Invasive Species Council of BC

Monitoring for Success

of the Invasive Species Strategy for British Columbia

Provincial Survey Report
2018 – 2022

ACKNOWLEDGEMENTS

Thanks to the agencies, organizations, and individuals that contributed and provided input through the Monitoring for Success Provincial Survey distributed in early 2023. Additionally, thank you to all of those who have provided ongoing input on the development of the Monitoring for Success Framework (2012-2017), the associated provincial survey, and who have been involved since inception. Continued contribution and participation allow us to monitor and track trends over time, providing valuable information that will help shape future provincial invasive species strategies and the array of work undertaken in British Columbia.

Gail Wallin and Dr. Nick Wong of the Invasive Species Council of BC led the development of this report, with data analysis and writing by Stephanie Woods, founder of Woods Environmental and Conservation Services. Special thanks to Crystal Chadburn, senior invasive plant specialist with the Ministry of Forests, for supporting the development of this report.

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Executive Summary

The development and release of the Invasive Species Strategy for British Columbia (the Strategy) began in Spring 2012 and was revised in 2017 for the next five-year period, through collaboration and support from multiple partner organizations and agencies across British Columbia. From 2012 to 2017, the provincial Inter-Ministry Invasive Species Working Group (IMISWG), the Invasive Species Council of BC (ISCBC), federal government, local government, regional invasive species organizations, industry, non-governmental organizations, formed a diverse advisory committee to develop a monitoring framework to measure success towards the commitments made in the Strategy. In late 2016, the Monitoring for Success (MFS) Framework was used to create a provincial survey. Each survey question was originally based on an indicator developed by the advisory committee. The survey was distributed each five-year period to measure the success of the current Strategy in early 2017 and in early 2023. Participation in the survey from all organizations, groups and individuals involved in invasive species management in the province was encouraged. This report summarizes all input received during the 2023 survey process and direct reporting from government agencies. This report also shows trends over time, and where relevant, compares the 2017 results to the 2023 results. For the first time, we are now able to see a longer-term picture of how BC is doing as a province on invasive species management from 2012 to 2022.

Knapweed Removal at Lake City Secondary School. Photo Credit: ISCBC

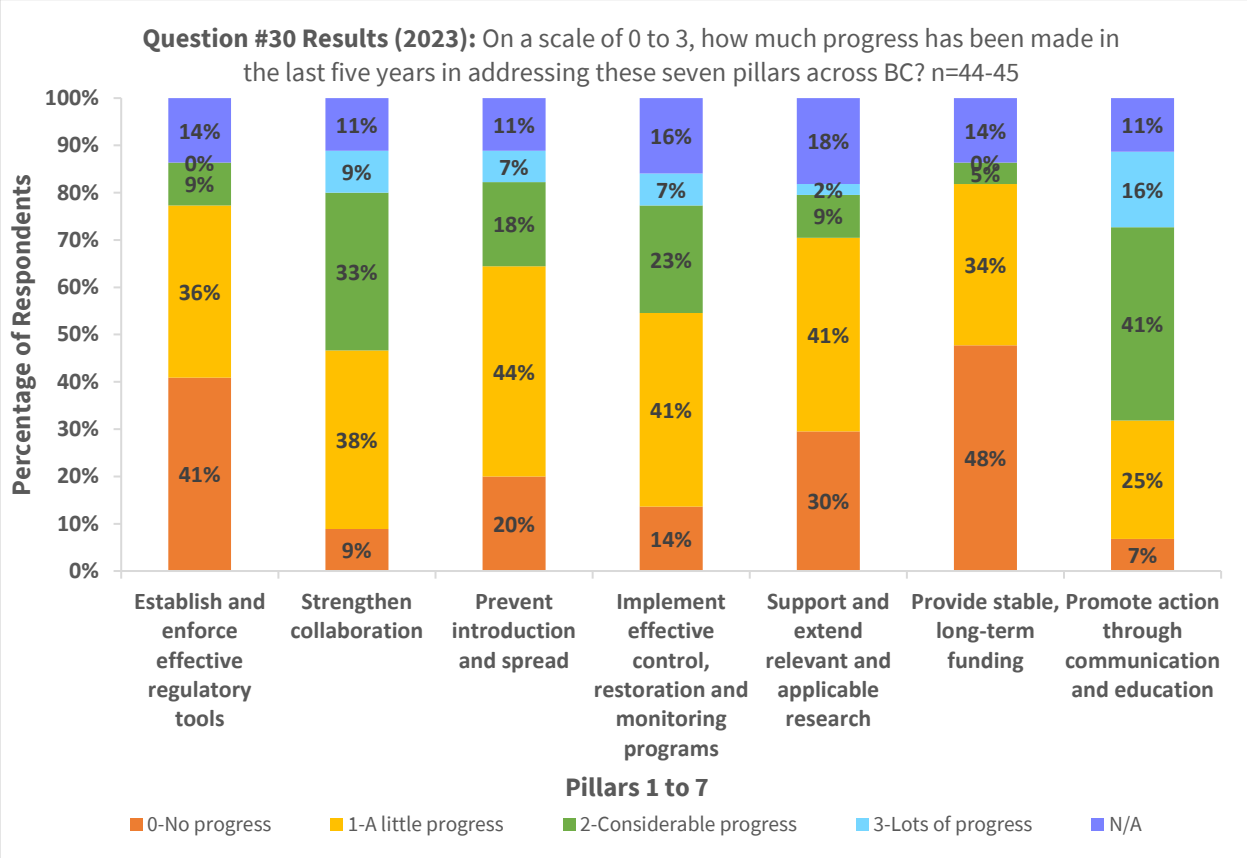
A Few Highlights!

- 11% increase in proactively monitoring for compliance since 2017.
- 20% increase in respondents monitoring for compliance with enforcement actions.
- 97% of all respondents are involved in some form of work with other groups indicating a high level of collaboration.
- Most changing behaviour programs show an increase in public behaviour change or are stable, except for Clean, Drain, Dry.
- 75% of respondents receive funding from external sources.
- 63% of respondents have reported an increase in budget in the past 5 years.
- The average annual budget across all respondents for invasive species is approximately $420,000.
- 59% of respondents have volunteers that assist their organizations.
- 62% of respondents have increased the number of volunteers engaged over the past five years.

So how did we do?

It was important to take the opportunity in the 2023 survey to ask participants how they thought we have collectively done towards achieving the pillars as outlined in the provincial Strategy in the past

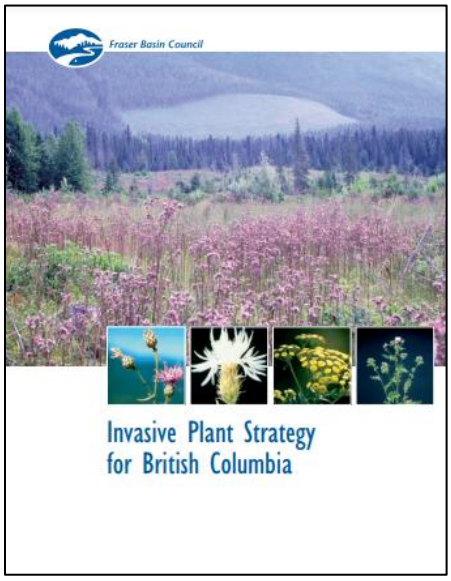
five years. Question #30 from the survey was designed to qualitatively measure the participant's perception of how organizations and governments across BC have done over the five-year period. Below are the survey result highlights.



1.0 - Background: The Evolution of the Invasive Species Strategy of BC and the Monitoring for Success Framework

Invasive plants have long been a concern in British Columbia dating back as far as the time of the BC *Thistle Prevention Act* of 1895. Increasing concern that agricultural "weeds" were spreading began in the 1970s and early 1980s, and Provincial and local government agencies responded through a variety of invasive plant treatment programs, including introduction of weed biocontrol into BC. Increased management was encouraged by the BC Cattlemen's Association resulting in the formation of the "knapweed action committee" and targeted treatment crews. Local livestock based "weed committees" began to form in the 1980s as well, which then evolved into the establishment of four initial regional weed committees in the 1990s in the Boundary, East Kootenay (in partnership with the Kootenay Livestock Association), Okanagan-Similkameen and Southern Interior of BC.

Years 2000-2012



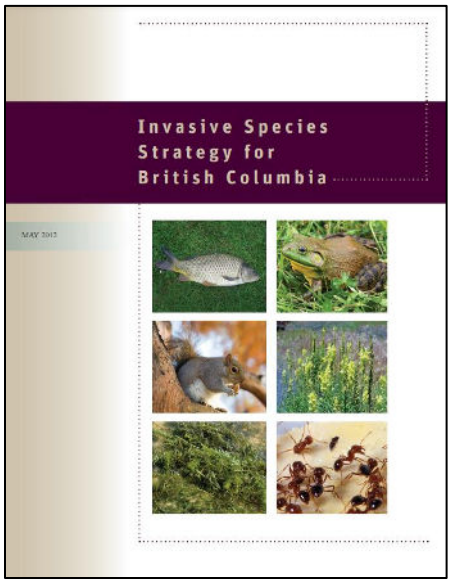
In 2000, invasive plants continued to be a growing concern for ranchers and rural communities and by 2002, there was a call for a more collaborative approach to manage agricultural "weeds" in BC. During this time, regional and provincial workshops were held to develop an innovative strategy for the province. With this input and direction, the *Invasive Plant Strategy for BC* was born in 2004! The Strategy dictated the mandate, design and development of the Invasive Plant Council of BC (IPCBC). Following the release of the Strategy, the newly established provincial Inter-Ministry Invasive Plant Committee, the IPCBC, and other partners began tackling the ten solutions defined in the original Strategy. Building cooperation, supporting coordinated research, compiling common lists of invasive plants, and strengthening regulatory tools were key initial activities, along with the call for stable long-term funding.

The IPCBC and the provincial government worked together to grow the number of regional non-profit organizations, growing to 12 regional non-profit organizations by 2017. Many regional invasive species organizations started as invasive plant committees focusing on education and awareness.

As knowledge of impacts and pathways of introducing and spreading invasive species grew, there was a call to broaden the IPCBC's mandate from solely invasive plants to include all invasive species. In 2012 the IPCBC's mandate evolved to focus on all invasive species – and the Council became the Invasive Species Council of BC (ISCBC). This change was in line with a number of other organizations and agencies also shifting to a broader invasive species mandate. The provincial Inter-Ministry Invasive Plant Committee had also already expanded its mandate, offically becoming the Invasive Species Inter-

Ministry Working Group (IMISWG) in November of 2009. Most regional invasive species organizations followed this trend over time, expanding from plants to all invasive species.

Years 2012-2016

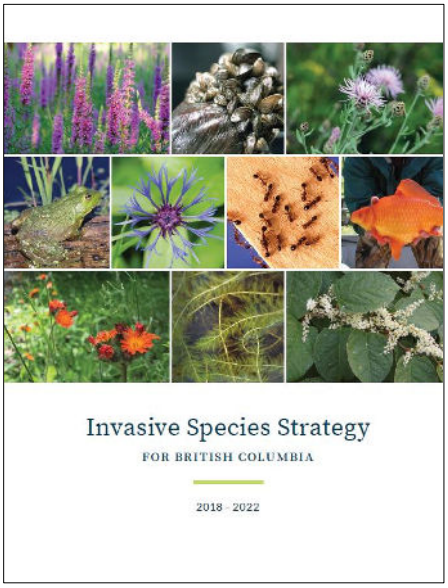


The *2012–2016 Invasive Species Strategy for BC* (the Strategy) was released in 2012 by Minister Steve Thomson of Forests, Lands and Natural Resource Operations. Building on the foundation of the original Invasive Plant Strategy for BC, the new Strategy was developed through nearly two years of stakeholder input and consultation. A provincial writing team, composed of key stakeholders involved in invasive species management, played a central role in its creation. The ISCBC served as the secretariat for the process and continues to fulfil this role today.

To work towards the Strategy's vision that "British Columbia's citizens, ecosystems, and resources are protected from invasive species impacts," there was a need to develop a monitoring framework to determine if current management efforts were successful. The IMISWG and ISCBC, with input from others, including governments and regional committees, established an advisory committee to collaborate on ideas, provide advice and support towards developing a monitoring framework for the success of all invasive species initiatives in BC.

Building off of the Strategy's solutions and goals, a Monitoring for Success (MFS) Framework was created during 2012 and 2013. In late 2016, the MFS Framework was used to derive one or two survey questions for each goal, and was finalized between the ISCBC and the IMISWG.

Years 2017-2022



In early 2017, the provincial survey was distributed broadly across BC, encouraging participation from all organizations, groups and individuals involved in invasive species management in the province from 2012 to 2016. The *Monitoring for Success of the Invasive Species Strategy of British Columbia Report* was distributed in 2017. The report summarized all input and feedback received during the survey process and set a baseline to compare against for future measurement.

Concurrently, during this time, the ISCBC, a consultant and partners worked through a series of sessions to update the Strategy to reflect the province's invasive species vision for the 2018-2022 timeframe. Since the 2012-2016 Strategy, promoting action through communication and education emerged as a key area that hadn't fully been defined. In the *2018-2022 Strategy*, the six "Solutions" were redefined as "Pillars," and a seventh

pillar was added to promote action through communication and education. Similarly, the "Goals" were incorporated into a concise "Key Actions" list.

From 2017 to 2022, work toward the Strategy's vision of invasive species in BC evolved. Indigenous reconciliation, braiding Indigenous, local, and Western science approaches, climate change, biodiversity loss, and working with volunteers and youth emerged as key focus areas.

2023 and Beyond

In early 2023, the provincial MFS survey was updated with new areas of interest since the first distribution in early 2017. The updated survey was distributed and open from January through March 2023. A dedicated MFS and Strategy webpage was created, providing background information and links to the survey. The survey was promoted on social media platforms, through email to the ISCBC networks, the 2023 ISCBC Annual Forum, and through the Invasive Species Strategy advisory team.

A New Version of the Strategy Needed to be Envisioned

In late 2022-early 2023, the ISCBC again convened a diverse team of advisors to guide the new *2024-2028 Strategy*. Advisors recognized some "themes" that needed a bigger focus and four additional input workshops were held. Therefore, the seven "Pillars" have taken the shift to "Strategic Directions" and the "Key Actions" evolved into "Key Directions". Incorporated in each is strategic direction, a deeper focus on Indigenous knowledge, reconciliation, collaboration and support, climate change, and working with youth and volunteers.

2.0 - Purpose

The purpose of the monitoring for success analysis and report is to measure change over time towards reaching the goals outlined in the Strategy. The MFS Framework, provincial survey, direct government engagement, and the resulting report showcasing the results, serve as the method of tracking provincial trends over time. In 2017, the ISCBC reported on the baseline results. Now, in 2023, the following report showcases the MFS results of the 2018-2022 Strategy and, in key areas of interest, highlights the trends over time since the 2012-2016 Strategy. The results continue to be a baseline from which to measure the success of the Strategy every five years.

3.0 - Survey Methodology

The 2012-2016 Strategy is organized around six solutions and eleven goals to address the challenges of invasive species management in British Columbia. In 2012, the IMISWG and ISCBC worked to assemble an advisory group that was representative of the different levels of invasive species management in the province to provide their expertise in developing the monitoring framework. With the ISCBC acting as the secretariat, the advisory group began developing the framework around the six solutions and

eleven goals. Within each solution and goal, there is a list of objectives and preliminary actions. During the MFS Framework building process, the advisory group designed a set of indicators to represent each goal, but due to the large number of objectives and actions in the Strategy, not all all objectives have an indicator outlined. These indicators were then used to create suggested survey questions to gather the necessary information to develop a Provincial Monitoring for Success Survey ('Provincial Survey'). Before distribution, the IMISWG provided input on the draft survey and confirmed the final draft in late 2016.

SurveyMonkey was used to create a survey, featuring multiple-choice, Likert-scale and open-ended questions. A Likert-scale question is a type of survey question used to measure people's attitudes, opinions, or perceptions. A mixture of question types was used to capture the diversity of invasive species activities across the province. In January 2017, the Provincial Survey was distributed through ISCBC networks, shared via listservs and made publicly available.

In late 2022, the Provincial Survey was updated to include questions that targeted areas that had evolved in the latest version of the Strategy. Key questions were added around Indigenous engagement, volunteer work, case studies, research, funding, and gathering input on updating the Strategy for 2024-2028. In 2023, the survey was available online and distributed to the ISCBC networks, Indigenous, federal, provincial, and local governments, regional invasive species committees and other non-profit organizations, academic researchers, stewardship groups and community organizations, and the general public.

4.0 - Survey Results and Discussion

SurveyMonkey, was used to capture participant responses. 71 people (*n*=71) and 58 (*n*=58) organizations completed the survey. This is a large increase in the number of organizations that completed the survey in 2017 (*n*=37). While reviewing the survey results, it is important to consider which organizations and/or individuals participated and have, therefore, influenced the results on behalf of the province. It is important to note there were significantly more First Nations and consultants reporting in 2023 than previously. For a full list of organizations that completed the survey see Appendix A.

Survey Participant Breakdown
- Non-Governmental Organization – 32.76%
- Local Government – 25.86%
- Indigenous – 18.97%
- Business/Industry – 13.79%
- Federal Government – 5.17%
- Provincial Government – 3.45%

Although the results of the survey questions spark a wide variety of discussions, only high-level strategic discussion is targeted in this report and not every question asked is discussed. Please see section 6.0 Recommendations and Considerations for more information.

This results section will focus on the survey results of the 2018-2022 Strategy and the resulting 2023 survey; however, the 2017 survey results have been selectively inserted to compare and to begin to see trends over time. Please see the exectitive summary from the previous Monitoring for Success of the 2012–2016 Invasive Species Strategy for British Columbia here.

4.1 - Establish and Enforce Effective Regulatory Tools

PILLAR 1

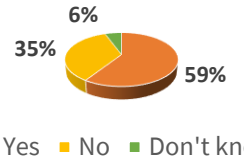
Questions 1 - 4 were used to measure the success of establishing and enforcing effective regulatory tools.

Question 1: Progress towards the creation of a single piece of legislation, such as an Invasive Species Act, was established as an indicator for this pillar. The BC provincial government is responsible for this regulatory tool and reported that it has not been completed at the time of the survey, but that there continues to be much-continued discussion about it and remains a priority objective for the future.

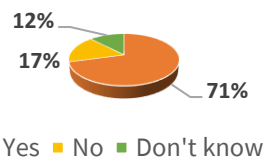
For the remainder of the questions under this pillar, the respondent is first asked to clarify if their organization has legislative and/or regulatory responsibilities, and only those that responded yes were permitted to provide answers to questions 3 and 4 (see below).

The slight majority of respondents stated they have legislative and regulatory (including bylaws) responsibility (Q2). The majority of these respondents stated they monitor regulatory compliance (Q3). Lastly, just over half of these respondents said their organization monitors for compliance with enforcement actions (Q4).

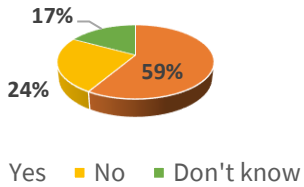
Question #2 Results (2023): Does your organization have legislative and regulatory (including bylaw) responsibilities? *n*=71



Question #3 Results (2023): Does your organization monitor regulatory compliance? *n*=41



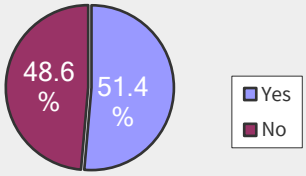
Question #4 Results (2023): Does your organization monitor compliance with enforcement actions? *n*=41



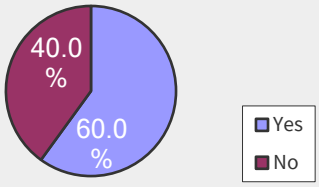
Flashback to 2017

Compared to monitoring for success results of the 2012-2016 Strategy, there have been steady increases in having legislative and regulatory responsibilities (51% in 2017 to 59% in 2023), monitoring regulatory compliance (60% in 2017 to 71% in 2023) and monitoring compliance with enforcement actions which showed the largest increase (39% in 2017 to 59% in 2023).

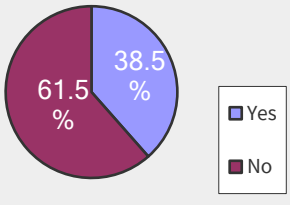
Question #2 Results (2017): Does your organization have legislation and regulation (including bylaws) responsibilities? If "Yes", please proceed to Question 3, if "No" proceed to Question 6. *n*=37



Question #3 Results (2017): Does your organization proactively monitor for compliance with legislation? *n*=25



Question #4 Results (2017): Does your organization monitor for compliance with enforcement actions? *n*=26



4.2 - Strengthen Collaboration

PILLAR 2

One question (Q5) was used to measure the success of Pillar 2: Build Strong Collaboration and Coordination to determine at what scale organizations are working alongside others in invasive species initiatives. In the 2012 to 2016 period, the MFS advisory committee classified collaboration using a continuum scale: networking, alliances, collaboration and partnership (see Question #5 results below for definitions). A comparison of 2012-2016 to 2018-2022 results is displayed in Question #5 results below.

In 2023, the majority of respondents worked with other groups at the level of "networking" but many also worked with groups in the form of alliances, collaboration and partnership:

Question #5 Results

- *Networking:* 82% in 2017 to 80% in 2023 – stable
- *Alliances*: 67% in 2017 to 43% in 2023 - decrease
- *Collaboration:* 73% in 2017 to 75% in 2023 - stable
- *Partnerships*: 64% in 2022 to 48% in 2023 - decrease
- *Other*: Not an option in the question in 2017 to 8% in 2023 - increase
- *n*=33 in 2017 and *n*=65 in 2023

Although these results indicate an encouraging level of joint efforts, similar to 2017, the results may also indicate that there is potential to increase collaboration from the "networking" level to include more "alliances" and "partnerships" to target more invasive species management issues collectively.

Definitions:

Networking: Organizations have separate budgets, and they come together to discuss common issues and potential opportunities.

Alliances: Organizations come together to support an issue or policy change.

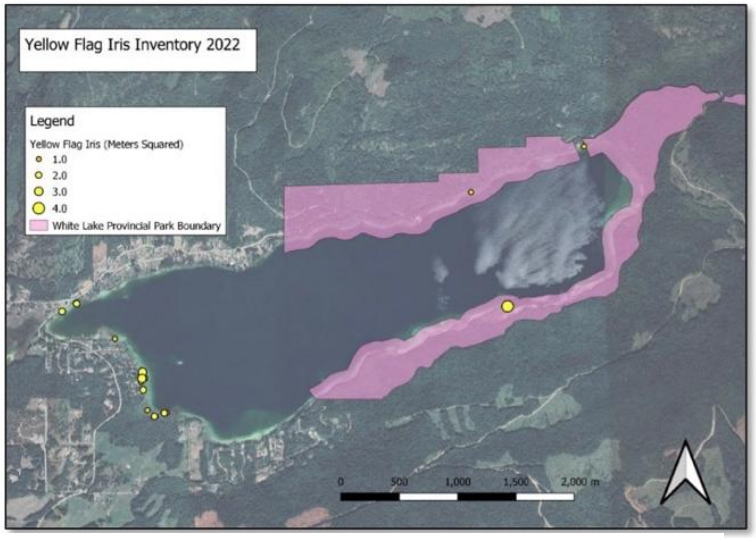
Collaboration: Organizations are actively engaged in a project and have a functioning relationship with some joint sharing of resources.

Partnerships: Organizations are actively engaged in a project together and share a common budget around an activity or initiative.

Case Study: Columbia Shuswap Invasive Species Society (CSISS) - Shuswap Yellow Flag Iris Project

CSISS report submitted by Robyn Hooper, CSISS, Executive Director: "In 2022, the CSISS completed detailed site inventory and mapping program for invasive yellow flag iris in sites around the Shuswap.

Yellow flag iris infestation on Little White Lake (left), Deadheaded yellow flag iris stalks (centre), CSISS staff and volunteers deadheading (right)



Yellow flag iris infestation on Little White Lake in 2022. Photo credits: CSISS

In 2022, there was a combined infestation size of 0.0884 Ha in the Shuswap: 0.0031 Ha at White Lake, 0.0645 at Ha Little White Lake, 0.0199 Ha at Gardom Lake, 0.0001 Ha at McGuire Lake and 0.0006 Ha at Turner Creek. A total of 0.0724 Ha were treated (mechanically or dead-heading to prevent seed spread): 0.0031 Ha at White Lake, 0.0645 Ha at Little White Lake, 0.0161 Ha at Gardom Lake, 0.0001 Ha at McGuire Lake, and 0.0006 Ha at Turner Creek. Many more sites were treated by local residents at Gardom Lake. CSISS saw reductions in total infestation size at White Lake, Gardom Lake and Turner Creek and the Salmon Arm Bay Nature Enhancement Society Foreshore Trail site has been eradicated. Monitoring and further treatment are recommended for future years.

4.3 - Prevent the Introduction and Spread of Invasive Species

Eight questions (Q7-14) were constructed to measure the success of Pillar 3. Some questions from the 2012 to 2016 MFS period were removed or incorporated into others for efficiency. Additionally, a new question was added to capture more detail to capture if key entry pathways were being monitored. (Q14).

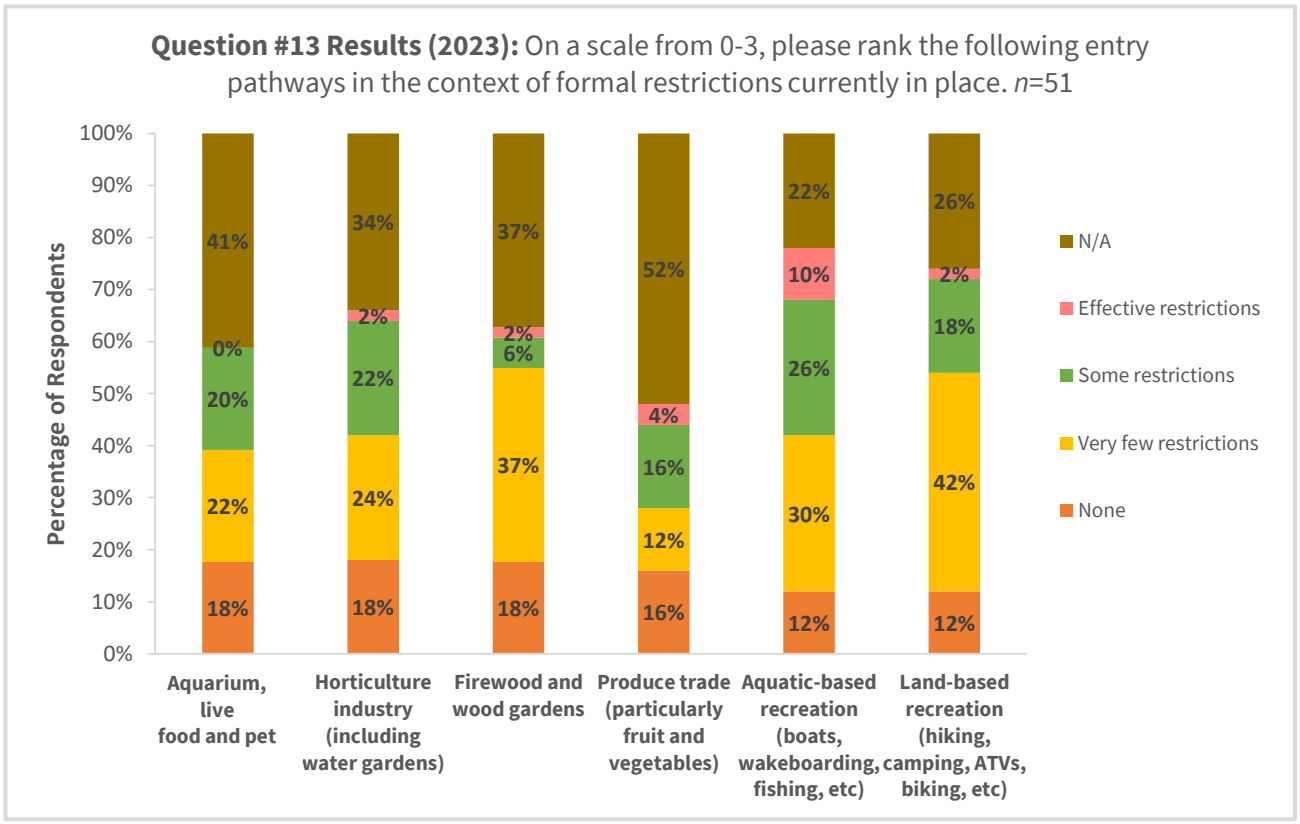
4.3.1 - Key Entry Pathways: Restrictions and Monitoring

A Likert-scale question was used to measure if key entry pathways have formal restrictions in place:

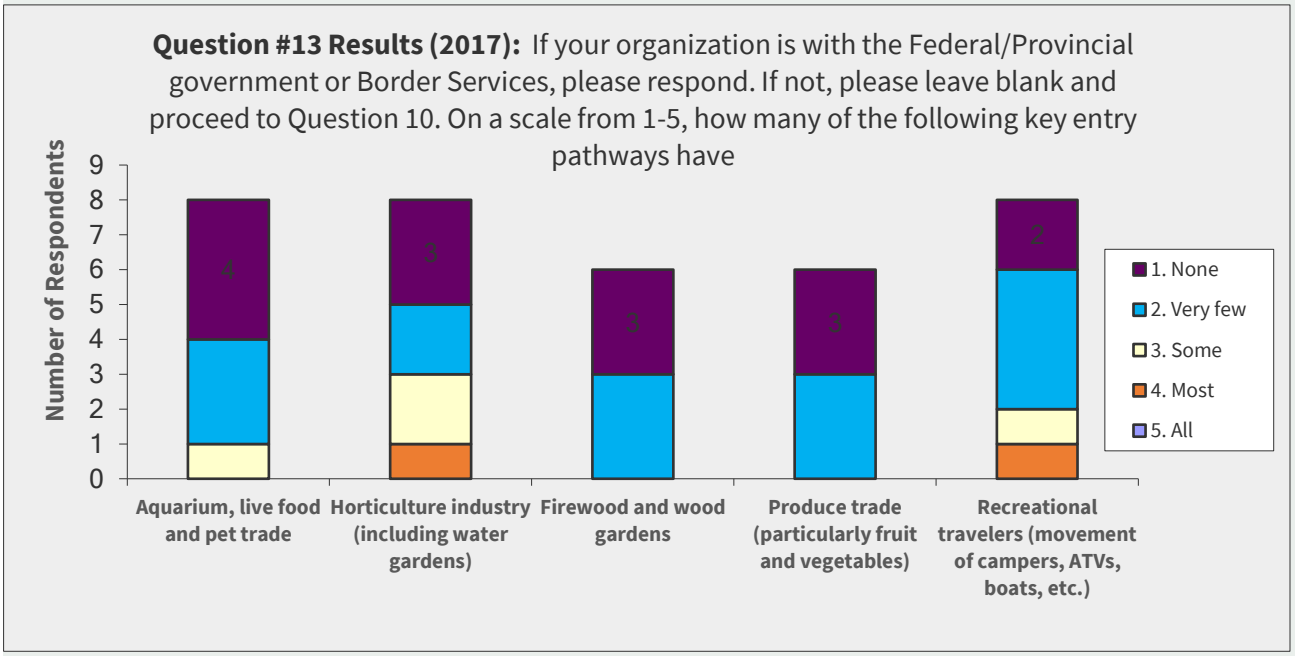
Question #13 Results (2023):

- A*quarium, live food and pet trade:* the majority of respondents indicate that information is not available (N/A) or very few key entry pathways have restrictions in place.
- *Horticulture industry, including water gardens:* the majority of respondents indicate that information is not available (N/A) or very few key entry pathways have restrictions in place
- *Firewood and wood gardens:* the majority of respondents indicate that there are very few restrictions in place or that the information is not available (N/A).
- *Produce trade, particularly fruit and vegetables:* the majority of respondents indicate that information is not available (N/A), very few or no key entry pathways have restrictions in place.
- *Aquatic*-based recreation (boats, wakeboarding, fishing, etc.): the majority of respondents indicate that there are very few or some restrictions in place.
- *Land*-based recreation (hiking, camping, ATVs, biking, etc.): the majority of respondents indicate that there are very few or no key entry pathways have restrictions in place.

Although the majority of respondents indicated N/A (meaning they did not have a responsibility or information to report on this indicator) or there are very few restrictions in place for key entry pathways, results show that some are being targeted and some have been identified as being effective. In the 2012-2016 results, this question was only asked of provincial and federal governments. However, in 2023, the question was expanded to all respondents, the Likert-scale was shifted to be more effective in measurement, and recreation was separated into aquatic and terrestrial. This baseline data on key entry pathways will be valuable for comparison with future measurements of these key entry pathways.



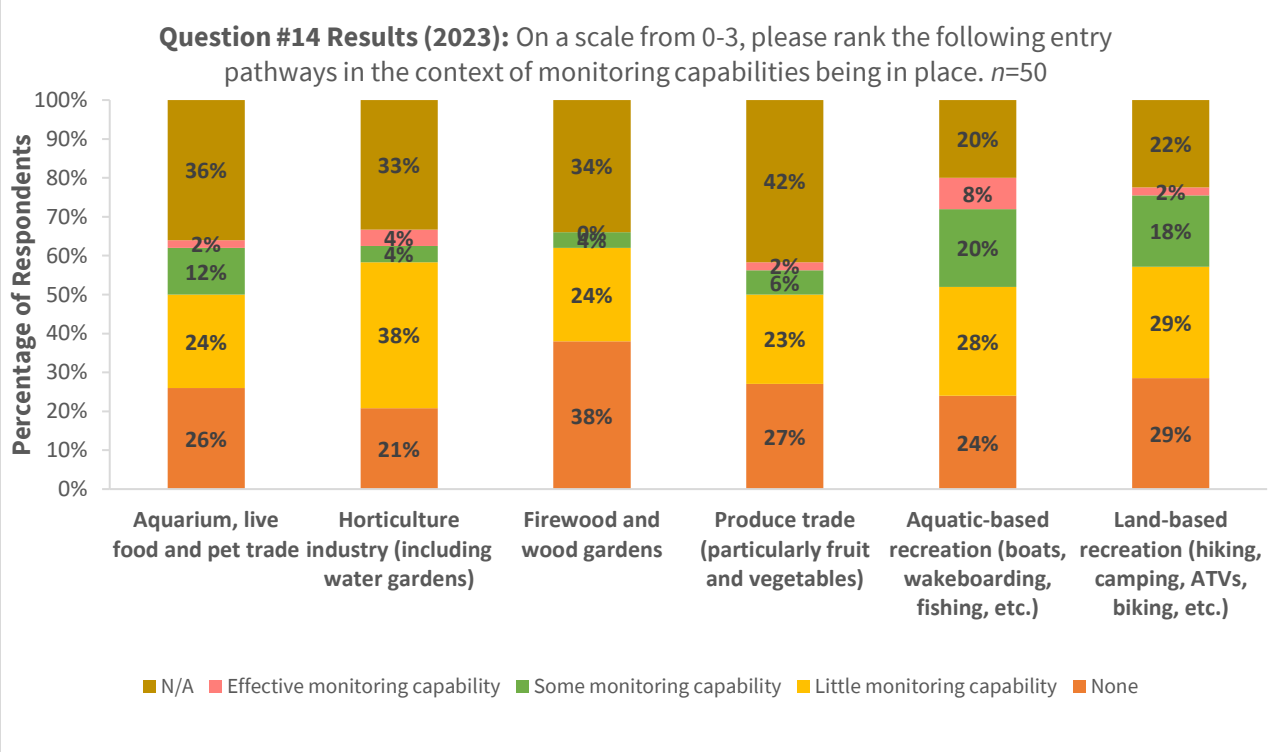
Flashback to 2017



For the 2018 to 2022 period, a new question (Q14) was added to the survey to capture if key entry pathways were being monitored. Similarly, a Likert-scale question was used to measure if key entry pathways are being monitored, and like question 13, N/A (meaning they did not have a responsibility or information to report on this indicator):

Question #14 Results (2023):

- A*quarium, live food and pet trade:* the majority of respondents indicate that information is not available (N/A), or no key entry pathways have monitoring capability.
- *Horticulture industry, including water gardens:* the majority of respondents indicate very few key entry pathways have monitoring capability or that the information is not available (N/A) .
- *Firewood and wood gardens:* the majority of respondents indicate that no key entry pathways have monitoring capability or that the information is not available (N/A).
- *Produce trade, particularly fruit and vegetables:* the majority of respondents indicate that information is not available (N/A), or no key entry pathways have monitoring capability.
- *Aquatic*-based recreation (boats, wakeboarding, fishing, etc.): the majority of respondents indicate that there is little monitoring capability or that no key entry pathways have monitoring capability.
- *Land*-based recreation (hiking, camping, ATVs, biking, etc.): the majority of respondents indicate that there is none or little monitoring capability.



Case Study: The Battle of 46 - Broombusters Removal from Parksville Interchange

Reported by – Joanne Sales, Broombusters: "*Broombusters has over six hundred volunteers in fourteen municipalities plus four regional districts. They Cut Broom in Bloom. Where volunteers are working, broom*

is disappearing. The technique and partnership work!"

"The Battle of Hill 46" was a Regional District project along Parksville interchange 46 on Hwy 19. Joanne Sales with Broombusters describes: "*Interchange 46 had large, dense broom well established on all banks and round hills. Work had been done on parts of Interchange 46 for a few years, but in 2019, the work got serious. We had a few community cuts clearing the banks of the large broom. Then one man, Jim Gledhill got inspired and took on the challenge for himself. He called it "The Battle of Hill 46." He spent well over 100 hours each year cutting new areas of the broom – while in bloom. (199 hours in 2022). Some follow up was needed after cutting, but not much. In 2022, his work was complete, so Jim has now moved on to cutting along Hwy 19*". Take a look at the photos that showcase an amazing amount of effort and success!

Before broom removal

A clear bank

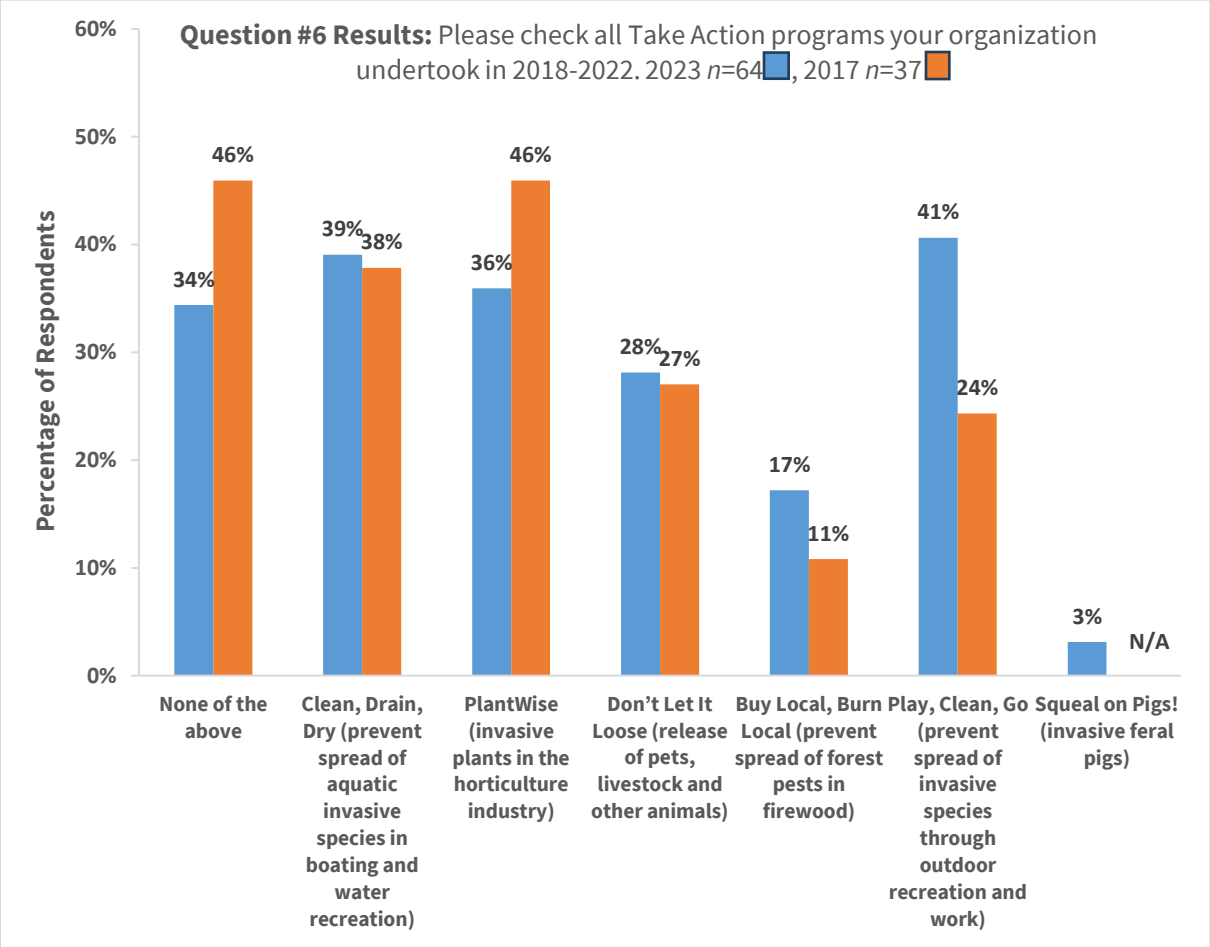
Broombusters team 2019
Photo credit: Broombusters

4.3.2 - Undertaking Responsible Behaviour: Behaviour Change Programs

Over the past ten years, provincial invasive species behaviour change programs have continued to expand. Here, trends over time reflect the growth in organizations adopting behaviour change programs and in some cases, a shift in some of the topics targeted from 2012-2016 to 2018-2022. It is important to note that since the number of respondants increased substantially for the 2018-2022 survey, the increase in organizations not adopting any behaviour change programs shown below may not actually indicate that organizations have stopped using behaviour change programs and rather may just indicate that a portion of the new respondants do not use them.

Question #6 Results (2023):

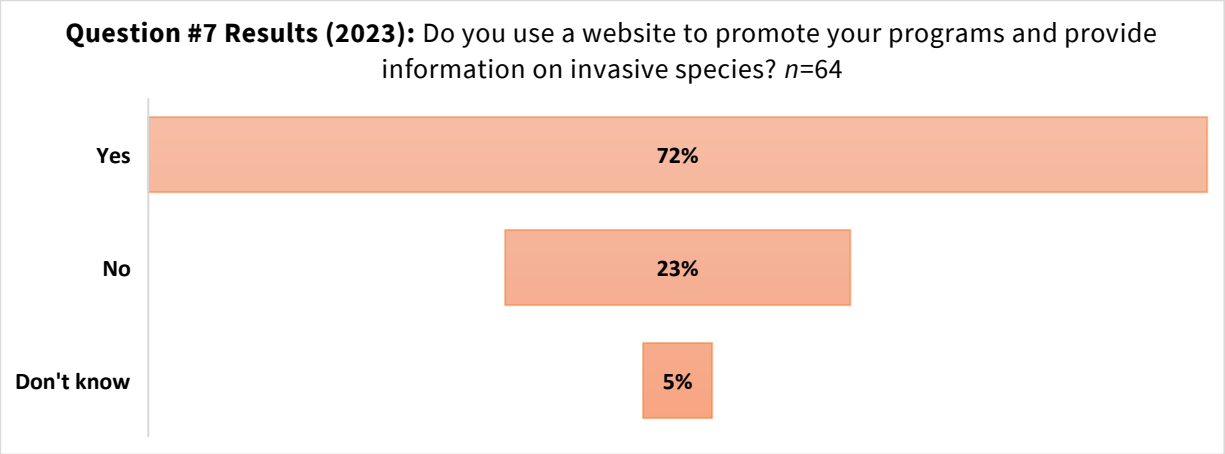
- *Clean, Drain, Dry:* 46% in 2017 to 34% in 2023 - decreasing
- *PlantWise*: 38% in 2017 to 39% in 2023 - stable
- *Don't Let it Loose:* 27% in 2017 to 28% in 2023 - stable
- *Buy Local, Burn Local*: 11% in 2017 to 17% in 2023 - increasing
- *Play, Clean, Go*: 24% in 2017 to 41% in 2023 - increasing
- *Squeal on Pigs*!: N/A in 2017 to 3% in 2023 – increasing as it was not a program from 2012-2016
- *None of the above*: N/A in 2017 to 8% in 2023 – increasing as it was not an option in the 2023 survey
- *n*=37 in 2017 and *n*=64 in 2023



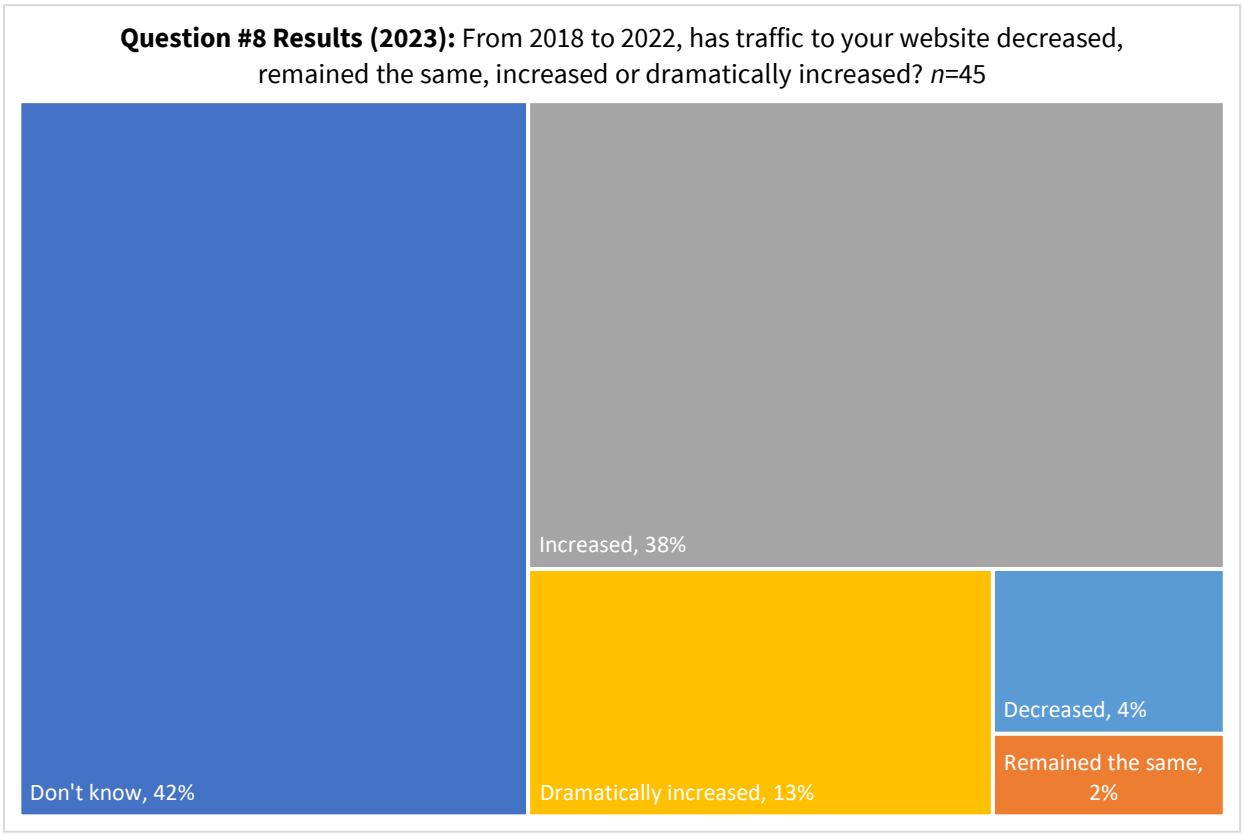
4.3.3 - Active Communication Through Technology and Social Media

The MFS advisory committee identified active communication through technology and social media as an objective under this pillar. In 2023, five questions (Q7-11) were used to measure technology and social media usage.

The large majority of respondents use a website to promote programs and provide information on invasive species (Q7).



Many respondents don't know if traffic to their website has decreased, remained the same, increased or dramatically increased over the past 5 years (Q8).

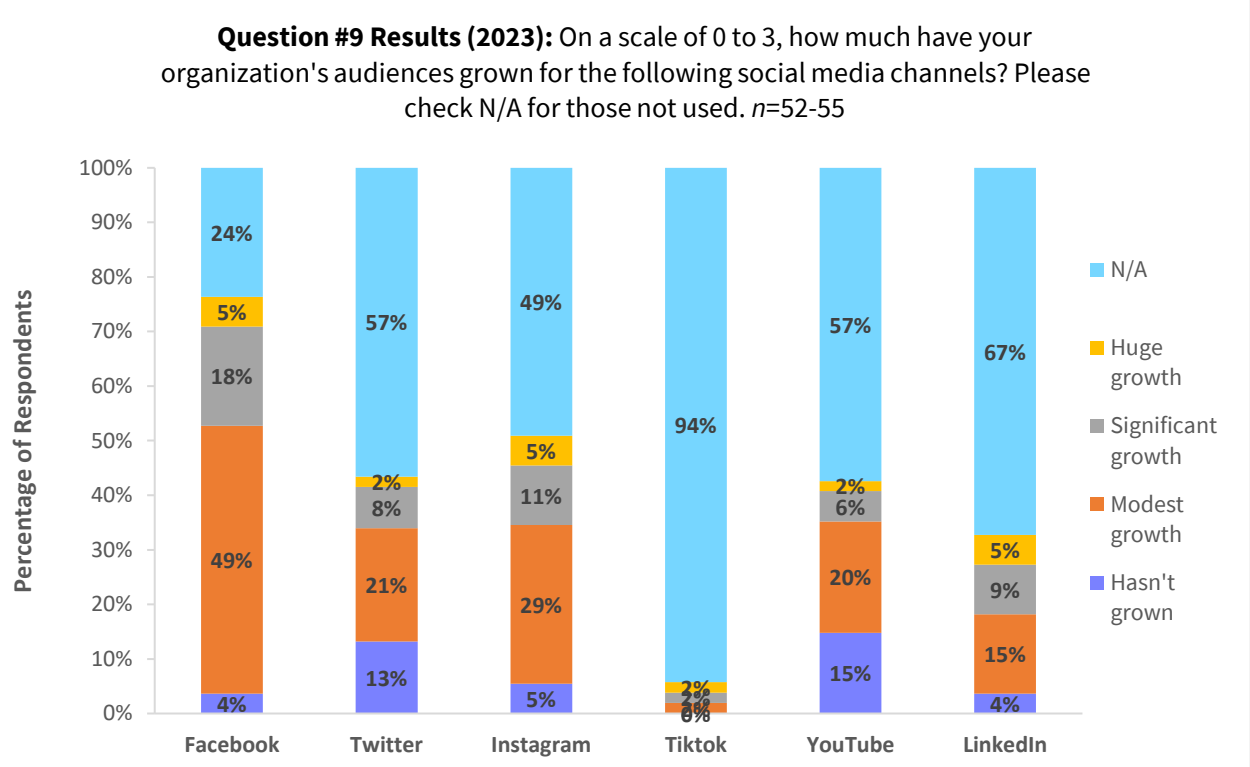


Audience growth in social media channels has been measured differently in 2023 compared to 2017, as 2012-2016 data was insufficient due to a small number of participants being able to report the exact sizes of audiences. A Likert-scale question was implemented and trends over time will be more notable in the 2024-2028 MFS report.

Question #9 Results (2023):

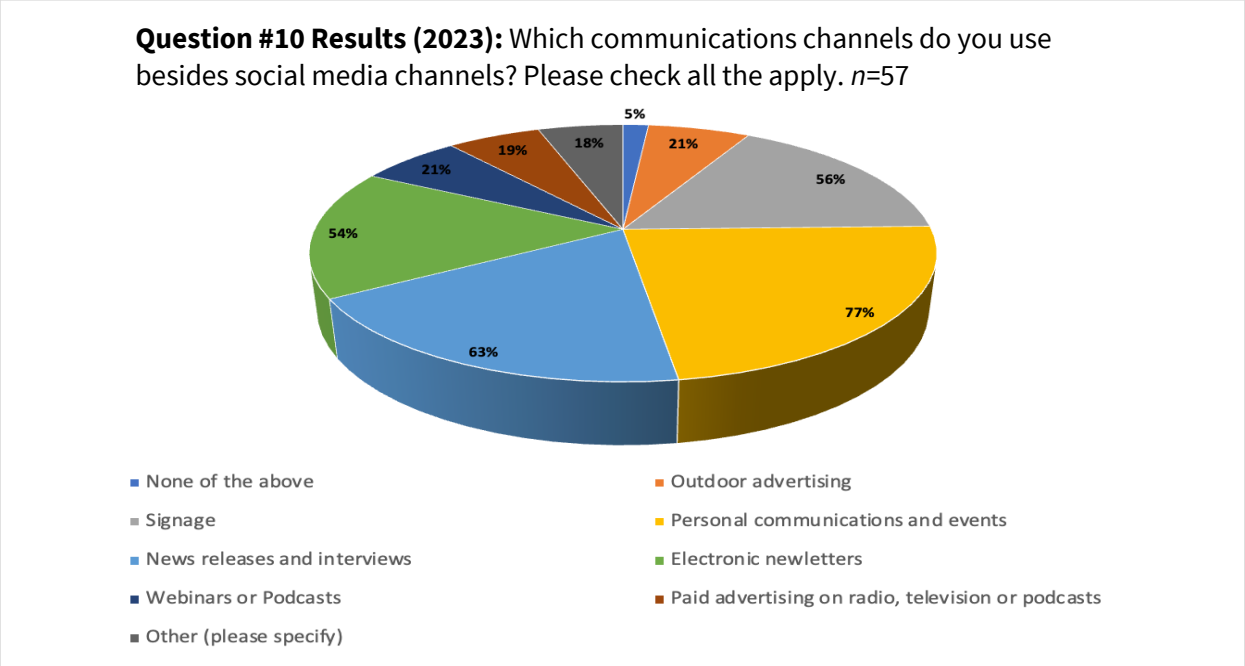
- » ***Facebook:*** The majority of respondents have experienced modest growth on their Facebook accounts.
- » ***X (formerly known as Twitter):*** The majority of respondents noted that audience growth on their Twitter account was not applicable.
- » ***Instagram*:** The majority of respondents noted that audience growth on their Instagram account was not applicable. This may or may not be a direct result of not using this social media channel as an organization.
- » ***TikTok:*** The large majority of respondents noted that audience growth on their TikTok account was not applicable. This may or may not be a direct result of not using this social media channel as an organization.
- » ***YouTube:*** The majority of respondents noted that audience growth on their YouTube account was not applicable. This may or may not be a direct result of not using this social media channel as an organization.
- » ***LinkedIn:*** The majority of respondents noted that audience growth on their LinkedIn account was not applicable.

  ***Note:** Many respondents selected "N/A: not applicable." This may be a direct result of not using this social media channel as an organization at the time of the survey.

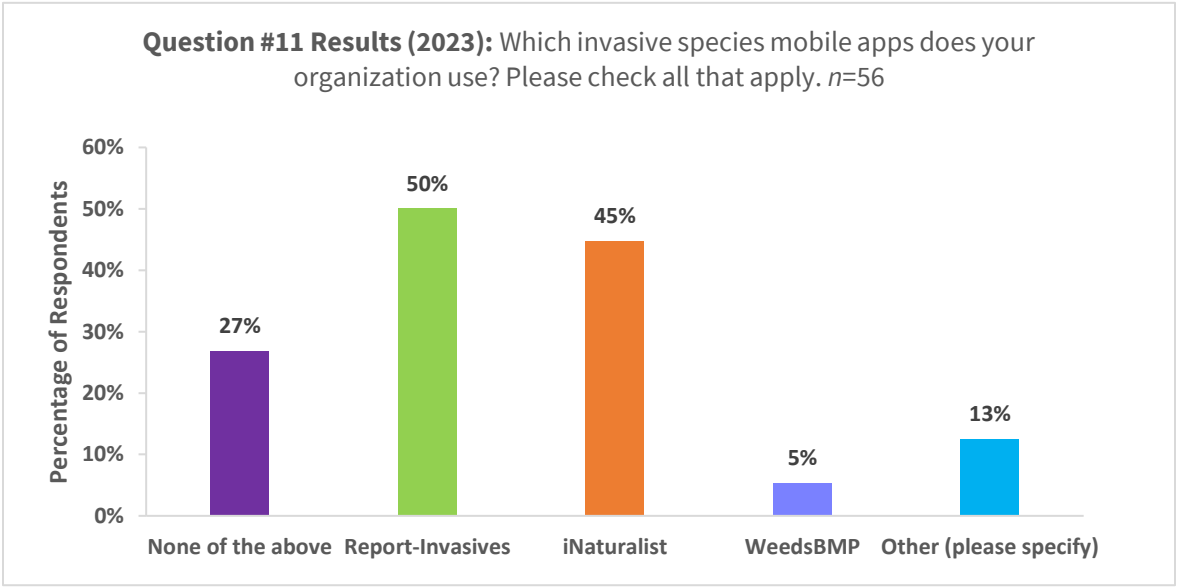


Besides social media, the majority of respondents use personal communications and events, followed closely by news releases and interviews, signage and electronic newsletters as their main communication channels (Outdoor advertising: 21%, Signage: 56%, Personal communications and

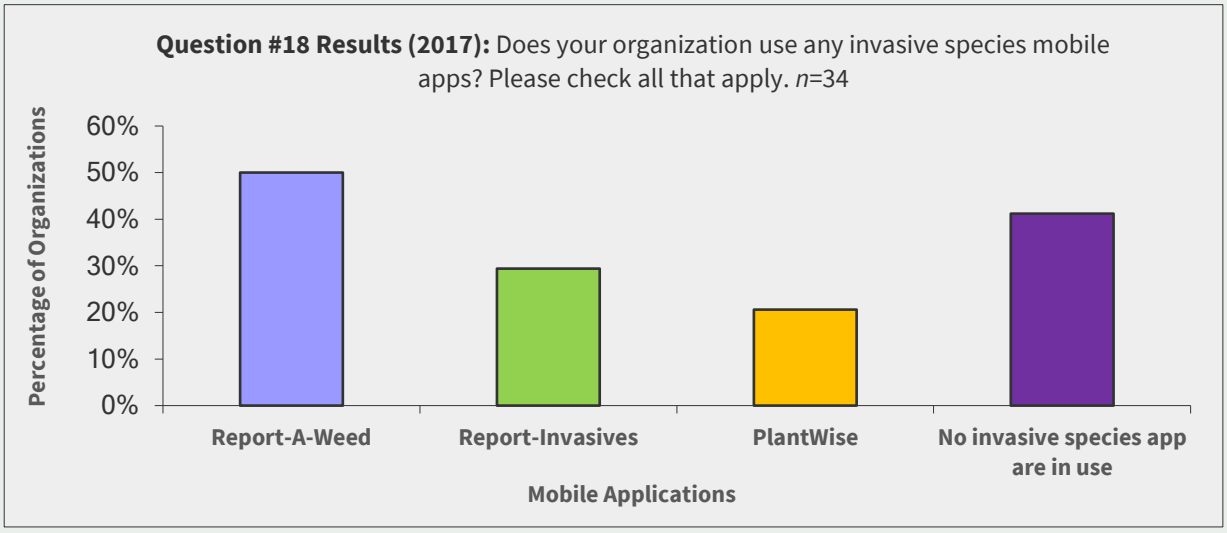
events: 77%, News releases and interviews: 63%, Electronic newsletters: 54%, Webinars and podcasts: 21%, Paid advertising on radio, television or podcasts: 19%, None of the above: 5%, Other: 18%, *n*=57, Questions #10 Results). Respondents listed the following other communication channels: open house events, community events, parades, direct emails, local government contacts, website, community newsletter, education teaching in post-secondary institutions, advertising in calendars, paid advertisements in local newspapers and direct mail (Q10).



The use of technology, particularly mobile apps, as a form of invasive species education, monitoring and reporting is steadily increasing in popularity. Half of the respondents are using the Report-Invasives mobile app and almost half are using iNaturalist (Q11). Other apps that were listed are IAPP, PlantThis, Picture This and EDDMapS (Q11).



Flashback to 2017: Report-Invasives was new on the app scene, Report-A-Weed was phasing out (replaced by Report Invasives) and the PlantWise app was new and later transitioned to WeedsBMP.



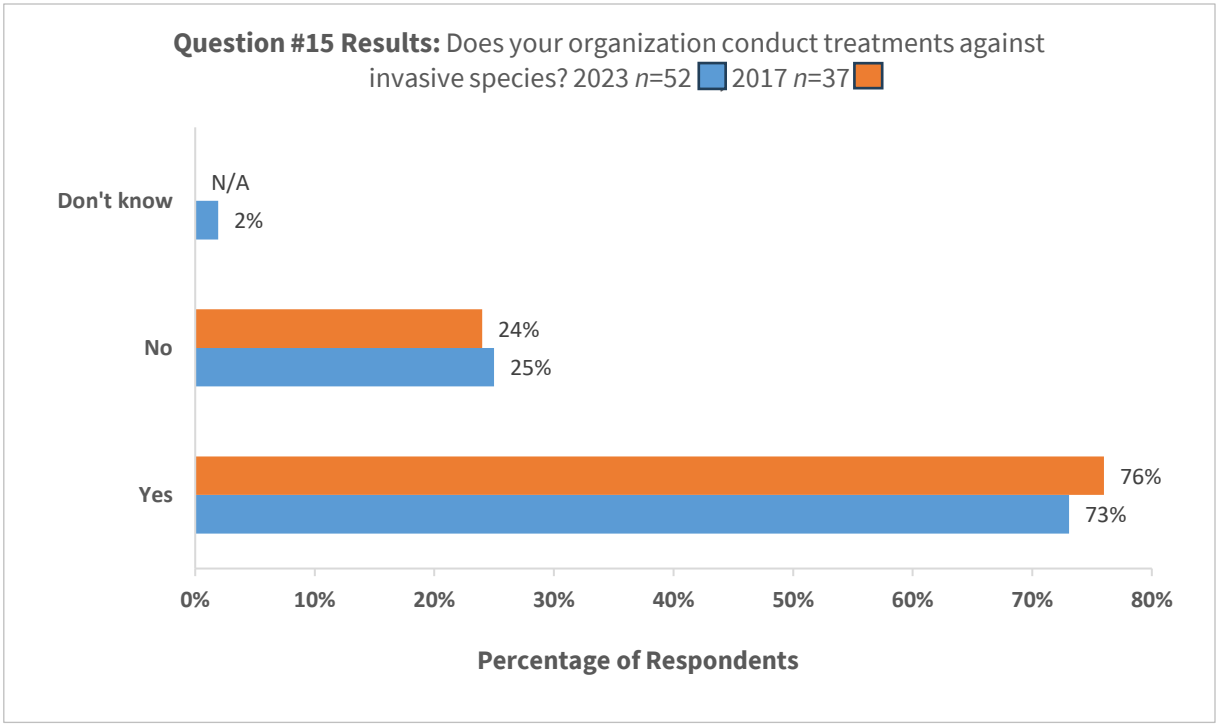
PILLAR 4

4.4 - Implement Effective Control, Restoration and Monitoring Programs

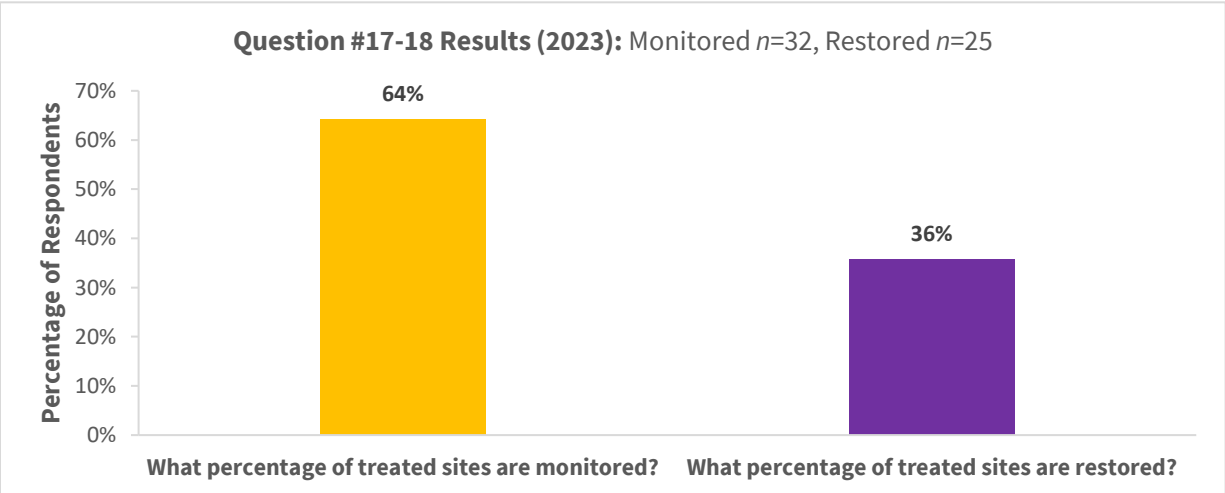
Four questions (Q15-18) were constructed to measure the success of Goal 6: Eradicate new invasive species occurrences, Goal 7: Effectively treat invasive species populations to minimize impacts, Goal 8: Restore ecosystems impacted by invasive species and Goal 9: Monitor management efforts to enhance effectiveness and efficiencies.

The provincial government's IMISWG reported on responding to new invasive species occurrences as the lead on Provincial Early Detection and Rapid Response (EDRR) across all jurisdictions and taxonomic groups in BC, with the exception of marine plants and animals, which are the Federal Government's responsibility. The IMISWG's monitoring and reporting period occurred between 2015 and 2020 however it doesn't directly represent the 2018-2022 period, but it was determined that these results are still representative of the timeframe for this report and are therefore included here. From 2015-2020, 100% of Early Detection Rapid Response (EDRR) invasive plants and 30% of EDRR animals had provincial response plans developed, and overall 91% of these response plans were successfully implemented. The IMISWG reported that the barriers to implementing the remaining 9% of response plans not achieved included challenges related to lack of tools, capacity and resources .

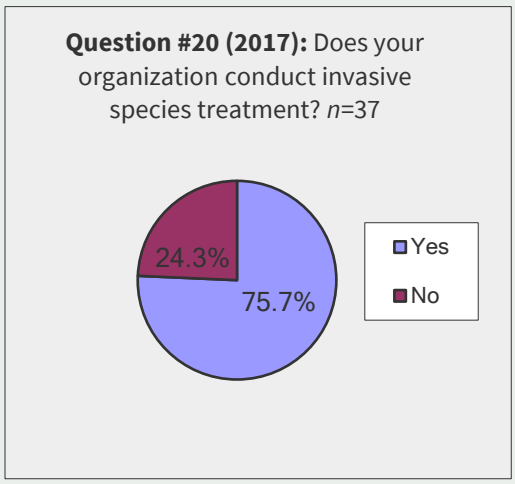
All survey participants were invited to respond to the remaining questions under this pillar. The majority of respondents stated they conduct invasive species treatment (Q15).

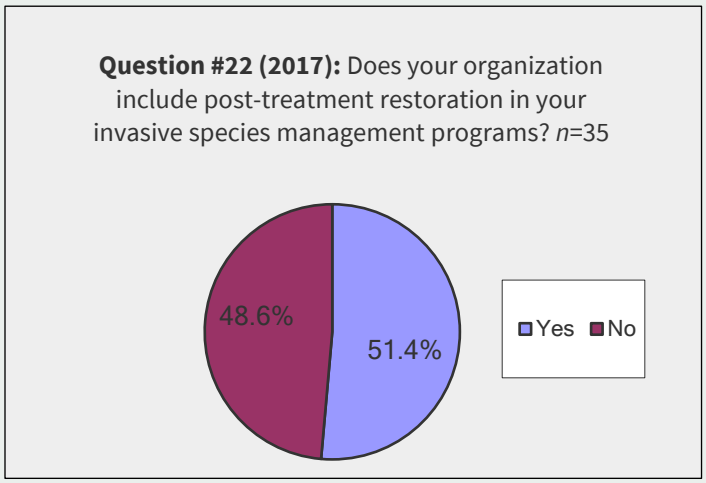


A new open-ended question was added to the 2023 survey: "How many sites are treated per year." There was a large range of 2 sites/year to greater than 4800 sites per year. All responses averaged ***617 sites per year***, *n*=31, Question #16 Results. Similarly, in 2023, the following two questions were shifted from multiple-choice to open-ended questions to gather additional information.Therefore, the average percentage was taken for each. The average percentage of monitored treated sites is 64%, *n*=32, Question #17 Results. The average percentage of restored treated sites is 36%, *n*=25, Question #18 Results. Please see the recommendations section for input on how best to measure Questions #16-18 in the future.



FLASHBACK to 2017: the questions of conducting invasive species treatment and restoration were asked differently, yet the results are still telling.





Case study: Knotweed Treatment Success by the Sea to Sky Invasive Species Council (SSISC)

Reported by Clare Greenberg, SSISC: A large knotweed site first treated in 2011 was originally 175 meters squared in size! With dedication and persistence, this site was treated yearly until 2018 and has been monitored since. There has been no regrowth found since 2018! Take a look at the before and after photos!

Photo credit: Clare Greenberg, SSISC

PILLAR 5

4.5 - Support and Extend Relevant and Applicable Research

Two questions (Q21, 22) were constructed to measure the success of Goal 10: Conduct relevant research on invasive species.

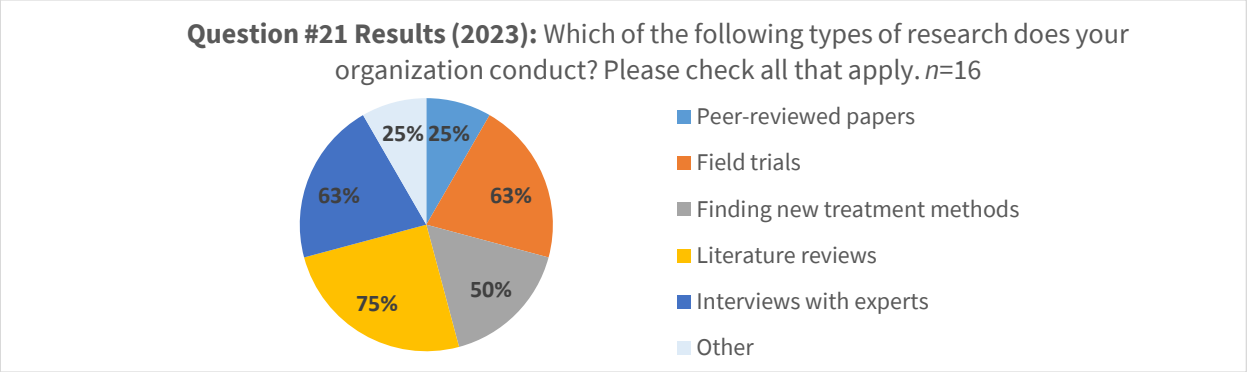
In the 2023 survey, only one-third of the respondents conduct research on invasive species compared to the slight majority in 2017 (Yes: 56% in 2017 to 33% in 2023, *n*=36 in 2017, *n*=49 in 2023, Question #19 Results), however there were more respondents overall in 2023 so this may not actually indicate a drop

overall in the amount of research happening, even though it does show a drop in the percentage of respondents conducting research. Survey respondents also identified a variety of invasive species research gaps they feel should be priorities (Q20). The following themes emerged:

- Treatment efficacy
- Species specific knowledge and best management practices (BMPs)
- Implementation of research to on-the-ground action
- Environmental DNA markers
- Disposal
- Economic and overall impacts
- Education
- Restoration
- Pathways of spread
- Funding
- Prioritization
- Bylaws
- Climate change impact
- Using volunteers for effective monitoring

A complete list of identified gaps is listed in **Appendix B** from 2023 survey.

A new question was added to the survey (Q21) to capture more detail on the types of invasive species research done by organizations(peer-reviewed papers: 25%, field trials: 63%, finding new treatment methods: 50%, literature reviews: 75%, interviews with experts: 63%, other: 25%, *n*=16, Question #21 Results). Other research listed were community surveys on cultural management methods, applied trials for invasive plant treatment methods, long-term monitoring and data analysis and very small-scale trials of different approaches.



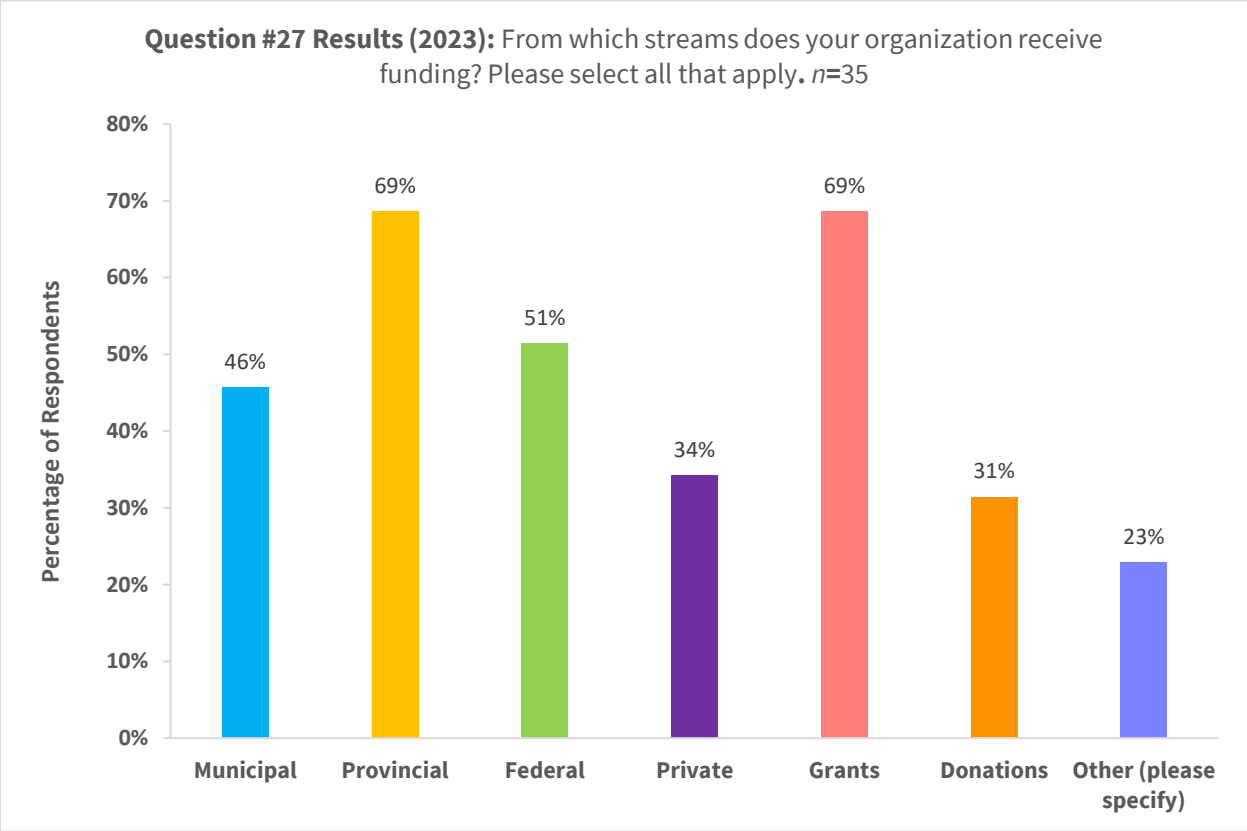
PILLAR 6

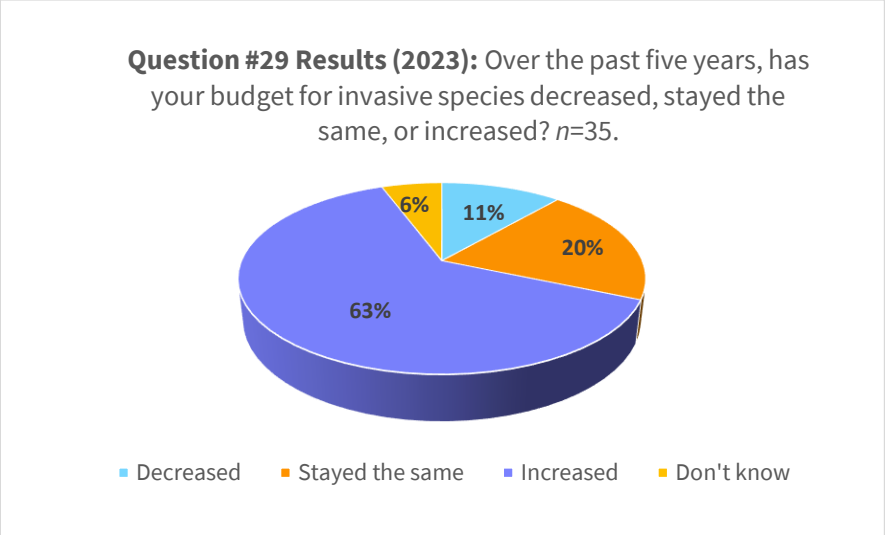
4.6 - Provide Stable Long-term Funding

In 2017, no questions were included to measure the success of establishing adequate, stable, long-term funding for invasive species management. It was discussed that more information was needed to ask appropriate questions. In 2023, four new questions (Q26-29) were constructed to gather information on funding, and provide baseline data to track over time.

The large majority of respondents receive funding from external sources (Yes: 75%, No 17%, Don't

know: 8%, *n*=48, Question #26 Results). The majority of respondents receive funding from the provincial government as well as through grants (Municipal: 46%, Provincial: 69%, Federal: 51%, Private: 34%, Grants 69%, Donations: 31%, Other: 23%, *n*=35, Question #27 Results). Other sources included: fee for service, First Nations, program partnerships, NGOs, utility companies, Regional Districts, memberships, events and programs.





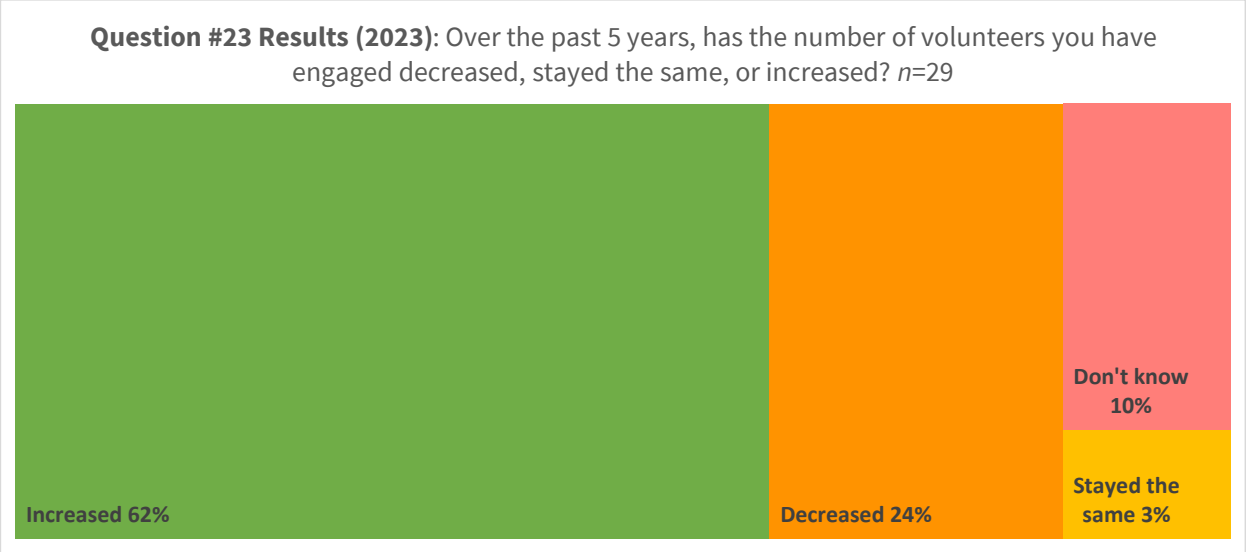
The average 2022 annual budget across the diverse respondents from the 2023 survey for invasive species was $419,267 (range: $0 to $4.19 million; *n*=27, Question #28 Results). Over the past five years, the majority of respondents budgets have increased (Increased: 63%, Decreased: 11%, Stayed the same: 20%, Don't know: 6%, *n*=35, Question #29 Results).

4.7 - Promote Action through Communication and Education

PILLAR 7

Pillar 7 was a new addition to the 2018 - 2022 Strategy; therefore, it was not a part of the original MFS indicator development between 2012 to 2017. Since then, questions have been developed (Q22, 23) around volunteer work and are captured under this pillar. In the future, more indicators and questions will be refined to effectively measure the success of promoting action through communication and education.

The majority of respondents have volunteers that assist their organizations (Yes: 59%, No: 39%, Don't know: 20%, *n*=49, Question #22 Results). Over the past five years, the majority of respondents have increased the number of volunteers engaged with (Increased: 62%, Decreased: 24%, Stayed the same: 3%, Don't know: 10%, *n*=29, Question #23 Results).

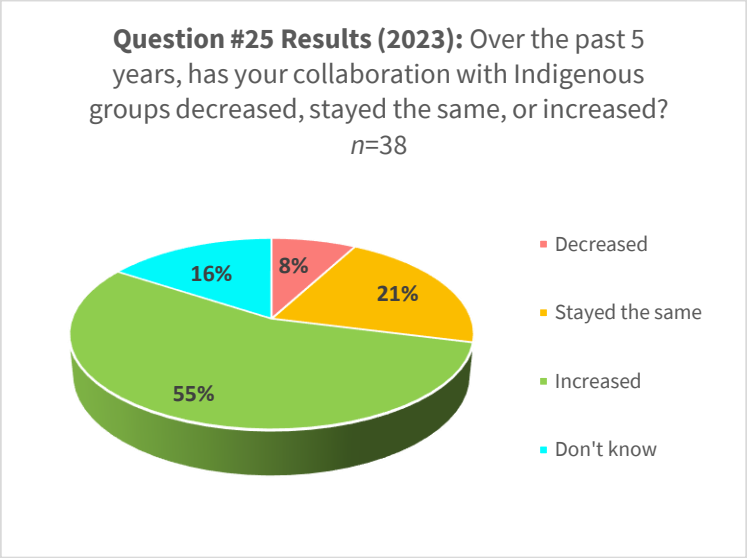


4.8 Additional Results

Additional questions were added to the 2023 survey (Q24, 25) to capture information on important themes that have come to the forefront since the writing of the 2018-2022 provincial Strategy. These have included: collaboration with Indigenous groups, climate change and biodiversity.

The majority of respondents collaborate with Indigenous groups (Yes: 78%, No:10%, Don't know: 12%, *n*=49, Question #24 Results).

Over the past five years, the majority of respondents have increased collaboration with Indigenous groups (Increased: 55%, Decreased: 8%, Stayed the same: 21%, Don't know: 16%, *n*=38, Question #25 Results).



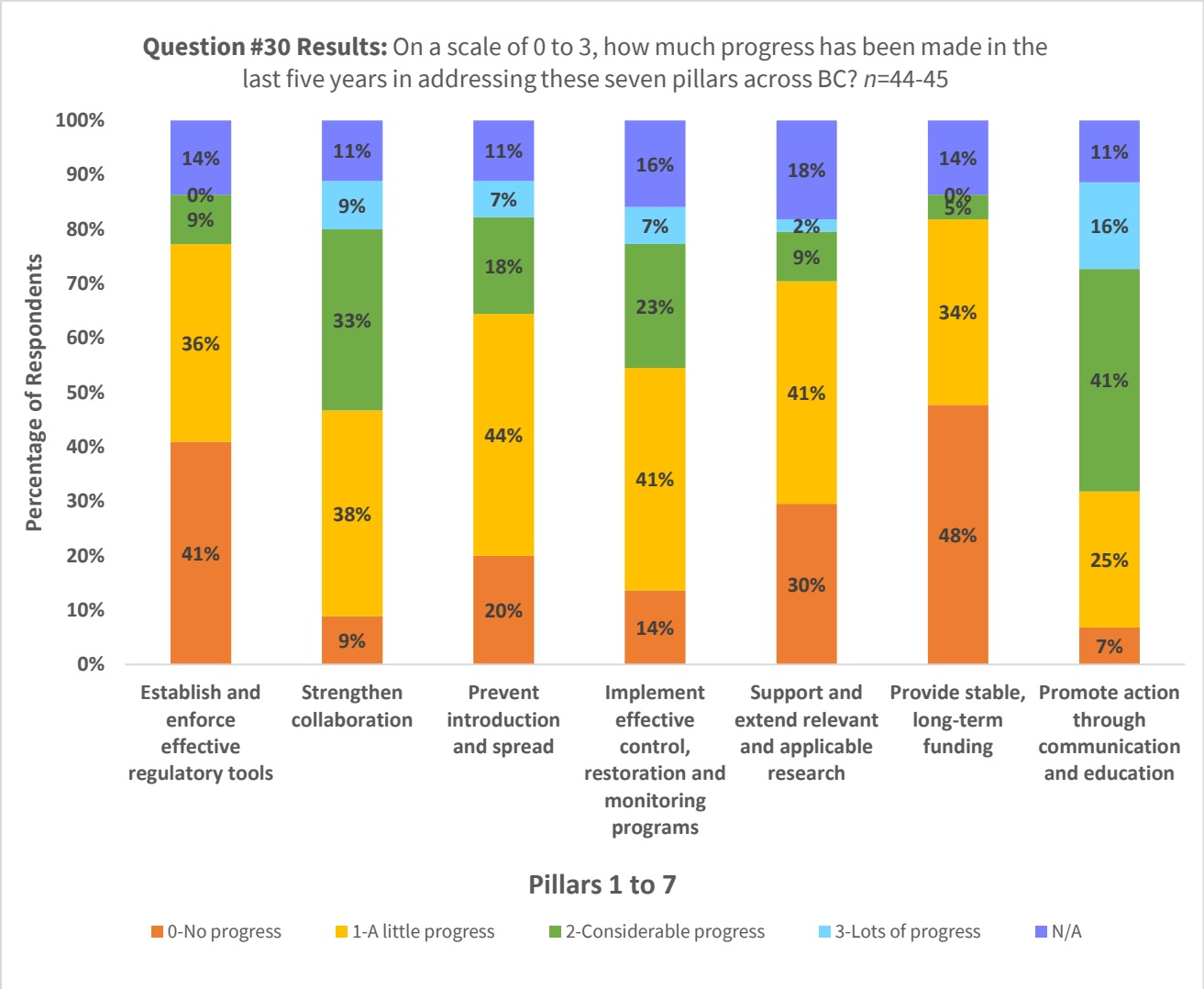
Additional information was also collected to inform the next version of the Invasive Species Strategy for British Columbia 2024 - 2028. Specifically, input on the effectiveness of the existing pillars in the context of restoring biodiversity under climate change, recognizing Indigenous leadership in invasive species management, closing the pathways and stopping the spread of invasive species was collected. Key priorities to capture in the 2024-2028 Strategy were also identified.

Reflections on Progress

It was important to take the opportunity in the 2023 survey to ask participants how they thought we have collectively done in achieving the identified pillars in the past five years. Pillars which respondants said showed the most positive progress were Promoting Action Through Communication and Education, Strengthening Collaboration, whereas the pillars which remain a challenge included Establishing and Enforcing Effective Regulatory Tools and Providing Stable and Long-term funding (Q30).

Question #30 Results:

- Establish and enforce effective regulatory tools: the majority said no progress (No progress: 41%, A little progress: 36%, Considerable progress: 9%, Lots of progress: 0%, N/A: 14%, *n*=44).
- Strengthen collaboration: the majority said a little progress (No progress: 9%, A little progress: 38%, Considerable progress: 33%, Lots of progress: 9%, N/A: 11%, *n*=45).
- Prevent introduction and spread: the majority said a little progress (No progress: 20%, A little progress: 44%, Considerable progress: 18%, Lots of progress: 7%, N/A: 11%, *n*=45).
- Implement effective control, restoration and monitoring programs: the majority said a little progress (No progress: 14%, A little progress: 41%, Considerable progress: 23%, Lots of progress: 7%, N/A: 16%, *n*=44).
- Support and extend relevant and applicable research: the majority said a little progress (No progress: 30%, A little progress: 41%, Considerable progress: 9%, Lots of progress: 2%, N/A: 18%, *n*=44).
- Provide stable, long-term funding: the majority said no progress (No progress: 48%, A little progress: 34%, Considerable progress: 5%, Lots of progress: 0%, N/A: 14%, *n*=44).
- Promote action through communication and education: the majority said considerable progress (No progress: 7%, A little progress: 25%, Considerable progress: 41%, Lots of progress: 16%, N/A: 11%, *n*=44).



Participants were given the opportunity to comment on the progress towards the pillars. A list of the responses received on pillar progress are included in **Appendix C**.

5.0 - Conclusion

The original development of the MFS Framework and associated Provincial Survey to measure the success of the Strategy throughout the 2012 to 2017 period has proven to be a valuable process in measuring how we have done collectively. This data now serves as a baseline to track trends over time, and measure the success of each five year term of the Strategy.. This report is the first to dually monitor the success of our most recent strategy 2018-2022, as well as compare trends over time. Key MFS findings have also been considered in the current development and reshaping of the the Invasive Species Strategy for British Columbia 2024 - 2028, which was released in July 2024.

6.0 - Recommendations and Considerations

It is strongly recommended that this monitoring for success framework is completed again in 2029/30 to continue to measure the success of invasive species management efforts throughout BC over the next five-year period, with incorporation of the lessons learned outlined below. The results section of the MFS reports include high-level strategic discussion and focuses on the overall results which are intended to be used as a basis for discussions that may guide future management efforts.

Three different types of survey questions (multiple choice, Likert-scale and open-response) were used with the aim of creating consistency and clarity over time. The second version of the survey tweaked some questions, including changing the scale of Likert questions from i.e. 1-5 to 0-3, with wording shifting more reflective of the information being gathered. While trends can still be compared over time, measuring the change accurately when the scale or questions shift slightly is more challenging. It is recommended that in the future, no to very little changes are made to specific questions. If more information is needed, adding a question is suggested instead of adjusting the original questions.

In the original MFS survey, there was some confusion associated with the regulatory tools questions (Q2-4) in the respondent feedback provided. In 2022, efforts were made to make the wording clearer for a large variety of organizations and scale of work. However, there were numerous “Don’t know” or N/A responses. It is recommended that definitions of legislative responsibilities, regulatory responsibilities, regulatory compliance and enforcement actions be added to the questions to increase clarity and that the MFS advisory committee review the questions and results to ensure the appropriate category of respondents are receiving each question before launch of the next questionaire.

Similarly, in question #18, there was confusion about what restoration means. This will be solved in the 2024-2028 Strategy by clearly defining restoration and recognizing that restoration involves many phases, including restoration following treatment through natural succession. It is suggested that this question is supported with a clear definition and supplemented by an additional question that breaks down the types of restoration to measure the level of effort conducted by organizations. For example, invasive species are removed and no additional species added; invasive species are removed and native ecosystem-specific species are seeded and/or planted; the site is monitored for new invasive species growth and recovery of desirable species, or similar.

Questions #16-18 around treatment, monitoring and restoration were shifted to be open-ended in the 2023 survey compared to multiple choice in the 2017 survey. Although an average was calculated for each, not all answers could be used, or had to be adjusted. For example, answers like “multiple” were not used, or if the answer was a range of 5-to-15 sites treated, the number 10 was used towards the overall average. The budget open-ended questions provided similar challenges. A possible solution could be to supplement these questions with “If you do not know the exact number, please select between the following range of values that best reflects your organization’s value” or similar.

In the 2017 recommendations, it was mentioned that increased participation throughout the province would increase the reliability of the data. In 2023, the number of organizations participating in the provincial survey almost doubled (37 organizations in 2017 and 60 in 2023, Question#1 Results). In particular, there was a large increase in the participation of Indigenous groups. The 2023 survey results

are missing input from federal government agencies, so ensuring they are include in 2029/30 is important.

Photo credit: Kaslo Bay Boat Launch – CDD - CKISS

Some areas in the MFS Framework may need to be revisited, expanded or rerouted as the future Strategies and the priorities of the province transform. It is important to keep asking the same meaningful questions to ensure that comparisons of each five-year period, and over the long term, can take place. However, it is also import to adapt and revise the framework to reflect the current situation. Therefore some questions should change or be rerouted as priorities shift.

Prior to reporting back on the 2024-2028 Strategy begins, it is recommended that another advisory committee guide the review and revision of the current MFS framework and provincial survey to expand them to be reflective of the new Strategy. Updating the MFS framework alongside creating a new Strategy for each five-year period will need to go hand-in-hand and the advisory committee and writing team model has been effective to date.

In conclusion, the process of monitoring for the success of invasive species management, now over the course of ten years, has provided meaningful insight into trends across the province over time. It remains important to build off this work in future years, including celebrating success and exploring lessons learned through invasive species initiatives from 2012 to 2016 and now 2018 to 2022. In this report, clear trends have emerged, gaps have been identified and essential information has been gathered that will continue to guide invasive species work in the province, and inform future management efforts. As always, let's look forward to the next five years!

APPENDIX A – List of Organizations That Completed the Survey

All organizations that completed the Provincial Survey (*n*=58, Question #1 Results):

BC Ministry of Forests
Bowen Island Municipality
Blueberry River First Nation
Broom Busters Invasive Species Society
Capital Regional District
Cariboo Regional District
Central Kootenay Invasive Species Society
City of Port Moody
City of Powell River
City of Kamloops
Clear Seas Centre for Responsible Marine Shipping
Columbia Shuswap Invasive Species Society
District of Saanich
DWB Consulting Services Ltd.
First Nations Agricultural Association
Flathead Lake Biological Station
FortisBC Inc.
Friends of Kalamalka Lake Provincial Park
Friends of Todd Creek Watershed
Greater Victoria Harbour Authority
Health Canada
Invasive Species Council of British Columbia
Invasive Species Council of Metro Vancouver
Islands Trust/Conservancy
Kwantlen First Nation
Kwikwetlem First Nation
Lillooet Regional Invasive Species Society
Lower Nicola Indian Band
Lower Nicola Indian Band Development Corporation
Morrow BioScience Ltd
Nature Tech Nursery Ltd
Northwest Invasive Plant Council
Okanagan and Similkameen Invasive Species Society
Parks Canada - Gulf Islands and Fort Rodd Hill
Parks Canada - Mount Revelstoke and Glacier
BC Public Service
Pineview Management
Pepaken Hautw Foundation
Powell River Broom Busters/Powell River Fire Rescue
Rabbitats Rescue Society
Regional District of Central Okanagan
Regional District of Nanaimo
Regional District of Okanagan-Similkameen
Resort Municipality of Whistler
Sea to Sky Invasive Species Council
Setetkwe Environmental Inc.
Shuswap Watershed Council
Spectrum Resource Group Inc.
Stqeeye' Learning Society
Swan Lake Christmas Hill Nature Sanctuary
Teal Solutions Ltd
Thompson-Nicola RD & Invasive Plant Management Ctte
Town of View Royal
Township of Esquimalt
Township of Langley
Tsawwassen First Nation
Upper Similkameen Indian Board
Williams Lake First Nation

APPENDIX B - Research Gaps Identified by Organizations

Question #20 Results: Please list the invasive species research gaps your organization has identified. This question was measured using an open-ended response to allow for the explanation of results. The following is a summary of the answers received.

Complete listing of participant responses (*n*=35):

Research on effectiveness of different methods of treatment - herbicide, bio-control and mechanical & other non-herbicide control methods - whether pilot projects with utilizing covering ground to allow no growth in certain areas or other non-chemical related techniques to manage invasives.
Mustard weed (not sure where it's from but everywhere in Thompson-Nicola) and Dalmatian toadflax.
There is research by specific scientists in universities, and studies, such as the 2021 assessment study for ISCBC by ESSA Technologies. This research is documenting the harm done by Scotch broom, but in spite of it, it seems that Scotch broom is being largely ignored and allowed to spread. We would love for the province to take note of the massive areas Broombusters has successfully cleared of Scotch broom, with very little expense.
Need to map and study changes
We are behind in Best Management Practices's. Some herbicide research would be good.
Pathways and solutions
eDNA markers for monitoring American Bullfrogs and other high priority aquatic invasive species that can be hard to detect in the early stages of invasion.
Seed viability in compost and soil
Invasive species from marine shipping
Identification of characteristics that enable species to invade temperate rainforests. Effects of invasive species on alpine habitats.
Aquatic invasive plants in roadside ditches
Invasive species impacts to BC ecosystems; economic impacts and future projections.
Tsawwassen First Nation Subcontracts removal of Invasive Plants once identified.
Alternative treatment methods to pesticides and deep burial - thermal effectiveness, sterilization methods.
Education
Effectiveness of Integrated Vegetation Management Plans without use of pesticides

We are always interested in more invasive species research on treatment options, restoration opportunities and pathways of spread (and how we can improve outreach)
Funding, resources, prioritization
There are still invasive species being grown and released into areas like parks, lakes and forests. Government needs to do more to educate non-professional people, regular citizens, not to release or grow invasive species.
We are a utility so we are aware of what type of research is being done, but do not conduct research in-house.
Better social media communications / By - laws in place
Climate impacts on invasive spread.
Identifying and preventing spread/introduction of invasive plant species through cross-border
agricultural trade. Studies on the effect of cattle and rangeland on spread of invasive species. Effectiveness of biological management methods
Treatment for Zebra and Quagga Mussels in infested waterways.
(1) Alignment in needed between Canadian Council on Animal Care, provincial, and BC SPCA guidelines on humane euthanasia of American bullfrog; (2) duration of benthic barrier or shading treatment required to achieve 100% mortality of parrot's feather
Innovative, effective treatment/control options and/or strategies.
Support with recruiting volunteers for effective monitoring
Safe use of chemicals (not glyphosate or triclopyr) to manage aggressive invasives
Restoration on treated Spotted knapweed sites
Prioritizing different invasives (ex. Shiny geranium) based on status in different regions, not just over the entire province.
How to effectively compost or dispose of *Iris pseudocorus* rhizomes once removed.
No empirical research conducted
Certain species and advice on how to treat in a conservation context. These include: Shiny Geranium, Crow Garlic, Spanish Bluebells, Carpet Burweed

APPENDIX C - Progress Towards the Seven Pillars

Question #31 Results: Please provide comments you have about progress on these pillars. This question was measured using an open-ended response to allow for the explanation of results. The following is a summary of the answers received.

Complete listing of participant responses (*n*=26):

Community engagement has been most successful. Lack of capacity limits progress in other areas.
I don't feel I can respond to that question with any authority. But I appreciate the increased collaboration among NGOs, invasive species councils, Ministry of Transport and Infrastructure, and local governments.
Much of this is not on the radar for bands.
We are under-resourced with no paid staff and very minimal research and development funding, but our species control and management pilot programs have been very successful.
ISCBC is producing great educational resources to develop consistent messaging and campaign recognition across the province (Play, Clean, Go etc.). It would be great to have a central location to go for BMPs for management of priority invasive species rather than each jurisdiction duplicating efforts and producing their own (e.g., Metro Vancouver, Surrey, ISC).
Regulatory protection is weak and there is little incentive to do the right thing
Unfortunately, this hasn't been a priority for the nation
Limitations in the legislation and provincial species priority lists are a concern to our region as we are located on a high traffic corridor for both terrestrial and aquatic invasive species. By the time a newly introduced species makes it onto the provincial priority list, our region could potentially be overrun. Highly worrying considering the number of species that are within a very short distance from the Canada/US border.
New to position in 2022, unfortunately not able to provide much details on these categories during last five years. Likely a decrease during 2020/2021 due to COVID
No comments at this time as I am new to this position
I'm not as aware of regulatory progress provincially
As an indigenous-led conservation society, we have not had any invasive species education programs, funding or targeted collaboration outreach directed to us. We have included invasive species control in our grants, and we do invasive species control because we don't want invasives growing on our food harvesting lands, but we do not get funded or supported in this work by government.
Elementary school awareness initiatives

We so need an Invasive Species Act and stable and sustained funding. In light of climate impacts, this is critically needed to reduce impacts in BC.
USIB has multiple Right of Ways and industrial sites within our territory, we are finding that there is not adequate funding or follow through from government entities to manage invasive species in our area. There is a marked lack of communication between the USIB, industry in the area, and government and a lack of funding available to develop and implement multi-year invasive species management plans.
My responses in #23 pertain only to the invasive species we work on which is Zebra and Quagga Mussels.
To my knowledge, existing federal and provincial legislation has not been updated on invasive species, and there is still no harmonized provincial Act for invasive species. For example, there needs to be a way to strictly regulate and enforce the import, propagation, and sale of invasive plants; the fact that nurseries can still sell English holly, cherry and Portuguese
Laurels, English ivy, bamboos, and countless other invasive species is a testament to the lack of progress on regulatory tools and prevention.
Funding for local governments is lacking. Rural communities with few resources and available AM volunteers seriously inhibits the ability to control and manage invasives
Government funding and incentives are not well communicated and disseminated around invasive species in the BC agriculture sector, so many farmers, in particular small farmers, are not very aware. Also the definition of farm is not inclusive enough, so very small or hobby farms are often left out of the work in this and other areas within the Ministry of Agriculture entirely, there is virtually no monitoring (in my area at least), and enforcement and education action is largely complaint driven.
Unable to comment on provincial changes as I am new to invasive species work and province PM of BC, not familiar with now vs 2018