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# BEAVER INTRINSIC POTENTIAL HABITAT MODELING IN THE ROGUE BASIN *COMPLETION REPORT*

Through this project, we conducted a field-verified beaver intrinsic potential (BIP) model of the Rogue Basin. We then developed and implemented a field survey protocol with diverse partners to assess high BIP reaches for beaver or the limiting factors for beaver habitat. These field assessments will directly inform partner planning for beaver-based restoration in the Rogue Basin. This project was identified in the Rogue Basin Partnership's Rogue Action Plan as a Priority Strategy Project. It received funding from the Rogue Basin Partnership (RBP) and Rogue River Watershed Council (RRWC), with in-kind support from Applegate Partnership and Watershed Council (APWC), Bureau of Land Management (BLM), Beaver State Wildlife Solutions LLC (BSWS), Lower Rogue Watershed Council (LRWC), RRWC, The Freshwater Trust (TFT), US Fish and Wildlife Service (USFWS), and US Forest Service (USFS).



**ROGUE BASIN**  
PARTNERSHIP

**ROGUE RIVER**  
WATERSHED COUNCIL



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## Introduction

As our region struggles with drought and the effects of climate change, beaver could play a critical role within the Rogue Basin's increasingly rain-dominated watersheds by helping retain water into the summer months. Beaver are also heavily prioritized by federal fish recovery plans. To support beaver on the landscape, we must be able to provide the necessary education, outreach and assistance to people who are not accustomed to living with beaver. Additionally, as restoration practitioners increasingly look to beaver-based restoration as a scalable, effective and low-cost tool for building habitat resiliency and watershed health, we must work together regionally to strategically prioritize our efforts to reflect the realities of our landscape and its beaver population. Finally, we must also develop a collaborative protocol around when and how relocation is to be used as a last resort. For these reasons, this project to assess the beaver intrinsic potential (BIP) in our basin was identified as a priority strategy in the Rogue Basin Action Plan in 2016.

The benefits of modeling the BIP are three-fold:

1. Through identifying and ground-truthing areas with high BIP values, we were able to identify areas with good habitat and current beaver occupancy. This is important for informing targeted education and outreach around strategies to **live with beaver in-place**.
2. In those high BIP areas with no beaver, we surveyed to identify the limiting habitat factors for beaver. These limiting factors are often forage availability, instream habitat complexity (cover and pools), water availability or human conflict/trapping. Through this effort, we are able to **inform planning for beaver-based restoration**.
3. We began to compile a list of sites where BIP and habitat value was high, but beaver are extirpated. In these areas, partners can **pursue relocation of beavers** from other conflict areas, as long as the underlying reasons for the current absence of beaver are addressed.

## Project Goals

**Understand the intrinsic potential of our basin for beaver.** Using an assessment tool to model Beaver Intrinsic Potential (BIP) as in Dittbrenner et. al. 2018, our aim was to narrow down the potential areas for focus on beaver-based restoration to those reaches that have intrinsic features in the landscape which are often correlated with beaver habitat. We wanted to make sure that this model properly weighted intrinsic variables to reflect our bioregion, so we developed it in conjunction with field verification.

**Empower beaver-based restoration.** Getting out into the field to assess high BIP areas, our aim was to look for beaver presence and limiting habitat factors for beaver. Through development of a survey protocol and datasheet, our goal was to equip restoration practitioners and agency biologists with tools for taking an informed look at the feasibility and applicability of beaver-based restoration in a given stream reach.

**Enable relocation in the Rogue Basin.** In order to successfully relocate problem beaver in the Rogue Basin under the ODFW Beaver Relocation Requirements, the first step is to compile a list of suitable release sites and lay the groundwork for potential relocation to these areas before a problem beaver relocation is needed. Our goal was to build out a process for proposing beaver relocation in the Rogue.

## Project Methods

### Rogue BIP Modeling

Thera Lombardi developed the GIS BIP model, based on past BIP modeling from the literature. See Appendix A; “Modeling intrinsic potential for beaver (*Castor canadensis*) habitat to identify and prioritize suitable release sites in the Rogue River Basin”. She worked in close collaboration with Jakob Shockey to verify how the drafted model responded to our ecoregion, and to adjust the weighting of the model variables based on field verification and partner input. From the BIP model, Thera then generated PDF maps of “hot-spots” for areas to help focus field surveys. These focus areas were identified for their contiguous stretches of high BIP stream. See Appendix B; “Field Survey Focus Areas” for these focus areas, organized by watershed.

### Field Surveys

Jakob Shockey developed survey protocol and data sheets in close collaboration with the RBP’s Native Species Working Group, Oregon Department of Fish and Wildlife and the APWC’s summer intern Ashley Burt (Anderson). See Appendix C and D; “BIP Survey Guidance” and “BIP Data Sheet”. Over an iterative process, Jakob and Ashley worked to refine the datasheet and protocol such that those data collected best reflected the goals of the project and the realities of the habitat quality for beaver. They then provided in-field training with project partners in the survey protocol, and Ashley continued to accompany most of the partners in their field surveys for the remainder of the field season.

## Project Results

### Rogue BIP Modeling

The entirety of the Rogue Basin BIP model was shared with, and is available to project partners or interested parties. Please contact RBP or APWC for those files.

### Field Surveys

There were 15 field surveys conducted under this project by multiple partners. Those data from these surveys were aggregated and are available upon request from either the APWC or RBP. Of the 15 surveys conducted, 6 had recent signs of beaver in varying degrees, 4 had limiting factors for beaver that were identified, and 5 sites were identified as potential relocation sites. All of these results are important for planning beaver-based restoration activities as discussed above. At the sites with beaver presence, strategies to mitigate for any future conflicts at culverts or other infrastructure will be prioritized. Where we identified limiting factors in the beaver habitat, those observations will go into informing regional restoration planning. At the sites where relocation may be an option, potential project partners will begin scoping these sites with ODFW.

## Discussion

This project exemplifies agencies and organizations working together in collaboration for a basin-wide tool that will aid in future beaver-based restoration project planning. The effects of beaver on our basin's aquatic system are important and varied. Whether our future beaver-based restoration projects are focused on specific species recovery (like the Southern Oregon Northern California Coast Coho or Oregon Spotted Frog), water security, water quality or simply building habitat resiliency—this project is the first important step toward planning those projects. Resulting from this project, there is already a funded project to write a beaver management plan for the USFS in the middle and upper Rogue. Thanks to much of the groundwork for collaboration initiated in this project, multiple partners came together to relocate beaver from a site in Medford to the Cascade Siskiyou National Monument in fall 2019. This was the first sanctioned beaver relocation in the Rogue basin we are aware of and it set the basis for future relocation project planning with ODFW.

Before choosing to move beaver into an area of high habitat value from which they seem to have been extirpated, it is important to consider why they are absent. Two of the sites we identified for potential future beaver relocation projects, Horse Creek Meadow and Miller Lake, have a history of beaver in the past that were trapped out. In addition to seeking proper ODFW approvals for relocation, it is also important to consider options for creating trapping closures for areas that are prone to extirpation. Generally speaking, those areas of high beaver habitat, which are on federally managed public land, high in our basin, nearby to recreational facilities or access, and disconnected from other nearby quality habitat are especially prone to long-term extirpation after trapping.

For those areas where limiting factors, such as forage availability or in-stream complexity were identified, we would suggest restoration actions that are planned to address those specific limiting factors. For areas that are limited by incision, instream complexity and cover, and velocity barriers to beaver damming—we suggest the Low-tech Process-based Restoration of Riverscapes Design Manual by Wheaton et. al.

This manual is currently found at this website: <https://lowtechpbr.restoration.usu.edu/>

For those areas where beaver are currently occupying habitat, we recommend the Beaver Restoration Guidebook by Castro et. al. This guidebook represents a single document with much of the best available science and management practices for “working with beaver to restore streams, wetlands and floodplains”.

This guidebook is currently found at this website:

<https://www.fws.gov/oregonfwo/ToolsForLandowners/RiverScience/Documents/BRG%20v.1.0%20final%20reduced.pdf>

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