

Notes for *From Theory to Practice: Landscape-Level Restoration Principles*

Workshop
December 1-2, 2016
Lubrecht Experimental Forest

Sponsored by: Southwestern Crown Collaborative, Northern Rockies Fire Science Network, National Forest Foundation, and the US Forest Service

Objectives: Demonstrate and discuss methods for expanding project planning from stand- to landscape-based planning. Drawing from the recent publication, *Restoring fire-prone Inland Pacific landscapes: seven core principles*, share examples from planning efforts in multi-jurisdictional, fire-prone, mixed-conifer forests in the Northern Rockies. Discuss, capture, and disseminate successes and challenges encountered during landscape-based project planning.

Target Audience: Land managers including line officers, planning team members, silviculturists, foresters, resource specialists, scientists, and informed partners to landscape-scale project planning.

Also see accompanying presentations

Thursday, December 1st

SESSION NAME: Why is Landscape Planning Important to Agencies?

SPEAKER NAME: Rob Campellone, Landscape Conservation Design, U.S. Fish & Wildlife Service

MAJOR POINTS:

- Landscape planning has been discussed/debated since the 1970s but we're still struggling to implement it.
- LCCs were established in 2009 to develop collaborative strategies and respond to climate change.
- USFWS is moving toward the iCASS system – innovate, convene stakeholders, assess conditions, spatial design, strategy design

LESSONS/BIG TAKEAWAYS:

- Safeguard sociological systems during a time of change
- Facilitate social learning & Develop a coordinated response
- Convene landscape stakeholders
- Use spatial and scenario planning
- Need to embark on a national trajectory of landscape conservation through stakeholder-driven design processes at regional scales

REFERENCED MATERIALS:

- National Fish, Wildlife, and Plant Climate Adaptation Strategy, 2014

- LCD and the iCASS Platform: An Adaptation Pathway for Social Transformability in Sustainability Planning (in review)

FULL DISCUSSION – MAJOR POINTS

- Will LCC’s survive political change? A: Probably, because there has been good sharing and feedback recently. The National Science Foundation review was extremely positive; funding may dry up but it’s unlikely that people will stop working together.
- Collaboration and coordination will enable more efficient use of resources.

SPEAKER NAME: Dave Schmid, Deputy Regional Forester, Region 1

MAJOR POINTS:

- Need to have “A to Z” at the table (right now we have “B to Y”)
- Concern about change in NEPA, ESA under the new administration

LESSONS/BIG TAKEAWAYS:

- Be open to learning & evolve
- Don’t criticize your predecessors because they were operating with the best available science at the time
- Southeast Region – Restoration there was done in an integrated way
 - In order to have an impact on landscapes we had to work “outside the green lines.” Because there are many land ownerships.
 - Removed timber targets and met objectives for all resources
 - Lots of support for active management.
- Forest Service manages landscapes programmatically through forest plans
- Litigation has influenced where work gets done – Forest Service doesn’t go to controversial places on the landscapes, which means our ability to restore native ecosystems is limited.

SPEAKER NAME: Jodi Wetzstein, Bureau of Land Management, Missoula Field Office

MAJOR POINTS:

- 2009 climate change order influenced the agency and led to a different approach to planning – Planning 2.0
- BLM looks at planning units at three levels:
 - County area
 - Subunits - ~3 counties
 - Jurisdictional level
- Conduct ecosystem assessments at a watershed scale and provide local information
- Barriers to landscape planning include:
 - Litigation
 - Coordination across boundaries (difficult due to different systems)
 - Different agency missions
 - Translation of concepts

REFERENCED MATERIALS:

- Planning 2.0

SESSION NAME: Introduction to the Seven Principles

SPEAKER NAME: Dr. Paul Hessburg, EFHR Team Leader, Research Scientist, Pacific Northwest Research Station

MAJOR POINTS:

- At regional and local scales we inadvertently broke ecological patterns, which impacts how forests function
- Just planning across a large area does not restore ecological functions – planning on a landscape level does not mean we’re necessarily working toward landscape restoration
- Wildfire is a maintainer of ecological function and processes. Used to have lots of fire all the time that maintained patchworks of burned and recovering vegetation – which in turn influenced fire. Extreme weather events occasionally over-rode other conditions.
- Frequent LSF and MSFs reinforced resilience. Locally, fires continually thinned forest patches, reducing density of fuels. Regionally, fires created patchiness.
- Low severity fire (LSF) –
 - <20% of dominant trees killed
 - Common in driest ponderosa pine and mixed conifer forests
 - Frequent (5-25 years); continuously reducing fuels
 - Resulted in a variety of successional conditions
 - Current condition – increase in mid & high severity fires
- High severity fire (HSF) –
 - >70% dominant trees killed
 - Common in wet, cold forests
 - Infrequent (150-300 years)
 - In the past mild climatic conditions favored mild fires, but these days we see more HSF than ever before

LESSONS/BIG TAKEAWAYS:

- See summary slide in presentation

REFERENCED MATERIALS:

- Seven Principles for Restoring Fire-Prone Inland Pacific Forests - <http://www.fs.fed.us/outernet/pnw/research/science-stories/seven-principles.shtml>

FULL DISCUSSION – MAJOR POINTS

- Operating at a big scale isn’t necessarily the key to restoration
- Landscape restoration results from changing the patterns that happen locally and regionally
- Need to have societal discussions about how we can live with, relate to, and adapt to fire
- How do we sell the idea of creating patchiness (which means fire and logging) to serial litigants? Need a large toolkit. Need to let fires work to reduce fuels and use more managed wildfire. Can’t thin and burn our way out of this, but thinning and burning should be used in high priority areas where we’re looking for specific outcomes. For example, we can punch holes in mid-elevation homogenous stands to interrupt fire flow and get a more diverse burn.

SESSION NAME: Photo Interpretation for Landscape Planning

SPEAKER NAME: Dr. Bill Gaines

MAJOR POINTS:

- Why Photo Interpretation:
 - the detail is what is needed at the project scale
 - helps rectify incorrect stream and road inventories
- Photo Interpretation leads to Landscape Prescription, which leads to development of Purpose and Need
- Photo Interpretation matches ~85-90% with ground observation (which is great)

LESSONS/BIG TAKEAWAYS:

- Photo Interpretation goes a long way towards creating a common data set for the multiple aspects of forest management (wildlife, harvest, wildfire, aquatics, etc.)

REFERENCED MATERIALS:

- 7 Principles paper

FULL DISCUSSION – MAJOR POINTS

- Landscape analysis is like a diamond: the idea of a diamond is composed of dozens of facets; similarly, landscapes have hundreds of facets (or dimensions) that are analyzed and linked in a model that builds the bigger picture of a landscape.
- First step in new collaboratives utilizing this information (which is a new approach) is really education and trust building (go slow to go fast)

ADDITIONAL NOTES/COMMENTS

- Dr. Hessburg joined in the Q&A

SESSION NAME: Landscape Evaluation Approaches Part 1: Photo Interpretation

SPEAKER NAME: Dr. Derek Churchill

MAJOR POINTS:

- Raw data (photo interpretation data) → measure against historic and future ranges of variability and evaluate departures (metrics pertain to fire, insects/disease, wildlife, structure, etc...) → build a Landscape Prescription → identify Landscape Treatment Areas → develop treatment recommendations → create NEPA alternatives (purpose and need) → post-recommendation, measure against historic and future ranges of variability again in order to see how much the landscape has moved
 - Landscape prescriptions target overlap zone of HRV and FRV

- Treatment recommendations try to align present vegetation with topographic and biophysical conditions (big emphasis)
- This occurs on the watershed scale, and each watershed is evaluated independently (each watershed has its own historic and future ranges of variability)

LESSONS/BIG TAKEAWAYS:

- This is a really robust method of evaluating landscapes, which helps build public support

FULL DISCUSSION – MAJOR POINTS

- This takes a long time to communicate and integrate into dealings with the public/collaboratives
 - This is a whole new language, and one unlike anything the science has attempted before
 - Hessburg says this is getting easier, but doing so slowly
- This process is more transparent about what they're looking at and what it means
- There is potential for a never ending modification of landscape characteristics (you get your structure close, but now your habitat metric is off, etc...), so they use the linkage model that allows them to see what moving the dial on one metric will have on moving other metrics (think of a spider web: pull or push on a single strand and the whole web warps in response)
 - The overall goal isn't to nail down a single metric/characteristic, but to move the *landscape* in a certain direction, so the linkages modeling is vital to support decision-making
- This happens watershed-by-watershed, and so there are no overarching prescriptions or solutions for a landscape
- Why is this all based on photo interpretation?
 - Allows for an “apples-to-apples” comparison for a single watershed, as there is a wealth of historical data to measure against
 - New platforms just can't provide that history
 - Most other platforms (LiDAR) have 65-80% accuracy, and when combined with other platforms, the combinatorial accuracy drops to ~25%
 - w/photo interpretation, the accuracy is much higher

ADDITIONAL NOTES/COMMENTS

- Dr. Hessburg joined the Q&A

SESSION NAME: Landscape Evaluation Approaches Part 2: LiDAR

SPEAKER NAME: Dr. Derek Churchill

MAJOR POINTS:

- LiDAR generates a ton of data quickly, but can be expensive
 - Because it generates so much data, it can be hard to use beyond a small scale unless it is translated into another format (e.g. surface models, 30m rasters, topo metrics, etc...)
 - This translation allows LiDAR to be scaled from tree neighborhoods to watershed scales
- They are working on developing LiDAR reference metrics (for things like California Spotted Owl habitat)
 - National Parks are useful in this respect
 - Doesn't compare well with Photo Interp. data at larger scales

- How to marry LiDAR and Photo Interp for purposes of Landscape Evaluation? (big question they are working on)
- LiDAR can be used for monitoring changes pre- and post-treatment
- Can identify areas of high mortality

LESSONS/BIG TAKEAWAYS:

- LiDAR can be very useful but need reference conditions for setting desired conditions
- Can be useful for monitoring pattern metrics

FULL DISCUSSION – MAJOR POINTS

- High Spectrum Imagery (flown at higher altitudes) can work with LiDAR (best at lower altitudes) in order to reduce prices and increase utility of data from a single flight (LiDAR is less effective, but is still useful for some questions)
- LiDAR also measures intensity of return lasers, which allows them to distinguish dead trees (87% accuracy) and live trees (95% accuracy)

Friday, December 2nd

SESSION NAME: Challenges of Integrating Climate Change into Forest Planning at Multiple Scales

SPEAKER NAME: Dr. Bob Keane, Supervisor Research Ecologist, USFS

MAJOR POINTS:

- If you're only looking at climate models, you're missing a big part of the picture
- All climate models have a high degree of uncertainty. For example, with data extrapolation, we often lose the variability (e.g., a big drought or other events) that we know and have measured to occur. People alone can't predict climate change – there are too many interactions and too much variability.
- Models are not the answer, but they're an important point in the decision/solution space.
- We don't have a great climate change model for simulations – haven't invested in it.
- HRV assumes no exotics, historical climate disturbance regimes, assumes humans (Native Americans) were present, no management – there's no "true HRV" (it's only a reference, but the best reference for resilience)
- FRV assumes exotics, future climates, disturbance regimes – it's highly subjective because people often leave or take out different variables
- On integrating climate change into forest planning:
 - Some of the modeling results are hard to believe. People are skeptical. But the results should be included in the decision space.
 - Topography is incredibly important and influential with regard to modeling results. Principle #2 of the 7 – with climate change you cannot "cut and paste."
- Predicting habitat types for the future may be just as important as climate simulations.
- NRAP:
 - Region 1 is the first to use NRAP. Produced a GTR that is awaiting review from the Rocky Mountain Research Station

- For vegetation, the authors rated vulnerabilities for increasing wildfires, increasing drought, growing seasons, and others. The results show that shade tolerance is rated #1 for vulnerability. *See slides for full list.*

REFERENCED MATERIALS:

- NRAP and GTR: <http://adaptationpartners.org/nrap/>

FULL DISCUSSION – MAJOR POINTS

- Need to have valid and vetted climate futures; right now when we research climate change we choose one and go with it
- Need a consensus method for determining NRV and its expression for management
- Why are we optimistic that we'll manage to let fire burn in the future? Suppression policy will ensure that we're managing for the most severe fire possible.
- Missing from this discussion is development in the WUI – it's a real concern for managers because of the values at risk.
- How do you reconcile models that show you where to do what with results from simulations? How does this help managers make decisions? A: NRAP includes a set of management recommendations and prioritization recommendations for WBP but not for other species. Therefore it doesn't provide the necessary management recommendations for all species.
- Is HRV useless? If we're not going to manage for climate change, why should we measure HRV? A: It's still the best measure for resilience and integrity.

SESSION NAME: Incorporating Terrestrial Biodiversity into Landscape Planning

SPEAKER NAME: Dr. Bill Gaines

MAJOR POINTS:

- Wildlife, as a factor, often decides what restoration efforts do or do not occur on a landscape, and Landscape Evaluation offers a new tool for assessing wildlife
- There are a lot of species out there, and they can't look at them all, so they developed an 8 step process to choose *focal species* and build viability models for them (**note:** the 2012 Planning Rule uses this term in the context of monitoring; Bill's group uses it in the context of indicators)
- Canada lynx is a great example of a species that benefits greatly from the historic and future ranges of variability (HRV/FRV) analyses: they require complex structure at the landscape level
- Also allows us to get away from an emphasis on habitat connectivity; habitat connectivity for one species might undo the landscape for another species

LESSONS/BIG TAKEAWAYS:

- Wildlife, through the use of focal species, can operate as a reference condition in the context of HRV/FRV analyses by looking at the amount and arrangement of those species' habitat
- This way of doing things was/is difficult to get wildlife biologists to accept – it's a much squishier (range of habitat conditions rather than discrete boundaries) way of looking at wildlife, especially since most of these biologists have spent their whole careers looking at a single or a small amount of species

REFERENCED MATERIALS:

- Maintaining Populations of Terrestrial Wildlife Through Land Management Planning: A Case Study, Suring et al (2013)

FULL DISCUSSION – MAJOR POINTS

- Landscape analysis and focal species are being used to develop an alternative view in order to assess what’s really going on with species and habitat and to get away from single species management. Instead, they use an individual species to act as a reference point for a broad range of species and conditions
- This process mainly looks at habitat, but they do also incorporate actual species occupancy to develop more accurate viability models for the focal species
- USFWS is supportive of this approach, at least for northern spotted owl management
- They haven’t really had any legal challenges to the Landscape Evaluation method, and have actually seen a lot of collaboration with non-profits (NPs pursuing funding for conducting Landscape Eval.)
 - The collaboratives are really allowing the Feds to expand capacity (e.g. TNC paid for an FTE to conduct Landscape Evaluation for a recent project)
- How to deal with barred owls (which out-compete spotted owl) in spotted owl restoration? Build a resilient landscape, and let it play out naturally is about all you can do
- One of the challenges in implementation is that terrestrial work, aquatics work, road work, etc. occur at different times and rely on different funding, so it is difficult to package all this together for a NEPA Purpose and Need, for instance
 - There is a tension between the “single species mentality” and the “landscape mentality.” To address this, it’s important to have a good team that operates as an overarching, landscape level group to communicate and educate. Important to remember that the single species mentality is still important, as it is a more detail-oriented viewpoint
- There are still a lot of factors that just can’t be captured by this methodology (e.g. thermal or precipitation triggers rather than habitat change triggers)

SESSION NAME: NEPA Options Panel

SPEAKER NAME: Timory Peel/Bill Gaines/Paul Hessburg/Pete Zimmerman (USFS NEPA Planner)

MAJOR POINTS:

- Hessburg suggests, in lieu of one big NEPA for the entire BSLRP area, instead do a broad programmatic EIS, then follow up with smaller, more focused EAs
 - This has a couple of advantages: you get to dig into the individual areas better than if you did a big NEPA, and there are opportunities to do EAs while working on EIS
 - CONCERN: getting sued on a big EIS, then getting sued on subsequent EAs
- “Big Gulp” NEPA analyses have a big pitfall: they fail to capture the broader needs of the landscape. They may offer a lot of prescriptions over a wide area in a short amount of time, but only for a narrow range of conditions, like fire. It can do that well, but it misses the larger needs of the landscape
- The size of a single NEPA for BSLRP isn’t the concern, necessarily, but the ability to show that you’ve taken a “hard look” at such a complex ecosystem
- What about developing a Categorical Exclusion that would allow us to avoid the EIS/EA altogether?
 - Or Implementation Guidance, or a Determination of NEPA Adequacy?

- NOTE: This makes some folks uncomfortable, as it risks the success of the BSLRP overall by causing it to become inefficient (which was the driving force behind the Project's funding)
- We need to have wall-to-wall maps of what vegetation is on the ground in our forests, and where everything is

LESSONS/BIG TAKEAWAYS:

- Strike a balance between efficiency and the specificity of Landscape Evaluation
- Stepping out of the Forest Service's entrenched NEPA paradigm is as big of a challenge to big projects as the implementation of the big project is

FULL DISCUSSION – MAJOR POINTS

- Why use Photo Interp. (PI) over VMAP and LiDAR? PI, despite its human error, can assess successional patches, where VMAP/LiDAR cannot. The pattern process function is really what drives restoration at the landscape level, and that's what PI gets at.

SESSION NAME: BSLRP Team Discussion

MAJOR POINTS:

- Sandy Mack
 - Provided an intro to the BLSRP project and introduced the BSLRP team.
 - It's important that we have line officers who are willing to try something so big and new.
- Nick Oscheneek
 - Reviewed the latest BSLRP timeline (slides show FY16 to FY18)
 - Team is planning to host workshops, starting in 2017
- John Bassman
 - Reviewed the progression from forest production to ecosystems to managing for biodiversity.
 - When the 7 Principles paper came out it became clear that it could guide the team and help develop the project underpinnings.
 - Collaboration is critical to shape the thinking of BSLRP; there's a strong link to the SWCC.
 - Goal is to have functional ecosystems – following the “if you build it, they will come” strategy.
 - Described how many of the 7 Principles apply to BSLRP. For example, fire following topographic patterns.
- Wade Sims
 - If we follow the 7 principles, we should improve the quality of aquatic ecosystems.
 - Big limiting factor is that non-native fish are competing directly for food and other resources.
 - Climate change will have the greatest impact on fish.
 - NRAP predictions and strategies for implementation are excellent – a great resource for the team.
- Chip Fisher
 - Discussed wildlife biodiversity and how we're applying the 7 Principles.
 - Moving toward restoration of natural fire regimes would lead to heterogeneous patch distributions and, in turn, increased biodiversity.

DISCUSSION

- What is the vision for implementation across time and space? A: This won't be "one and done" – the restoration will require maintenance.
- How will this project be useful in other regions? A: Part of the charge to BSLRP is to be innovative and push scientific and technological boundaries. Products from the BSLRP team are already being used elsewhere. The team will be documenting processes and lessons learned so that the approach is understood and could be potentially duplicated elsewhere.
- How will the public and stakeholders be able to engage? A: The Ecosystem Management Decision Support System (EMDSS) – once some of the initial prescriptions are drafted, stakeholders can do some "gaming" with the team during workshops and potentially other venues. Transparency will be an important component of the process.
- What's the relationship between BSLRP and the SW Crown? A: BSLRP will help address some Southwest Crown goals on a broader scale. The BSLRP effort is being funded through regional and Washington Office funding – not SW Crown CFLR dollars.
- Are we looking for homogeneous stands or trying to map clumps – how does disturbance play into it? A: May have clumps within patches – trying to get patches that result from disturbance events as much as possible.
- How will photo interpretation work? A: We're not comparing 1930s photos to photos of today. Historic photos are used to establish historic reference conditions. Photo interpretation costs include a \$300k contract with the Montana Natural History Museum and \$70k for flights.
- As the project moves forward, it would be helpful to partners who work with private landowners if the team were able to say (a) this is what we're doing and (b) this is how projects will affect fire management.

ADDITIONAL NOTES/COMMENTS

BSLRP website is a great resource -

<http://www.fs.usda.gov/detail/r1/landmanagement/?cid=FSEPRD480785>