



Lower Columbia Land Managers Conservation Action Forum Summary Report

Prepared by: Kootenay Conservation Program
December 13, 2018

LOWER COLUMBIA LAND MANAGERS CONSERVATION ACTION FORUM
HELPING SPECIES AT RISK, TOGETHER
2 OCT 2018

PHOTOS BY JAKOB DILLISSE

The purpose of this forum is to identify priority needs and actions that will contribute to maintaining species at risk and their habitats in the Lower Columbia Valley over the next 5 years.

WHERE & WHEN?
Tuesday, October 2, 2018 - 9 am - 4:30 pm
Muriel Griffiths Room in the Charles Bailey Theatre
1501 Cedar Avenue, Trail, B.C.

WHO?
Land managers and planners who work in the Trail/Waneta area. *Participation is by invite only.*

FOR MORE INFORMATION...
Adrienne Shaw, KCP Stewardship Coordinator
adrienne@kootenayconservation.ca

Together we're taking care of our natural landscapes and our Kootenay way of life.

Columbia Basin Trust | Kootenay Conservation Trust Foundation | FWCP (Forest Wildlife and Watershed Protection Program) | Government of British Columbia



TABLE OF CONTENTS

Acknowledgements.....	iii
Executive Summary.....	1
I. Overview.....	3
Desired Outcomes of the Forum.....	5
II. Taking a Conservation Neighbourhood Approach.....	7
III. Management and Conservation Recommendations to Reduce Impacts to Species and Ecosystems at Risk.....	9
IV. Determining Feasible Priority Actions.....	13
Themes Guiding Small Group Discussions.....	13
Outcomes from Small Group discussions.....	14
GROUP #1: Planning/Permitting And Data Management.....	14
GROUP #2: Invasive Species Management, Vegetation Management.....	16
GROUP #3: Development and Field Operations, Other Ground Disturbance, Other Land Management.....	17
GROUP #4: Access Management, Recreation Development Pressure, Road Maintenance and Use.....	18
V. Priority Actions.....	20
1. Access to Resource Tools.....	20
2. Training to Use and Interpret the Available Resource Tools.....	20
3. A Tool to Predict Where You Can Find Species and Ecosystems At Risk (Sear).....	20
4. Best Management Practices to be Available on a Local Level.....	20
5. Effective Communication with Experts and Land Managers.....	20
6. Create an Access Management Plan to Reduce Recreational Pressures.....	21
VI. Conclusions.....	21
VII. Moving Forward.....	21
Appendix A: Lower Columbia Forum Participants.....	23
Appendix B: Forum Agenda.....	25

Appendix C: Science Presenters and Topics28

Appendix D: Definition of Acronyms.....29

Appendix E: Species And Ecosystems At Risk30

 Table 1: Conservation status of listed vertebrate species confirmed in the Lower Columbia Valley.30

 Table 2. Conservation status of listed invertebrate species confirmed or expected in the Lower Columbia Valley.31

 Table 3. Conservation status of listed vascular plant species confirmed or expected in the Lower Columbia Valley.32

 Table 4. Conservation status of listed ecological communities confirmed or expected in the Lower Columbia Valley.33

 Table 5. Conservation status summary for vertebrates, invertebrates, plants, and ecological communities confirmed or expected in Lower Columbia Valley.34

ACKNOWLEDGEMENTS

The Lower Columbia Land Managers Conservation Action Forum was the result of collaborative efforts of many people. We are extremely grateful to the Forum Steering Committee for helping organize this event: Adrienne Shaw, Juliet Craig, Marlene Machmer, Jakob Dulisse, Irene Manley, Jennifer Vogel and Lindsay Anderson. We appreciate funding from Columbia Basin Trust, Habitat Conservation Trust Foundation, Fish and Wildlife Compensation Program – Columbia Basin, Columbia Power Corporation, and Environment and Climate Change Canada. We wish to extend our appreciation to everyone who attended the Forum, shared ideas in a collaborative spirit, and helped set the stage for greater conservation of the Lower Columbia River Valley’s extraordinary biological diversity.



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada



EXECUTIVE SUMMARY

On October 2, 2018, the Kootenay Conservation Program (KCP) and KCP Partners hosted the Lower Columbia Land Managers Conservation Action Forum in Trail, B.C. During this full day workshop and field tour, 32 participants representing diverse perspectives as scientists, resource managers, planners, land managers, conservationists, and representative officials worked together to identify priority needs and actions that will contribute to maintaining species and ecosystems at risk and their habitats in the Lower Columbia Valley over the next 5 years.

The Forum began with scientists providing four-minute speed presentations of their research findings and sharing their conservation action recommendations that would make the biggest difference in protecting and conserving species and ecosystems at risk with respect to land management activities. A table of 'Land Management Activities and Recommended Conservation Actions' along with a 'Species and Ecosystems at Risk' table was provided to participants. The small groups reviewed the following four Land Management Activity Themes:

- Planning/Permitting/Data Management
- Invasive Species Management, Vegetation Management
- Development and Field Operations, Other Ground Disturbance, Other Land Management
- Access Management, Recreation Development Pressure, Road Maintenance and Use

Participants working in small groups based on the four land management activity themes addressed three questions:

- What actions are you doing already?
- What is your experience in doing these recommended actions?
- What would help you better implement these actions?

The Lower Columbia Land Managers Conservation Action Forum resulted in the following identified six priority actions (not ranked):

- 1. Access to Resource Tools (where are the resources, what information do they provide, what are the data gaps)**
- 2. Training to use and Interpret the available Resource Tools**
- 3. A tool to predict where you can find Species and Ecosystems at Risk (instead of only having data that shows an historical occurrence)**
- 4. Best Management Practices to be available on a local level**

5. **Effective communication with experts and Land Managers**
6. **Create an Access Management Plan to reduce recreational pressures**

The Lower Columbia Land Managers Conservation Action Forum was based on the neighbourhood conservation model used in the Slocan Valley and Columbia Valley in 2017. Conservation Neighbourhood Action Planning has provided the Kootenay Conservation Program with a new way to approach conservation by working in the local context of a “conservation neighbourhood” to assist KCP partners in identifying common priorities and objectives for on-the-ground conservation and stewardship activities in their region. This approach supports KCP’s partners in developing collaborative action plans that identify conservation targets and propose solutions to mitigating threats in their local neighbourhood.



COLUMBIA VALLEY CONSERVATION ACTION PLANNING FORUM PARTICIPANTS.

I. OVERVIEW

The Lower Columbia Land Managers Conservation Action Forum, hosted by the Kootenay Conservation Program (KCP), took place on October 2, 2018, in Trail, B.C. The overall purpose of the Forum was to improve awareness of species at risk, their critical habitats, and listed ecological communities in the Lower Columbia River Valley (extending from Trail south to the US Border including the Pend d'Oreille Valley). The forum focused on how to consider and conserve these values during land management activities.

The Lower Columbia River and surrounding valley supports a variety of ecosystems ranging from valley bottom riparian areas to wetlands, shrublands, and dry to mesic forests, and includes some unique provincially-listed ecosystems. The region has abundant fish and wildlife and diverse recreational opportunities. There is particular interest in species and habitats at risk since this valley is a hot spot in both a Kootenay regional and provincial context. This focus can be witnessed during Critter Day, which KCP has co-hosted for the past three years, which brings hundreds of people to Beaver Creek Provincial Park to learn about the diversity of reptiles, amphibians, fish, birds, mammals, plants and invertebrates living in this area. The Lower Columbia and adjoining side valleys are also a hub for economic development such as hydroelectric power generation, metal smelting, forestry, and transportation (vehicle, rail, air) and other industrial activities. The area is an important hunting and fishing destination and there is increasing recreational pressure on parks, conservation lands, and even selected private properties that are being used for motorized activities (e.g., dirt-biking, ATV, 4x4), as well as dog walking and horseback riding. These activities are often not compatible with maintaining ecosystems, species and habitats at risk, and the challenge remains how best to protect and restore biodiversity values while maintaining economic development, recreation and other valued activities, particularly in the context of climate change (e.g., warmer and dryer summers with increased moisture stress, more serious invasive species infestations, increased forest insect and disease incidence, higher risk of catastrophic wildfire).

The Lower Columbia Land Managers Conservation Action Forum was hosted by KCP (Juliet Craig and Adrienne Shaw) and steered by Marlene Machmer (Pandion Ecological Research) and Jakob Dulisse (Jakob Dulisse Consulting). KCP and its partners have a common interest in exploring collaborative strategies to conserve the native biodiversity and ecological processes of the Lower Columbia River Valley. KCP is a partnership program comprised of over 80 organizations that are involved in conservation and stewardship in the East and West Kootenays¹. KCP's

¹ www.kootenayconservation.ca

mandate is to *facilitate and coordinate efforts on private land and to generate the resources and support to maintain this effort.*



FIELD TOUR IN THE PEND D’OREILLE RIVER VALLEY.

During this full-day workshop and field tour, 32 participants (Appendix A) representing diverse perspectives as scientists, resource managers, planners, land managers, conservationists, and representative officials worked together to identify priority needs and actions that will contribute to maintaining species at risk and their habitats in the Lower Columbia Valley over the next 5 years.

The Forum agenda (Appendix B) was structured to address these questions:

- What is the current knowledge regarding species at risk, their suitable and critical habitats, listed ecological communities and associated processes in the Lower Columbia?
- What improvements (e.g., actions, information, tools, guidelines, capacity, funds, zoning, legislative changes, enforcement, etc.) will make the most difference in reducing mortality, protecting suitable and critical habitats, enhancing connectivity, preventing/controlling invasive species, reducing recreational pressure, and promoting climate change resilience?
- Where do you see barriers and opportunities in your company's or organization's plans, policies, programs, budgets and communications for realizing improvements?
- What kind of alignment do we need to foster between land managers, scientists, First Nations, non-government organizations and local/provincial governments to effectively collaborate and make a significant, positive impact while also meeting individual mandates?

DESIRED OUTCOMES OF THE FORUM

- Land Managers will receive up to date information on local animal and plant species and communities at risk, their suitable and critical habitats, existing threats, and sensitivities to current practices.
- Land Managers will provide feedback on examples of Best Management Practices (BMPs) for target herptile species which will help facilitate the development of BMPs for all relevant taxa.
- The Forum will identify needs (and constraints) to promote improved management and conservation actions and implementation of BMPs.
- The Forum will identify key conservation actions and discuss steps on how Land Managers can implement and/or promote these to achieve positive results.
- Land Managers have clear direction for how they can support the proposed conservation actions/best management practices in the Lower Columbia.

The Lower Columbia Land Managers Conservation Action Forum included scientific presentations (Appendix C) that set the foundation for small group strategy sessions. Within the small groups, participants discussed management and conservation actions in regards to land management activities. Participants discussed the actions that they were able to achieve, what

barriers they experienced in doing these recommended actions and what they would need to better implement these actions.



FIELD TOUR IN BEAVER CREEK PROVINCIAL PARK.

**Note: Please refer to Appendix A for Forum Participants; Appendix B for the Forum Agenda; Appendix C for Scientists' Presentations; Appendix D for a Glossary of Acronyms; Appendix E for Species and Ecosystems at Risk*

II. TAKING A CONSERVATION NEIGHBOURHOOD APPROACH

Over the past three years, the Kootenay Conservation Program has engaged its partners in landscapes through the East and West Kootenays to develop an approach to framing conservation and stewardship objectives in terms of ecological benefits to local landscapes². KCP's Conservation Action Planning Initiative has worked with partners to identify 14 "Conservation Neighbourhoods" in the region (Figure 1). These areas are informed by watershed and ecosystem boundaries, yet they also capture what KCP partners deem "local" by encompassing areas that have a common conservation culture.

In March 2018, KCP organized an initial meeting with partners involved in the Lower Columbia River Valley to begin framing an approach to bring awareness to Species and Ecosystems at Risk and identify the needs and barriers for land managers in implementing conservation and management actions for Species and Ecosystems at Risk. Participants at that meeting defined an area within KCP's Lower Columbia River Conservation Neighbourhood (Figure 1) that made sense from an ecological and land management activity perspective. They proposed that the forum would target the lower portion of the Lower Columbia River Valley Conservation Neighbourhood extending from Trail south to the US Border including the Pend d'Oreille Valley, and include east-west from the height of land in these two river valleys.

It was acknowledged that the Lower Columbia River and Pend d'Oreille River Valleys are important areas for numerous Species and Ecosystems at Risk and is an area of high land management activity impacts (such as development, invasive species, habitat fragmentation, and recreational pressures). At the March meeting, partners concluded it was necessary to have a Conservation Action Forum to help address the impending impacts to Species and Ecosystems at Risk and identified a role for KCP to collaboratively develop the Lower Columbia Land Managers Conservation Action Forum.

² <http://kootenayconservation.ca/conservation-neighbourhoods/>

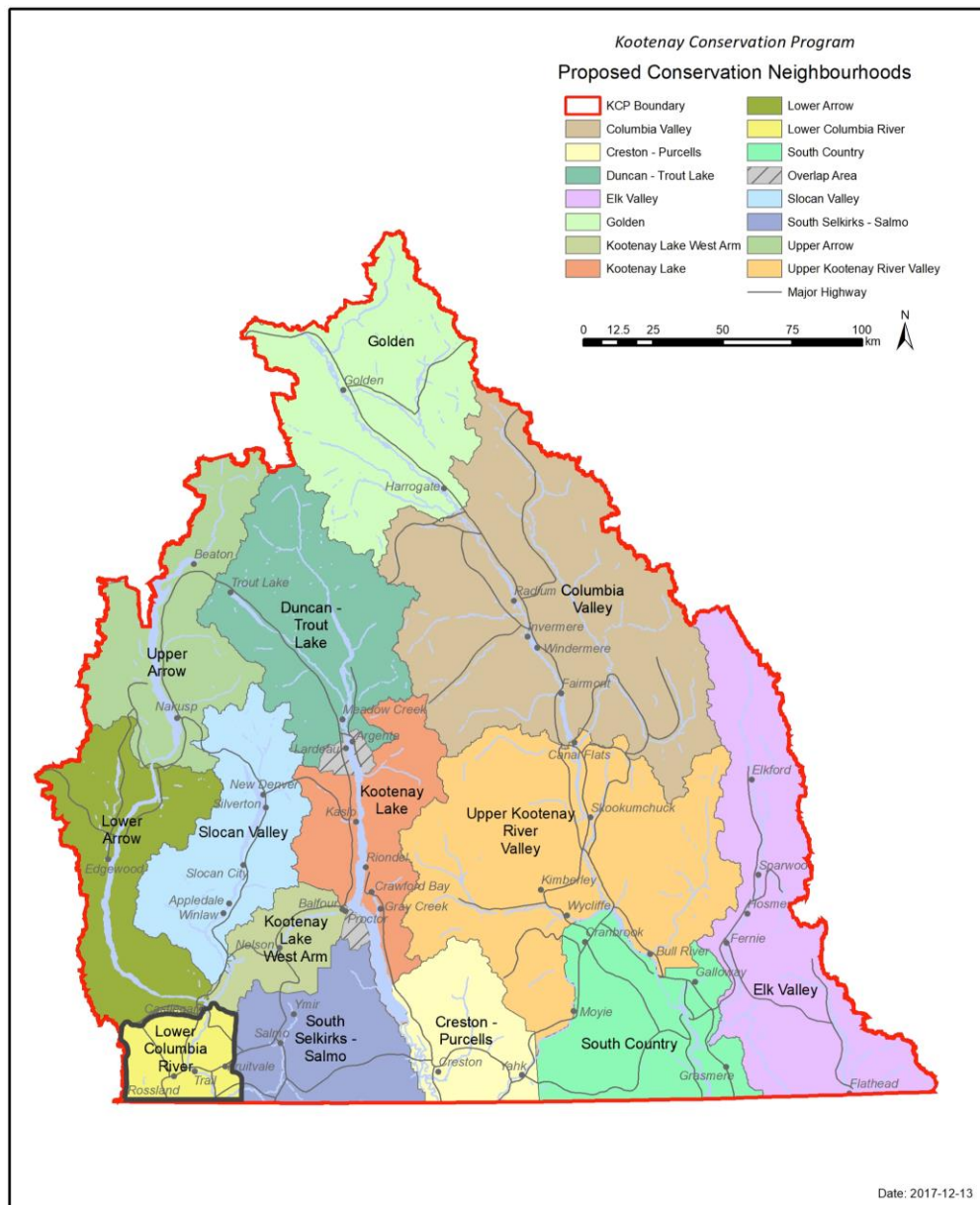


Figure 1. Map of KCPs 14 Conservation Planning Neighbourhoods in the East and West Kootenays. The Lower Columbia River Conservation Neighbourhood is outlined in black.

III. MANAGEMENT AND CONSERVATION RECOMMENDATIONS TO REDUCE IMPACTS TO SPECIES AND ECOSYSTEMS AT RISK

Prior to the Forum, Marlene Machmer (Pandion Ecological Research Ltd.) prepared a list of conservation and management actions recommended to reduce impacts to Species and Ecosystems at Risk in the Lower Columbia (Table 1). As well, a comprehensive list of Species and Ecosystems at Risk was created (Appendix E).

Land management activities were defined as:

1. **Planning/Permitting**
2. **Development and Field Operations**
 - infrastructure or road building, harvesting, mining, quarrying, site preparation, other footprint changes
3. **Other Ground Disturbance**
 - soil excavation, movement, deposition
4. **Vegetation Management**
 - tree/shrub cutting, brushing, pruning, mowing, planting, slash and debris management
5. **Invasive Species Management**
 - herbicide, mechanical, bio-control, steaming, electro-shocking
6. **Access Management**
 - gates, fencing, road/area closures, road deactivation, signage, cameras, speed limits
7. **Recreation Development/ Pressure**
 - motorized trails/use, biking, walking and multi-use trails for people, dogs, horses; rock-climbing, caving; boating, other
8. **Road Maintenance and Use**
 - road washing, ditching, grading, gravel/salt deposition, traffic management
9. **Other Land Management**
 - habitat restoration, enhancement, creation and offsetting

Management and conservation actions were created to address each land management activity with up to six recommended actions to reduce impacts to Species and Ecosystems at Risk. Cumulative impacts are difficult to quantify and even more difficult to predict. Therefore, a precautionary approach to management and further development was identified as important in order to minimize the impacts on Species and Ecosystems at Risk.

TABLE 1: RECOMMENDATIONS FOR MANAGEMENT AND CONSERVATION ACTIONS BASED ON LAND MANAGEMENT ACTIVITY.

LAND MANAGEMENT ACTIONS AND RECOMMENDATIONS FOR MANAGEMENT AND CONSERVATION ACTIONS	
1. Planning/Permitting	<ul style="list-style-type: none"> • Identify known or potential values and habitat features in and around AOI using available resources. • Conduct surveys in right season for listed species, communities, habitat values (nests, roosts, dens, perches, corridors, licks, wallows, wetlands, streams, seeps, etc.). • Contact MFLNRORD* and/or local experts to supplement info for lesser known values. • For target SAR*, gather info on habitat needs and use, sensitivities, and seasonal timing restrictions. • Assess likely impacts, develop mitigation, estimate residual impacts, adjust plans accordingly (i.e., location, footprint, design, timing). • Clarify roles and responsibilities with respect to target SAR and identify any red flags.
2. Development and Field Operations (e.g., infrastructure or road building, harvesting, mining, quarrying, site preparation, other footprint changes)	<ul style="list-style-type: none"> • Plan effectively (see 1). Adhere to design and SAR timing restrictions. • Have QP* oversee implementation and mitigation; flag new issues to be managed adaptively. • Minimise footprint; retain as much natural habitat (soil, vegetation, structure) and features as possible. • Clean equipment before/after use; ensure use of clean materials and fill. • Salvage and store topsoil to keep weed-free; control erosion, run-off, sedimentation • Revegetate asap; restore, enhance and create habitat, where opportunities arise. • Monitor and offset residual impacts on site (off-site).
3. Other Ground Disturbance (e.g., soil excavation, movement, deposition)	<ul style="list-style-type: none"> • Plan effectively (see 1). Minimize footprint and retain as much natural habitat (soil, vegetation, structure) as possible. • Adhere to SAR timing restrictions. Use the right equipment for the job, site and season. • Retain habitat features (nests, roosts, dens, perches, corridors, licks, wallows, wetlands, streams, seeps, etc.) and surrounding buffer. • Clean equipment before/after use; ensure use of clean materials and fill. • Salvage and store topsoil to keep weed-free; control erosion, run-off, sedimentation. • Revegetate asap; restore, enhance and create habitat, where opportunities arise.
4. Vegetation Management (e.g., tree/shrub cutting, brushing, pruning, mowing, planting, slash and debris management)	<ul style="list-style-type: none"> • Plan effectively (see 1). Map listed species/ communities and alter treatment prescriptions accordingly. • Adhere to SAR timing restrictions. Use the right equipment for the job, site and season. • Minimize treated area; retain as much natural habitat (soil, vegetation, structure) as possible. • Retain habitat features (nests, roosts, dens, perches, corridors, licks, wallows, wetlands, streams, seeps, etc.) with appropriate buffer.

- Clean equipment before and after use; adopt proper sanitization techniques to reduce invasive species spread.
- Train ground crews to ID listed communities, species, high value trees and native low-growing shrubs that should be retained.
- Do not dispose of cut slash/debris onto live shrubs and herbs; remove slash wherever possible (see 5).

5. Invasive Species Management (e.g., herbicide, mechanical, bio-control, steaming, electro-shocking)

- Plan effectively (see 1). Map listed species/ communities and alter treatment prescriptions accordingly.
- Adhere to SAR species timing restrictions; adjust treatment timing to maximize effectiveness.
- Minimize treated area; retain as much natural habitat (soil, vegetation, structure) and habitat features as possible.
- Clean equipment before and after use, use clean materials, and adopt proper sanitization techniques to reduce invasive species spread.
- Ensure proper disposal of invasive species to minimize new infections (e.g., chipping black locust scarifies seeds; cutting promotes re-sprouting).
- Monitor invasive species distribution, abundance and treatment effectiveness.
- Promote greater awareness among workers and the public.

6. Access Management (e.g., gates, fencing, road/area closures, road deactivation, signage, cameras, speed limits)

- Plan effectively (see 1). Select the right tool(s) to meet objectives while minimizing impacts.
- Ensure appropriate fence/gate design to reduce mortality and maintain movements and permeability for SAR.
- Minimize ground disturbance, habitat removal and impacts during construction.
- Monitor to ensure access restrictions are effective and manage adaptively where not.
- Follow-up with enforcement where appropriate.

7. Recreation Development/ Pressure (e.g., motorized trails/use, biking, walking and multi-use trails for people, dogs, horses; rock-climbing, caving; boating, other)

- Plan effectively (see 1). Define appropriate use type, locations, routes, and timing/season of use early on; document extensively and adjust, if necessary.
- Avoid recreational development/use in SAR habitat. Retain suitable buffers, maintain existing density and distribution of habitat features.
- Ensure high standard of construction (e.g., IMBA) and maintenance. For natural features (e.g., cliffs, caves), limit modifications and restrict use as needed.
- Monitor periodically for impacts (invasive species, erosion, compaction, mortality, disturbance, displacement, etc.) and manage adaptively (see 6).
- Conduct compliance monitoring and follow through with enforcement, as necessary.

8. Road Maintenance and Use (e.g., road washing, ditching, grading, gravel/salt deposition, traffic management)

- Plan effectively (see 1). Adhere to SAR timing restrictions.
- Minimize treated area; avoid natural habitat and habitat features to the extent possible.

- Clean equipment before/ after use; ensure use of clean materials and fill.
- Use the right equipment for the job, site and season.
- Remove slash; avoid disposal of cut slash/debris onto native vegetation; ensure proper disposal of weeds to avoid spread (see 5).
- Reduce travel distance and speed to minimize roadkill mortality. Record and report roadkill of SAR (location, species, date, etc.).

9. **Other Land Management** (e.g., habitat restoration, enhancement, creation and offsetting)

- Plan effectively (see 1).
- Adhere to SAR timing restrictions; use the right equipment, materials and design for the job, site and season.
- Minimize footprint; retain habitat features (nests, roosts, perches, dens, licks, wallows, corridors, wetlands, seeps, etc.) and appropriate buffers.
- Clean equipment before and after use; use proper sanitization techniques to avoid invasive species spread from clothing, materials and equipment (see 5).
- Conduct baseline and post-treatment monitoring to determine effectiveness.
- Train ground crews to ID listed plants, communities, high value trees, native shrubs and herbs that should be retained.

*AOI - Area of Interest; *IMBA - International Mountain Bike Association; *MFLNRORD - Ministry of Forests Lands, Natural Resource Operations and Rural Development; *QP - Qualified Professional; *SAR - Species at Risk



NORTHERN RUBBER BOA (PHOTO COURTESY OF JAKOB DULISSE)

IV. DETERMINING FEASIBLE PRIORITY ACTIONS

THEMES GUIDING SMALL GROUP DISCUSSIONS

The Forum began with scientists providing four-minute speed presentations of their research findings and sharing their conservation action recommendations that would make the biggest difference in protecting and conserving Species and Ecosystems at Risk. A table of Land Management Activities and Recommended Conservation Actions (Table 1) along with a Species and Ecosystems at Risk table (Appendix E) was provided to participants. The small groups reviewed the following four Land Management Activity Themes:

- **Planning/Permitting/Data Management**
- **Invasive Species Management, Vegetation Management**
- **Development and Field Operations, Other Ground Disturbance, Other Land Management**
- **Access Management, Recreation Development Pressure, Road Maintenance and Use**

Participants working in small groups based on the four land management activity themes addressed three questions:

1. **What actions are you doing already?**
2. **What is your experience in doing these recommended actions?**
3. **What would help you better implement these actions?**

The Next-Steps needed to help protect and conserve Species and Ecosystems at Risk were discussed on the field tour of the Lower Columbia and Pend d'Oreille River Valleys.



WESTERN SKINK (PHOTO COURTESY OF ADRIENNE SHAW)

OUTCOMES FROM SMALL GROUP DISCUSSIONS

This section contains notes from each of the small groups working on Land Management Activities and the corresponding recommended management and conservation actions (Table 1).

GROUP #1: PLANNING/PERMITTING AND DATA MANAGEMENT

What actions are you doing already?

- Looking to legislation to support actions
 - Land covenants
 - Crown standards on private land
 - Actions are accomplished differently for each organization (e.g. Ministry of Transportation (MOT): has access to more social capital and other resources while forestry companies are able to do field surveys but MOT doesn't have the ability to many surveys due to private land issues

What is your experience in doing these recommended actions?

- Social capital is important
 - Using people with expertise to help with actions
- Engaging people who work with Species at Risk or landowners with Species at Risk on their property is important so actions are completed
 - Communicating effectively
 - Target your audience and speak to their values and concerns
- Incomplete information in the current resources that are publicly available
 - Conservation Data Center (CDC) has sensitive information access that not all people can use (i.e., masked occurrences)
 - Not all individuals report their data to the CDC
 - Delay in reporting info versus it appearing on searchable CDC website
- Lack of money for biologists/experts and lack of internal expertise on Species and Ecosystems at Risk

What would help you better implement these actions?

- Mapping tools
 - Critical Habitats
 - SAR Habitats
- Knowing how to access current information and be aware of the gaps and interpretive limitations in applying this information
 - A workshop/webinar for instruction on the use of existing tools
- Create a hub/database
 - Directing users to specific resources or tools depending on their needs
- Need to learn how to interpret the output provided from available tools and resources and also how to better understand their limitations
- Need access to real people to navigate information and answer questions on the resources provided



COMMON NIGHTHAWK (PHOTO COURTESY OF JAKOB DULISSE)

GROUP #2: INVASIVE SPECIES MANAGEMENT, VEGETATION MANAGEMENT

What actions are you doing already?

- Some training
- Plans in place

What is your experience in doing these recommended actions?

- There are large disparities in standards and consistency for addressing species and ecosystems at risk among organizations (and even within parts of an organization depending on location and department), because of different management emphasis among organizations (e.g., BC Hydro, FortisBC, Teck)
- Things slip through the cracks because different parts of the business (e.g., generation versus transmission) have different objectives and priorities
- These disparities make it difficult for the public to know who to deal with, what to expect, and how to navigate when there is an issue

What would help you better implement these actions?

- Mapping tools for SAR occurrences, SAR habitats and critical habitats
- Better information on what to manage for where (SAR locations, sensitive timing, priority weed locations, etc.)
- Prescriptions for what to do where and when based on SAR occupancy and habitat (i.e., key features of habitat, instruction on sensitive timing, mitigation of disturbance, other restrictions)
- Need access to better info and databases
- Better communication internally (between managers and contractors), among departments and organizations, and with stakeholders
- Contractor requirements for cleaning equipment, compliance and enforcement
- Higher level of planning and BMPs needed (Clean equip, SARA work)
- Training to understand and implement BMPs for species and ecosystems at risk and invasive species
 - Keep it simple
 - Key objectives
- Climate Change
 - Fire window and operations can lead to fallout SARA management

GROUP #3: DEVELOPMENT AND FIELD OPERATIONS, OTHER GROUND DISTURBANCE, OTHER LAND MANAGEMENT

What actions are you doing already?

- Doing some actions but not consistently as there are barriers to even knowing that they are needed

What is your experience in doing these recommended actions?

- Info comes too late in the planning process
 - Disconnect between environment and other departments
- Acknowledging incomplete information - all data doesn't get mapped
- Best management practices and higher level plans are out of date

What would help you better implement these actions?

- Data and Information sharing
 - CDC, professional reliance
 - Rapid/current database updating
 - Geo BC/IMAP BC
- Improved timing and greater communication
- Establishing goal posts- re-establishing higher level planning and best management practices
- Continuity among professionals is key to improve outcomes/ high turnover necessitates mentoring and training of new hires to reduce loss of knowledge
- Compliance and enforcement follow-up
- Funds to conduct inventories
- Habitat-based approach to species at risk is important and easier to apply
- Manage wildlife and ecosystem inventory the same as the Veg/ Forest inventory
- SAR legislation will drive management with or without enforcement (but without enforcement there is not a convincing incentive for incorporating SAR in planning)
- Private land management needs conservation incentives and legislation
- Identify opportunities for restoration
- Improved communication within large organizations
- Regional land manager forum
- Regional government bylaws/regulations are powerful

GROUP #4: ACCESS MANAGEMENT, RECREATION DEVELOPMENT PRESSURE, ROAD MAINTENANCE AND USE

What actions are you doing already?

- Closing Fort Shepherd - gate
- Teck closed access to their lands (private land)
- Attempts at access management planning for Pend d'Oreille Valley
- Signing trail use agreements with stewardship groups to improve oversight
- Hiring a part time warden to improve monitoring and compliance

What is your experience in doing these recommended actions?

- Positive for species and habitats (evidence of ecosystem recovery), limited ORV use
- Push back from the general public
- People want 'somewhere else to go' when areas are closed
- Individuals who speak up want proof of impacts
- Accumulating evidence of damage in areas where access is unrestricted; increased degradation, erosion, and weed encroachment
- Gates are not always successful and can create more difficulty (some people put locks on but they get cut)
- Vandalism is occurring
- Local government goes into areas after development/logging companies cause damage
- Access Management plan needed for PDO
- People are building their own roads and trails without any planning
- Access is not being managed and proliferating trails are being used but not maintained, leading to irreversible damage
- Certain forms of access are more impactful

What would help you better implement these actions?

- When a group of organizations does it at the same time
- Public outreach and education, benefits to decrease access
 - Education in schools on impacts to SAR from ORV use
- Having some areas authorized for ORVs

- Enforcement
 - Make the stewards of the land the caretakers (e.g., guardian program)
 - Teck has purchased wildlife cameras to monitor both wildlife and people
 - Require License plates for ORVs
 - Require ORVs to stay on main roads
- Establish Agreements with clubs for trail use and maintenance, still needs referral process and access to funding
- Need tools to protect road right away
 - Legislation
 - Road closure
 - High wildlife value
 - Access Management Area (AMA) access
- Enhanced stumpage rate to regulate access (costs included in stumpage appraisal)



LEWIS'S WOODPECKER (PHOTO COURTESY OF JAKOB DULISSE)

V. PRIORITY ACTIONS

The Lower Columbia Land Managers Conservation Action Forum resulted in identifying barriers to implementing recommended management and conservation actions. The following are the priority actions (not ranked):

1. ACCESS TO RESOURCE TOOLS

- Where are the resources, what information do they provide, what are the data gaps?
- Need a centralized place for all Resource Tools (e.g. mapping tools for Critical and SAR Habitat and Species at Risk). Create a hub/database directing users to specific resources or tools. Kootenay Spatial Data Partnership could be hub for providing a list of available Resource Tools
- Need information from experts to be available in the currently available Resource Tools (Conservation Data Center does not show all known SAR information, either because the information is not provided to CDC, the entry of the date is back-logged due to lack of capacity, or the information is sensitive/masked and therefore not publically available)

2. TRAINING TO USE AND INTERPRET THE AVAILABLE RESOURCE TOOLS

- webinars, workshops, one on one

3. A TOOL TO PREDICT WHERE YOU CAN FIND SPECIES AND ECOSYSTEMS AT RISK (SEAR)

- Instead of only having data that shows historical occurrences
- If SEAR are not identified in the area of the project (e.g. using the Conservation Data Centre) then SEAR mitigation is not incorporated in the planning
- This could also Identify important biodiversity areas

4. BEST MANAGEMENT PRACTICES TO BE AVAILABLE ON A LOCAL LEVEL

- Generic Best Management Practices are often too vague or don't incorporate site specific issues or safety concerns
- Need multi-user friendly Best Management Practices for SEAR and invasive species
- Land Managers need to be involved in the next steps for creating Best Management Practices

5. EFFECTIVE COMMUNICATION WITH EXPERTS AND LAND MANAGERS

- By-in from land managers and project supervisors is key for reducing impacts to Species at Risk
- Need to have resources available or be aware of the red flags in the planning phases of projects
- Information on Species at Risk Best Management Practices needs to be available to workers well before the projects have started

6. CREATE AN ACCESS MANAGEMENT PLAN TO REDUCE RECREATIONAL PRESSURES

- Ensure by-in from all users (including Clubs, Associations, etc.)

VI. CONCLUSIONS

During the Forum, presentations on Species and Ecosystems Risk and the impacts from land management activities provided a foundation for discussing the barriers to implementing conservation actions. Six priorities were suggested for priority actions in working with land managers to reduce impacts to Species and Ecosystems at Risk.

According to participant evaluations, 70% of participants rated the Forum “very helpful” to “super helpful.” Participants reported that they acquired new information, discovered new collaborators, and saw that there were other people dealing with the same issues.

Evaluations included the following benefits:

- Relationship building
- Overview on development pressures and activities
- Provided linkages to similar problems
- Valuable to hear that challenges in implementing BMPs are being heard
- Action oriented
- Collaboration and efficiencies are possible
- Information sharing
- Networking and creating next steps with other participants
- Knowledge sharing
- Multi-jurisdictional involvement
- More forums are needed throughout the Kootenays and beyond
- Meeting resource people in adjoining regions
- Positive discussions and attitudes

VII. MOVING FORWARD

All Forum participants, as well as those people who were invited but could not attend, will be provided the Forum’s findings and will be encouraged to participate in future events. The priority actions were collectively generated and incorporated objectives and activities that align with participants’ program interests.

The Lower Columbia Land Managers Conservation Action Forum (and the previous Columbia Valley and Slocan Lake Science and Conservation Action Forums) have provided the Kootenay Conservation Program with a new way to approach conservation by working in the local context of a “conservation neighbourhood” to assist KCP partners in identifying common priorities and objectives for on-the-ground conservation and stewardship activities. This approach supports KCP’s partners in developing collaborative action plans that identify conservation targets and propose solutions to mitigating threats in their local neighbourhood. KCP will remain engaged in supporting the Lower Columbia process and implementation of the priority actions. The Forum’s process and outcomes will also help KCP guide collaborative neighbourhood conservation action planning in other regions of the Kootenays where partners want to work together to protect local biodiversity.

APPENDIX A: LOWER COLUMBIA FORUM PARTICIPANTS

Lower Columbia Land Managers Conservation Action Forum October 2, 2018

Company/Organization

Name

Land Managers

Trail Wildlife Association	Al Mallette
BC Hydro	Bill Laflin
Selkirk College	Brendan Wilson
Regional District of Kootenay Boundary	Carly Rimmel
Ministry of Transportation and Infrastructure	Christine Nichol
Teck	Clare North
Okanagan Nation Alliance	Dave DeRosa
Central Kootenay Invasive Species Society	Erin Bates
Ministry of Transportation and Infrastructure	Jill Carruthers
Regional District of Kootenay Boundary Lower Columbia-Old Glory	Linda Worley
Columbia Basin Trust	Michael Hounjet
ATCO	Nancy Hiebert
BC Hydro	Rhonda Kariz
Back Country Horseman of BC	Rick Fillmore
Trail Wildlife Association	Rob Frew
City of Trail – Trail Airport	Robert Baker
Teck	Ryan Cloutier
Teck	Sarah MacPherson
Fortis BC (representative)	Steve Ogle

Kalesnikoff
Kootenay Native Plant Society

Tyler Hodgkinson
Valerie Huff

Science Presenters

Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Deb MacKillop

Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FWCP)

Irene Manley

Jakob Dulisse Consulting

Jakob Dulisse

Janice Arndt Consulting

Janice Arndt

Central Kootenay Invasive Species Society

Jennifer Vogel

Pandion Ecological Research

Marlene Machmer

Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Mike Knapik

Facilitators

Kootenay Conservation Program

Adrienne Shaw

Kootenay Conservation Program

Juliet Craig

APPENDIX B: FORUM AGENDA



Lower Columbia Land Managers Conservation Action Forum

Tuesday, October 2, 2018

9:00 am – 4:30 pm PT

Muriel Griffiths Room in the Charles Bailey Theatre

1501 Cedar Ave Trail

Purpose: To identify priority needs and actions that will contribute to maintaining species at risk and their habitats in the Lower Columbia Valley over the next 5 years.

Guiding questions:

- What is the current knowledge regarding species at risk, their suitable and critical habitats, listed ecological communities and associated processes in the Lower Columbia?
- What improvements (e.g., actions, information, tools, guidelines, capacity, funds, zoning, legislative changes, enforcement, etc.) will make the most difference in reducing mortality, protecting suitable and critical habitats, enhancing connectivity, preventing/controlling invasive species, reducing recreational pressure, and promoting climate change resilience?
- Where do you see barriers and opportunities in your company's or organization's plans, policies, programs, budgets and communications for realizing improvements?
- What kind of alignment do we need to foster between land managers, scientists, First Nations, non-government organizations and local/provincial governments to effectively collaborate and make a significant, positive impact while also meeting individual mandates?

Desired outcomes:

- Land Managers will receive up to date information on local animal and plant species and communities at risk, their suitable and critical habitats, existing threats, and sensitivities to current practices.

- Land Managers will provide feedback on examples of Best Management Practices (BMPs) for target herptile species which will help facilitate the development of BMPs for all relevant taxa.
- The Forum will identify needs (and constraints) to promote improved management and conservation actions and implementation of BMPs.
- The Forum will identify key conservation actions and discuss steps on how Land Managers can implement and/or promote these to achieve positive results.
- Land Managers have clear direction for how they can support the proposed conservation actions/best management practices in the Lower Columbia.

MORNING

8:30 Display Set-up, Registration & Refreshments

9:00 Welcome

9:10 Agenda Review

9:15 Round Table of Introductions: 2 minute each

Name, title/position, organization, and mention What you are hoping for today?

9:45 Scientists' speed presentations – 5-10 minute presentations on wildlife, species at risk and their habitats: what we have found, implications and recommendations.

10:45 Bio break

11:00 Species at Risk Impacted by Land Management Activities

11:15 Land Management Activities and Recommended Management and Conservation Actions Overview

11:25 Management and Conservation Actions Identification – Small Groups with Table Hosts

Based on the Recommended Management and Conservation Actions identified:

What actions are you doing already?

What is your experience in doing these recommended actions?

What would help you better implement these actions?

12:00 Summary of the Management and Conservation Actions

12:15 LUNCH

AFTERNOON

- 1:00 **Management and Conservation Actions– Next Steps**
Where do we go from here?
- 1:30 **Field Trip to the Lower Columbia and Pend d’Oreille River Valleys**
- 4:00 **Evaluation and Closing Remarks**
- 4:30 **Departure**



FWCP
Fish & Wildlife
COMPENSATION PROGRAM



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada



APPENDIX C: SCIENCE PRESENTERS AND TOPICS

Below are the names, presentation topics, and affiliations of scientists who gave speed presentations at the Lower Columbia Land Managers Conservation Action Forum. They are listed in order of presentation.

	Name – Topic	Title, Organization
1	Jakob Dulisse – Biodiversity in the Lower Columbia	Wildlife Biologist, Jakob Dulisse Consulting
2	Marlene Machmer – Impacts to Species at Risk from Land Management Activities in the Lower Columbia	Wildlife Biologist, Pandion Ecological Research
3	Janice Arndt – Invertebrate Species at Risk in the Lower Columbia	Wildlife Biologist
4	Deb MacKillop – Ecosystems of Concern and Plant Species at Risk in the Lower Columbia	Research Ecologist, Ministry of Forests, Lands, Natural Resource Operations and Rural Development
5	Jennifer Vogel – Invasive Species in the Lower Columbia	Executive Director, Central Kootenay Invasive Species Society
6	Mike Knapik – Overview of the MOFLNRORD Species at Risk Decision Support Tool	Habitat Management Section Head, Ministry of Forests, Lands, Natural Resource Operations and Rural Development

APPENDIX D: DEFINITION OF ACRONYMS

BMP	Best Management Practices
CBT	Columbia Basin Trust
CDC	Conservation Data Centre
KCP	Kootenay Conservation Program
MFLNRORD or FLNRO	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
ORV	Off-road Recreational Vehicle
SAR	Species at Risk
SEAR	Species and Ecosystems at Risk

APPENDIX E: SPECIES AND ECOSYSTEMS AT RISK

Species and Ecosystems at Risk Tables prepared by Marlene Machmer, Pandion Ecological Research Ltd.

TABLE 1: CONSERVATION STATUS OF LISTED VERTEBRATE SPECIES CONFIRMED IN THE LOWER COLUMBIA VALLEY.

English Name	Scientific Name	SARA Status	COSEWIC Ranking	BC CDC Listing
<u>Amphibians:</u>				
Coeur d'Alene Salamander	<i>Plethodon idahoensis</i>	1-SC (2003)	SC (2007)	Y
Western Toad	<i>Bufo boreas</i>	1-SC (2018)	SC (2012)	Y
<u>Reptiles:</u>				
North American Racer	<i>Coluber constrictor</i>	1-SC (2006)	T (2015)	B
Northern Rubber Boa	<i>Charina bottae</i>	1-SC (2005)	SC (2016)	Y
Painted Turtle	<i>Chrysemys picta (Intermountain pop)</i>	1-SC (2007)	SC (2016)	B
Western Skink	<i>Eumeces skiltonianus</i>	1-SC (2005)	SC (2014)	B
<u>Birds:</u>				
American Avocet	<i>Recurvirostra americana</i>	-	-	B
American Bittern	<i>Botaurus lentiginosus</i>	-	-	B
Bank Swallow	<i>Hirunda riparia</i>	1-T (2017)	T (2013)	Y
Barn Owl	<i>Tyot alba</i>	1-T (2018)	T (2010)	R
Barn Swallow	<i>Hirunda rustica</i>	1-T (2017)	T (2011)	B
Black Swift	<i>Cypseloides niger</i>	-	E (2015)	B
Bobolink	<i>Dolichonyx oryzivorus</i>	1-T (2017)	T (2010)	B
Broad-winged Hawk	<i>Buteo platypterus</i>	-	-	B
California Gull	<i>Larus californicus</i>	-	-	B
Canyon Wren	<i>Catherpes mexicanus</i>	-	-	B
Common Nighthawk	<i>Chordeiles minor</i>	1-T (2010)	SC (2018)	Y
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	-	NAR (1978)	B
Eared Grebe	<i>Podiceps nigricollis</i>	-	-	B
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	-	SC (2016)	Y
Great Blue Heron	<i>Ardea herodias herodias</i>	-	-	B
Horned Grebe	<i>Podiceps auritus</i>	1-SC (-)	SC (2009)	Y
Lewis's Woodpecker	<i>Melanerpes lewis</i>	1-T (2012)	T (2010)	B
Long-tailed Duck	<i>Clangula hyemalis</i>	-	-	B
Northern Goshawk	<i>Accipiter gentilis atricapillus</i>	-	-	B
Olive-sided Flycatcher	<i>Contopus cooperi</i>	1-T (2010)	SC (2018)	B
Peregrine Falcon	<i>Falso peregrinus anatum</i>	1-SC (2012)	NAR (2017)	R
Short-eared Owl	<i>Asio flammeus</i>	1-SC (2012)	SC (2008)	B
Surf Scoter	<i>Melanitta perspicillata</i>	-	-	B
Swainson's Hawk	<i>Buteo swainsoni</i>	-	-	R
Tundra Swan	<i>Cygnus columbianus</i>	-	-	B
Western Grebe	<i>Aechmophorus occidentalis</i>	1-SC (2017)	SC (2014)	R

English Name	Scientific Name	SARA Status	COSEWIC Ranking	BC CDC Listing
Western Screech-Owl	<i>Megascops kennicotti macfarlanei</i>	1-T (-)	T (2012)	B
White-throated Swift	<i>Aeronautes saxatalis</i>	-	-	B
Yellow-breasted Chat	<i>Icteria virens</i>	1-E (2003)	E (2011)	R
Mammals:				
American Badger	<i>Taxidea taxus</i>	1-E (2018)	E (2012)	R
Fringed Myotis	<i>Myotis thysanodes</i>	3 (2005)	DD (2004)	B
Grizzly Bear	<i>Ursus arctos</i>	1-SC (2018)	SC (2002)	B
Little Brown Myotis	<i>Myotis lucifugus</i>	1-E (2014)	E (2013)	Y
Mountain Goat	<i>Oreamnos americanus</i>	-	-	B
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	-	-	B
Wolverine	<i>Gulo gulo luscus</i>	1-SC (2018)	SC (2014)	B
Fish:				
Bull Trout	<i>Salvalinus confluentus</i>	-	SC (2012)	B
Columbia Sculpin	<i>Cottus hubbsi</i>	1-SC (2013)	SC (2010)	B
Mountain Sucker	<i>Catostomus platyrhynchus</i>	1-SC (2017)	SC (2010)	B
Shorthead Sculpin	<i>Cottus confusus</i>	1-SC (-)	SC (2010)	B
Umatilla Dace	<i>Rhinichthys umatilla</i>	3 (2005)	T (2010)	R
Westslope Cutthroat Trout	<i>Oncorhynchus clarki</i>	1-SC (2010)	SC (2016)	B
White Sturgeon	<i>Acipenser transmontanus</i>	1-E (2006)	E (2012)	R

TABLE 2. CONSERVATION STATUS OF LISTED INVERTEBRATE SPECIES CONFIRMED OR EXPECTED IN THE LOWER COLUMBIA VALLEY.

English Name	Scientific Name	SARA Status	COSEWIC Ranking	BC CDC Listing
Butterflies and Moths:				
California Hairstreak	<i>Satyrium californicum</i>	-	-	B
Checkered Skipper	<i>Pyrgus communis</i>	-	-	B
Dun Skipper	<i>Euphyes vestris</i>	1-T (2003)	T (2013)	R
Eastern Tailed Blue	<i>Cupido comyntas</i>	-	-	B
Immaculate Green Hairstreak	<i>Callophrys affinis</i>	-	-	B
Monarch	<i>Danaus plexippus</i>	1-SC (2003)	E (2016)	B
Oreas Angelwing	<i>Polygonia oreas threatfuli</i>	-	-	B
Silver-spotted Skipper	<i>Epargyreus clarus</i>	-	-	B
Variegated Fritillary	<i>Euptoieta claudia</i>	-	-	B
Dragonflies:				
Twelve-spotted Skimmer	<i>Libellula pulchella</i>	-	-	B
Vivid Dancer	<i>Argia vivida</i>	-	SC (2015)	B
Other Insects:				
Hairy-necked Tiger Beetle	<i>Cicindela hirticollis</i>	-	-	B
Western Bumble Bee	<i>Bombus occidentalis</i>	-	T (2014)	B
Molluscs:				

Ashy Pebblesnail	<i>Fluminicola fuscus</i>	-	-	R
Attenuate Fossaria	<i>Galba truncatula</i>	-	-	B
Banded Tigersnail	<i>Anguispira kochi</i>	-	-	B
Coeur d'Alene Oregonian	<i>Crytomastix mullani</i>	-	-	B
Herrington Fingernailclam	<i>Sphaerium occidental</i>	-	-	B
Magnum Mantleslug	<i>Magnipelta mycopghaga</i>	1-SC (-)	SC (2012)	B
Pale Jumping Slug	<i>Hemphillia camelus</i>	-	-	B
Pygmy Slug	<i>Kootenaia burkei</i>	-	SC (2016)	B
Sheathed Slug	<i>Zacoleus idahohensis</i>	-	SC (2016)	B
Shortface Lanx	<i>Fisherola nuttalli</i>	-	E (2016)	R
Striated Fingernailclam	<i>Sphaerium striatinum</i>	-	-	B
Widelip Pondsnaill	<i>Stagnicola traski</i>	-	-	B

TABLE 3. CONSERVATION STATUS OF LISTED VASCULAR PLANT SPECIES CONFIRMED OR EXPECTED IN THE LOWER COLUMBIA VALLEY.

English Name	Scientific Name	COSEWIC Ranking	BC CDC Listing
<u>Vascular Plants:</u>			
Atkinson's coreopsis	<i>Coreopsis tinctoria var. atkinsoniana</i>	-	R
Common clarkia	<i>Clarkia rhomboidea</i>	-	R
Heterocodon	<i>Heterocodon rariflorus</i>	-	B
Least bladderly milk-vetch	<i>Astragalus microcystis</i>	-	R
Long-leaved aster	<i>Symphotrichum ascendens</i>	-	R
Midget quillwort	<i>Isoetes minima</i>	-	R
Mountain blue-curles	<i>Trichostema oblongum</i>	-	R
Pursh's wallflower	<i>Erysimum capitatum var. purshii</i>	-	R
Spurless touch-me-not	<i>Impatiens eecornuta</i>	-	R
Steer's head	<i>Dicentra uniflora</i>	-	B
Sweet-marsh butterweed	<i>Senecio hydrophiloides</i>	-	B
Tall beggarticks	<i>Bidens vulgata</i>	-	B
Western wallflower	<i>Erysimum capitatum</i>	-	R
Wild licorice	<i>Glycyrrhiza lepidota var. glutinosa</i>	-	B

TABLE 4. CONSERVATION STATUS OF LISTED ECOLOGICAL COMMUNITIES CONFIRMED OR EXPECTED IN THE LOWER COLUMBIA VALLEY.

English Name	Scientific Name	BC CDC Listing
<u>Ecological Communities:</u>		
Cottonwood – Snowberry – Rose (Fm01)	<i>Populus trichocarpa</i> – <i>Symphoricarpos albus</i> – <i>Rosa</i> spp.	R
Cottonwood – Spruce – Dogwood (Fm02)	<i>Populus trichocarpa</i> – <i>Picea engelmannii</i> x <i>glauca</i> – <i>Cornus stolonifera</i>	R
Cottonwood – Redcedar – Dogwood – Lady fern (Fm04)	<i>Populus trichocarpa</i> – <i>Thuja plicata</i> – <i>Cornus stolonifera</i> – <i>Athyrium filix-femina</i>	R
Idaho fescue - bluebunch wheatgrass - silky lupine – junegrass (ICHxw/Gg11)	<u><i>Festuca idahoensis</i> - <i>Pseudoroegneria spicata</i> - <i>Lupinus sericeus</i> - <i>Koeleria macrantha</i></u>	R
Ninebark – Oceanspray – Bluebunch wheatgrass (Gb03)	<i>Physocarpus malvaceus</i> – <i>Holodiscus discolor</i> – <i>Pseudoroegneria spicata</i>	In progress
Sumac – Bluebunch wheatgrass (Gb05)	<i>Rhus glabra</i> – <i>Pseudoroegneria spicata</i>	In progress
Snowbrush – Poverty oatgrass (Gb06)	<i>Ceanothus velutinus</i> – <i>Danthonia spicata</i>	In progress
FORESTS		
Douglas-fir / tall Oregon-grape / parsley fern (ICHdw1/102)	<u><i>Pseudotsuga menziesii</i> / <i>Berberis aquifolium</i> / <i>Cryptoграмма acrostichoides</i></u>	R
Western hemlock / common snowberry (ICHxw/01)	<u><i>Tsuga heterophylla</i> / <i>Symphoricarpos albus</i></u>	R
Western redcedar – Western hemlock – Horsetail – Lady fern (ICHxw/112; ICHdw1/112)	<i>Thuja plicata</i> – <i>Tsuga heterophylla</i> – <i>Equisetum arvense</i> – <i>Athyrium filix-femina</i>	Ranking planned
Western redcedar – Spruce – Skunk cabbage (ICHxw/113; ICHdw1/113)	<i>Thuja plicata</i> – <i>Picea engelmannii</i> x <i>glauca</i> – <i>Lysichiton americanus</i>	Ranking planned

TABLE 5. CONSERVATION STATUS SUMMARY FOR VERTEBRATES, INVERTEBRATES, PLANTS, AND ECOLOGICAL COMMUNITIES CONFIRMED OR EXPECTED IN LOWER COLUMBIA VALLEY.

Conservation Status	Vertebrates					Total	Invertebrates	Plants	Ecological Communities
	Amphibians	Reptiles	Birds	Mammals	Fish				
BC CDC Red List	0	0	5	1	2	8	3	9	6
BC CDC Blue List	0	3	20	5	5	33	22	5	(TBD)
Total Red & Blue	0	3	25	6	7	41	25	14	6 (5 being assessed)
COSEWIC List – E	0	0	2	2	1	5	2	-	-
COSEWIC List – T	0	1	6	0	1	8	2	-	-
COSEWIC List – SC	2	3	6	2	5	18	4	-	-
Total COSEWIC List	2	4	14	4	7	31	8	-	-
Total Listed	2	4	30	7	7	50	25	14	5 (TBD)