



NATIONAL WILDLIFE FEDERATION®

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February 19, 2014

Mary Mahaffy
Science Coordinator

North Pacific Landscape Conservation Cooperative USFWS, Washington Fish and Wildlife Office
510 Desmond Drive SE Suite 102
Lacey, WA 98503-1263

RE: Final Progress Report, U.S. FWS Agreement Number F11AP00032 and Modification No. 001

Dear Ms. Mahaffy:

This final progress report describes the completion of the objectives of U.S. FWS Agreement Number F11AP00032 (Agreement) – *Moving from Impacts to Action: Expert Focus Groups for Climate Change Impacts and Adaptation Strategies in Marine and Freshwater Ecosystems of the North Pacific LCC* – and Modification No. 001 to said Agreement – *Identifying and Synthesizing Climate Change Effects, Adaptation Approaches, and Science Opportunities in the North Pacific Landscape Conservation Cooperative's (NPLCC) Terrestrial Ecosystems*. National Wildlife Federation (NWF) completed all objectives associated with this Agreement and Modification No. 001 on time and within budget. They include:

- Completion and analysis of all surveys, focus groups and workshops associated with the Agreement and Modification No. 001 (complete as of June 29, 2012). Production, review, finalization, and dissemination of a report of findings, entitled *Advancing Landscape-Scale Conservation: An Assessment of Climate Change-Related Challenges, Needs, and Opportunities for the North Pacific LCC* (focus groups report, complete as of June 30, 2013).
- Finalization of two reports, entitled *Climate Change Effects and Adaptation Approaches in Marine and Coastal Ecosystems of the North Pacific Landscape Conservation Cooperative Region: A Compilation of Scientific Literature* (marine report, submitted September 13, 2013) and *Climate Change Effects and Adaptation Approaches in Freshwater Aquatic and Riparian Ecosystems in the North Pacific Landscape Conservation Cooperative Region: A Compilation of Scientific Literature* (freshwater report, submitted September 13, 2013), under Modification No. 001 to the Agreement.
- Production, review, finalization, and dissemination of a report, entitled *Climate Change Effects and Adaptation Approaches for Terrestrial Ecosystems, Habitats, and Species: A Compilation of the Scientific Literature for the North Pacific Landscape Conservation Cooperative Region* (terrestrial report), under Modification No. 001 to the Agreement. Production of this report began June 30, 2012 and was completed in conjunction with other grant deliverables. The draft report was reviewed from December 9-23, 2013. The final report was submitted December 31, 2013.

This Final Progress Report covers the period July 1, 2013 to December 31, 2013 in detail and provides an overview of the entire grant period (September 18, 2011 through December 31, 2013).

Background

The purpose of the focus groups project and report is to identify and understand the challenges, needs, and opportunities germane to project participants regarding their efforts to address current and projected climate change effects in their daily work and long range planning. The findings inform NPLCC members, specifically the Science and Traditional Ecological Knowledge Subcommittee, as they assess priorities, develop, and update the 2013-2016 Strategy for Science and Traditional Ecological Knowledge (S-TEK Strategy) and associated Annual Implementation Plans. Results were obtained through qualitative data analysis (using the grounded theory approach, an iterative process of data collection and analysis through which participants' input is collected, assessed, and synthesized) of survey responses, focus group input, and workshop documents provided by the 195 natural and cultural resource managers, conservation practitioners, and scientists who participated in the project and work in the NPLCC region. The qualitative analysis of participant input suggests six categories of challenges, four core needs, and seventeen activity areas particular to ecosystems, habitats, species, and indigenous resources. The report of findings is thoroughly cited and reviewed by experts and project participants in the field.

The purpose of the marine, freshwater, and terrestrial reports is to provide a common understanding of the most up-to-date science regarding climate change effects on marine, freshwater, and terrestrial ecosystems in the NPLCC geography. The reports provide a platform and starting point for NPLCC participants and stakeholders to consider issues and make decisions about NPLCC activities and priorities. They compile a large and rapidly evolving body of scientific and agency literature on historical baselines, observed trends, future projections, and implications for ecosystems, habitats, species, and biological communities. They also provide a menu of policy and management responses culled from the scientific literature on climate change adaptation in natural systems. The reports are thoroughly cited and reviewed by experts in the field. They are modeled after similar papers written for Washington State to inform Washington's statewide integrated climate change response strategy.

Summary of Significant Activities and Results

Key results

For the focus groups project and associated report, the primary result of NWF's effort is to identify conservation delivery, applied science, and science and data provision opportunities the NPLCC could consider to support resource managers, conservation practitioners, and researchers in their efforts to conserve and manage ecosystems, habitats, and species in light of climate change effects. Four core needs and seventeen activity areas particular to ecosystems, habitats, species and indigenous resources were identified that, if addressed, would respond to the six categories of challenges cited by project participants as impeding their ability to incorporate climate change into their daily work and long range planning. Findings were used to inform development of the S-TEK Strategy and 2013 Implementation Plan, and are also used to inform updates to subsequent Annual Implementation Plans. The final report is available on the [NPLCC](#) and [NWF](#) websites. NWF also printed eight full reports and 20 executive summaries for distribution in the region. Additional details on the project approach, methodology, and report production process were provided previously (see 2012 and 2013 Interim Progress Reports for this Agreement).

For the marine, freshwater, and terrestrial reports, the primary result of NWF's effort is to organize in a consistent and logical fashion a large and rapidly evolving body of literature to produce the first-ever reference documents of climate change impacts, implications for ecosystems, habitats, species and biological communicates, and climate change adaptation approaches particular to the North Pacific LCC geography. Together, the three reports provide this information for the NPLCC region's three major biome types: marine/coastal, freshwater, and terrestrial. These reports are used by natural and cultural resource professionals in the region, both to inform the NPLCC's consideration of science priorities and

activities and to inform natural and cultural resource professionals about the climate change impacts that are or are expected to affect their work.

Finalization of the marine and freshwater reports

NWF made revisions to increase the ease of navigation and usefulness of each document, for example by including thorough cross-referencing and providing hyperlinks to all Bibliography sources for which a hyperlink was available. Both final reports were submitted September 13, 2013. NWF printed nine copies of each full report for distribution to NPLCC members, partners, and stakeholders. They are also available on the [NPLCC](#) and NWF websites ([marine](#) and [freshwater](#)).

Additional details on the production and review process for the draft final marine and freshwater reports were provided previously (see 2012 and 2013 Interim Progress Reports for this Agreement and Final Progress Report for FWS Agreement Number 1017AG200).

Description of the terrestrial report production process

The terrestrial report assembles approximately 250 sources, most of which are peer-reviewed science and agency literature, to describe the major effects on terrestrial ecological processes, ecosystem services, habitats and species resulting from climate change throughout the North Pacific LCC geography and adaptation approaches to address those impacts. First drafts of several sections were completed between June 30, 2012 and February 28, 2013. The full review draft was finalized between September 1, 2013 and December 9, 2013. The terrestrial report is 462 pages long and contains eleven chapters, with detailed information on climate change drivers, impacts, implications for ecological processes, ecosystem services, habitats and species, and climate change adaptation approaches. Attachment A provides the Table of Contents for the terrestrial report. The full report is available on the [NPLCC](#) and [NWF](#) websites.

NWF worked closely with the University of Washington's (UW) Climate Impacts Group (CIG) and others to ensure the accuracy and usefulness of the report. For the terrestrial report completed under Modification No. 001, six climate change scientists and subject matter experts reviewed the report: Dr. Andrew Shirk (CIG), Dr. David L. Peterson (U.S. Forest Service), Dr. Dominique Bachelet (Conservation Biology Institute), Dr. Jessica Halofsky (UW Pacific Wildland Fire Sciences Lab), Ms. Lara Whitely Binder (CIG), and Mr. Michael Case (UW Landscape Ecology & Conservation Lab).

NWF printed 11 copies of the full report for distribution to NPLCC members, partners, and stakeholders. NWF also compiled the Executive Summaries for the marine, freshwater, and terrestrial reports into a single document and printed 40 copies for distribution to NPLCC members, partners, and stakeholders.

Presentations

Presentations of the marine and freshwater reports were described previously (see Final Progress Report for FWS Agreement Number 1017AG200). NWF presented results from the focus groups project three times:

1. Society for Conservation Biology, North America Congress (July 16, 2012): NWF presented interim results of the focus groups project, focusing on activities requested region-wide and project participants' emphases on integrating conservation and sustainable resource management across ecosystems, collaboration, and facilitation activities in a changing climate. Conference attendees commented positively on the project's focus on both data gaps and capacity needs among resource managers and conservation practitioners, as well as the inclusion of tribal and First Nations representatives and perspectives in the project approach and implementation.
2. NPLCC Steering Committee (August 29, 2012): NWF presented final results of the focus groups project, emphasizing the top nine focus areas (of 23) identified most frequently and strongly through qualitative analysis of project participants' survey responses, focus group input, and

workshop documents. Five of the top nine focus areas are support functions not targeted to a particular ecosystem, habitat, or species. The remaining four focus areas are science or science-oriented functions targeted to a particular ecosystem, habitat, or species. Four of the top nine focus areas represent core needs for science and traditional ecological knowledge that emerged through qualitative analysis of participants' survey responses, focus group input, and workshop documents.

3. 4th Annual Pacific Northwest Climate Science Conference (September 5, 2013): NWF presented final results of the focus groups project, focusing on the four core needs identified through the qualitative analysis of project participants' survey responses, focus group input, and workshop documents. The key message was that to respond to the impacts of climate change in their work, resource managers and conservation practitioners in the NPLCC region requested mostly non-technical assistance to make decisions. In meeting those needs, visualization emerged as a common and dominant theme – information is preferred in a visual and interactive format. The presentation catalyzed several discussions about the key role of the NPLCC in understanding and responding to these needs, next steps for responding to the needs, and similarities or differences between project results and results from similar endeavors.

Problems, Delays, and Efforts to Resolve

There are no problems or delays to report.

Conclusion

National Wildlife Federation completed the objectives outlined in this grant agreement on time and within budget. The focus groups report is the first systematic assessment particular to the NPLCC geography of the challenges, needs, and opportunities associated with incorporating climate change into the daily work and long range planning of resource managers, conservation practitioners, and scientists working in the NPLCC region. Similarly, the marine, freshwater, and terrestrial reports provide the first compilation of climate change impacts and adaptation approaches specific to the North Pacific LCC geography. Under separate funding, NWF is synthesizing the content in the marine and freshwater reports for use in an interactive web-based map displaying climate impacts, key risks and benefits for ecosystems, habitats and species, and climate-smart response strategies and case studies for the NPLCC region. This map is a communications and educational tool to inform natural and cultural resource managers, conservation practitioners, scientists, environmental educators, and the public about climate impacts, implications for valued resources, and climate-smart response options in specific geographic and ecological regions within the NPLCC geography. NWF appreciates the opportunity to contribute to this important work.

Thank you for your support.

Sincerely,

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ATTACHMENT A: Table of Contents for Terrestrial Report

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