# Connectivity Through Collaboration Workshop

December 6th, 2016
Oregon Department of Transportation
Workshop Synthesis

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# Overview & Landscape Conservation Design Project Goals

Through late 2015 to May 2016, the North Pacific Landscape Conservation Cooperative (NPLCC) convened a group of stakeholders to scope out needs and an action plan for a Landscape Conservation Design (LCD) effort along the coastal Pacific Northwest. This scoping yielded a project action plan that identifies a suite of activities to meet the efforts vision and goals:

**Vision**: Achieve a network of healthy, connected, ecosystems and working landscapes capable of providing a full suite of ecosystem services that can absorb, respond, and adapt to climatic change and other key stressors through the use of collaborative, science-based strategies.

More on the LCD effort can be found here:
http://columbiacoastblueprint.org/
The project action plan can be found here:
http://columbiacoastblueprint.org/wp-content/uploads/2016/06/Pacific-Northwest-Coast-Landscape-Conservation-Design_June15-1.pdf

In the Project Plan:
*Objective 3.2: Map connectivity zones*
Mapping connectivity is an essential component of spatial design and connects priority core areas. Connectivity conservation is not only an important strategy for problems associated with habitat fragmentation, but it is also a well accepted strategy for climate adaptation (Heller and Zavaleta 2009).
Tasks:

- Task A: Convene a one-day workshop to share knowledge about past and existing connectivity work in the region, identify a limited suite of focal species throughout the region, and develop a methodology.
- Task B: Model connectivity using GIS methods and incorporate climate gradient Analysis
- Task C: Work with regional partners to explore connectivity mapping for nearshore marine habitats and species as well as aquatic-associated

**Goals**:
1) To foster a spirit of collaboration, communication, and continual learning among the communities and diverse interests within the study area.
2) To understand how climate change and other stressors will affect the region.
3) To identify a diverse suite of intact, connected, functioning ecosystems and working landscapes capable of adapting to stressors and providing important ecological functions and services.
4) To create science-based, spatially explicit products that identifies priority areas and the conservation actions necessary to achieve specific conservation goals and targets.
5) To sustain healthy habitats for native fish, wildlife, and plant species and a suite of ecosystem services that benefit people

Connectivity was identified early on as a priority for the region. A small ad-hoc working group of participants in the Washington Wildlife Habitat Connectivity Working Group, Oregon Department of Transportation, USFWS Refuges and NPLCC was formed. This group identified the need to

understand the current state of the science in connectivity, as well as understand who is doing what in the region. Another goal was to connect Oregon connectivity practitioners with Washington. This workshop is an outcome of those conversations.

# Connectivity Workshop Goals

**Workshop Goals:**

- Identify who is doing what in the region related to landscape and habitat connectivity
- Develop a shared understanding of the current State of the Science in connectivity mapping and modeling
- Develop and brainstorm ideas for an implementation plan.

**Outcomes**:

- Develop and document ideas for an approach for landscape/habitat connectivity in the region that is informed by other efforts in the region and based upon the best available science.
- Identify opportunities for collaboration across different projects.

## Acknowledgements

*Planning Team:* Cidney Bowman, Lisa Debruyckere, Chris Maguire,Mary Mahaffy, Kelly McCallister,Tom Miewald,Kristeen Penrod, Jim Strittholt, Khem So
*Presenters*: Peter Singleton, Brad McRae, Andrew Shirk, Sonia Hall, Michael Schindel, Meade Krosby, Kelly Mcallister, Bill Gaines
Facilitators and Notetakers: Katie O'Connor, John Grettenberger, Levi Old
Logistics: Shirley Donnelly

**Thanks to ODOT for use of their meeting facility!**

# Presentations

Below are links to the presentations.

- Connectivity through Collaboration, Overview, Tom Miewald.
- Wildlife Habitat Connectivity: An Overview (Peter Singleton and Brad McRae, via webex)
- Washington Habitat Connectivity Working Group: Experiences from the Columbia Plateau (Andrew Shirk, University of Washington and Sonia Hall, SAH Ecologia)

- Oregon Statewide Connectivity Assessment (Jim Strittholt, Conservation Biology Institute)
- Regional Pacific Northwest Connectivity Assessment (Michael Schindel, TNC)
- Connectivity and Climate Analyses for the WHCWG (Meade Krosby, University of Washington)
- The Metro Connectivity Toolkit ( Leslie Bliss-Ketchum, Samara Group)
- Connectivity Assessment for Columbian White-Tailed Deer(Kelly McAllister, Washington Department of Transportation)
- Applying Connectivity Analysis to Land Management in the Forest Service (Bill Gaines, Conservation Science Institute)

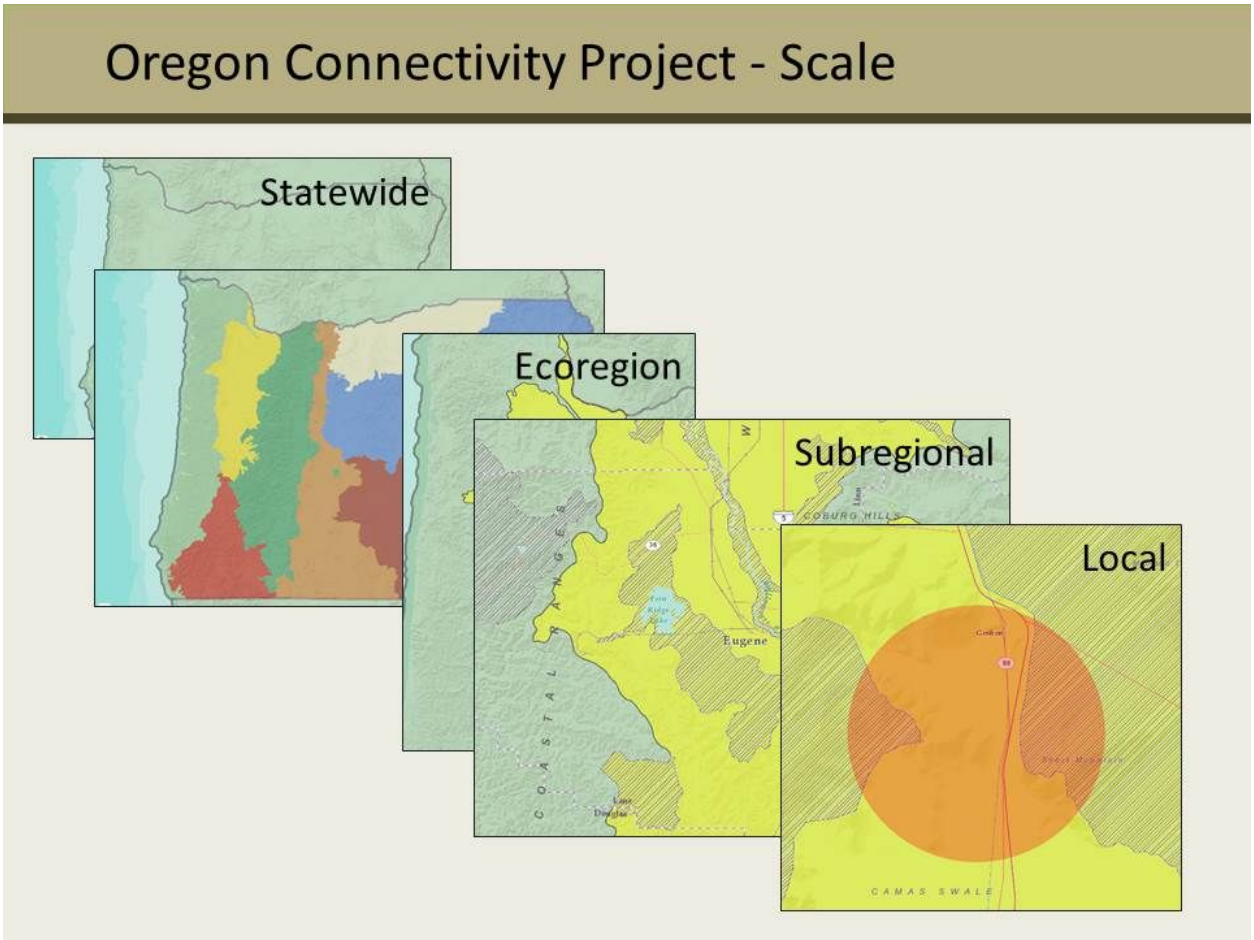
# Breakout Session Notes

There were 4 breakout groups of approximately 10 people each. The goal was to discuss and brainstorm some best practices and lessons learned for a connectivity analysis project. Each group had a facilitator and notetaker. There were 6 themes that groups were asked to address: scale/extent, data and modelling approach, convening stakeholders, products, and leveraging efforts. The following is a synthesis of those notes, peppered throughout with slides from the presentations that served as inspiration throughout the discussions.

## Geographic scale and extent

Scale and Grain

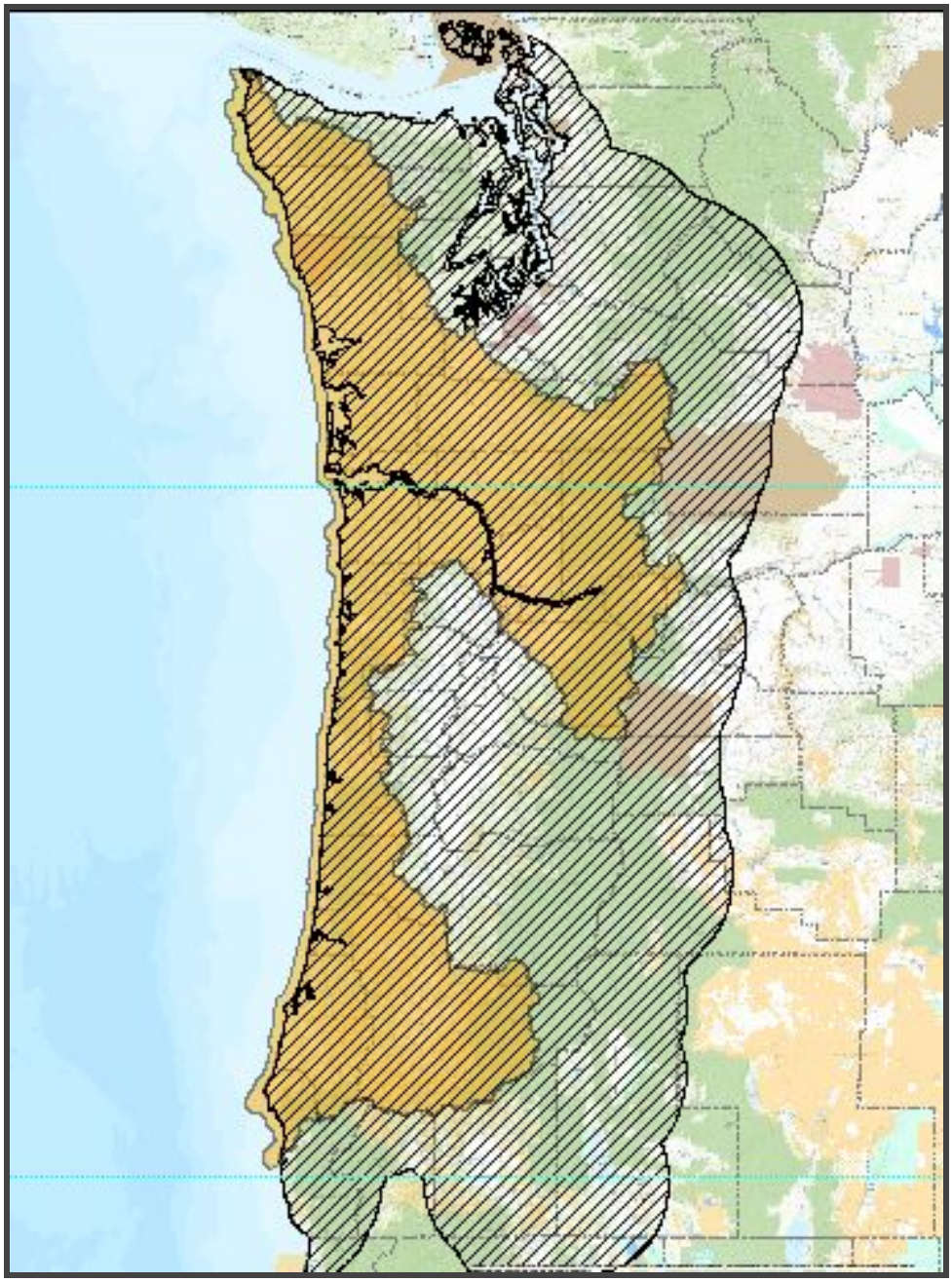
- Based upon conversations, there is overwhelming support for a 30 meter analysis, at a minimum. There was some conversation around more detailed local-scale analysis. However, that is beyond the scope of our project.
- At the same time, several articulated the need for multiple scales of analysis. The most common articulation was that of
    - Broad region, or statewide for significant broad scale patterns
    - Ecoregional, for more detail and context to prioritize particular areas
    - Localized, for implementation and corridor design.




From Jim Strittholt's presentation on the Oregon Connectivity Project. Multiple scales are essential in connectivity.

**Extent**

- Several attendees mentioned the need to align with ODFW ecoregions in Oregon.
    - Merge the Coast Range, Willamette and West Cascades in Oregon
    - Align with WA ecoregions
- Ecoregions should be buffered.
    - One group recommended 50km.
- Puget Sound should be left out because connectivity needs there are much finer.
- Olympia to Ashland I-5 corridor



Revised map of connectivity area based upon comments from the workshop. Area in orange is the core study area for the Landscape Conservation Design.

# Data and Modelling approach

- Base Data Needs

Attendees identified several base data needs that are part of a resistance layer. A resistance layer is a synthesis of several mappable factors that impede permeability/connectivity.

- Land cover/vegetation
  - Need seral/age structure information for forests.
- Roads
  - Bridges used for passage
- Development
  - Energy development
  - Transmission lines
  - Rail lines
  - Fences
- Topography (Do LiDAR-derived DEMs exist for the region?)
- Streams
- Riparian zones and Floodplains

Bridges likely to provide suitable safe passage were identified. At these locations, the resistance of the road was broken and assigned the resistance of the background land cover/land use

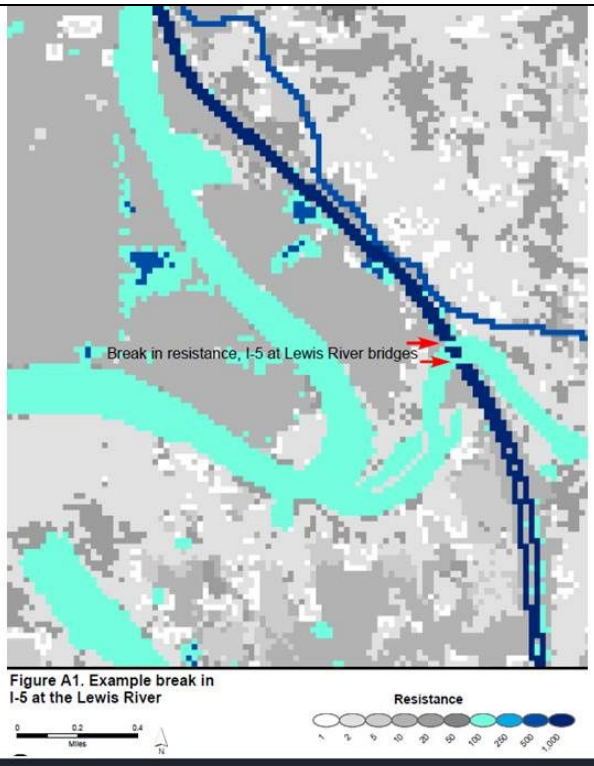
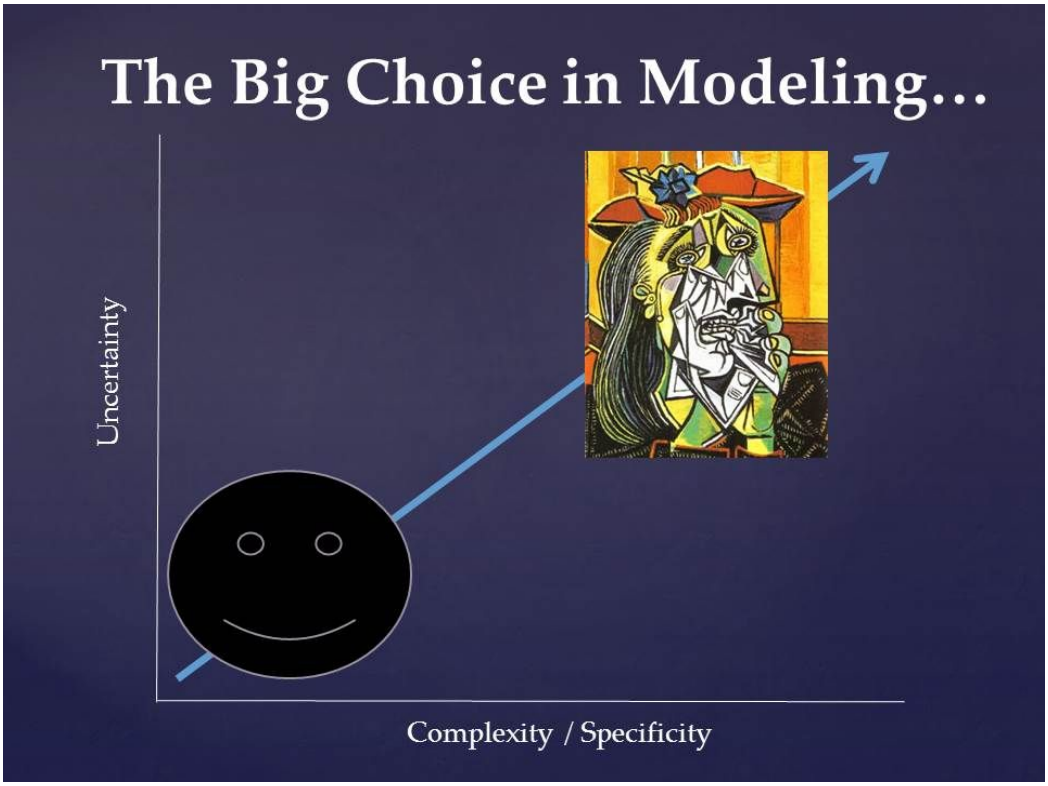



Figure A1. Example break in I-5 at the Lewis River

WSDOT

From Kelly McCallisters presentation, showing the importance of data inputs into connectivity modeling.

- Core Areas for species
    - Need to map core areas to link for focal species. What data exists? Need to inventory.

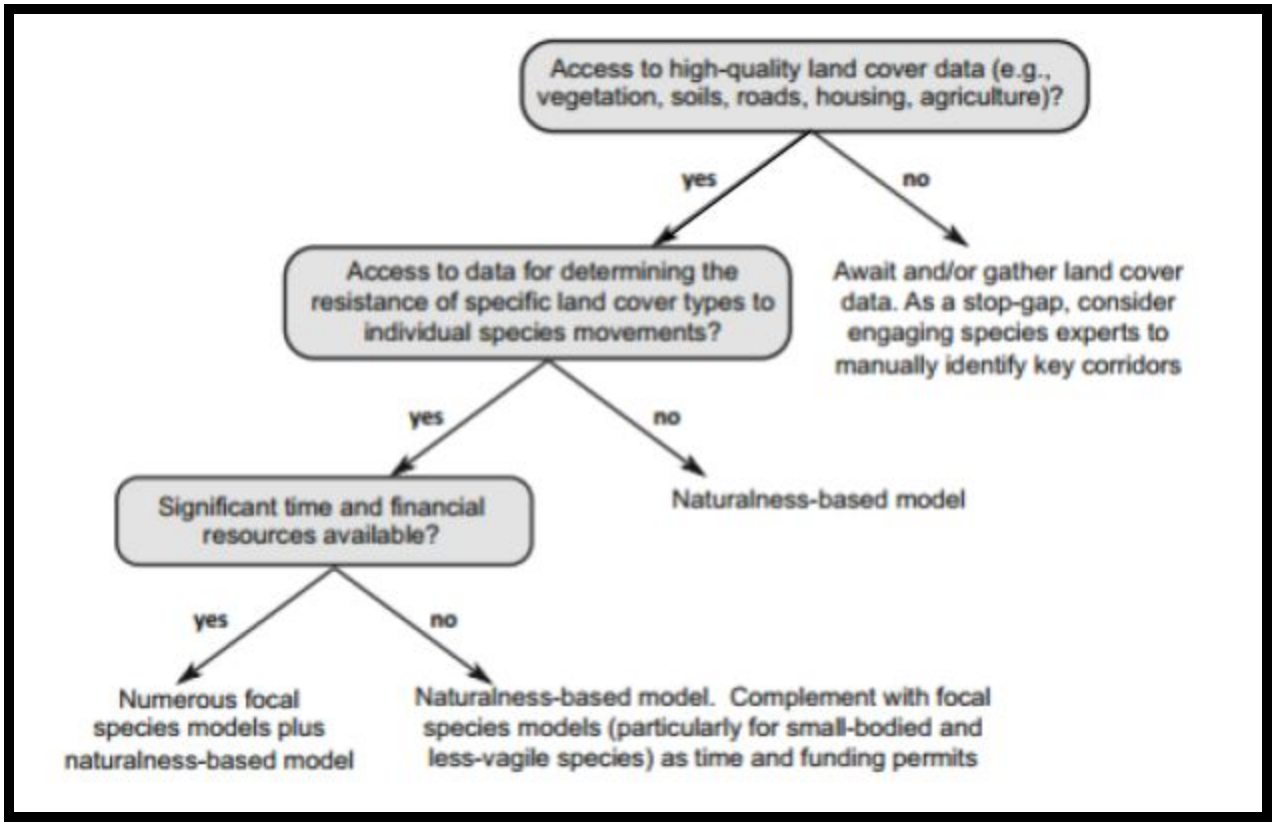



From Peter Singleton's presentation. Making the case to start simply.

## General approach

Attendees brainstormed approaches for modeling connectivity. The general consensus was to build from existing experience in the region and find ways to learn from what has already been done.

- Focal species vs. Landscape Integrity
    - General agreement that both a focal species and landscape integrity approach should be combined and adopted.
    - Consider Meade Krosby's publication on focal vs. integrity approach.




From an article referenced in discussion. Krosby M, Breckheimer I, John Pierce D, Singleton PH, Hall SA, Halupka KC, et al. Focal species and landscape "naturalness" corridor models offer complementary approaches for connectivity conservation planning. Landsc Ecol. Springer Netherlands; 2015;30: 2121–2132. doi:10.1007/s10980-015-0235-z

- Focal Species Selection
  - Need to be thoughtful on how many species to include. Refer to Andrew Shirk's presentation for the Columbia Plateau.
  - Use a guild approach if necessary
  - Choose a suite of species that represent all habitats (surrogate species approach).
  - Should have different categories:
    - Species that represent habitats
    - Species that are "climate-driven"
    - Species that move across habitat gradients
    - A plant species
  - Understand what species we have good data for
  - Consider quantitative approach to species selection, such as Metro.


From Leslie Bliss-Ketchum's presentation on species selection. Using a species selection approach similar to Metro's was discussed.

- Core Areas
  - How do we identify? How do we identify high value conservation lands?
  - We need to do this after focal species selection.
- Inventory existing analyses.
  - Question: do we really need to do this further?
- Modeling tool:
  - Circuitscape
  - LinkageMapper
  - No clear decision on what tool/algorithm to use.

# Convening and Engaging Stakeholders

- How to Engage?
  - Develop a core team
  - Engage people in the selection of focal species
- Who to Engage?
  - Targeted outreach
  - Take advantage of existing collaboratives. There are many coastal partnerships, perhaps they haven't all been reached
  - Need targeted strategies for private landowners
    - We could develop a core group of landowners
  - Consider nodes in the social network analysis
  - Timber and Fishing industries
  - Large public land owners
  - Planning departments (users), wildlife agencies, large land managers (private and public), tribes, NGOs, researchers, ODOT, WDOT
  - Watershed councils
  - Brief politicians
  - Energy planners
- When to Engage?
  - Engage early and often, but also balance overload.
  - Meet monthly for core team by phone
  - Quarterly in person

# Products that support implementation

- What are potential uses?
  - Land Trust: Easements
  - Connectivity important for refuge system, buying land needs science
  - Forest Service – Forest planning & regional scale planning efforts. Forest Service policy.
  - USFWS: T&E
  - Prioritizing areas to focus on protection

- What are products?
  - GIS data and maps
  - Vision product (similar to Columbia Plateau)
  - Prioritization
  - Model validation
  - On-line spatial tools that target specific uses (Data Basin)

- Meta-data is important
- Webinars
- Workshops
- Need base data/models
- Reports for users, focusing on implementation

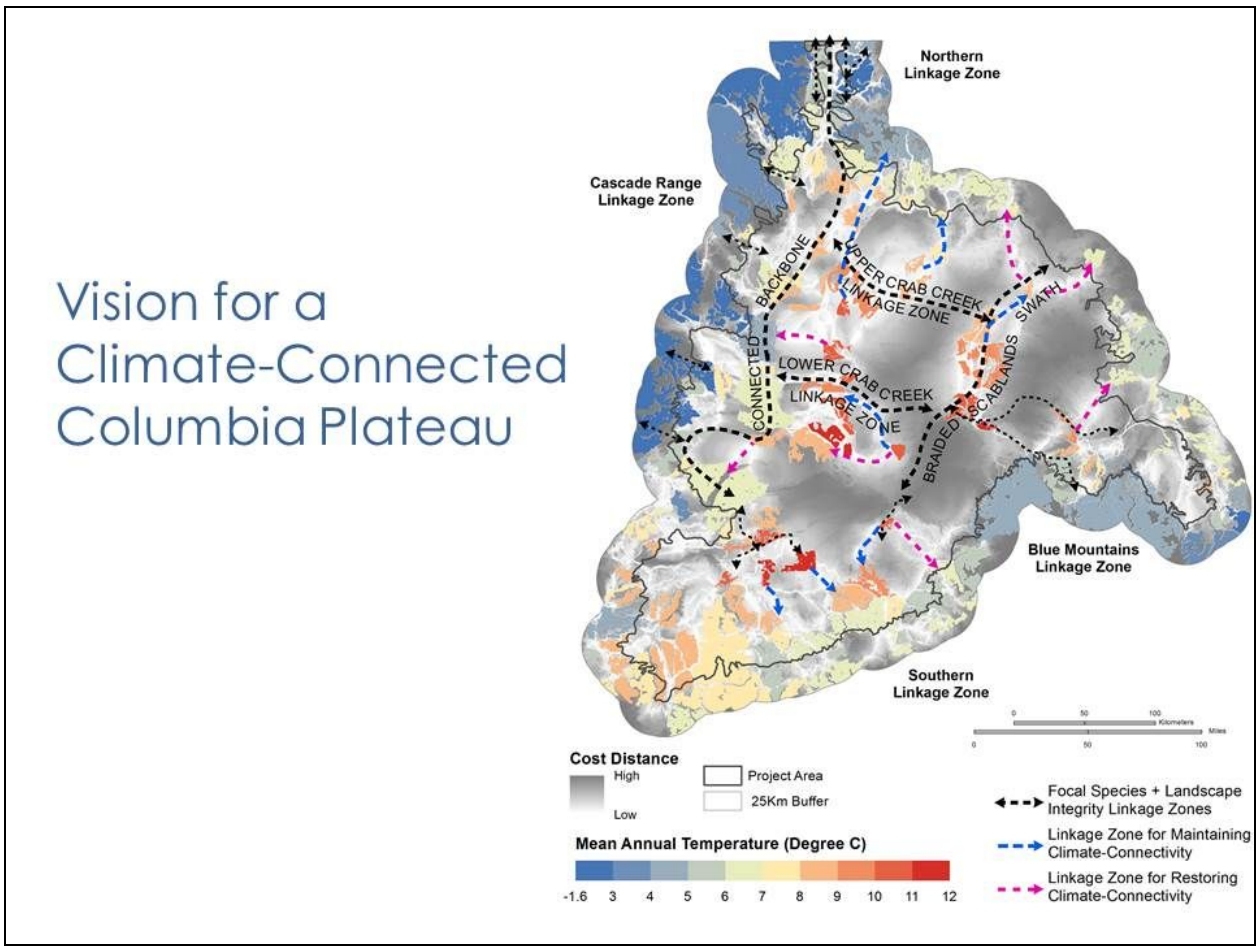
## Model Applications

| Application | Relevant Models |
|---|---|
| Conserve best remaining habitat | Habitat & core models, core metrics, core centrality |
| Conserve best remaining corridors | Corridor models, corridor metrics, corridor centrality, pinch points |
| Select areas for restoration/mitigation | Barrier models, corridor metrics, centrality |

From Andrew Shirk's presentation. Different products are needed for different applications.

- How
  - Decide on end products first
  - identify ways to update data
  - Coproduction of all products with users
  - Provide support for data users
- What do the products show?
  - Bring together aquatic and terrestrial connectivity, riparian corridors

- Value of resources you might protect on small (habitat) and large (connectivity) scale analysis, how do they add to healthy whole – they'd want to ID things at those two scales. And how does this landscape plug in to the larger PNW landscape. For potential acquisitions. (3 scales – small, large, and fitting into larger landscape)
- Multiple scales of analysis? Large scale down to fine scale?




From Meade Krosby's presentation. It was mentioned that products such as these, that easily convey information are needed for potential users.

## Leveraging Existing Efforts

- Communication:
  - Increase communication and sharing
  - One good web presence known to all!

- How
    - Identify key players for models, specific work prodcuts
    - Everybody has a specific role – Collective Impact – the steps were great – good framework to get everyone into the puzzle
    - Don't let perfect be enemy of the good
    - Tap into coastal partnerships
    - Using Leslie's Bliss-Ketchum's (Metro) small scale + Michael Schindel's (TNC) large scale for example. Integrate the two.
    - Conservation Northwest, key role, non-profit group that played big role in keeping things going (Peter, Wash). Also clearing house for money

- Which efforts should be coordinated:
    - CBI statewide assessment
    - WA Habitat Connectivity Group
    - Natural links already exist between several of the efforts
    - Spotted owl/marbled murelet – all consistent with this landscape
    - Connect with TNC aquatic effort
    - USFS Forest planning for Forest Plans
    - Watershed councils

Next Steps:

- Develop connectivity project plan
- Continue to coordinate with Oregon Connectivity effort, along with the Washington Habitat Connectivity Working Group.


WASHINGTON WILDLIFE HABITAT CONNECTIVITY WORKING GROUP

# 3. Lessons Learned from the WWHCWG: 6 Principles

1. Engage users from beginning to end,
2. Simplify, but don't oversimplify,
3. Invest in interpretation,
4. Make all products freely available online,
5. Develop additional products tailored to users' needs,
6. Shared vision and leadership.

Slide by Sonia Hall

Closing Thought: Six lessons from the Washington Wildlife Habitat Connectivity Working Group. (Sonia Hall and Peter Singleton)

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**Outcome**:

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- Identify opportunities for collaboration across different projects.

**9:45: Wildlife Habitat Connectivity: An Overview (Peter Singleton and Brad McRae, via webex)**

**10:15: Efforts in the Region - recent work and/or projects that are emerging: State of the Science.**

- Washington Habitat Connectivity Working Group: Experiences from the Columbia Plateau (Andrew Shirk, University of Washington and Sonia Hall, SAH Ecologia)
- Oregon Statewide Connectivity Assessment (Jim Strittholt, Conservation Biology Institute)
- Regional Pacific Northwest Connectivity Assessment (Michael Schindel, TNC)
- Questions and Discussion

**11:10 <Break>**

**11:20 Efforts in the Region, continued - recent work and/or projects that are emerging: State of the Science.**

- Connectivity and Climate Analyses for the WHCWG (Meade Krosby, University of Washington)
- The Metro Connectivity Toolkit ( Leslie Bliss-Ketchum, Samara Group)
- Connectivity Assessment for Columbian White-Tailed Deer(Kelly McAllister, Washington Department of Transportation)

Applying Connectivity Analysis to Land Management in the Forest Service (Bill Gaines, Conservation Science Institute)

# List and Contact Info for Attendees

Collaboration Through Connectivity, Participant Contact List

| First Name | Last Name | Email | Organization |
|---|---|---|---|
| Susan | Barnes | susan.p.barnes@state.or.us | ODFW |
| Lee | Benda | leebenda@terrainworks.com | Terrain Works |
| Arwen | Bird | arwen@wovenstrategies.com | NW Climate Science Center |
| Leslie | Bliss-Ketchum | bliss.ketchum@gmail.com | Samara Group LLC |
| Justin | Bohling | justin_bohling@fws.gov | |
| Cidney | Bowman | Cidney.N.Howard@odot.state.or.us | ODOT |
| Norman | Buccola | nbuccola@usgs.gov | USGS |
| Marion | Carey | CareyM@wsdot.wa.gov | WSDOT |
| Brett | Carre | btcarre@fs.fed.us | USFS |
| Josh | Chapman | Joshuachapman@fs.fed.us | US Forest Service |
| John | Chatel | Jchatel@fs.fed.us | Forest Service |
| Catherine | Corbett | ccorbett@estuarypartnership.org | Lower Columbia Estuary Partnership |
| Renee | Coxen | Renee.J.Coxen@state.or.us | ODFW |

| | | | |
|---|---|---|---|
| Tonnie | Cummings | tonnie_cummings@nps.gov | National Park Service |
| CalLee | Davenport | callee_davenport@fws.gov | USFWS |
| Ann | Edwards | aedwardsbio@gmail.com | Contractor |
| Michelle | Eraut | Michelle.Eraut@dot.gov | FHWA, Oregon Division |
| Sara | Evans-Peters | sara@pacificbirds.org | Pacific Birds |
| Steve | Gagnon | skgagnon@bpa.gov | Bonneville Power Administration |
| Bill | Gaines | bgaines@genext.net | Wa. Conservation Science Institute |
| Jessica | Gist | jessica.gist@gorgecommission.org | Columbia River Gorge Commission |
| Sonia | Hall | hallsoniawild@gmail.com | SAH Ecologia LLC |
| Jennifer | Hamblen | jennifer.hamblen@sitkatribe-nsn.gov | Sitka Tribe of Alaska |
| Andrea | Hanson | andrea.v.hanson@state.or.us | Oregon Department of Fish and Wildlife |
| Shana | Hirsch | shanalhirsch@gmail.com | University of Idaho Water Resources |
| Dave | Johnson | cdj@blm.gov | BLM |
| Jason | Karnezis | jpkarnezis@bpa.gov | Bonneville Power Administration |
| Kammy | Kern-Korot | kammy@wmswcd.org | West Multnomah Soil & Water Conservation District |
| Louise | Kling | louise.kling@aecom.com | AECOM |
| Martin | Lafrenz | lafrenz@pdx.edu | Portland State University |
| Lora | Leschner | lora@pacificbirds.org | Pacific Bird Habitat Joint Venture |
| Robert | Long | Robert.Long@zoo.org | Woodland Park Zoo |
| Chris | Maguire | christine.c.maguire@odot.st | Oregon Dept of Transportation |

| | | | |
|---|---|---|---|
| | | ate.or.us | |
| Mary | Mahaffy | mary_mahaffy@fws.gov | NPLCC |
| Sean | Matthews | sean.matthews@oregonstate.edu | Oregon State University |
| Kelly | McAllister | mcallke@wsdot.wa.gov | Wa Dept of Transportation |
| Mike | Mertens | mike@ecotrust.org | Ecotrust |
| Tara | Meyer | tara.meyer@dfw.wa.gov | Washington Department of Fish and Wildlife, Region 5 Wildlife Program |
| Tom | Miewald | thomas_miewald@fws.gov | University of Washington |
| Karen | Miller | karen.l.miller@sbcglobal.net | |
| Katie | O'Connor | katie.oconnor@consbio.org | Conservation Biology Institute |
| Levi | Old | lold@thegreatbasininstitute.org | GBLCC |
| Kristeen | Penrod | kristeen@scwildlands.org | SC Wildlands |
| Quinn | Read | QREAD@defenders.org | Defenders of Wildlife |
| Phil | Rickus | prr@deainc.com | David Evans and Associates |
| Catherine | Rivera | derivera@pdx.edu | Portland State University |
| Arthur | Rodriguez | arthur.h.rodriguez@state.or.us | Oregon Department of Fish and Wildlife |
| Jane | Rombouts | infoforjane@gmail.com | The Wetlands Conservancy |
| Bob | Rose | rosb@yakamafish-nsn.gov | Yakama Nation |
| Ethan | Rosenthal | ejro@deainc.com | David Evans and Associates, Inc. |
| Bill | Ryan | bill.ryan@dsl.state.or.us | Oregon Dept. of State Lands |
| Nathan | Schumaker | schumaker.nathan@epa.gov | US EPA |

| | | | |
|---|---|---|---|
| Tanner | Scrivens | tscrivens@columbialandtrust.org | Tanner Scrivens |
| Andrew | Shirk | ashirk@u.washington.edu | University of Washington |
| Jennifer | Siani | jennifer_siani@fws.gov | USFWS |
| Devin | Simmons | devin.l.simmons@odot.state.or.us | Oregon Departmen of Transportation |
| Marcia | Snyder | snydermn@gmail.com | EPA |
| Khem | So | khem_so@fws.gov | USFWS |
| Jonathan | Soll | jonathan.soll@oregonmetro.gov | Metro Parks and Nature |
| James | Strittholt | stritt@consbio.org | Conservation Biology Institute |
| Chris | Swenson | Chris_Swenson@fws.gov | USFWS |
| Rich | Szlemp | Richard_Szlemp@fws.gov | US Fish and Wildlife Service |
| Jennifer | Thompson | jennifer_thompson@fws.gov | USFWS |
| Lauri | Turner | lturner@fs.fed.us | USFS - Deschutes NF |
| Kelli | Van Norman | kvannorm@blm.gov | Bureau of Land Management |
| Joy | Vaughan | joy.r.vaughan@state.or.us | oregon department of fish and wildlife |
| Lindsey | Voskowsky | lindseyvoskowsky@gmail.com | |