STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF AN
ADMINISTRATIVE ORDER
AGAINST:
Bonasa Breaks Ranch, LLC

AGREED ORDER
DOCKET # 15901

To: Bonasa Breaks Ranch, LLC
209 Deer Haven Drive
Ponte Verda Beach, FL 32082

<table>
<thead>
<tr>
<th>Order Docket #</th>
<th>15901</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Location</td>
<td>46.905026, -117.189774</td>
</tr>
</tbody>
</table>

I. INTRODUCTION

This is an Agreed Order between the Department of Ecology (Ecology), and Bonasa Breaks Ranch, LLC ("Bonasa Breaks"), to achieve compliance with Chapter 90.48 Revised Code of Washington (RCW) by taking certain actions that are described below to restore portions of the Rattlesnake Creek ecosystem to meet Washington State Water Quality Standards. If the Adaptive Management Plan (described below in this Agreed Order) is approved by Ecology and Ecology is unable to enforce any portion of the approved Adaptive Management Plan against Bonasa Breaks for any reason, after exhausting all available remedies against Bonasa Breaks, Stephen E. Croskrey agrees to be personally responsible for implementing the approved Adaptive Management Plan, subject to the following limitations: (a) Stephen Croskrey agrees to be personally responsible for up to $2.5 million, provided that after Ecology confirms that all required restoration actions in Table 1 for Reaches 1-3 (as may be modified by the Adaptive Management Plan) have been completed, Stephen Croskrey's personal responsibility shall be reduced to $1.0 million to complete the required restoration actions in Table 1 for Reaches 4 and 5 (as may be modified by the Adaptive Management Plan) of Rattlesnake Creek; (b) Stephen Croskrey's personal responsibility shall not include payment of stipulated penalties under Table 1; and (c) Stephen Croskrey shall have no personal liability if the Adaptive Management Plan is not approved by Ecology.

II. RECOGNITION OF ECOLOGY'S JURISDICTION

This Agreed Order is issued pursuant to the authority vested in Ecology by the Federal Water Pollution Control Act (FWPCA), 33 U.S.C. sec 1311, et seq. and Chapter 90.48 Revised Code of Washington (RCW).

RCW 90.48.030 provides that Ecology shall have the jurisdiction to control and prevent the pollution of streams, lakes, rivers, ponds, inland waters, salt waters, watercourses, other surface and underground waters of the state of Washington.
RCW 90.48.120 authorizes Ecology to issue administrative orders requiring compliance whenever it determines that a person has violated or created a substantial potential to violate any provision of Chapter 90.48 RCW or fails to control the polluting content of waste to be discharged to waters of the state.

Bonasa Breaks agrees to undertake all actions required of it by the terms and conditions of this Agreed Order and not to contest Ecology’s jurisdiction and authority to administer this Agreed Order. This Agreed Order is comprehensive and includes all penalties, resolution of all Notices of Violation, compensation, damages, and restoration available under RCW Chapter 90.48, including but not limited to the following Notices of Violation: NOV Docket No. 14216 and NOV Docket No. 15583. Bonasa Breaks agrees not to appeal this Agreed Order.

Nothing in this Agreed Order shall, in any way, relieve Bonasa Breaks of its obligations to comply with the requirements of any other state, federal, tribal or local permits or approvals. Nor shall anything in this Agreed Order limit Ecology’s authority to enforce departmental laws and regulations.

III. FINDINGS OF FACT

Ecology’s determination that a violation has occurred is based on the following facts.

The Bonasa Breaks Ranch, LLC’s dam in the Rattlesnake Creek watershed breached on April 13, 2017.

The breach severely damaged the majority of the Rattlesnake Creek stream corridor and associated wetlands resulting in immediate and ongoing violations of designated use standards in Water Quality Standards for Surface Waters of the State of Washington [Washington Administrative Code (WAC) 173-201A-600 (2)].

Overview

The Department of Ecology determined that Bonasa Breaks enlarged, without a permit, an existing private dam on its property. On April 13, 2017, the Bonasa Breaks Ranch dam breached releasing approximately 9 million gallons of water (as estimated by Ecology) and a large volume of sediment, and debris into portions of Rattlesnake Creek and the Grande Ronde River in violation of RCW 90.48.080. Rattlesnake Creek is to be protected for the designated uses of salmonid spawning, rearing and migration. WAC 173-201A-600(1). The breach caused immediate and ongoing impacts to the Rattlesnake Creek ecosystem in violation of WAC 173-201A-200(1).

On October 23rd and 24th, 2017, Ecology and other agency partners walked 6 miles of Rattlesnake Creek downstream of the breached dam and observed damages from the flood. The agency partners included the Department of Fish and Wildlife, the Department of Natural Resources, the National Oceanic and Atmospheric Administration, and the Asotin County Conservation District. The U.S. Army Corps of Engineers and the Farm Service Agency were provided a copy of the draft Rehabilitation Plan. Ecology and the agency partners determined
that the ecosystem has been pushed into a degraded alternative stable state that will require
human intervention for a functional and timely recovery. The findings of that assessment have
been compiled into a collaborative Rattlesnake Creek Conceptual Rehabilitation Plan now and
hereby after referred to as the Restoration Plan (Sage Environmental Research, 2018). This
Restoration plan includes recommendations from ecologists, biologists, engineers and other
environmental professionals from several state and federal agencies, special districts, tribes and
regional experts in the private sector. Bonasa Breaks did not participate in the development of
the Restoration Plan. The impacted channel was segmented into 5 distinct reaches based on
gradient breaks, geology, results from the field assessments, feasibility of restoration, observed
g geomorphic and habitat conditions, and an expected timeline for recovery (Figure 2). The
Restoration Plan includes solutions to address habitat and water quality impairments from the
breach (Attachments A. Justification for Restoration Techniques) for each reach. Riparian
plantings, fish barrier removal, large woody debris (LWD) and boulder structures are the primary
techniques required for stream restoration.

In April 2018, Bonasa Breaks paid for the restoration of the bridge across Rattlesnake Creek
located near the Grande Ronde River in the amount of $72,240.63 sent to the Washington State
Department of Fish and Wildlife. Bonasa Breaks, in cooperation with state and federal agencies,
has taken significant steps to stabilize the pond on the Bonasa Breaks property and reduce the
impoundment of the pond below the jurisdictional limits.

Objective

The objective of this order is to ensure rehabilitation of the Rattlesnake Creek ecosystem to meet
its designated uses per Washington State Water Quality Standards in lieu of compensation
pursuant to RCW 90.48.367.

IV. CORRECTIVE ACTIONS

For the reasons detailed above, and in accordance with RCW 90.48.120, IT IS AGREED that
Bonasa Breaks shall take the following actions by the dates set forth below. These actions are
necessary to satisfy the required rehabilitation of Rattlesnake Creek. Bonasa Breaks has
participated in defining the dates by which the actions shall be completed. Bonasa Breaks shall
also submit permit applications and documents needing approvals from the various government
agencies in a timely fashion in order that the dates for the various actions are able to be met.

1. Effective Immediately
   a. Bonasa Breaks or hired contractors must not start restoration work on Rattlesnake
      Creek without necessary permits, agreements and approvals.
   b. Document all activity regarding Rattlesnake Creek restoration for reporting in
      Annual Reports.

2. On or before July 30, 2018 Bonasa Breaks must:
   a. Hire consultants(s) who are qualified in working on stream restoration projects and
      have experience planning, designing, and implementing in-stream habitat
      restoration projects using large woody debris, project management in fields of
fluvial geomorphology, fisheries biology, and or aquatic ecology, planting and or maintaining riparian vegetation, and managing field crews. Experience working with juvenile steelhead habitat in the Snake River Basin is preferred. Field crews are defined as laborers hired by the contractor(s) to help the contractor(s) achieve restoration actions.

3. On or before August 30, 2018, Bonasa Breaks must:
   a. Start the application process for all applicable federal, tribal, state, and local permits or approvals for any restoration related work, and weed control. Report to Ecology within 30 days if permits are delayed or denied.
   b. Commence obtaining signed agreements from affected landowners granting contractors and crew(s) access to parcels for restoration actions on Rattlesnake Creek. These agreements must be included in the Adaptive Management Plan. Agreements must include both landowner and lessee signatures if applicable. Report to Ecology within 30 days if access is denied.

4. On or before October 30, 2018 Bonasa Breaks must:
   a. Complete an Adaptive Management Plan for approval by Ecology that contains a detailed strategy covering Rattlesnake Creek from the Bonasa Breaks dam breach site to the confluence of the Grande Ronde.
      i. The plan must include a work schedule, all steps and materials necessary to achieve all implementation actions, maintenance, and monitoring. The plan must be prepared in accordance to Table 1, Requirements for Restoration Actions, and all other Attachments and sections in this order. The plan must also be prepared in accordance to the Rattlesnake Creek Conceptual Rehabilitation Plan, and WDFW Report 10374 (2012 Stream Habitat Restoration Guidelines) when applicable; provided, however, Ecology will consider modifications to the specific elements associated with Reaches 4 and 5 proposed by the consultant retained by Bonasa Breaks as part of the development of the Adaptive Management Plan.
      ii. The plan must include a riparian planting design outlining which species of trees, shrubs and grasses will be purchased, maps of where plants will be planted in each reach, number and size of plants (e.g. 2 gallon container vs bare-root), and specific plans for weed control, watering and other maintenance necessary for ensuring plant survival. The riparian planting design must include methodology for replacing plant mortalities as necessary to meet required surviving plant densities. The riparian planting design must be prepared in accordance with Table 1.
      iii. The Adaptive Management Plan must be followed immediately upon approval.
      iv. The approved Adaptive Management Plan may be modified through a written agreement by Ecology and Bonasa Breaks or hired agents.
5. On or before 12/31/2018 and annually until 12/31/2029 Bonasa Breaks must:
   
   a. Submit a comprehensive Annual Report on Rattlesnake Creek restoration progress including items such as monitoring observations, maps, and photos of where all implementation has occurred that year.
      
      i. The Annual Report must also include copies of all permits, landowner agreements and other authorizations that have not been submitted in previous Annual Reports.

      ii. The Annual Report must also include a comprehensive assessment of restoration work and other changes of Rattlesnake Creek from the breach to the Grande Ronde every October.

      iii. The Annual Report must include surviving plant density the September following each reach's Completion Date in Table 1.

      iv. The Annual Report must also include number and GPS location (decimal degrees) of each structure installed, and fish barrier removed, during that implementation year as required in Table 1.

      v. The Annual Report must document the presence, approximate size, and GPS location of areas with wetland conditions (e.g. hydrophytic vegetation, soil saturation during the growing season) that have not been reported in previous Annual Reports.

      vi. The Annual Report must identify new fish passage barriers that may arise from channel avulsions and fluvial response, or from the failure or displacement of restoration structures. The Annual Report must also include a strategy to remove barriers arising from the failure or displacement of restoration structures and new fish passage barriers that develop within 3 years following the completion of work associated with each Reach identified in Table 1 during the next implementation year. In no event shall Bonasa Breaks be responsible for identifying or removing fish passage barriers that may arise after the Reach 5 Monitoring End Date.

V. PROGRESS REPORTING

Bonasa Breaks shall immediately notify Ecology of any occurrence that may result in noncompliance with the requirements of this Agreed Order. Such notifications shall state the nature of the potential noncompliance, the reason(s) therefore and the actions taken by Bonasa Breaks to address the potential noncompliance.

1. On or before July 30, 2018 Bonasa Breaks must submit a copy of the signed contract including the consultant's credentials to Ecology.
2. On or before October 30, 2018 Bonasa Breaks must submit an Adaptive Management Plan to Ecology meeting all aforementioned requirements.

3. On or before 12/31/2018 and annually until 12/31/2029 Bonasa Breaks must submit a comprehensive Annual Report on Rattlesnake Creek to Ecology meeting all aforementioned requirements.

VI. STIPULATED PENALTIES

1. A penalty in the amount of $115,000 is due within 30 days of signatures on this Agreed Order by all parties. Bonasa Breaks shall make payment by check or money order payable to “Department of Ecology,” and shall send the payment to:

   Department of Ecology
   Attn: Cashiering Unit
   P.O. Box 47611
   Olympia, WA 98504-7611

2. If Bonasa Breaks fails to meet the deadlines in Sections IV and V of this Agreed Order, Bonasa Breaks agrees to pay Ecology a stipulated penalty in the amount of $250/day for each day late for the first 30 days for each action item. Penalty per day will double on the 31st day to $500 per day for each additional day late.

3. If Bonasa Breaks fails to meet the deadlines in Table 1 of this Agreed Order, Bonasa Breaks agrees to pay Ecology the stipulated penalties detailed in Table 1.

Ecology shall waive the stipulated penalties in Table 1 if Bonasa Breaks has demonstrated a good faith effort to meet the deadline AND Ecology concurs that the delay is attributed to delays in acquiring permits/approvals from governmental agencies, but only if Bonasa Breaks timely applied for the permit or approval, or other unforeseeable causes that are outside of Bonasa Breaks’ control.

If stipulated penalties are imposed, Ecology shall notify Bonasa Breaks in writing through a notice of Penalty and provide an opportunity for Bonasa Breaks to cure within 30 days of the notice. If Bonasa Breaks fails to cure, the penalties are due within 45 days of receipt of Ecology’s notification or, in the event of a dispute, within 30 days of the completion of the dispute resolution process.

VII. AMENDMENTS TO THE AGREED COMPLIANCE SCHEDULE

Amendments to the agreed compliance schedule and Adaptive Management Plan may be requested for causes beyond the control of Bonasa Breaks that delays or prevents the performance of any obligation under the compliance schedule or Adaptive Management Plan despite Bonasa Breaks’ best efforts to fulfill the obligation. The requirement to exercise “best efforts to fulfill the obligation” includes using best efforts to anticipate any reasonably foreseeable events and best efforts to address the effects of any such event. Extension of the
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deadlines imposed by this Agreed Order or the Adaptive Management Plan will be granted when requests for extensions are submitted in writing, in a timely fashion, and demonstrate good cause for granting the extension. Failure to obtain financial assistance in the form of grants or loans, the financial inability to perform any obligation, and the failure to apply in a timely manner for a required permit or approval shall not be considered good cause. To be effective, all proposed amendments must be signed by the person with signature authority for each party. An amendment to the Adaptive Management Plan shall not be considered an amendment to the Agreed Order. Once approved, the Adaptive Management Plan will govern the work to be performed and will supersede the tasks and dates in Table 1 and the Rehabilitation Plan to the extent the approved Adaptive Management Plan contains tasks or dates that are inconsistent with Table 1 or the Rehabilitation Plan.

VIII. EFFECTIVE DATE

This Order is effective on the date the agreement has been signed by both parties.

IX. TERMINATION OF THE AGREED ORDER

Upon completion by Bonasa Breaks of the actions identified in Section IV of this Agreed Order, a Notice of Compliance shall be issued by Ecology, and the requirements of this Agreed Order shall be deemed to be fulfilled and shall have no further effect on Bonasa Breaks.

X. DISPUTE RESOLUTION

If a dispute arises between Ecology and Bonasa Breaks regarding any noncompliance with this Agreed Order or the Adaptive Management Plan, the parties shall attempt to resolve the dispute by informal resolution. A dispute shall be considered to have arisen when one party notifies another, in writing, that there is a dispute. If the parties cannot resolve the dispute informally within thirty (30) days, Bonasa Breaks shall serve on Ecology a written Statement of Position within fourteen (14) days after the 30-day informal dispute resolution period ends. Within thirty (30) days after receipt of Bonasa Breaks’ Statement of Position, Ecology shall provide Bonasa Breaks with a final administrative decision.

The position advanced by Ecology shall be considered binding unless Bonasa Breaks elects to pursue arbitration of the dispute. In order to pursue arbitration, Bonasa Breaks must hire an arbitrator from the list of arbitrators attached to this Agreed Order, and approved by Ecology within 30 days of receiving Ecology’s administrative decision. Each party shall bear their own attorneys’ fees and costs for the arbitration. The arbitrator shall determine the dispute. In making this determination, the arbitrator shall review this Agreed order, the Statement of Position, Ecology’s final administrative decision, and evidence from all parties. The decision of the arbitrator shall be binding on all parties.
XI. ENFORCEMENT

Failure to comply with this Agreed Order after dispute resolution is completed, if invoked, may result in or other actions, whether administrative or judicial, to enforce the terms of this Agreed Order.

XII. THIRD PARTY RIGHT TO APPEAL

By signing this Agreed Order, Bonasa Breaks may not appeal this Agreed Order, however, a third party may.

A third party other than Bonasa Breaks has a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal the third party must do both of the following within 30 days of the date of receipt of this Order:

- File an appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of the appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

The third party must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

The appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

XIII. ADDRESS AND LOCATION INFORMATION

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<thead>
<tr>
<th>Street Addresses</th>
<th>Mailing Addresses</th>
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<tbody>
<tr>
<td><strong>Department of Ecology</strong></td>
<td><strong>Department of Ecology</strong></td>
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<tr>
<td>Attn: Appeals Processing Desk</td>
<td>Attn: Appeals Processing Desk</td>
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<tr>
<td>300 Desmond Drive SE</td>
<td>PO Box 47608</td>
</tr>
<tr>
<td>Lacey, WA 98503</td>
<td>Olympia, WA 98504-7608</td>
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<tr>
<td><strong>Pollution Control Hearings Board</strong></td>
<td><strong>Pollution Control Hearings Board</strong></td>
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<tr>
<td>1111 Israel Road S W</td>
<td>PO Box 40903</td>
</tr>
<tr>
<td>STE 301</td>
<td>Olympia, WA 98504-0903</td>
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<tr>
<td>Tumwater, WA 98501</td>
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</table>
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XIV. CONTACT INFORMATION

Please direct all questions about this Order to:

Chad Atkins
Department of Ecology
Eastern Regional Office
4601 N. Monroe 99205

Phone: (509) 329-3499
Email: CATK461@ecy.wa.gov

XV. MORE INFORMATION

• Pollution Control Hearings Board Website
  http://www.elubo.wa.gov/Board/PCHB

• Chapter 43.21B RCW - Environmental and Land Use Hearings Office Pollution
  Control Hearings Board
  http://apps.leg.wa.gov/RCW/default.aspx?cite=43.21B

• Chapter 371-08 WAC - Practice And Procedure

• Chapter 34.05 RCW - Administrative Procedure Act
  http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05

• Ecology's Laws, rules, & rulemaking website
  https://ecology.wa.gov/About-us/How-we-operate/Laws-rules-rulemaking

XVI. SIGNATURES

Bonasa Breaks Ranch, LLC
By, SEC, LLC, member

Stephen E. Croskrey, Member
SEC, LLC

Polly Zehm
Department of Ecology
Deputy Director

16 July 18

Date

7/20/18

Date
### ATTACHMENTS

#### Table 1. Required restoration actions for Rattlesnake Creek organized by reach.

<table>
<thead>
<tr>
<th>Reach</th>
<th>Restoration Type</th>
<th>Action or Required Density</th>
<th>Implementation Start Date</th>
<th>Completion Date</th>
<th>Monitoring End Date</th>
<th>Required Maintenance and Monitoring</th>
<th>Penalty if Incomplete/Inadequate by Completion Date</th>
<th>Additional penalty if still incomplete/inadequate by Monitoring End Date</th>
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<tbody>
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<td>1</td>
<td>Riparian Planting</td>
<td>Riparian area &lt; 5.5 acres; Max. 2.57/ha Initial density</td>
<td>Immediately upon plan approval</td>
<td>3 years from Reach 1 implementation start date</td>
<td>10 years from Reach 1 implementation start date</td>
<td>As needed to meet survival requirements by Reach 1 maintenance end date</td>
<td>$25,000</td>
<td>$15,000</td>
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<tr>
<td>1</td>
<td>Fish Barrier Removal</td>
<td>1) RM 4.6 (Stream barriers)</td>
<td>Immediately upon plan approval</td>
<td>3 years from Reach 1 implementation start date</td>
<td>10 years from Reach 1 implementation start date</td>
<td>Annually through monitoring end date</td>
<td>$25,000</td>
<td>$15,000</td>
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<td>2) RM 4.5</td>
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<td>1</td>
<td>3) RM 4.6 (future barriers)</td>
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<td>Stream Function</td>
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<td>Riparian Planting</td>
<td>Riparian area &gt; 35.5 acres; at least 2.57/ha Initial density</td>
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<td>3 years from Reach 1 implementation start date</td>
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<td>$37,000</td>
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<td>1</td>
<td>3) RM 4.8 (future barriers)</td>
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<td>Riparian Planting</td>
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<td>2 years from Reach 1 implementation start date</td>
<td>3 years from Reach 1 implementation start date</td>
<td>10 years from Reach 1 implementation start date</td>
<td>As needed to meet survival requirements by Reach 1 maintenance end date</td>
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<td>$38,750</td>
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<td>Fish Barrier Removal</td>
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<td>2</td>
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<td>3</td>
<td>Riparian Planting</td>
<td>Riparian area &lt; 6.3 acres; at least 4.9/ha Initial density</td>
<td>2 years from Reach 1 implementation start date</td>
<td>3 years from Reach 1 implementation start date</td>
<td>10 years from Reach 1 implementation start date</td>
<td>As needed to meet survival requirements by Reach 1 maintenance end date</td>
<td>$75,000</td>
<td>$38,750</td>
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<td>Fish Barrier Removal</td>
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### A. Justification for Restoration Techniques

The restoration corrective actions in this order are based on the Rattlesnake Creek Conceptual Rehabilitation Plan (Sage Environmental Research, 2018) Snake River salmon and steelhead recovery plan (NOAA, 2016) and the 2012 Stream Habitat Restoration Guidelines (Cramer et al. 2012). Large woody debris (LWD) structures are commonly used in stream restoration projects to enhance fish habitat and improve water quality. These structures anchor a single large or several small pieces of tree trunks and branches often using boulders, root wads or wooden posts. The objective with LWD structures is to simulate a dead tree that has fallen into the stream for areas devoid of natural riparian vegetation recruitment. These structures force pinch points in the stream, capturing sediment and sorting the substrate into distinct patches of similar size classes (e.g., gravel, cobble, boulder). Where appropriate, similar structures can also be built using entirely boulders. Structures can be placed off-stream banks, in the floodplain, or directly in the channel. In the Asotin Creek Watershed, located approximately 10 miles to the north, over 600 LWD structures have been added to the mainstem and tributary since 2012. The benefit of adding LWD to streams and floodplains for restoration is well documented. We expect LWD structures to: increase geomorphic complexity (i.e., pools, runs, side-channels, islands and bars), create step pools...

<table>
<thead>
<tr>
<th>Riparian Plantings</th>
<th>Riparian area ≥ 16.1 at least 1,652 initial stems.</th>
<th>3 years from Reach 1 implementation start date, after all permits and permits for Reach 1 have been applied</th>
<th>75,000</th>
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<tbody>
<tr>
<td></td>
<td>Surviving density of trees and shrubs ≥ 100 stems per acre.</td>
<td>3 years from Reach 1 implementation start date</td>
<td>$18,750</td>
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<td>Weed removal and control</td>
<td>3 years from Reach 1 implementation start date</td>
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<td>Fish Barrier Removal</td>
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<td>3 years from Reach 1 implementation start date</td>
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<tr>
<td>Riparian Plantings</td>
<td>Riparian area ≥ 16.1 at least 1,652 initial stems.</td>
<td>Immediately upon plan approval, after all permits and permits for Reach 1 have been applied</td>
<td>10 years from Reach 1 implementation start date</td>
<td>500,000</td>
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<td>Surviving density of trees and shrubs ≥ 100 stems per acre.</td>
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<td>Weed removal and control</td>
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<tr>
<td>Stream Function</td>
<td>LWD and/or Boulders structures: Min density ≥100 meters, Max density ≤ 20/100 meters</td>
<td>5 years from Reach 1 implementation start date</td>
<td>10 years from Reach 1 implementation start date</td>
<td>100,000</td>
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<td>4 years from Reach 1 implementation start date</td>
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for fish barrier removal, connect the stream to the floodplain, provide fish cover and shelter from high flows, sort pebbles and gravels, trap sediment and detritus, and aid in riparian vegetation recovery. These improvements benefit water quality and aquatic biota. The density of structures to be applied was derived from pre-breach woody debris counts, loss of mature trees from the flood, and stream channel needs. In the lower two reaches there is plethora of wood available for building structures. Boulders needed to create steps over bedrock ledges for fish passage, are also widely available.

Riparian vegetation is a crucial part of a healthy river ecosystem. Weeds are quick to inhabit areas after disturbances and outcompete native plants for nutrients and sunlight. Less than a year after the breach, Reaches 1 and 2 are dominated by invasive plants. It is important to establish native grasses and other plants that germinate readily before weeds spread even further. We expect that planting woody species will overtime: provide shade and bank stabilization, provide a seed bank for future trees, cool ambient air temperature, provide fish and wildlife habitat, filter sediment and nutrient inputs, promote the growth of herbaceous vegetation, and recruit LWD to the channel.

B. Requirements for Restoration Actions:

B.1 Boulder and Large Woody Debris (LWD) structures
Create structures following the Stream Habitat Restoration Guidelines 2012 (Cramer et al. 2012) that do not act as new passage barriers to juvenile or adult fish. A structure is defined as boulder(s) and or LWD piece(s) strategically placed by field crews after 6/19/2018, in ways that improve geomorphic and or hydraulic conditions, remove fish barriers, and or aid in recovery of native riparian vegetation within the floodplain. Required minimum number and density of installed structures must be met for each reach by the Completion Date in Table 1. Seventy-five percent of the structures for each reach must be within the bankfull channel. The remaining 25% must be in the floodplain (75' or less from the ordinary high water mark) and placed in ways that will promote native vegetation recovery after high water events. The Annual Report must include a strategy to restore structures arising from the failure or displacement of restoration structures identified in Table 1 for a period of 3 years following the completion of work associated with each Reach identified in Table 1 during the next implementation year.

B.2 Riparian Plantings and Weed Control
Create a riparian restoration planting plan that will reasonably mimic historical or pre dam breach vegetation assemblages and aligns with species provided in Shrub and Tree Species for Planting Riparian Areas in Major Land Resource Area 9 Species must be planted in the appropriate zone (Figure 1). At least 25% of riparian plantings for each reach must be 2 gallon potted shrubs and trees or larger. Plantings must occur on each side of the stream within 75' from the ordinary high water mark. Native grasses are encouraged to be used for weed control and or planted in areas with exposed soil, but do not count towards required planting densities. Required surviving plant densities for each reach is an average, and must be achieved by the Completion Date in Table 1.

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Weeds must be reduced or eliminated at least biannually (i.e. spring and fall before seeding) for each reach, through the Completion Date to help improve native plant survival. Weed control strategies must be consistent with recommendations from weed management experts in the region, such as Asotin County Weed Control Board.

B.3 Barriers to Fish and Other Biota
Eliminate all passage barriers identified in Table 1 to allow for unimpeded passage of juvenile and adult fish. The Annual Report must also include a strategy to remove barriers arising from the failure or displacement of restoration structures and new fish passage that develop within 3 years following the completion of work associated with each Reach identified in Table 1 during the next implementation year.

1.1 Reach 1:
Location Description: Grande Ronde Confluence to Highway 129 crossing
Start: 46.041500, -117.252156
Stop: 46.057162, -117.237800
Length: Approximately 1.45 miles
Landowners: Kevin Botts, Gerald Halsey

1.1.1 Riparian Plantings and Weed Control
Re-planting native riparian vegetation is crucial to the recovery of Rattlesnake Creek. In Reach 1: 1.45 river miles are to be planted with native, woody and herbaceous riparian vegetation, measuring up to 75' from the ordinary high water mark along each bank. Common mulehead and blackberry was observed throughout Reach 1 in high densities. Reach 1 begins at the bottom of the watershed and was the beneficiary of sediment that was washed downstream during the flood. Planting 2-5 gallon pots compared to bare-root will increase survivability in the topsoil-deprived areas. Watering the new plantings during the summer will also increase survivability. In Reach 1, there are a few small isolated patches where alder have begun to recolonize. Survival in these patches will increase if shade were provided by planting larger trees within the patch and around the perimeter of the patch. Required surviving plant density is listed in Table 1. Required surviving density can be achieved by watering, replacing mortalities, planting larger trees, or planting at higher original density. Specific species of plants and acceptable planting zones for the Rattlesnake Creek basin can be found in Shrub and Tree Species for Planting Riparian Areas in Major Land Resource Area 9). Maintenance is defined as watering plantings, replacing plant mortalities, weed control and any other means necessary to achieve required surviving densities through the Completion Date in Table 1.

1.1.2 Fish Barrier Removal
An alluvial fan of cobble and gravel was created at the mouth of Rattlesnake Creek as the floodwaters reached the Grande Ronde. Prior to the breach, there was a scour pool at the confluence. The fan is raised above the surface of the Grande Ronde and has created fish passage barrier especially during low flows. The bedform has been scoured to create additional boulder or bedrock ledges that were identified as barriers during the assessment at RM 0.15 and RM 0.45.
1.1.3 Large woody Debris (LWD) and Boulder Structures
Much of the fine sediment and fine gravel was washed into the Grande Ronde during the breach. Reach 1 has copious amounts of LWD resting in debris piles above the bank-full channel. The available wood and existing boulders will be used to create 150 structures within Reach 1. Structure density will be minimum of 10 and maximum of 20 per 100 meters. Boulders will be used to create steps over bedrock ledges for fish passage. In the event more wood is needed for creating structures, LWD may also be acquired from Reach 2 or 3. LWD and boulders are to be used to increase pool frequency and geomorphic complexity. Structures will be spaced and created in ways that do not create new passage barriers for juvenile or adult fish. Structures are not to be built in a ways that have the potential to cause flooding or damage to Highway-129. Floodplain connection will encourage natural recruitment of woody species and aid vegetation recovery. Woody debris will help sort pebbles fine and coarse gravel to promote new spawning areas. These structures will also provide fish shade, refuge from predators and protection during high-flows while the newly planted riparian vegetation matures.

1.2 Reach 2:
Location Description: Highway 129 crossing to start of Halsey parcel 20074501877000000
Start: 46.057162, -117.237800
Stop: 46.075131, -117.217591
Length: Approximately 1.85 miles
Landowners: Gerald Halsey, Iris Mallory, Dianne Wilson

1.2.1 Riparian Plantings and Weed Control
In Reach 2: 1.85 river miles are to be planted with native, woody and herbaceous riparian vegetation, measuring up to 75' from the ordinary high water mark along each bank. Weeds will need to be reduced or eliminated before native plants can be re-established. In Reach 2, much of the required topsoil and fine sediment for plantings was washed downstream into lower reaches and the Grande Ronde River. Some remaining soil was observed at RM 1.5-1.6 and at RM 2.05. Plantings and maintenance will be more challenging in Reach 2 due to difficult access and lack of adequate remaining soil. Planting 2-5 gallon pots or larger trees may increase survivability in topsoil-deprived areas. Watering the new plantings during the summer will also increase survivability. Required surviving plant densities are listed in Table 1. Required surviving density can also be achieved by watering, replacing mortalities or planting at higher original density. Specific species of plants and acceptable planting zones for the Rattlesnake Creek basin can be found in Shrub and Tree Species for Planting Riparian Areas in Major Land Resource Area 9 (Figure 1). Maintenance is defined as watering plantings, replacing plant mortalities, weed control and any other means necessary to achieve required surviving densities through the Completion Date in Table 1.

1.2.2 Fish Barrier Removal
The West Branch of Rattlesnake Creek was not damaged by the breach, but is currently blocked by a debris pile. This barrier must be removed as soon as possible to allow out migration of trapped migratory fish, and in migration for fish and other biota seeking refuge in the undisturbed habitat. Boulders will be used to create steps over a bedrock ledge barrier that exists near RM 1.78. An unnamed tributary entering Rattlesnake Creek near RM 3.3 has been disconnected from the main channel and must be reconnected using step pools and or re-grading the mouth. Bedrock and boulder piles at RM 3.3 must also be cleared to allow fish passage.
1.2.3 Large woody Debris (LWD) and Boulder Structures
Reach 2 has copious amounts of LWD resting in debris piles above the bank-full channel. The available wood and existing boulders will be used to create 198 structures within Reach 2. Structure density will be minimum of 10 and maximum of 20 per 100 meters. Boulders may be used to create steps over bedrock ledges for fish passage. Structures built to create step pools and remove fish barriers count towards the 198 minimum total for Reach 2. In the event more wood is needed for creating structures, LWD may also be acquired from Reach 3. LWD and boulders are to be used to increase pool frequency and geomorphic complexity. Structures will be spaced and created in ways that do not create new passage barriers for juvenile or adult fish. Structures are not to be built in a way that have the potential to cause flooding or damage to Highway-129. Floodplain connection will encourage natural recruitment of woody species and aid vegetation recovery. Woody debris will help sort pebbles fine and coarse gravel to promote new spawning areas. These structures will also provide fish shade, refuge from predators and protection during high-flows while the newly planted riparian vegetation matures.

1.3 Reach 3:
Location Description: Start of parcel 20074501877 to RM 4.0
Start: 46.075152, -117.217568
Stop: 46.078502, -117.205147
Length: Approximately 0.71 miles
Landowners: Gerald Halsey, (Other parcel is owned by Bonasa Breaks)

1.3.1 Riparian Plantings and Weed Control
In Reach 3: 0.71 river miles are to be planted with native, woody and herbaceous riparian vegetation, measuring up to 75' from the ordinary high water mark along each bank. Weeds are not as prevalent as in Reaches 1 and 2 but still need to be reduced or eliminated before native plants can be re-established. Weed control strategies must be consistent with recommendations from weed management experts in the region such as Asotin County Weed Control Board. Native grasses planted for weed control do not count towards required planting densities. Distribution and species of riparian plantings for restoration must reasonably mimic historical (i.e. pre dam breach) vegetation assemblages and align with species listed in Shrub and Tree Species for Planting Riparian Areas in Major Land Resource Area 9 (NRCS 13160)( Figure 1). In Reach 3, much of the required topsoil and fine sediment for plantings was washed downstream into lower reaches. Planting gallon pots or larger trees may increase survivability in topsoil-deprived areas. Watering the new plantings during the summer will also increase survivability. Required surviving plant densities are listed in Table 1. Required surviving density can also be achieved by replacing mortalities or planting at higher original density. Maintenance is defined as watering plantings, replacing plant mortalities, weed control and any other means necessary to achieve required surviving densities through the Completion Date in Table 1.

1.3.2 Fish Barrier Removal
Barriers at RM 3.03 (the bottom of Reach 3) are addressed in Reach 2 corrective actions. There are substantial sub-surface sections near the top of Reach 3 where the stream is buried under boulder and sediment. Boulders and debris should be moved where possible to connect habitat and better set-up the stream for recovery during future high flows.
1.3.3 Large woody Debris (LWD) and Boulder Structures
Reach 3 has limited amounts of LWD but does have plenty of boulders available for structures. Most of the available LWD is resting in a large debris jam at RM 3.65. The available wood and existing boulders will be used to create 76 structures within Reach 3. LWD and boulders are to be used to increase pool frequency, hydraulics and geomorphic complexity. In the event more wood is needed for creating structures, LWD may also be acquired from leftover wood Reach 1 or 2. Floodplain connection will encourage natural recruitment of woody species and aid vegetation recovery. These structures will also provide fish shade, refuge from predators and protection during high-flows while the newly planted riparian vegetation matures. Structures will be spaced and created in ways that do not create new passage barriers for juvenile or adult fish.

1.4 Reach 4:
Location Description: RM 4.0 to RM 6.08, about 0.15 miles downstream of parcel 30074500934
Start: 46.078553, -117.205139
Stop: 46.087947, -117.179034
Length: Approximately 2.08 miles
Landowners: Reverse Mortgage Solutions, Lucian Lyons, Michael Joseph Ceske, Terry Rudd, Field Springs State Park

1.4.1 Riparian Plantings and Weed Control
In Reach 4: 2.08 river miles are to be planted with native, woody and herbaceous riparian vegetation, measuring up to 75’ from the ordinary high water mark along each bank. Weeds are currently not as prevalent as in other reaches but still need to be reduced or eliminated before native plants can be re-established. Reach 4 is deprived of topsoil and needs several high flow events to deposit fines in the floodplain. A minimum of 25% of plantings must be 2 gallon or larger potted as opposed to bare-root but would likely require 50% or more to achieve required survival densities. Shade from the canyon and upland canopy will provide some cover for the new plantings that is lacking in lower reaches. In this reach, plantings are not scheduled to begin until 3 years from Reach 1 implementation start date and are only required at a density of 100 stems per acre.

1.4.2 Fish Barrier Removal
Reach 4 is severely damaged with multiple sub-surface segments, boulder berms that cut-off the floodplain, channel incision and bedrock ledges. Removing the bedrock ledge fish barriers by reworking boulders and adding LWD will help promote recovery as the stream heals. Reach 4 has 5 bedrock ledge barriers from RM 4.18-4.53 that must be removed. All bedrock and boulder fish passage barriers identified during the October 2017 assessment must be eliminated to allow for unimpeded passage of juvenile and adult fish. Sub-surface fish barriers will continue to be monitored annually.

1.4.3 Large woody Debris (LWD) and Boulder Structures
Reach 4 also has limited amounts of LWD in some sections, but does have plenty of boulders available for structures. The available wood and existing boulders will be used to create 223 structures within Reach 4. LWD and boulders are to be used to increase pool frequency, hydraulic and geomorphic complexity. Structures must be placed to increase floodplain connection to disperse flow and fine sediment laterally, especially where the channel is incised. Restructuring boulder assemblages in the present channel and valley bottom will restore fluvial processes. There is a possibility that LWD for structures could come from Field Springs State
Park which was identified during the assessment as needing thinning. Inquiring about using Field Springs State Park wood is the responsibility of Bonasa Breaks or hired contractors. Floodplain connection will encourage natural recruitment of woody species and aid vegetation recovery. Required number of structures must be installed by Completion Date Table 1.

1.5 Reach 5:
Location Description: RM 6.08 to 50 meters downstream of the dam site
Start: 46.088076, -117.178989
Stop: 46.094688, -117.189251
Length: Approximately 0.71 miles
Landowners: Field Springs State Park, Mallory Iris, John Zillich, John Hanley, Joanne Bolick, (Other parcel is owned by Bonasa Breaks)

1.5.1 Riparian Plantings and Weed Control
In Reach 5: 0.71 river miles are to be planted with native, woody and herbaceous riparian vegetation, measuring up to 75' from the ordinary high water mark along each bank. Weeds must be reduced or eliminated before native plants can be re-established. Reach 5 has enough remaining topsoil and intact floodplain to re-plant riparian vegetation starting in 2018. These plants will act as an important seed source and help with recovery of the lower reaches. Required surviving plant density for Reach 5 is listed in Table 1. Required surviving density can be achieved with adequate maintenance, replacing mortalities, planting larger trees, or planting at a higher original density. Specific species of plants and acceptable planting zones for the Rattlesnake Creek basin can be found in Shrub and Tree Species for Planting Riparian Areas in Major Land Resource Area 9. Maintenance is defined as watering plantings, replacing plant mortalities, weed control and any other means necessary to achieve required surviving densities through the Completion Date in Table 1.

1.5.2 Fish Barrier Removal
Barriers in Reach 5 are not a large a concern compared to the lower reaches. Near RM 6.2 and 6.3 boulders should be moved to improve flow and geomorphic condition.

1.5.3 Large woody Debris (LWD) and Boulder Structures
Available wood and existing boulders will be used to create 76 structures within Reach 5. Wood and boulder structures in the channel and floodplain must promote sediment retention to raise the stream bed in incised areas and capture sediment on the floodplain. Floodplain connection will encourage natural recruitment of woody species and aid vegetation recovery.

1.5.4 Access Road
It is likely that the dirt road near RM 5.5 will need to be repaired in order to effectively access Reaches 3 and 4 to meet implementation requirements (e.g. transporting crews and plantings, watering, installing structures etc.). The original culvert used at this crossing may no longer be salvageable. The condition of the access road following the creek should be professionally assessed to determine feasibility of utilizing the road for restoration activities.
1.6 Technical Assistance

- Landowner participation or feedback in the contractor hiring process may increase likelihood of obtaining required agreements.
- Ecology is considering assembling an interagency task force to help with permitting requirements.
- Asotin County Conservation District is a great resource for stream restoration and riparian planting guidance (509) 552-8117.
- Asotin County Weed Control Board District 3 (Asotin Flats) can provide technical assistance for weed removal and permitting for herbicide use (509) 243-2098. Some of the species observed include: Common mullein, Common teasel, Canada thistle, Scotch thistle, Himalayan blackberry.

A. 17.7 Tables and Figures

![Riparian Planting Zones](image)

Figure 1. Each zone represents a riparian planting zone in relation to the ordinary high water mark or bankfull discharge. Species listed in NRCS 13160 must be planted accordingly in their appropriate zone. *Image from NRCS, https://www.nrcs.usda.gov/internet/PSER_DOCUMENTS/arc144p2_b43594.pdf*
Reach Breaks for Rattlesnake Creek Restoration

Figure 2. Map of the Rattlesnake Creek watershed where restoration actions are to occur. Reach breaks are labeled at the bottom of each reach.
References and Links

Asotin County Noxious Weed Board’s current noxious weed control management plan
http://www.co.asotin.wa.us/noxious-weed-control/weed-management-plan/


EAP, 2016. Washington State Department of Ecology’s Status and Trends Habitat Monitoring Project Rattlesnake Creek (WAM06600-032101) Provisional Data


NRCS 13160: Trees and Shrubs for Riparian Plantings Natural Resources Conservation Service Washington

Sage Environmental Research, 2018. Rattlesnake Creek Conceptual Rehabilitation Plan

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