



Saskatchewan Aquatic Invasive Species Strategy

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1.0 Introduction

Saskatchewan has an abundance of lakes, rivers and other waterbodies that provide economic, environmental and social benefits to the people of the province. These waterbodies are being put at significant risk by the possible introduction of aquatic invasive species and their devastating impacts.

Aquatic invasive species are non-native species that can be introduced and become established in areas beyond where they are naturally found. The threat from these species varies; however, the establishment of invasive species outside of their native range results in some level of impact to the environment, the economy or society (Government of Canada, 2004).

The ability of a species to become invasive is dependent on a number of factors, such as the ability to establish a successful population and naturally reproduce, the extent of the invasion, and the vulnerability of the aquatic ecosystem. Aquatic invasive species can alter and degrade habitat, decrease biodiversity, compete with native species for food and habitat, and introduce diseases and parasites. Once established, invasive species are extremely difficult and costly to control, and may be impossible to eradicate.

The problems associated with aquatic invasive species are complex due to the range of impacts they can have on the environment, society and economy. They may be introduced to Saskatchewan from neighbouring provinces and states known to have invasive aquatic species, or through vectors such as the pet industry and global trade.

The Saskatchewan Aquatic Invasive Species Strategy is a provincial framework to help prevent, respond to and manage aquatic invasive species threats. It emphasizes the need for collaboration and co-ordination with provincial and federal government agencies, non-government organizations and neighbouring jurisdictions to prevent the introduction and spread of high-risk aquatic alien species.

2.0 The Importance of an Aquatic Invasive Species Strategy

Problem

Aquatic invasive species pose a significant risk to aquatic ecosystems and their use. The potential risk that aquatic invasive species may be introduced to Saskatchewan is high, as some neighbouring provinces and states already have established populations of aquatic invasive species.

Vision

To develop an effective, co-ordinated, inter-agency and multi-jurisdictional management strategy involving resource users and the public. The strategy promotes information exchange and public awareness through education; and takes a science-based approach to prevention, early detection, rapid response, management and control, and restoration measures.

Scope

This strategy is broad in scope and has been developed to help prevent, detect, respond to and manage aquatic invasive species for Saskatchewan's ecosystems, biodiversity and economy. The strategy addresses intentional and unintentional introductions to the province.

Economy

Once established, aquatic invasive species can cause significant economic impacts. Some impacts include: direct costs to manage the particular invasive species; reduced production from commercial and recreational fisheries; reduced property values; reduction in recreational use of a waterbody and impacts to the local economy; and damage to water-related infrastructure and increased maintenance costs for these facilities.

As an example, Alberta has estimated an annual cost of \$75 million if invasive mussels were to infest that province (Neupane, 2013). This includes impacts to power generation, drinking water systems, recreational fishing and water management structures. The estimated cost in Ontario is \$75 to \$91 million per year (Marbek, 2010).

Zebra mussels are costing Ontario power producers \$6.4 million per year in increased control and operating costs (Colautti et al., 2006). In Idaho, the estimated costs from the establishment of invasive mussels, excluding impacts on irrigation systems, is approximately \$94 million (Western Regional Panel on Aquatic Nuisance Species, 2010).

Society

Population growth and the movement of people increases the risk of aquatic invasive species being introduced. They can affect society by decreasing property values; increasing costs for equipment maintenance, resources and public utilities; degrading water quality; decreasing interest in recreational use of waterbodies; and endangering public health and safety.

Saskatchewan has more than 100,000 lakes and rivers that have become a place for tourists and visitors to enjoy fishing, hunting and other water-based recreational opportunities. Many human activities depend on aquatic ecosystem health and the establishment of aquatic invasive species can significantly impact these uses. For example, Eurasian watermilfoil has been shown to significantly impact recreational activities such as swimming, boating and fishing. This is in addition to diminishing water quality and fish abundance when it becomes established outside of its natural range (Zhang et al, 2010).

Environment

The ecological impact of aquatic invasive species varies and depends on the type of invading species, ecosystem vulnerability and the extent of the invasion. An aquatic ecosystem is a community of organisms that live together and interact with their environment. These ecosystems are home to a variety of organisms such as bacteria, aquatic plants and animals. Aquatic invasive species can drastically alter ecological communities by competing with native species for food and habitat, reducing biodiversity, disrupting nutrient cycles and altering community structure.

For example, the ability of invasive mussels to filter water at high rates reduces the food available for other native species. Their high filtering capability can also cause the water to become clearer within the ecosystem. This allows the sunlight to penetrate deeper within the water column, resulting in environmental changes such as the establishment of submerged vegetation in deeper zones of the waterbody and forcing some light-sensitive fish species (e.g. walleye) to find new habitat (Western Regional Panel on Aquatic Nuisance Species, 2010).

3.0 Goals of the Aquatic Invasive Species Strategy

The main objective of the Aquatic Invasive Species Strategy is to prevent and minimize the introduction and spread of harmful, non-native species by eliminating or reducing the threats, impacts and costs to the environment, economy and the people of Saskatchewan.

This strategy is a living document to allow for adjustments based on the acquisition of new information, changes to current and emerging aquatic invasive species threats, public perception, future challenges and new opportunities.

The four main goals of Saskatchewan’s Aquatic Invasive Species Strategy are listed below. These goals are in alignment with the federal strategy as outlined in the document *An Invasive Alien Species Strategy for Canada* (Government of Canada, 2004).

GOALS	
Prevent Entry To prevent intentional and unintentional introductions of new harmful invasive species.	Respond to Establishment To respond quickly to aquatic invasive species before they establish or spread.
Prevent Establishment To detect aquatic invasive species before they become established or spread.	Adaptation Take action to eradicate or manage aquatic invasive species and include adaptation measures where required.

4.0 Strategic Actions and Approaches

To achieve this strategy's goals, actions are identified under four categories: risk analysis, preventing introductions, monitoring and response and co-ordinated efforts. These categories identify opportunities by enhancing current programs and increasing co-ordination and communication efforts.

4.1 Risk Analysis

Risk analysis is based on scientific research and knowledge and is used to make informed decisions on how to prevent and manage the introduction and spread of aquatic invasive species. It includes three components: risk assessment, risk management and risk communication.

Risk assessments evaluate the potential for aquatic invasive species to be introduced and the consequences they can have on aquatic ecosystems and habitat, as well as fishery resources. The risk of an aquatic invasive species being introduced is based on factors such as species biology, human behaviour, pathways and vectors, and the risks posed to aquatic ecosystems (Table 1).

Table 1. Risk Level based on Ecological, Economic and Social Criteria

Risk Level	Criteria		
	Ecological	Economic	Social
High Risk	<ul style="list-style-type: none"> Suitable water quality/habitat No natural predators/control Known to out-compete native species Known to carry secondary impacts (pathogens) 	<ul style="list-style-type: none"> Risk to infrastructure and economic development Requires species-specific controls and maintenance Reduces natural aesthetics, native species or efficiency of infrastructure (e.g. tourism, irrigation, hydro-electric stations) 	<ul style="list-style-type: none"> Poses human health risks Impacts to recreational activities (e.g. fishing, swimming, boating) Loss of revenue or income
Medium Risk	<ul style="list-style-type: none"> Suitable water quality/habitat Possible natural predator(s)/control options Native species are able to compete for resources May carry secondary impacts 	<ul style="list-style-type: none"> Potential risk to infrastructure and economic developments Able to control through current management activities or other options May reduce natural aesthetics, abundance of native species or efficiency of infrastructure, but control options can reduce impacts 	<ul style="list-style-type: none"> May increase human health risks May reduce some abilities to perform all traditional activities Reduced revenue/income
Low Risk	<ul style="list-style-type: none"> Unsuitable water quality/habitat Identified predators and/or other control options 	<ul style="list-style-type: none"> No risk to infrastructure, natural aesthetics or native species 	<ul style="list-style-type: none"> No human health risk No impact to traditional activities

Risk management refers to evaluating mitigation options, establishing recommendations and knowing or understanding the levels of uncertainty with respect to the risks these species can

pose. Risk communication refers to working with other experts and combining information to make informed decisions.

The ministry will take a science-based approach to risk analysis and monitoring to assess the threats associated with aquatic invasive species through the following actions.

ACTION 1: Assess potential impacts of aquatic invasive species on ecological, economic and social systems.

- Utilize risk analysis guidelines and protocols that are science-based, transparent, adaptive and flexible.
- Identify aquatic invasive species that have the highest risk of being introduced and established in Saskatchewan.
- Identify known and potential pathways for introduction and vectors of spread.
- Conduct risk assessments for priority aquatic invasive species and high-risk waterbodies.
- Conduct and incorporate research to identify threats associated with high-risk aquatic invasive species and predict what impacts high-risk species may have on Saskatchewan's economy, society and environment.
- Gain knowledge of the location of invasive species relative to Saskatchewan waterbodies and their vulnerability to establishment (water quality/habitat).

ACTION 2: Effectively manage data and share information.

- Develop standard protocols for data collection and entry of data into one shared and accessible central database.
- Work co-operatively with other provinces, government and non-government agencies to establish data sharing agreements.
- Report high-risk aquatic invasive species to neighbouring jurisdictions.
- Utilize tools such as GIS and other data management and reporting tools to co-ordinate and integrate data on invasive species that supports decision making and can be used to assess the threat/risk posed by a certain species.

4.1.1 Species of Concern in Saskatchewan

The Saskatchewan Ministry of Environment evaluates aquatic species to determine potential risks and impacts to the province. When a species is identified as a high-risk threat, they will be added to the list of prohibited species of fish in Saskatchewan listed in *The Fisheries Regulations (Saskatchewan), 1995*. Aquatic invasive plant species identified as high-risk will be added to Schedule 1 of *The Weed Control Act (Saskatchewan), 2010*.

4.1.2 Habitats of Concern in Saskatchewan

The ministry's risk assessment incorporates a number of factors to determine the level of risk a species may pose to the province. Factors include the likelihood of introduction, magnitude of biological impacts to ecosystems, native species and habitat degradation. Additional factors are also considered, such as potential risks to infrastructure and impacts to society if a species were to invade Saskatchewan waters.

For example, zebra mussels have invaded multiple, neighbouring jurisdictions, causing significant impacts to some ecosystems. The potential of this species invading Saskatchewan is high.

4.1.3 Pathways of Introduction

Pathways refer to the ways in which aquatic invasive species are introduced or spread. Vectors of spread are the mechanisms by which invasive species move from a source population to a new destination (Government of Canada, 2004). There are numerous pathways and vectors for these species to enter and spread within Saskatchewan. Identifying pathways and vectors is critical because the easiest means to prevent and reduce the spread of new invasions is vector interception or disruption (Carlton and Ruiz 2005).

The introduction of aquatic invasive species can be intentional and unintentional. Intentional introductions happen when an aquatic species is deliberately released into waters; an example of this would be unauthorized fish introductions. While impacts may be significant, this is thought to be a minor component of introductions (Alaska Department of Fish and Game, 2017). Humans have been largely responsible for the movement and unintentional introductions of aquatic invasive species. Recreational boaters and anglers inadvertently transport these species contained in or attached to water-related equipment, including boats, trailers, waders and fishing and recreational equipment. Other ways aquatic invasive species can be introduced is through the aquarium and pet industry. For example, koi fish have been found in the Boundary Dam Reservoir, likely released from an aquarium owner who was uneducated on the proper disposal of an unwanted fish.

ACTION 3: Manage pathways to prevent the spread and introduction of aquatic invasive species.

- Conduct risk assessments to identify high-risk pathways.
- Increase public understanding of potential risks associated with pathways of concern.
- Create best management practices (BMPs) for high-risk species and pathways.
- Partner with researchers to advance our knowledge on invasive species within the province with respect to vectors and pathways.

4.2 Prevent Entry

Research that focuses on preventing, controlling or eradicating invasive species has shown that prevention is the most economically effective approach (Leung et al., 2002). Prevention is best implemented through education initiatives with the goal of changing social behaviour. Effective prevention and early detection efforts require Saskatchewan citizens to be aware of, and engaged in, the prevention and detection of these species, as well as aware of how these species can impact their own lives – directly and indirectly.

4.2.1 Education, Awareness and Stewardship

The ministry has been informing the public and non-government partners on what they can do to prevent aquatic invasive species from coming to Saskatchewan. Education initiatives include:

- ❖ Development and distribution of a public service announcement that airs on network television.
- ❖ Declaration of an annual Aquatic Invasive Species Week to raise public awareness, as well as the release of information to the media.
- ❖ Installation of signs along highways, and heavily used boat launches on high-risk lakes.
- ❖ Incorporation of aquatic invasive species information on the Government of Saskatchewan's website, the Anglers Guide and other relevant government publications.
- ❖ Maintaining a presence at tradeshow and exhibitions by Ministry of Environment staff and partners to raise public awareness.
- ❖ Development and distribution of Clean, Drain, Dry brochures, posters, promotional items and information cards.
- ❖ Hosting workshops with non-government partners who help with education and awareness.

The ministry will continue to develop information and education regarding the risks of introduction of invasive species through the following actions:

ACTION 4: Identify target audiences and develop targeted information and awareness campaigns regarding the risks of introduction of aquatic invasive species into Saskatchewan.

- Review and update educational materials and programs to provide new, relevant and up-to-date information.
- Monitor effectiveness of education and outreach and identify gaps.

- Continue to prepare, update and distribute educational and program materials concerning impacts of aquatic invasive species (e.g. fact sheets, public service announcements, presentations).
- Continue to enhance and expand programs by developing common messaging and materials that are consistent across jurisdictions.
- Educate retailers (e.g. watercraft, pets/aquariums, boat manufacturers, outdoor gear) about the threat of aquatic invasive species and actively promote their role in prevention.

4.2.2 Legislation, Regulation and Policy

Legislation is important in the prevention, detection and management of aquatic invasive species. The management of aquatic invasive species requires a co-ordinated effort among governments, non-government organizations and industry. In Saskatchewan, the Ministry of Environment is the lead agency for regulating aquatic invasive species, although multiple agencies are involved in prevention.

For example, the Water Security Agency manages water and its uses under *The Water Security Agency Act, 2013* and jointly protects aquatic habitats with the ministry under *The Environmental Management and Protection Act, 2010*. The Ministry of Environment manages fisheries and aquatic invasive species under *The Fisheries Act (Saskatchewan), 1994* and its regulations. Fisheries and Oceans Canada protects fish and fish habitat under the federal *Fisheries Act* and prevents aquatic invasive species introductions into Western Canada under the federal *Aquatic Invasive Species Regulations (2015)*. The Ministry of Agriculture manages aquatic invasive plants under *The Weed Control Act (Saskatchewan), 2010*.

ACTION 5: Participate in co-ordinated legislative efforts.

- Participate in high-priority policy or legislative initiatives led by federal or provincial agencies to prevent, control and manage aquatic invasive species.
- Participate in federal-provincial-territorial committees tasked with the development and implementation of co-ordinated invasive species legislation and policy.

ACTION 6: Review and enhance existing legislation and policy for aquatic invasive species.

- Examine the need for amendments to legislation or regulations to enable appropriate actions to identify, prevent, eradicate and control aquatic invasive species.
 - Review, update and amend legislation so it is current and effective.
 - Analyze the strengths and weaknesses of current invasive species legislation and regulation and amend as required.

4.2.3 Compliance and Enforcement

Aquatic invasive species legislation, regulation and policy require enforcement to be effective. Inter-jurisdictional and interagency collaboration and co-operation is important as aquatic invasive species threats are not limited by national and provincial borders.

- Saskatchewan is currently working with neighbouring provinces to co-ordinate inspection efforts.
- The ministry will take a risk-based approach to watercraft inspection, focusing on high-risk pathways and targeted enforcement of violations related to aquatic invasive species.
- Fisheries and Oceans Canada has federal regulations that afford protection to Western Canada from high-risk aquatic invasive species threats that are enforced by federal fisheries officers and designates.
- Canada Border Services Agency has assisted with compliance monitoring at border crossings between Saskatchewan and the United States. These crossings are potential points of entry for aquatic invasive species.
- The ministry's Compliance and Field Services Branch is responsible for compliance and enforcement of provincial legislation pertaining to aquatic invasive species, and in conjunction with other ministry staff, are trained to inspect watercraft to identify high-risk boats that may require decontamination.

ACTION 7: Enhance legislation, regulations, policy and enforcement of aquatic invasive species.

- Work with provincial and federal partners to ensure relevant staff are trained to identify high-risk aquatic invasive species and enforce existing legislation.
- Improve co-operation and collaboration with key partners to enhance enforcement of provincial and federal legislation.
- Continually increase staff awareness, knowledge and training on threat, prevention, identification and reporting.
- Encourage public to report sightings or suspected sightings of aquatic invasive species to the ministry.

4.2.4 Evaluation

The actions and initiatives within this strategy should be evaluated to determine effectiveness, and amendments should be made to address significant gaps, as necessary.

ACTION 8: Review and enhance existing initiatives within the aquatic invasive species strategy.

- Review, update and amend aquatic invasive species strategy initiatives so they remain current and relevant.
- Determine effectiveness of programs with regards to the aquatic invasive species strategy and identify gaps.

4.3 Prevent Establishment

Although preventing entry is the most important element of the strategy, it does not completely eliminate the potential for an introduction. It is critical that all potential introductions are identified early, which greatly increases the chances that a response will be effective. An effective response requires a planned, well co-ordinated approach with defined roles and responsibilities for key players. In order to respond effectively, the ministry has developed a formal rapid response plan that incorporates an incident command structure. This response plan will be tested regularly and revised as necessary to ensure it remains effective.

4.3.1 Early Detection Monitoring

The Ministry of Environment strives for monitoring and management actions that are scientifically, socially and economically viable; provide the desired effect on the target species; and minimize negative effects on the environment, society and the economy.

ACTION 9: Conduct regular monitoring activities to detect aquatic invasive species.

- Develop and adopt science-based, standard protocols for monitoring the introduction of high-risk aquatic invasive species.
- Conduct regular monitoring to detect species introduction, establishment or spread that is focused on high-risk species within areas of the province that are susceptible to invasions.
- Co-ordinate monitoring activities with neighbouring jurisdictions and readily share monitoring results with our partners and the public.
- Document activities to detect and intercept invasive species at points of entry.
- Continue to work with and develop partnerships with other ministries, agencies, organizations, and First Nations and Métis groups.

4.3.2 Rapid Response Planning

ACTION 10: Develop and implement a risk-based aquatic invasive species early detection and rapid response plan to control or eradicate aquatic invasive species establishment.

- Develop proactive early detection and rapid response plans to address potential introductions of high-risk aquatic invasive species.

- Co-ordinate rapid response planning with neighboring jurisdictions and the federal government for responding to introductions in shared waterbodies.
- Research options for control and eradication of high-risk aquatic invasive species.
- Develop an approach to disseminate data and ensure that adaptive management strategies (e.g. treatment, control measures) evolve based on new information.
- Consider and mitigate threats to species at risk in the response.

4.3.3 Evaluation

- Early detection, monitoring and rapid response protocols will be tested regularly to evaluate effectiveness. Gaps identified through testing will be addressed by amending existing plans.

4.4 Respond to Establishment and Adaptation

In cases where an introduction results in the establishment of an invasive species, long-term management plans are needed in order to inform appropriate action. Actions coming out of the management plan will take into consideration a cost-benefit analysis and focus on annual management and control of the establishment, and include long-term monitoring, suppression, communication and engagement.

ACTION 11: Ensure management plans for high-risk aquatic invasive species are in place that include mitigation and adaptation measures where eradication is not feasible.

- Complete a cost-benefit analysis to inform efforts for annual management and control of an establishment.
- Develop communications plans specific to an establishment.
- Evaluate options for suppression and include recommendations in management plans
- Develop restoration components, as required, within management plans for significantly impacted aquatic ecosystems.
- Develop standard monitoring protocols for target aquatic invasive species to evaluate population trends and management efforts.
- Where aquatic invasive species pose a risk to species-at-risk, incorporate aquatic invasive species management into recovery plans to reduce risk to listed species and promote recovery.

4.5 Co-ordinate Efforts

Effective co-operation and collaboration among government, non-government organizations, industry and stakeholders is critical to the success of our efforts in preventing the introduction and spread of aquatic invasive species in Saskatchewan. The strategic plan outlines some of the

work that has been done by various groups and identifies the roles that require co-ordination among agencies. **Table 3** summarizes the groups and agencies that play a critical role in aquatic invasive species prevention across Saskatchewan.

Table 3. Partnerships in Aquatic Invasive Species Prevention and Management in Saskatchewan.

Participant	Role
Saskatchewan Ministry of Environment	Provincial lead in aquatic invasive species prevention and management. Provides provincial leadership, education and awareness, regulation and policy development, compliance and enforcement activities and potential control measures.
Saskatchewan Ministry of Agriculture	Administers <i>The Weed Control Act</i> and the prohibited species list related to riparian aquatic invasive plants.
Saskatchewan Ministry of Highways and Infrastructure	Education and awareness, aquatic invasive species monitoring support.
Saskatchewan Ministry of Parks, Culture and Sport	Manages provincial parks, provides public education, and aquatic invasive species monitoring.
Fisheries and Oceans Canada (DFO)	Protection of fish and fish habitat, science and risk assessment support, co-ordination of national activities through the Canadian Council of Fisheries and Aquaculture Ministers (i.e. National Aquatic Invasive Species Committee). Partners with Canada Border Services Agency to facilitate enforcement and compliance of federal <i>Aquatic Invasive Species Regulations</i> at international border crossings
Environment and Climate Change Canada	Prepares national invasive species strategies in collaboration with the provinces and territories.
Health Canada (Pest-Management Regulatory Agency – PMRA)	Develops regulations regarding the use of pest control products along with the Pest Management Regulatory Agency for aquatic invasive species management and eradication.
Canada Border Services Agency	Ensures compliance with federal <i>Aquatic Invasive Species Regulations</i> at international border crossings.
Parks Canada	Management of national parks lands and waters, including aquatic invasive species management and monitoring of federal waterbodies.
Provincial-Territorial Partners	Co-ordination of AIS prevention, response and management actions.
Water Security Agency	Water management and allocation, protection of source water and aquatic habitats, public education and awareness, and aquatic invasive species monitoring.
SaskPower	Power generation, education and awareness, and aquatic invasive species monitoring.
SaskWater	Crown water utility providing water and wastewater services to municipalities, First Nations and Métis communities, and industry. Education and awareness, and aquatic invasive species monitoring.
Municipal Governments (Municipalities, Saskatchewan Urban Municipalities Association, Saskatchewan Association of Rural Municipalities, Provincial Association of Resort Communities) and Regional Authorities (e.g. Meewasin Valley Authority, Saskatchewan Regional Parks)	Public education and awareness, monitoring and aquatic invasive species related bylaws.
Universities and other Research Partners	Research and science around aquatic invasive species prevention, detection, management and control.

Saskatchewan Invasive Species Council	Provides communication and education information to the public and various partners and agencies.
Non-Government Partners: Saskatchewan Association of Watersheds, Watershed Stewardship groups, Saskatchewan Wildlife Federation, and others	Community based aquatic invasive species education and awareness, monitoring and response.
Saskatchewan Conservation Data Centre	Works with all partnering agencies to gather, interpret and distribute standardized information on the presence or absence of aquatic invasive species in Saskatchewan.

The actions listed below are intended to identify the need and enhance the present level of communication, co-ordination efforts and partnerships.

ACTION 12: Clarify roles and responsibilities.

- Clearly outline roles and responsibilities within Government of Saskatchewan ministries and agencies, industries, and non-government organizations involved in aquatic invasive species management in Saskatchewan.
- Build an aquatic invasive species network of professionals within the province.

4.4.1 Developing and Expanding Partnerships

ACTION 13: Develop and participate in partnerships that work towards education, awareness, prevention, early detection and management.

The ministry will continue to participate and expand partnerships that work towards prevention, early detection and control:

- Continue to work with partners and stakeholders to educate and raise public awareness about aquatic invasive species and their threats.
- Work to maintain and expand partnerships with non-profit organizations, other government agencies and stakeholders through the provincial Aquatic Invasive Species Task Force.
- Continue to collaborate with other Canadian and U.S. jurisdictions to prevent the spread of aquatic invasive species.
- Continue to communicate with other jurisdictions regarding existing programs and the threats of aquatic invasive species.
- Discuss and co-ordinate control measures among stakeholders.
- Develop a communications plan that incorporates a co-operative effort within government, government agencies, non-government organizations and other jurisdictions.

- Encourage public, academic institutions, non-government organizations, industry and stakeholder involvement and stewardship.
- Support interprovincial-territorial agreements to improve inter-jurisdictional collaboration and co-ordination of prevention efforts.
- Capitalize on opportunities to collaborate with First Nations and Métis organizations on aquatic invasive species prevention efforts.

4.4.2 Communication and Collaboration

ACTION 14: Communicate, collaborate and co-ordinate efforts with other agencies and jurisdictions.

- Ensure effective communication, collaboration and co-ordinated management efforts with other jurisdictions (provinces, federal government and states) through existing communication networks and forums as listed below:
 - Canadian Council of Fisheries and Aquaculture Ministers National Aquatic Invasive Species Committee, the working group for the Western Canadian Agreement on Aquatic Invasive Species Prevention, Pacific North West Economic Region.
 - Canadian Council on Invasive Species and Provincial Invasive Species Councils.
- Utilize existing partnerships with other Government of Saskatchewan ministries and agencies, provincial academic institutions, industries and non-government organizations on the Aquatic Invasive Species Task Force to improve co-ordination and communication and avoid duplication of efforts by ensuring the effective use of available resources for early detection, rapid response and management of aquatic invasive species.
- Work with partners to co-ordinate data management and reporting from early detection monitoring.
- Support communication and co-ordination networks with neighbouring provinces and states to share information and facilitate a notification network for the arrival, interception or expansion of aquatic invasive species.
- Identify any gaps with respect to existing committees and groups within Saskatchewan and including inter-jurisdictional committees.

5.0 Implementation

The Saskatchewan Aquatic Invasive Species Strategy represents a co-ordinated and collaborative approach to prevent, respond to and manage aquatic invasive species. The actions that have been listed throughout the strategy are meant to build and strengthen initiatives and fill in any gaps to prevent and manage aquatic invasive species.

Dealing with aquatic invasive species is a complex issue. Aquatic invasive species can cross inter-jurisdictional borders. This illustrates the need for co-operation and communication with neighbouring provinces and states, federal government, other government and non-government organizations, and all other stakeholders.

There are many challenges associated with the prevention and management of aquatic invasive species, such as limited funding and resources, regulatory gaps and limited co-operation and support from other government agencies, non-government organizations and the public. Funding is a crucial aspect of this strategy and will be essential in the effective and successful prevention and control of aquatic invasive species.

The Aquatic Invasive Species Strategy will need to be promoted, supported and implemented by multiple ministries, organizations and agencies to be successful.

Appendix

Glossary

Alien species: non-native organisms that are introduced beyond their natural range and become established in a new area.

Aquatic invasive species: non-native aquatic organisms living their native range that have been introduced and become established. They can have negative effects on a region's economy, environment or public health.

Ecosystem: a biological community of interacting organisms and their physical environment.

Eradicate: to remove something completely or to eliminate.

Invasive species: species living outside their native range that have been introduced and become established. They can have negative effects on a region's economy, environment or public health.

Monitoring: to gather information on physical, chemical or biological variables before and after proposed activities take place (Mazzotti et al 2009).

Native species: naturally occurring species within a region or that have migrated into the region and established without human actions.

Non-native species: species introduced into new areas that have not historically been part of their native range.

Pathways: the geographic routes by which invasive species are transferred from one ecosystem to another.

Risk assessment: process of estimating the risk presented by an invader through quantitative or qualitative terms to determine options to manage those risks.

Species at risk: species identified by the federal government as being in danger of becoming extinct or extirpated.

Vectors: the means by which invasive species follow a pathway and spread from one ecosystem to another.

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