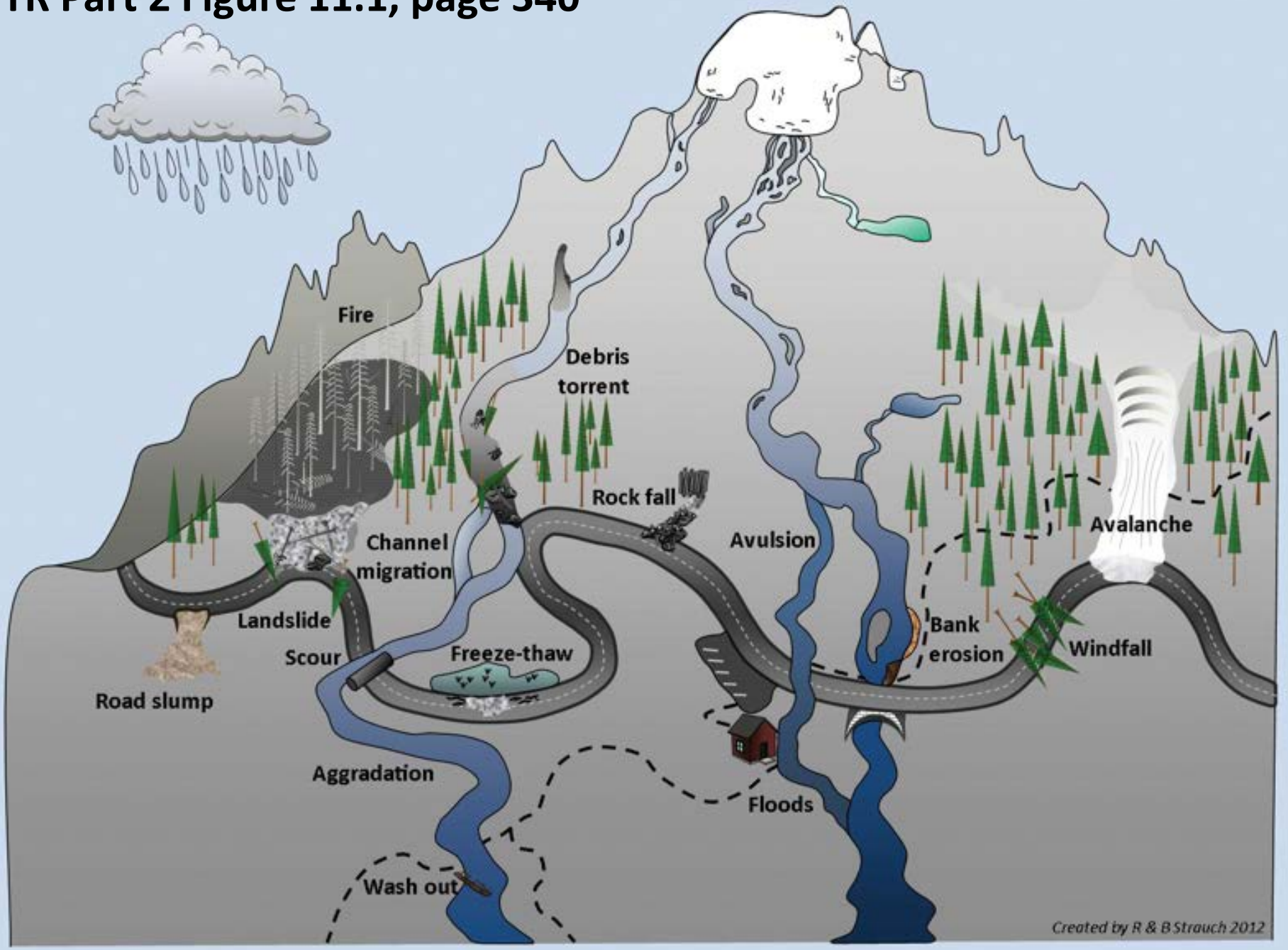
Overview of Topic – Why assess Infrastructure?

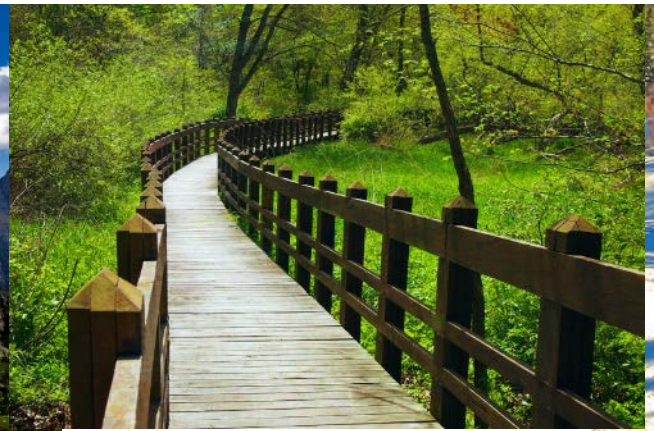
- Infrastructure is integral with land management
- $$$$$ - lots of money used to develop and maintain infrastructure
- Ecosystem protection
- Human safety

GTR Part 2 Figure 11.1, page 340



Assessment Approach – Three Levels

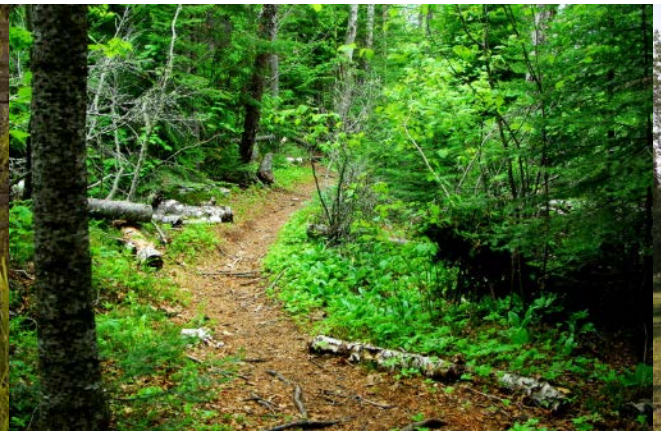
- Level One – Infrastructure presence
  - How much of each type and where
- Level Two – Regional scales of analyses
  - Regional level
  - National Forests
- Level Three – Local scales of analyses
  - Watersheds
  - Past ERFO sites
  - High human presence and/or infrastructure values



Infrastructure Presence – Types of

- Road transportation system: roads, bridges, culverts
- Trails, trail bridges
- Developed Recreation Sites
- Buildings
- Dams

Roads	45,769 miles
Bridges	862
Trails	31,074 miles
FA&O Buildings	2,195
Dams	317
Campgrounds	628



Region 4 Bridges

National forest	Adequate	Structurally deficient	Total
		Number	
Ashley	30	7	37
Boise	90	9	99
Bridger-Teton	85	31	116
Caribou-Targhee	58	19	77
Dixie	38	13	51
Fishlake	15	0	15
Humboldt-Toiyabe	60	5	65
Manti-La Sal	26	4	30
Payette	60	2	62
Salmon-Challis	101	20	121
Sawtooth	95	12	107
Uinta-Wasatch-Cache	68	14	82
Total	726	136	862

Region 4 Buildings

National forest	Buildings	Total deferred maintenance	Current replacement value
	-----Number-----	----------Dollars----------	
Ashley	117	3,209,244	27,992,597
Boise	278	7,694,875	70,596,571
Bridger-Teton	220	1,697,102	35,884,205
Caribou-Targhee	170	1,222,776	40,343,855
Dixie	98	3,583,176	21,397,194
Fishlake	89	364,549	8,811,909
Humboldt-Toiyabe	255	8,190,928	52,857,539
Manti-La Sal	79	920,872	9,516,946
Payette	237	14,095,341	54,471,482
Salmon-Challis	278	18,677,939	44,905,880
Sawtooth	142	7,781,721	25,255,776
Uinta-Wasatch-Cache	227	7,151,204	45,857,589
Regional	5	396,713	1,656,011
Total	2,195	74,986,439	439,547,553

Climate change expected to increase risk by:

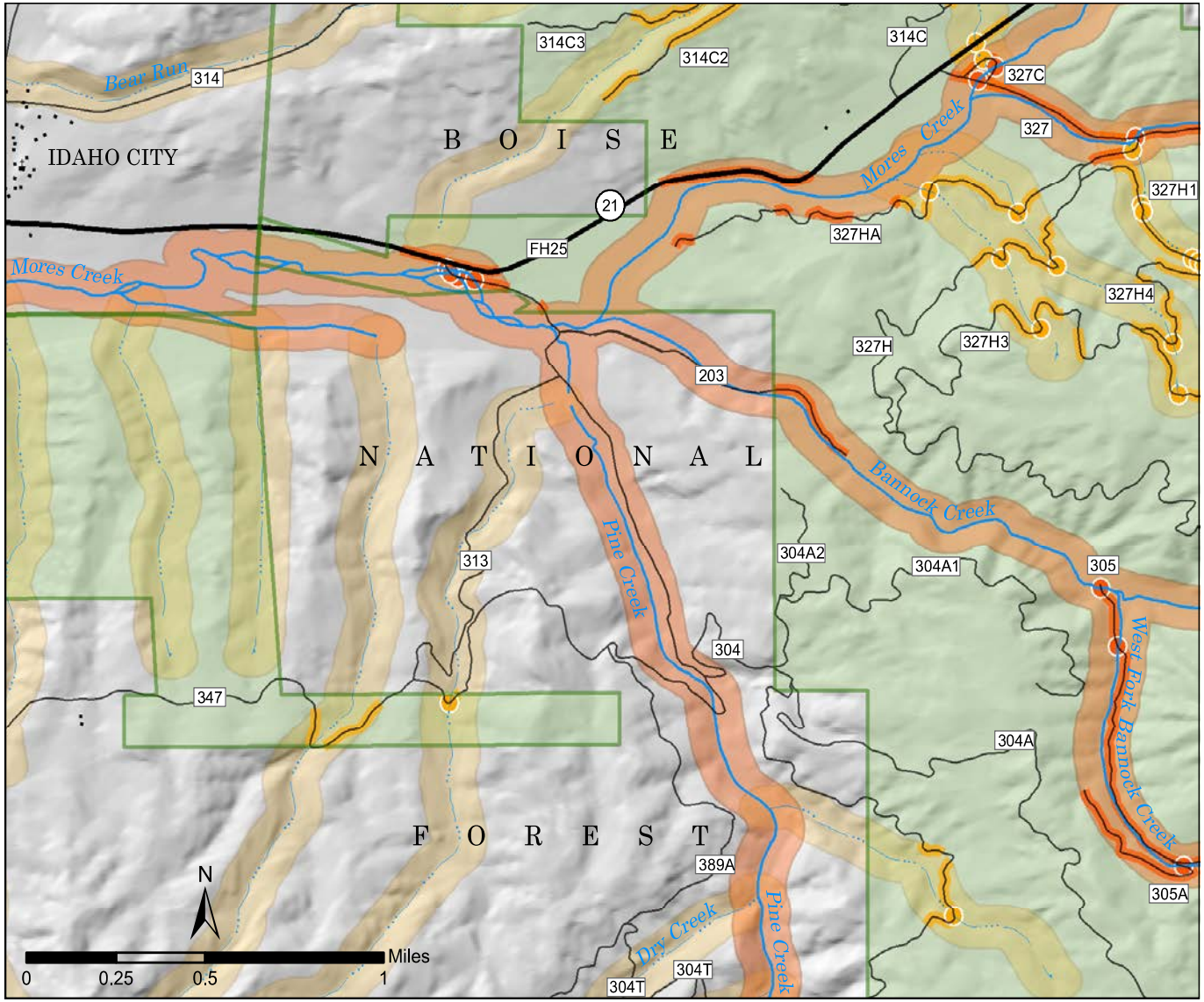
- Extreme rainfall, Snowmelt changes, Flooding

Increased risk to:

- Infrastructure, People, Ecosystems

Types of risks include:

- Washouts, Landslides, Culvert failure, Streamside Road Avulsion



ational Forest System (NFS) Land

Adaptation Strategies & Tactics

- Increase resilience as funding opportunities allow
- Add guidance to existing design standards
- Incorporate knowledge into permit management

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Effects of Climate Change on Cultural Resources

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Uinta-Wasatch-Cache National Forest

Chapter 12 Organization

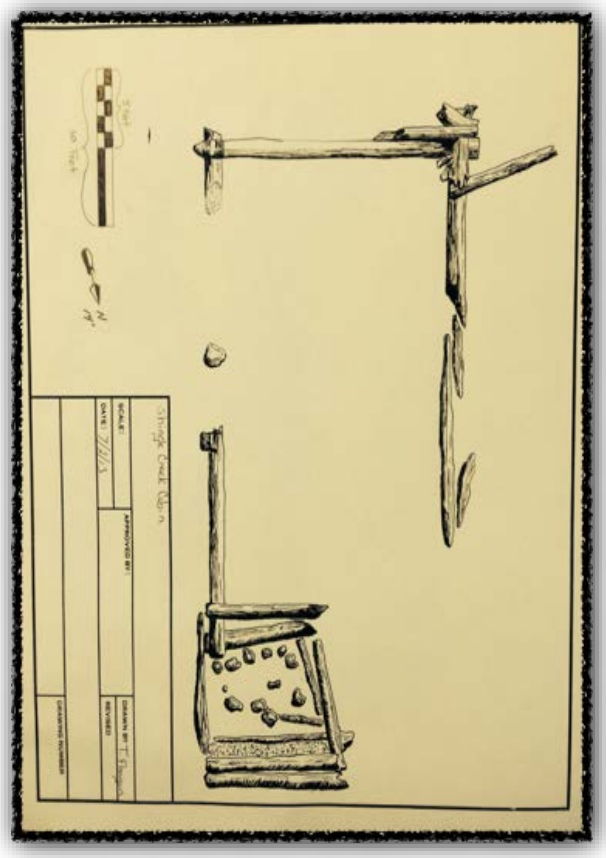
- Introduction
- Overview of Cultural Resources
  - Defining Cultural Resources
- Cultural Resources in the Intermountain West
  - Indigenous Lifeways
  - Traces of Past Lifeways
  - Ethnographic Resources as a Legacy of Indigenous Lifeways still in Practice
  - Agricultural and Industrial Activities
  - Activities in the Historic Period
- Climate Change Effects on Cultural Resources
  - Context
  - Biophysical Effects on Cultural Resources
- Risk Assessment Summary

Cultural Resources: Non-renewable links to the past

- **Defining *Cultural Resources***

Cultural Resources located on federally managed lands fall into two broadly defined categories:

1) The archaeological and historic sites that represent the tangible and intangible story of past human activities on the landscape that are generally over 50 years in age



Defining *Cultural Resources* (cont.)

2) The ongoing relationship the American people have with the ecology that is managed by federal agencies.

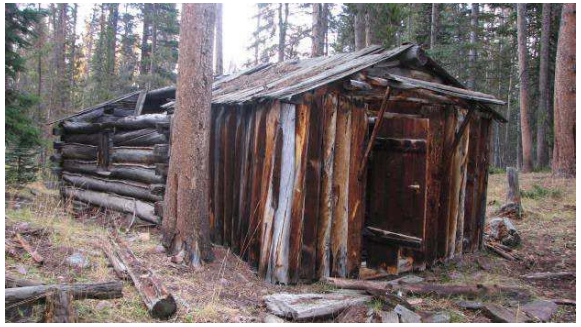
Ecology is used here in the holistic sense of the landscape, environment, flora-fauna, extant human interaction, including the management of Indian Sacred Sites and Traditional Cultural Properties (TCPs).

Material Culture

The important aspect relating to the potential for climate change to affect physical resources is about material culture and sites. It is more related to what physically constitutes those resources, rather than what time period they represent.

Climate Change Effects on Wooden Resources:

- Increased fire frequency and scope are likely the most threatening impacts to wooden resources.
- Wood, like all organic cultural resources degrades naturally over time. They are best preserved in consistent contexts, such as: Always dry or always wet, and with a minimum of temperature change and disturbance.
- As weather regimes fluctuate more in frequency and/or intensity, organic artifacts and structures degrade will more quickly, and have a higher likelihood of being lost to fire.



Stone Artifacts

- The bulk of the visible archaeological record of R4 is made up of stone tool scatters on the surface of the ground.
- In some cases these sites have existed for millennia, and have been subject to changes in climate and exposed to fire numerous times.
- With the exception of the direct application of fire, climate change does not affect the stone tools themselves, but has the potential to affect the overall context of archaeological sites.

Adaptation Strategies & Tactics

- Increased Wildfire Frequency and Intensity:
  - Protect wooden and structural resources from fire during suppression efforts.
  - Proactively thin fuels around structures and sensitive sites, such as clearing fuels from structures and rock art panels.
  - Engage archaeological resource advisors during suppression efforts and on BAER teams.
  - Protect sites from erosion after wildfires.
  - Work with Native American Tribal partners for rehab and reseeding efforts.
  - Identify sites that are susceptible to negative effects from fire retardant drops: example porous sandstone outrcrops that possess rock art or Native American structural elements.
- Developing new Water Sources for livestock
  - Identify archaeological sites that could be affected by new developments, and mitigate any adverse effects.

Adaptation Strategies & Tactics

- Mitigating effects to ongoing indigenous use:
  - Identify important resources in consultation with tribal interests. Example, pinyon pine nut collection areas.
  - As ecological regimes shift and change, identify new areas to provide resources to tribes. Example: alternate pinyon stands, willow groves, plant collection areas.
  - Explore options to integrate Traditional Ecological Knowledge (TEK), into land and resource management practices. Example: Rx fire to reduce fuel loading and regenerate vegetation.

Summary & Major Results

- It is possible to mitigate the adverse effects of climate change to cultural resources, but the key is to know what kinds of resources exist on the lands managed by Federal agencies.

- Cultural resources encompass much more than archaeological and historic sites, but also include renewable resources related to culturally significant flora and fauna.

Weblinks & Additional Resources

- Wildland fire in ecosystems: The effects of fire on cultural resources and archaeology
  - https://www.fs.usda.gov/treesearch/pubs/40417

- National Park Service: Cultural Resources Climate Change Strategy:
  - https://www.nps.gov/subjects/climatechange/culturalresourcesstrategy.htm

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DIALOGUE AND Q&A

GROUP EXERCISE

Intermountain Climate Assessment Workshop

May 22-24, 2018

Have a nice evening … see you tomorrow.

United States Department of Agriculture

Intermountain Climate Assessment Workshop

May 22-24, 2018

Dinner at 6pm

The Union Grill
315 24th St, Ogden