



PPGIS case studies

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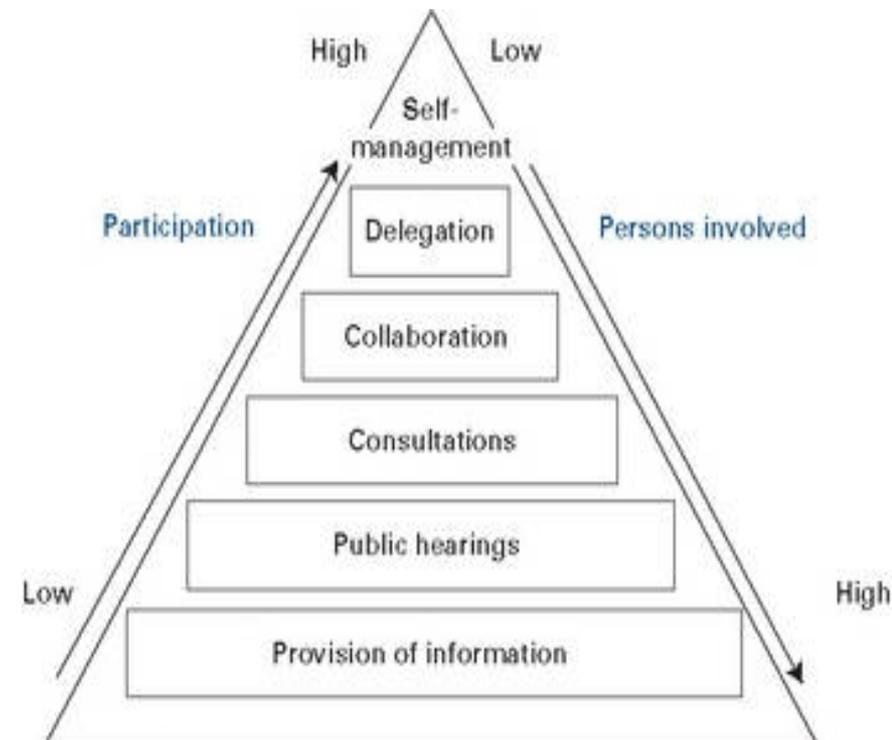
College of Forestry & Conservation
University of Montana

Pablo, March 7th, 2014



Outline

- Provision of Information: EcoCities Spatial Portal
- Consultation: Shoreline Management Plan Consultation
- Collaboration: Where is Wild Scotland?
- Collaboration: The Wilderness Area Buffer Zone of the Mission Mountains
- Collaboration: The Jocko Landscape Unit





EcoCities Spatial Portal



Greater Manchester





Climate Change effects in a metropolitan area

The EcoCities Spatial Portal

assessing the geography of Greater Manchester's vulnerability to climate change

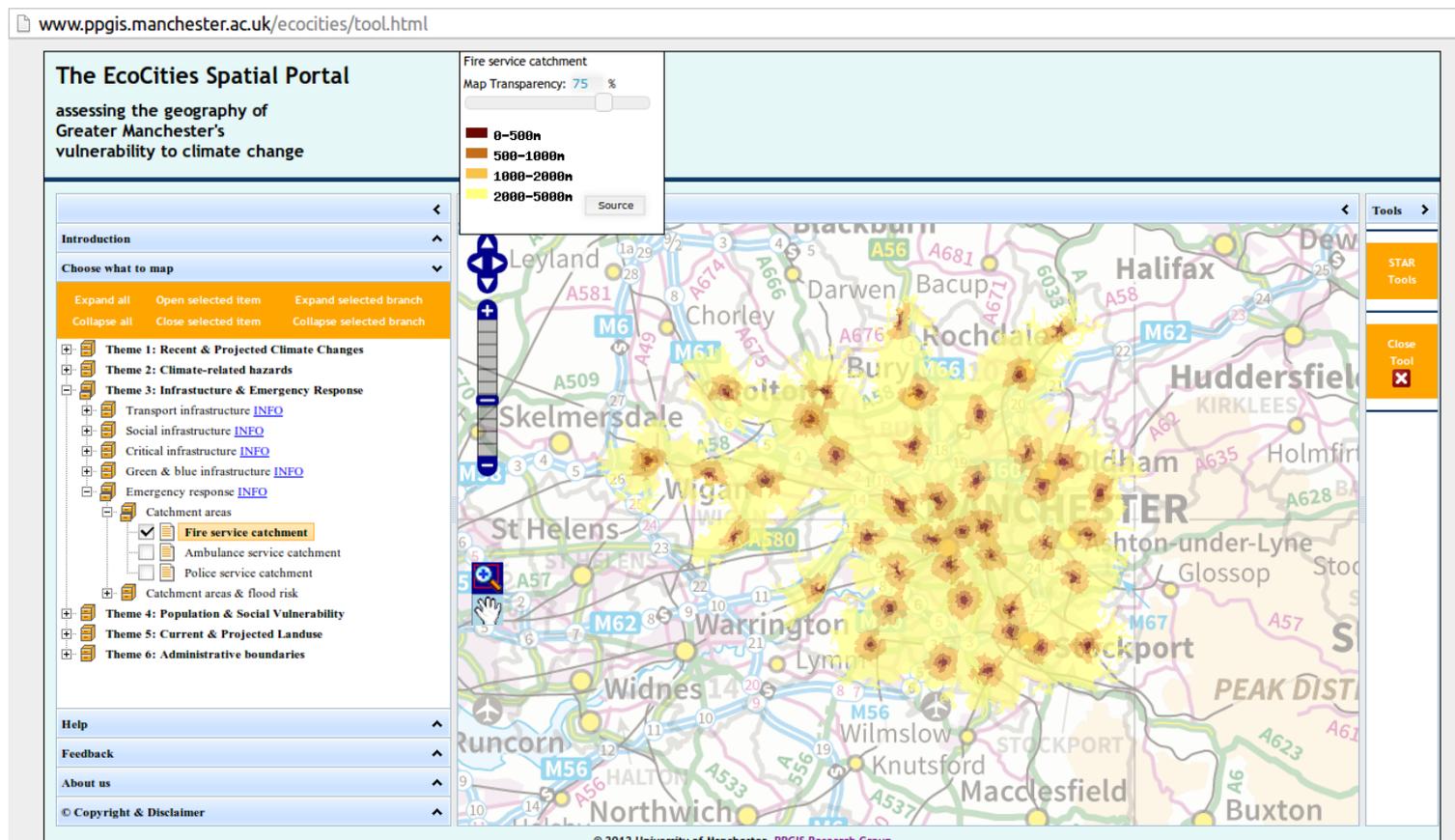
The spatial portal is an **interactive platform that displays spatial data** and provides information to improve understanding of issues of climate change vulnerability in Greater Manchester, helping to build the evidence base available to decision makers and other stakeholders when developing climate change adaptation plans and strategies.

The spatial portal is **for all stakeholders, including community members, to visualise vulnerability** exposure and climate hazards **within a particular location**, thus raising awareness, **aiding decision-making and facilitating community and stakeholder participation in formulating appropriate adaptation responses.**

Launch the Tool



A descriptive portal

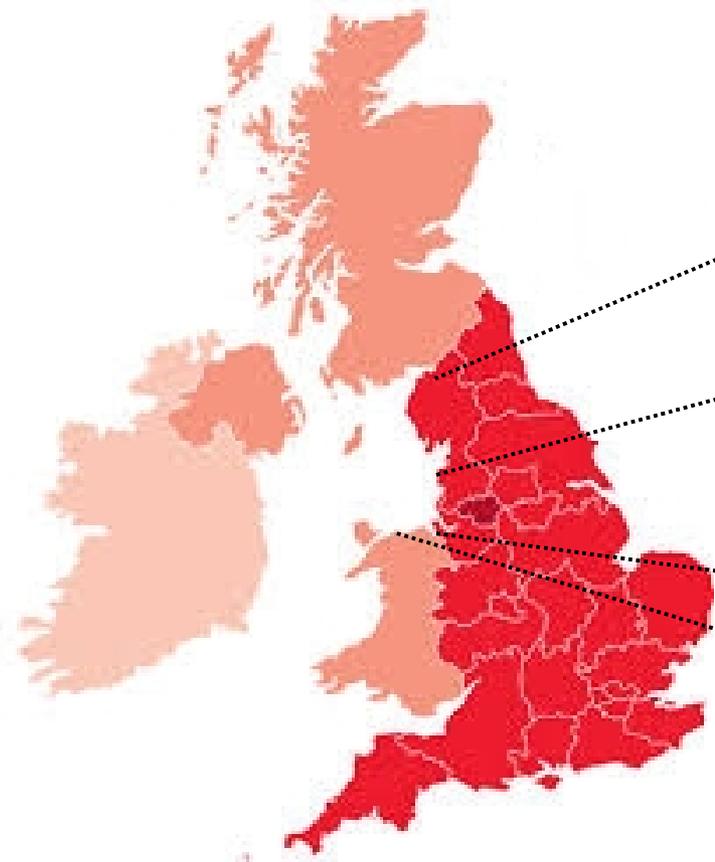




Shoreline Management Plan Consultation



West shoreline of Great Britain





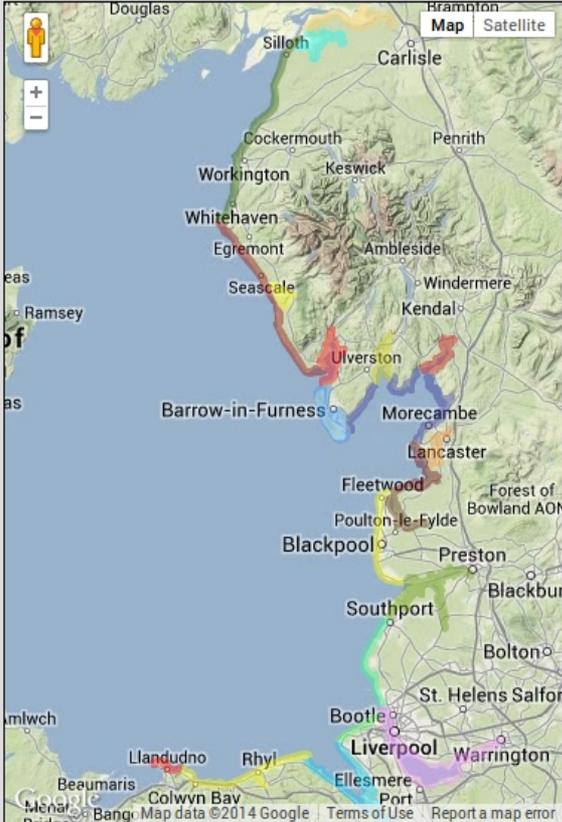
A management plan for the next 100 years

Instructions Legend

Using the map & making comments

Here you can consult Shoreline Management Plan (SMP) policy proposals and make comments. The Google Map allows you to view the proposals over the top of aerial photos or mapping and zoom to specific locations. You can select a specific district council, or search for a particular place name using the 'search map' function.

Once you have identified a particular location you click on the map and a window will appear giving you further information about the area and the proposed SMP policy for that particular location. This will only work **within the 1km coastal zone!** You can then send your comment which will be stored along with your contact details in our consultation database.



The map displays the coastline of the United Kingdom with various colored zones indicating different Shoreline Management Plan (SMP) policy proposals. Key locations labeled include Douglas, Sillith, Carlisle, Cockermouth, Penrith, Workington, Keswick, Whitehaven, Egremont, Ambleside, Seascale, Windermere, Kendal, Ulverston, Barrow-in-Furness, Morecambe, Lancaster, Fleetwood, Forest of Bowland AON, Poulton-le-Fylde, Blackpool, Preston, Southport, Bolton, St. Helens Salford, Bootle, Liverpool, Warrington, Llandudno, Rhyl, Beaumaris, Colwyn Bay, and Ellesmere Port. The map includes a search bar, a legend, and a scale indicator.

- Revised Shoreline Management Plan (SMP) for a sustainable use of the coast for the next 100 years.
- Comments from the public on local planned actions were requested.



A qualitative survey for planning

Instructions | Legend

Using the map & making comments

Here you can consult Shoreline Management Plan (SMP) policy proposals and make comments. The Google Map allows you to view the proposals over the top of aerial photos or mapping and zoom to specific locations. You can select a specific district council, or search for a particular place name using the 'search map' function.

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Liverpool

COASTAL UNIT E - MERSEY ESTUARY

| Location/feature | Key issues and benefits | Objectives that apply |
|------------------|---|---|
| Wallasey | Wallasey is a predominantly residential area, which includes the seaside resort of New Brighton, which has the longest promenade in the UK and is a popular recreational facility for walking and cycling. | To avoid loss of property due to erosion and/or manage risk of flooding to people and property To avoid loss due to erosion of and manage risk of flooding to key community, recreational and amenity facilities |
| Birkenhead | Birkenhead is an industrial town well known for its ship building, with a number of ports, docks and associated industries and infrastructure. The urban area is mostly set on higher ground, not at significant risk of coastal flooding. The land near the shoreline, at greatest risk from erosion and flooding is predominantly industrial and residential, but includes some community facilities and amenities. | To avoid loss of property due to erosion and/or manage risk of flooding to people and property To avoid loss due to erosion of and manage risk of flooding to key community, recreational and amenity facilities To minimise the impact of policies on marine operations and activities To avoid loss due to erosion of and manage risk of flooding to industrial, commercial and economic assets and activities |
| Bebington | Bebington is predominantly a residential area which includes the Park Golf Club | To avoid loss of property due to erosion and/or manage risk of flooding to people and property |



Where is Wild Scotland?



Wildlands of Scotland





Public perceptions of wilderness

Where is wild Scotland?



◆ Wild land in Scotland is relatively remote and inaccessible, not noticeably affected by contemporary human activity, and offers high-quality opportunities to escape from the pressures of everyday living and find physical and spiritual refreshment. ◆
(National Trust for Scotland, January 2002)

Introduction

Scottish Natural Heritage, the National Trust for Scotland and the John Muir Trust have all recently published statements outlining their policy about wild land (links to these policy documents are given at the end of this survey). Wildness is difficult to define in absolute terms, but each organisation develops similar definitions of what wild land is considered to be. A common theme is that our ideas of what is considered wild countryside and where we might find it can vary markedly from person to person because of differences in our background, education, interests and experience. This survey is designed to help generate a better picture of just how widely people's perceptions of wild land in Scotland may vary.

In order that your survey results can be better analysed, we would be grateful if you first answer the following questions about yourself before continuing on to the main part of the survey. This information will only be used as part of this research.

[Next Page](#)



A tagger for capturing fuzzy spatial perceptions

Please mark on the map the areas you think are wild land.

Instructions
Spray harder in those areas you think are wildest.

You can comment on a specific area in the box.

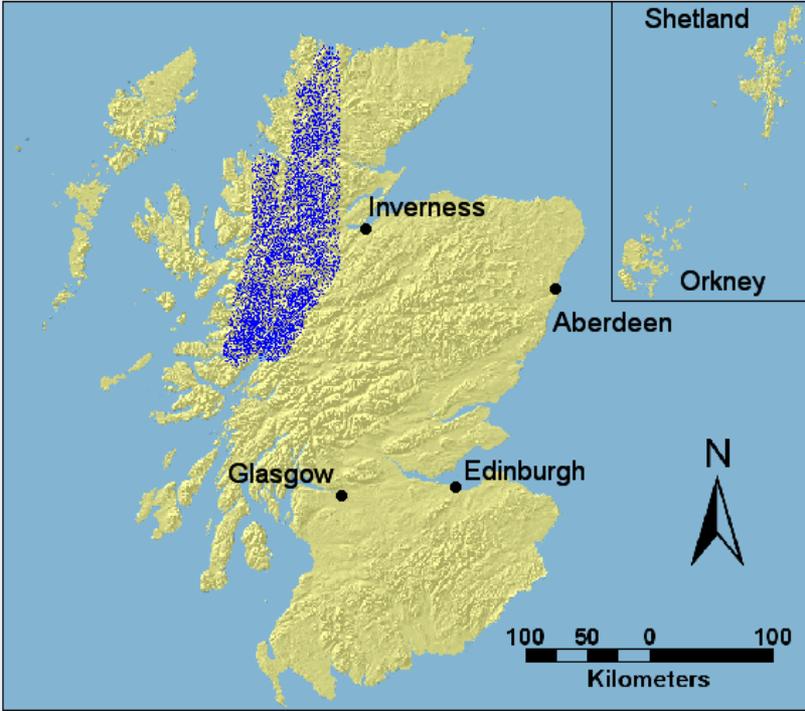
If you want to mark on more than one separate area then use the "New Area" button. Your previous area will be stored.

When you're happy you've added enough, press "Send All". Your areas and comments will be sent to us, and you'll then be sent to a web page where you can see everyone else's

Spray size Tagger Map Marker

Small
● Medium
Large

Clear
New Area
Send All



The map shows Scotland with a yellow shaded area in the north and west, indicating wild land. Major cities are labeled: Inverness, Aberdeen, Glasgow, and Edinburgh. An inset map shows Shetland and Orkney. A scale bar indicates 100, 50, 0, and 100 Kilometers. A north arrow is also present.

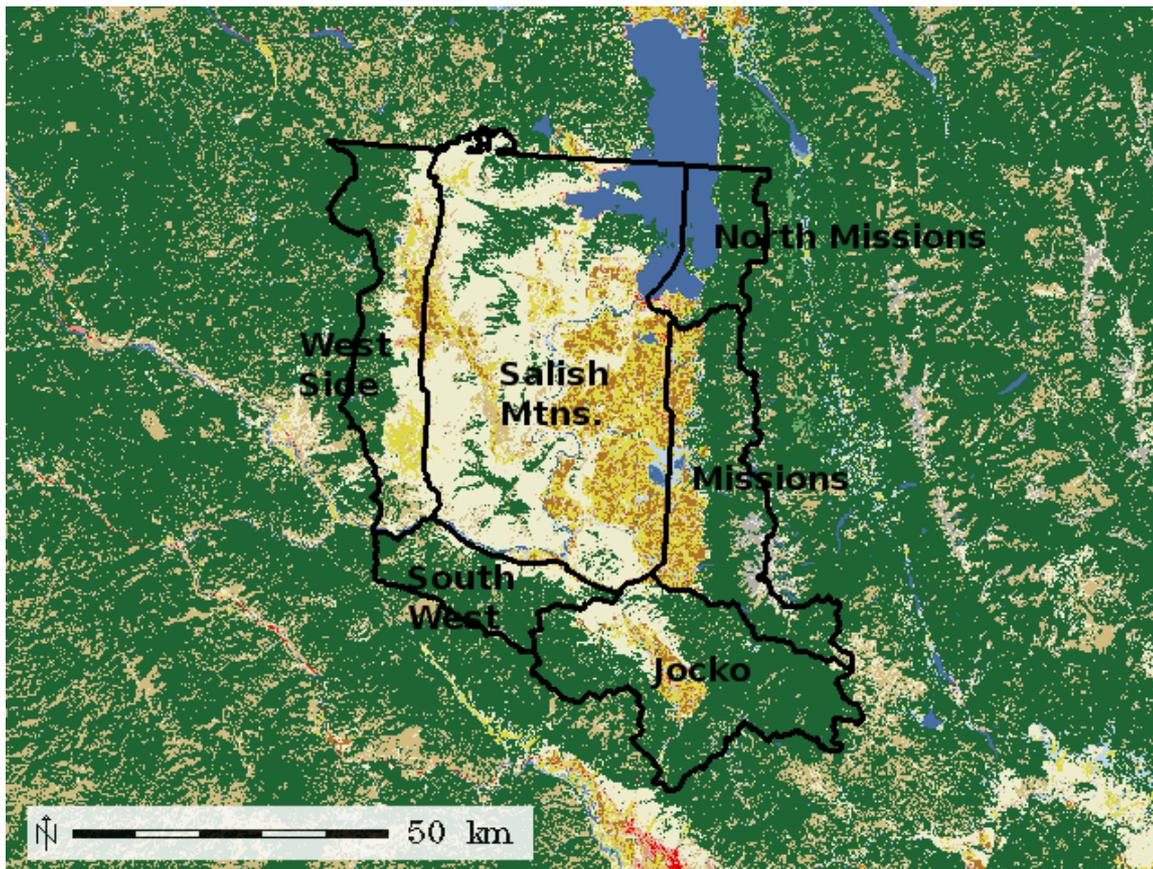


Case studies on the Flathead Indian Reservation

- Principal Investigators: Roian Matt, Forest Management Department, CSKT; Alan Watson, Also Leopold Wilderness Research Institute, RMRS



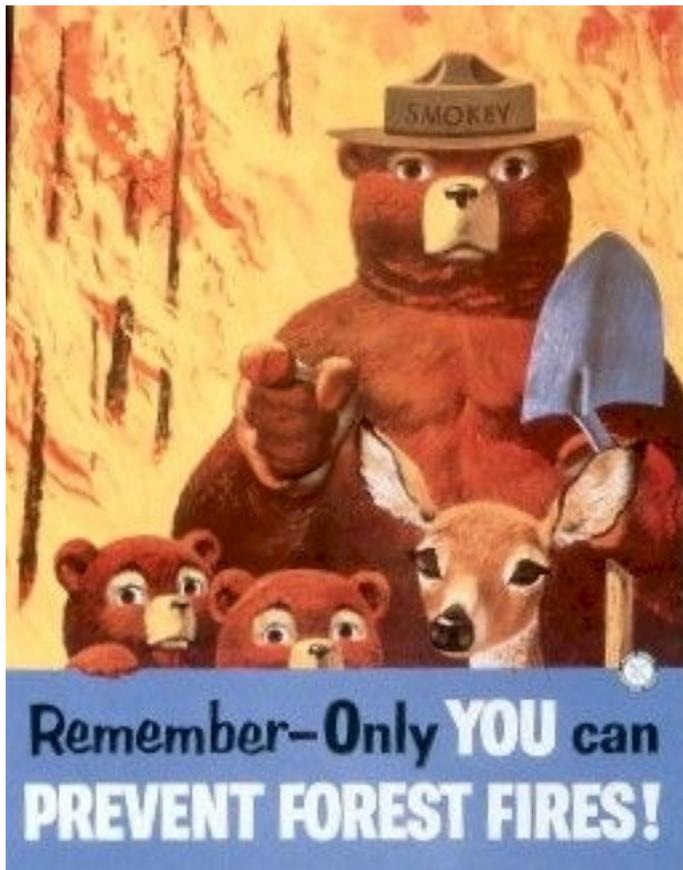
Landscape units on the Flathead Reservation



- Northwest Montana.
- Confederated Salish and Kootenai Tribes of the Flathead Reservation.
- Composed of portions of Lake, Sanders, Missoula and Flathead counties.



Issue: has fire suppression had a negative effect on the fire-adapted ecosystems of the Mission mountains?



- Over the 20th century use of fire was largely banned in forests of the USA in order to prevent the effects of fire hazards.
- As a consequence, traditional techniques of prescriptive fire are no longer common practice on the Reservation.



Effects of fire suppression



- Oversized tree communities.
- Anomalous accumulations of dead wood on the forest floor.
- Dense understoreys of brush and young trees.
- Closed forest canopies.



Effects of fire suppression



- Susceptible to destructive wildfires.
- Reduction of soil moisture.
- Decrease in sunlight to the forest floor.
- Proliferation of plant pathogens and disease.

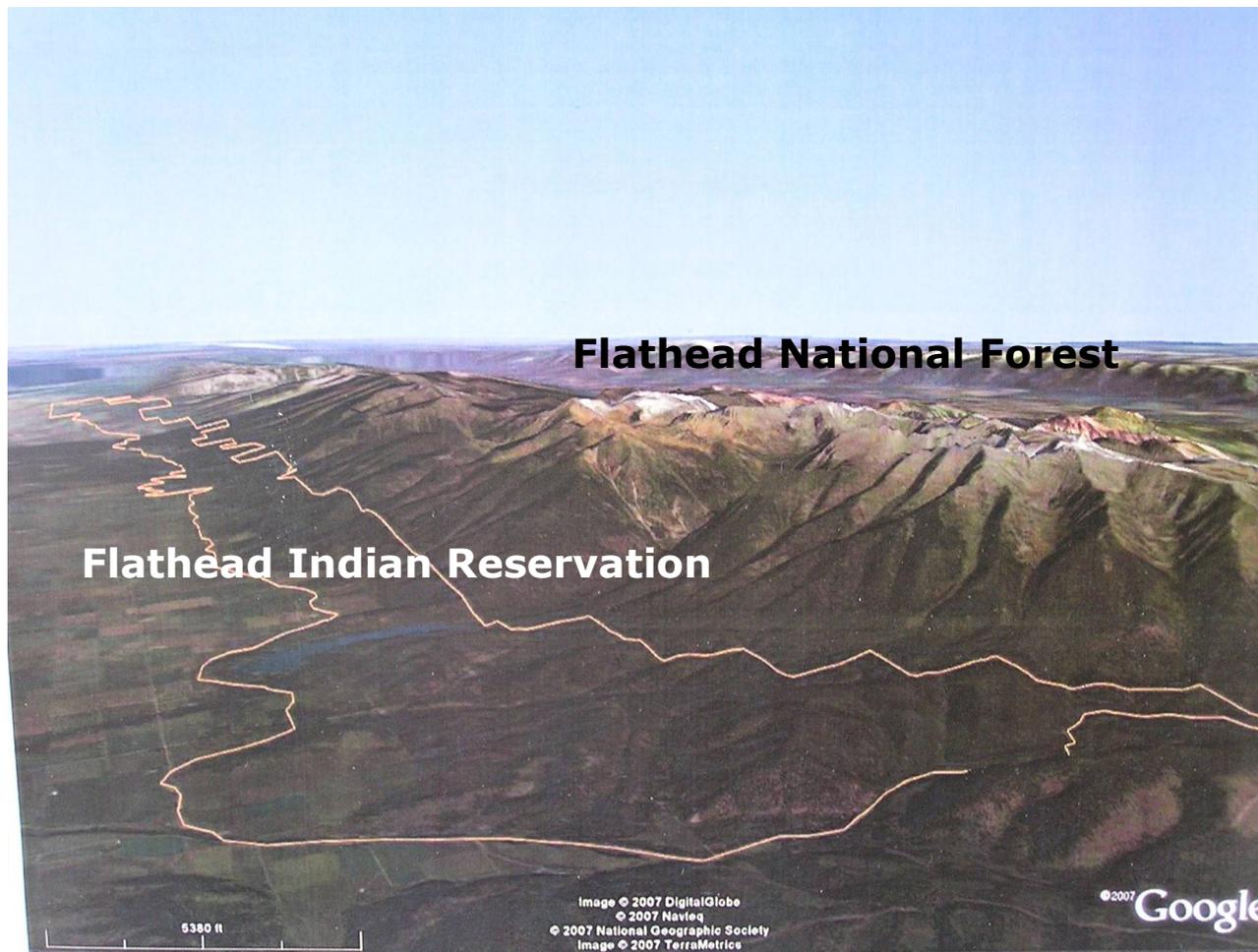




The Mission Mountains Tribal Buffer Zone



Mission Mountains Tribal Buffer Zone (est. 1987)



- Interface area between Mission Mountains Tribal Wilderness and non-wilderness valley floor; multiple uses.
- ***What meanings do tribal and non-tribal residents place on this protected landscape?***



Meanings attached to the Buffer Zone (5 themes)

- Interviews with knowledgeable key informants led to identification of 5 themes of meanings.
- 1) Wilderness Protection, 2) Wildlife Habitat & Water Quality, 3) Recreation & Scenic Values, 4) Access & Functional Benefits, 5) Personal & Cultural.
- Themes were used as basis for a PPGIS survey using a fuzzy tagger.



PPGIS interface

Recreation and Scenic Value

Please show on the map those areas that are most important to you for recreational activities and scenery.

1. Choose a spray paint size and spray over the areas that are important to you. The more you spray over an area, the more important it is.

Scroll down to see all the map.

2. In the boxes on the right side, type in why you think these areas are important.

3. Type what threats you think affect these areas.

4. Press "Send Everything".
Your areas and comments will be sent to us.

If you want to do spray paint more than one area, press the "New Area" button.
If you make a mistake, press "Erase".

Notes:

If you want to skin this map, click here:

Spray Can size

Small

Large

Erase

New Area

Paint all

Send Everything

1. Define on the map where the areas are



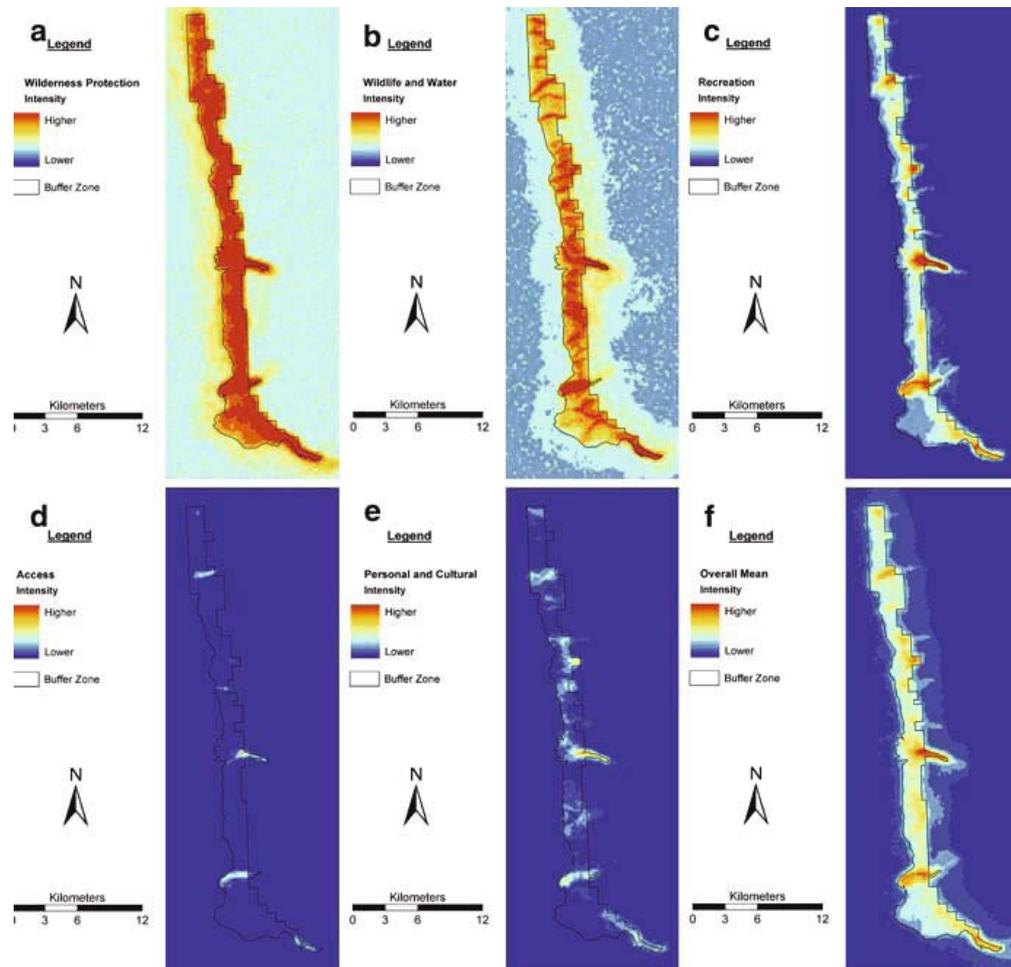
Write about these areas:

2. Type in why these areas are important

3. What are the threats to these areas?



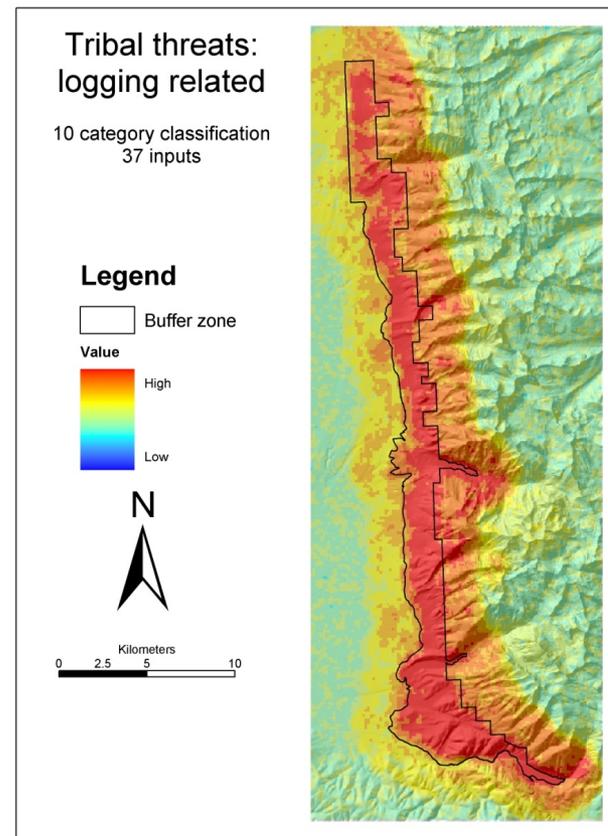
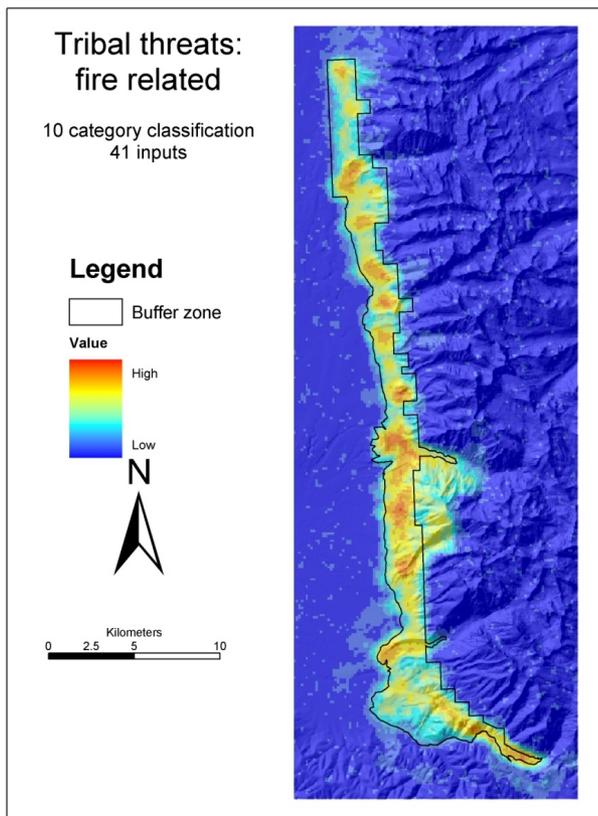
Heat Maps by Themes



- 34 participants created spray patterns for each of the 5 themes.
- A composite map of all responses was also created.



Threats perceived by tribal members



- Perceived threats from fire, heterogeneous, extensive and widely distributed.
- Perceived threats from logging, stationary, more intense and more broadly distributed.



Implications for management



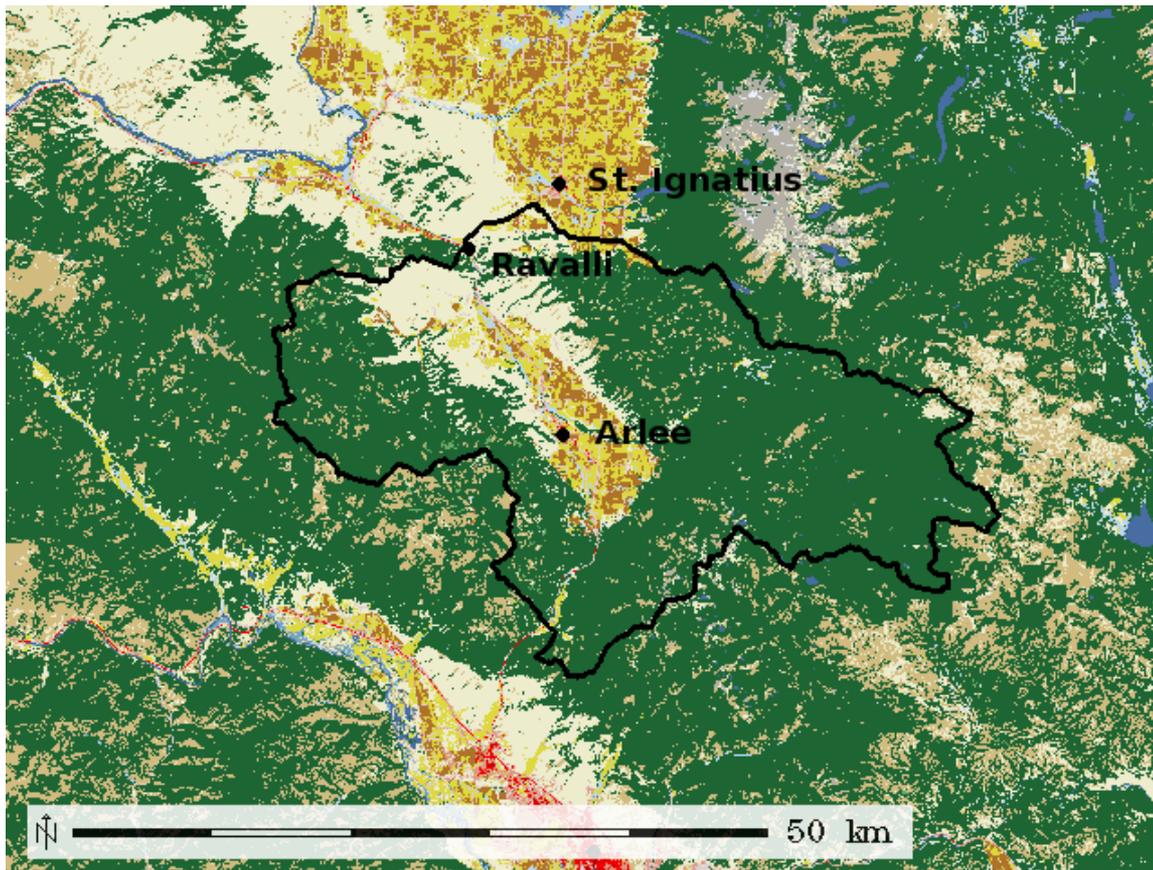
- If managers can work with tribal members to manage trade-offs and establish acceptable limits, appropriate management initiatives can move forward.



The Jocko Landscape Unit



The Jocko landscape unit



- Southernmost unit on the Reservation.
- ~ 700 people (CDP's of Arlee and Ravalli).
- Mostly ranges and woodlands surrounding the valley of the Jocko River.

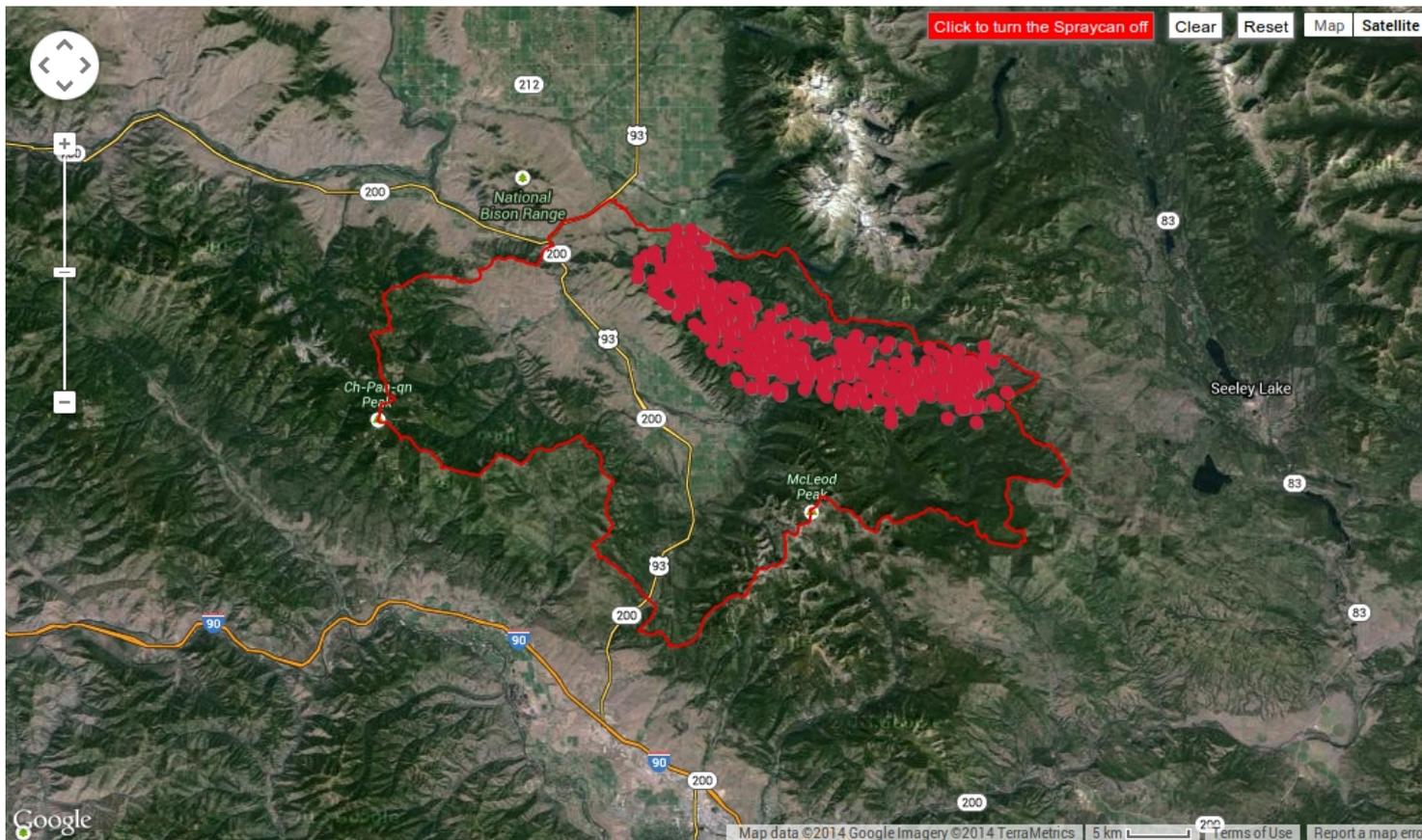


Objectives

- Determine perceived climate change impacts to resources in the Jocko landscape unit, by incorporating knowledge and opinions of residents and natural resource managers.
- Analyze output to illustrate both cultural and biophysical attributes of the landscape based on participants' responses.



Map-Me PPGIS survey



The area outlined in red is the Jocko Landscape. Please indicate an area that you believe has changed over the years.

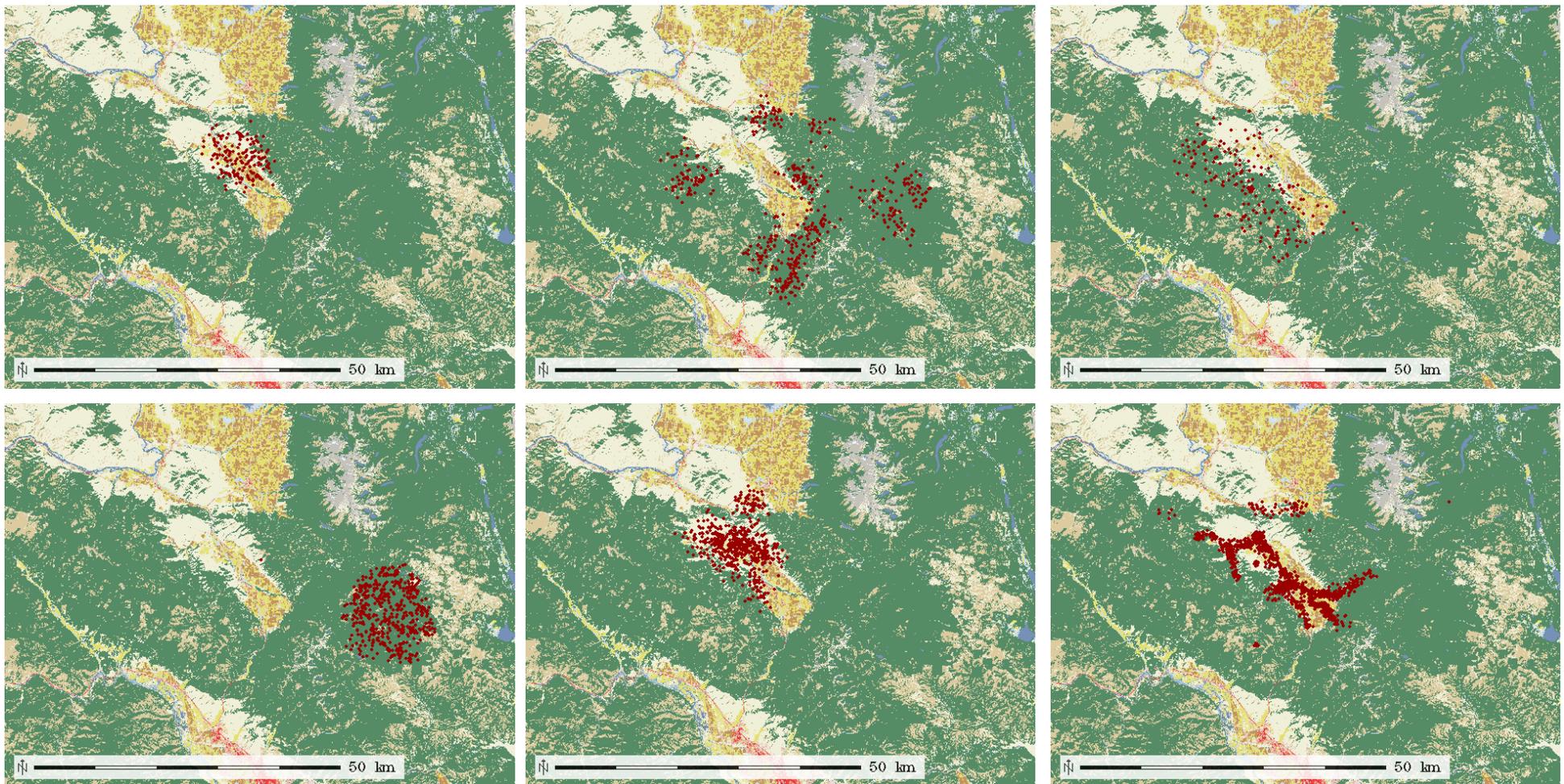
What did this area used to be like and what is the source of your knowledge?

What is the area like now and what do you believe has caused the change from what it used to be like?

What would you like this area to be like in the future and why?

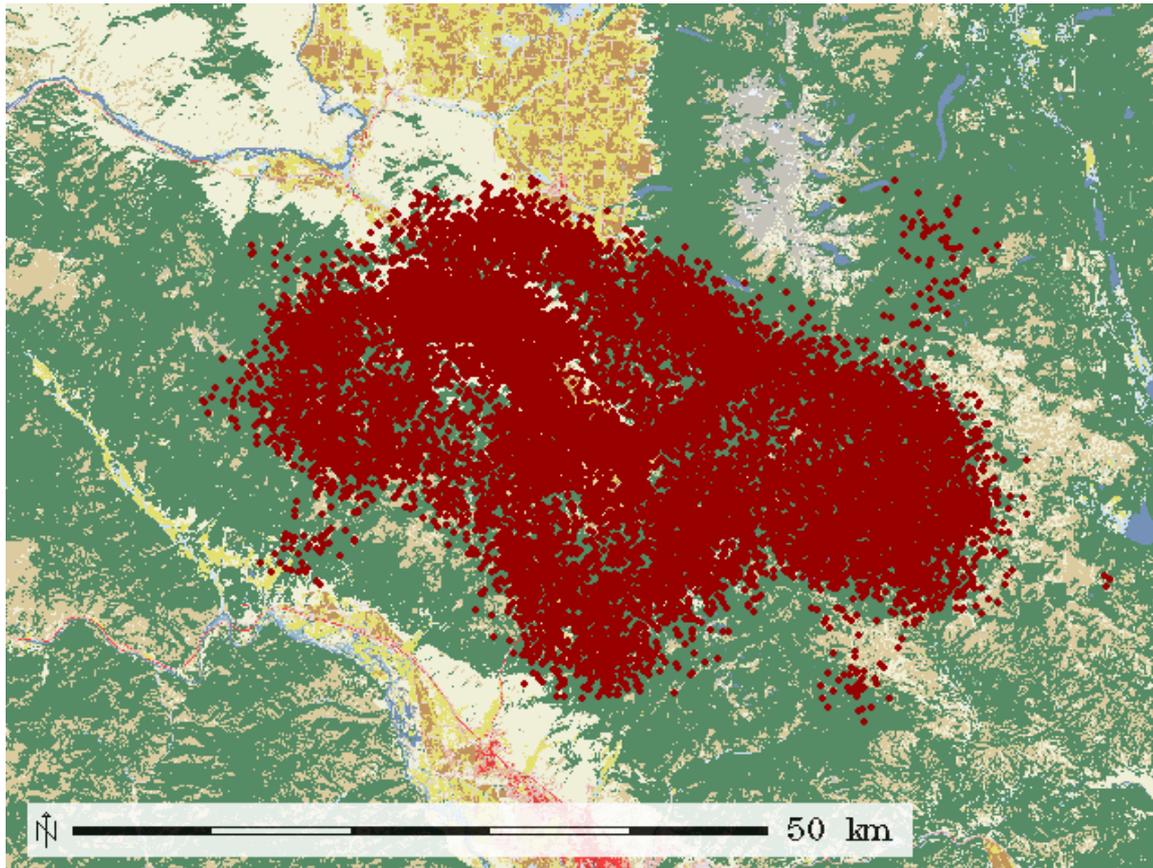


Spray patterns locating environmental changes in the last decades (some individual responses)





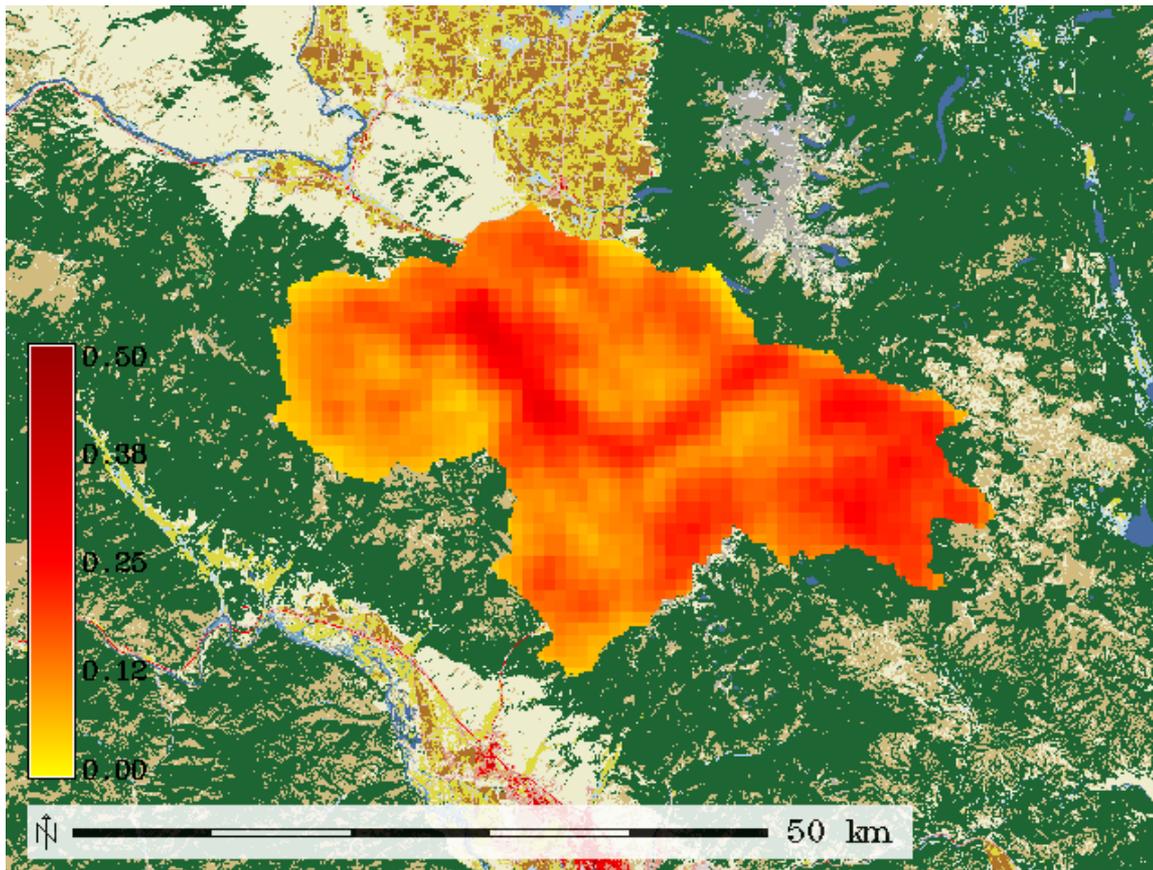
Spray patterns locating environmental changes in the last decades (all)



- More than 20,000 single blobs.
- 40 comments providing details about specific environmental changes.
- 29 spray patterns (so 11 comments were given without locations being tagged).



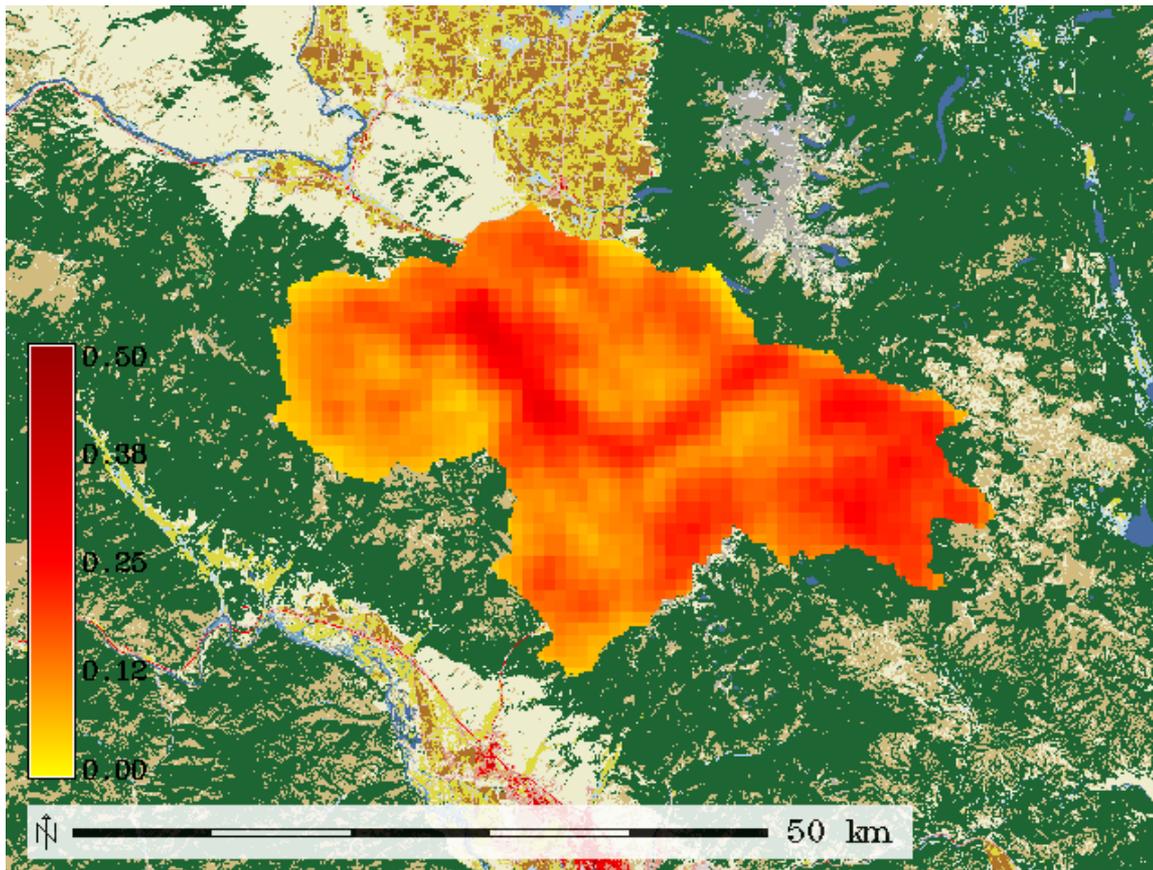
How frequently in the survey is every location tagged as a place that has undergone recent environmental changes?



- Cell value = Number of overlapping spray patterns / Total number of spray patterns.
- Maximum number of overlapping spray patterns in a given location is 36 % of total number of spray patterns.



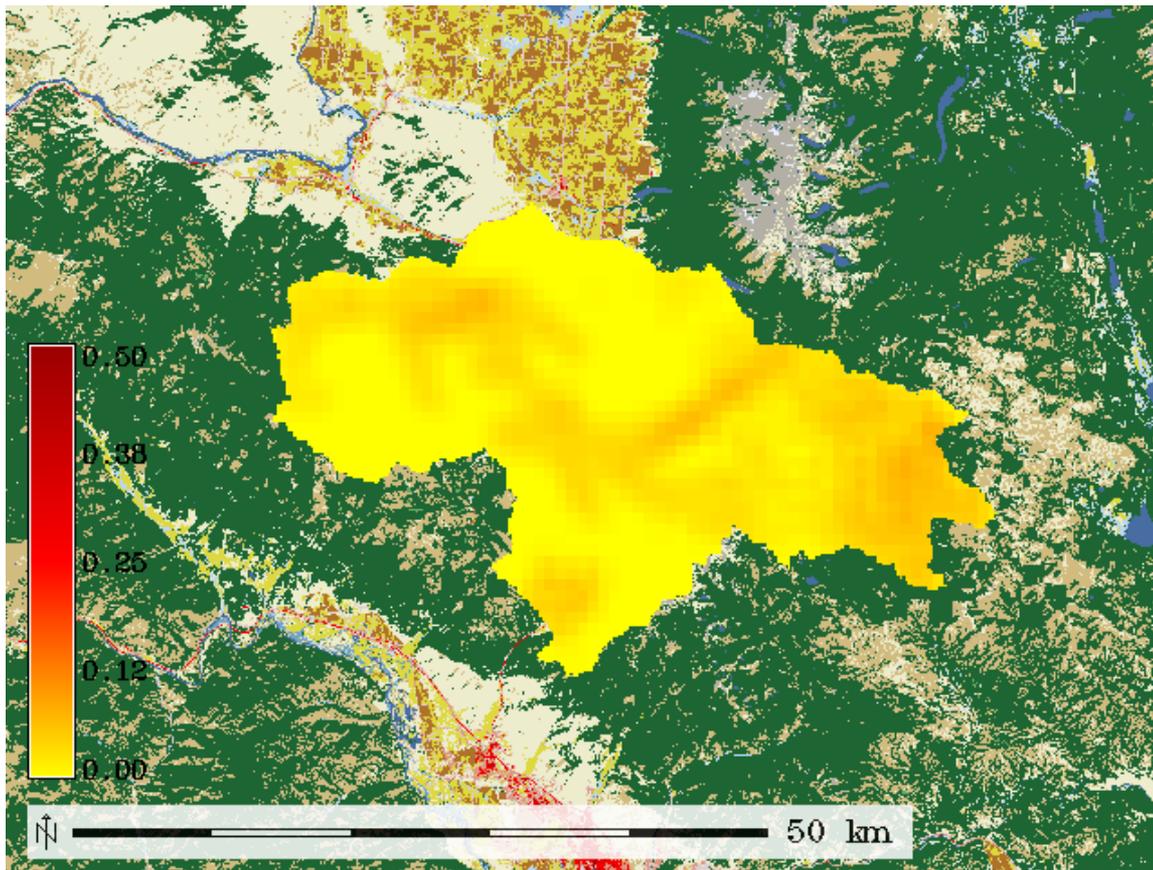
How frequently in the survey is every location tagged as a place that has undergone recent environmental changes?



- Places where interviewees agree in having observed changes concentrate along the Jocko river and in the primitive area of the Mission Mountains.



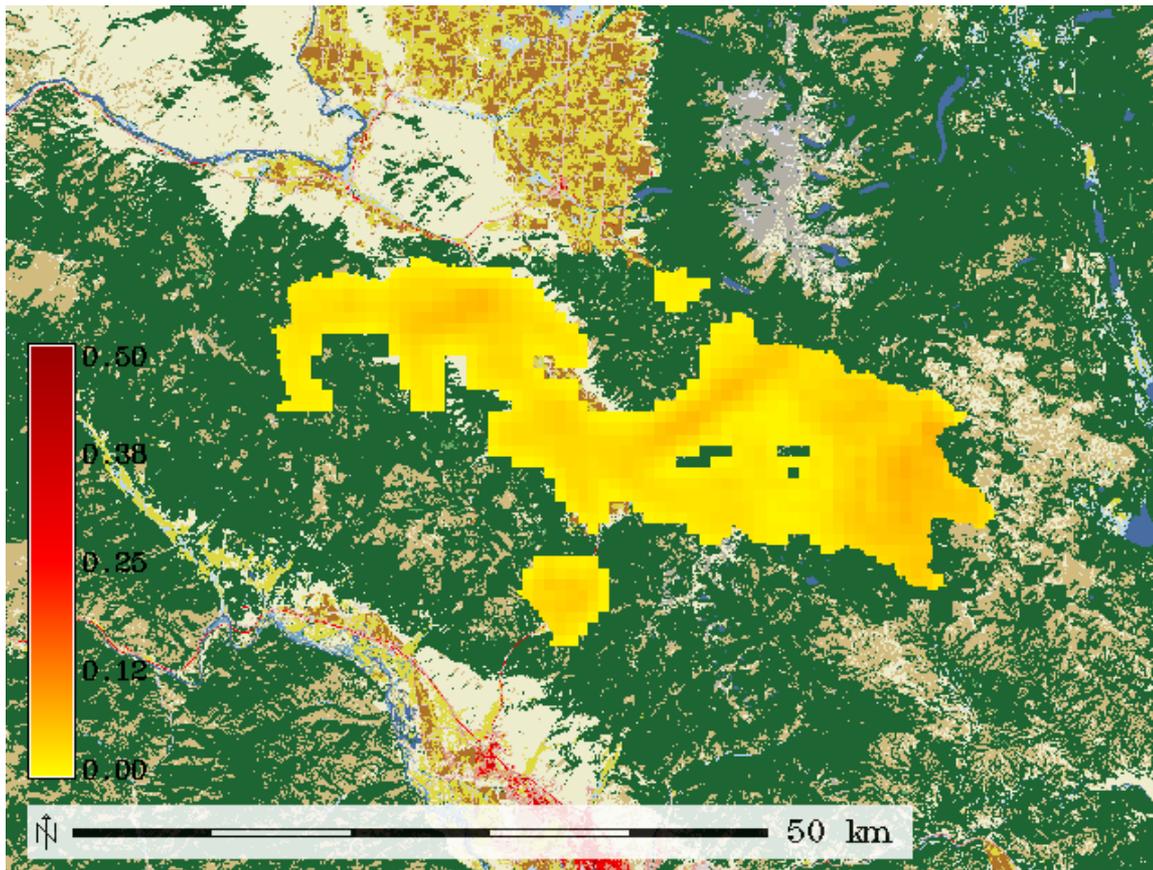
How frequently do tagged places have comments supporting *in situ* use of prescribed fire?



- 31 % of spray patterns support the use of prescribed fire in tagged spots.
- Maximum number of overlapping spray patterns in a given location is 12 % of all spray patterns.



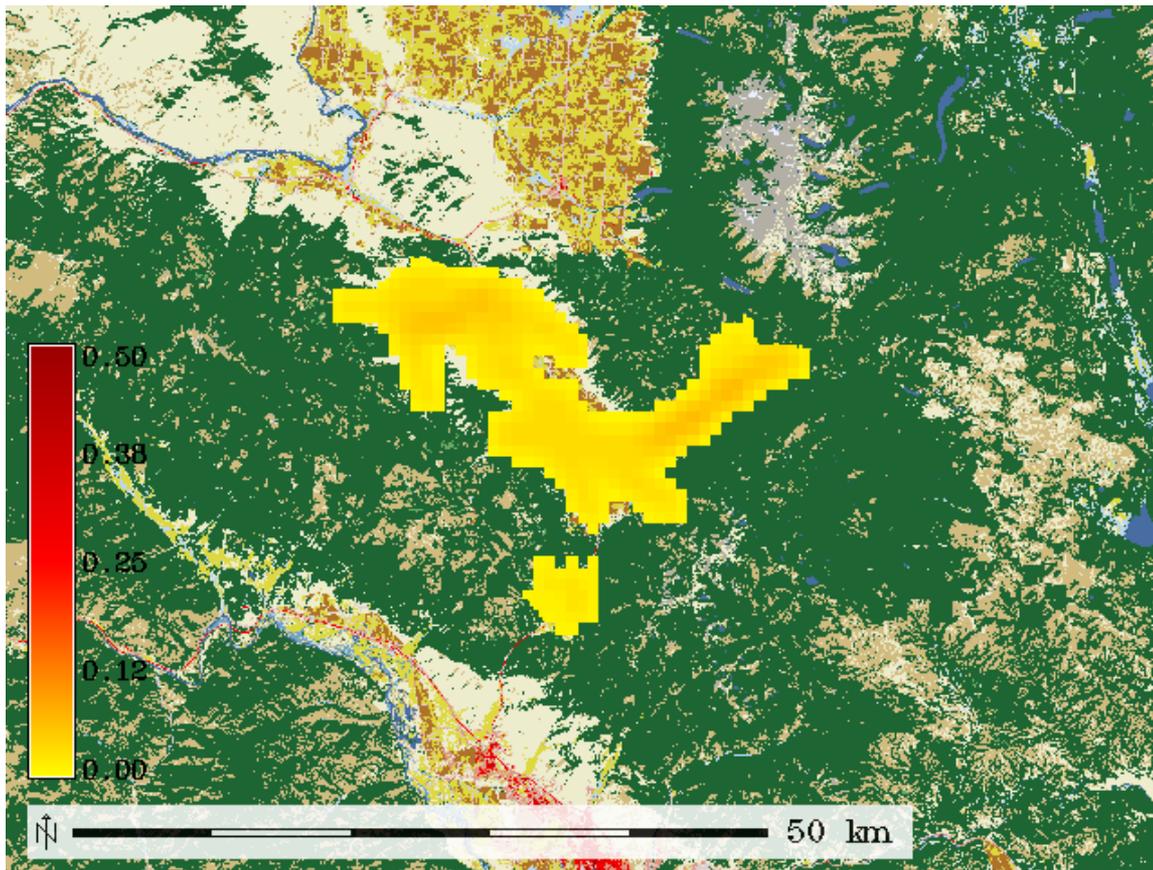
How frequently do tagged places have comments supporting *in situ* use of prescribed fire? (frequency > 0)



- 31 % of spray patterns support the use of prescribed fire in tagged spots.
- Maximum number of overlapping spray patterns in a given location is 12 % of all spray patterns.



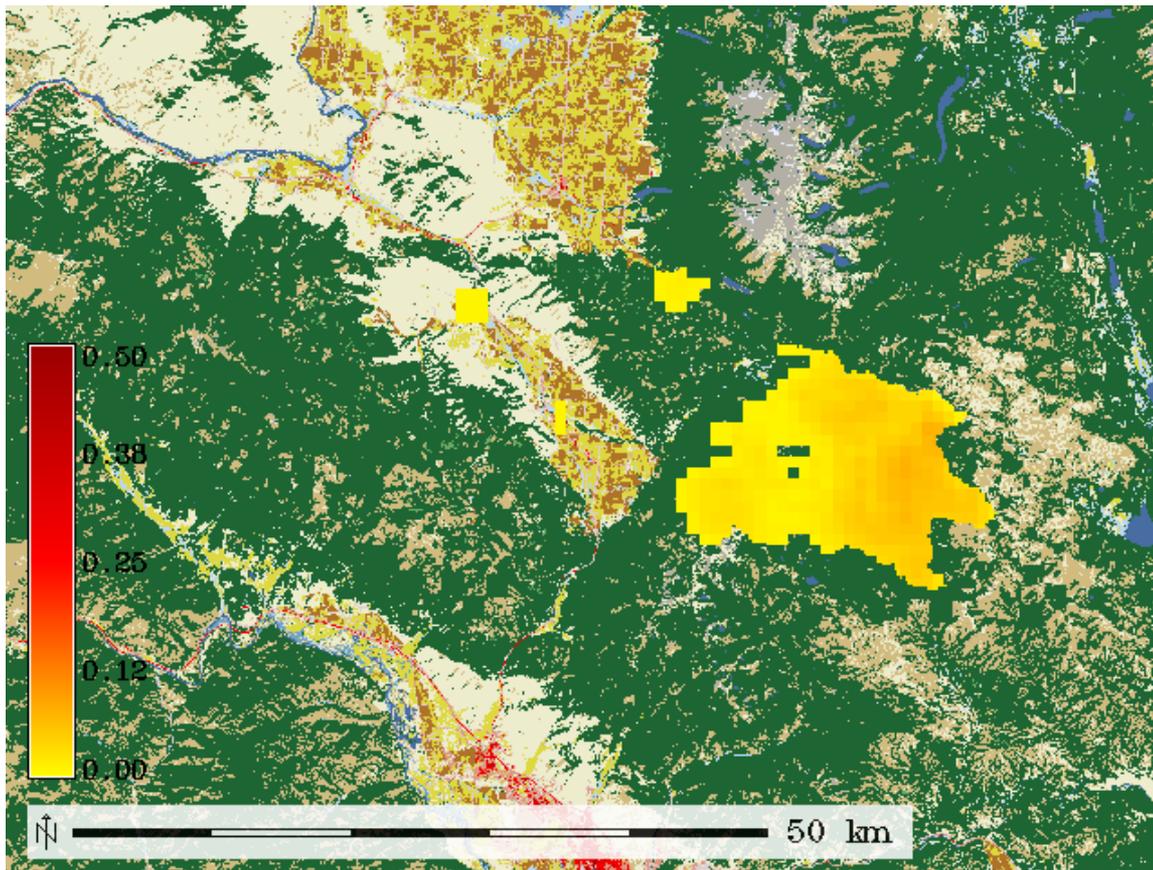
How frequently do tagged places have comments supporting *in situ* use of prescribed fire? (non tribal)



- Spots most frequently tagged by non-tribal people concentrate along the Middle Jocko and in herbaceous lands between the basin and higher woodlands.



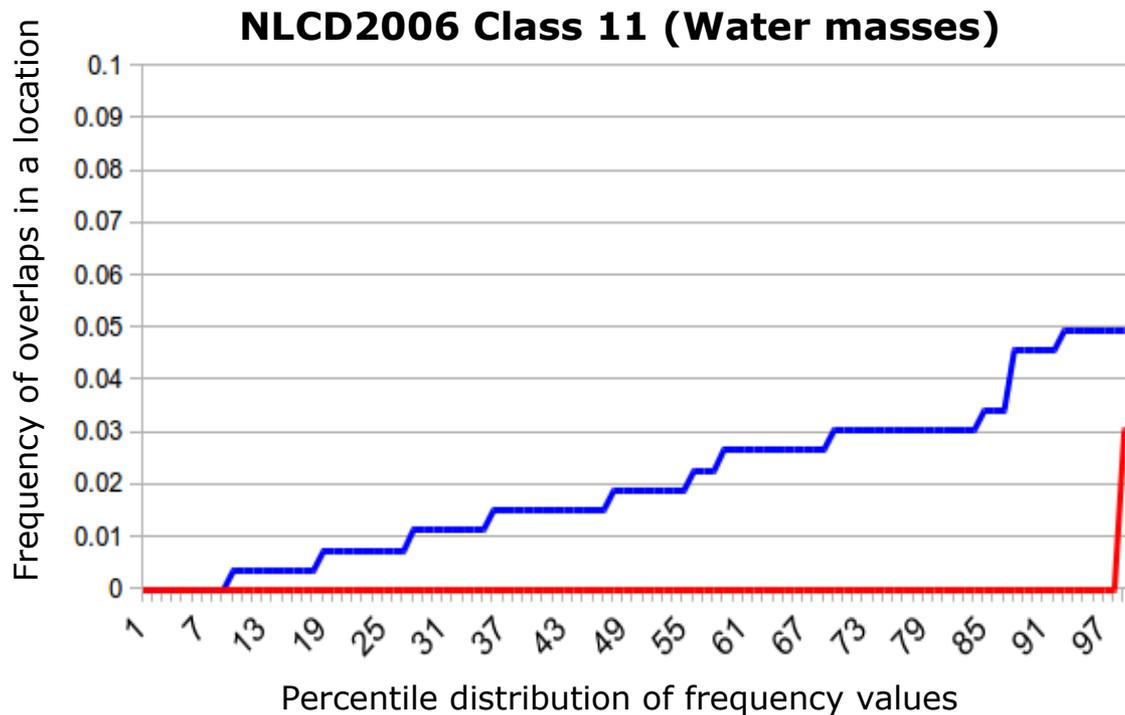
How frequently do tagged places have comments supporting *in situ* use of prescribed fire? (tribal)



- Spots most frequently tagged by tribal members concentrate in the mountain woodlands and summits of the eastern primitive area.



What is the spatial association between support of prescribed fire and land-use classes?

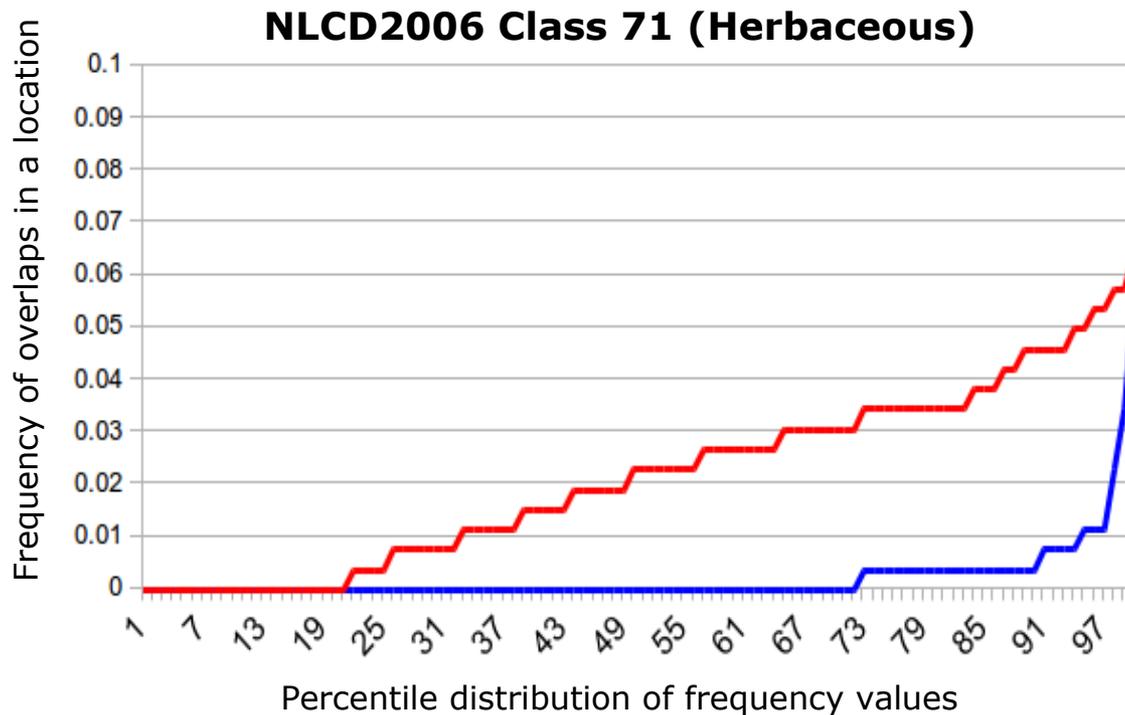


The frequency of respondents tagging this land-cover class rises regularly among tribal members, being negligible among non-tribal people.

Red: non-tribal members
Blue: tribal members



What is the spatial association between support of prescribed fire and land-use classes?

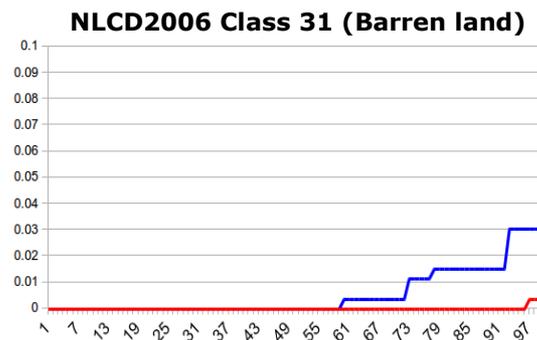
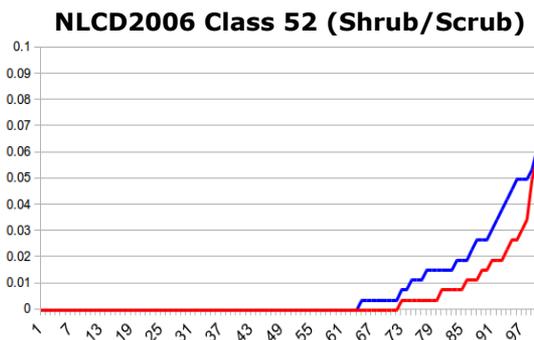
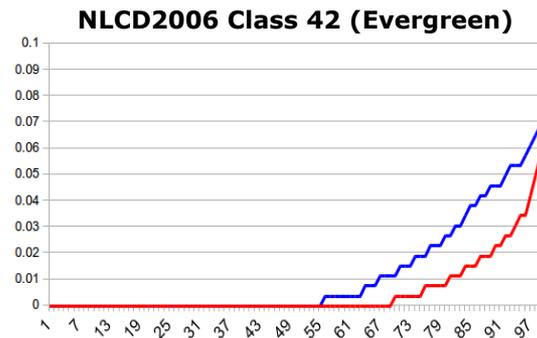
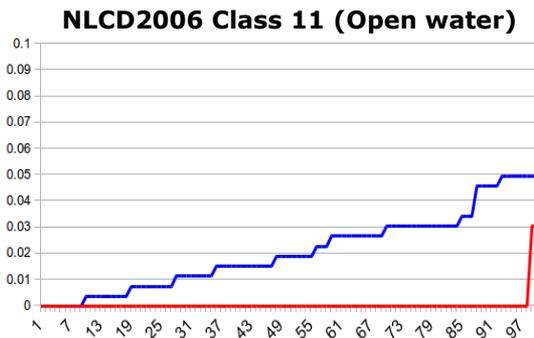


Red: non-tribal members
 Blue: tribal members

The frequency of respondents tagging this land-cover class rises regularly among non-tribal people, being negligible among tribal members.



What is the spatial association between support of prescribed fire and land-use classes?

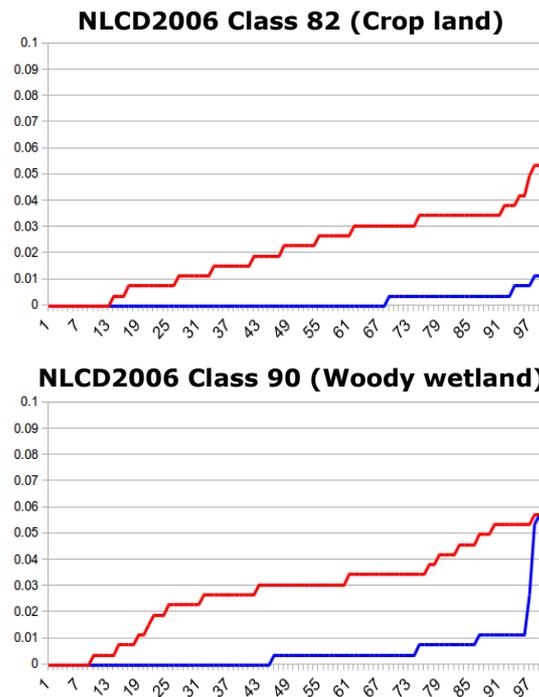
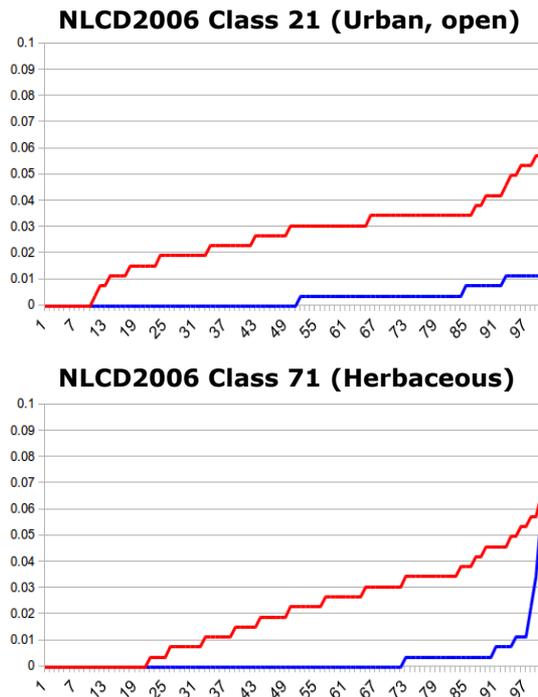


Most tagged land-cover classes among tribal members are mountain lake spots, evergreen forest, scrub land and moors.

Red: non-tribal members
Blue: tribal members



What is the spatial association between support of prescribed fire and land-use classes?



Most tagged land-cover classes among non-tribal people are open spots in developed areas, woody crops, pastures and woody wetlands along the Jocko.

Red: non-tribal members
Blue: tribal members



Next steps

What is the probability of these spatial associations with specific land-use classes to be the product of chance?

- Testing of randomness hypotheses with:
 - Simulation of random spray patterns.
 - Bootstrapping (reshuffling the allocation of spray patterns to interviewees).
- Analysis of candidate covariates other than land cover (e.g. evolution of fire regimes, land status).
- Testing of substratum effects on the geometry of the spray patterns by spatially-aware regression models.



Thank you

