



# R & E Grant Application 17-19 Biennium

Project #: 17-017

## *Nehalem Watershed Rapid Bioassessment*

### *Project Information*

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**Requested Cycle:** 17-2  
**R&E Project Request:** \$81,760  
**Other Funding:** \$194,967  
**Total Project:** \$276,727  
**Spending Start Date:** 8/5/2017  
**Spending End Date:** 5/31/2018  
**Project Start Date:** 4/1/2017  
**Project End Date:** 5/31/2018  
**Organization:** Lower Nehalem Watershed Council (Tax ID #: 911826263)

### *Fiscal Officer*

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**Name:** Claudine Rehn  
**Address:** PO Box 493  
Garibaldi, OR 97118  
**Telephone:** 503-322-2222  
**Email:** claudine@tbnep.org

### *Applicant Information*

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**Name:** Alix Lee  
**Address:** PO Box 249  
Nehalem, OR 97131  
**Telephone:** 503-368-7424  
**Telephone 2:** 541-231-8041  
**Email:** lnwc@nehalem.tel.net

### *Past Recommended or Completed Projects*

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This applicant has no previous projects that match criteria.

## Location Information

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### Where is it?

The project will occur on public land owned or managed by another party  
The project will occur on private land owned or managed by another party

### Landowner Information

**Name:** See Attachemnt

### Site Description

*Street Address, nearest intersection, or other descriptive location.*

The Lower Nehalem Watershed Council is proposing to conduct a Rapid Bioassessment and collect supplementary data for a Limiting Factors Analysis "Lite" of 332 miles of stream habitat in the Lower Nehalem (201 miles) and Upper Nehalem (131 miles) watersheds. Select stream reaches from all five Lower Nehalem 5th field basins (Middle, Lower, North Fork, Salmonberry and Cook Creek HUCs) and portions of the Upper Nehalem 5th field basins not previously inventoried will be surveyed using the protocol outlined in this application. Preliminary estimates of reaches proposed for the RBA snorkel inventory were identified by Bio-Surveys in coordination with the LWNC and UNWC. A GIS analysis was conducted to identify the end of potential coho distributions for primary rearing habitat. The analysis identified primary stream reaches with appropriate gradients for coho rearing. See attached map and stream miles estimates.

*Directions to the site from the nearest highway junction.*

*Following project completion, public anglers will be allowed the following level of access to the project site:*

Limited access

*Please describe what leases, easements, agreements are in place to ensure angler access to the project site, and what is the length of each agreement.*

This monitoring project encompasses Select stream reaches from all five Lower Nehalem 5th field basins and portions of the Upper Nehalem 5th field basins many of which are accessible to anglers through public lands, established access points and existing agreements. This project will not have any effect on access.

*Dominant Land Use Type:*

Forest  
Range/pasture  
Rural residential

### Project Location

*General Project Location.*

**County:** Tillamook, Clatsop, Columbia and Washington Counties  
**Town/City:** Nehalem  
**ODFW Dist:** Tillamook  
**Stream/Lake/Estuary Name:** Nehalem River Tributaries  
**Sub-basin:** Nehalem River (17100202)

*Specific Project Location.*

## ***Project Summary***

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### *Project Summary*

*Please provide a couple sentence summary of the proposal.*

This project will conduct a Rapid Bioassessment of 332 miles of stream habitat in the Lower Nehalem (201 miles) and Upper Nehalem (131 miles) watersheds. The project will collect critical data regarding salmonid distributions and abundance and associated watershed characteristics that may serve as potential limiting factors for salmonids.

### *Overall Project Goals*

*Describe the primary goals or outcomes of the entire project, including elements not requesting funding from R&E.*

- 1) Spatially describe the distribution and quantify the abundance of juvenile salmonids in the Nehalem Basin.
- 2) Spatially describe the location and quantify the abundance of spawning gravels appropriate for coho in the basin.
- 3) Spatially describe the location of key anchor habitats. These are the unique stream reaches that provide for all of the seasonal life history needs of coho (incubation, functional summer rearing habitat that is not temperature limited and interactive floodplains for winter rearing).

### *Primary objectives of R&E funding*

*Please describe the measurable objectives for the R&E portion of the funding request.*

- 1) Spatially describe coho distribution. The RBA will give a detailed picture of coho distribution within and among basins. Results will be used to identify “hotspots” with high rearing densities, poorly seeded areas, and extirpated local populations.
- 2) Identify streams with high coho potential/low seeding rates. Streams with high coho potential (extensive low gradient habitat with functional flood-plain connection), but less than desired seeding rates will be identified as high priorities for restoration.
- 3) Identify Streams with high coho potential/high seeding rates. Data will be utilized to identify streams with both high potential and high seeding rates as high priorities for conservation.
- 4) Develop restoration strategies. Streams or stream reaches will be ranked as a result of this survey effort for the development of a prioritized Work Plan for restoration that can be amended annually.
- 5) Assess restoration project effectiveness by collecting baseline data. Data will be utilized to monitor the effects of restoration projects on fish populations. The data collected within the inventory will function as baseline, pre-project monitoring data.

### *Current Situation/Justification*

*Please describe the current situation and explain why this funding is needed.*

The Nehalem Strategic Action Plan for Coho (in process) has identified the lack of basin-scale inventories of salmonid distribution, abundance and habitat distribution in the Nehalem watershed as overwhelming data gaps in our effort to systematically identify high priority areas

for restoration and conservation. Once complete, the plan will outline the process for filling those data gaps by conducting a Rapid Bioassessment for areas that have not been previously surveyed and collecting the necessary data to implement the newly developed Limiting Factors Analysis "Lite" (LFA-Lite) protocol. The assessments will be used to effectively identify and prioritize areas for restoration and conservation.

The Lower Nehalem Watershed Council is requesting funding in order to conduct a Rapid Bioassessment and collect supplementary data for a Limiting Factors Analysis "Lite" of 332 miles of stream habitat in the Lower Nehalem (201 miles) and Upper Nehalem (131 miles) watersheds. If awarded, ODFW Restoration and Enhancement funding will be used to hire a qualified consultant to conduct the survey.

Recreation and Commercial Benefit

*This project will provide benefits to:*

- Recreational fisheries
- Commercial fisheries

*Explain how this project will contribute to current (and/or potential) fishing opportunities, access, or fisheries management.*

The project will collect critical data regarding salmonid distributions and abundance and associated watershed characteristics that may serve as potential limiting factors for ESA-listed Oregon Coast coho salmon, Chinook salmon, chum salmon, and steelhead trout. The data will be employed to identify habitat conditions that restrict the success of one or more salmonid life history stages and to develop a prioritized list of restoration activities designed specifically to address the identified limitation(s). From this project, conservation practitioners and agencies will be able to systematically implement restoration actions throughout the watershed which enhance and increase spawning and rearing habitat for wild fish populations. Improving salmonid habitat throughout the Nehalem Watershed is essential to increasing the abundance and resiliency of wild salmonid populations which will highly benefit commercial and recreational fisheries.

*Percent benefit split between Commercial and Recreational anglers:*

- 50 % Commercial
- 50 % Recreational

*Please explain, or justify, how the percentage split was determined:*

The proposed inventory gathers baseline data critical for the development of a basin-scale prioritization of restoration actions. The data will be used to generate a road-map for Lower and Upper Nehalem Watershed Councils and partners to effectively implement restoration and conservation projects that address limiting factors for coho in each sub-watershed. Implementation of restoration actions throughout the watershed will improve spawning and rearing habitat for wild coho, Chinook, steelhead and cutthroat trout. By enhancing rearing and spawning habitat we expect to increase total populations of adult salmonids. This would benefit both commercial and recreational anglers equally.

*This project has been identified as an ODFW priority for:*

- Local/watershed
- Basin/regional

*Does this project directly support implementation of the ODFW Strategic Plan and/or current Fish*

*Division priorities?*

*Please briefly explain when this was identified as a priority and what process or workgroup was used to identified this as an ODFW priority.*

*Identify any plan or other document that identifies this priority.*

Nehalem Strategic Action Plan for Coho (in process) has identified the lack of basin-scale inventories of salmonid distribution, abundance and habitat distribution in the Nehalem as overwhelming data gaps.

Nehalem Conservation Action Plan (2012) identified high priority strategies to benefit riparian and freshwater systems. The RBA will identify areas for restoration and conservation where these strategies can be employed.

*Is this project part of an approved Salmon-Trout Enhancement Program (STEP) activity?*

No

*This project is intended to benefit the following species:*

Other Fish Species  
Chum Salmon  
Chum Salmon  
Spring Chinook Salmon  
Coho Salmon  
Lamprey  
Winter Steelhead  
Cutthroat Trout

*This project will benefit anglers or fishery by providing:*

Monitoring/Research

*Monitoring/Research*

*This project will be used to evaluate:*

Habitat (i.e structure, passage, water quality)  
Distribution (i.e. presence, absence, abundance)

*Has this project been reviewed or developed by an individual with appropriate qualifications (i.e ODFW biometrician, research professor)?*

Yes

The Rapid Bioassessment protocol described in this application was developed by ODFW, the Mid-Coast Watershed Council, and Bio-Surveys in 1998 to begin to answer the fundamental questions of species-specific spatial distribution within a watershed. This protocol has been utilized and refined since then. The Limiting Factors Analysis "Lite" protocol has been developed with the Nehalem Strategic Action Plan for coho team with input from Bio-surveys, ODFW, NOAA, and other technical advisers. The protocol is modified from "Approach to Limiting Factors Analysis and Restoration Planning" (Trask, Higley, 2003).

*Is this study critical to fishery management decisions?*

Yes

The primary use of the data will be to inform the development of restoration and conservation priorities for the Lower Nehalem Watershed Council, Upper Nehalem Watershed Council (UNWC) and their partners. ODFW staff biologists can utilize the data to help with identifying and designing restoration projects or in other decision processes such as land use decisions.

Neighboring watershed RBA databases are also routinely consulted by other ODFW district offices for prioritizing and designing restoration projects. The data have also informed ODFW decision making on supplementation programs and industrial timber companies are using the data in planning and implementing stream enhancement projects. The National Marine Fisheries Service's Coastal Coho Technical Review Team recently utilized RBA data from neighboring basins in their recovery planning processes.

Yes

The proposed inventory gathers baseline data critical for the development of a basin-scale prioritization of restoration actions. The data will be used to generate a road-map for Lower and Upper Nehalem Watershed Councils and partners to effectively implement restoration and conservation projects that address limiting factors for coho in each sub-watershed.

*Is there a plan to repeat this monitoring or research in the future?*

No

*Will the data be reported or published?*

Yes

The report will be distributed to interested landowners and agencies by LNWC and will be used as a foundation for the prioritization of restoration actions and project planning.

## ***Project Description***

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### Schedule

Activity	Date	RE Funding
Hire a qualified contractor	03, 17	No
First Technical Advisory Committee Meeting - Project Kickoff	04, 17	No
Landowner Contacts	05, 17	No
Conduct Rapid Bioassessment Surveys	06, 17	Yes
Data Analysis	10, 17	Yes
GIS Analysis	11, 17	No
Final Report and Presentation	04, 18	Yes

### Permits

Permit	Secured?	Date Expected
	No	

### Project Design and Description

*Please describe in detail the methods or approach that will be used to achieve the project objectives.*

#### BACKGROUND INFORMATION

The Nehalem Watershed encompasses a drainage area of approximately 855 square miles. Originating on the east side of the Coast Range then circling around the northern tip of the mountains, the Nehalem River travels 118.5 miles before draining into the Nehalem Bay Estuary. This expansive watershed provides habitat for Endangered Species ACT-listed (ESA) Oregon Coast coho salmon, as well as Chinook and chum salmon, steelhead trout, coastal cutthroat trout and Pacific and brook lamprey. Numerous watershed assessments and plans drafted by local, state, tribal and federal organizations/entities have identified a high priority need to fill data gaps for juvenile salmonid population abundance and distribution and their potential limiting factors in coastal streams.

Beginning in 2014, a focused team of public and private partners which included the Oregon Department of Fish and Wildlife (ODFW), National Oceanic and Atmospheric Administration (NOAA) Fisheries, NOAA Restoration Center, National Fish and Wildlife Foundation (NFWF), Wild Salmon Center (WSC), and the Oregon Watershed Enhancement Board (OWEB), convened to increase the funding available for coho salmon conservation on the Oregon Coast while engaging local partners to develop Strategic Action Plans (SAP) that identify local restoration priorities. The partners are working toward the development of the Coast Coho Business Plan to clearly and succinctly articulate a road map to reach regional conservation goals and locally determined conservation objectives. As part of this process, the Nehalem River basin was chosen as one of three “pilot” areas to develop a SAP for an independent coho population on the Oregon coast.

In 2015, The Lower Nehalem Watershed Council (LNWC) and Upper Nehalem Watershed Council (UNWC) teamed with local partners to promote the Nehalem Coho Strategic Partnership (NCSP) and develop the Nehalem Strategic Action Plan (NSAP) for coho pilot project with key support from WSC, ODFW, NOAA, NFWF and OWEB. Together we are building the foundation of a collaborative partnership focused on the advancement and expansion of coho recovery efforts in the Nehalem watershed. Our current efforts build on local assessments and action plans, North Coast TMDL and ODFW and NOAA agency mandates specific to coho recovery through the species’ freshwater range of life history stages.

The Nehalem Strategic Action Plan process has built upon the historical, collaborative planning efforts and findings from the numerous Nehalem watershed health assessments, limiting factors analysis and basin wide data synthesis. Integration of those findings are built into the current strategic planning process through a data synthesis, identification of professional goals and objectives at the 6th field HUC scale and expert consultation. However, none of these analyses provide quantitative assessments of juvenile salmonid abundance or distribution for the entire Nehalem River watershed.

Through the NSAP process, partners have continually identified the lack of basin-scale inventories of salmonid distribution and abundance and habitat distribution in the Nehalem watershed as overwhelming data gaps in our effort to systematically identify high priority areas for restoration and conservation. Unfortunately, the aforementioned surveys and inventories have not been quantified on the basin-scale and partners lack a comprehensive inventory during a single life history stage that gives us the ability to answer the following basic questions:

- 1) Where are juvenile salmonids summer rearing in the Nehalem basin?
- 2) What is the relative contribution to basin-scale coho production from each major 6th field tributary and the mainstem Nehalem (production potential)?

The Nehalem Coho Strategic Partnership and NSAP process seek to implement a data driven approach to restoration prioritization. Answering the fundamental questions above gives a strong foundation for weighing the cost/benefit relationships of most projects proposed in the Nehalem watershed. It is understood by the team that we are working with summer parr distribution and that winter habitat requirements are also part of the restoration matrix. However, strengthening the core summer populations (i.e. working in reaches that are not temperature

limited) and providing habitat improvements where juveniles are summer rearing allows us to expand populations from centers of spring and summer refugia habitat.

## PROJECT GOALS AND OBJECTIVES

In order to answer the fundamental questions of where juvenile salmonids are summer rearing in the Nehalem basin and what the production potential of each 6th Field tributary and the mainstem Nehalem is, the Lower Nehalem Watershed Council is proposing to conduct a Rapid Bioassessment (RBA) of 332 miles of stream habitat in the Lower Nehalem (201 miles) and Upper Nehalem (131 miles) watersheds. The project will provide essential data regarding salmonid distributions and abundance and associated watershed characteristics that may serve as potential limiting factors for salmonids. These studies are necessary for LNWC, UNWC and their partners to make informed, systematic and empirically driven recommendations for local watershed restoration priorities.

The data proposed for collection is of particular relevance for conducting Limiting Factors Analyses (LFA). The LFA is a powerful restoration prioritization tool employed by numerous conservation organizations and agencies in Oregon to identify habitat conditions that restrict the success of one or more salmonid life history stages and to develop a prioritized list of restoration activities designed specifically to address the identified limitation(s). The UNWC has completed an LFA for the Upper, Middle and Lower Rock Creek 6th field HUCs which has been integral to developing a restoration plan for the Rock Creek sub-basin. The NSAP process has developed a protocol to conduct an "LFA-lite" for the remaining 6th field HUCs in the rest of the Nehalem watershed. The NSAP identifies completing LFA-lites as a high research priority, allowing for the development of the baseline required for effective decision making and project prioritization. Along with the RBA snorkel data, the proposed effort intends to collect the other fundamental metrics for conducting an LFA-Lite. These are the abundance of coho specific spawning gravel and the physical location of Key Anchor Habitats. The Anchor Habitats are defined by a standard set of morphological metrics that can be observed while conducting the RBA snorkel inventory.

The RBA inventory will be employed to answer the following questions:

- 1) Where are juvenile salmonids rearing in the basin?
- 2) What is the relative contribution to basin scale coho production from each major 6th field tributary and the mainstem Nehalem (production potential that facilitates the prioritization of a basin scale restoration strategy)?
- 3) Which segments of the Nehalem basin are summer temperature limited (revealed by the absence of rearing salmonids)?
- 4) Where do thermal refugias exist from temperature limited stream segments (small order tributaries, side channels, etc.)?
- 5) Where are the key anchor habitats in each 6th field that are currently producing the bulk of the coho production for each seasonal life history (summer, winter, spawning and incubation)?

6) Where are all of the passage barriers and which life history do they impact (adult migration, temperature dependent upstream juvenile migrations or both)?

7) How well represented is the nomadic life history in the lower mainstem Nehalem?

8) Describe the current status and distribution of functional (dam building) beaver colonies in the Lower Nehalem 5th field in an effort to incorporate a beaver recovery strategy as part of the long term coho restoration plan. This also establishes a pre-restoration baseline of beaver dam abundance.

The results of the RBA will be used in endless ways to identify and prioritize basin-scale restoration actions by watershed councils, agencies and private landowners that are designed to identify and address the high priority seasonal habitat limitations that affect coho production. The goal is to utilize the results of the RBA to formalize a coho recovery plan that targets limited grant based resources on restoration actions with the greatest return on the investment.

Looking beyond the importance of the proposed data collection, this monitoring proposal is an investment in an overall process that will empower the LNWC to cultivate deeper relationships with a diversity of landowners, partners, and funders. These relationships are essential for strengthening our efforts to coordinate watershed-scale restoration. The LNWC and UNWC are utilizing the NSAP process to unite local conservation partners in collaborative, basin-wide aquatic restoration planning and prioritization. This proposal will build upon the NSAP which enabled the LNWC and UNWC to initiate this collaborative process and to convene the Nehalem Coho Strategic Partnership. There is momentum to develop these relationships and improve coordination of local watershed restoration. This monitoring proposal will not only provide essential data, but will also serve as a springboard for cultivating the levels of partner coordination, funder investment, and public support that are required to accelerate the pace and effectiveness of restoration in the Nehalem Basin.

## PROJECT DESCRIPTION AND METHODOLOGY

The Lower Nehalem Watershed Council will contract qualified consultants to conduct the following tasks as part of this project:

### 1. Landowner Contacts: May – July 2017.

Much of the survey area takes place on private land. This task will involve querying the Washington, Columbia, Clatsop and Tillamook County Tax Assessors databases, identifying landowners adjacent to proposed survey reaches and contacting landowners via phone and mail. Permission forms will be sent out for landowner signature to formally allow survey crews to access the waters of the state via private property. The consultant will lead this task. The LNWC project manager will assist with landowner contacts as needed. The Oregon Department of Fish and Wildlife (ODFW) Tillamook District and ODFW Life Cycle Monitoring Program will be consulted during landowner contacts to ensure positive relationships are maintained where their survey crews have been given access permission.

## 2. Surveys: June – September 2017

Select stream reaches from all five Lower Nehalem 5th field basins (Middle, Lower, North Fork, Salmonberry and Cook Creek HUCs) and portions of the Upper Nehalem 5th field basins not previously inventoried will be surveyed using the RBA protocol. Preliminary estimates of reaches proposed for the RBA snorkel inventory were identified by Bio-Surveys in coordination with the LWNC and UNWC. A GIS analysis was conducted to identify the end of potential coho distributions for primary rearing habitat. The analysis identified primary stream reaches with appropriate gradients for coho rearing. See attached map and stream miles estimates.

The RBA protocol described below was developed by ODFW, the Mid-Coast Watershed Council, and Bio-Surveys in 1998 to begin to answer the fundamental questions of species-specific spatial distribution within a watershed. This protocol has been utilized and refined since then. The RBA method is contiguous sampling within a watershed (census) designed to quantify salmonid distribution changes as you proceed up each tributary. This facilitates the identification and location of key rearing habitats and production hotspots (anchor sites).

Most surveys are initiated by randomly selecting any of the first five pools encountered. The protocol is altered, however, for small tributaries (2nd order) where salmonid presence or absence is undetermined. In these tributaries, the first pool above the confluence is selected as unit number one. This alteration in protocol was adopted to identify minor upstream temperature dependent migrations that may not have extended more than a few hundred feet. The identification of this type of migratory pattern in juvenile salmonids is critical for understanding potential limiting factors within a basin (e.g. temperature, fish passage, etc.).

The survey continues sampling at a 20% frequency (every fifth pool) until at least two sample units without anadromous salmonids are observed. In addition, pools that are perceived as having good rearing potential (beaver ponds, complex pools, and tributary junctions) may be selected as supplemental sample units to ensure that the best habitat is not excluded by the 20% sample (the selected units are flagged as non-random in the database).

In sub-basins with low rearing densities, there are situations where salmonids are not detected for more than two sampled units. These situations are left to the surveyor's discretion whether to continue or terminate the survey. There is a possibility that very minor, isolated populations of anadromous salmonids may be overlooked in headwater reaches of small tributaries. These tributaries would have to include a strong beaver population that would impound emergent fry and truncate their normal downstream migration patterns.

Pools must meet a set of minimum criteria to be surveyed. The pool must be at least as long as the average stream width. They must exhibit a scour element (this factor eliminates most glide habitats) and a hydraulic control at the downstream end. There are no minimum criteria established for depth. Only main channel pools are sampled. Side-channel pools, back waters, and alcoves are not incorporated into the surveyed pool habitats.

The lineal distances represented in the database are estimated by pacing from the beginning of one sampled unit to the next. The length of the sampled pool is always measured and not estimated. Pool widths are generally estimated. Since pool widths vary significantly within a

single unit, a visual estimate of the average width is considered appropriate. Pool widths are typically measured at intervals throughout the survey to calibrate the surveyor's ability to estimate distance.

The snorkeler enters the pool from the downstream end and proceeds to the transition from pool to riffle at the head of the pool. In pools with large numbers of juveniles of different species, multiple passes are completed to enumerate by species (e.g. steelhead first pass, O+ trout second pass, etc.). This allows the surveyor to concentrate on a single species and is important to the collection of an accurate value. In addition, older age-class steelhead and cutthroat trout are often easier to count on the second pass because they concentrate on locating food items stirred up during the surveyor's first pass and appear to exhibit less avoidance behavior.

In large order stream corridors, two snorkelers survey parallel to each other, splitting the difference to the center from each bank.

A cover/complexity rating is attributed to each pool sampled. This rating is an attempt to qualify the habitat sampled within the reach. The 1-5 rating below is based on the abundance of multiple cover components within a sampled unit (wood, large substrate, undercut bank, overhanging vegetation). Excessive depth (>3 feet) is not considered a significant cover component. The following criteria are used:

- 1) 0% cover present
- 2) 1-25% of the pool surface area is associated with cover
- 3) 26-50% of the pool surface area is associated with cover
- 4) 51-75% of the pool surface area is associated with cover
- 5) > 75% of the pool surface area is associated with cover

A numerical rating 1-3 is assigned to each sampled unit for the surveyor's estimate of visibility. This variable provides a measure of confidence in the collected data. Survey segments with a rating of 1 (excellent) can assume normal probabilities of detection (the observed is within 20% of the actual for steelhead). Segments with a measure of 2 (moderate) suggest that less confidence can be applied to the observed number (uncalibrated). Segments with a visibility rating of 3 (poor) suggest that the observation should only be used for an assessment of presence/absence.

Within each of the surveyed reaches comments are recorded on temperature, tributary junctions, beaver activity, knotweed presence, culvert function, abundance of other species, major land use changes, and LWD. These field observations are included in only the raw Access database under the "Comments" field and not included the Excel workbook.

The database contains fields designed to facilitate development of an associated GIS data layer. These are LLID location numbers unique for each stream segment.

Along with the RBA snorkel data, the proposed effort intends to collect the other fundamental metrics for conducting an LFA-Lite analysis. These are the abundance of coho specific

spawning gravel and the physical location of Key Anchor Habitats. The Anchor Habitats are defined by a standard set of morphological metrics that can be observed while conducting the RBA snorkel inventory. These are:

- 1) Gradients between 1% and 4%
- 2) Terrace heights below 2 feet
- 3) A functional floodplain 3 X active channel width or greater
- 4) The presence of spawning gravel

The proposed spawning gravel census will result in the quantification of spawning gravel abundance and the ability to georeference its distribution. This facilitates an evaluation of the systems condition as it relates to limitations associated with spawning and incubation.

Additionally the project will promote the development of a spatially explicit map that identifies the location of geomorphologically driven Anchor Sites (zones that provide for each and all of the life history requirements of salmonids, incubation, summer and winter habitat). This facilitates the development of a prioritized restoration plan.

### 3. Data Analysis: October – November 2017

After all surveys are completed, field data is entered into an Access database. Access is the fundamental storage device for the raw data that can be appended annually or integrated into other coast wide databases. The consultant will convert the Access data into an Excel Pivot table that is user friendly and allows easy manipulation and presentation of the data by species or stream. The consultant will conduct all data analysis and provide a final report that reviews abundance, distribution, and relative contribution to the watershed by 6th field. For example, the Excel pivot table is able to produce a histogram of either fish density or actual fish numbers over the lineal distribution of a selected stream.

Another product of the RBA inventory will be blackline USGS quad maps with the end of Coho and knotweed distribution indicated for every stream and tributary. In addition, these maps will indicate the location of all unnamed tributaries in the RBA database that have been assigned an arbitrary letter or number as they are surveyed. This information may then be digitized and justified to the existing GIS map layer so that the information can be utilized in restoration planning from the GIS platform. This step elevates the utility of the data significantly because it can be compared to existing road layers, elevation models, culvert layers, etc., which exist within other agencies.

### 4. GIS Analysis: November 2017 – April 2018

The GIS consultant will prepare GIS layers of the completed RBA and LFA-Lite data. The consultant will create geo-referenced ID's for each stream and the location of all of the unnamed tributaries in the RBA and LFA-lite data base that have been assigned an arbitrary letter or number as they are surveyed. This information will then be digitized and justified to an existing GIS map layer so that the information can be utilized in restoration planning from the GIS platform. The consultant will also create georeferenced RBA point layer to present fish presence data (including point data for each pool = type/density/abundance and species) and will create a

georeferenced point layer for site specific observations (identified in database and summary reports, such as: manmade and natural barriers, beaver dams, and invasive species). The consultant will create map products and layers that enable portrayal of reach definition and characteristics, channel types, side channel frequency, valley form/VWI, gradient profiles. The GIS consultant will also work closely with the RBA survey contractor to develop map products and layers and incorporation of other layers, such as ODF mapping that would allow further assessment of data.

The GIS consultant will provide all GIS layers, meta data, list of base layers and layer sources, and maps in GIS project formats to LNWC. LNWC is proposing to work with the GIS consultant to develop a web-based application to display results and also an in-house interactive map tool that allows the LNWC to manage, use and update GIS data for the entire Lower Nehalem watershed at the basin and sub-basin scale and to access information and update project data. The products of the GIS analysis will be made available to project partners and the public.

#### 5. Final Report: April – May 2018

Raw and analyzed data will be assembled into a final report by the consultant. The report organizes the results of the inventory by 5th and 6th fields. The consultant will conduct all data analysis and provide a final report document that reviews abundance, distribution, and relative contribution to the watershed. The report also details distribution and abundance data to describe biotic and morphological relationships that are important to fish production. The report will be distributed to interested landowners and agencies by LNWC and will be used as a foundation for the prioritization of restoration alternatives and project planning.

#### 6. Final Presentation: April – May 2018

The consultant will describe the methods, results and facilitate a discussion in a formal setting with the public. This forum will be organized and hosted by LNWC during a regularly scheduled speaker series event.

### BUDGET EXPLANATION

This monitoring proposal outlines the need, strategy and cost to conduct the Rapid Bioassessment and supplementary data for the Limiting Factors Analysis "Lite" of all 332 miles of stream habitat in the Nehalem watershed that have not previously been inventoried during earlier RBA projects that were implemented by the Upper Nehalem Watershed Council. We recognized that the scope and cost of this project may be prohibitive for the amount of funding available, therefore we have structured the budget in a phased approach. The survey reaches in the Lower Nehalem (201 miles) are identified as Phase I and those in the Upper Nehalem (131 miles) as Phase II. It is the recommendation of the project partners that this proposal be completed during one season (summer 2017) because it will allow the data to be correlated across the watershed, especially data that reflects temperature limited reaches and their effects on coho distribution. However it would be feasible to implement Phase I and II over a two year period. If awarded, ODFW Restoration and Enhancement funding will be used to hire a qualified consultant to conduct the survey.

Under the "Contracted Services" Budget Category, please note that the rate of \$440/mile for the line items "RBA survey Phase I" and "RBA survey Phase II" includes all of the following

services:

- 1) RBA Fish Snorkel Inventory.
- 2) Documentation of knotweed presence/absence (large, continuous patches), lamprey and winter steelhead redds, salmonid fish passage barriers, major land-use changes, beaver activity, large woody debris jams, floodplain/side-channel connectivity, and riparian vegetation, among other key watershed data observations.
- 3) RBA data entry into Access Database and creation of Excel Pivot-Table Workbook.
- 4) RBA data analyses and final reporting.
- 5) Lead and facilitate a community presentation of RBA data results and recommendations.
- 6) Coordination with GIS Consultant.

### Engineering

*Does the project involve capital improvement, engineering, site grading or other construction?*

No

### Project Management and Maintenance

*What is the life expectancy of R&E funded construction, structures, equipment, supplies, data or fishery?*

The inventory gathers baseline data critical for the development of a basin-scale prioritization of restoration actions. The data will be used to generate a road-map for Lower and Upper Nehalem Watershed Councils and partners to effectively implement restoration and conservation projects that address limiting factors for coho in each sub-watershed.

*Who is responsible for long term management, maintenance, and oversight of the project beyond what is funded by R&E.*

A Technical Advisory Committee (TAC) will be convened to assist in the overall implementation of the project. The TAC will be comprised of technical advisors representing a variety of conservation organizations/agencies, landowners of major holdings, and local landowners/stakeholders.

Each member's engagement on the TAC will vary based on their interests/abilities, however, overall the goal of the TAC is to provide opportunities for coordination of and/or participation in the following:

- 1) Share relevant monitoring data for RBA data interpretation.
- 2) Review RBA survey data & Final Report.
- 3) Participate in follow-up discussions regarding how best to use the RBA results and to implement recommendations as individual organizations and in collaboration with each other.

The report, GIS products and data will be distributed to interested landowners and agencies by

LNWC and will be used as a foundation for the prioritization of restoration actions. The contracted consultant will also describe the methods and results and facilitate a discussion in a formal setting with the public. This forum will be organized and hosted by LNWC during a regularly scheduled speaker series event.

LNWC will be responsible for the long-term management, update and review of the database, report and GIS products.

*Will the project require ongoing maintenance?*

No

*Is there a plan to collect baseline data and to conduct monitoring efforts to measure the effectiveness of the project?*

Yes

As stated previously, the proposed inventory gathers baseline data critical for the development of a basin-scale prioritization of restoration actions. The data will be used to generate a road-map for Lower and Upper Nehalem Watershed Councils and partners to effectively implement restoration and conservation projects that address limiting factors for coho in each sub-watershed. As a baseline, this data will be able to be utilized to monitor the effectiveness of habitat enhancement and restoration projects implemented in the future.

## ***Project Funding***

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### *Funding*

*Have you applied for OWEB funding for this project?*

Yes

OWEB application number: 217-1037

R&E money is needed as matching funds.

Awaiting a decision from the panel.

Lower Nehalem Watershed Council submitted an OWEB Monitoring Application in November 2016 requesting funding for the Nehalem Watershed Rapid Bioassessment. The project was recommended for funding by the Regional Review team and is awaiting OWEB staff funding decisions. The OWEB Board will make final decisions on projects in April 2017.

*Has this proposal, or similar proposal for this project location, previously been denied by OWEB or other funding source?*

```
[{"source":"Oregon Watershed Enhancement Board","type":"Cash","secured":"Pending","dollarValue":173267,"comments":"OWEB Monitoring Application Submitted November 2016"}, {"source":"Lower Nehalem Watershed Council Technical Advisory Committee","type":"In-Kind","secured":"Pending","dollarValue":6000,"comments":"Anticipated partner time participating in TAC"}, {"source":"Western Oregon University","type":"In-Kind","secured":"Pending","dollarValue":8000,"comments":"Staff and Student time for GIS analysis"}, {"source":"Columbia Soil and Water Conservation District","type":"In-Kind","secured":"Pending","dollarValue":6000,"comments":"In-kind staff time for landowner contacts and RBA survey in Upper Nehalem Watershed"}, {"source":"Tillamook Estuaries Partnership","type":"In-Kind","secured":"Pending","dollarValue":1500,"comments":"In-kind staff time for TAC participation"}]
```

Other Funding Source

Type

Secured

Dollar Value

Comments

Oregon Watershed Enhancement Board	Cash	Pending	173267	OWEB Monitoring Application Submitted November 2016
Lower Nehalem Watershed Council Technical Advisory Committee	In-Kind	Pending	6000	Anticipated partner time participating in TAC
Western Oregon University	In-Kind	Pending	8000	Staff and Student time for GIS analysis
Columbia Soil and Water Conservation District	In-Kind	Pending	6000	In-kind staff time for landowner contacts and RBA survey in Upper Nehalem Watershed
Tillamook Estuaries Partnership	In-Kind	Pending	1500	In-kind staff time for TAC participation
		Total	194767	

## Budget

Item	Unit Number	Unit Cost	In-kind or non-cash contributions	Funding from other sources	R&E Funds	Total Costs
<b>PROJECT MANAGEMENT</b>						
LNWC Council Coordinator	220	35.00	0	7700	0	7700
		<b>SUBTOTAL</b>	0	7700	0	7700
<b>IN-HOUSE PERSONNEL</b>						
LNWC Technical Advisory Committee	150	40.00	6000	0	0	6000
Columbia SWCD Technical Assistance	1	6000.00	6000	0	0	6000
Clatsop SWCD Technical Assistance	1	200.00	200	0	0	200
Tillamook Estuaries Partnership Technical Assistance	1	1500.00	1500	0	0	1500
		<b>SUBTOTAL</b>	13700	0	0	13700
<b>CONTRACTED SERVICES</b>						
Landowner Outreach and Recruitment	1	15000.00	0	15000	0	15000
RBA Survey - Phase I	201	440.00	0	48440	40000	88440
Spawning Gravel Inventory - Phase I	201	100.00	0	10100	10000	20100
Anchor Habitat ID - Phase I	201	50.00	0	10050	0	10050
RBA Survey - Phase II	131	440.00	0	37640	20000	57640
Spawning Gravel Inventory - Phase II	131	100.00	0	3100	10000	13100
Anchor Habitat ID - Phase II	131	50.00	0	6550	0	6550
GIS Consultant - Western Oregon University	1	25000.00	8000	17000	0	25000
		<b>SUBTOTAL</b>	8000	147880	80000	235880
<b>TRAVEL</b>						
Mileage for LNWC Project Management/TAC Coordination	250	0.53	0	135	0	135
		<b>SUBTOTAL</b>	0	135	0	135
<b>SUPPLIES/MATERIALS</b>						
			0	0	0	0
		<b>SUBTOTAL</b>	0	0	0	0
<b>EDUCATION/OUTREACH</b>						
Presentation Quality Maps, large	1	400.00	0	400	0	400
Printing of final report	1	400.00	0	400	0	400
		<b>SUBTOTAL</b>	0	800	0	800
<b>EQUIPMENT</b>						
GIS Software (LNWC License Renewal)	1	100.00	0	100	0	100
GPS Unit for LNWC	1	400.00	0	400	0	400
Dry Suit for LNWC	1	500.00	0	500	0	500
		<b>SUBTOTAL</b>	0	1000	0	1000
<b>FISCAL ADMINISTRATION</b>						
Fiscal Administration of ODFW R&E Grant	40	44.00	0	0	1760	1760
Indirect costs for OWEB Grant	1	15751.50	0	15752	0	15752
		<b>SUBTOTAL</b>	0	15752	1760	17512
		<b>BUDGET TOTAL</b>	21700	173267	81760	276727

## ***Internal Review Results***

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**Review Score:** 0.3 out of 3

(0 = Do Not Fund, 1 = Strengthen Proposal, 2 = Recommend, 3 = Strongly Recommend)

### *Summary of Review Team Comments*

The review team did not support this project. The team believes the connection to the angler is weak and far removed, especially in the near term. The team felt that RE is not an appropriate source of funding for this project. The team also had concerns with the design of the study and usefulness of the data from this proposal. Review team scores included six 0s, and three 1s.

### *Specific Review Team Comments*

This is nice data to have, but ultimately is a snapshot of one year in time, with no plans to repeat. Previous RBA's were conducted over 3 year periods to encompass a coho generation.

Probably is not a good use of R&E funds as there really are no angler benefits from the project. The money would be better spent elsewhere.

Looks like a great science project but why is this appropriate for R&E funds? What's the near term benefit to anglers?

Why only salmon? If you are doing the assessment collect data on trout and other sport species and when discovered non-native species. This could provide more value to ODFW district fishery managers and kill two birds with one stone. Don't just look at this at how to justify funding for habitat projects for salmon but also how to quantify the ecology of all interdependent species. This could make it more desirable for use of the angler dollar.

Need to describe what your \$1,760 in fiscal admin is going to be used for.

The RBA approach offers a basis for prioritization. It will probably provide for a reasonable picture of distribution, but things like hotspots for juvenile rearing seem like they need to be viewed in the context of spawner abundance. These surveys will reflect juveniles that derive from relatively low spawner abundance. That is part of the picture, but it seems like you would want to use the RBA approach over a range of spawner abundance. This means more years of data, at least 3.

If the project is recommended, it should be conditional on funding from OWEB.

### *Specific Review Team Questions*

*How was the 50/50 split for sport and commercial benefit determined? Only chinook and sometimes Coho have a commercial value. How much do the Nehalem populations contribute to commercial harvest?*

*While this has a strong tie to identifying where to target Coho restoration, it is baseline data and anglers may not see benefits until many years in the future. Please explain when and what sort of benefit you see for anglers in the near term.*

*Will this data move restoration project planning beyond those with a willing landowner to proactively targeting only locations with the greatest return on investment?*

## ***Additional Files***

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Budget Information

Maps

[Nehalem Rapid Bioassessment Project Area](#)

*Project Map*

Photos

Design Information

Management Plans and Supporting Documents

[LNWC Racial & Ethnic Impact Statement](#)

[Nehalem Rapid Bioassessment Stream Mile Estimates](#)

Permits and Reviews

Partnerships

[Nehalem RBA Landowner Outreach letter](#)

Public Comment

[Nehalem Watershed RBA Letters of Support](#)

Administrative Documents

[LNWC Signature Authorization Page](#)

[LNWC Tax Exempt Status](#)

***Completion Report***

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A completion report has not been submitted for this project.