

APPENDIX A:

GNLCC Priorities Crosswalk - Adobe Connect Chat Comments, Jan 12 and Jan 26 2016

CrossWalk 1 January 12, 2016

Unattributed additions at end of each section are from Survey Monkey participants; Highlighted text was (mostly) included as comments in 'Brief Report'

GOALS X STRESSORS

Tom Olliff: I didn't choose large blocks because they are the most static (I think) conservation element of our four; I chose connectivity and land use change (the most urgent impact to connectivity); aquatic integrity and climate change (again the most urgent impact); and cultural resources with the urgent stressor land use change. I chose cultural because we cannot achieve conservation without community support

Brittany Morlin: I want to do aquatic integrity and invasives, but I think in light of future climate change getting a grip on disturbance regimes may take precedence so we preserve areas with water into future

Erin Sexton: I am thinking that if we move the needle for the goals on the left, we will be addressing the stressors on the right, collectively - so I see some "lumping" of addressing stressors, by achieving the goals.

Brittany Morlin: I chose large blocks and climate change because of the potential loss of habitats such as subalpine, alpine

Charles Curtin: I am not sure why we need to distinguish between climate and land-use change - they seem largely entwined.

Jill H: I feel that there is a great deal of overlap among goals and stressors. So, I tried to pick 3 that would cover a broad spectrum of issues between them all.

Sean Finn: I am highly concerned we as a group are not considering the human response to CC and the potential for influx of human migrants that would completely change low elevation/riparian systems

Ian Dyson: Intact/Invasives: keep the good stuff good. Connectivity/Land Use Change: Triage, anthropogenic severance of extant connectivity. Aquatic Integrity/Climate change: huge vulnerability to out of normal variation/less opportunity for adaptation (either cold/clean or toast)

joe adamski: I have selected Large blocks climate change / Invasives / Aquatic Integrity Climate Change as these are the current tenants for BLM integrated landscape management

Geneva Chong: I made selections to emphasize my interest in impacts of land use and climate on large scale processes. My hope is that aquatic and cultural issues can be "umbrella'd" in.

Linh Hoang: I had hard time with overlap too - so chose those that overlapped -

Geneva Chong: And I really appreciate all the comments that I am seeing.

Carl Scheeler: Land use change may be the greatest driver as it functions both symmetrically in response to climate change and independent of climate change. Likewise, connectivity, once lost will be difficult to restore and aquatic integrity impacts from invasives may be irreversible in impact.

Sean Finn: Therefore I chose cultural goal/land use change as a critical element to address

Charles Curtin: I see Tom's point. Connectivity seems the core point and large blocks encompass connectivity. So using the bike analogy this seems like the frame, or core of the bike. However, I suspect one could make an equally compelling argument for the Large blocks as the crux

Erin Sexton: I also see land use change as the greatest overall driver with the most immediate consequences. Addressing climate change, however, is largely a cultural problem.

Brittany Morlin: As land use and climate continue to change, I imagine preventing aquatic invasion will be more difficult to remedy; if we lose entire biomes or if they shift to something that doesn't support species that can adapt, that would be a bummer; can we intervene, slow roll?

Molly Cross: Not surprisingly, I am particularly interested in advancing how we as a large landscape collaborative consider climate change. While I hesitated to highlight aquatic integrity and climate change because there has already been a lot of focus on that topic, I tend to think there is still room to really pull that information together to look at conservation at the large landscape scale - something that we've tried to do but is very difficult. Which must mean that it's important! I think it will be valuable to proactively think about the consequences of climate change for the protection of large intact blocks of habitat, and I don't think we've really pulled together available info and on-the-ground conservation to look at this more closely.

The Tribe's fishery touchstone is harvest of salmon and lamprey; therefore, aquatic integrity is key. Having access to information which supports decisions that can provide adequate flow quality (temperature, cold water refugia) and quantity (seasonal, loss of snowpack) addresses that priority. All three aquatic integrity stressors apply strongly to the Yakima Subbasin. Other second tier goals and stressors would be addressed with this focus (connectivity, cultural, etc.).

It seems to me that invasives largely come about as a function of climate change and land use change and thus I "rank" them lower than the other two stressors. The core mission of the LCC program centers on large intact landscapes and, if "intact-ness" is not possible, then connectivity. Thus selection of Large Intact Blocks x2, and then a nod to Connectivity through land use change, which I see as more tightly linked with connectivity than climate change. If you would have allowed a 4th, I would have selected the Cultural Goal, and honestly am not sure that "Sustaining local, place-based land use values" needs a paring stressor to be a critical GNLCC focus.

I believe the socio-economic changes in response to climate change (and even expected climate change) and on top of climate change will drive environmental change and constrain management/adaptation options as much if not more than direct climate change. Land use change is a reasonable way to focus efforts here. Understanding and working within the human systems involved will be the key to success.

Connectivity is a key Large Landscape resource that requires engagement at the GNLCC scale--the most immediate stressor is land use change. Water in the west is THE key issue now and in the future climate change will greatly exacerbate water availability challenges. I believe that the greatest challenges from climate change will be in the socio-economic realm as government and community structures and communication break down. We need more investment in this arena if we are to communicate and implement ecologically based strategies.

Climate Change will affect productivity of land and therefore working landscapes Large Intact blocks in lower in GNLCC states are largely under public ownerships, connectivity areas are mostly in private ownership and subject to land use changes. There is a growing interest in protecting the riparian systems from land use changes, invasives seems to be the biggest concern from the aquatic scientists.

I am assuming that large intact block contain the other key variables as part of being "intact and large" so I chose the three that included intact and large assuming it would essentially cover all the other variables. So it may be in large measure a factor of how I interpreted the question for I see large and intact as, almost by definition, as including all the other variables you list (connectivity, aquatic integrity, disturbance, culture, etc).

Mixed feelings on how I decided and what I got. Basically I thought things needed to be divided by public vs private lands (given this is the west). And from this only **intact blocks and disturbance regimes would be exercised on public lands while connectivity, hydrology and culture were both public and private land issues**. So what I think I ended up with are those goals we should focus on and the stressor that is the main cause of them given my private/public lands premise.

LARGE BLOCKS

Large Blocks X Climate Change: Ecosystems

Brittany Morlin: **Alpine, sub-alpine for sure; but sage-grass or riparian**

Tom Olliff: **In US, most large, intact blocks are protected (national parks, wilderness, roadless areas); most are under federal management, unlike valley bottoms in GNLCC. Climate change impacts are projected to completely alter alpine and subalpine areas**

Geneva Chong: I am thinking of **two main things here: snowpack/water changes and changes in fire regimes (moisture and temperature). Riparian corridors are my umbrella/integrator for the former, and forests and sage/grasslands for the latter**. Note riparian corridors also have fire regimes that can change with climate.

Charles Curtin: I picked **watershed uplands for it couples aquatic and terrestrial systems**. I specifically listed fire-adapted forests because fire regime change is becoming an increasingly large issue. While **mid-elevation shrub-grassland systems are crucial linkages and disproportionately impacted by disturbance and climate**

Sean Finn: I'm thinking about the historical range of variability, systems like shrub-steppe and woodlands were the 'vast expanses' of the west; most affected by fragmentation?

Erin Sexton: Same comments as earlier that **perhaps we should consider some language around "habitat mosaics" that better captures the dynamic nature of ecosystems - intent would be to capture both Structure and Function in an ecosystem, rather than just Structure**

Carl Scheeler: Shrub-steppe functions in large blocks so this is an easy. all the others seem to be components of large functional landscapes Riparian areas drain large landscapes..

Molly Cross: **For me, this question hinges on our real definition of the goal - are we truly satisfied with large intact blocks of whatever habitat may be there now or in the future...or are we really thinking about large intact blocks of *specific* types of habitats**. If the first, then we will be more accepting of ecological changes brought about by climate change...if the second then we will be less tolerant, and we will need to do some strategic science and planning to determine actions needed (or possible) to protect large intact blocks of climate-sensitive ecosystems.

Ian Dyson: **This is my personal 'biggest win' bias - keep the large native landscapes intact**. Typology of ecosystems is wierd - parkland, non sage shrublands apparently don't exist in the GNLCC..

Sean Finn: Agree Molly, we have not seems to integrate the concept of habitat mosaics and connectivity... the first approximation is to add larger connected reserves

Melly Reuling: Yes **sage shrub and grasslands disproportionately impacted, watershed uplands critical to tie the system together**

To maintain suitable rivers for salmon and lamprey, providing information to support protection and management of these three habitats is a priority: 1) **large riparian corridors** that allow natural river behavior (evaluation of full floodplain connection), 2) **managing uplands** to prevent landslides and large sediment influxes, and 3) **fire management** (a major threat in YNF territories increasing due to climate change).

I think the **focus here has to be on the aquatic/terrestrial interface**. Climate change will impact hydrologic regimes first and foremost. River systems, wetlands, riparian zones--which will be impacted--tie large landscapes and the people, plants (read forests, grasslands, etc also mentioned), and animals they support together.

Water resources in the region are largely snowpack dependent. We can try to mitigate with water control structures, but if we lose snowpack and time, we will have different systems.

Wetlands are vital resources for many species in the arid west and will be impacted by climate change, particularly the more ephemeral seasonal wetlands. Invasive plants and fire will have increasing impact upon sage shrub habitats in a changing climate. Sub-alpine forests (e.g. WBP) are stressed.

Alpine because of changes in snow zone. Fire-adapted forests because of ongoing fire management practices and changes predicted in water/temperature envelopes. Climate changes impacts in arid lands could increase threats due to invasives.

In my mind we are picking the fly shit out of the pepper with this question. **Large intact blocks in my mind could encompass some or all of the above.** By using that term we are implying that they consist of a variety of **ecosystems such as listed here.** Therefore I did not choose any. I think answering this question actually drives us away from where we want to go.

Large Blocks X Climate Change: Taxa

Brittany Morlin: lynx, wolverine, whitebark pine

Geneva Chong: I picked salmon for aquatic umbrella. mule deer for sage/grassland umbrella and Canada lynx for higher elevation forest and above umbrella.

Charles Curtin: As before I see **white bark pine as an important assay of upper elevation integrity that is projected to be impacted by climate change.**

Tom Olliff: **I chose "wilderness" species (those that typically need large blocks for some segment of life cycle) and sage grouse due to declining habitat from fragmentation**

Jill H: Just curious are there any bird advocates responding today?

Jill H: **The woodpeckers are not getting a lot of votes, some bias here perhaps.**

Carl Scheeler: I picked steelhead for aquatic umbrella because they use more of the watershed than salmon.

Ian Dyson: Again, **wish I knew more about the woodpeckers and the rabiit..**

Brittany Morlin: Again, bears are generalists, more adaptive in light of climate change

Brittany Morlin: Me too Ian

Matt Heller: Picked cutthroat trout due to their significant range

Charles Curtin: Bull Trout integrate assays of aquatic and surrounding landscape integrity. While grouse and pronghorn couple mid-elevation integrity. Finally bear couple connectivity of high elevation sites

Tom Olliff: Good point, Jill; the woodpeckers were added to indicate integrity of low elevation, dry forests

Erin Sexton: If we limited this to just terrestrial species, I would suggest the "wilderness" species as Tom discusses

Charles Curtin: couple mid-elevation integrity. Finally bear couple connectivity of high elevation sites

I chose salmon as an obvious indicator for stream health. I believe that the YN wildlife biologists are working on Whitebark Pine and woodpecker's; but I can't remember which is the correct species.

Likely not the best one to answer here, but with changing hydrologic regimes brought on by climate change, I am thinking of those animals that are adapted to the current aquatic regime (e.g., timing, temperatures of annual runoff), migrate or move long distances and thus need large blocks of land, and plus rely on the current climate for life history (e.g., winter over-snow travel and prey availability).

I am not as confident about my choices here. I stuck with terrestrial top predators as indicators of ecosystem resilience. I would stay away from species-specific management where we can end up fighting for elements that ecosystem trajectories (e.g., whitebark pine might be one of those)

Wolverine core habitats will be increasingly limited. Same is true of wetlands, cold water and water quality in river corridors, and vernal vegetation in sage/grasslands.

Species selected coincide (closely associated) with ecosystems selected

Again, I am not sure what this question gets us. I did select species which I felt were dependent on large intact blocks but I am not convinced this is an appropriate scale or how we should be looking at this. First because it is so driven by our historical focus and knowledge of this species and systems. But as we don't yet have it all figured out yet, I chose those species I think are the wildest and that need space and place to live.

Large Blocks X Land Use Change: Ecosystems

Molly Cross: I have the same question as before - where are land use changes most urgent/pressing/rapid? Those are the places I would prioritize for focus here

Charles Curtin: Same three, however, instead of fire-adapted forests selected riparian corridors for their disproportionate human impacts

Linh Hoang: agree with molly - i'm having hard time not lumping many of the categories -

Tom Olliff: I think of large blocks being primarily higher elevation, and protected, so land use change is less of an issue than climate change and invasives. Picked watershed uplands, riparian, and wetlands because they occur across the landscape

Sean Finn: I agree too and make the pitch that land use change is more prevalent in low elevations

Brittany Morlin: subalpine and forestry; forest plans should help address, but we could help facilitate research that identify how forest types are shifting and whether or not we could intervene; suspect differences in shifts based on slope and aspects, could help refine forest management

Geneva Chong: My usual reasons: riparian to represent wet; woodland and sage related to development.

Erin Sexton: Agree with comments on the importance of forests - hope we can flush this one out later

Geneva Chong: Discussion on range of protectedness - consider using base-data layers developed for the fire refugia project to get "whole view" of GNLCC area related to many of these topics.

Tom Olliff: note: we need an evaluation (maybe just a white paper) on large block protection in US and Canada--I have some assumptions about large blocks in US and I know a lot about Canada--need to characterize it for the entire landscape

Geneva Chong: I agree with Ian - much of the matrix around "protected areas" is not public/protected.

Very similar information needs as climate change stressor for this goal.

Greatest impact, to me, is development along river systems. This could be home building, ag development, poor timbering practices (cuts too close, poor road construction). Most urgent need is to protect riparian corridors--perhaps that could become the key focus of the GNLCC, across all ecosystems.

Water is a key driver and ecosystem service in the region. Regardless of climate change impacts, these are important areas for focus.

Believe that land use change is generally greatest threat in lower elevation core habitats.

Most impacts would be in private lands that are still part of Large Intact Blocks. Land use change includes land use practices.

As I see land use change as primarily a private land issue, I selected for water drive systems given that humans will need this as well as ecosystems and species. So on private land it will both be most important and probably most agreeable to conserve large intact blocks for benefit of water for people and ecosystems.

Large Blocks X Land Use Change: Taxa

Molly Cross: bears are generalists, but they need sufficiently large safe spaces (i.e., safe from human conflict)

Erin Sexton: I am limiting to terrestrial species here, as I think "large blocks" does not apply to rivers and riparian systems - connectivity better describes aquatic systems, but need to capture the importance of "Intact" river systems

Geneva Chong: I selected steelhead because of someone's earlier comment about better aquatic integrator. Mule deer because need large areas accessing sagebrush to high elevation and all in between. Grizzly for similar reasons as mule deer but added complication of top carnivore (politics).

Carl Scheeler: Shrub-steppe species may be urgent in terms of ag development

Tom Olliff: choosing species that might have issues connecting to large blocks due to land use change (roads, housing developments, etc.)

Brittany Morlin: I put pygmy rabbit here, because perhaps not so much of connectivity issue, but they need functioning habitat

Sean Finn: Looking for species that move alot, esp. those that need extensive landscapes as individuals; population/metapopulation considerations also important but we need to avoid high mountain 'zoos'

Charles Curtin: Similar rationale as in the past. Except I did not pick White pine for there is not much direct human impact at these elevations. Grouse and prongs are key indicators of integrity and connectivity at mid-elevations. Bear are comparable at higher elevations. Lynx are very sensitive to human action

Melly Reuling: agree with Charles

Using indicators for these species would help assist land use management for large blocks of land affecting salmon streams.

Land use change/large landscapes -- here I think about the critters that travel far but with the least ability to escape or alter their home range over a period of rapid change. I think the LCC could fill a void by adapting the model we saw in the Salmon, by convening local groups and helping them understand how their control over key areas--again to me those are foremost the locations that include the aquatic/terrestrial interface--impacts a very large landscape around them.

Same logic: water.

Here reference is to potential loss of core habitat quality and quantity. Seasonal ranges for ungulates impacted, winter ranges. Also species for which core habitats are at lower elevations where there is a greater human footprint. And for species that are particularly sensitive to higher human use, such as grizzly.

Impacts envisioned related to renewable energy development and potential impacts to migratory species

Chose species based on watershed priorities and water connection.

Large Blocks X Invasives: Ecosystems

Tom Olliff: choose ecosystems highly affected by invasive species

Ian Dyson: Mesic environments likely most susceptible

Charles Curtin: I just picked the habitats that I thought are the most impacted by invasives

Carl Scheeler: Invasive grass impacts to fire resiliency of shrub steppe is critical.

Geneva Chong: Ditto others on wet areas and sage/grassland for fire interactions with invasives.

Brittany Morlin: I think I chose these for connectivity and invasives as well (riparian, wetlands, sage-grass)

Sean Finn: Where does/will IS have ecosystem changing impacts? Aquatic and wetlands and shrub steppe

Information regarding aquatic invasive and their impact stream conditions for salmon populations.

Invasives travel by many routes, including via the natural connection provided by flowing water ways plus the rampant human-caused movement into susceptible grasslands. Biggest effort for the GNLCC here would be to increase education program already underway with AIS, but expanded across the LCC. Could such a program be expanded to terrestrial invasives? This seems like a big hole that the LCC could fill with the potential for dramatic impact.

Invasives in forests and grasslands will be mitigated by disturbance regimes, particularly fire. I don't think we be able to manage fire or at that scale of impact. I believe focusing on wetlands in general can be more effective.

1/21/2016 9:48 AM [View respondent's answers](#)

Invasive species have largest immediate impact in sage shrub and fire adapted systems and aquatic habitats.

1/21/2016 9:30 AM [View respondent's answers](#)

Done w group

1/20/2016 9:58 AM [View respondent's answers](#)

Areas where invasives are currently the bigger problems, including bark beetles etc.

1/19/2016 2:31 PM [View respondent's answers](#)

With climate change, you can assume the ecology of the block will change. And that will come via "invasives". And those invasives will come primarily from humans and human-related activity which will prob focus in water areas.

Not sure my logic works though.

1/15/2016 5:24 PM [View respondent's answers](#)

Large Blocks X Invasives: Taxa

Tom Olliff: chose species where I thought they had strong impacts from invasive species (wbp, trout, sage-grouse)

Brittany Morlin: Swans, wetlands, reed canary grass

Carl Scheeler: I'm thinking of the linear nature of rivers as a large block.

Geneva Chong: cutthroat trout for aquatic umbrella (though I am open to better) and sage-grouse and mule deer for sage/grassland and other (e.g., riparian).

Brittany Morlin: pygmy because again they need blocks of functioning habitat and similar invasives to sage grouse apply

Charles Curtin: I habe to plead ignorance here. I leaned toward aquatic species. But I suspect t.here is a lot we do not know. For example, does changes in grassland plant comp impact deer or prong energetics? Could this change in prey base have cascading impacts on predators? There are huge parts of this question we know little about in terms of interconnections

Tom Olliff: Filter on trumpeter swans: pop seems to be doing well range wide but declining residents in GYA. How do we consider this information, and fact check it?

Information on migratory focal species can provide response indicators for aquatic invasive species.

My focus here is only to recognize that river systems allow for easy, ready, rapid movement for both invasive fish and plant species and that the areas at risk (largely because other areas have already been compromised) are often in intact, large public lands that could be readily addressed by GNLCC-supported projects. I would love to see a pareto approach, where we assess risk and then address the areas most at risk first and show that they can be protected in a logical, step-wise fashion.

Again aquatic ecosystems.

These species more dependent upon habitats where invasive species are greatest threat.

I don't know a lot about species specific impacts. The species I selected require healthy native forb/shrub complex for forage in arid lands

I am not convinced we have the right species here or that species level concerns are appropriate. And for the latter, wouldn't that be prioritizing?

CONNECTIVITY

Connectivity X Climate Change: Ecosystems

Brittany Morlin: relax... lol

Brittany Morlin: Again the connectivity between riparian and aquatic is huge! But how do I capture here?

Tom Olliff: Riverine and riparian are important connectivity linkages, with high impacts from climate change; sage steppe is a vulnerable habitat; connectivity for sage species (sage grouse, mule deer) is being lost due to many factors, including the fire-cheatgrass-climate cycle

Erin Sexton: Riparian as defined by the complete hyporheic zone from valley-bottom to valley-bottom - not just the surface river channel

Jill H: I can't help it, I am an aquatic person so I emphasized those areas, but included woodland to have a terrestrial component as well.

joe adamski: These elements best aligned with BLM land mangement / use issues

Sean Finn: We will capture some of that 'lost' detail in subsequent crosswalks Brittany

Brittany Morlin: Again, the subalpine and alpine are critical to me because if we can't ensure persistence into future and species dependent can't adapt or shift, we could lose em (caribou, lynx, whitebark pine...)

Charles Curtin: I selected Riparian coordiors for my sense is that to a certain extent incorporate the connectivity of riverine systems. Watershed uplands are key not just because they drive the hydrology of the system and are also diproportiojnately impacted by climate change. While grasslands and sage systems tend to have high human impacts, have been disproportionatley impacted by human action and thus are also volnerable to climate change and a coupling of climate and land use change.

Sean Finn: I'm concerned that cc effects will disproportionately afffect low mobility alpine specialists

Jill H: Riparian corridors are also a nice interface between aquatic and terrestrial landscapes, species, processes.

Molly Cross: As climate gets more arid, connectivity within and between relatively wet areas (wetlands, riverine, riparian) will be important for many species.

Erin Sexton: Need to think about large landscape mosaics, and providing for diversity and complexity. Given the broad representation of ecosystem types across the GNLCC region, it might be good to prioritize a diversity of ecosystem types.

Tom Olliff: I wanted to vote for alpine, too, but it was 4th; I wonder if connectivity might increase for wildlife if treeline moves higher due to climate change

Brittany Morlin: climate projections suggest that loss of woodland might not be an issue, but forest type shifts could be huge

Linh Hoang: selected riparian corridors as many of our resources dependent on them - selected dry-forest as it is one of most vulnerable to CC

Brittany Morlin: Hi Molly! Agreed.

Carl Scheeler: Aquatic impacts both from a connectivity and quality aspect are important and urgent. Likewise upland plant communities may not be capable of changing as rapidly as they must. Shrub-steppe loses due to wildfire could be a rapid and permanent impact due to cheat grass and other non-native invasives.

Ian Dyson: Concur with Erin/Charles comments.

Matt Heller: Selecting the connectivity transition areas impacted by the climate change stressor

Melly Reuling: Watershed uplands are the key to healthy riparian and riverine systems and riparian and riverine systems provide key connectivity throughout the landscape

Geneva Chong: I am struggling with actually looking beyond the "ecosystem" component - to include connectivity x climate change x ecosystem. I agree that all things "wet" will continue to be stressed mightily by climate change, thus affecting connectivity already highly altered by land use. Over the largest scale of the GNLCC, I think the ecosystems representing forests and sage/grasslands represent the largest area (matrix that the "wet" systems occur in) and deserve an "entire area" analysis - such as begun by the fire refugia concept analyses.

Brittany Morlin: Climate change and altered flow regimes could have implications for connectivity of riparian

Molly Cross: wetlands are key because they will be key to storing water as we lose snowpack water storage

Climate change impacts on connectivity for salmon and lamprey will be represented by thermal blocks. Knowing where cold water refugia are available and hyporheic exchange for groundwater recharge will drive connectivity actions for salmon; as well as in-river water management.

I am thinking again that climate change will first and foremost impact aquatic systems, meaning focus on two key connectivity zones -- riparian for all things connecting aquatic to terrestrial, and I think of the Pothole lakes and their critical role in waterfowl migration. Also, I select sub-alpine, thinking of the vertical migration/connectivity of many critters through an annual cycle.

The species that can migrate under climate change appear to be mostly terrestrial and in the forest to grassland zones.

Riparian corridors, grasslands, and watershed uplands are key connectivity zones that will be impacted by climate change.

Riparian corridors will an important robust adaptation for movement across the landscapes. Riverine systems (water) will become potentially more fragmented because of watershed level changes in water temperatures and water flow regimes. Changes in Snow levels will impact alpine connectivity.

I choose these two because I see riparian as overlapping riverine and wetlands (so its a cheat) and sage shrub because if has such connection/overlap with private lands, which is where I see connectivity being a priority.

Connectivity X Climate Change: Taxa

Tom Olliff: aquatic systems are so vulnerable, so I chose all fish + sage grouse as work by Knick and others shows loss of connectivity due to climate change

Sean Finn: Bull trout is big for me; how do we effectively connect headwater streams?

Brittany Morlin: But could cutthroat be a better surrogate than bull trout?

Charles Curtin: White bark pine is an umbrell species for higher elevation systems and impacted by climate change. Likewise sage grouse is an umbrella species for mid-elevation sage habitats. These two stand out as really have overarching system implications. Other species werve more specific indicator functions.

Carl Scheeler: Both connectivity in aquatic systems and total loss of habitat suitability for sage grouse seem critical and imporant as umbrellas for those cover types. Grizzly

Tom Olliff: We need to investigate salmon and steelhead in terms of "What are others NOT addressing." Seems like a lot of work going into those species, but I am not sure how it is being put together and addressed at the landscape scale

Ian Dyson: Agree with Tom and Sean. Bull would top the list for me. Again - we will all bias, based on species/ecosystem familiarity, thereby risking 'biased selective opinion' vs 'scientifically- defensible' evaluations

joe adamski: (Highest value / indicator) Species occuring on lands managed by BLM

Jill H: Connectivity, flows and temperature are very important for fish and specifically Bull Trout - identifying areas that will hold up as good habitat through adverse climate change effects will be important as well as Identifying areas that may be lost.

Sean Finn: Stream networks are complexx and in cases 'banded' by elevation/temp combinations. I could be that we refine this focus to cold-water trout

Brittany Morlin: Who is our riparian target? Is it Lewis'

Charles Curtin: In the species attribute area Bull Trout are an indicator of intact riparian-riverine systems.

Brittany Morlin: Charles so are cutthroat, and coldwater

Sean Finn: Brittany, we never made linkages ala 'surrogate spp' among habitats and taxa

Tom Olliff: Riparian ecosystems themselves can be the target--not sure how to measure them

Brittany Morlin: Gotcha

Charles Curtin: Pronghorn are another meta indicator species in mid-elevation systems indicating intactness of grassland and sage.

Geneva Chong: I selected greater sage-grouse and mule deer as umbrellas for sagebrush systems and cultural importance. I think the Canada lynx could be an umbrella for wolverine, grizzly bear and other forest and higher elevation species whose habitats are impacted by climate change. I think that the cultural/politics of grizzly management makes them difficult to use as an umbrella (and GNLCC shouldn't be funding work on this species) and wolverine are harder to study.

Molly Cross: snow-dependent species are going to see loss of habitat, making connections between more sparse habitat even more important than it is today. Pronghorn are a long-distant migrant so experience challenges across many different jurisdictions/ecosystem types so seem like a good indicator (although i'm not sure how dependent they are on climate-sensitive habitats so maybe more relevant for connectivity X landuse). Fish ability to move to annually and seasonally cold habitats will be critical.

Charles Curtin: Bear are a key indicator of connectivity in higher elevation systems. While Lynx is

Charles Curtin: hyper sensitive to human impacts and is intrinsically rare

Brittany Morlin: But bears are such generalists

Brittany Morlin: Perhaps more able to adapt

Charles Curtin: I see bear as important because there seems to be relatively good data on them. But at the same time there is a certain bear-centric approach to the biology which means too much focus on bear may lead to bias

Brittany Morlin: Again, I'm so curious as to if subalpine spruce/fir habitats are regenerating

Brittany Morlin: Forest practices affect connectivity, but climate change could affect ultimate connectivity

These species provide indicators of climate impacts on riverine connectivity.

Species selected are, by my reckoning, those that are most urgent for LCC focus since they require movement over great areas where they are least able to adapt. Not swans, who can fly to a different lake that didn't dry up, but grizzly that can't cross the human-populated lowlands as they will likely be killed. Greatest need, at least species wise, for LCC focus should be to simply take all species and slot into their designations: Endangered, threatened, etc. Use this prioritization as a defensible way of focusing LCC resources.

Following the above logic.

Species with higher sensitivity to climate change and that need intact connectivity across large landscapes.

Species selected are closely associated with ecological systems above.

I focused what I think are the species with the greatest connectivity problems related to private lands (shrub steppe related). And where the change/threat is most growing or fastest.

Connectivity X Land Use Change: Ecosystems

Brittany Morlin: Riparian, sub-alpine for reasons stated on previous slide, and sage shrub

Matt Heller: Sage shrub/ grasslands issues with connectivity and land use change seems well documented

Matt Heller: Well documented and one to choose and this poll that is

Charles Curtin: I AM voting for the same for I see the climate and land use drivers as totally interconnected

joe adamski: Shrub steppe, woodland and wetlands most related to LUC impacting BLM

Sean Finn: land use cahnge is all about low elevations - even energy development is more prevelant in lower, flatter areas

Molly Cross: Anyone know which of these habitat types are experiencing the fastest/greatest land use changes? Those would be the ones I would pick...but other than sage steppe habitats and riparian areas, I'm not sure what else would rank highly on that list.

Tom Olliff: Land use change is pervasive in lower elevation ecosystems; riparian is always in danger of development

Erin Sexton: I agree with Charles - if we move the needle on the targeted ecosystems or specues, we will be addressing all of the stressors to some degree.

Carl Scheeler: developemnt will continue to focus on riparian floodplains impacting wetlands disproportionately. upland haitats will be impacted from linear developments associated with transportation and energy developments and conversion to agriculture and housing.

Jill H: I did not select wetlands, as it seems sage shrub/grasslands is a bigger issue of concern due to the Greater Sage-grouse species however, I do feel that loss of wetlands is a big issue especially due to development.

Melly Reuling: Riparian and riverine are always under great threat from land use changes

Charles Curtin: I suspect grasslands are experiencing the greatest chnage

Linh Hoang: selected ripairan corridors, uplands and forested areas - as this is where many of the federal projects are occuring. We don;t do much land use activity in alpine areas or in wetlands abecause those are mostly mititatgated through voidance

Charles Curtin: in terestrial habitats

Jill H: I did keep riparian corridors and watershed uplands, as being key habitats for riverine processes

Ian Dyson: Generally concur with Tom, but we see a lot of footprint impact (forestry, energy sector, transmission, ATVs) in watershed uplands.

Erin Sexton: I would like to see some greater detail around the "Woodland" category, as Forest Management Practices are a critical piece of the puzzle with respect to fire, climate change, and the species that depend on forested habitat.

Tom Olliff: Erin, also woodlands is where WUI is happening

Geneva Chong: I selected two "wet" systems because they are likely the most impacted by humans overall. I selected sage/grasslands because these areas are experiencing fragmentation from development of all types (including energy). I just switched one "wet" to woodlands because of Tom's comment about WUI.

Primary focus is on aquatic connectivity. Keeping cold clear water in streams.

Sorry, without looking back I can guess this is likely similar to answer for large landscapes/land use change (and maybe that is the purpose of this cross walk...). The big changes happen most where people and development are. The LCC can have the most impact by getting on the ground to meet with the people developing those lands that are key connectivity corridors and bringing groups together to meet and talk in forums that by LCC design are couched in a large landscape paradigm (and to be sure, that paradigm will likely never before have been considered by those in attendance--such exposure alone would have impact toward achieving LCC goals). Habitats that support large scale connectivity and are threatened by land use change.

These are systems likely to undergo land use change and therefore affect connectivity on the landscape

My choices tried to reflect the fast changing threats to connectivity in shrub steppe areas as well as the need for riparian and riverine systems to provide connectivity in mtn valleys, etc

Connectivity X Land Use Change: Taxa

Brittany Morlin: lynx and forest practices

Brittany Morlin: swans and wetland fill

Brittany Morlin: grizzly and highways

Tom Olliff: land use change is immediately affecting mammal migrations and fish passage; also sage grouse

Brittany Morlin: cutthroat and loss of riparian due to shoreline development

Charles Curtin: Same as with climate change picked the same suit of species for their indicator roles across a hierarchy of scales

Brittany Morlin: And of course, sage grouse

joe adamski: (Highest value) Species most affected by LUC on lands managed by BLM

Molly Cross: A survey of bear and connectivity experts in the High Divide that I just completed indicated strong consensus that bear connectivity is most threatened by human tolerance (related to land use)...more so than climate change threats because they are generalists (if humans aren't causing them problems)

Geneva Chong: I selected salmon as an umbrella "wet" species. Sage-grouse and mule deer as umbrellas for sage/grassland - both need large areas of high quality/high function sagebrush, which, as mentioned in connectivity x land use is seeing great impacts.

Molly Cross: long migrations of pronghorn and their sensitivity to human land use (fences, roads) makes them a good indicator

Matt Heller: I was matching these selections up with the ecosystems poll before and seemed to match up well with no conflicts in poll answers

Sean Finn: An 'Indicators' approach is not one we've talked about; we have good knowledge of some species-habitat relationships ... is that a good indicator?

Ian Dyson: Bull as surrogate. Sage grouse sensitivity to sage habitat footprint. Wish I knew more about the woodpeckers and the rabbit.

Molly Cross: I'm not an expert on either system, but it sounds like sage grouse habitats are under extreme threat from land use change, and lynx are sensitive to human activities

Brittany Morlin: But salmon get all the attention.... 'salmon, salmon, salmon' (in the voice of Marsha Brady)

Carl Scheeler: **migratory species seem to be most at risk** and salmon entering systems later in the season will be most likely to be impacted by water quality issues resulting from development.

Jill H: If rivers and river corridors are taken care then landscapes around them will also remain more intact. And hey salmon are a sexy species for climate change issues and economic and cultural values

Brittany Morlin: Woops! I guess that would be in the voice of Jan Brady lol

Brittany Morlin: Yeah, swans are pretty sexy too

Erin Sexton: I agree that we need to look at the extent to which salmon are effectively being addressed. They are **the perfect species in aquatic systems for addressing connectivity, climate change with respect to water allocations and land use and human cultural use**

I think of **Bull trout due to immediate vulnerability to poor timber and road building practices. The LCC could move forward in a great big step if it could bring a forest products entity on board** (e.g., on the SC and/or AT); even better if we had one from Canada, one from the US.

Species with lower human tolerance and need for connectivity across large landscapes.

Species that are likely going to need connected landscapes that will potentially change through changing land use not sure on these choices.

Connectivity X Invasives: Ecosystems

Ian Dyson: Riparian/wetlands for aquatic invasives and sage for terrestrial invasives.

Joe Adamski: Ecosystems of highest importance / most threatened to BLM managed lands

Erin Sexton: Invasives are a big problem in non-Alpine lakes, which are not represented here. Have cost millions of dollars in damage in large freshwater lakes.

Geneva Chong: I emphasized impacts of invasives on wet systems by choosing two of them, and impacts of invasives on fire and resulting loss of sage/grassland.

Tom Olliff: sagebrush strong #1 with cheatgrass issues; tamarisk makes riparian #2 for me

Charles Curtin: I picked the same habitats for the same reason as in the previous two polls. Riparian are crucial corridors and include the surrounding land a bit more than the term riverine (as I interpret it). Headwater systems are key to large system health. While sage and grassland systems are disproportionately impacted by people

Linh Hoang: selected riparian - non-native fish huge impact native fish, - also selected drier habitats as most vulnerable to new invasive species establishment and competition

Sean Finn: The invasives that capture my focus are those having or potentially leading to intense system breakdown. Cheatgrass in terrestrial, mussels in aquatic

Carl Scheeler: Invasive annual grasses impact on shrub-steppe cover types ability to withstand fire is huge! riverine systems ability to transport invasives puts riparian and aquatic systems at disproportional risk.

Matt Heller: A lot of consv. efforts for sage shrub, big need

Molly Cross: riverine = concerns about native salmonids - biggest threat today is non-native fish, which is exacerbated by climate change...and solution to deal with climate change (increase connectivity) is the opposite for dealing with invasives (isolation). Not surprisingly I chose the native trout species on the taxa list, too.

Brittany Morlin: riparian and reed canary grass

Molly Cross: I also flagged sage steppe because of obvious issues with cheatgrass, fire, etc.

Brittany Morlin: We agree!

Jill H: Again, being from the aquatic side of things, I have to select those as super vulnerable invasives

Erin Sexton: Overall, Invasives is an easier Stressor to crosswalk with targets because the impacts are better documented and the threat is more tangible (as opposed to climate change).

Molly Reuling: Threats to waterways from mussels and threats to grasslands are huge

We are seeing huge aquatic invasive plant populations at the mouth of the Yakima River that threaten migration of salmon and steelhead.

Invasives move along the path of least resistance. Could the LCC create a model that ranked aquatic and terrestrial invasives by economic and ecologic impact and then use that model to target LCC work? Perhaps this has been done? A repeat of an earlier question--is anyone working aggressively on terrestrial invasives?

selected these with the idea that invasives represent the greatest threat both to these and related systems and also it is these systems that can provide the greatest pathways for invasives. Obviously this does not apply in all cases.

Invasive species compromise the connectivity habitat values on these systems.

Important connectivity areas are likely areas for within and across annual temporal movements. I assume invasives would be most important in areas that provide connectivity for cross-generational movement, and associated with less mobile species

Connectivity X Invasives: Taxa

Molly Cross: For native salmonids - need connectivity for climate change, but connectivity often brings non-natives, their biggest concern

Geneva Chong: I picked one fish for issues of aquatic invasives. I stuck with two sage/grassland umbrellas because of the impacts of invasive plants on fire and loss of native sage/grassland systems.

Tom Olliff: sage grouse-cheatgrass; wbp - blister rust; fish -non-native fish and AIS

Charles Curtin: I picked the same five for their intrinsic importance as indicators, but in many case I do not know enough about the species interactions with invasives to articulate justifications specific to invasives

Sean Finn: Sage-grouse and some aquatic spp are most threatened by invasives ... what are invasive impacts on connectivity though?

Brittany Morlin: Invasives and whitebark? Insect?

Geneva Chong: Additional note as I keep including mule deer - recent study I heard about from UWY: CWD could result in zero mule deer in <50 years. Mule deer receiving significant amount of attention now/ongoing because of habitat loss, population declines - high profile umbrella species.

Joe Adamski: Threat of impacts to species /habitat by invasives most importance

Carl Scheeler: Non-native fish impacts to natives is huge as are the impacts of annual grasses to shrub-steppe dependent species

Charles Curtin: So this is really more an indication of overall relevance as indicators, than specifically addressing your question regarding invasives

Ian Dyson: Native specialists have a tendency to show they can be anthropogenic specialists when push comes to shove (pronghorn). Also most aquatic systems are horrendously compromised already. Less a food than habitat issue for most species.

Geneva Chong: I don't know if chronic wasting disease (CWD) counts as an "invasive" but something to consider.

Regarding what's not being done--or perhaps I just don't know about it--do we consider disease when we are talking about invasives? I select CT just because, for example, of whirling disease. How can the LCC add the most value? Hmm... for this or any topic, how about creating GNLCC Centers of Excellence or perhaps Centers of Conservation as a way of parsing money in each funding cycle? Once this crosswalk shows the key focus areas, then state that 20% of LCC funding will go to priority A, 20% to priority B, etc. The RFP is driven by the GNLCC Centers of Conservation. Those who are awarded are given a certificate that declares them "2017 GNLCC Fellow for the Invasives Center of Conservation." To be a fellow requires a talk, a video, a paper, etc.

I am not sure any of these species list reflect much sensitivity to invasive issues as affecting connectivity. Based on the premise that I had to select some species rather than none, I chose the above. But my logic about wetland/riparian habitats and systems being important related to connectivity does not seem to "connect" with species connectivity issues as seen here. And are we clear on what we mean by "invasives". What about disease affecting whitebark pine or nonnative fish species?

Invasive species compromise the connectivity habitat values for these sensitive species.

Less mobile species associated with ecosystems identified above.

AQUATIC INTEGRITY

Aquatic Integrity X Climate Change: Ecosystems

Erin Sexton: I Love this Process!

Carl Scheeler: Kind of obvious that the aquatic systems would be most important here.

Sean Finn: Thanks Erin! As always searching in a dark room...

Tom Olliff: We are already seeing huge impacts in wetlands (see Greater Yellowstone I&M and USGS reports on amphibian monitoring); also big changes occurring and projected in riverine and riparian

Charles Curtin: Riparian and riverine were easier choicee. In terms of wetlands, lakes, watershed uplands I chose wetlands for it seems more all encompassing from an aquatic perspective

Ian Dyson: Thx Carl, I'll quickly untick woodlands, dry adapted forests and sage shrub!

Molly Cross: Wetlands will be a critical source of water and water storage as snowpacks decline

Geneva Chong: I decided to "go weird" on this one for the sake of discussion. If we broaden "aquatic integrity" to encompass hydrologic integrity, then these dry, but highly productive upland systems become critical related to climate change - these cover vast areas and are likely to transform to drier, less productive systems under climate change - then we lose vast amounts of habitat (sagebrush, woodlands, forests).

Melley Reuling: agree with wetlands and riverine

Tom Olliff: I thought about that too, Geneva, but decided to go with the obvious

Jill H: Watershed uplands are important too

Focus of this goal is on both water quality and quantity. Also, a major emphasis for aquatic integrity includes connectivity of floodplains to their rivers.

Changing climate seems first and foremost to be witnessed in changing hydrologic regimes. Most urgent need-- focus on riparian areas because they are tied together/are relied upon by the most species and thus give most bang for the buck.

mostly concerned about warmer and drier climate with changes in the timing and amounts of precip affecting aquatic integrity

Systems vital to aquatic integrity that are most impacted by climate change.

Climate change is assumed to affect water flow and temperature regimes

Aquatic Integrity X Climate Change: Taxa

Carl Scheeler: Likewise, aquatic dependent species Mr. Obvious

Brittany Morlin: And swans!!!

Tom Olliff: ditto Carl

Matt Heller: I may actually get done early on this one

Charles Curtin: I immediately picked the 5 aquatic species or animals more reliant on water

Sean Finn: Yeah, we called out aquatic integrity specifically when defining the Conservation Goals ... makes sense we've consistently indicated its important

Charles Curtin: So this was more a vote by default - my sense is your process works less well with these species

Geneva Chong: Please see my comments for ecosystems - why I picked two sage/grassland umbrella species and salmon as an integrator for aquatics.

The rate of change caused by climate change is the key here, so LCC focus should be on those species that have the least ability to adapt over a short time.

I think this one was relatively easy.....if I see it right.

Key taxa in aquatic systems.

Species associated with ecosystems identified above

Aquatic Integrity X Land Use Change: Ecosystems

Tom Olliff: highways and wetlands--huge impacts since they are linear features with a lot of earth moving

Jill H: I feel that if we focus on riparian corridors, wetland and watershed uplands the riverine component will be taken care of as well

Matt Heller: Thinking of Land User Change made me swap out one from previous poll. Swapped Rivering with Watershed uplands

Ian Dyson: FO clarity - as per Erin's original definition - I am assuming riparian corridors captures the riverine systems.

Tom Olliff: good point, Jill

Geneva Chong: I went with some traditional/obvious here and kept sage/grassland because of, for example, impacts of energy development that change hydrologic systems (e.g., hydro-fracking) such as altering water quantity (groundwater, surface flow) and quality.

Erin Sexton: With adequate buffers around all water features in a landscape (including all of the above on the list), there would be real gains toward protecting aquatic integrity through best management practices, rather than singling out particular aquatic systems- this is either a regulatory measure or voluntary best practices.

Melly Reuling: irrigation and agricultural practices effect riverine in particular

Land use change stressor has same impacts on aquatic integrity goal as Large Block goal.

This feels like a repeated answer. LCC can have most impact working with people who cause land use change that most impact the aquatic ecosystems -- that is the private land owners living in the bottomlands be they farmers, ranchers, or second home owners.

I chose those I thought were most susceptible to land use change.

Systems of importance to aquatic integrity where land use change is biggest threat.

Habitats that would be subject to land use alteration that are also related to aquatic systems

Aquatic Integrity X Land Use Change: Taxa

Sean Finn: Again, don't mean to simplify but 'land use change' is primarily a low elevation stressor therefore I chose fish species that are associated with lower elevations, also swans as they primarily use low elevation lakes and wetlands

Charles Curtin: Again, I just picked the 5 species directly reliant on water. While in reality indirect effects are key and other indicator species may be more valuable as indicators of overall landscape and ecological function

Tom Olliff: ditto Charles

Carl Scheeler: Again, aquatic dependent species seem most appropriately associated with aquatic integrity.

Geneva Chong: Same points here - land use change such as energy development impacts hydrologic/aquatic integrity that directly impacts these species' habitats. Also, seasonally, aquatic systems are critical for these taxa.

Geneva Chong: I should have said "wet" systems.

Erin Sexton: Agreed on riparian species, but lots of data to support the importance of bears needing access to riparian areas for life history

Again, as before, my thought here is that timber practices have an impact on bull trout, who of the species shown are to me the most vulnerable and thus deserve the most LCC attention.
self explanatory

Species closely associated with habitat identified above and sensitive to integrity condition

Aquatic Integrity X Invasives: Ecosystem

Brittany Morlin: Riverine and wetland... reed canary grass

Carl Scheeler: Great one Brittany.

Erin Sexton: Same comments as earlier that large freshwater lakes (not a currently identified ecosystem) are one of the most impacted systems with respect to AIS and pose some of the biggest risks with respect to river-lake connectivity.

Sean Finn: I'm thinking about isolated wet systems here and intentional or accidental IS introductions; potential to destroy endemic spp as well as ecosystem function

Geneva Chong: I included the non-traditional sage/grassland because conversion to cheatgrass would have profound effects on hydrologic processes.

Charles Curtin: I picked the same big three (recognizing that watershed uplands are also extremely important). However, in this case I see wetlands as especially threatened by invasives. I also emphasized watershed uplands because through them invasives can spread to the rest of the system.

Jill H: I did not select watershed uplands on this, but kept with the other aquatic habitats. However, I do feel that invasives and watershed uplands can be an issue in water uptake by trees and plants that could otherwise be conserved as groundwater.

Jill H: But, admittedly I am not a plant tree person so I am not sure which species are worse or better for those systems.

LCC role = (1) education not enforcement, (2) being information clearinghouse to create data base to answer the question posed here -- who is doing what *across the entirety of the LCC* and when assessing that, what are we missing? #s 2 would be a huge add.

self explanatory

Running out of time and need to head to a meeting -- no way to save. Limiting comments from this point.

Aquatic areas vulnerable to degraded integrity due to invasives

Aquatic Integrity X Invasives: Taxa

Geneva Chong: I selected salmon for integrator terrestrial to ocean, cutthroat trout related to invasives (disease and other fish) and grizzly bear related to need for physical habitat (?) and food source (fish).

Sean Finn: Invasive brown trout detrimental to cutthroats

Ian Dyson: Less (already) recalibrated invertebrate ecology than invasives that have potential to destroy food chain/habitat (mussels/didymo) or competition/genetics (non native salmonids)

Charles Curtin: I picked the same five due to their association with water. But recognize in reality much more complex interactions may be occurring and other species may be better overall indicators. I just do not know enough about these interactions. This highlights a crucial research gap that we may not know enough about large scale interactions

I default back to considering disease in the invasives category. If so, then impact on terrestrial species like grizzly when disease (whirling) and invasives (Lake Trout) decimates food source (CT).

self explanatory but not sure the spp are what we are concerned about when we talk invasives

Resident aquatic species most likely impacted by degraded integrity

DISTURBANCE

Disturbance X Land Use Change: Ecosystems

Charles Curtin: Same determining factors of picking habitats impacted by humans, and that have cascading impacts on the rest of the system

Molly Cross: I am wishing that there were a floodplain category, as that would be my # choice

Charles Curtin: while being broad in geographic extent

Carl Scheeler: I believe that aquatic systems will be most constrained by human development. We will not permit the natural dynamics that create and maintain these systems

Molly Cross: Since no floodplain option, I'll select riverine

Tom Olliff: cheatgrass and fire are already impacting sage; higher density of housing in low elevation woodlands increase problems with WUI, fire fighting, and affect fire frequency (as more fires are controlled)

Jill H: I tried to cover all bases here riverine, alpine and woodland - ok I left out sage shrub but someone else will include it

Geneva Chong: I am answering with umbrella related to development/use (riparian includes use of water, not just footprint on the land).

Erin Sexton: Aquatic systems, Forests and Sage shrub grasslands, seem to most vulnerable to disturbance regimes across the landscape

Melley Reuling: riparian corridors and other water most impacted by humans, and sage /grassland

Ian Dyson: Struggling here - I think disturbance regimes will be operating out of normal range and impact all ecosystems - don't think its helpful to focus on selected ecosystem components

Sean Finn: trying to think about severity and frequency

Erin Sexton: Perhaps we could look at the vulnerability of each of the targets to the cumulative impact of all of the stressors combined and see what rises to the top as most at risk??? (not sure if we did this in an early iteration of the framework and plan)

Molly Cross: selected forest systems because of concerns about being able to maintain natural fire regimes as humans develop into the WUI

Jill H: hydrologic regimes are likely to shift with increased development and tapping in to river flows water demands

Geneva Chong: disturbances fire, flood, drought.

Again, focus on wildfire. LCC adding the most value? Perhaps with modeling efforts that reveal areas most susceptible to wildfire not with the intent of stopping it, but with the intent of (a) helping locals plan fire breaks, travel routes, home protection, (b) determining interface of how likely future wildfires might impact susceptible species and creating "hotspots" (sorry) map of vulnerability.

focused on those expected to show the greatest change because of disturbance (fire and hydrology)

With forest fire, I don't think we can have meaningful impact at large scale. We might focus on aquatic ecosystem impacts.

Would increased energy development reduce fire frequency? Not sure

Shrub steppe and woodland having significant changes in disturbance partly due to fragmentation and loss of the cover type on the landscape; riparian disturbance regime due to river control (dams & diversions) a high conservation concern

Disturbance X Land Use Change: Taxa

Brittany Morlin: swan, lack of water, and land development

Brittany Morlin: lynx, forest, and fire

Charles Curtin: Same justifications as in the past. I picked overarching indicator species such as bear, prongs, and deer. Trout as an aquatic indicator for they need clean water that is impacted by surrounding land use. While Lynx are sensitive to human action

Tom Olliff: I picked salmon and steelhead because of land use change (dams) affecting river disturbance regimes (floods, flow, etc.)

Brittany Morlin: lynx, forest, fire, insects, and disease

Geneva Chong: picked mule deer as sage/grassland umbrella and grizzly for large carnivore needing large areas. salmon for all things wet.

Carl Scheeler: fire will continue to be controlled to the detriment of native habitats. low elevation anadromous fish will be most impacted by constraints on natural floodplain function

Molly Cross: would pick species most dependent on fire-dependent systems (not knowledgeable enough to know which those are) and species that are dependent on natural floodplain processes (picked salmon and cutthroat for now but not sure those are best species to represent those concerns)

I am thinking about grassland fires and sage grouse and pronghorn and wondering if fire doesn't improve (eventually) the range. Whether yes or no, how about changing the paradigm? What if the LCC put some focus on disturbance and the ecological *positives* it brings about. Surely no group is currently charged with that task.

fire and water disturbance regimes were the drivers

because land use change tends to be a low-elevation phenomena, I focus on bottom land species. The exception is Canada lynx where the disturbance is shifting fire regimes and the land use is improper salvage logging.

-----END of January 12 Session-----

Disturbance X Climate Change: Ecosystems

Disturbance regimes for salmon and lamprey will be triggered by impacts to the surrounding terrestrial areas including fire, loss of snow accumulation/change in runoff amount and timing, and development in riparian corridors.

I am not strong in this topic but to me the impact of climate change on disturbance will be/already is most strongly seen in forest fires. What about dropping all else and having the LCC *only* focus on wildfire in this realm?

Fire, insects/disease - will sub-alpine and sage/grassland habitats regenerate to something that can accommodate similar species or are we facing novel ecosystems; potential changes to timing, magnitude and duration of hydrologic regime - constriction and lack of riparian corridors

hydrology changes for riparian corridors and fire disturbance for forests and sage shrub

I selected the systems I considered the most impacted by the interaction of disturbance and climate

Stand replacement wildfire fires will increase with climate change and most relevant in these habitats.

Disturbance X Climate Change: Taxa

With my focus on fire, I am simply selecting species I assume are impacted by wildfire the most (essentially all are, I recognize, be in where they live, water quality, etc).

picked both shrub-steppe species affected by fire disturbance and aquatic spp affected by hydrological and temp disturbances

I picked what I considered to be key indicator species. White bark pine at higher elevations. Sage grouse in sage systems at mid elevations that are impacted by habitat change. Pronghorn for a widely ranging grasslands species that needs connectivity. Grizzly as a wide ranging carnivore and Lynx because of their sensitivity to disturbance and human action

Species most impacted by stand replacement fires

Disturbance X Invasives: Ecosystems

Could the LCC create new knowledge around the concept that fire opens up ecologic niches for fast adapters (often invasives) to exploit? What species come in, how fast? And can selective fire also be used ... hmmm ... as a treatment to remove those species?

focused on those I felt would be most affected because of changes to fire and hydrology regimes

I selected those habitats I considered most impacted by invasives. I saw riparian and riverine as somewhat interchangeable - but selected riparian assuming it was a bit more broadly inclusive

Riparian corridors: critical disturbance regimes - flooding and fire (some systems good, some not) are generally disrupted and include interactions with invasive species to the detriment of native species. Watershed uplands: I used as the catchall for veg systems, including those in the WUI (someone brought this up on the first call) where disturbances could range from fire to flood, extreme weather, etc. - strong interactions between fire and invasive/veg structure and composition change. Sage shrub/grasslands: significant interactions between invasives and fire resulting in large-scale habitat conversion and loss of productivity.

Sage steppe the poster child for this combination. I selected riverine and wetlands due to the potential ecosystem disruption invasives may cause.

Disturbance X Invasives: Taxa

Inventory of what invasives come in after fire or mudslides etc. Then, determine if climate change and / or land use change are accelerating that process and to what extent and map vulnerabilities across the LCC.

mostly thought about shrub steppe and dry forests

I highlighted native trout, sage grouse because of the impact of invasives in sage systems, and pronghorn because of their apparent sensitivity to forage change and forage quality.

Fish as integrators of watersheds - cutthroat trout for specific emphasis on high elevation/cold systems -influenced by disturbances such as flooding, fire, drought and interactions with invasives including disease. Greater sage-grouse for sagebrush system. Mule deer for integrating sage-brush to high elevations (which are likely to experience greater impacts from invasives with climate change).

Two guilds: shrub steppe associates and low-elevation fish (at least lower than bull trout). Depending on your definition could consider rainbow trout invaders of BT habitat but I went with conventional definitions and the lower elevation fish are faced with diverse aquatic invasive species.

Cultural Goal X Land Use Change: Ecosystems

difficult choice. The changing ice/snow regimes in the northern GNLCC, and the major fire events in the sage/grasslands of the southern GNLCC, have been noted by many tribal and traditional communities as experiencing accelerated rates of change/impacts. Tangible cultural heritage resources (e.g., sites; features; buildings) and the landscapes themselves are under threat.

I am thinking about First Nation dependence on the uplands for food and medicines and how those are impacted by changes in settlement, and extractive industries.

not sure if I know what " watershed uplands" means when I got to thinking about it. At least in terms of how I might differentiate it from other systems/habitats. Focused on those private land areas most likely to undergo land use change.

Same selections as above for the same reasons

Assume land use change would take away from rural working landscapes and move into urbanization

Riparian corridors intended to represent all things related - including hydrologic connections with groundwater use. Watershed uplands intended to include woodlands, forests, etc. Sage shrub/grasslands for large areas of ag conversion, energy development, general land use.

Cultural Goal X Land Use Change: Taxa

Bear, salmon, bull trout, sage grouse are all culturally significant species (although the others are, too--these seem to be iconic to tribal and traditional communities who share their ecosystems). Whitebark pine is a keystone taxon to the upland ecosystems of the GNLCC and losses due to climate change and disease are likely to affect many culturally significant species and landscapes.

Grizz are critical for many native populations and being so habitat squeezed, susceptible to almost any and all land use change.

selected those most iconic species that I expect to be affected by land use change (positive and negative)

Same selections except I did not select the pine for it is probably above most land -use change. Bull trout due to need to clean water is a good assay of upstream land use. The other selections were for the reasons outlined above of each are an indicator for a particular system.

Reduction in rural working landscapes would affect these economically important species

I chose wide-ranging species (salmon and grizzly) and those dependent on certain systems experiencing extensive change for different reasons.

Cultural Goal X Climate Change: Ecosystems

People, like critters, focus in inordinate amount of their time and culture and economies in the vicinity of water. Climate will change the hydrologic character of the west. The LCC should focus here.

assuming changes in water availability will drive cultural goals in these systems

Water resources, if depleted or interrupted, will likely trump other impacts. Focus where we can.

I picked those systems that are most likely to have human impacts and cultural values. It was a bit of a toss up between fire adapted forests and watershed uplands as I assume they are often the same places. I picked watershed uplands thinking this term was a bit more broadly applicable and that heads of watersheds (everything else being equal), were more significant than a forest that was not near a headwaters.

Assume climate change would change working landscapes, grazing and timber management, hunting and fishing

Riparian corridors: water. Watershed Uplands: where people live, water. Sage shrub/grasslands: most productive dry system we have that we stand to lose most quickly.

This one is hard! All of our targets are biological/ecological. Takes careful thinking about how cultural element intersect. Humans gather at the water's edge, climate impacts on water resources will adversely impact culture.

Cultural Goal X Climate Change: Taxa

Here I would put singular focus on the species that are emblematic of the cultures of the GNLCC *and* may have the hardest time as the climate changes rapidly. There may be more, but that's the criteria.

focused on those I felt were most susceptible to climate change and that are most important to human culture

Same selections for the same reasons

Habitat impacts to economically important species identified above

I selected species that are directly culturally/economically (salmon, mule deer) important and others that represent systems that are culturally/economically important (sage-grouse, white-headed woodpecker - NW forest type, wolverine - high elevation/snow large range intactness).

Which are the most culturally significant taxa? Those in the human food chain; and the grizzly bear totem.

Cultural Goal X Invasives: Ecosystems

The impacts from invasives are felt in riparian corridors, where important traditional food and material species are being threatened. I mention the dry fire adapted forests and sage/grasslands because stand-changing fires are opening up niches for invasives to colonize aggressively, changing culturally significant landscape characteristics and replacing culturally important plant and animal resources.

Impact of invasives on native people for food and traditional medicine sources.

focused on those areas felt to be most important culturally that are important in terms of the invasive threat

Same systems for the same reasons as outlined above.

My top 3 trying to cover everything :-)

Cultural Goal X Invasives: Taxa

whitebark pine are threatened by invasive diseases; salmon threatened by downstream invasives (sea lions) and others; cutthroat trout threatened by lake trout and whirling disease; sage grouse threatened by loss of habitat due to fire and energy development; burrowing owl threatened by grazing and pets. all of these are culturally important species.

Aquatic invasives may dramatically change the species mix of aquatic systems, to the detriment of native people (and non-natives), be it for traditional foods or recreation values.

most iconic

Same selections as above -these are key indicator species. Bear perhaps less so than the others.

Economically important species sensitive to invasives

Integrators of systems likely to be impacted by invasives.

GENERAL CHAT

Sean Finn: Good morning!

Linh Hoang: morning - I see slide

Matt Heller: Yes

Tom Olliff: yes

Brittany Morlin: yes

Ian Dyson: Yes

Geneva Chong: All, I am sorry, but I need to listen in to another call until about 9:30. I am watching the screen.

joe adamski: yes

Brittany Morlin: Yay! We passed!

Geneva Chong: This is a really cool tool. Thank you. Ian, you are cracking me up!

Elsa Haubold: We would provide door prizes if we could. Thanks for sticking with it. --Mary

Geneva Chong: More soapbox: I think it is time to elevate mule deer in discussion because: chronic wasting disease, indicator/umbrella for habitat quality including connectivity from winter range (sagebrush) to summer (higher elevation), huge social and economic value.

Tom Olliff: Sean, are the 4 filters of "Where are we going" going to be explicitly factored into the priority process? I think we ought to add them as another filter along with "Common Landscape Issue" and "Geographies"

Geneva Chong: And more: consider using base data layers from the fire refugia project to get full GNLCC area view/coverage as you look at where things are being done, needed, etc.

Linh Hoang: thank you

Brittany Morlin: Thank you Mary! Great work Sean!

Jill H: Great meeting format.

Geneva Chong: Thank you!!!

Elsa Haubold: --End of Jan 12 session

GNLCC Priorities Crosswalk 2 - Adobe Connect Chat Comments, Jan 26 2016

1. In addition to four questions, please provide other questions that GNLCC should focus on when prioritizing resources (staff time, funding, capacity, outreach)

- What is greatest landscape conservation need?
- What is most urgent landscape conservation need?
- Where can GNLCC add most value to landscape conservation?
- What landscape conservation issues are others not addressing?

Brittany Morlin: What and where is the 'greatest' need and where can GNLCC add most value/be most effective. Get the 'biggest bang for our buck'...

yvette converse: also, we still need to get many other individuals and organizations to weigh in...

Sean Finn: There's lots of conservation action ongoing ... an important question is how/where can GNLCC be most effective. Urgency is important because if we lose something now, it's gone

John Pierce: Votes are weighted in context of what should GNLCC should prioritize

Cynthia Wilkerson: What critical landscape conservation issues are not being addressed that the GNLCC is well poised to address?

yvette converse: Also the AT and SC will ultimately be deciding on our priorities...this exercise is providing some rationale and assessment to that end but will not be the only thing going into that.

Michael Whitfield: Definition of "large landscape" is key. Lots going on at regional scale, but GNLCC is the game for the really big picture and the linkage among regional efforts is key.

yvette converse: exactly Michael

Linh Hoang: what is most urgent need AND what needs are not getting attention - AND how can GNLCC help coordinate and contribute to knowledge base and actions to address these uregent needs and those not getting the attention needed

Brittany Morlin: Yeah, I thought the sixth goal/stressor was distrubance regime and climate change, which makes total sense to me (actually I would have rated it higher), but then I see disturbance regime and invasives on the spaghetti diagram of connectors. I just appreciate that none of the combos are 'thrown off the boat'... we can revisit later.

Molly Cross: I selected greatest need and where GNLCC can add the most value. I agree with Michael that addressing issues at a larger scale than most others are currently working is key.

Steve Waste: Most value = address opportunitis for preventative conservation actions versus curative restoration actions whihc are more expensive and outcomes are less certain

Cynthia Wilkerson: How can the GNLCC support and catalyze place-based collaborative landscape conservation?

yvette converse: me too Molly!

John Pierce: What is greatest need is a difficult question without having a conceptual model developed to understand how one action might be critical over another in achieving the goal.

Brittany Morlin: Just because it's urgent doesn't mean it's important, might have to let some things go. Keep our eyes on the collective prize

yvette converse: yup

Molly Cross: I agree with John that defining "greatest need" is not necessarily a simple exercise

Brittany Morlin: And just because it's not receiveing attention doesn't mean that we can effectively do anything about it...

Brittany Morlin: Me too Yvette and Molly!

Sean Finn: Agree Molly and John. Very difficult or impossible to quantify "greatest need". So many ways to slice the pie. This more akin to a expert-driven approach

John Pierce: Others may be addressing an issue, but having a GNLCC focus could facilitate/enhance/align (Thanks Yvette) what others are doing

Brendan Moynahan: I intially chose 'what are others not addressing' as one of the top two, but then realized that it conflicted with my interest in seeing the LCC add the most value. I think partnerships/leveraging/connecting is key, and the LCC could get lost by trying to pursue something that others are not addressing. So, I selected (1) what is the greatest need and (2) where can the GNLCC add the most value.

Steve Waste: Greatest conservation needs = stressors which have widespread impacts (contaminants, invasive spp.) and for which there is no clear leadership or single lead entity, and consequently falll through the gaps between management agency perogatives

Cynthia Wilkerson: In defining "greatest need" we need to understand the stressors and the targets, but also understand the good work that IS happening and how we can fit into that context/support/catalyze. We don't have to do it all with one body.

yvette converse: True Steve...we will have to think about those particular issues when we get through this and see if it rings true (as falling through the cracks)

Michael Whitfield: None of our efforts have much value or interpret to much progress until we engage with people at all levels up and down the communication chain. Vital to fully articulate our goal 5 as the other 4 hinge on the socio-economic-cultural connection.

Molly Cross: I also had the same thought process, Brittany, on adding value vs. working on issues not being addressed by others. Perhaps one way to think about the "not being addressed by others" issue is the scale question that Michael first raised - we should be working at a scale that is necessary for large landscape conservation and perhaps often at a larger scale than others are.

Kim Trotter: Where can the GNLCC add the most value to landscape conservation and what are the greatest conservaiton need. I also like the idea of catalyzing on0the ground conservation.

John Pierce: Brendan - changing the last question to "what issues that others are addressing that need help" - would address your thought

Cynthia Wilkerson: Absolutely agree with Michael. Have to engage people and decisionmakers at all levels.

Brittany Morlin: I really like where we can add most value... leads right into solutions. Can we intervene, increase resiliency, resistance, etc

Brendan Moynahan: John - good idea. wonder if that would result in much overlap with 'greatest conservation need'?? Don't know, just thinking.

yvette converse: harp harp harp (Seal)

Brittany Morlin: I think Brendan and John, 'add most value' also addresses

Question 3 gets at the heart of it. The GNLCC is on a conservation implementer; it is a collaborative of conservation implementers. Therefore, the greatest conservation need may be information which would be a great value-added product for the LCC.

1. I think the greatest landscape conservation need is to develop and implement connectivity strategies at multiple scales. Because there is no one scale or species that signifies or delineates connectivity, it must be conveyed and implemented at multiple scales. And because it is a relatively vague and conceptual idea that is both intuitively understood but practically difficult to make happen, I think it represents the greatest gap or need. 3. I think the GNLCC can add the most value to landscape conservation by identifying what it is that prevents its members from addressing connectivity. Is it \$? Is it politics? Is it data? By doing a gap analysis on this issue, I think the GNLCC can become the greater whole of its individual members. Through the GNLCC, the members can then work to fill the gaps that prevent connectivity implementation, assessment, data, models, etc

I think the answers to these questions may be different than where leadership of the LCC is willing to go, i.e. the greatest landscape conservation need is often in arenas of implementation and policy. These questions should be framed by some sideboards or context as well. In complement to the question on adding value, I think there is an opportunity to add an element of scale to this question: at a landscape scale and then where more locally where

the GNLCC can play a unique role in adding value to efforts valued by GNLCC members/partner forums/tangible pilots that can provide examples of repeatability or catalytic change.

The four questions by stressors and goals:

- Land Use Change-Connectivity
- Land Use Change-Large Blocks
- Land Use Change-Cultural Goal
- Climate Change-Large Blocks
- Climate Change-Aquatic Integrity
- Invasives-Disturbance Regime

2A. What is greatest landscape conservation need?

Cynthia Wilkerson: the cultural goal drives the on-the-ground changes. so, 2A for me is about on-the-ground, but 2B is what we need to address now to succeed in addressing 2A

yvette converse: good point CW

yvette converse: darn..i picked two...hard to pick one. will think about it

Brittany Morlin: Climate change/ large blocks; we are at a point where novel ecosystems may result after disturbance; what does that mean for the critters that use what exists today? Chaos vs transition. Humans are absolutely integral to what landscape looks like in future, so land use change-connectivity also huge!

yvette converse: But water/cc is key

Brendan Moynahan: This is a very thoughtful and effective way to address a very complex task... Very good work, GNLCC team.

Brittany Morlin: Yeah, Yvette... I'm re-thinking...

Cynthia Wilkerson: Agree with Brendan - well done. And fun too!

Steve Waste: Water is the life blood of every ecosystem. Decrease and/or changes in the timing of water availability throughout the west will impact aquatic biota, which in turn will impact terrestrial species (avian, mammals, herps) dependent upon wetland and riparian habitats.

yvette converse: i can also see where we need John's cc/connect/cultural on this one...the trifecta

Sean Finn: IMO, the big issue in the west is water availability for humans and natural systems; though land use change will have deep impacts, ultimately if climate shift intensely reduce the volume of water it will have devastating consequences for humans and ecosystems

joe adamski: Thinking the rate of change invasives influence the landscape and the effect of that change is the greatest conservation need

yvette converse: true Joe...its huge

Brendan Moynahan: a note for the record that I'm thinking of "connectivity" in the first option to include not just polygon connection but connection/continuity of aquatic systems (thinking riparian systems in particular). My preference would be for a 'land use change - aquatic integrity'

Brendan Moynahan: option

Linh Hoang: at landscape level - connectivity is important for ability of resources to move and reassemble and adapt - and large blocks, cultural goals, disturbance regimes and aquatic integrity all influence connectivity

Molly Cross: I selected climate change and aquatic integrity for similar reasons already vocalized by others, but would want to see this go beyond a focus on fish, to include riparian/floodplain hydrology, wetlands, etc. as others have indicated in their comments.

yvette converse: and it starts to flow into disturbance w/ drought

Erin Sexton: To Molly's point - perhaps we could define the aquatic environment as the entire floodplain, including the hyporheic zone

Brittany Morlin: Without water, we have nothing.

2B. What is most urgent landscape conservation need?

yvette converse: to me urgency is to shift how we think (cultural) wrt land use....

Michael Whitfield: GNLCC participants are beginning to pull together lots of information (data) to inform how we conserve large landscape integrity and connectivity, but we are lagging in our engagement with the people who will select, implement, and steward the conservation actions that are needed.

Brittany Morlin: You're swaying my vote today Yvette...

yvette converse: good point michael. (and you mine BM)

Brittany Morlin: We definitely need a paradigm shift

Erin Sexton: Achieving the cultural goal seems to be the common underlying or foundational goal that we have to achieve for success in all of the other areas.

Sean Finn: We are already seeing influx of human immigrants. Changing land uses must be addressed immediately or we risk creating 'sky islands' of wild reserves separated by impenetrable barriers in valleys

Cynthia Wilkerson: Erin, I like the "foundational" term. Fitting.

Steve Waste: Invasive species can out compete natural species or even take them out of a system, but we usually cannot take the invasive species out of a system, once it has penetrated...like letting the bad Genie out of the bottle

Linh Hoang: aquatic integrity most urgent - based on high risk and immediate high consequences to resources that depend on them

2C. Where can GNLCC add most value to landscape conservation?

John Pierce: Is cultural goal best addressed at local level, assuming a nonregulatory solution

yvette converse: this might be where rubber meets the road in terms of GNLC role...hmmmm

Molly Cross: I think the added value comes from doing science, science translation, and conservation coordination at a larger scale than is typically being done. I picked LUC-Conn because thinking about connectivity at a large scale is needed, and CC-large blocks because I think that considering how climate change will influence ecosystems across the entire GNLC will be critical to thinking about whether/how we can achieve place-based conservation goals as well as large landscape conservation goals.

Michael Whitfield: I continue to believe that GNLC is and should be the go to venue for big picture landscape connectivity. At the same time, I think GNLC could and should play a major role in supporting efforts to get people engaged at all levels. I have to pick two here for that reason, LUC-Connectivity and LUC-cultural goal

Brittany Morlin: I think we need more info to be able to more accurately address this question... who's working where, doing what? Can we partner to be more effective, or is it better for us to tackle that which no one is working on. I agree Molly. May be the vehicle we need to invoke paradigm shift

yvette converse: i want to pick cultural b/c of reasons Erin and Michael have stated...but am inclined to agree w/ Molly in terms of GNLC role. not sure

Sean Finn: Though I'm tempted to answer Land Use/Cultural Goal, I don't know that GNLC can do much about cultural change. Our focus needs to be on partnerships that are working in dynamic human-natural systems and our impact will be on protecting and restoring the connections that are left (or have the opportunity to serve connectivity functions).

John Pierce: I have to follow Michaels'

Erin Sexton: We need networked large landscape scale collaboration to be effective in addressing Invasives - this is tough!

Cynthia Wilkerson: I think that we should continue with the connectivity piece, but there is a lot of that now. We could add a lot because of our scale to the cultural issue by highlighting what's working and pulling together the info from the local level work about what the needs are and working at the large landscape scale to address them

Brittany Morlin: Bring about cultural change via our dissemination of the land use change-connectivity science.

yvette converse: yes

Brittany Morlin: Really great visuals come out of connectivity work fo public dissemination

Linh Hoang: coordinating and looking at big picture beyond the jurisdictions cor connectivity

joe adamski: I agree with landscape scale collaboration efforts addressing invasives

John Pierce: to complete my sentence - GNLC's role in Goal 5 is to build capacity and facilitate a discussion

Cynthia Wilkerson: Brittany - absolutely, visuals are essential and we have the skills to create them.

Steve Waste: The identification and protection of aquatic thermal refugia from land use change is critical for maintaining connectivity between aquatic habitats for a number of fish species

yvette converse: this might become more clear when we start to talk about the common landscape issues later in this session

2D. What landscape conservation issues are others not addressing?

John Pierce: Lot of attention is being paid to connectivity. Don't want to take our foot off the pedal

John Pierce: We (that's the big We) need to do a lot more figuring out how to address climate change across the GNLCC

yvette converse: i some ways, it seems like we're using 'connectivity' as a surrogate for climate...in that we need to have that basic science/understanding in order to understand how climate will change things wrt connectivity

Kim Trotter: Engagement of our communities - native and rural in particular - often go unaddressed in large landscape conservation.

Brendan Moynahan: agreed. yvette... connectivity can be thought of as something important in its own right, but also serving a need to be conservative in the face of uncertain CC scenarios

Erin Sexton: The most effective way to "manage for climate change" is to decrease/mitigate for other stressors - invasives, land use change

Sean Finn: I just recognized a logic flaw here - it may be that the other Goal-Stressor combinations we evaluated in Crosswalk 1 scored low BECAUSE they are not being addressed by others. Alas, hoping the baby steps help us grow

Cynthia Wilkerson: I am with you, Kim. Finding ways to engage local communities directly in landscape issues - at this point getting them to even consider it is difficult to do without triggering ideology. Need innovative ways to engage - like this kind of interactive forum!! With visual images of potential futures, etc. There's a lot we could do with the tools and approaches that we use for detailed LCD that could be applied by partners at the local level.

Michael Whitfield: I believe that the big challenge for conservation of landscape scaled connectivity in a setting of a rapidly changing climate is going to be more of a cultural problem than a scientific or ecological problem. If we don't get many more sectors of the human community engaged in addressing these issues we will fail, and the engagement challenge is only going to grow as social capacity is challenged by all the changes.

Brittany Morlin: Climate change and large blocks. Again, what can we do about large blocks of land that could be wiped out w/ one major disturbance event? What will replace? Do we need a plan to promote it's transition to a better alternative?

yvette converse: lets face it...they're all inter-related...time to head to the bar

John Pierce: I struggle (from an applied perspective) with the best way to address the uncertainty in the Climate Change science

Linh Hoang: agencies not looking as well at big picture o terrestrial invasive weeds at disturbance regime and how that affects large blocks and connectivity - they are looking more at other discutabacnces like insect and disease and fire but not as uch focus on terrestrial invatsive weeds

Sean Finn: I chose land use change - cultural goal because I think we're collectively missing the the direct human impacts due to the changing ways we are using landscapes

Brendan Moynahan: +1 for John's initial comment...

joe adamski: Land Use change - cultural goal issues are perhaps being least addressed but perhaps it is not realistic to consider GNLCC may effect change

Brendan Moynahan: and +1 for yvette's thirsty exasperation...

Steve Waste: In regards to disturbances which can invite or exacerbate invasives we are operating reactivley, rather than proactively.

Brittany Morlin: Yeah, I get it! Land use change - sort of like beating head against a concrete wall

Climate change effects on aquatic integrity is the greatest concern for the tribe - salmon. The most urgent conservation need is information, but that is not the question you asked here. So I selected land use change - cultural goal to reflect impacts of land use on salmon. The GNLCC can add a lot of value in down-scaling climate change models to local environmental impacts. I'm not sure about question 4, but wonder if none of the LCC partners are addressing a conservation issue then it may not be a priority.

Perception is LUC-Cultural goals are to realistically attainable

My answers are consistent with how I answered #2 for question 1 and 3. For question 2 I put connectivity in the urgent category both because it is something that is essential to help address climate change effects as well as because it is what I feel is the least refined of the issues (needs the most work).

3. Land Use Change: Connectivity, Large Blocks and Cultural Goals

Steve Waste: Elsa - "First Foods" are important to CR Basin and NW Coastal Tribes (Fish, Deer, Roots, Berries - Water)

Elsa Haubold: Here's the cultural goal again--it's not in the Strategic Conservation Framework: Draft Goal 5: Sustaining local, place-based land use values including: 1. Tribal resources (TEK, tribal trust interests and priorities), 2. Traditional land uses (ranching, rural ways of life), 3. Cultural heritage (historical structures or places of cultural or ancestral importance)

Cynthia Wilkerson: Looks like #5 and #12 are the same??

John Pierce: 2 & 3 seem closely related

yvette converse: also, SC has asked us to 'rework' the working in goal 5 mainly b/c of the word '

yvette converse: sustain.

yvette converse: so we'll be working on that but it will likely include those 3 components Mary listed

Erin Sexton: Not sure I would parse out structural and functional connectivity - you need both to have functioning ecosystems (# 9 and # 10)

Brittany Morlin: 3B- #5 Forest management and fire. #8 Have to be strategic, which means planning asap

Sean Finn: Most value: Land Use change related to sage shrub structural and functional maintenance of large blocks and connectivity among them

Kim Trotter: I agree with the connection between 9&10 by definition of cumulative effects and functioning ecosystems.

Brendan Moynahan: Glad to see inclusion of 'cumulative effects' considerations at this step.

Erin Sexton: I think we are missing a "conservation need" here, something that articulates the need to align goals, strategies, out-comes across jurisdictional boundaries - perhaps a statement of the obvious - but something the GNLCC is designed to do.

yvette converse: this is hard.

Brendan Moynahan: Would like to see 9 and 10 collapsed into one... agreement with Erin and Kim.

Michael Whitfield: Difficult to separate out 4 and 9/10 as well, 10 more inclusive

Sean Finn: 3a: because connectivity is a high priority for climate change adaptation, the greatest need is to manage land use change in ways that maintain connectivity

Brittany Morlin: The nuances between some of these issues are hard to decipher

Molly Cross: I voted for cumulative effects piece since that gets at larger scale and bigger picture issues that I think should be the focus for GNLCC

Sean Finn: Most urgent 3B: is better landscape scale coordination among Land use change drivers ... we're seeing death by a thousand cuts

Molly Cross: That is, both of the cumulative effects factors (9&10)

Brittany Morlin: e.g., 2,3,4; 4 and 10

Linh Hoang: again - ability for resources to adapt to changes without the hinderance the land uses - so connectivity and landuse are greatest need and most urgent for me (#10)

Michael Whitfield: Agree Molly, I also went with cumulative plus the human response, 11.

Brendan Moynahan: Agree with others' comments that there may be too much splitting here... Hard to distinguish 1 and 2 other than calling out energy development as a source for the land use change in 1, while #2 includes all of that plus more general and broad change.

Molly Cross: If we could vote for 3 I would also add #11 (or if we combined 9&10 into one)

Sean Finn: 3D: cultural attitudes about CC may be changing but actions are not. And no one is looking at that big picture

Cynthia Wilkerson: What is "land use change related to human response to climate change" - changes we make do to the fact that climate change is happening? move to higher ground?

John Pierce: I like Erin's comments about the higher level of conservation strategic planning and alignment of shared strategies

Steve Waste: Large areas of ceded lands outside of reservations currently support utilization of the First Foods, but are subject to impacts from landscape scale stressors. Tribal resource management agencies are grappling with

these issues locally/regionally. but should be drawn into deeper participation with GNLCC as a structure for information transfer and science support.

Molly Cross: I defined #11 as land use changes that happen as human communities respond to the effects of climate change

Brendan Moynahan: because the umbrella for the question was LUC - which we already found as very important/strongly supported, I found it hard to vary my choices across 3a, 3b, and 3c.

Brittany Morlin: Greatest conservation needs... connectivity bw what? You have to have large blocks of habitat to start with.

yvette converse: agree....difficult to discern

Cynthia Wilkerson: Agree with Erin's comment as well - I think this brings us back to the cultural work.

Brendan Moynahan: Not surprised to see high support for #10 in a, b, and c... but surprised to see it also leading in D...

Brendan Moynahan: Interesting that 6 and 7 didn't figure high in D... especially given that the GNLCC itself felt it had to go back and add an articulated cultural goal because it is important but wasn't captured in the strategic framework.

Kim Trotter: Agreed.

Cynthia Wilkerson: OK, thanks for the discussion on what #11 is. I guess I'd agree people aren't working on it, but also agree with the other votes that it isn't (or at least I can't figure out how it is) a major issue that needs to be addressed above others.

yvette converse: i think there are too many....we need to have like 3-5 for each goal...not 12

John Pierce: I thought of the 9 & 10 as aquatic vs terrestrial. Overall cumulative effects is not being adequately addressed by anyone

Cynthia Wilkerson: Agree, hard to make choices between 12 and get clear signal from responses.

Michael Whitfield: For me, number 11 also would include climate change disruption of human communities and cultural structures

Brendan Moynahan: good point John on lack of attn to cumulative effects work

Difficult to get my head around these choices, but I am comfortable with the outcome. Greatest conservation need is land use change (driven by climate) related to human response to CC and fragmentation of ecosystems. Most urgent is cumulative effects and land use change impact on cultural priorities - water/salmon. Interesting that I picked the repeat landscape issue for question 4. I don't see anyone mapping land use change related to development (and climate change) impacts on infrastructure and cultural sites.

Woodland management with respect to Sage grouse conservation and Shrub-steppe ecosystems

there is a duplication of issues....not sure if by accident or as a test for us??? My answers to questions 1 and 3 are consistent with previous answers and what I feel is priority and why. I think the human/cultural issues are those least being looked at and that could benefit from some focus or at least definition. I focused the urgency issue (#2) on human activities which can respond the quickest and become urgent if they aren't already.

4. Climate Change: Aquatic Integrity & Large Intact Blocks Goals

Brittany Morlin: #7 - much broader applicability than to just salmonids; don't like the redundancy of including specific species on this poll

John Pierce: instream ecosystem function includes (in my mind) temperature

yvette converse: way too many choices

Linh Hoang: agree - so many options - this is taking some time

Brendan Moynahan: agree

Cynthia Wilkerson: John - agree. Agree with Yvette, this is very hard to decipher small nuances. the snowpack one is clearly a standalone, so that makes it easier for me. Tougher to choose between the others.

Michael Whitfield: Agree with Yvette. These choices are much more discrete other than 4/5. Sean are you saying we can select 4

Erin Sexton: The biggest challenge we have with respect to Climate related impacts to aquatic systems are the human disturbances/manipulations that we have inflicted upon our aquatic systems - dams, artificial engineering, invasive species introductions, human development in floodplains, etc. Not sure how to articulate the need - but it is translating science into cultural change.

yvette converse: i'm picking 4

yvette converse: 2 for each goal

Linh Hoang: the riparian ecosystem function - is encompassed by many of the other aquatic integrity options - so I have selected this for greatest need

Kim Trotter: Is there a climate related effects on hydrology and impacts on humans - yes- now what Erin said.

Brittany Morlin: I'm choosing the aquatic flow regime (7) but recognizing that it's important to riparian health, stream temps, etc.

Linh Hoang: 11 and 16 my other selections - because they deal with two systems that have high risk and consequences

Erin Sexton: Agreed on too much splitting of options - given the Large landscape focus of the GNLCC - I would lump #2,3,4 into "aquatic ecosystem functioning (including hyporheic)"

Cynthia Wilkerson: I would agree and am picking #3 as my combined vote

yvette converse: agree....

Cynthia Wilkerson: add #5 to the lumping from Erin as well.

yvette converse: also, i think the 'large blocks' goal has relatively few landscape issues and can be greatly narrowed

yvette converse: few in terms of characterization..now importance

yvette converse: not importance

Brendan Moynahan: I have a pesky feeling about the iterations of question D... I'm viewing lack of work by others as not necessarily translating to need, but also speaking to the flip side of the urgency question... meaning most resources are generally going toward more urgent issues.

yvette converse: i changed my vote to 3 to capture erin's combo

Linh Hoang: might be better to display the numbers here then instead of percentages

John Pierce: One question - Where do we consider the question "What is feasible or where is science good enough to act on"? In the end there should be a reality check to guide "What we do".

Brittany Morlin: I've switched my #7 to #3 for 4A thinking that aquatic flow regime is an underlying premise

yvette converse: John....i think that will come in the last step

Cynthia Wilkerson: feasibility comes after we figure out need. it will help define what we do. it will also impact the "where can GNLC add value"

My selections link to down-scaling climate data to forecast impacts on river flow and temperature as it affects salmon and competing land use activities.

Increasingly more complex questions with increasingly more complicated logic to try and answer. Not sure I am up to the task. But my answers for #1 relate to connectivity in my mind. For #2 I focused on shrub-steppe and human pop changes as those that are most urgent and most rapid as of now. The other two are just mostly guesses by me....very tough to define.

5. Invasives: Disturbance Regime Goal

John Pierce: We need an option to "Map where invasives are currently a problem"

yvette converse: John...i would suggest that is a science need under one of the invasives 'issues'

Erin Sexton: A motion to lump 1,2,3

yvette converse: 2nd

Cynthia Wilkerson: Signing off - great work everyone!

Sean Finn 2: Agree John and Yvette. The staff struggled with a 'conservation' focus in relation to a science need' focus. We fully intend to go to the science need aspect ... stay tuned, I know you will!

Linh Hoang: I disagree - techniques for aquatic invasive fauna different than plants

Brendan Moynahan: these seem to be much more local activities/priorities than for previous goals... harder to see how the GNLC engages in many of these local boots-on-the-ground actions/priorities

Linh Hoang: agree mapping high - I selected the monitoring - as thought the mapping would be part of this

Sean Finn 2: Erin, Linh and others - lump as a 'common landscape issue' but split when we're thinking/about appropriate action?

yvette converse: Linh...we probably need to think more about the intent of identifying common landscape issues....techniques and methodologies may also be part of the science/info need rather than the issue..not that you may not be correct

Erin Sexton: same comment as before, that one of the greatest contributions of the GNLCC is the alignment and enhanced capacity by working across jurisdictional boundaries - common goal, strategies, vision

yvette converse: i have another call at 11 so have to drop off...thank you all so much! we will continue to work on this...it is not a final step...its iterative and ongoing

Linh Hoang: thanks all

John Pierce: This is an ecological area that I do not have much knowledge. Not sure what is not being addressed so did not vote

Michael Whitfield: thanks much Sean and crew. well done

Brittany Morlin: Thank you!

Aquatic macrophytes are impacting salmon migration in the mainstem of the Yakama river. Invasive fish species are competing with and preying on salmon. We will need to understand how much of this is driven by climate and how much of the impact we can control.

#1 - I am not sure that rapid response qualifies as landscape level conservation need. It strikes me as tactical rather than landscape. But I am having a hard time differentiating between what is and is not landscape conservation need.....or that all those listed are landscape conservation needs. #2. Greatest and urgent remain much the same for me in these questions. #3. I focused on aquatics with the reason being that the GNLCC could help bring a more coord effort among the players in this area. #4 - Believe that work is not being done related to the effects of habitat change from invasives.