



North Pacific Landscape Conservation Cooperative

Steering Committee **Draft** Meeting Summary
Lacey, Washington
July 9-10, 2014

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Welcome and Introductions

Lyman Thorsteinson and Rory Annett, Steering Committee Co-Chairs, welcomed Committee members to the meeting. They acknowledged new faces round the table and the progress the NPLCC has made since it was established three years ago. The meeting focused on getting feedback from Committee members on ways the NPLCC can help its partners in moving their programs and work forward.

Penny reviewed the meeting agenda and objectives:

- Foster greater awareness about climate change impacts and adaptation practices in the NPLCC.
- Learn about and identify collaborative opportunities with NPLCC members, partners, projects, and the Nisqually National Wildlife Refuge.
- Provide guidance on NPLCC Conservation Goals and Objectives.

- Identify priorities for the S-TEK FY15-16 Implementation Plan.
- Review and adopt NPLCC Data Management Plan, Project Management Database, and Communications Strategies.
- Discuss and determine next steps for ensuring project relevance and working with S-TEK.

The Steering Committee approved the April 24th meeting summary to be posted on the website.

Introduction to the NPLCC

John Mankowski, NPLCC Coordinator, gave an overview ([Attachment 1](#)) about the NPLCC. He explained the NPLCC wants to ensure it is helping its partners meet their needs. His presentation described the overall framework for LCCs nationwide and reviewed the mission, goals, and organizational structure of the NPLCC. He expressed that at its core; the NPLCC convenes partners, funds strategic projects, builds capacity, and communicates to share information.

North Pacific Climate Science and Action Options

Lara Whitely Binder, UW Climate Impacts Group, gave a presentation ([Attachment 2](#)) on climate change impacts in the geography of the NPLCC. She explained that the UW Climate Impacts Group studies the impacts of climate variability with the goal of providing information to decision-makers. She reviewed observed trends in the NPLCC region related to climate, hydrology, sea-level rise, and oceans. She described key climate impacts drivers, including:

- Rapid projected warming in the range of four to six degrees by 2050
- Lengthening of the growing season due to longer frost-free periods
- Thawing of permafrost in Alaska
- Continued variability in precipitation
- Less snowpack
- Shifting streamflows
- Sea level rise of 3.9 to 56.3 inches by 2100 in California, Oregon, Washington, and British Columbia
- Increased ocean acidification by 100-150% by 2100

Lara closed her presentation by discussing the implications for resource management due to these drivers, highlighting that there will be winners and losers based on the shifting landscape.

Patty Glick, National Wildlife Federation, gave a presentation ([Attachment 3](#)) on the Climate-Smart Conservation Guide. Patty explained that one of the primary conclusions of the national climate assessment is that tremendous changes in the environment are occurring and managers need to prepare and plan for those changes now. With growing interest in climate change adaptation, the National Wildlife Federation worked with partners to develop an adaptation guidance approach called the Climate-Smart Conservation Guide. The guide:

- Provides general principles for adaptation planning based on best practices
- Describes four conservation themes – 1) act with intentionality; 2) manage for change, not just persistence; 3) reconsider goals, not just strategies; and 4) integrate adaptation into existing work
- Includes a climate-smart conservation cycle to act as a framework for adaptation planning and implementation, including:

1. Define planning purpose and scope
 2. Assess climate impacts and vulnerabilities
 3. Review/revise conservation goals and objectives
 4. Identify possible adaptation options
 5. Evaluate and select adaptation actions
 6. Implement priority adaptation actions
 7. Track action effectiveness and ecological response
- Discusses obstacles to adaptation and how they can be overcome

Steering Committee Discussion

Robyn Thorsen, US Fish and Wildlife Service, asked whether Lara has presented this information to other industries beyond the science community and natural resource organizations.

Lara Whitely Binder responded that this information is gaining traction with transportation agencies. They are looking at their infrastructure and planning to adapt based on climate change. The insurance industry is also paying close attention.

Eric Morrison, Tribes/First Nations (Alaska), asked if Lara could provide the specific citation for the marmot data she cited in southeast Alaska.

Lara explained she got that information from the National Wildlife Federation reports looking at climate impacts in the NPLCC region. She suggested reviewing the terrestrial report to find the source citation.

John Mankowski asked if there was information outlining how often extreme weather events were to be expected in the future.

Lara indicated studies in the NPLCC area indicate an increase in severity and frequency of extreme events. Work is ongoing to use regional climate models to capture extreme events to better understand potential changes.

James Partain, National Oceanic and Atmospheric Administration (NOAA), said that NOAA is working on extreme event research. They have found that climate change is affecting the ability to forecast climate change in the short term.

Stephen Zylstra, US Fish and Wildlife Service, explained that the Department of Defense (DOD) is starting to fund adaptation planning and was wondering if anyone had heard about how those funds were being used.

Lara responded that she has not heard specifics about the DOD and adaptation planning. Patty Glick, National Wildlife Federation (NWF), added that the NWF has received some funding from DOD.

NPLCC Conservation Goals and Objectives

Karen Jenni, Insight Decisions, gave a brief presentation ([Attachment 4](#)) on the background behind the NPLCC's draft conservation goals and objectives. Karen reviewed that the NPLCC is looking to establish conservation goals due to congressional direction and US Fish and Wildlife Service performance expectations. She discussed how conservation goals would fit into the current NPLCC charter and their

relationship to current strategies. Particularly they would relate as context to the Science and Traditional Ecological Knowledge (S-TEK) Strategy and be used to develop S-TEK implementation plans.

Karen explained that NPLCC staff drafted a set of conservation goals. They used information in the current S-TEK strategy, reviewed goals/objectives of NPLCC partner climate-related initiatives, and work being done by other LCCS to draft these goals. Staff then developed an overall conservation goal and one goal with two supporting objectives for each priority topic identified in the S-TEK Strategy. She then reviewed each goal and facilitated discussion to get input from the Steering Committee.

Proposed Overall Conservation Goal | *Increase the likelihood that the NPLCC region will continue to support its emblematic species, ecosystems, and the cultures and livelihoods that depend on them. We [NPLCC Partners] will accomplish this by managing in ways that anticipate climate change and related stressors thereby contributing to sustainable ecologically-connected landscapes.*

The Steering Committee provided the following comments on the proposed overall conservation goal:

- The use of the term “emblematic species” is problematic as it indicates there is a specific list of species that should be considered. The Committee recognized that the NPLCC does not want to create a specific list, but rather focus on supporting agencies in their work with species they have identified as important. Some suggestions to improve this wording included:
 - Adding the phrase “partner-defined emblematic species” or “support partners’ species of interest”
 - Switch the list so it reads “ecosystems, species, and the cultures and livelihoods”
 - Remove species from the list entirely
- The goal needs to clearly call for the need of adaptation planning regarding climate change and related landscape-scale stressors.
- Concern that the goal is not direct enough. Suggestions were made to remove the wording “increase the likelihood” or make sure the statement was written as a goal. As it is written now the second sentence describes a strategy to achieve a goal.
- The goal needs to support the organization’s abilities to be proactive in management. There was discussion whether the word “anticipate” should be supplemented with a different modifier, but no clear consensus was reached on an alternate.
- Tribal representatives were unsure if the overarching goal could be adapted for tribes. They described the unique connection between tribal culture and the resources they use on the land. As climate change forces ecosystem changes, there is a lot of concern about how that impacts their culture.

Topic-Specific Conservation Goal | *Inform policy, management decisions, and the actions of resource managers to maintain ecosystem functions so as to provide sustainable cultural, subsistence, recreational, and commercial resource use [of the priority resource] in light of [the climate-related stressor]*

The Steering Committee provided the following comments on the proposed topic-specific conservation goal:

- A concern was raised about whether the goal focused on ecosystem functions that provided a use value only and did not include non-use values. The Committee felt that revising the goal to focus just on ecosystem function rather than describing those functions would account for this concern. They suggested removing the following text, “so as to provide sustainable cultural, subsistence, recreational and commercial resource use.”

- The goal connects well with the NPLCC's overall goals and mission. The use of the word inform could be strengthened

Supporting Objectives

(a) Identify decision-relevant information needs associated with understanding how [climate-related stressor] will affect [priority resource]

(b) Where appropriate, support/develop/provide that information to decision-makers in a manner that will be useful for promoting and informing decisions that (1) anticipate landscape-scale [climate-stressor-related] changes, and (2) reduce risk, increase adaptive capacity, increase resilience [of the priority resources]

The Steering Committee provided the following comments on the proposed supporting objectives:

- The objectives fit well with the management goals.
- Tribal members of the Steering Committee commented that there is a need to get additional tribal representation on the S-TEK Subcommittee. They also discussed the difficulty of taking science related facts and language and translating them to tribal leaders. Overall, they felt the goals looked good.
- These objectives will help agencies do their work better especially to ensure there are not duplicative efforts underway and identify ways to leverage science capacity.

Penny Mabie closed the discussion noting that the Steering Committee was generally supportive of the conservation goals and objectives. She then confirmed next steps for updating and finalizing the goals and objectives:

1. NPLCC staff will revise the goals and objectives based on feedback from the Steering Committee
2. NPLCC staff will send out these revisions to the Steering Committee for review
3. The Steering Committee will look to approve the goals and objectives at their next meeting

S-TEK 2014

Mary Mahaffy, NPLCC Science Coordinator, gave a presentation ([Attachment 5](#)) on the projects funded in fiscal year 2014. She reviewed the 2014 focused activities that led to the request for proposals. Overall the NPLCC is funding \$430,000 worth of projects. She gave a brief overview of the funded projects, including:

- Conservation Planning Atlas (CBI; \$25,000)
- Cascadia Partner Forum (Conservation Northwest, \$9,500)
- Cascadia Interactive Climate Map (University of Washington; \$25,000)
- Conference Support: Exchange of Climate Science Information (\$1,500)
- Climate Change Vulnerability Assessment of Pacific Lamprey Year 2 (US Fish and Wildlife Service; \$26,000)
- Workshop – Using Species Traits to Predict Nearshore Species Climate Vulnerability (Environmental Protection Agency, US Geological Survey, NPLCC; \$30,000)
- Bringing Climate Change into Habitat Plans (US Fish and Wildlife Service; \$2,000-\$3,000)
- Cross Boundary Planning for Resilience and Restoration of Endangered Oak Savanna and Coastal Douglas-fir Forest Ecosystems (Nature Trust of British Columbia; \$52,500)

- Implementing Climate-Smart Resource Management Across Multiple Ownerships in Southwest Oregon (US Forest Service, \$49,500)
- How to Adapt to Climate Change – A Practical Workshop for Protected Area Managers (Ministry of Forest, Lands, and Natural Resources Operations and Ministry of Parks, \$10,000)
- Climate Change Impacts on Nooksack River Hydrology (Nooksack Tribe; \$50,000)
- Climate-Smart Conservation Class for NPLCC Partners (\$9,500)

Steering Committee Discussion

Stephen Zylstra noted the importance of not only reporting NPLCC funds but also how these funds are leveraged with partner funds.

Mike Tranel, US Forest Service, asked if there were any sectors not well represented in proposals for the 2014 funding.

Mary Mahaffy responded that there is not an Alaskan project being funded in 2014. Overall, the NPLCC did not receive many proposals from state agencies. Mary also noted that the NPLCC is going to work on ensuring tribal proposals be considered using a different process for review in future years. Lastly, Mary indicated she would send a full breakdown of pre-proposals by geographic region to the Steering Committee.

S-TEK Fiscal Year 2015-16 Priorities

Karen Jenni gave a presentation ([Attachment 6](#)) and facilitated a discussion of S-TEK fiscal year 2015 to 2016 priorities. Karen established the context for the implementation plan which identifies Areas of Focus and Activities related to the priority topics and guiding principles outlined in the S-TEK Strategy. She outlined the planning process to develop the implementation plan, including:

1. Identifying potential activities
2. Evaluating and ranking activities
3. Selecting areas of focus for 2015 and 2016
4. Develop activities for NPLCC support in 2015 and 2016

Karen reviewed the nine Areas of Focus for the implementation plan and the set of candidate Activities that were identified by the S-TEK Subcommittee. These Activities fell under three distinct types: 1) tool development and needs identification, 2) analysis and sharing of “what works,” and 3) adding climate considerations to “traditional” projects. Karen then led the Steering Committee through a discussion of the identified Activities and what they see as priorities for the next two years.

Steering Committee Discussion

The following are the key points noted during the Steering Committee discussion:

- Committee members identified that the list of current Activities do not include looking at how human health and well-being are impacted by climate change. They speculated that this may be because there are few social scientists on the S-TEK Subcommittee. Health and well-being are an important focus particularly to communicate with politicians around why actions need to be taken to address climate change. Also related, another important topic for consideration is looking at visitor access issues and recreation impacts.

- Several Committee members identified a need to have better economic valuation methods to value ecosystem services and environmental benefits. Agencies are required to report the socio-economic impacts of projects. Showing the economic benefit from climate change action projects would further the argument for why they should be implemented. These valuation methods need to start being incorporated into all activities and should not just be considered a separate issue.
- Tribal members of the Steering Committee explained that they see lots of information being lost. TEK about plants and species are disappearing and the tribes are still struggling with sharing that information more broadly. They also mentioned the need for additional capacity for their work.
- One Steering Committee member highlighted the importance of trainings and workshops for managers. These opportunities teach them how to turn the corner from planning to action on the ground.
- Karen led the Steering Committee in a dot exercise, asking them to allocate \$800K to fund projects across the Areas of Focus and identified Activities. The results of the exercise and resulting discussion are summarized below:
 - The top activities selected were:
 - Data and information synthesis and sharing
 - Assess vulnerability and resilience of resource(s) to projected climate change
 - Further clarify decision-maker needs for S-TEK information
 - Conduct or support stakeholder outreach by the NPLCC or by NPLCC partners
 - Improve information on how climate change will affect linkages between ecological and human resources.
 - Steering Committee members offered specific suggestions to focus work, including:
 - Review current lists of indicators being monitored to identify a usable number of indicators that decision-makers can use to better understand ecological dynamics in the NPLCC region
 - Where possible, extend prior NPLCC work by doing similar projects in new geographic regions, on new species, and supporting workshops or trainings to present information developed from NPLCC projects to decision-managers
 - Identify ways tribes can participate in study projects and have some of their questions and/or needs answered through funded projects
 - British Columbia needs better estuary and sea-level rise modeling to better understand areas of importance for conservation
 - More information is needed on climate impacts on the outer coast of Washington State; a lot of focus has been around Puget Sound
 - There is need to understand climate impacts in alpine regions on both the ecosystem and cultural values these areas provide

Karen explained that she and the S-TEK Subcommittee would incorporate insights from the discussion to create a draft 2015-16 implementation plan. The draft would be presented for review at the next Steering Committee meeting.

S-TEK Project Management and Accountability Practices Plan

Mary Mahaffy gave a brief presentation ([Attachment 7](#)) on the draft Project Management and Accountability Practices Plan document developed by the S-TEK Subcommittee. The document outlines clear objectives and accountability assurances for funded projects, including: identification of project priorities; solicitation and award of projects; and project implementation. The Steering Committee had the document two weeks in advance for review. Mary noted that one additional change that was suggested was to add a paragraph that outlines that a delegated ad hoc committee would have the authority to approve small amounts of “year-end” funds to projects that are less than \$20,000 without the requirement to involve the entire Steering Committee.

Steering Committee Discussion

The following are the key points noted during the Steering Committee discussion:

- Ensure that project investigators understand the management applications of their work and directly call that out in their final report that is provided to the NPLCC
- Think about targeting project webinars towards key audiences who may care most about the results of a project.
- Remaining concerns about TEK and requirements to list past data and data ownership. Additional language needs to spell out how the NPLCC will work with partners and data from TEK to ensure it is not transferred between agencies.

The Steering Committee conditionally approved the document with the caveat that it is revised to address tribal concerns about data accessibility. They approved the addition of the clear process for approving small, “year-end” projects.

Steering Committee Round-Robin

Daniel Brody, EnviroIssues, introduced the Round Robin explaining that each Steering Committee member would have several minutes to highlight current work their agency is doing related to climate change adaptation and sustainable resource management. Steering Committee responses are captured in the below table:

Steering Committee Member	Organization	Work Highlights
Joe Hostler	Yurok Tribe	<ul style="list-style-type: none"> ▪ Received \$800,000 EPA Star Grant to work on climate change adaptation plan ▪ Tributary assessment on reservation is occurring
Whitney Albright	California Fish and Wildlife	<ul style="list-style-type: none"> ▪ Updating and incorporating climate change into state Wildlife Action Plan ▪ Second year of Climate College for employees ▪ Updating California’s Climate Adaptation Strategy
Stephen Grey	Alaska Climate Science Center	<ul style="list-style-type: none"> ▪ Preparing for November meeting of LCCs and Climate Science Centers in Alaska

Steering Committee Member	Organization	Work Highlights
Barbra Schrader	US Forest Service	<ul style="list-style-type: none"> Two national forests are developing climate change vulnerability assessments Developing regional mapping strategies Will work with NPLCC to identify ways to share NPLCC information with Forest Service managers in concise ways
Brad Bales	Pacific Coast Joint Venture	<ul style="list-style-type: none"> Reviewing how to keep internal and external operations relevant by looking at communications, branding with emphasis on larger landscape conservation
Eric Morrison	Douglas Indian Association	<ul style="list-style-type: none"> Conducting tribal environmental workshops in southeast Alaska
Eliza Ghitis	NW Indian Fisheries Commission	<ul style="list-style-type: none"> Providing technical support and coordination of climate change efforts Working collectively with tribes to avoid duplication, increase accessibility of data, and share data and tribal knowledge where applicable and appropriate Identifying collective tribal needs, including time, resources, and funding
David Redhorse	Bureau of Indian Affairs	<ul style="list-style-type: none"> Conducting a self-assessment of how the agency would mainstream climate change, including asking tribes to consider climate change when submitting proposals
Gustavo Bisbal	NW Climate Science Center	<ul style="list-style-type: none"> Coordinating with the NPLCC, NorWEST, and Forest Service Hubs to reduce duplication Funding science projects Offering Climate Boot Camp to educate and train young adults on climate change Co-sponsoring NW Climate Science Conference Have new communications specialist that will coordinate with the NPLCC
Mike Tranel	National Park Service	<ul style="list-style-type: none"> Trying to ensure that they are not just going through planning efforts, but are putting those plans into action A recent report on climate change effects on parks nation-wide was controversial For Alaska, they are dealing with a messaging problem around climate change with visitors because most like that it is warmer and sunnier
Frank McCormick	US Forest Service	<ul style="list-style-type: none"> Pacific Wildland Fire Lab does a lot of prediction and modeling of fire risk A lot of work being done in aquatic ecosystems around bull trout modeling Green LiDAR program being used to get detailed bathymetry of water bodies; being used along the Atlantic coast.

Steering Committee Member	Organization	Work Highlights
Vicki Finn	US Fish and Wildlife Service	<ul style="list-style-type: none"> Using surrogate species process in the Willamette Valley to communicate with the public and looking to replicate the project across every landscape
Stephen Zylstra	US Fish and Wildlife Service	<ul style="list-style-type: none"> Department of Interior is looking strategically at landscapes for where to conserve, preserve, and develop
Chris Tunnoch	British Columbia	<ul style="list-style-type: none"> Developed a climate change roadmap to help managers create plans for climate action Using tools based on the work of PCIC and are interested in understanding what are the latest and greatest tools
Karen Taylor-Goodrich	National Park Service	<ul style="list-style-type: none"> Integrating climate change into everyday operations Working on an overall national climate strategy Doing adaptive management planning Working collaboratively with several LCCs and other forums
Carri Hessman	Bureau of Reclamation	<ul style="list-style-type: none"> Will be releasing a climate change strategy soon Developing an adaptation strategy for the Hood River basin Conducting vulnerability assessments in the Columbia River Developing climate science and tools through the Rocky Mountain Science Center Improving infrastructure resiliency and how water is delivered Recently hired a communications specialist focused on climate change using the Student Conservation Association
Steve Brockman	US Fish and Wildlife Service	<ul style="list-style-type: none"> Identified priority species for each of the five LCCs in the Alaska region Recently received a petition to list the Alaska yellow cedar which are suspected of being impacted by climate change since their roots are freezing without snow cover
Joyce Kelly	Environmental Protection Agency	<ul style="list-style-type: none"> Looking at what climate change means for EPA's day-to-day operations, but are running into staffing resource issues Developing pilot projects to apply climate change science in day-to-day work Looking at using climate change in TMDL projects on the Nooksack River with the Nooksack Tribe Using a Triple Value Simulation Model with tribes to model regional economic drivers, social behavior, and impacts that occur in the permitting process

Steering Committee Member	Organization	Work Highlights
Terry Williams	Tulalip Tribe	<ul style="list-style-type: none"> Working with NRCS on climate change issues including land use, restoration, recovery, and water quality Working with Washington’s governor on ocean acidification projects Developing guidelines to share TEK with partners Northwest Indian Fisheries Commission developed Treaty Rights at Risk document given to President Obama and the Council for Environmental Quality
Tasha Sargent	Pacific Coast Joint Venture	<ul style="list-style-type: none"> Planning work being done to identify areas to conserve based on climate change predictions – data issue in Canada because there is no wetland inventory Nationally climate change is not an issue, but some focus in British Columbia Strategic Relations branch is looking at glacier melt related to the Columbia River Treaty Recent grant from NAFTA to assess estuary carbon sequestration, they are looking for partners, information, and LiDAR data
James Partain	National Oceanic and Atmospheric Administration	<ul style="list-style-type: none"> NPLCC was used as an example of how to create a science plan within NOAA Working to integrate climate into various parts of NOAA
Lyman Thorsteinson	US Geological Survey	<ul style="list-style-type: none"> Supporting Jill Hardiman as NPLCC Assistant Science Coordinator Held a workshop in March to develop classification system for glaciers in the region to inform watershed approach Partnered in an LCC funded project to look at hydrologic/hydrographic data and input into national database Acquiring topographic data in southeast Alaska Looking at mineral inputs in the Copper River and effects on phytoplankton in Gulf of Alaska Researching expansion of sea otters into former range in response to food availability Studying pacific lamprey and effects of climate change on different life history stages Working with the Swinomish on changes in fish, habitat, and wildlife conditions

Panel Discussion

John Mankowski introduced the panel discussion. The panel focused on how different organizations are incorporating climate change science and information into their natural and cultural resources management activities.

The panel included:

- Carolyn Kelly, Air Quality and Climate Change specialist, Quinault Indian Nation
- David Troutt, Natural Resources Director, Nisqually Indian Tribe
- Crystal Raymond, Climate Adaptation Program Lead, Seattle City Light
- Whitney Albright, Climate Change Coordinator, California Fish and Wildlife
- Kyle Hanson, Fish Physiologist and Lab Manager, US Fish and Wildlife Service

Quinault Tribe

Carolyn Kelly gave a presentation ([Attachment 8](#)) on how the Quinault tribe is facing climate change. She explained that the Quinault Reservation is about 220 acres and that the tribe strongly relies on natural resources and sees themselves as a part of nature. They have seen the loss of Olympic glaciers, loss of ecosystem function in the Upper Quinault River, and have had their seawall breached. The Quinault see climate change as an issue and are beginning to seek funding for projects to plan for climate change. They have received a Bureau of Indian Affairs grant to do vulnerability assessments and are doing restoration work in the Upper Quinault River. They have staffing and resource challenges and are struggling to identify how best to incorporate TEK.

Robyn Thorsen asked what galvanized the tribe to move the lower village off the seawall and whether it increased support for taking action against climate change.

Carolyn responded that the tribe was seeing the impacts of climate change on people. Currently, the tribe is looking at where the lower village could be relocated.

John Mankowski asked where the tribe currently goes to find out what climate change work is going on.

Carolyn answered that they participate on Kathy Lynn's monthly tribal coordination calls.

Lyman Thorsteinson asked how fish viruses from state run fish hatcheries have impacted the Quinault resources and is that being considered in planning.

Carolyn responded that she is unsure as she focuses her work on the reservation.

Karen Taylor Goodrich asked if the Quinault work with other organizations on the peninsula

Carolyn explained the tribe got some grants to work with the US Fish and Wildlife Service on endangered species and some from the Forest Service related to forest management.

Terry Williams noted that he is working with the Quinault Tribe on biological diversity questions around glacial melting. One opportunity they have identified is to put in dams above 5,000 feet to capture water and release it through the summer.

Nisqually Tribe

David Troutt gave a presentation ([Attachment 9](#)) on the Nisqually tribe and their work in the Nisqually basin. David explained that the Nisqually Council is the oldest watershed council west of the Mississippi. A major challenge facing the basin is population growth as additional people move to the Puget Sound area. In 2001, a Nisqually Chinook recovery plan was created and serves as the basis of identifying the need to restore ecosystem function to prepare for climate change. The Nisqually estuary is now 92 percent functioning and is a critical part of the watershed. Monitoring in the estuary has identified that areas that mix slowly are critical habitat for juvenile fish.

David also discussed work occurring along the mainstem of the river, which is now 77 percent protected. Another concern for the basin is the loss of glaciers, with the Nisqually glacier predicted to disappear by 2070. To help adapt to this change, the tribe is working to get more water back into the river through natural filtration by installing rain gardens in the watershed. Future work the tribe is looking into is purchasing land to create a community forest and ideas to have I-5 cross over the estuary on a bridge rather than remain on top of a dyke.

Frank McCormick commented that groundwater storage and restoring groundwater connections is an important climate change mitigation strategy. He explained it will be important to demonstrate that work with private landowners.

David added that the tribe is looking at options to develop sustainably and find economically viable and successful ways to support the watershed.

Terry Williams added that the Tulalip tribe is concerned about freshwater and marine water mixing in aquifers. As sea-level rises this may become a greater issue.

Seattle City Light

Crystal Raymond gave a presentation ([Attachment 10](#)) on the work Seattle City Light is doing related to climate change adaptation. She explained the utility has been concerned about impacts of climate for years, especially as hydropower accounts for 90 percent of their electricity generation. In 2012, the agency released a strategic plan that included a new climate change initiative. The initiative focused on research and adaptation planning. They have been working in the Skagit area to assess the agency's ability to manage for multiple objectives. They are also looking at hazards that can impact transmission lines and system reliability. A major question and challenge they face is understanding how to quantify the costs and benefits of taking adaptation actions.

James Partain explained that NOAA is looking to provide more probabilistic information in the future. He asked Crystal if she felt that type of information would be useful for Seattle City Light.

Crystal responded that Seattle City Light uses probabilistic information in design of transmission infrastructure. Understanding extreme events would be useful to ensure infrastructure can withstand different scenarios.

California Fish and Wildlife

Whitney Albright gave a presentation ([Attachment 11](#)) on work California Fish and Wildlife is doing related to climate change. The state has a climate science and renewable energy policy department that coordinates with federal and state partners. Fish and Wildlife runs a Climate College program designed to build capacity and empower staff to address climate change in their daily work. They are also updating their state wildlife action plan using an open standards framework to identify stressors and implementation actions. Some of the challenges they are facing is general information needs around climate change. Working with the LCCs is one way California hopes to reduce information gaps.

Frank McCormick asked if the Climate College information is on their website.

Whitney answered that all lecture recordings and materials are posted for both courses on their website.

US Fish and Wildlife Service

Kyle Hanson gave a presentation ([Attachment 12](#)) on vulnerability assessments for national fish hatcheries. The basis for the project was to understand if hatcheries can operate in the future given climate impacts. They started by looking at the Winthrop hatchery and gathered local knowledge of current conditions through stakeholder engagement. This helped them ensure the vulnerability assessment would be useful to managers. The research team reviewed climate change data and exposure of the facility and modeled future scenarios. They found that summer months there is extreme vulnerability. With this conclusion they engaged stakeholders again to identify adaptive approaches to mitigate this impact. They are now looking to conduct similar vulnerability assessments at other fish hatcheries and share information with stakeholders.

Shaun McKinney, US Forest Service, asked if the hatchery was looking at chillers, water management and the consideration of forestland and rangeland best practices.

Kevin responded that the hatchery is incorporating these strategies as part of a larger system. Shaun added he has some models that could be useful to Kevin's work and suggested they discuss after the meeting.

James Partain commented that Kevin's data graph is a perfect example of how to present data to decision-makers as actionable information. NOAA has heard from managers in Alaska that if they knew nine days in advance of a freezing rain event they could decrease caribou quotas for hunters to reduce caribou loss due to freezing rain events.

Eric Morrison explained that hatcheries are not positively viewed in Alaska. He explained that the first hatchery was developed in the birthing ground of a herring run. When fry from the hatchery were released it only took several years before the herring were gone. Hatcheries can also pollute nearby waters. He asked what types of salmon the hatchery raises and if they have considered changing species.

Kevin answered that the Winthrop hatchery raises Chinook, Coho, and some Steelhead. Their work did not look at whether the hatchery should shift species it rears.

Panel Discussion

Penny Mabie asked the panel where they saw opportunities for synergy between their work and the work of the NPLCC.

Carolyn responded that understanding where information is available for the tribe is really important. If the LCC knows what people are doing and can facilitate conversations with the tribes that would be advantageous.

David Troutt explained that Northwest treaty rights are at risk. Tribes are losing habitat and the resources they depend on. Far too often the focus is on resolving conflicts between landowners rather than actually resolving habitat issues. More federal leadership is needed ahead of the curve before these issues become major crises. In general, opportunities to be more proactive need to be pursued.

Kyle answered that the LCC can help bring together different groups and can promote the work that is being done in the region.

Crystal responded that bringing together people with similar questions to pool research funding could be an important function of the NPLCC. Demonstration projects that showcase on-the-ground actions are needed to educate others on how to do climate change adaptation.

Whitney explained that she appreciates the LCC offering training opportunities and sharing the results of projects.

NPLCC Business

NPLCC Staff provided the following updates on activities:

LCC Council and LCC Network: The LCC Council adopted their charter, which outlines its role to support LCCs in gaining international recognition and buy-in from federal and state agencies, Tribes and, indigenous peoples. They are planning to adopt a communications strategy soon and LCC steering committees will see viable communications from the Council soon.

National Workshop: There is an upcoming national workshop on large landscape conservation. It is an international meeting focused on products and progress being made by LCCs. It is in Washington, DC and will occur in October. Over 460 papers have been submitted.

August Steering Committee Meeting: The next Steering Committee meeting was scheduled for August 13. NPLCC staff believes the meeting should be moved to September. John will send out a Doodle poll to members to identify the best date and time for the meeting.

Communications and Outreach Subcommittee (COR): Mike Tranel explained that the COR has been meeting over the last few years and has overseen a lot of communications progress. Meghan Kearney, NPLCC Communications Specialist gave a brief presentation ([Attachment 13](#)) on current efforts underway related to communications. She added that she will be working to develop project specific outreach strategies to target project relevance.

Tribal/First Nations Committee: Eric Morrison gave an update on the Tribes/First Nation Committee. They are planning for a September 4th meeting in Portland to gather tribes. The meeting will focus on how to best engage them with the NPLCC and how tribes can get their needs met through the NPLCC. Also on the agenda will be to educate tribes about the NPLCC; review federal climate change programs in different regions; and discuss experiences tribes have had working with the NPLCC. The result of the meeting will be recommendations on how the NPLCC can work with tribes on TEK and other issues.

Don Sampson, Affiliated Tribes of NW Indians, added that he represents 54 tribes and he will connect with Eric on notifying them about the upcoming meeting.

Partner Highlight

Eric Morrison gave a brief presentation ([Attachment 14](#)) about the affiliated tribes of southeast Alaska. They recently started a program called Local Environmental Observers (LEO). Several villages have signed up for the program where individuals who notice anything unusual in their village or region take photos and send it to a centralized group that meets and discusses them. The tribes are also building a good relationship with the US Forest Service. They have been working with them on historical and sacred sites as well as climate change issues.

One of the biggest issues related to climate change the tribes face is the movement of historical sites. Eric explained that elders have gone out to identify historic sites and they were unable to find many of them. They've found that over time land has risen, sometimes between 50-300 feet. These historical sites that were right on the coast are now up the mountain in many places. Another major issue is the spruce beetle which is killing trees. They've seen over 100,000 acres of dead cedar due to climate change. Tribes have also encountered new phytoplanktons that are poisonous that are infiltrating crabs and other shellfish eaten by tribes. Other concerns include unpredictability of harvest schedules and ocean acidification. Tribes in Alaska are partnering with First Nations in British Columbia over shared concerns.

A recent effort they are undergoing is to work with EPA and the US Forest Service at a community level. The state is required to acknowledge subsistence rights and protection of resources. Often subsistence needs go beyond territory areas currently identified. Tribes are trying to have the federal government recognize Traditional Territory Maps that include the full range of historical subsistence use for protection.

Steering Committee Discussion

Lyman Thorsteinson asked why the tribes so often work with EPA regarding territory maps.

Eric responded that EPA funds a lot of the environmental work done in Alaska communities. It is often hard for tribes to work with the Bureau of Indian Affairs as well.

Alaska Steering Committee Meeting

John Mankowski explained that the NPLCC is planning a joint meeting with other Alaska LCCs in November. The meeting will be in Anchorage. It will focus on cross-cutting issues among the LCCs and then also have time for individual LCCs to meet. There is a prospectus available for review by the Steering Committee. John asked that members share their thoughts with him so he can work with the meeting planners to make sure the meeting is relevant.

Steering Committee Discussion

The following points were discussed by Steering Committee members:

- Desire to have time for the Pacific Coast Joint Venture to present on their work
- A need to focus on research for application to ensure LCCs fund research that is relevant to decision-makers
- Worth having the NPLCC focus on TEK usage and highlight those activities with the other Alaska LCCs

Project Highlight

Chase Freeman, US Geological Survey, gave a presentation ([Attachment 15](#)) about a project the NPLCC funded to look at climate change effects shifting marshes to mudflats. The project was started in San Francisco Bay in 2008. Bay marshes are surrounded by infrastructure, making them more vulnerable to climate change. The NPLCC funding was used to collect information in the Humboldt Bay refuge complex.

The project focuses on establishing baseline conditions, developing site specific sea-level rise models, and using those models to assess the impacts on marshes. The project uses bottom-up modeling methods and looks at parcel scale information. Chase reviewed the project's methods and modeling approach. He discussed model inputs including elevation data, bathymetry, plant community, water level monitoring, and accretion rate. The project also used habitat assessments to look at bird population and distribution data.

The project team is currently analyzing data for Humboldt Bay. Chase presented initial findings from the work in San Francisco Bay. Their work shows that 96 percent of the marshes in the bay will become mudflats by 2100. Next steps for the project include sharing information and working with the US Fish and Wildlife Service and the Navy on scenario planning.

Steering Committee Discussion

Stephen Zylstra asked if the project assumed land cover stayed the same for the time period modeled.

Chase responded that the project focused on plant community change more than land cover and focused on the marsh itself.

Eliza Ghitis asked if there was any opportunity for marsh movement in the areas the project is investigating.

Chase answered that northwest marshes have some ability to move with sea-level rise, but those in San Francisco Bay do not.

Next Steps

Penny Mabie reviewed the action items from the meeting:

- Mary Mahaffy will provide the Steering Committee with the geographic distribution of pre-proposals submitted for the 2014 RFP
- NPLCC Staff with Karen Jenni will revise the Conservation Goals document and provide for review before the next Steering Committee meeting
- Steering Committee members will send John any thoughts on the November Alaska meeting prospectus
- Mary Mahaffy will work with tribal representatives to ensure there is adequate language on data accessibility in the Data Accountability document
- James Partain will connect with Eric Morrison regarding an annual Tribal meeting in Alaska
- Steering Committee members will send items of interest to Meghan regarding British Columbia and Alaska to support communications efforts
- John Mankowski will send out a Doodle poll to the Steering Committee to select a new Steering Committee meeting date in September
- The August Steering Committee meeting is cancelled

Attendees

Steering Committee Members and Alternates

Whitney Albright	State of California
Lyman Thorsteinson	US Geological Survey
James Partain	National Oceanic and Atmospheric Administration
Tasha Sargent	Pacific Coast Joint Venture
Joyce Kelly	Environmental Protection Agency
Carri Hessman	Bureau of Reclamation
Karen Taylor-Goodrich	National Park Service
Chris Tunnoch	British Columbia
Vicki Finn	US Fish and Wildlife Service
Frank McCormick	US Forest Service
Steve Brockman	US Fish and Wildlife Service
Mike Tranel	National Park Service
Gustavo Bisbal	NW Climate Science Center
David Redhorse	Bureau of Indian Affairs
Eliza Ghitis	Tribes/First Nations (Washington)
Eric Morrison	Tribes/First Nations (Alaska)
Shaun McKinney	USDA National Resources Conservation Service
Brad Bales	Pacific Coast Joint Venture
Rory Annett	British Columbia
Ken Berg	US Fish and Wildlife Service
Joe Hostler	Tribes/First Nations (California)

Others in Attendance

Patty Glick	National Wildlife Federation
Robyn Thorsen	US Fish and Wildlife Service
Stephen Zylstra	US Fish and Wildlife Service
Carolyn Kelly	Quinault Indian Nation
Pat Jihan	US Fish and Wildlife Service
Laura Leschner	Pacific Coast Joint Venture
Lara Whitley-Binder	UW Climate Impacts Group
Kyle Hansen	US Fish and Wildlife Service
Scott Powell	Seattle City Light
Don Sampson	Affiliated Tribes of NW Indians
Pat DeHaan	US Fish and Wildlife Service
Karen Jenni	Insight Decisions, LLC
John Mankowski	NPLCC Coordinator
Mary Mahaffy	NPLCC Science Coordinator
Meghan Kearney	NPLCC Communications Specialist
Jill Hardiman	NPLCC Assistant Science Coordinator
Penny Mabie	Envirolssues
Daniel Brody	Envirolssues
Tricia Tillmann	Envirolssues