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Invasive Species Strategy for British Columbia 2023-2027 DRAFT

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36 Setting the Stage

37 Why You Should Care

38 Invasive species are a significant threat to BC's lands, waters, and communities. Typically
39 introduced to BC by human activity, often intentionally, invasive species can reproduce and
40 spread rapidly, displace native species and disrupt the natural balance of ecosystems they
41 invade. Often introduced without their natural predators to keep them in check, invasive species
42 can alter habitats and outcompete native species for resources they depend on for food and
43 shelter. Reducing the impact requires all of us – at work, play and at home – to work together to
44 protect BC's biodiversity.

45 Increased trade and travel, combined with changing climate, and increased disturbances such as
46 fires and floods, mean BC is at greater risk for new invasive species to establish and existing
47 invasive species to spread. Whether the lush rainforests, interior grasslands, freshwater or
48 marine environments - there are invasive species threatening habitats in BC. Whether it's Scotch
49 broom or goldfish, knotweeds or brown marmorated stink bugs - the species will vary across BC,
50 but the solutions are the same. Preventing the introduction and spread is the first step, followed
51 by active 'reporting' and response to avoid establishment. For existing invasive species,
52 containment is key, as is consistent action to control and remove invasive species and restore
53 the health of impacted ecosystems.

54 Each person has a role to play in preventing and reducing the impacts of invasive species on
55 BC's environment, economy, and social and cultural values. Whether you are a gardener, outdoor
56 recreationist, developer or homeowner, we all need to work together to make a real difference in
57 protecting BC from invasive species.

58 **Vision:** To protect BC's lands and waters from the harmful impacts of invasive species.

59 Together we can create positive change by taking key actions to protect BC from invasive species.
60 In doing so we can:

- 61 - **Environmental** – restore ecosystem resilience and biodiversity, reverse habitat loss,
62 reduce competition with and predation of native species
- 63 - **Cultural** – restore the historic and cultural significance of the landscape, reverse loss of
64 culturally significant species for food, medicinal and spiritual purposes
- 65 - **Economic** – reduce losses and decrease management costs for agriculture, forestry,
66 tourism, recreation, horticulture, infrastructure, real estate, and urban spaces
- 67 - **Social** – increase access to lands and waters for recreation and nature activities, and
68 decrease impacts to human health, aesthetics, and communities

69 As invasive species 'do not respect boundaries', we must work together across boundaries and
70 jurisdictions to protect our ecosystems and communities from the impacts of invasive species. To
71 achieve our collective vision, it is imperative to foster a culture of understanding and respect – for
72 the land, for the water, for all living things and especially, for each other.

73 Text Box: Dedicated efforts are needed to address the 2030 targets for the Kunming-Montreal
74 Global Biodiversity Framework (2022), including Target 6 to “Eliminate, minimize, reduce and or
75 mitigate the impacts of invasive alien species on biodiversity and ecosystem services by
76 identifying and managing pathways of the introduction of alien species, preventing the introduction
77 and establishment of priority invasive alien species, reducing the rates of introduction and

78 *establishment of other known or potential invasive alien species by at least 50% by 2030, and*
79 *eradicating or controlling invasive alien species, especially in priority sites, such as islands”.*¹

80 Why a Strategy?

81 The Invasive Species Strategy for British Columbia represents a collective vision for strengthening
82 invasive species management and awareness in BC. The Strategy serves as an overarching,
83 guiding document for governments, businesses, organizations and individuals to move forward
84 together to protect our environment, economy, and social well-being from the widespread
85 negative impacts of invasive species. This is the fourth provincial strategy, with each developed
86 through broad and inclusive input, guided by a diverse oversight committee. Just as with the first
87 Strategy in 2004, the 2023-2027 Strategy identifies shared priorities and provides key actions
88 confirmed through input from across the province to guide our collective work over the next five
89 years in BC.

91 Text Box: Invasive species are plants or animals that are not native to the province or are
92 outside of their natural distribution. Invasive species negatively impact British Columbia’s
93 environment, people and/or economy.¹⁵

94
95 Text Box: Helpful links at a glance:

- 96 » [Invasive Species Strategy for BC 2004; 2012-2016; 2018-2022](#)
- 97 » [B.C. Inter-Ministry Invasive Species Working Group](#)
- 98 » [Invasive Species Council of BC](#)
- 99 » [Local Government and Regional Invasive Species Organizations in BC](#)

100 Advancing Reconciliation

101 The lands and waters currently known as British Columbia are rich with cultural and biological
102 diversity. The biodiversity that people take such pride in has been integral to the historical and
103 current practices of Indigenous People. Pre-contact, Indigenous People managed the lands
104 and waters within BC through systems of natural law, oral history, and deeply entrenched
105 responsibilities to care for their resources through reciprocal relationships. These relationships
106 were disrupted by colonization, and consequently so was the health of the lands and waters
107 they managed for millennia.

108 Invasive species have further altered ecosystems vital to the livelihood of Indigenous People.
109 By reducing the availability of native plants and animals, invasive species have led to the loss
110 of cultural practices tied to the use of native species. For Indigenous People to fully exercise
111 their inherent rights, the impact of invasive species on the health and integrity of the
112 ecosystems must be reversed.

113 Indigenous partnership and leadership in environmental initiatives is recognized for advancing
114 conservation efforts and sustaining biodiversity. The concept of reconciliation is fundamentally
115 linked to healing the land. A deeper understanding of the connections with the land, and the
116 relationship of Indigenous People to the land, is necessary to achieve success in restoring
117 natural functions, free of invasive species.

118 Indigenous Peoples identified four key actions for invasive species management:

- 119 1. Ensure Indigenous partnership and leadership - Empower Indigenous People to lead

120 and engage in the process of healing the land. The relationship we have with each
121 other is reflected in the relationship we have with the land.

122 2. Respect and reflect Indigenous knowledge - Work directly with local knowledge keepers
123 and communities. Solutions to invasive species issues require Indigenous knowledge
124 and Western knowledge to respectfully intersect. Reflecting the principles of Ethical
125 Space throughout planning and coordination is critical.

126 3. Expand knowledge sharing and research - Strengthen education and awareness within
127 and beyond Indigenous communities. Generations of Indigenous knowledge can
128 deepen our understanding of the impacts and interactions of invasive species with the
129 ecosystem and help guide management decisions.

130 4. Support and increase capacity – Expand management of invasive species through
131 shared knowledge and resources to enhance stewardship.

132 Text Box: British Columbia unanimously passed the *Declaration on the Rights of Indigenous*
133 *Peoples Act* (DRIPA)² in November of 2019, followed by the release of the *Declaration on the*
134 *Rights of Indigenous Peoples Act Action Plan 2022-2027* (DRIPA Action Plan)³, outlining
135 tangible actions and steps BC committed to as a path towards full implementation of the Act.
136 The principles outlined in the DRIPA Action Plan have been woven into this Strategy to support
137 commitment and action towards reconciliation.

138

139 Text Box: “*Ethical Space is formed when two societies with disparate worldviews, are poised*
140 *to engage each other. It is a space in which all knowledge systems (e.g., Indigenous, Western)*
141 *are validated and respected (also called two-eyed seeing) and where it is possible to arrive at*
142 *joint decisions arising out of mutually agreed protocols*”.⁴

143

144 Text Box: Jeannette Armstrong, PhD and Syilx Nation member from the Penticton Indian Band,
145 speaks clearly to the connection between human relationships, and the health of the land, ‘*The*
146 *land is us [...] The land feeds you, but we feed the land as well [...] we live on the land and we*
147 *can impact the land, we can destroy the land, or we can love the land and it can love us back*’.⁵

148 **Adapting to a Changing Climate**

149 Climate fundamentally impacts ecosystem structure and dynamics, and across the province, our
150 lands, waters, biodiversity, and communities now face ever-growing changes. Healthy and
151 diverse natural ecosystems are more resilient to changing climate and climatic events. Looking
152 forward, stewardship of lands and waters, which must include effective management of invasive
153 species, must be carried out considering climate adaptation and nature-based solutions to ensure
154 future ecosystem resilience.

155 Warming temperatures and changes in precipitation increase the risk of new invasive species
156 establishment and support the expansion of existing populations. Changing climate disrupts
157 native species by compromising their competitive ability, creating favourable conditions for
158 invasive species to colonize. Still, the intersection between invasive species and climate is
159 relatively understudied, and more extension and awareness of the linkages is needed.
160 Recognizing climate change impacts and the opportunities for invasive species that our changing
161 climate supports along with protecting and nurturing resilient natural ecosystems, is foundational
162 and necessary for invasive species prevention and control moving forward.

163 Recently, BC has seen record-breaking temperatures with little precipitation, leading to a rise in
164 destructive wildfires. Highly flammable invasive plants such as cheatgrass form dense stands of
165 dry material early in the year, increasing fuel load, risk and intensity of wildfires. On the other
166 hand, BC also experienced a surge in localized precipitation during atmospheric river weather
167 systems, causing flooding that spanned multiple jurisdictions. Invasive species, such as
168 knotweeds, can increase the impacts of these events by destabilizing riverbanks and increasing
169 erosion. Response to climatic events must incorporate invasive species management into
170 recovery efforts as invasive species are often the first to colonize following large disturbances and
171 the actions taken to address them. Post-event management requires training, knowledge sharing,
172 and extension of tools and resources to all those involved, including members of affected and
173 neighbouring communities.

174 It is also increasingly important to protect vulnerable at-risk habitats and species – which may be
175 more susceptible to climate impacts – and proactively monitor these areas for invasive species
176 rather than using a reactive approach. As prevention is the most effective tool for invasive species
177 management, taking measures to protect ecosystems from new introductions is key to minimizing
178 climate impacts and ensuring resilient ecosystems for future generations.

179 Text Box: Flood risk is increased by invasive species like Parrot’s feather, an aquatic milfoil plant
180 that can clog drainage culverts and ditches, reducing water flow, or invasive knotweeds that
181 reduce riparian resiliency, destabilize streambanks and increase siltation that impacts aquatic life.
182 Flood events also create opportunities for invasive species movement.
183

184 Text Box: Scotch broom plants contain flammable oils and form large infestations with many dry
185 and dead branches. Its presence can greatly increase fuel loads and result in more intense
186 wildfires. The rapid movement of people and equipment during and post-fire may also create
187 opportunities to transport and introduce invasive species to new areas.

188 STRATEGIC DIRECTIONS

189 The Invasive Species Strategy for BC is based on the foundation of four key directions – all equally
190 important and interconnected. Each Direction includes an overview with key goals, followed by
191 indicators to collectively measure progress towards achievement of the Direction. Just as
192 collective action is required, so is collective reporting. Note that the numbering of goals is not
193 reflective of priority.

194 1. Enhance Stewardship of Lands and 195 Waters

196 British Columbia is the most biodiverse province in Canada and is home to many rich and unique
197 ecosystems, as well as many Species at Risk and culturally significant species. Invasive species
198 are recognized as one of the five direct drivers of biodiversity loss, along with land-use change,
199 pollution, climate change and natural resource use and exploitation¹³. Reducing invasive species
200 impacts, protecting biodiversity and restoring ecosystem resilience is a top priority across BC.
201 Protecting our natural and cultural diversity, and enjoyment of nature requires proactive
202 stewardship of lands and waters. Stewardship includes prevention, control, and monitoring of
203 invasive species, as well as restoration of degraded ecosystems and green spaces.
204

205 Invasive species directly impact native species and Species at Risk. On land, invasive plants such
206 as knapweeds and Sulphur cinquefoil threaten sensitive grasslands by forming large
207 monocultures that reduce native biodiversity, impact forage production and quality, and alter soil
208 nutrient composition. On the coast, critical marine and estuarine salmon habitats are threatened
209 by species such as European green crab, a voracious species that out-competes and predated
210 upon native species and disrupts ecosystems by destroying critical eelgrass habitat. In freshwater
211 ecosystems, species such as Red-eared slider turtles can out-compete native species for food
212 and habitat and spread diseases to native species, such as the endangered Western painted
213 turtle. The introduction of Brown bullhead, an invasive fish species, to Hadley Lake in the 1990s
214 led to the local extinction of the endemic stickleback fish. Other species at risk such as Coast
215 Manroot and Deltoid balsamroot, commonly associated with Garry Oak ecosystems, are impacted
216 by invasive plants such as Scotch broom and Spurge laurel. Invasive forest insects like Spongy
217 moth threaten healthy tree cover which is vital to cool communities and store carbon. Stewarding
218 ecosystems to support resiliency against the impacts of invasive species requires detection,
219 collaboration, increased resources and immediate action.

220
221 **GOAL 1: Increase Prevention:** Preventing the introduction and spread of invasive species is the
222 cornerstone of invasive species management and is the most cost-effective method to stop
223 invasive species impacts. Identifying, closing and/or restricting the numerous pathways, vectors
224 and mechanisms by which invasive species are introduced and/or transported is a top priority.
225 Effective prevention requires a strategic approach that prioritizes invasive species based on risk
226 to BC. Risk assessments for invasive species and pathways support this approach and should
227 continue to be a key priority. Investing in prevention avoids ongoing losses for management and
228 restoration, estimated in well over millions, annually.

229
230 **Text Box:** Preventing the introduction of species such as Spotted lanternfly is a priority for BC and
231 Canada. Spotted lanternfly can feed on over 100 species of trees and plants, and poses a serious
232 threat to the tree fruit, wine, and ornamental tree industries.

233
234 **Text Box:** If Zebra and Quagga mussels eventually occupy all water systems where they could
235 physically survive and thrive in BC, damages to recreational boaters, water supplies and power
236 generation infrastructure alone are estimated to cost 2023 CAD \$64 – \$129 million annually⁶.

237
238 **GOAL 2: Strengthen the ‘Rapid’ in Rapid Response:** After prevention, Early Detection Rapid
239 Response (EDRR) is necessary to effectively respond to new invasive species introductions and
240 prevent their establishment. Eradicating a species before it is established requires early detection
241 monitoring and rapid action once detected. The Province of BC has an Invasive Species EDRR
242 Plan, and specific response plans, teams and resources must be ready and available for success.
243 Increased community science reports by individuals across the province is important to
244 complement formal monitoring programs. Preventing new invasive species from establishing and
245 expanding in BC requires the right tools and joint decision-making response frameworks before
246 new incursions occur.

247 As with any emergency response situation, rapid response needs to blend professionals,
248 Indigenous and local communities, and organizations to work together to detect, report and
249 respond to ensure responses are effective.

250

251 Text Box: *Insert the classic invasive species curve illustration to depict the stages of invasive*
252 *species management from pre-arrival (prevention) to long-term control and the cost involved.*

254 Text Box: If Japanese beetle were to establish, the cost to BC's turfgrass industry alone would be
255 an estimated \$73.85 million annually⁷.

257 **GOAL 3: Improve Control, Monitoring and Restoration:** Reducing impacts from existing
258 populations of invasive species is an urgent priority across BC requiring an integrated and
259 collaborative approach. Increased consistency across jurisdictions (public and private) must be
260 achieved and supported by more collaborative local planning, increased capacity and funding,
261 and equitable access to tools and resources. An holistic approach must combine scientific, local,
262 and Indigenous knowledge, ecological restoration, long-term monitoring, and adaptive strategies.
263 Lessons learned and successes in control need to be recognized, shared and leveraged - we
264 must report on progress of invasive species management leading to restored natural diversity.

266 Standardized protocols for monitoring, and up-to-date provincial and regional invasive species
267 priorities and watch lists, are critical tools that support efforts. Establishing regional priorities
268 requires strong local involvement. Providing tailored, invasive species training opportunities for
269 industry, Indigenous and local governments, and land managers will effectively increase both
270 prevention and management. Additionally, building Indigenous and local community capacity to
271 aid with on-the-ground efforts both enhances ongoing work and supports long-term sustainability
272 of healthy ecosystems.

273 Text box: Management should not end after the treatment or removal of invasive plant
274 populations. A site-specific restoration plan, which might include promptly re-seeding or
275 planting native species, combined with continued monitoring will increase the success of
276 restoration and lead to improved ecosystem resilience.

278 Text Box: Establishing provincial and regional lists of priority invasive species through
279 collaboration is critical to establish priorities for control and monitoring across all parties. The
280 same collaboration can be used to monitor and report on progress towards protecting
281 'containment lines'.
282

283 Measuring Success

284 The following indicators and associated targets will be used to measure progress and success
285 towards Enhancing Stewardship of our Lands and Waters:

Goal	Target (*refers to data collected from provincial survey)	Indicator
1	100% of key entry pathways have formal restrictions in place and are monitored	Percentage of key entry pathways that have formal restrictions in place that are monitored
2	No new high-risk invasive species are introduced to BC	Number of new high-risk invasive species introduced to BC

2	100% response rate to all newly reported provincial EDRR species identified by the provincial or federal government	Percentage of provincial EDRR species identified by the provincial or federal government that are responded to
3	All invasive species management programs or projects are monitored for effectiveness*	Percentage of invasive species management programs or projects that are monitored for effectiveness
3	Reduced extent of invasive plants since 2012-2013 baseline AND baseline of distribution in place for other non-plant invasive species (Species TBD)	Change in extent of invasive plants since 2012-2013 baseline AND baseline of distribution established for other non-plant invasive species
3	Increasing number of organizations conducting treatments against invasive plants*	The number of organizations conducting treatments against invasive species
3	100% of treated sites restored (refers to natural areas treated only) *	Percent of treated sites restored (refers to natural area treatments only; not vector management, agricultural, human health treatments, etc.)
3	Increased collaboration with Indigenous governments on invasive species initiatives	Level of collaboration with Indigenous governments on invasive species initiatives.
3	All organizations working on invasive species collaborate with neighbouring land managers and organizations*	Percentage of groups collaborating with neighbours (to include networking, alliances, collaboration, partnerships)

2. Improve Regulations and Enforcement

Current regulations, whether established at the federal, Indigenous, provincial or local government level, enable many invasive species to fall between the 'cracks' and outside of any authority. As a result, many invasive species can be legally transported, traded, and sold. While many responsible businesses and individuals will implement 'best practices' to avoid the introduction and spread of invasive species, additional 'rules' and education of the issues are required for others. Enforcement of the current regulations is haphazard or lacking, especially on the over 94% of the province known as public land, and work is needed to improve and provide consistent and clear regulatory tools, which include legislation, policy, bylaws, and standards of practice.

In British Columbia, authority over invasive species prevention and management involves four levels of government – federal, Indigenous, provincial and local. Current regulatory tools at the different levels are inconsistent and unclear, including invasive species priority and watch lists,

300 and requirements for management and monitoring. Across all past Invasive Species Strategies
301 for BC, there has been a clear call for a single piece of over-arching provincial legislation on
302 invasive species to ensure a current and consistent foundation to prevent the introduction and
303 spread of invasive species.

304 Beyond BC, strong leadership is needed from the federal government to prevent introduction of
305 new invasive species by closing federally regulated pathways, such as international trade and
306 travel. Recent work on regulating ballast water, and responding to species like the invasive
307 mussels, Japanese beetle and Northern giant hornet demonstrate the leadership needed to
308 protect BC from new invasive species. Working closely with the Province of BC and Indigenous
309 leaders, the federal government must pair regulations with increased monitoring and enforcement
310 at key entry points. Preventing new introductions into BC, and Canada, is the first line of defense
311 to avoid future environmental, economic and cultural losses.

312 Across Indigenous Nations, while there is a growing concern about the impacts of invasive
313 species on cultural activities and food security, there are inconsistent and few regulatory tools or
314 programs. There are only a few nations with Band Resolutions and programs, and those are
315 generally limited to invasive plants. Moving forward, there is a need to unite Indigenous efforts to
316 protect traditional food supplies like salmon, wild potatoes and berries from invasive species.
317 Increasing leadership by Nations including policy and protocols, supported by resources and
318 capacity, will support local, culturally appropriate best practices.

319 Locally, there is great variation with some local governments silent on invasive species and others
320 focused on invasive plants. There is a growing awareness that local governments have a major
321 opportunity to reduce the spread of invasive species by regulating what can be sold (such as pets
322 and plants) or used for landscaping, and how soil can be moved or disposed of. There are
323 examples, such as the City of Richmond and District of Squamish, where bylaws were created
324 and implemented to prohibit aspects of selling of pets and invasive plants or requiring landowners
325 to take action against invasives species. Across the province, regional districts and municipalities
326 often lack resources and capacity to enforce legal tools, creating significant barriers to process,
327 and gaps in invasive species management. There is also the risk of inconsistency across these
328 jurisdictions which can add confusion for residents.

329 Regulatory tools at all levels must be enforced across governments, industry, property owners,
330 and any resident of or visitor to BC. Education and awareness are critical first steps to encourage
331 compliance. Both incentives and deterrents should be considered to both recognize responsible
332 actions while ensuring penalties for those that violate regulations.

333 **GOAL 4: Develop Over-Arching Invasive Species Legislation:** A single piece of co-developed
334 provincial legislation, such as an Invasive Species Act, has been, and continues to be a
335 recommended priority action since 2012. New legislation should include a comprehensive list of
336 regulated species, that can be easily updated. New legislation must continue to be co-developed
337 with Indigenous leaders, with a commitment to legal pluralism, and based on best available
338 evidence from diverse knowledge systems.

339 **GOAL 5: Improve Capacity and Compliance:** Improve enforcement capacity across all lands
340 by broadening and clearly defining authority for and by provincial and Indigenous enforcement
341 officers, local government officers, and land guardians. Consideration of incentive-based tools
342 such as tax credits or lower fees supported by industry-specific training programs and standards
343 will encourage compliance. Any fines should be re-invested in preventing and responding to
344 invasive species.

345 **GOAL 6: Increase Enforcement Investment:** Ensuring compliance against existing regulatory
346 tools is critical to improve the prevention and management of invasive species. Enforcement must

347 be equitable across all lands, which can be complicated with over 94% of BC currently defined as
 348 public land, requiring strong leadership and investment by the province. However, increasing
 349 enforcement under the current government framework requires an increase in funding within each
 350 level of government to ensure leadership and enforcement of regulatory tools.

351 Text Box: Ontario’s Invasive Species Act (2015) ¹⁰ - Amended in 2022, the Invasive Species Act
 352 provides a framework for identifying, classifying, and managing invasive species in Ontario. As of
 353 2022, 22 species are now prohibited, meaning it is illegal to import, transport, possess, or release
 354 these species anywhere in Ontario. Additionally, there are 11 restricted species that are illegal to
 355 import or release.

356 Text Box: The District of Squamish¹¹ has implemented an Invasive Species Management Bylaw
 357 that requires landowners and occupiers to prevent growth and control the spread of invasive plant
 358 species on, to and from their land. It also prohibits improper treatment and disposal of invasive
 359 species

360 Measuring Success

361 The following indicators and associated targets will be used to measure progress and success
 362 towards Improving Regulations and Enforcement:

Goal	Target (*refers to data collected from provincial survey)	Indicator
4	A single piece of co-developed legislation for BC on invasive species is enacted	A single piece of co-developed invasive species legislation for British Columbia
5	100% of governments (federal, Indigenous, provincial, local) enforce regulatory tools for invasive species*	Percentage of governments (federal, Indigenous, provincial, local) that enforce regulatory tools for invasive species

363 3. Increase Responsible Action and 364 Understanding

365 Invasive species can affect all of us, yet many do not realize or understand the impacts. They are
 366 costing billions annually and impacting our lands, waters, wildlife, and communities – and most
 367 people are not aware. A 2021 study estimated biological invasions have cost the North American
 368 economy at least CAN ~\$1.70 trillion between 1960 and 2017¹². Empowering people by
 369 increasing understanding of the small but hugely impactful actions they can each take to protect
 370 BC’s rich biodiversity is imperative. Awareness, early reporting, and simple best practices enable
 371 everyone across the province to help make a real difference for the places they know and love.

372 British Columbia is home to people from a wide range of backgrounds and cultures and is visited
 373 by millions of Canadian and international tourists every year. Diverse communication strategies
 374 are needed to successfully extend information to everyone living in and visiting the province.
 375 Moreover, the flow of communication must be reciprocal, and knowledge from all cultures must
 376 be heard and shared to strengthen education and awareness efforts by ensuring the information

377 is both meaningful and applicable.

378 It is crucial to remember key invasive species messaging and information is easily lost when it
379 does not speak to its audience. This has been a significant barrier for many people across BC,
380 who have lacked translated resources, non-technical information, and relevant knowledge that
381 can be applied to their interests, roles, and connections with the natural world. Further
382 exacerbating this issue is a tendency to provide too much information, that can quickly become
383 overwhelming to its intended audience. Less is often more, and communication strategies would
384 benefit from identifying and focusing on a small number of key messages.

385 From prevention to management, increasing public understanding of the negative social,
386 economic, environmental, and cultural impacts of invasive species and simple best practices must
387 be integrated at all phases and across local, provincial, Indigenous, and federal governments,
388 industry, and communities.

389 **GOAL 7: Ensure Accessible Communication:** Plain language, and public-facing resources on
390 invasive species must be easily accessible, ideally from a central source. Resources from a
391 central source can then be shared and adapted across the province to increase access to
392 information. It is crucial that messaging and resources be adapted for diverse ethnic communities
393 and contain strong linkages to key pathways and regionally specific information such as priority
394 invasive species lists, disposal methods and local regulations.

395 **GOAL 8: Empower Youth:** Targeting communication and education to younger audiences has
396 a huge impact both immediately, and for the future of invasive species management. The lessons
397 and values learned during childhood are often instilled throughout one's lifetime, and by teaching
398 youth about invasive species and the importance of stewardship, they are empowered to act
399 instinctively throughout their lifetime. Providing inclusive, safe space opportunities for youth to be
400 involved in invasive species management is a top priority.

401 **GOAL 9: Increase Community Science:** Increasing community science reporting engages more
402 'eyes on the ground' across the province to support early detection and awareness of invasive
403 species. Engaging individuals in volunteer activities related to invasive species results in greater
404 overall capacity, enhanced stewardship, and increased adoption of responsible practices.
405 Ensuring community science opportunities are promoted and extended to everyone in BC should
406 be a key focus, as well as supporting and recognizing community members that are already taking
407 action across BC.

408 **Text Box:** The Northern giant hornet (NGH) was first detected in BC in Nanaimo in August 2019.
409 In addition to a multi-agency response by governments in BC and Washington, a collaborative
410 approach with the public has enhanced monitoring efforts. Local beekeepers in NGH target areas
411 have been voluntarily setting traps to monitor for NGH, while a campaign to the general public to
412 monitor their hummingbird feeders, report and photograph suspected NGH has increased
413 awareness and eyes on the ground. Since 2021, no other specimens have been found in BC.

414 **Text Box:** In 2022, a keen pet store employee observed and reported invasive mussels on marimo
415 moss balls at a store in Seattle, WA. The report created an international response including the
416 Province of BC, along with Fisheries and Oceans Canada, who identified and visited all pet stores
417 in the supply chain that could have received infested marimo moss balls. Together, the aquarium
418 and pet industry with the support of government agencies removed all of the potentially infested
419 supply of marimo moss balls - all due to an informed and alert individual.

420 **Measuring Success**

421 The following indicators and associated targets will be used to measure progress and success

422 towards Increasing Responsible Action and Understanding:

Goal	Target (*refers to data collected from provincial survey)	Indicator
7	Increasing number of annual visits to invasive species websites, and followers on social media platforms*	Number of annual visits to invasive species websites, and number of followers on social media platforms
8,9	Increased awareness and responsible actions by people across BC to prevent the introduction and spread of invasive species*	Level of awareness and responsible actions to prevent the introduction and spread of invasive species
8,9	Increased number of volunteers engaged in reporting, removing and/or restoring from invasive species*	Number of volunteers engaged in invasive species activities, including reporting, removing and/or restoring

423 4. Strengthen Knowledge and 424 Practices

425 Controlling and reducing the impact of invasive species on the lands and waters must embrace
426 leading-edge knowledge and integrate diverse knowledge systems. Restoring impacted habitats
427 to more resilient ecosystems requires streamlined approaches, new technology and knowledge
428 transfer to on-the-ground managers and stewards. Whether it is protecting fragile grasslands
429 from knapweeds or precious freshwater from invasive mussels or Eurasian watermilfoil - more
430 tools, innovation and resources are needed now and into the future. Researchers, practitioners,
431 Indigenous Knowledge keepers and others must come together to build shared solutions – now
432 is the time.

433
434 The collective understanding of invasive species in BC is limited by knowledge gaps that must be
435 addressed to maintain healthy, resilient ecosystems. Identifying and prioritizing the necessary
436 research must consider practical approaches to detecting, responding and reclaiming lands and
437 waters from invasive species – all through the lens of climate adaptation. Increased research on
438 priority species must be accompanied by extension to enable application in the ‘field’. Increased
439 research and/or access to current information must be available to land managers to utilize and
440 support local management planning and activities.

441
442 Based on clear shared research priorities, supported by increased resources, increased action
443 will address critical knowledge gaps such as impacts to BC’s economy, green infrastructure, and
444 traditional practices – to name a few. It is important that new tools are developed before high-risk
445 invasive species arrive, including both pre-determined coordinated response plans and registered
446 and approved response tools. Working with resource managers, research is needed to provide
447 clear practical tools to remove invasive species and restore ecosystem resilience.
448

449 Protection and revitalization of our lands and waters hinges on the implementation of effective
450 management strategies, legal tools, and inclusion of diverse knowledge systems.

451
452 **GOAL 10: Increase Knowledge Transfer:** Understanding the principles of diverse knowledge
453 systems is vital for effective communication. Increasing opportunities to share, learn from, and
454 document diverse knowledge and perspectives can support evolving management objectives.
455 Knowledge transfer between diverse groups is essential at all levels, from community to
456 management and policymaking.

457 **GOAL 11: Improve Extension:** Increasing access to risk assessments, data, multi-level
458 prioritization models, and knowledge is critical for stewards and resource managers to strategize
459 management efforts to enhance the protection of vulnerable species and habitats along with
460 addressing economic, social, and cultural impacts. Diversifying tools and methods to extend
461 resources – such as with workshops, webinars, in-person training, forums, etc. – will support
462 knowledge transfer from researchers to non-technical audiences. Information without effective
463 extension to relevant audiences creates significant barriers to applying leading-edge knowledge.
464

465 **GOAL 12: Address Critical Knowledge Gaps:** Developing and maintaining a current list of
466 shared research needs and priorities across academia, governments, and resource managers
467 can help ensure knowledge gaps are not hindering invasive species management efforts. Some
468 examples of current priorities include:

- 469 » Economic impacts of invasive species
- 470
- 471 » Linkage to culturally significant species as food and medicine
- 472 » Effective tools to control or eradicate high-priority invasive species
- 473 » Intersection of climate adaption with invasive species management
- 474 » Impacts of invasive species to green infrastructure
- 475 » Impacts of invasive species on species at risk
- 476 » Psychology and sociology of shifting behaviours and attitudes
- 477 » Monitoring success – where have we made a difference in BC – and lessons learned

478 **GOAL 13: Increase Research Investment:** Limited funding has long been a major barrier to
479 filling invasive species knowledge gaps in BC. It is critical to establish a stable pool of funding to
480 support the long-term nature of research projects with a focus on determining innovative and
481 effective approaches to early detection and controlling invasive species.

482 Measuring Success

483 The following indicators and associated targets will be used to measure progress and success
484 towards Strengthening Knowledge and Practices:

Goal	Target (*refers to data collected from provincial survey)	Indicator
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10	Increased collaboration with Indigenous governments on invasive species initiatives	Level of collaboration with Indigenous governments on invasive species initiatives.
11,12	Increased number of new publically available research reports produced on invasive species in BC.	Number of new publically available research reports produced on invasive species in BC.
Across All	Increased investment for invasive species prevention, management, enforcement, and research*	Investment over time for invasive species prevention, management, enforcement, and research

485 Text Box: Indigenous Knowledge¹⁴ reflects the unique cultures, languages, values, histories,
 486 governance and legal systems of Indigenous Peoples. It is place-based, cumulative and dynamic.
 487 Indigenous Knowledge systems involves living well with, and being in relationship with, the natural
 488 world. Indigenous Knowledge systems build upon the experiences of earlier generations, inform
 489 the practice of current generations, and evolve in the context of contemporary society.

491 Text Box: Emerging technologies have the potential to enhance invasive species management.
 492 These may include aerial and land-based drones for monitoring and treating invasive species,
 493 and environmental DNA technologies which can detect even rare invaders through the DNA
 494 fragments they leave behind. Effective and perpetual invasive species management will rely on
 495 the continued research on, and application of, the latest and most efficient detection and
 496 management technologies.

497 Next Steps

498 Protecting British Columbia from the escalating impacts of invasive species requires new and
 499 inclusive collaborative approaches, supported by increased awareness, action and extension of
 500 resources. As emphasized throughout this Strategy – as well as in all previous invasive species
 501 strategies for BC – increased investment is mandatory to improve prevention, management
 502 activities, enforcement, and research. Furthermore, we must strive to ensure invasive species are
 503 included as key components of biodiversity and ecosystem health related initiatives in BC. As one
 504 of the five direct drivers of biodiversity loss, invasive species must be recognized as a priority now
 505 and in the future, with clear actions to address their existing and potential impacts. Integration of
 506 invasive species into ongoing and future initiatives will support the goals outlined in this Strategy,
 507 while helping to create a cohesive provincial vision for biodiversity and ecosystem health in BC.

508 By implementing this Strategy, we can advance our commitment and action toward important
 509 federal, provincial and local priorities. Taking necessary steps to support reconciliation will
 510 improve our relationships with each other and with the land and set a meaningful example for
 511 years to come. The framework outlined in this Strategy will also set us on a forward path to
 512 protecting biodiversity across the province – whilst supporting large scale global targets and
 513 increasing ecosystem resiliency. By working together, acknowledging and reflecting diverse
 514 knowledge systems, we can prevent establishment of new invasives species and restore the
 515 health of ecosystems that have already been negatively impacted.

516 Text Box: Key biodiversity and ecosystem health initiatives in British Columbia:

- 517 • [BC Climate Preparedness and Adaption Strategy](#)
- 518 • [BC Watershed Security Strategy](#)
- 519 • [BC Coastal Marine Partnership](#)
- 520 • [BC Wild Salmon Strategy](#)
- 521 • [Together for Wildlife Strategy](#)
- 522 • Other initiatives and programs listed by the [Province of BC](#).

523 Who Needs to be Involved?

524 Tackling invasive species challenges must be done through strong collaboration across all levels
525 of government – federal, provincial, Indigenous, and local; non-governmental organizations,
526 industry, communities, and all those who touch the land. Increased collaboration and action
527 across the natural resource sector can lead to major strides forward in invasive species prevention
528 and management efforts. Heightened awareness and urgent action must also extend to everyone
529 associated with invasive species pathways, such as travel, trade, and outdoor recreation, as this
530 is a key area where substantial action can be taken, especially for prevention – the cornerstone
531 of invasive species management.

532 Whether you are an avid gardener, mountain biker, rancher, public land manager, or all of the
533 above – there is an opportunity for each one of us to be a part of the solution. Everyone can play
534 a role in protecting the lands and waters from new and existing invasive species. From being
535 alert and reporting, or taking responsible action at work, home, and play – everyone can make a
536 difference.

537 The time to act is now, to heal impacted ecosystems and communities, and protect our lands and
538 waters for future generations.

539 Text box: Visuals of impacts of invasive species such as Parrot’s feather, feral pig, Eastern grey
540 squirrel, Yellow floating heart, Rush skeletonweed, European green crab, Japanese beetle, feral
541 rabbits

542
543 Text box: Visual of rancher or grasslands or crop/livestock in field – *“From conservation
544 managers to ranchers – we all must be good stewards of the land to protect it for future
545 generations.”*

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