May 2015

CANADIAN COLUMBIA BASIN REGIONAL FRAMEWORK FOR AN AQUATIC INVASIVE SPECIES PROGRAM: 2015 TO 2020

Zebra Mussel

Yellow Flag Iris

Eurasian Water-Milfoil

American Bullfrog

Revised December 2017
Columbia Basin Aquatic Invasive Species Steering Committee

Columbia Basin **trust**

Cover photo credit: US Fish and Wildlife Service (Zebra mussels); Juliet Craig (Yellow flag iris); Jarek Tuszynski, Wikipedia (American bullfrog); A. Fox, U. of Florida, Bugwood (Eurasian water-milfoil)

Aquatic invasive species are non-indigenous species that impact, or have the potential to impact, the ecology, economy, and social opportunities of the Columbia Basin. In recognition of these concerns, the Columbia Basin Trust and the four regional invasive species organizations operating in this region (Central Kootenay Invasive Species Society, East Kootenay Invasive Species Council, Columbia Shuswap Invasive Species Society and Northwest Invasive Plant Council) are developing or expanding their current aquatic invasive species programs. The purpose of this document is to provide a framework for regional invasive species organizations and their partners to promote a proactive, strategic, collaborative, and coordinated approach to aquatic invasive species prevention and management. The primary focus of this program is to prevent the introduction and establishment of aquatic invasive species (such as zebra and quagga mussels) as well as to enhance coordination, response, and management of other priority aquatic invasive species. This program applies to the Canadian Columbia Basin in south-eastern British Columbia where waterbodies drain into the Columbia River prior to it flowing into the United States.

Since many species are introduced and spread in the same ways, addressing the pathways and vectors, rather than focusing on species, is an effective approach. This program framework sets out two key strategies for addressing this pathway: boat decontamination and public outreach. Prevention is aimed at outreach for human-assisted pathways of introduction and spread, including recreational water activities (e.g. boating, angling, diving), horticultural and water garden trade, pet and aquarium trade, intentional illegal fishing introductions, and marine works and water-based restoration activities. Prevention also includes increased efforts toward watercraft inspection and decontamination since one of the highest risk pathways of introduction, particularly for zebra and quagga mussels, is by contaminated watercraft.

Focal aquatic invasive species have been identified for this program based on pathways of introduction, probability of establishment, current distribution, and potential impacts. The management approach for each group of species has been outlined depending on the role of the provincial government (i.e. some species are provincial Early Detection Rapid Response species), the scope and expertise of regional invasive species organizations (e.g. currently invasive species organizations do not have invasive fish expertise), and the feasibility of management actions given available tools.

The program framework is designed to reflect shared goals and priorities and to facilitate a coordinated approach and may be undertaken by regional invasive species organizations and partner organizations. The timeline, organization(s) responsible, and details for each task will be identified in regional invasive species organization's annual work plans. Local and regional stewardship groups and other partners are encouraged to work with their regional invasive species organizations to identify projects and actions that work towards the goals of these program areas. The five areas of focus for this Aquatic Invasive Species Program are Coordination and Collaboration, Education and Outreach, Watercraft Inspection and Decontamination, Monitoring and Research, and Response and Management. For each of these program areas, Goals and Action items are identified.

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PURPOSE

Aquatic invasive species (AIS)[1] are non-indigenous species that impact, or have the potential to impact, the ecology, economy, and social opportunities of the Columbia Basin. In recognition of these concerns, the Columbia Basin Trust and the four regional invasive species organizations operating in this region (Central Kootenay Invasive Species Society, East Kootenay Invasive Species Council, Columbia Shuswap Invasive Species Society and Northwest Invasive Plant Council) have developed or expanded their current AIS programs. The purpose of this document is to provide a framework for regional invasive species organizations (RISOs) and their partners to promote a proactive, strategic, collaborative, and coordinated approach to AIS prevention and management. This Framework facilitates an AIS program that is consistent and complimentary to the efforts of the Province of BC and neighbouring jurisdictions and focuses resources where they are most effective within a 5-year time frame. The primary focus of this program is to prevent the introduction and establishment of AIS (such as zebra and quagga mussels) as well as to enhance coordination, response, and management of other priority AIS.

AQUATIC INVASIVE SPECIES PROGRAM AREA

This program applies to the Canadian Columbia Basin where waterbodies drain into the Columbia River north of the border with the United States (hereafter referred to as the "Basin"), which includes the operating areas encompassed by the Central Kootenay Invasive Species Society, East Kootenay Invasive Species Council, eastern portion of the Columbia Shuswap Invasive Species Society and southeastern tip of the Northwest Invasive Plant Council (Figure 1). Although activities focus primarily on south-eastern BC, they are designed to be consistent with broader initiatives of the Province of BC and the Invasive Species Council of BC. Many priority action items were identified as provincial in scope and, where relevant, the Basin would provide a supportive role for piloting or otherwise enhancing these activities.

IMPLEMENTATION PRINCIPLES

- ✓ Strive for coordinated activities and avoid duplicating efforts
- ✓ Recognize scope and roles of regional invasive species organizations and their partners
- ✓ Celebrate success, particularly when goals of strategy are met

WHO IS THIS PROGRAM FRAMEWORK FOR?

This Program Framework was designed primarily to increase collaboration between RISOs and their partners in the Basin, such as local stewardship groups and provincial agencies, for delivering their AIS programs. RISOs are non-profit societies that have no legal land or water management jurisdiction. One of the primary roles of these organizations is outreach and awareness, a critical component of AIS prevention. RISOs also participate in monitoring, treatments, and research activities by working in partnership with other organizations. This Program Framework may also be utilized by

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[1] For a list of acronyms, Appendix B

the partners of RISOs to identify shared priorities that promote a consistent and coordinated approach to AIS management in the Basin.
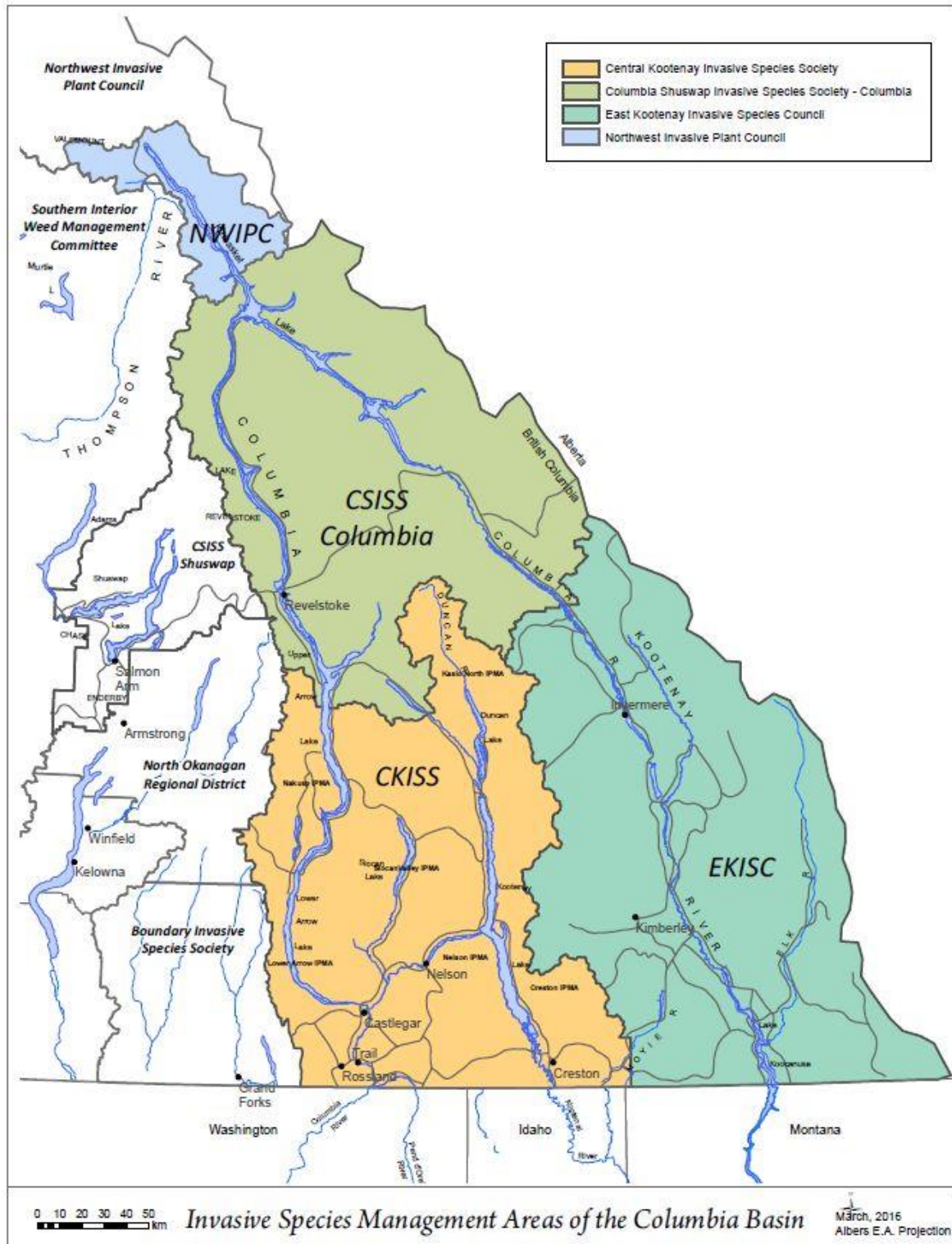
Figure 1: Administrative boundaries of Canadian Columbia Basin Aquatic Invasive Species program including regional invasive species organization boundaries.

The scope and roles of the regional program in the Basin are designed to recognize the broader initiatives in the Province of BC[2] and neighbouring jurisdictions. One of the highest priorities of this program is to ensure that it compliments Provincial activities, remains within the scope of RISOs' roles, and does not duplicate efforts. To illustrate the context within which this AIS program is nested, the following diagram describes some of the roles of organizations carrying out AIS activities in BC and bordering regions (Figure 2).

International and borders
- Washington, Idaho, Montana, Alberta and Pacific NorthWest Economic Region
- Watercraft inspection and decontamination and communication with BC
- Legislation, regulations, best practices and provincial protocols and standards; new detection methods

BC Gov't (MFLNRORD, MOE, etc.)
- Coordinates within BC, and collaborates with other jurisdictions
- Watercraft inspection and decontamination (under Wildlife Act); Host RAPP line and coordinate response
- Legislation, regulations, best practices and provincial protocols and standards; new detection methods
- Coordination and outreach at border-crossings
- Host and coordinate a province-wide repository of information (e.g. IAPP)
- Lead EDRR monitoring and response for ZQM and other provincial prohibited species

Province-wide (ISCBC)
- Coordinates with inter-province initiatives, neighbouring jurisdictions and RISOs; BC AIS Framework
- Develops province-wide messaging, signage and programs including Clean, Drain, Dry and PlantWise
- Develops best practices and targeted resources; promotes provincial protocols and standards
- Outreach to key organizations such as suppliers, boat haulers, NGO's, industry representatives
- Maintains a database of research information
- Conducts research to assess behaviour change related to province-wide programs (e.g. CDD, PlantWise)

Regional AIS Program and Committees
- Coordinate with cross-border programs, ISCBC, regional partners, provincial agencies
- Promote behaviour-change messages to target audiences within region
- Promote provincial RAPP line, provincial protocols and standards
- Outreach to regional groups and local target audiences
- Assist with surveillance for new AIS introductions
- EDRR and on-the-ground management of regional priority species

Other Regional Partners
- Coordinate with this program framework and RISOs
- Promote behaviour change by providing outreach, installing signs, using of boat wash station, etc.
- Promote provincial RAPP line, provincial protocols and standards
- Outreach to membership and associated audiences
- Participate in surveillance for new AIS introductions
- Conduct on-the-ground management of some AIS species

Figure 2: Overview of how regional AIS program aligns with province-wide initiatives. The majority of this AIS program will be delivered by the regional invasive species organizations and their regional partners.

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[2] See the BC Provincial Government Invasive Species Strategic Plan: https://www.for.gov.bc.ca/hra/invasive-species/Publications/Prov_IS_Strategy.pdf

PRIORITY AQUATIC INVASIVE SPECIES

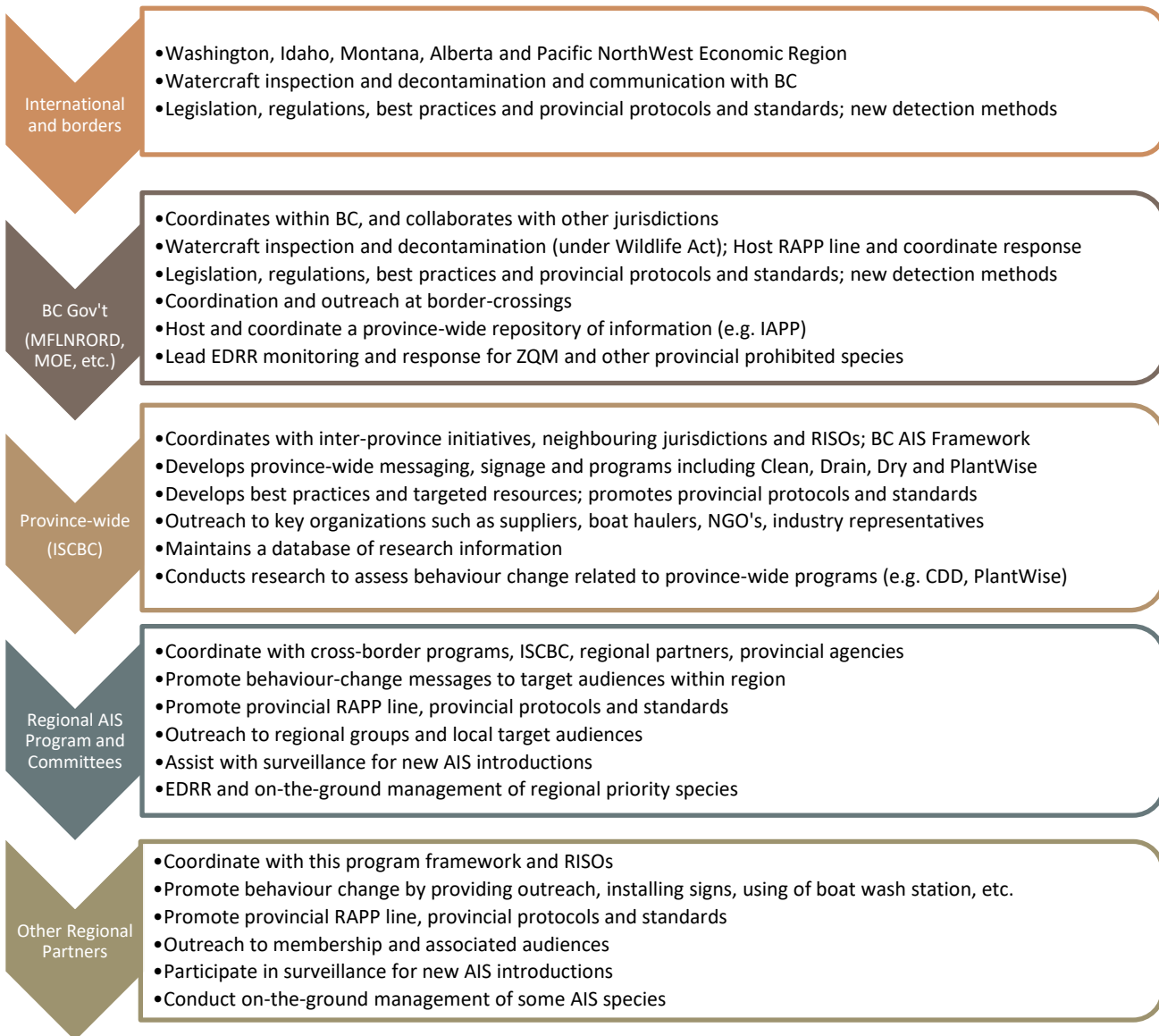Focal AIS have been identified for this program based on pathways of introduction, probability of establishment, current distribution, and potential impacts (Table 1). Since the pathways of introduction and vectors of spread for many AIS are similar, focusing on the prevention of one or two species in each pathway or species group will ideally prevent the spread of many other AIS. The management approach for each group of species has been outlined depending on the role of the provincial government (i.e. some species are provincial EDRR species), the scope and expertise of RISOs (e.g. currently RISOs do not have invasive fish expertise), and the feasibility of management actions given available tools. A comprehensive list of all AIS of concern is available as a spreadsheet.

Yellow Flag Iris
Photo credit: Juliet Craig

Riparian plants include species such as yellow flag iris, purple loosestrife, giant hogweed and invasive knotweeds that grow at the edge of aquatic environments. These species are generally introduced as horticultural species and can "jump the garden fence" to invade and impact riparian areas. The management action for each riparian plant species has already been defined in each RISOs' current operational plan.
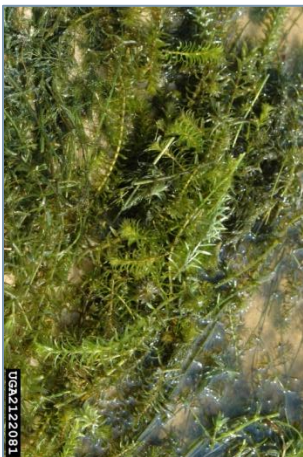
Hydrilla
Photo credit: Chris Evans, Bugwood

Aquatic plants include species that are partly or wholly submerged such as Eurasian water-milfoil, curly leaf pondweed and fragrant water lily. Given the limited effectiveness of mechanical control of these species and the current lack of herbicide tools to treat them in BC, prevention is generally the focus. Some aquatic plant species are included on the BC Government's Prohibited Species List[3] and are considered by the Province to require "EDRR" tactics. For these species, the Province takes the lead role in management action if the species is detected. RISOs will report these species immediately to the provincial government if they are detected during surveillance activities, assist with management (where required), and focus on education and outreach to prevent introduction and spread. RISOs and/or local governments will take the lead for management of aquatic plant species that are not on the BC Prohibited Species list, including outreach, inventory, and potentially treatment activities.

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[3] https://www.for.gov.bc.ca/HRA/invasive-species/Proposed_Prohibited_Noxious_Weeds_Apr2016.pdf

Zebra Mussels
Photo credit: US Fish and Wildlife Service

Aquatic invertebrates, including ZQM, are regulated under the *BC Wildlife Act* Controlled Alien Species Regulation (Appendix C) which gives authority to Conservation Officers and other provincial officers to inspect and issue a decontamination order for watercraft and equipment with signs of mussel contamination. The BC Government is taking the lead in provincial early detection by operating mandatory watercraft inspection stations throughout the Columbia Basin and elsewhere in the province, and in mussel response. In addition, they are promoting their "RAPP" line for mussel reporting and taking the lead in provincial highway signage. RISOs will provide "CDD" outreach for mussel prevention, promote boat wash activities and watercraft decontamination, and participate in veliger (mussel larvae) sampling. Since other aquatic invertebrates, such as New Zealand Mudsnail, will also be addressed under these activities, no other specific invertebrate management actions have been defined.

Northern Pike
Photo credit: Jeremy Baxter

Fish, including invasive species, are currently managed by the provincial government as well as other groups including the Fish and Wildlife Compensation Program (FWCP), BC Hydro, and the Upper Columbia White Sturgeon Recovery Initiative. Historically, RISOs have not participated in fish management and do not currently hold this expertise. RISOs will focus on education and awareness for fish, particularly for the pathways of intentional illegal release and the aquarium trade.

American Bullfrog
Photo credit: Jarek Tuszynski, Wikipedia

Other aquatic invasive vertebrates (not including fish) include the American bullfrog, which is known to occur in the Central Kootenay region's Pend D'Oreille and Creston Valleys, and could pose significant risks to at-risk northern leopard frog populations. The provincial government is coordinating the management of these species in BC and RISOs will focus on outreach and education (e.g. "Don't Let It Loose") and participate in surveillance and management as required.

Table 1: Management approach for aquatic invasive species.

Species Group	Examples of priority species	Management Approach	Prioritization of sites	Inventory/ Surveillance	EDRR Reporting	Treatments	Outreach	Collaboration with local groups
Riparian plants	Yellow flag iris Purple loosestrife Policeman's helmet Giant hogweed Invasive knotweeds	As per regional organization IPMA management plans; Management approach and response led by each regional invasive species organization	✓	✓	✓	✓	✓	✓
Aquatic plants on Prohibited Species List (Provincial EDRR)	Brazilian elodea Water hyacinth Hydrilla	EDRR Response led by MFLRNORD Regional involvement when required		✓	✓		✓	✓
Aquatic plants NOT on Prohibited Species List	Curly leaf pondweed Eurasian water-milfoil Fragrant water lily Flowering rush	Management approach and response led by each regional invasive species organization or local government		✓	✓	✓ Partici-pation where required	✓	✓
Aquatic invertebrates	Zebra & quagga mussel New Zealand mudsnail Rusty crayfish	Management approach and response led by provincial government. Regional involvement when required		✓	✓		✓	✓
Fish	Northern pike Yellow perch Large mouth bass	Management approach and response led by provincial government. Regional involvement when required		✓	✓		✓	✓
Vertebrates (non-fish)	American bullfrog	Management approach and response led by provincial government. Regional involvement when required		✓	✓	✓	✓	✓

NATURAL PATHWAYS OF INTRODUCTION

Pathways are the geographic routes by which AIS are introduced to the Basin. Pathways may be natural (e.g. downstream flow of flowering rush, natural movement of bullfrogs), or may be human-related. The primary natural pathway of AIS introduction into the Basin is via waterways, particularly those that flow into the Basin. The Columbia River begins at Columbia Lake and flows north through the East Kootenay and Columbia Regions, south through the Central Kootenay and then flows through Washington and Oregon before draining into the Pacific Ocean (Figure 3). The Columbia River Basin includes rivers, streams and other water bodies that ultimately drain into the Columbia River, such as the Elk, Kootenay and Slocan river systems. For the context of this program, the "Basin" refers to the Columbia Basin Trust area, which includes only those waterbodies and drainage areas that flow into the Columbia River north of the US border.

Figure 3: Canadian Columbia Basin region for this Framework for AIS Program (marked in red line)[4].

Given this flow of water bodies, there are several natural pathways of introduction for downstream and upstream movement of AIS into the Basin (Table 2). These natural pathways are a high priority for surveillance and monitoring activities, particularly for AIS found across the border. For many species, research is required to determine if and how they can be prevented from natural introduction (e.g. flowering rush, American bullfrog).

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[4] Map by Kmusser - self-made, based on USGS and Digital Chart of the World data. Licensed under CC BY-SA 3.0 via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Columbiarivermap.png#mediaviewer/File:Columbiarivermap.png.

Table 2: Aquatic invasive species with potential natural introduction pathways into/out of the Program Area.

River System	AIS in waterway	Comments
Kootenai River From Idaho and flows into the BC Kootenay River at Creston	American bullfrog	Present, and migrating into Creston via this waterway
	Eurasian water-milfoil	Already established in BC Kootenay River
	Brook trout	Possibly most widely distributed non-native fish in the Basin
	Brown bullhead	May be present in Creston; often confused with black bullhead so range not known definitively
	Pumpkinseed, largemouth bass, yellow perch	
	Curly leaf pondweed	Already established in BC Kootenay River
Pend D'Oreille River From Washington and flows into BC at Nelway then flows into Columbia River south of Trail, BC	Curly leaf pondweed	Already present in BC PDO River
	Eurasian water-milfoil	Already present in BC PDO River
	Flowering rush	Has not been detected to date in BC PDO River
	Yellow flag iris	Small sites have been detected and treated in BC PDO River
	American bullfrog	Already present in the Pend D'Oreille IPMA, Regional District Central Kootenay
	Purple loosestrife	Has not been detected to date in BC PDO River
	Asian clam	Present in Lake Pend D'Oreille
	Chinese mystery snails	Present in Priest Lake Idaho. Enters PDO River downstream from Lake PDO
	Northern pike and walleye	Already present in BC PDO River
	Lake trout, brown trout, black crappie, yellow perch, smallmouth bass, pumpkinseed and bullhead	Lake Pend D'Oreille; most species present in BC PDO River
	Virile crayfish	Known presence throughout PDO system from Flathead Lake to Lake PDO. Also present in Lake Roosevelt, WA (Columbia River)
Columbia River Flows south from Trail, BC, into Washington	Northern pike and walleye	Northern pike already in Columbia River from Trail to south of Hugh Keenlyside Dam
	Common carp, smallmouth bass, yellow perch, lake whitefish, lake trout	Present in the Columbia River up to the Hugh Keenlyside Dam and Brilliant Dam
Koocanusa Flows south from Newgate, BC, into Montana	Yellow perch	
	Brook trout	
	Northern pike, small and largemouth bass	Many fishing blogs/threads mention the presence of pike, small and largemouth bass in Koocanusa. Have found no official confirmation.
Flathead River Flows south from Flathead, BC, into Montana	American bullfrog	Located near Kalispell, Montana upstream from Flathead Lake. Can migrate over land.
	Flowering rush	Has been spreading northwards, perhaps by wildlife
	Northern pike, small mouth bass, black bullhead, pumpkinseed, yellow perch	Present in Flathead Lake. These species would be unlikely to migrate up the Upper Flathead to Canada
	Brook trout, brown trout	Flathead Lake

HUMAN PATHWAYS FOR AIS INTRODUCTION AND SPREAD

Intentional human pathways of introduction include activities such as planting invasive horticultural species or releasing fish into lakes. Pathways may also be unintentional, such as aquatic "hitch-hikers" on watercraft. Once introduced into the Basin, various vectors spread AIS from source populations to new destinations (e.g. fishing gear, boats, intentional illegal fish stocking). Addressing both pathways of introduction and vectors of spread is a critical component of AIS prevention. Since many species are introduced and spread in the same ways, addressing the pathways and vectors, rather than focusing on species, is an effective approach. This program framework sets out two key strategies for addressing this pathway: boat decontamination and public outreach.

One of the highest risk pathways of introduction, particularly for zebra and quagga mussels, is by contaminated watercraft. Watercraft inspection stations in many US States, including Idaho and Montana, have identified and addressed mussel-fouled boats heading for BC waters. The microscopic veligers can stay alive in wet conditions (such as bilge water, wet gear, engine water) for up to 30 days allowing for easy and unintentional transport of these species. Decontamination of these watercraft and associated equipment is a critical component of preventing the introduction of invasive mussels to the Columbia Basin. Recent changes to the *Wildlife Act of BC* Controlled Alien Species Regulation provide authority to the provincial government to issue decontamination orders for watercraft suspected of containing live or dead mussels. The establishment of watercraft inspection and decontamination stations in the Basin is a critical component of AIS prevention. The Province of BC is the lead agency for establishing and operating watercraft inspection and decontamination stations across the province.

Outreach strategies in this AIS Program to prevent human-caused AIS introductions are based on the concept of community-based social marketing[5], whereby key messages are promoted to encourage specific behaviours. The Invasive Species Council of BC has developed key messages for specific AIS-related behaviours including "Clean, Drain, Dry" your boat (and other water-based equipment) to remove aquatic hitch-hikers, "Don't Let it Loose" to discourage the release of pets and aquarium contents, and "PlantWise" to encourage the use of non-invasive species for water gardens and other horticultural purposes. To be consistent with this province-wide approach, the education and outreach component of this program will focus on changing behaviour of target audiences for specific priority pathways of introduction and spread (Table 3).

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[5] http://www.cbsm.com/public/world.lasso

Table 3: Priority pathways and target action items for education and outreach of aquatic invasive species in the Basin.

Pathway of Introduction	Strategy	Target Audience	Key message	Feature species[6]
Recreation (boating, fishing, diving)	Disseminate AIS messaging and encourage CDD behaviour	Boaters, anglers, and divers	**Protect our waters, Clean, Drain, Dry**	Zebra and quagga mussels; NZ mudsnail
- Update and maintain overall contact list (fishing /rod gun clubs, marine industry, boat and diving shops, stewardship groups, houseboat associations, water recreation clubs and centres) - Conduct brochure runs and put up posters for "Clean, Drain, Dry" - Send outreach about CDD to contact list and offer presentations and demonstrations on CDD - Prioritize boat ramps for outreach; utilize Priority Matrix for boat ramp locations - Prioritize boat events for info booths - Determine potential signage location (based on priority matrix and input from contacts)				
Horticulture and water garden trade	Promote PlantWise program	Horticultural centres, garden clubs, and stores	**Be PlantWise**	Yellow flag iris and invasive knotweeds; fragrant water lily; flowering rush
- Update and maintain overall contact list (garden clubs, plant nurseries, horticultural centres) - Conduct brochure runs and put up posters for "PlantWise" - Visit garden centres to offer training/workshops/resources on species to avoid selling, and proper disposal techniques, and to review inventory - Provide presentations to garden groups - Provide display booth or presentations at garden tours/shows - Provide information for Landscape Certification Courses with Codes of Conduct and/or principles - Advertise "PlantWise" garden centres and businesses on regional invasive species organization websites				
Aquarium, school and pet trade	Encourage the proper disposal of pets and lab specimens	Aquarium and pet stores, school biology depts., animal welfare societies, vets	**Don't Let it Loose**	Brazilian elodea; rusty crayfish; American bullfrog
- Update and maintain overall contact list (aquarium and pet centres, SPCA, animal welfare groups) - Conduct brochure runs and put up posters for "Don't Let It Loose" - Visit aquarium and pet centres to review inventory of species being sold and update on AIS Regulations - Determine which centres/stores provide disposal options (e.g. can they take pets back?) If so, advertise on website "Buy It Back" Program - Contact vets for humane disposal options - Offer school programs through Wild Voices for kids (wait for ISCBC to develop curriculum) - Visit/contact school Biology/Admin about school aquariums and proper disposal - Provide programs to youth (e.g. Girl Guide, Scouts, Junior Naturalists, Fishing Clubs, Summer camps, Home-school groups) - Contact Animal Welfare Societies - Provide citizen-science opportunities for monitoring bullfrogs				

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[6] Although the primary target species is the priority for outreach and management, the strategies address many other AIS.

Pathway of Introduction	Strategy	Target Audience	Key message	Feature species
Intentional unauthorized introductions	Educate anglers about impacts and consequences of illegal fish introductions	Anglers	**Don't Let it Loose**… invaders make bad neighbours	Northern pike
☐ Promote message "Don't Let It Loose" and illegality of moving fish in existing CDD presentations ☐ Consider signage at sites where high priority fish AIS occur (e.g. Castlegar to Trail for northern pike) ☐ Explore and identify further outreach options				
Agency and restoration activities	Promote decontamination and other prevention procedures into contracts, standard operating procedures, official community plans, and policies	Agencies that do water monitoring, fire suppression, AIS harvesting, etc.	**Protect our waters, Clean, Drain, Dry**	Eurasian water-milfoil; Zebra and quagga mussels
☐ Provide information/ presentations/ training to fisheries biologists, restoration ecologists, monitoring biologists, stream keepers on CDD (e.g. NCC, FWCP, stream keepers, stewardship groups) ☐ Provide information to organizations who develop contracts for water-based work so they can include best management practices within contract requirements ☐ Set up AIS Workshop that includes information and demonstrations on equipment disinfection, boat decontamination, AIS identification (e.g. CSISS AGM 2015 to model this)				
Industrial Marine Works[7]	Promote the adoption of policies and procedures for equipment cleaning and decontamination[8]	Industrial marine companies	**Protect our waters, Clean, Drain, Dry**	Eurasian water-milfoil; Zebra and quagga mussels
☐ Explore opportunities to contact or provide outreach to industrial marine works for CDD outreach ☐ Explore and identify further outreach options (e.g. MoE permits? BMPs?)				

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[7] E.g. equipment used to build and repair bridges, dredge navigation channels, install docks and breakwaters, underwater work diving equipment, boat hoists and lifts, AIS harvesting equipment, etc.
[8] http://gallery.mailchimp.com/e33c86939a981667760e6a3a2/files/MoE_CAS_training_V1.pdf

FRAMEWORK FOR REGIONAL AIS PROGRAM

The following program framework is designed to reflect shared goals and priorities and to facilitate a coordinated approach and may be undertaken by RISOs and partner organizations. The timeline, organization(s) responsible, and details for each task will be identified in RISOs annual work plans. Local and regional stewardship groups and other partners are encouraged to work with their RISOs to identify projects and actions that work towards the goals of these program areas. The five areas of focus for the AIS Program are Coordination and Collaboration, Education and Outreach, Watercraft Inspection and Decontamination, Monitoring and Research, and Response and Management (Figure 4).
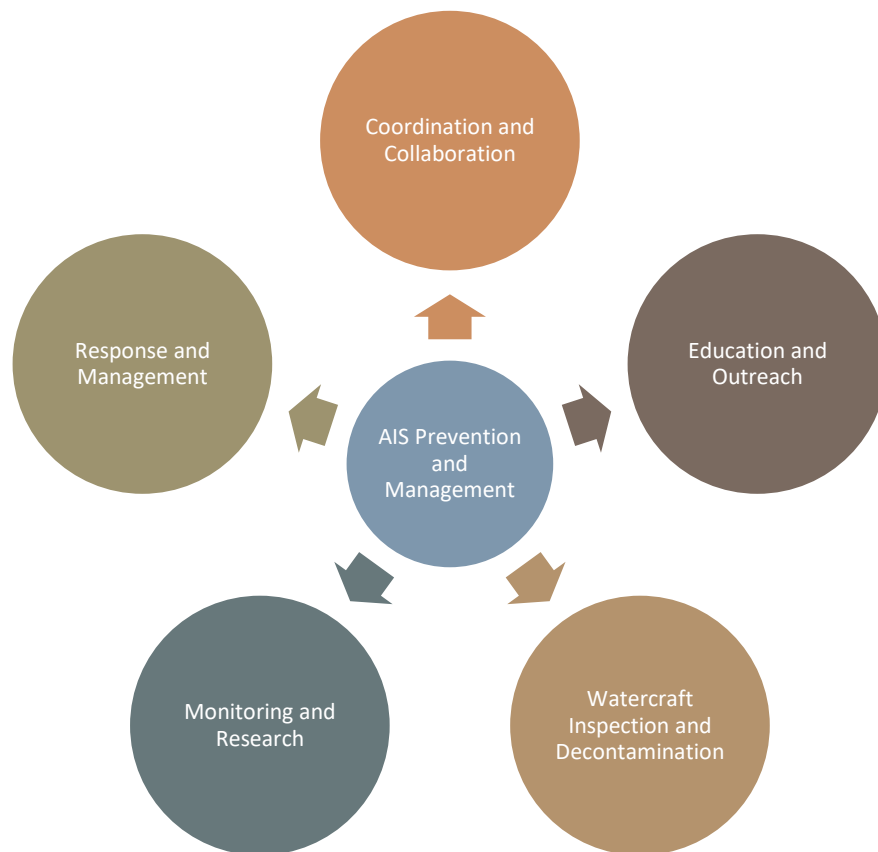

Figure 4: Diagram of five program areas for the Aquatic Invasive Species Program for the Columbia Basin.

COORDINATION AND COLLABORATION

GOAL 1.1: ESTABLISH A COORDINATED AIS PROGRAM IN THE BASIN, BUILDING ON EXISTING EFFORTS AND INTRODUCING NEW ONES

- ☐ Maintain a basin-wide AIS Steering Committee (that includes a representative from each regional invasive species organization) to oversee implementation of this Program
- ☐ Promote regional invasive species organizations as the "go to" organizations for AIS in the Basin.
  - o Regional invasive species organizations can play an important role as a coordinating body for AIS activities in the Basin
- ☐ Maintain an AIS Coordinator for each regional invasive species organization (in addition to the CB AIS Lead Coordinator) to maintain communication for on-the-ground coordination of efforts
- ☐ Maintain communication, and participate as required, with species-specific working groups established for priority AIS and identify opportunities to participate
  - o E.g. American bullfrogs, northern pike, flowering rush
- ☐ Maintain regular and two-way information flow with cross-border and provincial initiatives through the AIS Steering Committee
  - o E.g. MFLNRORD, ISCBC, and US Columbia Basin ZQM group (100th Meridian Initiative)
- ☐ Maintain a list of all local organizations involved in AIS including their roles and responsibilities, their activities, and waterbodies in which they are active
  - o See MS Excel Workbook titled: *AIS Partners in Columbia Basin.xls*
- ☐ Maintain a webpage for the CB AIS Basin-wide program that includes:
  - o List of project partners' activities and relevant links
  - o Alerts on new/approaching species
  - o Where to report AIS in the Basin
  - o Links to databases for locations and surveying/monitoring sites of priority AIS
- ☐ Produce annual communication that highlights achievements of the AIS Program
- ☐ Revisit this AIS Program Framework annually (fall SC meeting) to check-in with previous year's activities and adapt and modify this document as required

GOAL 1.2 FACILITATE COORDINATED PRIORITIES AND ACTIVITIES FOR MAXIMUM EFFICIENCY AND EFFECTIVENESS

- ☐ Maintain a list of priority species with their associated known locations and pathways of introduction
  - o See MS Excel Workbook titled: *CB AIS List.xls*
- ☐ Develop collaborative actions between agencies and organizations, including cross-border initiatives
  - o Ensure that cross-border initiatives are carried out in collaboration with the Provincial Government
- ☐ Maintain communication with provincial and province-wide programs to align with provincial priorities
  - o Through CB AIS Steering Committee

GOAL 1.3: IDENTIFY MODELS AND OPTIONS FOR LONG-TERM STABLE FUNDING

- ☐ Bring four regional invasive species organizations together to identify collaborative funding opportunities
- ☐ Identify, seek and acquire a range of funding models, partners, and opportunities

GOAL 1.4: EVALUATE AND CELEBRATE SUCCESS

☐ Monitor success of AIS Program and associated activities through a twice annual review of committee and partner achievements
  - o Check-in by AIS Steering Committee and AIS Coordinators of which action items have been completed or addressed and to determine funding opportunities in the fall, and to discuss upcoming seasons workplans in the spring
☐ Develop a "report card" of AIS in the Basin every three to five years: new AIS introductions, extent of infestations, and success of eradication efforts
  - o Report out this information on the CB AIS Basin-wide program webpage
☐ Develop and utilize a method of evaluating the outreach program by creating a baseline survey to measure change in knowledge and/or behaviour
  - o E.g. Tracking form for recording how many and which invasive species are being sold in garden and aquarium centres
  - o E.g. Tracking form for discussions at display booth and outreach events to find out if people have heard of Clean, Drain, Dry (or PlantWise or Don't Let It Loose), where they heard about it, and if they follow it
  - o E.g. Boat Ramp Outreach Survey
☐ Host a regional AIS forum every 3 to 5 years to share expertise, review program and celebrate success

EDUCATION AND OUTREACH

GOAL 2.1: IMPLEMENT SUCCESSFUL BEHAVIOURAL CHANGE PROGRAMS WITH CONSISTENT AND PROVEN MESSAGES THAT TARGET KEY PATHWAYS

☐ Utilize community-based social marketing and social networking tools (Facebook, website) and other appropriate approach (e.g. Clean, Drain, Dry; PlantWise; Don't Let it Loose)
  - o Work with ISCBC on changing behaviour to stay engaged with new and emerging opportunities provincially and within the Basin
  - o Develop and distribute targeted resources for horticultural Industry, horticultural consumers, boaters, anglers (Table 3). E.g. certification manuals, code of conduct, education materials/handouts, staff training, E-communications, mobile apps, magazine articles, press releases, signs, decals, brochures
☐ Utilize most effective key messages, locations, methods, and audiences for priority pathways (Table 3)
☐ Ensure regional outreach is consistent with the ISCBC BC Education and Outreach Framework for Invasive Species (in development)
☐ Maintain a list of all relevant audiences to target for presentations, brochures, posters
  - o E.g. horticultural centres, marinas, boat repair shops, angling clubs, etc. (Table 3)
  - o See MS Excel Workbook titled: *AIS Partners in Columbia Basin.xls*
☐ Provide outreach at relevant community events and with relevant audiences
  - o E.g. garden clubs, fly fishing symposium, wakeboarding competition, fishing derbies, garden tours
☐ Write regular articles and press releases to distribute to media and local group's newsletters
☐ Install signage by identifying existing and potential locations of signs, kiosks, and billboards (except at provincial and federal border crossings)
  - o Fill in gaps at high priority locations
  - o Maintain a spreadsheet of sign locations and the key message at each location

- ☐ Coordinate the development of a CB AIS brochure that is consistent between regions
- ☐ Provide programs to youth (e.g. Girl Guide, Scouts, Junior Naturalists, Summer camps, Home-school groups)
- ☐ Provide training workshops to relevant audiences (Table 3)

GOAL 2.2 REDUCE THE POTENTIAL FOR AIS-FOULED BOATS AND EQUIPMENT TO ENTER LOCAL WATER BODIES THROUGH EDUCATION

- ☐ Partner with the province-wide Clean, Drain, Dry program
- ☐ Coordinate with the ISCBC to share resources and messaging
- ☐ Target marinas, boat ramps, boat shops, marine mechanics, divers, anglers, etc. for face to face outreach
- ☐ Maintain a handout of boat and car wash stations available that do not drain into natural water bodies and advertise these to boaters
  - o Promote CDD signs at these venues
- ☐ Conduct outreach and coordinate to have WID stations at high priority events
  - o E.g. fly fishing symposium, kayak festivals, wakeboarding competitions, BC River's Day, fishing derbies
- ☐ Promote training on disinfection protocols to relevant audiences

GOAL 2.3 ENGAGE STEWARDSHIP GROUPS, COMMUNITY ORGANIZATIONS, EDUCATIONAL INSTITUTIONS, AND INDUSTRY FOR AIS OUTREACH

- ☐ Coordinate with and provide training (when required) to stewardship groups and others who do aquatic outreach to facilitate incorporating AIS messaging into programs
  - o See MS Excel Workbook titled: *AIS Partners in Columbia Basin.xls* for a list of stewardship groups
  - o Ensure that stewardship groups are recognized and compensated for their time
  - o Coordinate with the Basin-wide stewardship groups such as the Columbia Basin Watershed Network
- ☐ Continue to promote and incorporate AIS training into regional water/wetland training programs
  - o Currently Wetland Keepers incorporates AIS fact sheets into the resources of their workshops and will incorporate AIS training as part of the program if it is a local interest
  - o Coordinate with ISCBC (who works with province-wide stewardship groups such as BC Wildlife Federation)
- ☐ Promote AIS education in elementary and secondary schools and post-secondary institutions by providing guest speaker programs or "train the educator" opportunities
- ☐ Work with hydro electric utilities to conduct mail-outs, sponsor signs, and develop a mussel-impact on hydro-power awareness campaign
  - o E.g. FortisBC, BC Hydro, Nelson Hydro

GOAL 2.4 ENGAGE LOCAL GOVERNMENTS AND INDUSTRY IN AIS ISSUES

- ☐ Develop a template briefing note and associated talking points for meeting with officials
- ☐ Provide City Council delegations presentations on the importance of ZQM and other AIS prevention
- ☐ Write letters, conduct follow-up phone calls, and provide presentations to elected officials about the importance of AIS prevention and programs
  - o Prioritize municipalities situated on or nearby lakes

WATERCRAFT INSPECTION AND DECONTAMINATION

GOAL 3.1: REDUCE THE POTENTIAL FOR AIS-FOULED BOATS TO ENTER LOCAL WATER BODIES THROUGH WATERCRAFT INSPECTION AND DECONTAMINATION

- ☐ Identify opportunities to collaboratively support watercraft inspection and decontamination stations in the region
- ☐ Coordinate to have WID stations demonstrated at high priority events
  - o E.g. fly fishing symposium, kayak festivals, wakeboarding competitions, BC River's Day, fishing derbies

GOAL 3.2 INCREASE DETECTION OF MUSSEL-INFESTED WATERCRAFT

- ☐ Promote the RAPP line for mussel-reporting

MONITORING AND RESEARCH

GOAL 4.1: DEVELOP A COORDINATED, SPATIALLY COMPREHENSIVE MONITORING PLAN TO MONITOR AREAS AT HIGH RISK OF AIS INTRODUCTIONS

- ☐ Identify high priority sites for monitoring by developing Basin-wide criteria for prioritizing waterbodies
  - o Utilize criteria that are easily defined by RISOs (Appendix D)
- ☐ Coordinate monitoring activities with provincial government and regional organizations
- ☐ Conduct inventories for AIS, including aquatic and riparian plants and ZQM veligers, at high priority water ways
  - o Develop maps of monitoring sites by species up to 2015
- ☐ Contribute monitoring location data to the Columbia River Basin Aquatic Invasive Species Database[9]
- ☐ Identify natural colonization pathways of high priority AIS across the borders
  - o See MS Excel Workbook titled: *CB AIS List.xls*
  - o Develop maps of species closest known locations up to 2015
- ☐ Work with Provincial Government to identify experts in identification of species as required

GOAL 4.2: PROMOTE AND UTILISE STANDARDIZED MONITORING, DATA SHARING, AND REPORTING

- ☐ Promote and utilize a centralized database for AIS including IAPP until IASP[10] is available. The fields required for IASP will be[11]:
  - o UTMs (coordinates), species name, survey date, surveyor, jurisdiction
  - o Density and distribution of infestation
  - o Area of infestation (if possible) or presence/absence
- ☐ Promote and distribute BC AIS Monitoring protocols[12]
- ☐ Develop expertise within RISOs to identify provincial Prohibited and Controlled Alien Species as well as regional priority species

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[9] http://www.westernais.org/

[10] MFLNRORD is developing the Invasive Alien Species Program Application that will be centralized database for BC

[11] Becky Brown, Invasive Plant Specialist – EDRR Coordinator, MFLRNORD, personal communication

[12] BC Ministry of Environment has developed standardized AIS monitoring protocols

- ☐ Report Provincial EDRR species to the Provincial Government
- ☐ Where applicable, pilot novel monitoring options

GOAL 4.3: INCREASE OPPORTUNITIES TO PARTICIPATE IN AIS MONITORING

- ☐ Promote a citizen science AIS reporting program and link high priority sites with nearby stewardship groups
  - o See MS Excel Workbook titled: *AIS Partners in Columbia Basin.xls*
- ☐ Provide training workshops to relevant regional groups on AIS identification, monitoring standards, and disinfection protocols

GOAL 4.4 PROMOTE AND FACILITATE AIS RESEARCH

- ☐ Identify, support, and partner with research projects including potential impacts, mitigation techniques, and management strategies
- ☐ Enable communication of research activities through regional forums, basin webpage or other means

RESPONSE AND MANAGEMENT

GOAL 5.1: FOLLOW THE PROVINCIAL RESPONSE PLAN FOR ZEBRA AND QUAGGA MUSSELS

- ☐ Participate on the Provincial ZQM Rapid Response Team[13] as required
- ☐ Report any new potential Dreissenid mussel incursion events to the Provincial ZQM EDRR Coordinator
- ☐ Report suspected contaminated watercraft to the provincial RAPP line
- ☐ Collaborate with the Province where there are opportunities for EDRR and assist in any way possible

GOAL 5.2: COORDINATE WITH RELEVANT PARTNERS TO PARTICIPATE IN RESPONSE STRATEGY FOR HIGH PRIORITY AIS AS REQUIRED

- ☐ Participate on the Provincial EDRR Response Team[14] as required
- ☐ Promote RISOs as the organization to report sightings of regional priority species
- ☐ Develop a response plan for species that are not of provincial EDRR priority but are regional priority species
- ☐ Support the development of response tools that can be utilized if a high priority species is detected
- ☐ Disseminate annual update of Provincial EDRR activities and fact sheets to membership and networks

GOAL 5.3: CONTAIN AND MANAGE EXISTING AIS INFESTATIONS TO REDUCE IMPACTS AND SPREAD

- ☐ Identify potential spread patterns for existing AIS infestations to determine where to monitor or contain
- ☐ Prioritize AIS sites for management action
  - o Consider funding opportunities, jurisdiction, potential impacts, species at risk, and probability of success
- ☐ Install signage at AIS infested sites to promote CDD, Don't Let it Loose, or PlantWise to reduce spread
- ☐ Develop "alerts" and other tools for new invaders to prevent spread of existing infestations

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[13] https://www.for.gov.bc.ca/hra/invasive-species/Publications/Prov_ZQM_EDRR_Plan.pdf
[14] https://www.for.gov.bc.ca/hra/invasive-species/Publications/Prov_EDRR_IS_Plan.pdf

REGIONAL INVASIVE SPECIES ORGANIZATIONS
General information and resources; specific operational plans for riparian plant species; AIS workplans and projects
- Central Kootenay Invasive Species Society: www.ckiss.ca
- East Kootenay Invasive Species Council: www.ekisc.com
- Columbia Shuswap Invasive Species Society: www.columbiashuswapinvasives.org
- Northwest Invasive Plant Council: www.nwipc.org

INVASIVE SPECIES COUNCIL OF BC
- Province wide resources for AIS: www.bcinvasives.ca

INVASIVE SPECIES STRATEGY FOR BC (NON-GOVERNMENT)
- http://bcinvasives.ca/about/invasive-species-strategy-for-bc

PROVINCIAL INVASIVE SPECIES STRATEGIC PLAN
- https://www.for.gov.bc.ca/hra/invasive-species/Publications/Prov_IS_Strategy.pdf

PROVINCIAL GOVERNMENT EARLY DETECTION AND RAPID RESPONSE PLANS
- Invasive Species: https://www.for.gov.bc.ca/hra/invasive-species/Publications/Prov_EDRR_IS_Plan.pdf
- Zebra and Quagga Mussels: https://www.for.gov.bc.ca/hra/invasive-species/Publications/Prov_ZQM_EDRR_Plan.pdf

BC'S NEW CONTROLLED ALIEN SPECIES REGULATION
- Includes flow chart for watercraft decision-making: http://gallery.mailchimp.com/e33c86939a981667760e6a3a2/files/MoE_CAS_training_V1.pdf
- Full list of Controlled Alien Species: http://www.env.gov.bc.ca/fw/wildlifeactreview/cas/

BC PROPOSED PROHIBITED NOXIOUS WEEDS
- https://www.for.gov.bc.ca/HRA/invasive-species/Proposed_Prohibited_Noxious_Weeds_Apr2016.pdf

REPORT-A-WEED ONLINE APPLICATION
- https://www.for.gov.bc.ca/hra/Plants/raw.htm

BC AQUATIC INVASIVE SPECIES SURVEY METHODS
- Prepared by Inter-Ministry Invasive Species Working Group: https://www.for.gov.bc.ca/hra/invasive-species/Publications/BC_Aquatic_Sampling_March2015.pdf

INVASIVE ALIEN PLANT PROGRAM
- Database for invasive plant records. The Map Display is publicly accessible: http://www.for.gov.bc.ca/hra/Plants/application.htm

DATA BC
- Database for invasive species records: http://maps.gov.bc.ca/ess/sv/imapbc/

COLUMBIA RIVER BASIN AQUATIC INVASIVE SPECIES DATABASE (US AND CANADA)
- http://www.westernais.org/

100TH MERIDIAN INITIATIVE (ZEBRA AND QUAGGA MUSSEL)
- http://100thmeridian.org

INVASIVE MUSSEL VIDEO FOR BC (5 MINUTES - GREAT FOR PRESENTATIONS)
- http://vimeo.com/125057151

Guidance for the original version of this document, and the process through which it was developed, was provided by the Columbia Basin Aquatic Invasive Species Steering Committee:

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- Joe Caravetta, Ministry of Environment
- Tara Clapp, Columbia Basin Watershed Network
- Alvin Cober, Northwest Invasive Plant Council
- Adam Croxall, BC Hydro
- Rachel Darvill, Columbia Basin Watershed Network
- Dave DeRosa Rosa, Teck Ltd.
- Jason Hawkes, Ministry of Environment
- Matthias Herborg, Ministry of Environment
- Tim Hicks, Columbia Basin Trust
- Hamish Kassa, Columbia Shuswap Regional District
- Crystal Klym, Fish and Wildlife Compensation Program – Columbia Basin
- Todd Larsen, East Kootenay Invasive Plant Council
- Allana Oestreich, Ministry of Forests, Lands and Natural Resource Operations
- Trevor Oussoren, Fish and Wildlife Compensation Program – Columbia Basin
- Jodi Romyn, Invasive Species Council of BC
- Sheila Street, FortisBC
- Natalie Stafl, Columbia Shuswap Invasive Species Society
- Mike Trepanier, Northwest Invasive Plant Council
- Rena Vandenbos, Selkirk College
- Jennifer Vogel, Central Kootenay Invasive Plant Committee
- Will Warnock, Canadian Columbia River Inter-Tribal Fisheries Commission
- Kate Wilson, Alberta Environment & Sustainable Resource Development

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APPENDIX B: LIST OF ACRONYMS

AIS	Aquatic Invasive Species
BMP	Best Management Practices
CBSM	Community-Based Social Marketing
CDD	Clean, Drain, Dry
CKISS	Central Kootenay Invasive Species Society
CSISS	Columbia Shuswap Invasive Species Society
EDRR	Early Detection, Rapid Response
EKISC	East Kootenay Invasive Species Council
FWCP	Fish and Wildlife Compensation Program – Columbia Basin
IAPP	Invasive Alien Plant Program application (Provincial government database for invasive plants)
IASP	Invasive Alien Species Program application (IAPP being developed to incorporate invasive species)
IPMA	Invasive Plant Management Area
ISCBC	Invasive Species Council of BC
MFLNRORD	BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development
MOE	BC Ministry of Environment
NCC	Nature Conservancy of Canada
NWIPC	Northwest Invasive Plant Council
PDO	Pend D'Oreille (River)
RAPP	Report All Poachers and Polluters (provincial government phone line)
RISO	Regional Invasive Species Organization
WID	Watercraft Inspection and Decontamination
ZQM	Zebra and quagga (dreissenid) mussels

Invasive Species	Weed Control Act	Community Charters Act Spheres of Concurrent Jurisdiction	Forest and Range Practices Act, Invasive Plants Reg.	Weed Control Act (Controlled Alien Species Reg.)
Yellow flag iris	✓	✓	✓	
Purple loosestrife	✓	✓		
Himalayan balsam		✓		
Invasive knotweeds	✓	✓		
Flowering rush	✓	✓		
Eurasian water-milfoil		✓		
Common reed		✓		
Curly leaf pondweed		✓		
Reed canary grass		✓		
Hydrilla		✓		
Bullfrog		✓		
Zebra mussels				✓
Quagga mussels				✓

For a full list of Controlled Alien Species, see http://www.env.gov.bc.ca/fw/wildlifeactreview/cas/.

This ranking tool is designed to help prioritize monitoring, outreach and boat wash sites by indicating waterbodies with the highest priority for AIS Introduction and the greatest potential impacts. The ranking tool was adapted from one in Idaho[16]. A document on "*How to use the AIS Ranking Tool*" has also been developed.

Factor	Ranking	Comments
Probability of AIS Introduction (Use)		
# Boat Launches into waterbody	One point per launch	This is a proxy for the amount of boat traffic into this waterbody.
Motorized watercraft	If a waterbody allows motorized watercraft, the waterbody is given one point.	Motorized watercraft have the potential to transport more AIS than do non-motorized watercraft.
Moorage	If a waterbody has boat moorage facilities, the waterbody is given 4 points.	This information was used to factor in long term boater usage (vs. "day tripper" use). Long-term usage is seen as higher risk for inoculation of a waterbody.
Water-based events e.g. fishing/wakeboard/kayak festivals and tournaments	Waterbodies that have at least one event per year are given 3 points.	This data was factored into use due to the large number of out-of-province boats that compete in these events.
Ease of Access	By paved road (5 points) By gravel road (2 points) By foot (1 point)	More tourism and boat traffic with easier access, therefore more likelihood of AIS introduction
Proximity to source population	Upstream source of AIS (of category being monitored) (3 points)	Waterbodies that already have an upstream AIS population would be more likely to have natural introduction
Severity of Consequence of AIS Establishment and Spread		
Endangered/Threatened Species	If a waterbody has endangered species, it is given 6 points; if a waterbody has threatened species, it is given 3 points.	The presence of these species is a proxy for ecological impacts of invasion. Use Ecosystem Explorer for amphibians and fish species.
# Hydro-electric facilities and water intakes	Water intakes: • 1 to 4 = 1 point • 5 to 9 = 3 points • 10+ = 5 points Large dams & hydroelectric facilities = 5 points	The number of these facilities is a proxy for the economic impacts of invasion.
Recreation	Points for # recreation icons in the Backroads Mapbook (1=1; 2 to 4=2; 5+=3)	The number of these icons is a proxy for the recreational impacts of AIS on this waterbody Include the following icons: Anchorage; Boat launch; Beach; Campsites; Canoe access; Diving; Fishing; Paddling; Picnic site; Portage; Resort; Wildlife viewing; Windsurfing; Float Plane
Size of waterbody (as measured at longest/widest point)	< 2 km = 1 point 2 to 4 km = 2 points Greater than 4 km = 3 points	This is a proxy for the difficulty of control. Small discrete lakes may have more control options than larger or connected waterbodies. Note backroad mapbook is 1 cm = 2 km

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[15] *Dreissenid* specific ranking matrix available here: https://hctf.ca/wp-content/uploads/2018/04/2018_Invasive_Mussel_Field_Protocol_Final.pdf
[16] http://www.aquatics.org/musselreport.pdf

Critical	30 + points	"Critical" waterbodies are either highly susceptible to invasion and/or have significant threatened and endangered species concerns. In a "Critical" waterbody, it is considered essential that robust monitoring be conducted.
High Priority	15 – 29 points	"High Priority" waterbodies are considered susceptible to invasion and/or have significant consequences.
Medium Priority	7 – 14 points	"Medium Priority" waterbodies have limited access/low use and/or less significant impacts.
Low Priority	1 – 6 points	These waterbodies are the lowest priority for monitoring.

Goal	Date Completed	Comments
Goal 1: Coordination and Collaboration		
Form a basin-wide AIS Working Group (that includes a representative from each regional invasive plant committee) to oversee implementation of this Program	April 2016	Steering Committee was struck to oversee implementation of this Program
Designate an AIS Basin-wide Lead Coordinator for the Columbia Basin AIS Program	May 2015	Khaylish Fraser is CB AIS Program Coordinator
Identify an AIS Coordinator for each regional invasive species organization (in addition to the AIS Lead Coordinator) to maintain communication for on-the-ground coordination of efforts	2015	
Develop and maintain a list of all local organizations involved in AIS including their roles and responsibilities, their activities, and waterbodies in which they are active	May 2015	
Develop and maintain a website for the CB AIS Basin-wide program		A webpage is dedicated to the CB AIS Basin-wide program on each of the four RISO websites
Revisit this AIS Program Framework annually to check-in with previous year's activities and adapt and modify this document as required		CBAIS Steering Committee reviews and updates Framework during the fall meeting
Develop and maintain a list of priority species with their associated known locations and pathways of introduction		To be updated annually (each winter)
Monitor success of AIS Program and associated activities through an annual review of committee and partner achievements		CBAIS Steering Committee met on 5 April 2016. Consensus of SC was to meet twice annually moving forward
Develop and utilize a method of evaluating the outreach program by creating a baseline survey to measure change in knowledge and/or behaviour	June 2015	
Goal 2: Education and Outreach		
Identify and maintain a list of all relevant audiences to target for presentations, brochures, posters	May 2015	
Maintain a spreadsheet of sign locations and the key message at each location	2015	See MS Excel Workbook titled: *Signs All Regions.xls*

Columbia Basin AIS Program Framework 2015-2020   Updated December 2017

Coordinate the development of a CB AIS brochure that is consistent between regions	Spring 2017	
Develop a handout of boat and car wash stations available that do not drain into natural water bodies and advertise these to boaters	August 2015	To be updated annually (each spring)
Goal 4: Monitoring and Research		
Develop a map of monitoring sites by species up to 2015; Develop maps of species closest known locations up to 2015		See pre-2017 versions of the Framework for maps
Goal 5: Response and Management		
Develop a response plan for species that are not of provincial EDRR priority but are regional priority species	2016	The American Bullfrog Action Team (ABAT) has developed an EDRR Plan for American Bullfrog for the Kootenay-Boundary region