



Native Women's
Association of Canada



L'Association des
femmes autochtones
du Canada

NEW INTERIM STANDARD & CODES OF PRACTICE

SURVEY REPORT

December 12, 2023

THE SURVEY



Fisheries and Oceans
Canada

Pêches et Océans
Canada

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The goal of this survey was to gather the perspectives of Indigenous Women, Girls, Two-Spirit, Transgender and Gender-diverse People on the New Interim Standard and Codes of Practice for fish and fish habitat protection.

This survey represents NWAC's contribution to [WAVE 3 engagements](#) by Fisheries and Oceans Canada (DFO) on the [New Interim Standard and Codes of Practice](#).

RESEARCH METHODS

This report is based on an online survey completed by 267 Indigenous women, girls, two-spirit, transgender and gender-diverse people, from September 28th to November 20th, 2023. The survey was not open to male participants.

The questionnaire was designed by NWAC, with input and advice from Environics Research. Environics programmed the questionnaire on its survey platform, and NWAC distributed an open survey link via social media. A gift valued at \$50 was offered to the first 300 participants to complete the survey. Due to the nature of social media and the offer of a cash incentive, several responses were determined to be invalid and removed from the final data set before analysis. NWAC also sent an open link to several of its key stakeholders.

This sample is a convenience sample, meaning that it was drawn from a conveniently available group of individuals. Because it is not a probability sample (respondents were not randomly selected, nor did all individuals in the desired communities have an equal chance of being selected into the sample), **the sample cannot be considered representative of all Indigenous women, girls, two-spirit, transgender and gender-diverse people.** Therefore, the data should be interpreted within the limits of the survey design.

About this report: Unless otherwise noted, results for all questions are based on the total sample of 267 participants. Sometimes results do not add up to 100% due to rounding or multiple responses. Labels for values less than 2% are not shown.

The following page presents a regional and demographic profile of survey participants.

RESPONDENT PROFILE

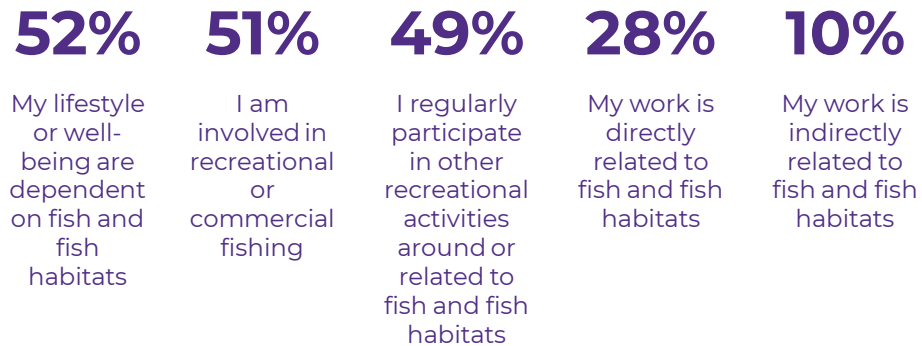
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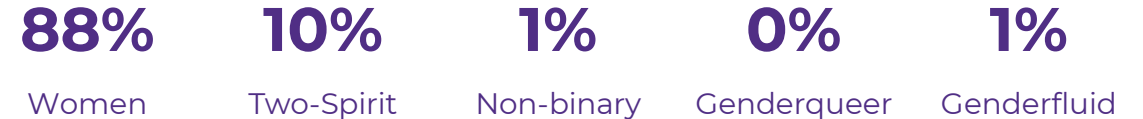
REGION



INVOLVEMENT IN FISH HABITATS



GENDER IDENTITY



INDIGENOUS IDENTITY



COMMUNITY TYPE



SUMMARY

KEY FINDINGS

- 1 **Survey participants are largely supportive of all measures put forth by the DFO.** A majority (at least **89%** or more) of survey respondents feel that all proposed measures will be enough to protect fish and fish habitat during the various practices identified in the survey. Across all four standards, respondents were less likely to support the codes of practice related to **bridge repair** and **maintenance (90%)** and more likely to support the codes of practice related to **repair, maintenance** and **construction of docks, moorings** and **boathouses (97% or higher)**.
- 2 **Very few notable differences were seen across demographic sub-groups, but those living in Indigenous communities are typically more supportive of the measures.** In some instances, respondents living on a **First Nations reserve**, in an **Inuit community** or a **Métis settlement (FNIMS)** were more likely to feel the measures presented were sufficient to protect fish and fish habitat.
 - a. For measures related to **in-water site isolation (96%** of respondents living on **FNIMS** felt the measures were sufficient compared to **84%** of respondents in **urban areas** and **81%** in **rural areas**).
 - b. For measures related to protecting aquatic habitat during bridge repair and maintenance (**96%** of respondents living on **FNIMS** felt the measures were sufficient compared to **88%** in both **urban** and **rural** areas).
 - c. For measures related to protecting fish and fish habitat from **deleterious substances** during the **repair** and **maintenance of in-water structures (98%** of respondents living on **FNIMS** felt the measures were sufficient compared to **93%** in **urban** areas and **90%** in **rural** areas).
 - d. For measures related to protecting fish during the **repair, maintenance** and **construction of docks, moorings** and **boathouses (98%** of respondents living on **FNIMS** felt the measures were sufficient, compared to **96%** in **urban** areas **90%** in **rural** areas).
- 3 **Additional suggestions to codes of practice.** Suggestions by participants for additional codes of practice varied, but some key themes were evident in their responses. Participants made broad suggestions for less disruption to fish and fish habitat, including less development and more restrictions on activities around fish habitat. Suggestions were also related to restriction on the use of harmful substances during construction, repair and maintenance, and avoiding the use of machinery when possible. There was also an emphasis on assessment, clean-up, and consistent monitoring before, during and after a project.

SECTION 1

IN-WATER SITE ISOLATION

METHODS

IN-WATER SITE ISOLATION METHODS

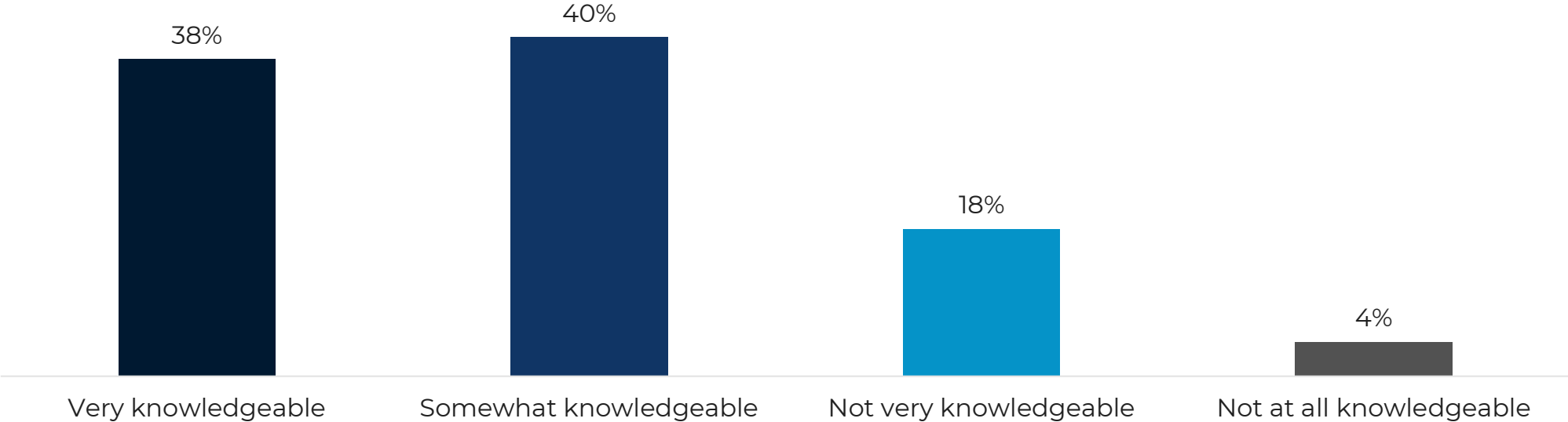
About this code of practice:

- In-water site isolation is a mitigation measure that is implemented during in-water work to manage sediment-laden water.
- The objective of the measure is to reduce the intensity, spatial scale, and duration of sedimentation of fish habitat resulting from work, undertaking and activity.
- This Standard provides guidance to proponents on how to implement in-water site isolation. It is intended for use in the installation, maintenance, monitoring and removal of in-water isolation methods occurring within:
 - Freshwater watercourses (i.e., rivers and streams)
 - Freshwater waterbodies (i.e., lakes and ponds)
 - Marine environments.

In-water site isolation methods | **Level of knowledge**

About four in ten respondents were either somewhat (40%) or very (38%) knowledgeable about in-site water isolation methods.

Q.1 *How knowledgeable are you about in-water site isolation methods and the terms used in the code of practice above? (n=267)*



IN-WATER SITE ISOLATION METHODS

The In-Water Site Isolation Standard includes guidance related to the following five (5) methods:

Cofferdams: A cofferdam is typically used **along the margins of a water body or watercourse and does not impede downstream flow**. It can be constructed using a variety of materials including rock, steel sheet pile, sandbags, concrete blocks, poly, or inflatable barrier.

Turbidity curtains: A turbidity curtain is typically used **along the margins of a water body or watercourse and does not impede downstream flow**. This method is also used in the marine environment.

Pump arounds: A pump around is used when it is necessary **to block the watercourse from one bank to the other** to undertake work in the dry. Downstream flow is maintained using pumps.

Flumes: A flume (or elevated pipe) is used when it is necessary **to block the watercourse from one bank to the other** to undertake work in the dry. Downstream flow is maintained using a pipe, and water is conveyed downstream by force of gravity.

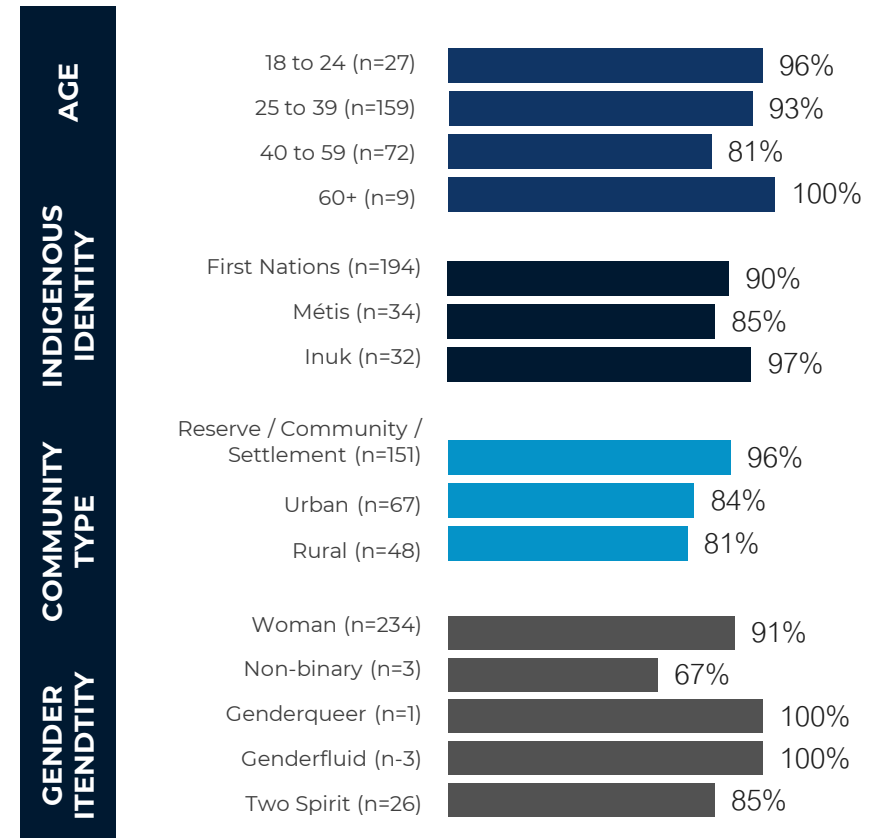
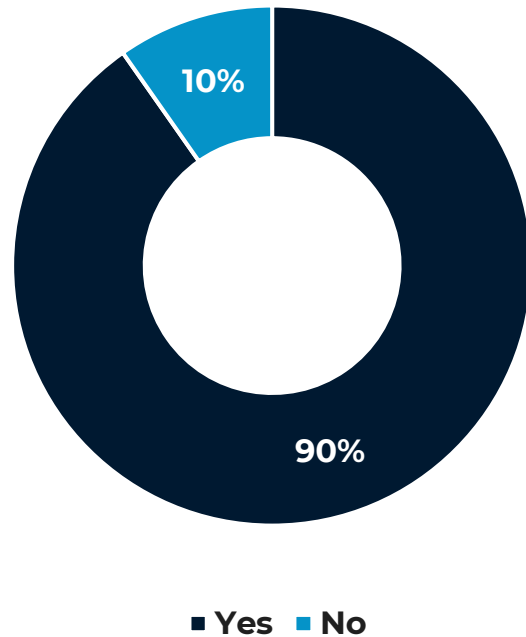
Diversion channels: A diversion channel uses a **temporary channel** constructed **to convey water around the in-water isolation area** and does not impede downstream flow. This method is often used to maintain fish passage.

In-water site isolation methods | Perception of measures

Nine in ten respondents felt the five in-water site isolation methods listed are sufficient (90%). Those living on a First Nation Reserve, Inuit Community, or Métis settlement are more likely to say this than those living in urban or rural environments.

Q. 2 Do you think the 5 in-water site isolation methods listed (i.e., cofferdams, turbidity curtains, pump arounds, flumes, and diversion channels) are enough to protect fish and fish habitats from sediment-laden water? (n=267)

% Feel Measures are Sufficient



In-water site isolation methods | **Open-ended suggestions**

Q. 2a *Please list other in-water site isolation methods that the DFO should include. If possible, state how your suggested methods will help protect fish and fish habitats from sediment-laden water.*

Suggested Methods

- 1. Filter systems:** Filtering plants, oil slick absorbing foams, tree lines grown (cypress) to anchor soil and provide a barrier for airborne silt from becoming sediment
- 2. Fish Ladders:** Fish ladders should be constructed to help fish migrate past barriers like dams and weirs. These structures consist of a series of stepped pools or inclined planes that allow fish to swim upstream
- 3. Riparian buffers:** Riparian buffers refer to vegetated areas consisting of trees, shrubs, and grasses located alongside water bodies. These buffers act as natural filters, trapping sediment and other pollutants, and enhancing water quality. By establishing and maintaining riparian buffers, fish species can be shielded from the harmful effects of sediment-laden water.
- 4. Sediment filters:** Sediment filters are devices installed on water discharge outlets to trap suspended sediments before releasing water. These filters include materials like sand, gravel, or geotextile fabrics, which capture sediment particles while allowing clean water to pass through. The use of sediment filters safeguards fish and their habitats by preventing sediment-laden water from directly entering a watercourse.
- 5. Testing & Monitoring:** There is no mention of testing the water in this strategy to see if the methods are effective or not. Or if the water is more sediment-laden from the outset. I'm wondering is there testing before and after to monitor
- 6. Monitoring** of invasive species
- 7. Use buffer zone** to keep the habitat as natural as possible.
- 8. Restrict farming** along the coast of freshwater lakes
- 9. Restrict protected areas** near fish habitats from the public.
- 10. Restrict fishing during peak periods.** During spawning season activities should be prohibited in certain areas of the lake/river/sea to protect fish and promote reproduction.
- 11. Stop the mining** in and around water sources

SECTION 2
**BRIDGE REPAIR &
MAINTENANCE**

BRIDGE REPAIR & MAINTENANCE

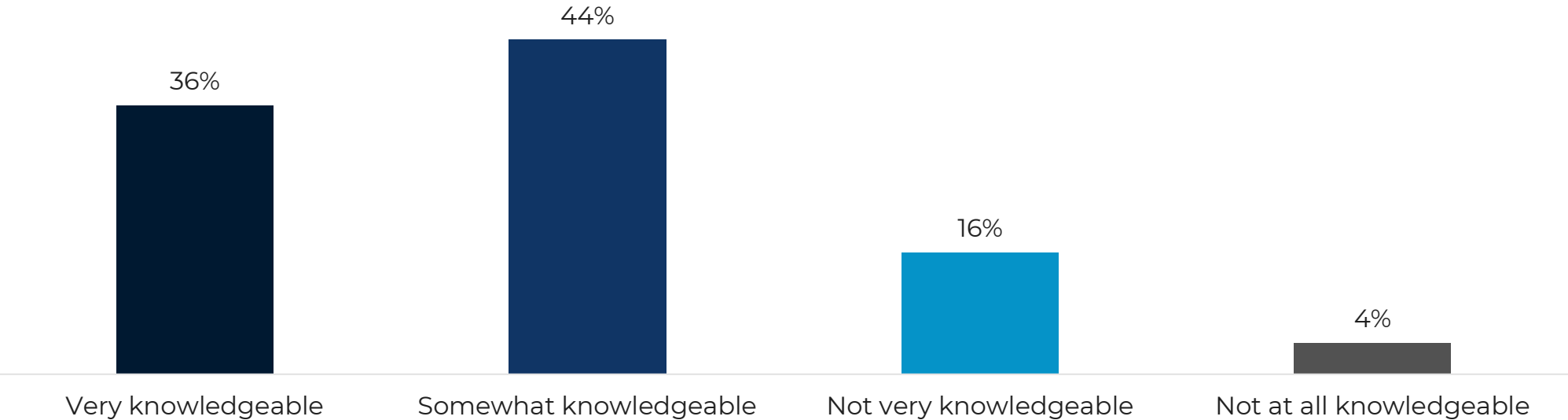
About this code of practice

- This code of practice outlines Fisheries and Oceans Canada's (DFO) national best practices for the repair and maintenance of bridges.
- Bridge repair and maintenance are generally undertaken to extend the life of the structure and to ensure that it functions as designed, thus ensuring public safety.
- This code of practice applies to structural bridge repairs and maintenance including:
 - Structural repair and maintenance of all bridge components (**substructure, superstructure, and deck**).
 - Cleaning, sweeping, and washing, of all bridge components, including the removal and application of protective coatings.
 - Removal of debris to protect **piers** and **abutments**.

Bridge repair & maintenance | **Level of knowledge**

A little over one-third are very knowledgeable about bridge repair and maintenance (36%), while nearly half are somewhat knowledgeable (44%).

Q.3 *How knowledgeable are you about bridge repair and maintenance and the terms used in the code of practice above? (n=267)*



LIST OF MEASURES

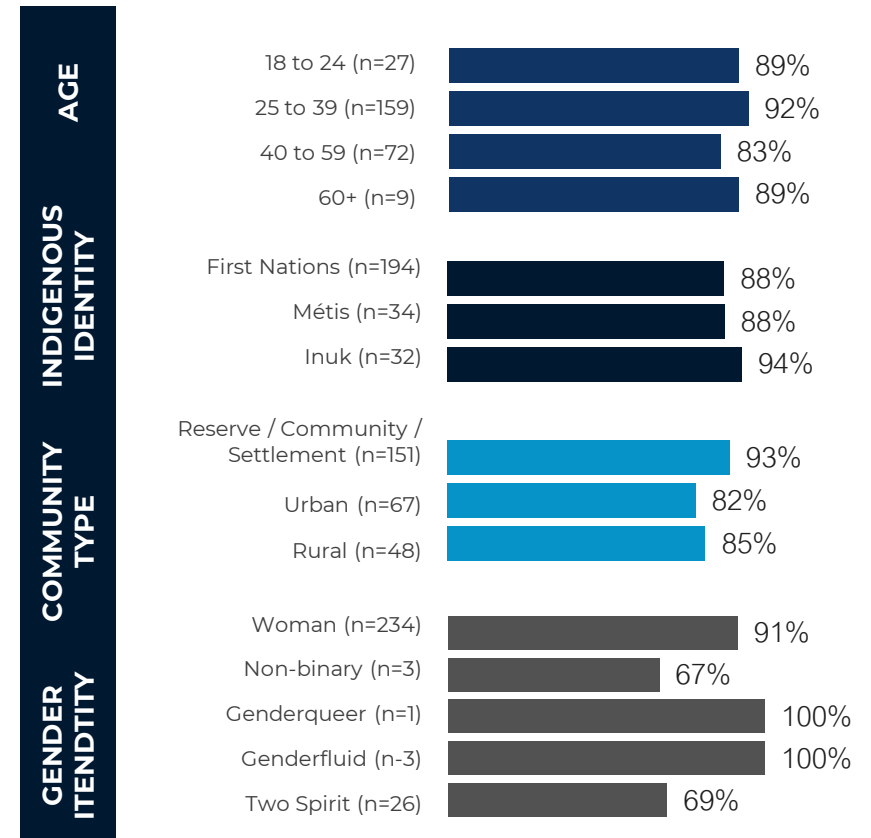
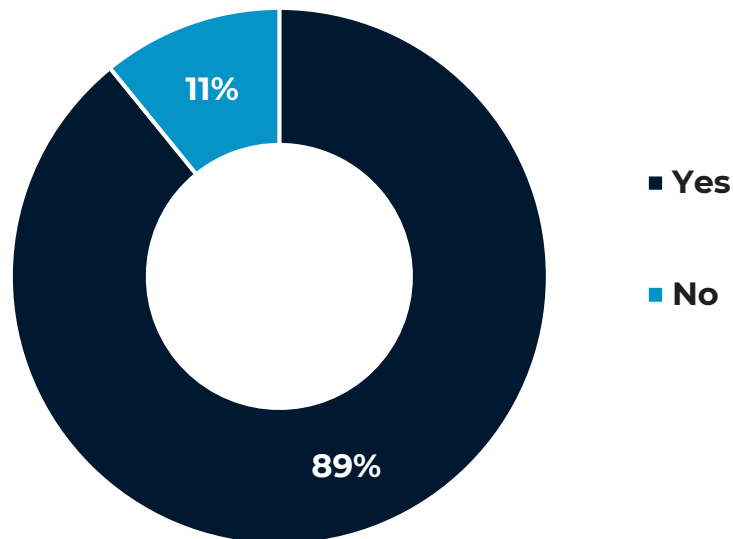
- **If water is present**, carry out the project to respect **timing windows**.
- **Limit the duration of in-water works**, undertakings and activities.
- **Screen intake pipes** during all phases of the project.

Bridge repair & maintenance | Perception of measures

Nine in ten respondents felt the measures listed are enough to protect fish during bridge repair and maintenance work (89%).

Q. 4 Do you think the measures listed above are enough to protect fish during bridge repair and maintenance work? (n=267)

% Feel Measures are Sufficient



Bridge repair & maintenance | **Open-ended suggestions**

Q. 4a *Please list other measures that can help in the protection of fish during bridge repair and maintenance work. If possible, state how your suggested measures will help improve fish conservation outcomes.*

Suggested Measures

- 1. Barriers** to prevent the runoff of construction materials, or debris off bridges
- 2. Creating a temporary eco-passage:** Around the construction site, we can set up a temporary ecological corridor to make sure the fish can keep migrating or swimming. These passages could be like temporary streams or waterways, helping to minimize the disruption caused by the construction work to the fish.
- 3. Establish a construction exclusion zone:** Designate a buffer zone around the construction area where fishing activities and other disturbances are not allowed to disturb fish populations. Do not schedule work during fish-sensitive periods: Avoid conducting construction activities during critical fish spawning, migration, or sensitive life stages to minimize disruption to fish populations.
- 4. Sediment Control:** Implement erosion and sediment control measures to prevent silt and debris from entering the water, as this can harm aquatic life.
- 5. Temporary Fish Barriers:** Install fish-friendly barriers like screens, nets, or fish ladders to prevent fish from entering the work zone.
- 6. Implement sediment control measures:** Sediment runoff can have a detrimental impact on fish and their habitat. Using silt curtains, sediment barriers, and erosion control techniques can help prevent sediment from entering the water and affecting fish.
- 7. Timing of maintenance and repairs:** The timing, construction and maintenance repairs shouldn't be when fish are spawning etc.
- 8. Fewer chemicals/harmful substances:** Chemical use is harmful to fish, so protectants need to be eco-friendly and sustainable like seal fat to protect the wood from elements and bridge structures made from long-lasting materials like Cypress, so repair is not needed as often so efforts are less intrusive.
- 9. Use environmentally friendly products** including recycled materials. Clean up the area after the project is done and maintain the area while doing the project. I feel that unfortunately, projects have taken over protecting the environment. One project recently by my house with a bridge took over 2 years. It was a mess, and metal and garbage everywhere for years. It finally was cleaned up at the end, but the metal and stuff all over for years made it very unsafe for people to fish.
- 10. Filter out harmful chemicals,** ban the use of some
- 11. Continuous monitoring** after implementation has been set in place.
- 12. Enforcing the proper disposal of garbage** and use of proper toilets for construction workers. While it seems common sense, I have known many individuals in my life who worked in construction that have said garbage is often tossed in dug-out holes into waterways or left on the roadside by workers. This would help reduce human waste and garbage (glass, metals and plastics) from entering the waterways
- 13. Worker awareness and safety** is a priority, no littering (cans or cigarettes) while working
- 14. Post-Construction Restoration:** After the work is completed, restore the site to its original condition or as close to it as possible, including replanting vegetation and stabilizing the shoreline.
- 15. Mindfulness around seasonal changes** and events when choosing to engage
- 16. Need more consultation** from affected communities, including water and land.

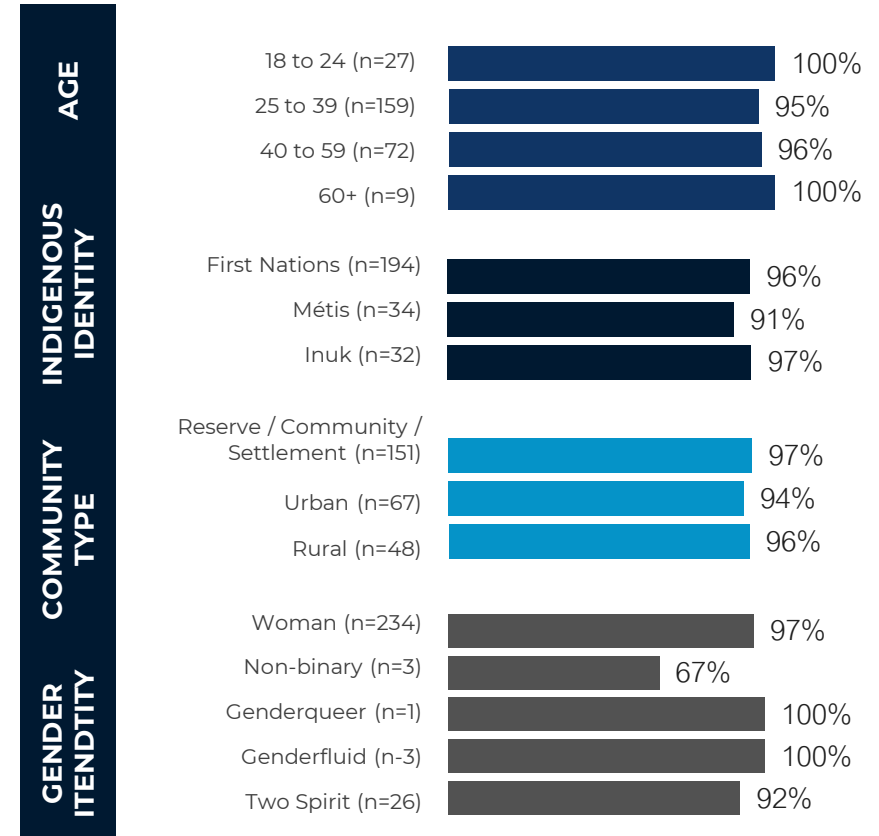
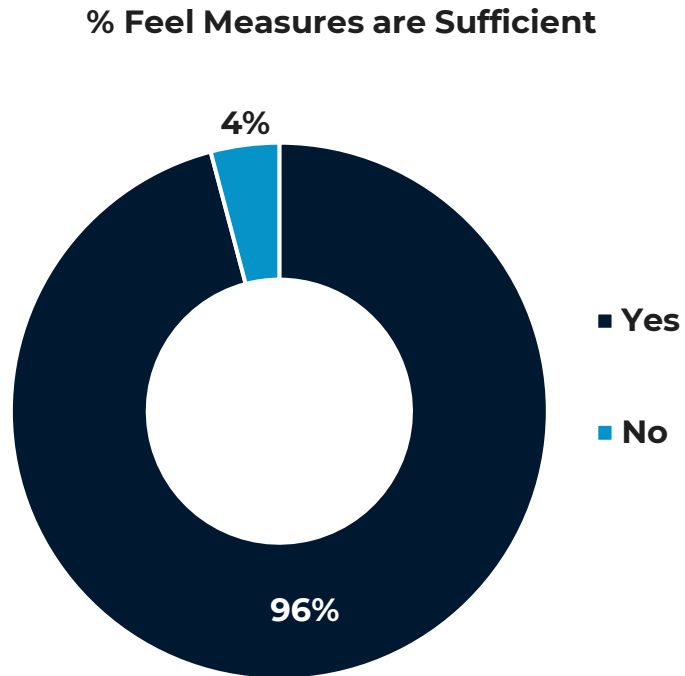
LIST OF MEASURES

- **Maintain fish passage** during all phases of the project.
- Ensure that **reinforcement rock** placed at the **base of abutments**, piers and **wing walls** does not interfere with fish passage or constrict the channel width.

Bridge repair & maintenance | Perception of measures

Almost all respondents felt the measures listed are enough to protect fish passage during bridge repair and maintenance work (96%).

Q. 5 Do you think the measures listed above are enough to protect fish passage during bridge repair and maintenance work? (n=267)



Bridge repair & maintenance | **Open-ended suggestions**

Q. 5a *Please list other measures that can help protect fish passage during bridge repair and maintenance work. If possible, state how your suggested measures will help improve fish conservation outcomes.*

Suggested Measures

- 1. Fish-friendly temporary bypass channels:** Constructing temporary bypass channels around the construction site can provide an alternate route for fish to navigate past the work area. These channels should be designed with features that mimic natural stream conditions and provide suitable water depth, flow velocity, and substrate to facilitate fish passage.
- 2. Homogeneity in water pH:** Make sure the rock placed is of the same mineral composition to maintain homogeneity in water pH etc.
- 3. Remote Sensing Technologies:** Advanced technologies such as underwater cameras, sonar, and acoustic tracking systems can be used to monitor fish movements and behavior in real-time. While these technologies don't physically isolate fish, they provide valuable information for managing fish populations.
- 4. Warning signs or slogans** can be set up around the fishway to remind construction workers to pay attention to protecting the fishway. During the construction period, the number of patrol personnel can be increased to ensure the safety of the fishway. During the construction period, the garbage and weeds around the fishway can be cleaned regularly to ensure the unobstructed fishway.
- 5. Continuously clean the area.** Do not leave metal and garbage around for years.

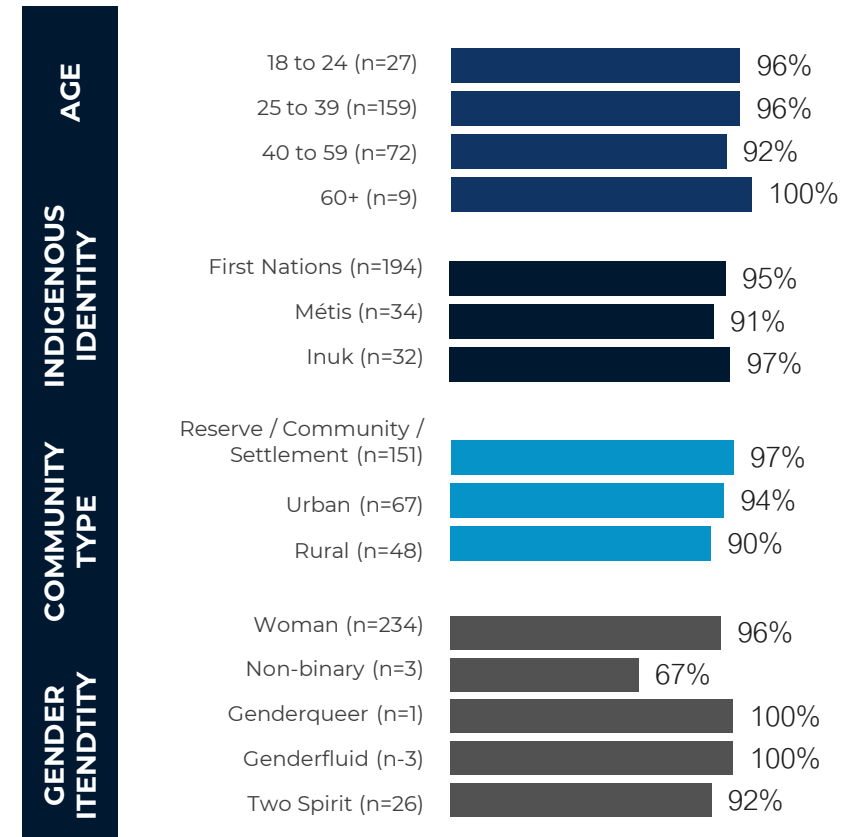
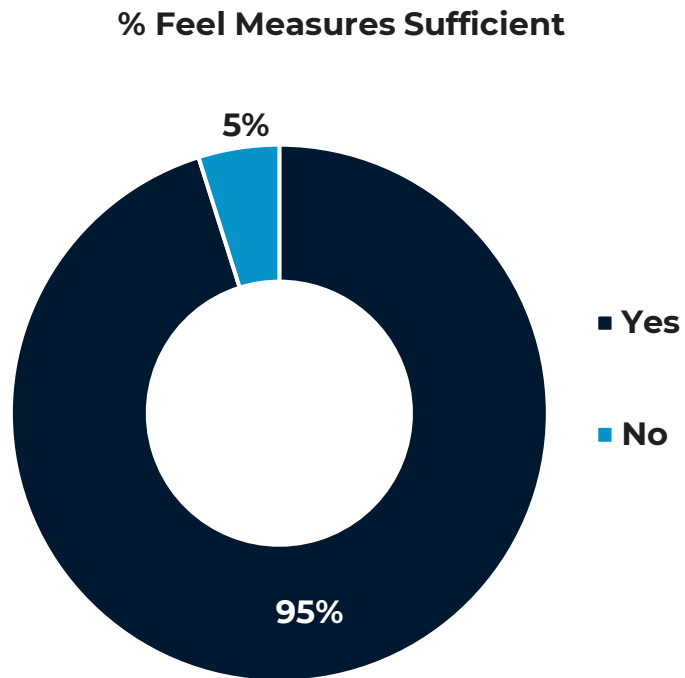
LIST OF MEASURES

- **Limit vegetation removal, pruning and grubbing** to the area required for accessing the project site.
 - Use existing **trails, roads, access points** or **cut lines**.
 - Use **methods** to **reduce soil compaction** (e.g., swamp mats, pads).
- **Reinstate stream banks and slopes** of the affected riparian zone.
- **Re-vegetate** the affected **riparian zone** with **native species** suitable for the project site.

Bridge repair & maintenance | Perception of measures

Almost all respondents felt the measures listed are enough to protect riparian zones during bridge repair and maintenance work (95%).

Q. 6 Do you think the measures listed above are enough to protect riparian zones during bridge repair and maintenance work? (n=267)



Bridge repair & maintenance | **Open-ended suggestions**

Q6a *Please list other measures that can help protect riparian zones during bridge repair and maintenance work. If possible, state how your suggested measures will help improve fish conservation outcomes.*

Suggested Measures

- 1. Construction barriers** to stop construction materials from entering the waterways or forests
- 2. Silt fencing and erosion control** measures can prevent sediment runoff into nearby water bodies. This reduces water turbidity, which is essential for fish breeding and foraging.
- 3. Incorporating fish passage structures** like fish ladders or bypass channels can enable fish to navigate around the construction site. These structures facilitate fish migration, allowing them to access critical spawning and rearing habitats, thus supporting fish conservation efforts.
- 4. Re-evaluation** to include any newer or better systems that may become available in the future.
- 5. Minimize noise and vibrations** from construction equipment, as these disturbances can be stressful and harmful to fish. Implement noise barriers or schedule noisy activities during periods when fish are less active.
- 6. Implementing erosion control measures** such as using mulch, retaining walls, or erosion control blankets can help prevent soil erosion and sedimentation in nearby water bodies. These measures can help maintain water quality and prevent the disturbance of fish habitats.
- 7. Conducting pre- and post-construction monitoring** of fish populations can help assess the impacts of bridge repair and maintenance work. If necessary, implementing fish rescue operations before construction can relocate fish from affected areas to safer habitats. This proactive approach ensures the protection of fish species during the construction process and promotes their long-term conservation.
- 8. Use environmentally friendly products.**
- 9. Make sure that fish preservation is always maintained as a top priority.** There are so many variables, and it can't just be a set standard for repair and maintenance because all bridges aren't the same and neither are the areas where they are built.
- 10. Individualized studies** need to be done when it comes to repair
11. I have seen firsthand how the plant life and animals are being displaced and distorted with the replacement of the bridge in a near by community

LIST OF MEASURES

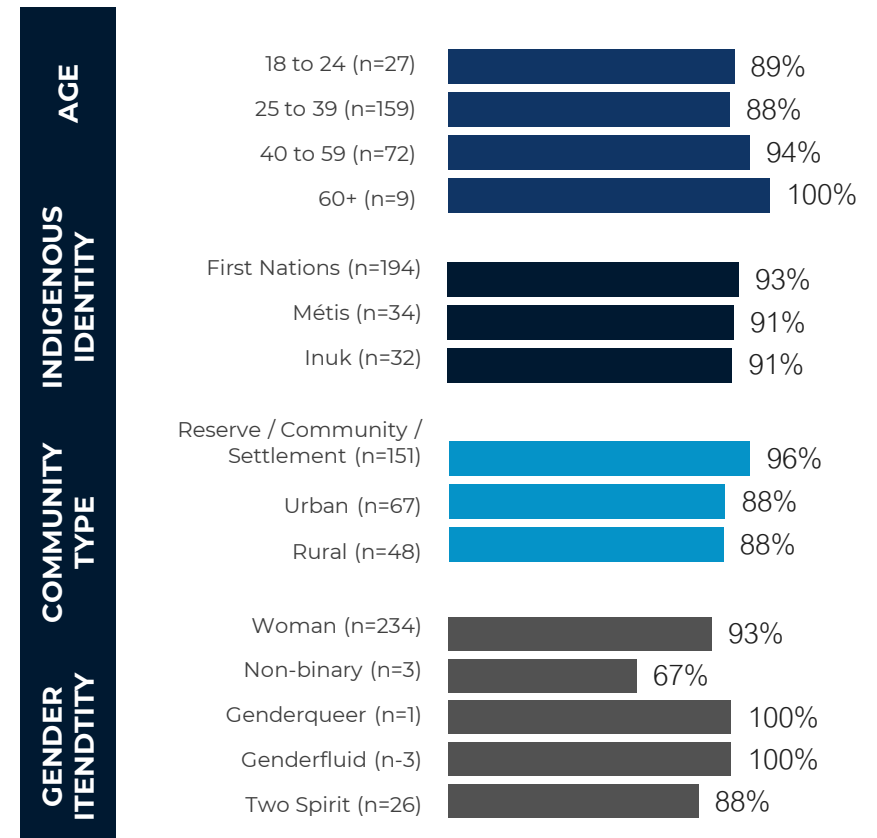
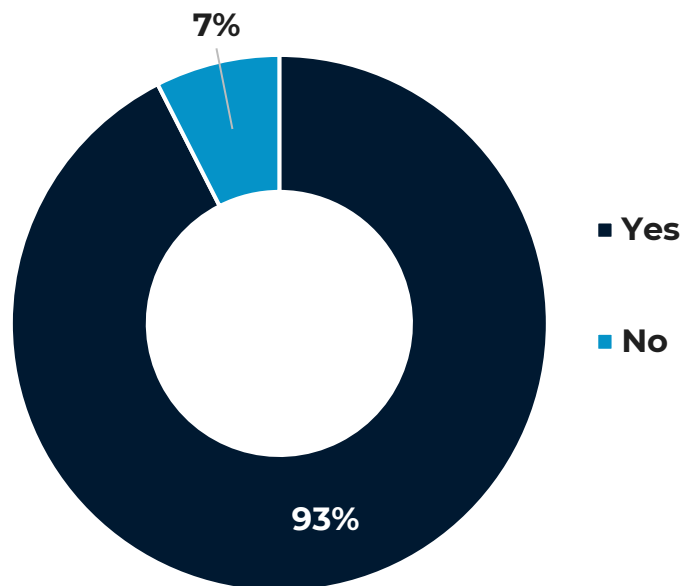
- **Limit** the **operation of vehicles** and **machinery** to the area required to carry out the project.
- **Ensure** that **equipment** and **machinery** are **clean** and free of **aquatic invasive species** once on the project site.
- **Operate machinery** on **land, from barges** or **on ice** during all phases of the project.

Bridge repair & maintenance | Perception of measures

The majority of respondents felt the measures listed are enough to protect aquatic habitat during bridge repair and maintenance work (93%). Those living on a First Nation Reserve, Inuit Community, or Métis settlement are more likely to say this than those living in urban or rural environments.

Q. 7 Do you think the measures listed above are enough to protect aquatic habitat during bridge repair and maintenance work? (n=267)

% Feel Measures are Sufficient



Bridge repair & maintenance | **Open-ended suggestions**

Q7a *Please list other measures that can help protect aquatic habitat during bridge repair and maintenance work. If possible, state how your suggested measures will help improve fish conservation outcomes.*

Suggested Measures

- 1. Use sediment barriers, erosion control blankets,** or straw wattles to prevent sediment runoff and erosion from entering water bodies.
- 2. Establish a construction exclusion zone:** Designate a buffer area around the construction site where no disturbance or equipment entry is allowed to protect sensitive aquatic habitats.
- 3. Minimize in-water work:** Whenever possible, use construction techniques that minimize the need for in-water work, such as using prefabricated around water and streams. buffer zones
- 4. Fishway needs to be temporarily** closed during the construction period, The relevant departments and people using the fishway can be notified in advance to ensure that they have enough time and choose other fishways.
- I'm not sure how to improve the outcome but in my community, dredging has had serious effects on the water levels in and around regions of Georgian Bay. My grandparents speak about where the water used to be almost to the road in certain areas and it's now 70 yards or more where the water used to bank. We no longer consume catfish from many of the waterways in Ontario because the fish look and taste different. We don't trust the lakebed is clean and as nourishing as it was 15 or 20 years ago
- 6. Use manpower:** Any work that can be done by manpower should be done instead of machinery. As organically as possible, heavy machinery can damage endangered species of plants etc.
- 7. Limiting the use of diesel-operated heavy equipment** and machinery in areas close to waters that possess aquatic species - there will always be a potential for spills, etc. Loud noises can also be harmful.
- 8. Not having machines in the water.** Doesn't matter how clean you think the machines are.
- 9. Not leaving the machine idling all day**
- 10. Ensure any machinery is using environmentally friendly eco-safe fuels**
- 11. Ensure no leakage or contamination** into water or surrounding wetlands
- 12. Create a boom around machinery** to ensure if any leak or spill happens from the machine it will be contained to a small area
- 13. Environmental Impact Assessment:** Before starting any bridge repair or maintenance work, conduct a comprehensive environmental impact assessment to understand potential risks to fish and their habitats. This assessment should guide your mitigation efforts.

LIST OF MEASURES

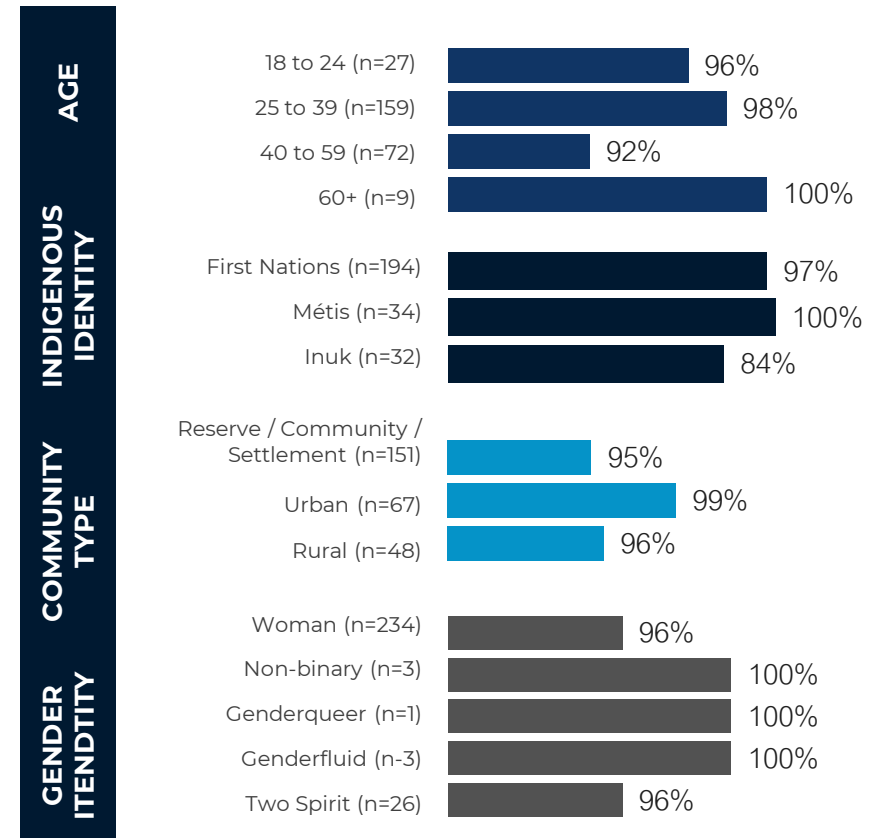
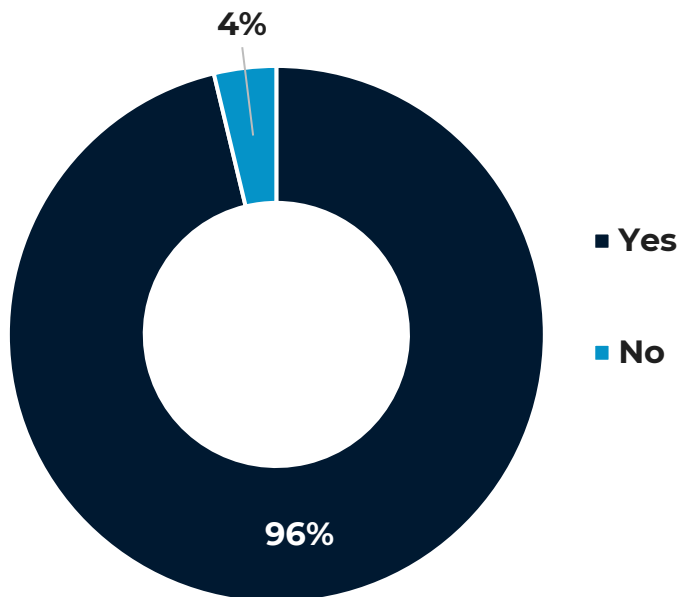
- **Manage sediment-laden water** flowing onto or through the site during all phases of the project.
- **Install erosion** and **sediment control** measures prior to the beginning of the project.
- Repair the **erosion** and **sediment controls** during all phases of the project.
- Keep **erosion** and **sediment controls** in place until all disturbed ground has been stabilized and suspended sediments have settled.

Bridge repair & maintenance | Perception of measures

Almost all respondents felt the measures listed are enough to protect fish and fish habitat from sediment during bridge repair and maintenance work (96%). First Nations and Métis respondents are more likely to say this than Inuit participants.

Q. 8 Do you think the measures listed above are enough to protect fish and fish habitat from sediment during bridge repair and maintenance work? (n=267)

% Feel Measures are Sufficient



Bridge repair & maintenance | **Open-ended suggestions**

Q. 8a *Please list other measures that can help to protect fish and fish habitats from sediment during bridge repair and maintenance work. If possible, state how your suggested measures will help improve fish conservation outcomes.*

Suggested Measures

- 1. Re-evaluation and inclusion** should newer or better measures become available.
- 2. Timing restrictions:** Implementing timing restrictions that limit construction activities during sensitive periods, such as fish spawning

seasons, can minimize disturbance to fish

- 3. Protection of critical life stages,** ensuring fish populations can thrive.

LIST OF MEASURES

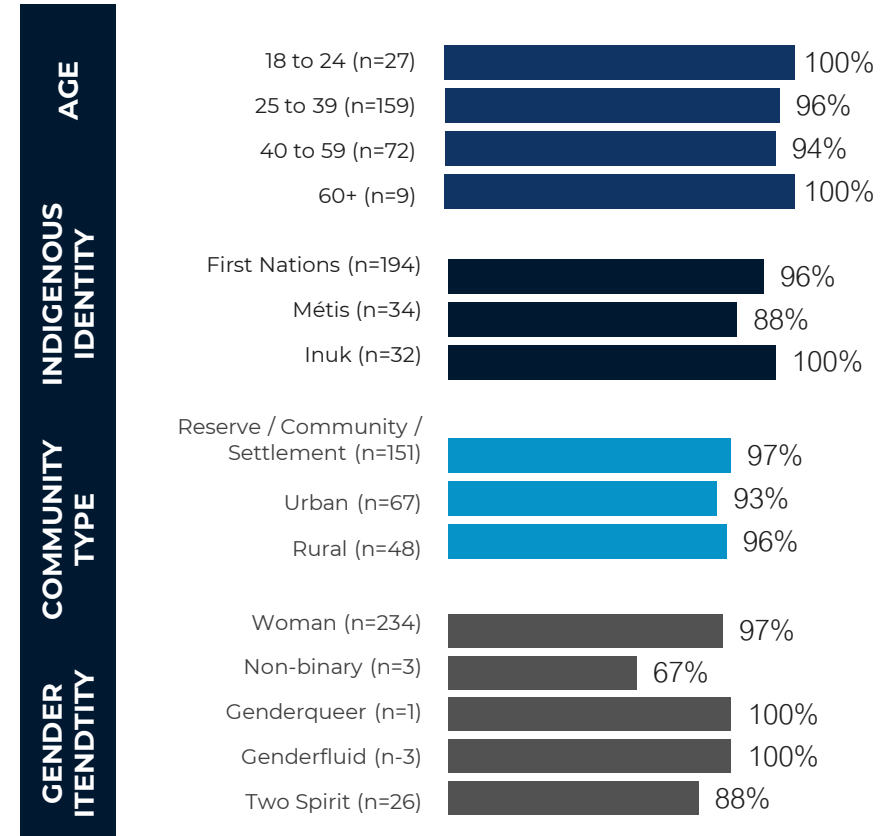
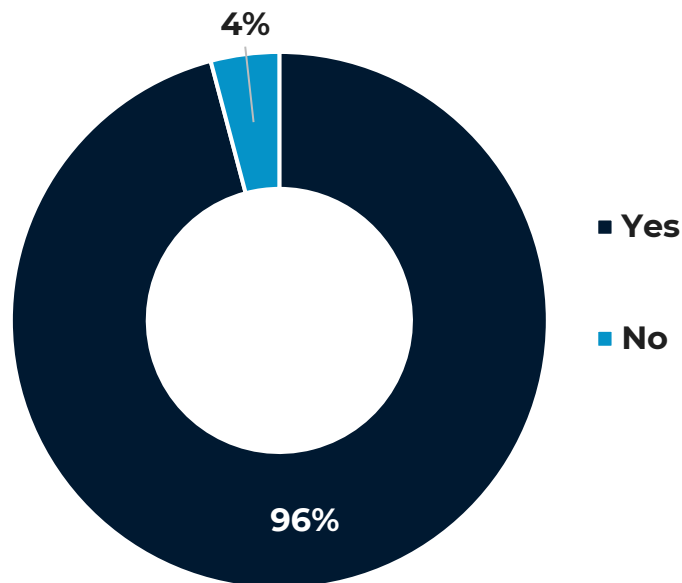
- Develop a plan to prevent deleterious substances from entering a watercourse or water body:
 - **Maintain all machinery** on the project site in a clean condition and free of fluid leaks.
 - **Wash, refuel and service machinery** in such a way as to prevent any deleterious substances from entering a watercourse or a water body.
 - **Store fuel** and other materials for the machinery in such a way as to prevent any deleterious substances from entering a watercourse or water body.
 - **Dispose of all waste material** on land in a designated area away from the ordinary high-water mark of any watercourse or water body.
 - Ensure that **acid-generating rock** is not used where it does not exist already.

Bridge repair & maintenance | Perception of measures

Almost all respondents felt the measures listed are enough to protect fish and fish habitat from deleterious substances during bridge repair and maintenance work (96%).

Q. 9 Do you think the measures listed above are enough to protect fish and fish habitat from deleterious substances during bridge repair and maintenance work? (n=267)

% Feel Measures are Sufficient



Bridge repair & maintenance | **Open-ended suggestions**

Q. 9a *Please list other measures that can help to protect fish and fish habitats from other deleterious substances, during bridge repair and maintenance work. If possible, state how your suggested measures will help improve fish conservation outcomes.*

Suggested Measures

- 1. Designate equipment wash/maintenance areas** away from waterbodies. Prevents greases, and chemicals from washing into fish habitats during cleaning.
- 2. Timing Restrictions:** Implementing timing restrictions that limit construction activities during sensitive periods, such as fish spawning seasons, can minimize disturbance to fish habitats.
- 3. Protection of critical life stages**, ensuring fish populations can thrive.
- 4. Machinery should use bio/eco-friendly fuel** and fluids whenever possible
- 5. Continuously monitor water quality parameters** during construction, including

turbidity, temperature, and dissolved oxygen levels. Implement corrective actions if water quality deteriorates beyond acceptable levels.

- 6. Use of heavy machinery should be limited** to only necessary

SECTION 3
**MUNICIPAL &
AGRICULTURAL DRAIN
MAINTENANCE**

MUNICIPAL & AGRICULTURAL DRAIN MAINTENANCE

About this code of practice

- This code of practice outlines Fisheries and Oceans Canada's (DFO) national best practices for municipal and agricultural drain maintenance and applies only to **drains with intermittent flow**.
- Intermittent drains flow only for a short period of time in spring or during wet weather and are dry for the remainder of the year.
- Municipal and agricultural drain maintenance is required to restore drains to their original design grade to ensure proper drainage during intermittent flow (e.g., **drainage for agricultural fields**, and **municipal storm drains**).

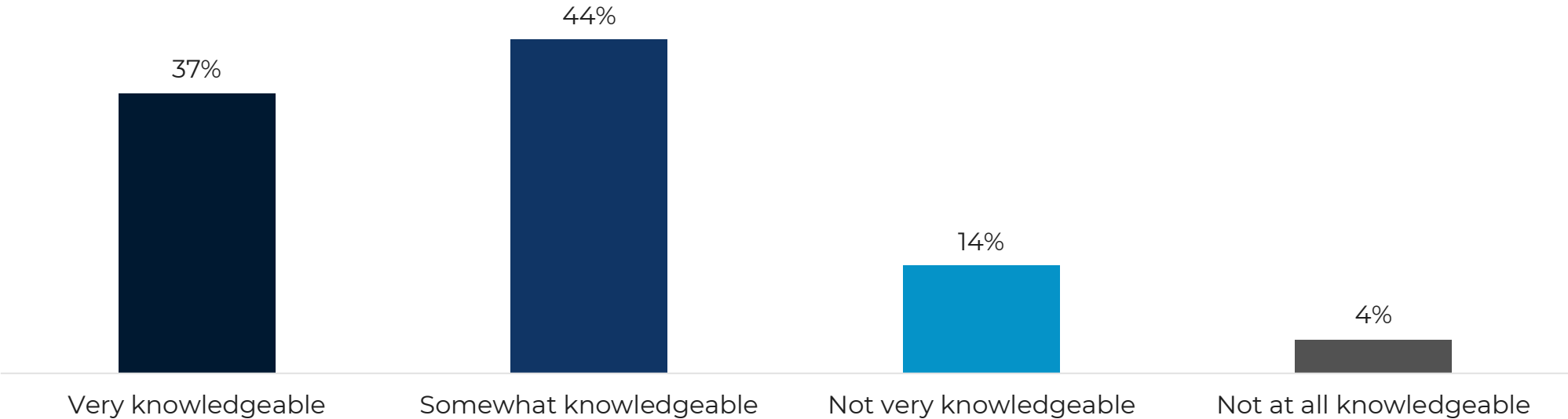
Maintenance activities can include:

- Work on the banks including repair, stabilization, and **brushing** (slope, and top of bank).
- Isolated **spot cleanout, full cleanout** (when dry or frozen), **bottom cleanout** (when dry or frozen).
- Repairs to, and maintenance of **water control structures, pipes, junction boxes, catch basins, pump stations, dikes and pipe outlets**.
- Removal of debris.

Municipal & agricultural drain maintenance | **Level of knowledge**

Nearly half of respondents (44%) were somewhat knowledgeable about municipal and agricultural drain maintenance and another 37% were very knowledgeable.

Q. 10 How knowledgeable are you about municipal and agricultural drain maintenance and the terms used in the code of practice above? (n=267)



LIST OF MEASURES

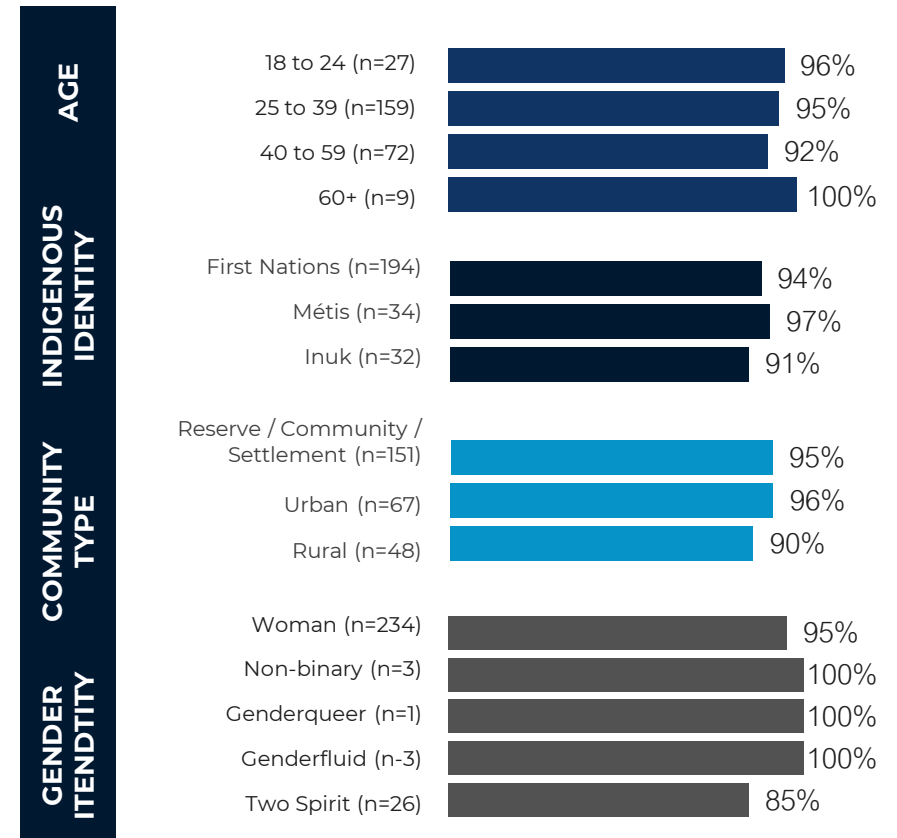
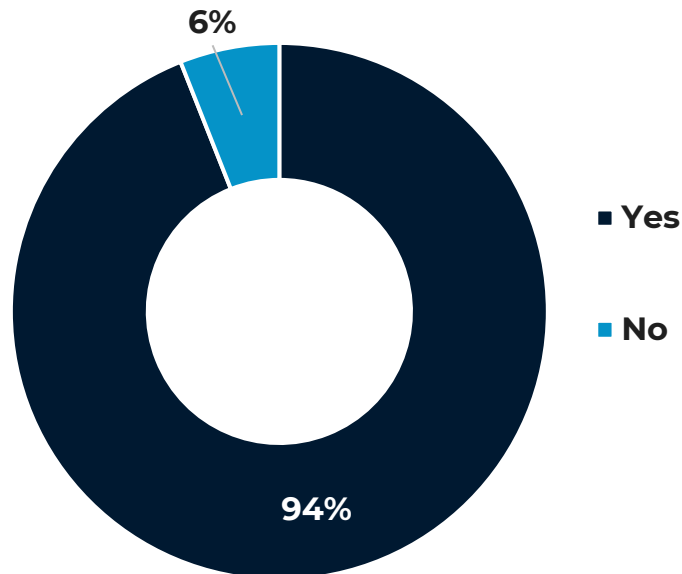
- If water is present, carry out the project to respect **timing windows**.
 - **Limit the duration** of in-water works, undertakings and activities.
- Ensure the project area is **isolated** using a **fish exclusion device**.
- **Capture fish trapped** within an **isolated** or **enclosed area** and relocate them to the same watercourse or water body.
- **Capture** and **relocate** any fish as per applicable permits.

Municipal & agricultural drain maintenance | Perception of measures

The majority of respondents felt the measures listed are enough to protect fish during municipal and agricultural drain maintenance (94%).

Q. 11 Do you think the measures listed above are enough to protect fish during municipal and agricultural drain maintenance? (n=267)

% Feel Measures are Sufficient



Municipal & agricultural drain maintenance | **Open-ended suggestions**

Q. 11a *Please list other measures that can help in the protection of fish during work related to municipal and agricultural drain maintenance. If possible, state how your suggested measures will help improve fish conservation outcomes.*

Suggested Measures

- 1. Buffer zone around fish habitats.** Keep as natural as possible so fish and wildlife are not disturbed.
- 2. Fish Salvage:** Employ fish salvage techniques, such as electrofishing or seining, to capture and relocate fish to a safe area during maintenance
- 3. Buffer Zones:** Maintain vegetated buffer zones along drainage channels to filter out pollutants and provide habitat for fish.
- 4. Provision of fish protection facilities** such as fish ladders and habitat restoration areas in municipal and agricultural drainage systems. These facilities can help fish migrate and reproduce, increasing their survival rate.
- 5. Spill Response Plan:** Develop and implement a spill response plan to manage accidental spills of hazardous materials during maintenance.
- 6. Continuously monitor water quality** in drains to detect any changes that could harm fish. Respond promptly if adverse conditions are identified.
- 7. Education and Training:** Provide education and training to personnel involved in maintenance work to ensure they understand the importance of fish protection measures.
- 8. Avoid capture and release:** Wild fish shouldn't be captured and released; the stress is too much.

LIST OF MEASURES

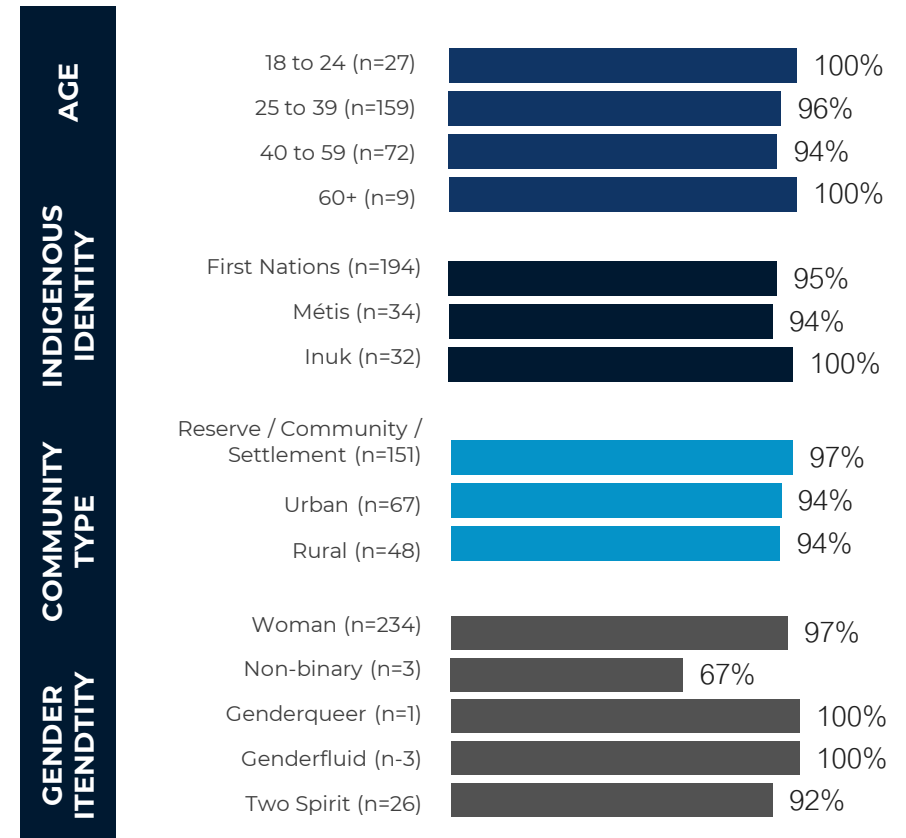
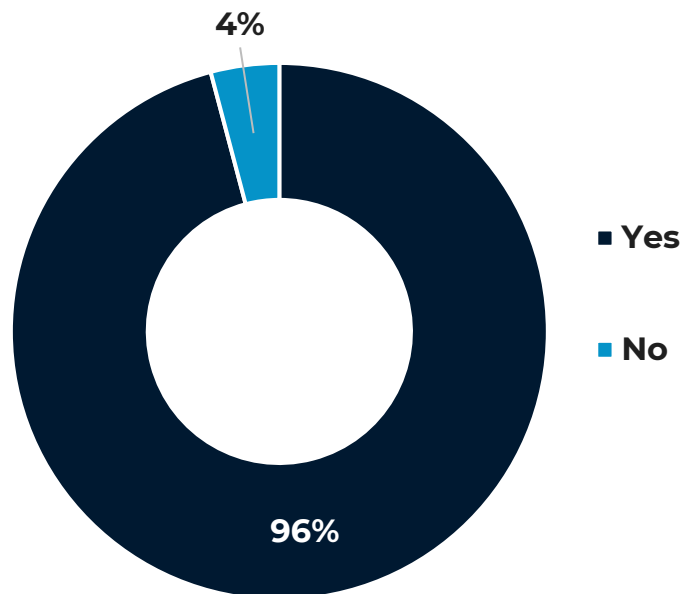
- **Limit vegetation removal, pruning and grubbing** to the area required for accessing the project site.
- **Limit access to shorelines and banks** or areas adjacent to the watercourse or water body.
- Use existing **trails, roads, access points** or **cut lines**.
- **Construct** roads, access points and approaches **perpendicular** to the watercourse or water body.
- Use **methods** to **reduce soil compaction** (e.g., swamp mats, and pads).
- Reinststate **stream banks** and **slopes** of the affected riparian zone.
- Re-vegetate the **affected riparian zone** with native or suitable species for the project site.

Municipal & agricultural drain maintenance | Perception of measures

Almost all respondents felt the measures listed are enough to protect riparian zones during municipal and agricultural drain maintenance (96%).

Q. 12 Do you think the measures listed above are enough to protect riparian zones during municipal and agricultural drain maintenance? (n=267)

% Feel Measures are Sufficient



Municipal & agricultural drain maintenance | **Open-ended suggestions**

Q. 12a *Please list other measures that can help to protect riparian zones during work related to municipal and agricultural drain maintenance. If possible, state how your suggested measures will help improve fish conservation outcomes.*

Suggested Measures

- 1. Barrier nets** are often used to prevent fish from entering or exiting specific areas in rivers and big water bodies. They can be employed to guide fish towards capture or away from danger.
- 2. Reduce soil compaction** in the fish breeding areas.
- 3. Education and Training:** Provide education and training to personnel involved in maintenance work to ensure they understand the importance of fish protection measures.
- 4. Minimize vegetation removal:** Avoid unnecessary vegetation removal within the riparian zone unless it poses a clear obstruction to drainage flow.
- 5. Preserve native vegetation** as much as possible to maintain the integrity of the riparian ecosystem.
- 6. Implement erosion control measures:** Use erosion control measures such as erosion control blankets, mats, or vegetation to stabilize exposed soils and prevent erosion within the riparian zone.
- 7. Use buffer zones** around fish habitat.
- 8. Use no-go zones** to prevent investors from developing and destroying the natural habitat.

LIST OF MEASURES

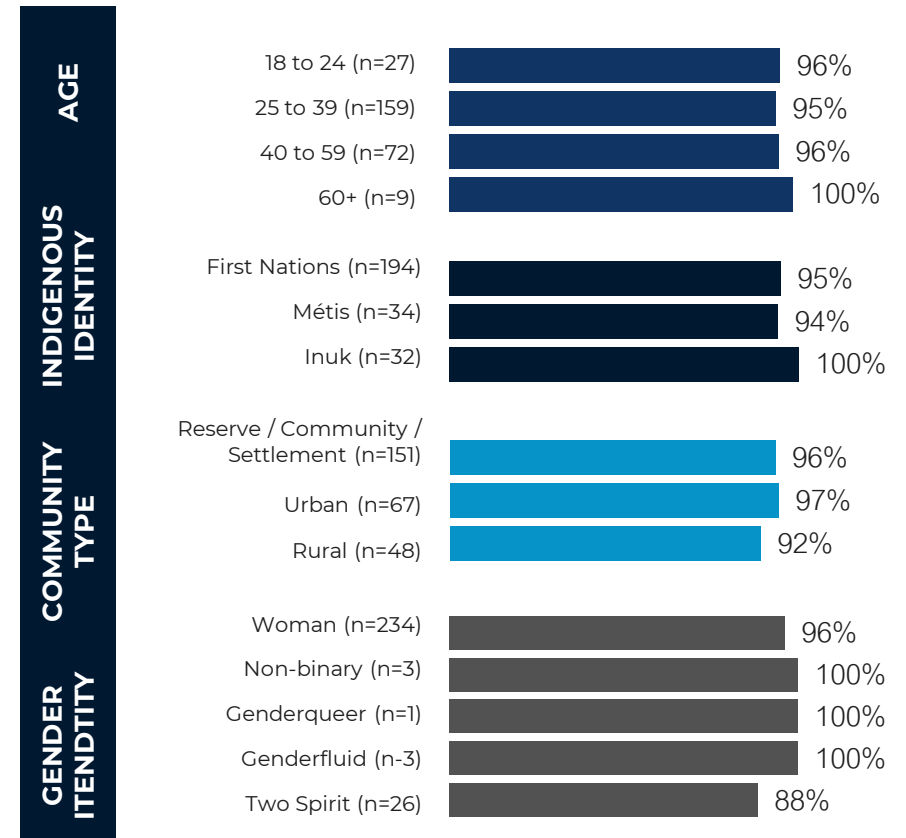
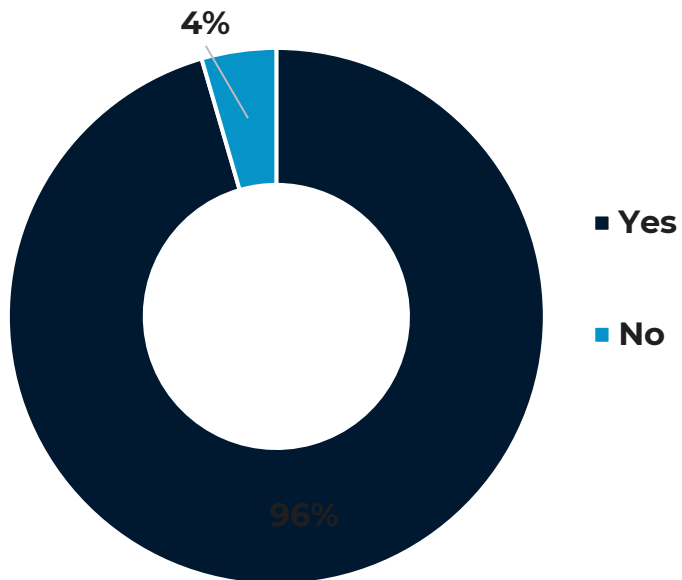
- **Maintain base flow** and **seasonal flow** of water during all phases of the project.
- **Restore** the **bed** and **banks**, gradient and contour affected by the project.
- **Operate machinery** on land, or on ice during all phases of the project.
- **Limit the operation of vehicles** and machinery to the area required to carry out the project.
- **Ensure that machinery arrives** on the project site in a clean condition and is maintained free of invasive species and noxious weeds.

Municipal & agricultural drain maintenance | Perception of measures

Almost all respondents felt the measures listed are enough to protect aquatic habitat during municipal and agricultural drain maintenance (96%).

Q. 13 Do you think the measures listed above are enough to protect aquatic habitat during municipal and agricultural drain maintenance? (n=267)

% Feel Measures are Sufficient



Municipal & agricultural drain maintenance | **Open-ended suggestions**

Q. 13a *Please list other measures that can help to protect aquatic habitats during work related to municipal and agricultural drain maintenance. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Close sensitive habitat areas** to equipment that causes damage and even use of equipment that requires less bottom contact
- 2. Stabilize soils and replant vegetation** along disturbed banks after work. Healthy, vegetated riparian zones aid water quality, and moderate flows to reduce erosion affecting fish habitats long-term.
- 3. Use silt curtains** to contain sediment runoff when working in or near waterways. This prevents habitat degradation which allows fish eggs and young to develop properly.
- 4. Divert the water flow or dewater** a section of the stream or river to create a dry work area. Ensure that this is done carefully and by permits and regulations.
- 5. Limit the machinery** around the site and possibly
- 6. Use time in-channel work** for low flow periods and outside fish spawning windows. Reduced disturbance means less stress on fish during critical lifecycle periods, supporting healthier long-term populations.

Comment

- 1. Port Alberni** is a prime example of agriculture upstream from the river. When I was a child the bottom of the river was clear. After the Arrowvale farm was put in, there is a sludge downriver which exists to this day from all that cow manure.

LIST OF MEASURES

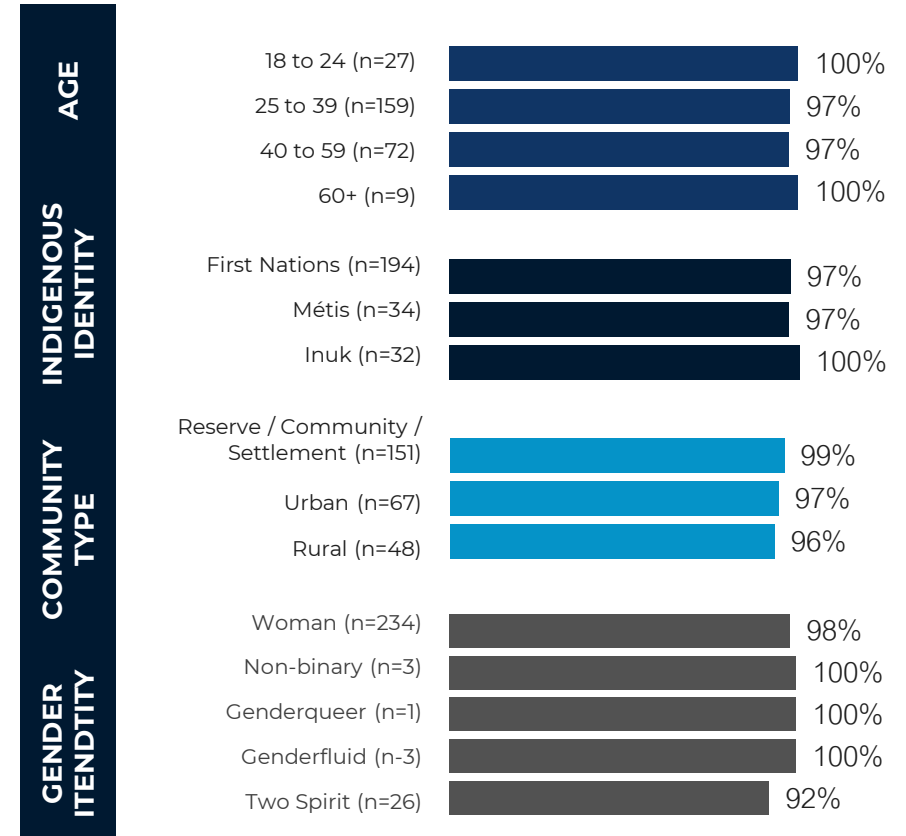
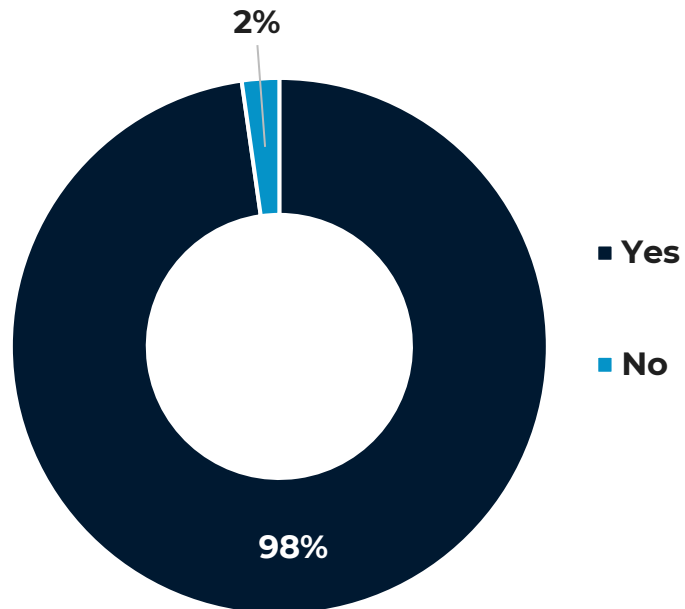
- **Manage sediment-laden** water flowing onto or through the site during all phases of the project.
- **Install erosion** and sediment control measures prior to beginning the project.
- **Repair** the **erosion** and **sediment controls** during all phases of the project.
- **Keep** the **sediment control measures** in place until all disturbed ground has been stabilized and suspended sediments have settled.

Municipal & agricultural drain maintenance | Perception of measures

Almost all respondents felt the measures listed are enough to protect fish and fish habitat from sediment during municipal and agricultural drain maintenance (98%).

Q. 14 Do you think the measures listed above are enough to protect fish and fish habitat from sediment during municipal and agricultural drain maintenance? (n=267)

% Feel Measures are Sufficient



Municipal & agricultural drain maintenance | **Open-ended suggestions**

Q. 14a *Please list other measures that can help to protect fish and fish habitats from sediment during work related to municipal and agricultural drain maintenance. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- **Constructing gravel beds** or channels can create isolated areas for fish spawning and incubation. This is often done in salmon fisheries to provide a protected environment for eggs and fry.
- **Reduce logging**, and development near land and water around fish habitat.

LIST OF MEASURES

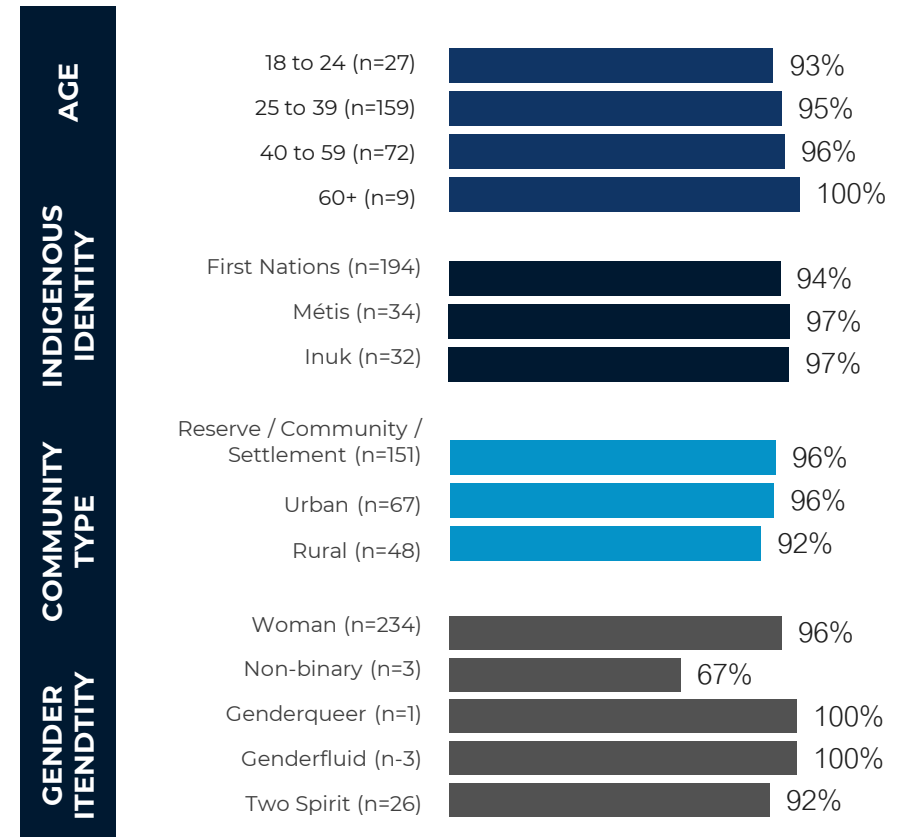
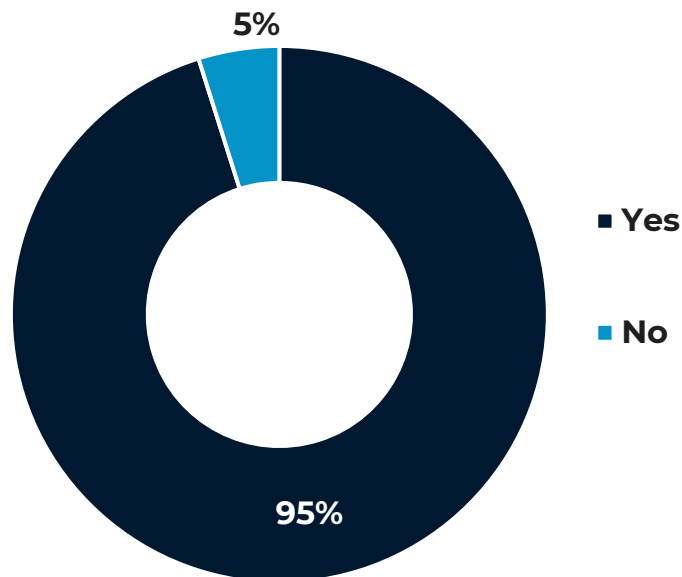
- **Develop a prevention plan** to prevent deleterious substances from entering a watercourse or water body.
- **Maintain all machinery** on site in a clean condition and **free of fluid leaks**.
- **Wash, refuel and service machinery**, and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering a watercourse or water body.
- **Store fuel and maintain machinery** (e.g., washing, refuelling, servicing) in such a way as to prevent any deleterious substance from entering the watercourse or water body.
- **Dispose of all waste materials** on land in a designated area away from the ordinary high-water mark of any watercourse or water body.
- Remove debris with machinery operating from land.

Municipal & agricultural drain maintenance | Perception of measures

The majority of respondents felt the measures listed are enough to protect fish and fish habitat from deleterious substances during municipal and agricultural drain maintenance (95%).

Q. 15 Do you think the measures listed above are enough to protect fish and fish habitat from deleterious substances during municipal and agricultural drain maintenance? (n=267)

% Feel Measures are Sufficient



Municipal & agricultural drain maintenance | **Open-ended suggestions**

Q. 15a *Please list other measures that can help to protect fish and fish habitats from deleterious substances during municipal and agricultural drain maintenance. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Adaptive Management:** Be prepared to adapt and modify protective measures based on changing conditions and feedback from indigenous communities and monitoring efforts.
- 2. Support habitat restoration projects** aimed at improving the health of water bodies and their surroundings, which can help mitigate the impact of pollutants.
- 3. Monitor water quality:** Conduct regular water quality monitoring to assess the impacts of drain maintenance activities on fish and aquatic habitats.
- 4. Monitor parameters such as nutrient levels,** turbidity, dissolved oxygen, and pH to detect any potential issues and take appropriate corrective actions.
- 5. Educate stakeholders:** Provide education and outreach to farmers, landowners, and other stakeholders about the importance of protecting fish and fish habitats during drain maintenance activities.
- 6. Promote awareness.** This needs to be done daily. Not just at the end of a project.
- 7. Monitor water quality and fish stocks** in water bodies, as well as the functioning of drainage systems. Through monitoring, problems can be detected and addressed promptly, reducing potential risks to fish.

SECTION 4
**REPAIR & MAINTENANCE OF
IN-WATER STRUCTURES**

REPAIR & MAINTENANCE OF IN-WATER STRUCTURES

About this code of practice

- This code of practice outlines Fisheries and Oceans Canada's (DFO) national best practices for the repair and maintenance of existing in-water structures (in freshwater and marine environments) associated with **harbours, marinas, ports, and public boat launches**.
- For the purposes of this code of practice, in-water structures include **piers, wharves, groynes, docks, boat launch ramps/slipways, breakwaters, and moorings**.
- There are two categories of repair and maintenance activities: activities that take place above the **ordinary high-water mark** (OHWM), and activities that take place below the **ordinary high-water mark**.

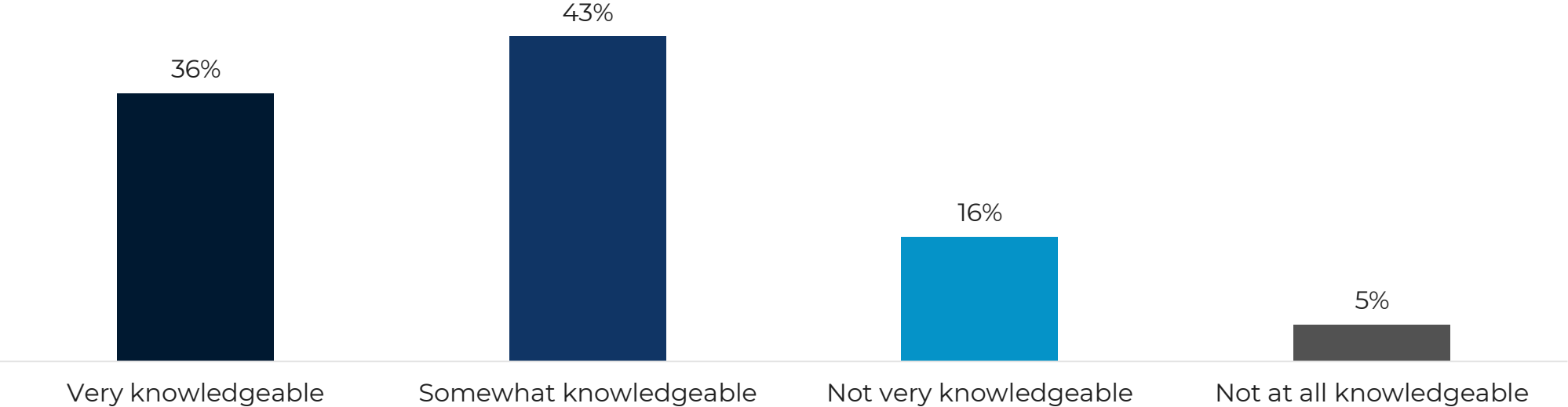
When implemented correctly, these measures can manage the risk of harmful impacts associated with the repair and maintenance of in-water structures, which can include:

- Disturbance to **water body bed** and **banks**.
- Release of sediments or other **deleterious substances**.
- Change to **aquatic habitat**.

Repair and maintenance of in-water structures | **Level of knowledge**

43% of respondents were somewhat knowledgeable about the repair and maintenance of in-water structures, while another 36% were very knowledgeable.

Q. 16 *How knowledgeable are you about the repair and maintenance of in-water structures and the terms used in the code of practice above?*
(n=267)



LIST OF MEASURES

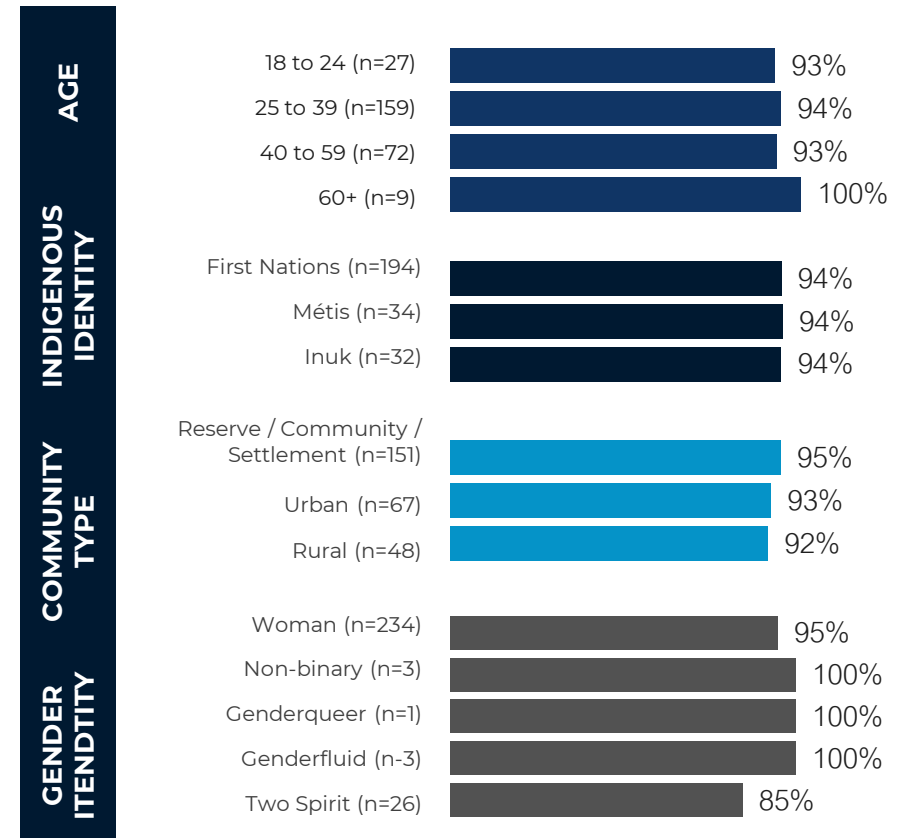
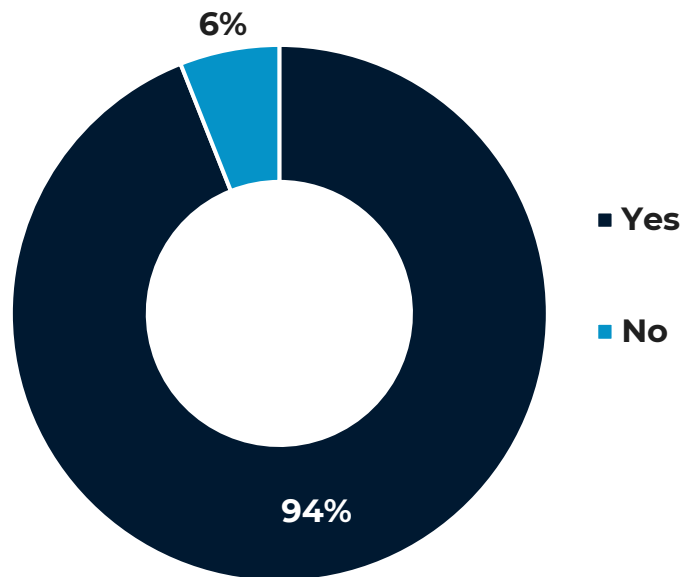
- Carry out the project in accordance with **timing windows**.
- **Limit** the **duration** of in-water works, undertakings and activities.
- **Capture** and **relocate** motile invertebrate (non-invasive) species from the removed piles and return them to suitable nearby habitats outside of the project footprint.

Repair and maintenance of in-water structures | Perception of measures

The majority of respondents felt the measures listed are enough to protect fish during the repair and maintenance of in-water structures (94%).

Q. 17 Do you think the measures listed above are enough to protect fish during the repair and maintenance of in-water structures? (n=267)

% Feel Measures are Sufficient



Repair and maintenance of in-water structures | **Open-ended suggestions**

Q. 17a *Please list other measures that can help in the protection of fish during the repair and maintenance of in-water structures. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Establishment of temporary or alternative habitats**, ensuring water quality remains uncontaminated, and mitigating any impacts on fish spawning and migration patterns.
- 2. Rehabilitate and restore** the affected habitat, including replanting vegetation and stabilizing banks to create a healthy environment for fish.
- 3. Store, use, and dispose** of construction materials, chemicals, and fuels responsibly to prevent contamination of the waterway.
- 4. Conduct an environmental impact assessment** to identify potential risks to fish habitats and develop appropriate mitigation strategies.
- 5. Before capturing and relocating species** it is important to take the necessary amount of time to determine the effects this relocation will have on them.
- 6. Timing windows:** Choosing the right time and method of construction can reduce direct disturbance to fish, such as harvest, injury, or mortality.
- 7. Turbidity Control:** Implement measures to control turbidity and sediment release during repairs, as excessive sediment can harm fish and their habitats.
- 8. Habitat Restoration:** After completing repairs, engage in habitat restoration efforts to improve the environment for fish in the affected area.
- 9. Limit noise and vibration** generation during construction to reduce disturbance to fish.
- 10. Set up isolated areas** during construction to relocate fish to temporary suitable habitats to protect them from construction activities.
- 11. Reduce underwater noise** generated during construction to reduce disturbance to fish.

LIST OF MEASURES

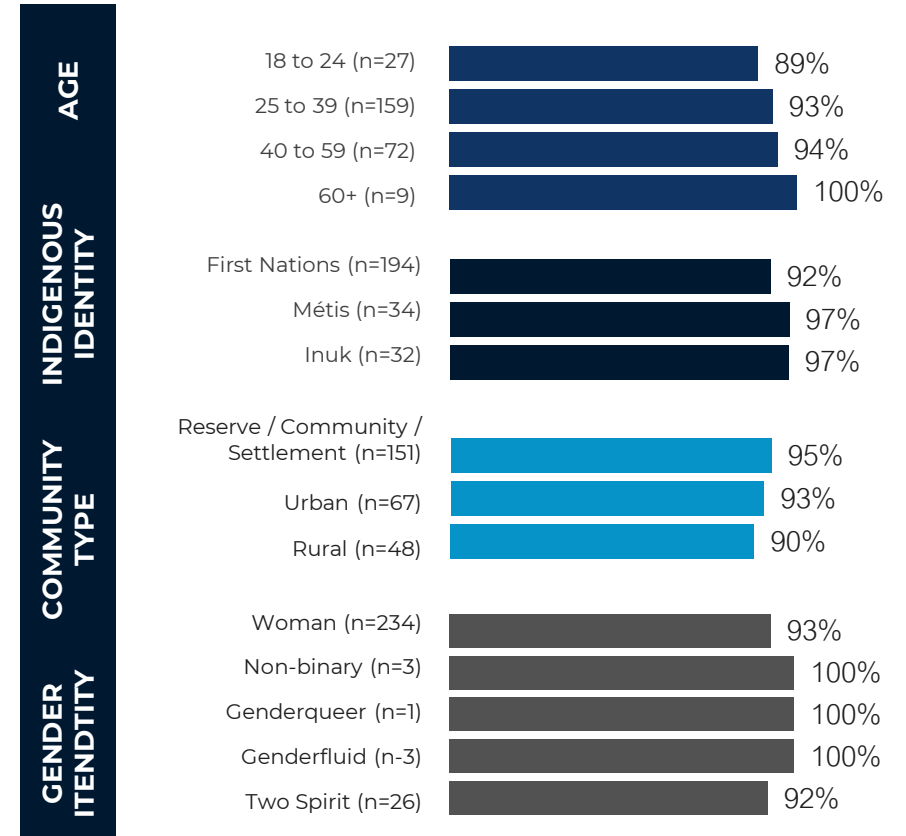
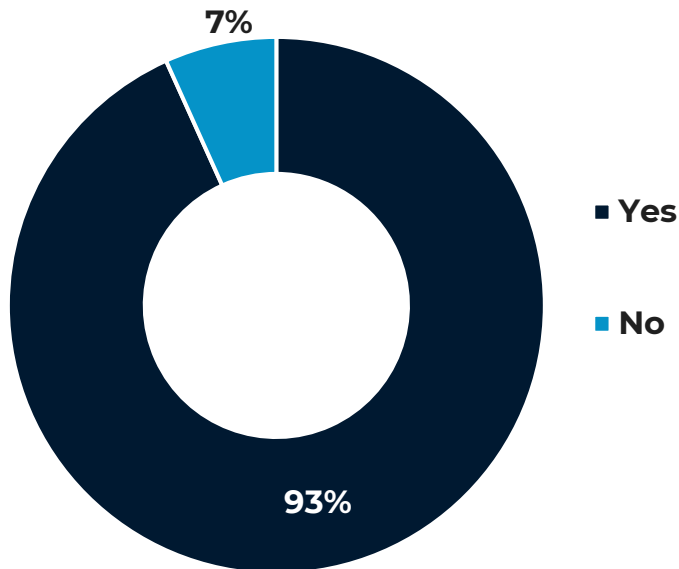
- **Limit disturbance** of fish habitat features (e.g., aquatic plants, rocks, woody material) to the area required to carry out the project.
- **Ensure** that **machinery arrives** on the project site in a clean condition and is maintained **free of invasive species** and **noxious weeds**.

Repair and maintenance of in-water structures | Perception of measures

The majority of respondents felt the measures listed are enough to protect aquatic habitat during the repair and maintenance of in-water structures (93%).

Q. 18 Do you think the measures listed above are enough to protect aquatic habitat during the repair and maintenance of in-water structures? (n=267)

% Feel Measures are Sufficient



Repair and maintenance of in-water structures | **Open-ended suggestions**

Q. 18a *Please list other measures that can help to protect aquatic habitats during the repair and maintenance of in-water structures. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Limit the amount of machinery** allowed on site
- 2. Implement fish exclusion screens:** Install screens or barriers on equipment or structures to prevent fish from entering the work area or being injured by the equipment.
- 3. Limit the time of the project** to enable a swifter return to a naturally established ecosystem.
- 4. Set up fish barriers** around the construction area to prevent fish from entering the construction area. These barriers can be physical barriers, such as nets or fences, or non-physical barriers such as sound or light
- 5. Use bubble curtains** or sound **attenuation devices** during pile driving/removal to reduce noise impacts. Loud noises cause stress and can damage fish hearing, affecting reproduction and survival.
- 6. Stabilize soils and replant vegetation** on shores and riparian areas disturbed by work activities. Healthy shoreline habitats provide shelter, food and temperature regulation important for fish.
- 7. Conducting pre-construction surveys** to identify the presence of fish and their habitats allows for the development of appropriate mitigation strategies. By knowing the location and characteristics of fish habitats, construction activities can be planned and executed in a way that minimizes disturbance, reduces habitat fragmentation, and supports fish conservation.
- 8. Continually check machinery** for no leaks, reduce the use of in-water machinery to protect fish species
- 9. Inspect materials regularly** for signs of deterioration/leaching and promptly repair. Degrading materials like creosote can pollute habitats impacting fish health and reproduction.
- 10. Monitor and assess the impact of construction or repair activities** on the aquatic habitat. Regularly evaluate the effectiveness of mitigation measures and make adjustments as necessary to minimize any negative impacts on the habitat.
- 11. Monitoring turbidity levels** in the water during construction activities can help assess the impact of sedimentation on fish habitats. By closely monitoring turbidity and adjusting construction practices as necessary, the risk of excessive sedimentation and potential negative impacts on fish, such as reduced visibility and compromised feeding and spawning areas, can be minimized.

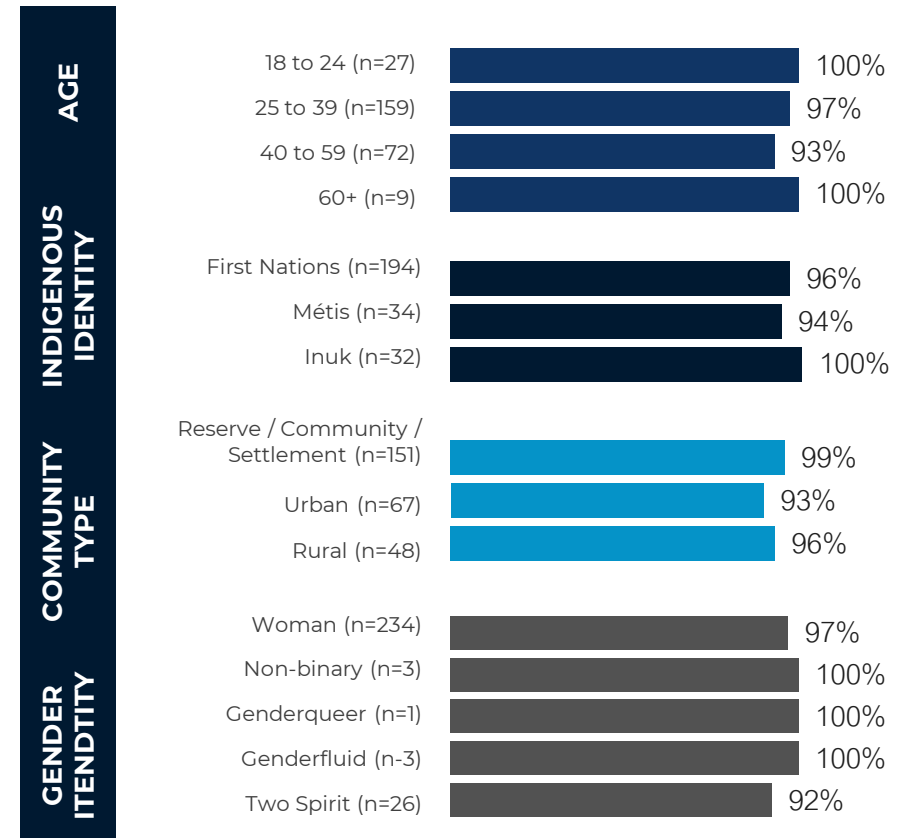
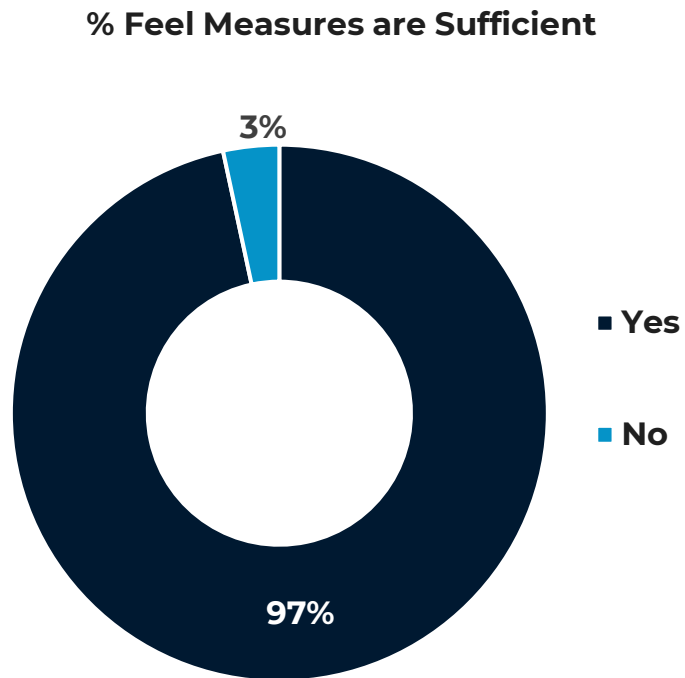
LIST OF MEASURES

- **Manage sediment-laden water** flowing onto or through the site during all phases of the project.
- **Install erosion** and **sediment control measures** prior to beginning the project.
- **Repair** the **erosion** and **sediment controls** during all phases of the project.
- **Keep** the **sediment control measures in place** until all disturbed ground has been stabilized and suspended sediments have settled.

Repair and maintenance of in-water structures | Perception of measures

Almost all respondents felt the measures listed are enough to protect fish and fish habitat from sediment during the repair and maintenance of in-water structures (97%).

Q. 19 Do you think the measures listed above are enough to protect fish and fish habitat from sediment during the repair and maintenance of in-water structures? (n=267)



Repair and maintenance of in-water structures | **Open-ended suggestions**

Q. 19a *Please list other measures that can help to protect fish and fish habitats from sediment during the repair and maintenance of in-water structures. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

1. Implement corrective actions if water quality deteriorates beyond acceptable levels.

2. Use sediment control measures to reduce the amount of sediment entering

the water column and thus reduce indirect damage to fish habitat, such as impacts on fish foraging and reproduction.

3. Ensure environmentally friendly materials are used.

LIST OF MEASURES

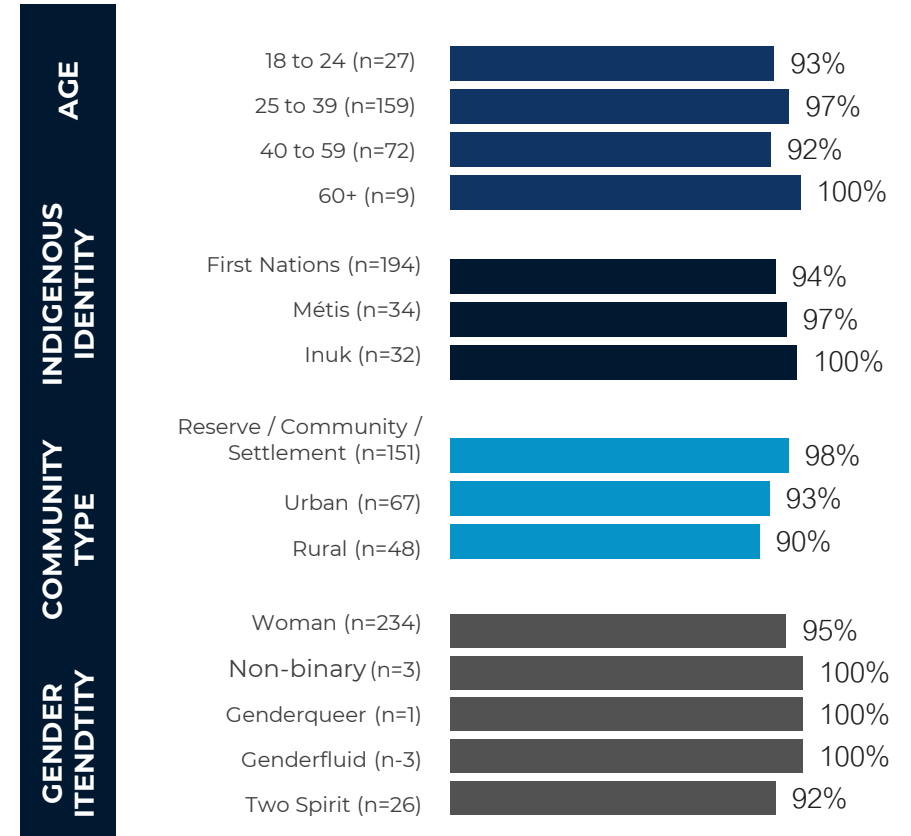
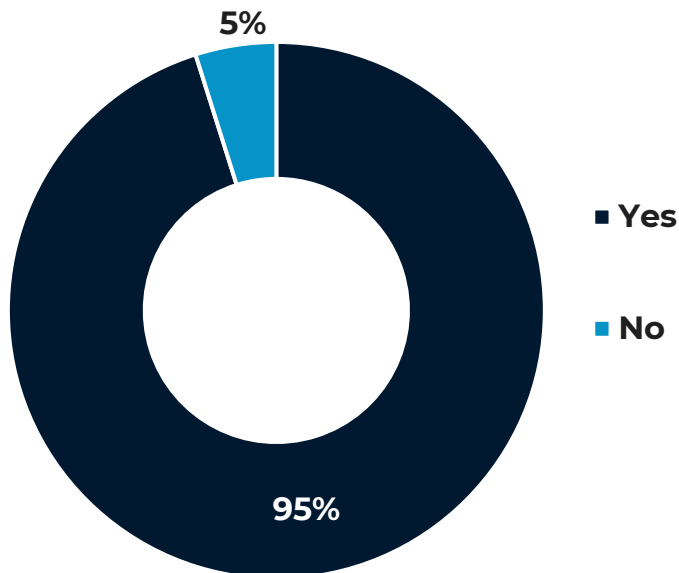
- **Develop a prevention plan** to prevent deleterious substances from entering a watercourse or water body.
- Implement a **response plan** immediately in the event of a **spill** of a **deleterious substance** (including sediment)

Repair and maintenance of in-water structures | Perception of measures

The majority of respondents felt the measures listed are enough to protect fish and fish habitat from deleterious substances during the repair and maintenance of in-water structures (95%). Those living on a First Nations Reserve, Inuit Community, or Métis settlement are more likely to say this than those living in rural environments. habitats

Q. 20 Do you think the measures listed above are enough to protect fish and fish habitat from deleterious substances during the repair and maintenance of in-water structures? (n=267)

% Feel Measures are Sufficient



Repair and maintenance of in-water structures | **Open-ended suggestions**

Q. 20a *Please list other measures that can help to protect fish and fish habitats from other deleterious substances during the repair and maintenance of in-water structures. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Recognize the increased capacity of sustainable fisheries to withstand pressures**, including those brought about by climate change, marine pollution and other factors.
- 2. Consult with fisheries experts or biologists** to assess the need for fish relocation and to determine the most appropriate methods.
- 3. Collaborate with local indigenous communities** to incorporate their traditional ecological knowledge into prevention and response plans. Indigenous peoples may have valuable insights about local ecosystems and how to protect them
- 4. Involve Indigenous environmentalists**, as land and water protectors in any spills or environmental emergencies.

SECTION 5
**REPAIR, MAINTENANCE &
CONSTRUCTION OF DOCKS,
MOORINGS & BOATHOUSES**

REPAIR, MAINTENANCE & CONSTRUCTION OF DOCKS, MOORINGS & BOATHOUSES

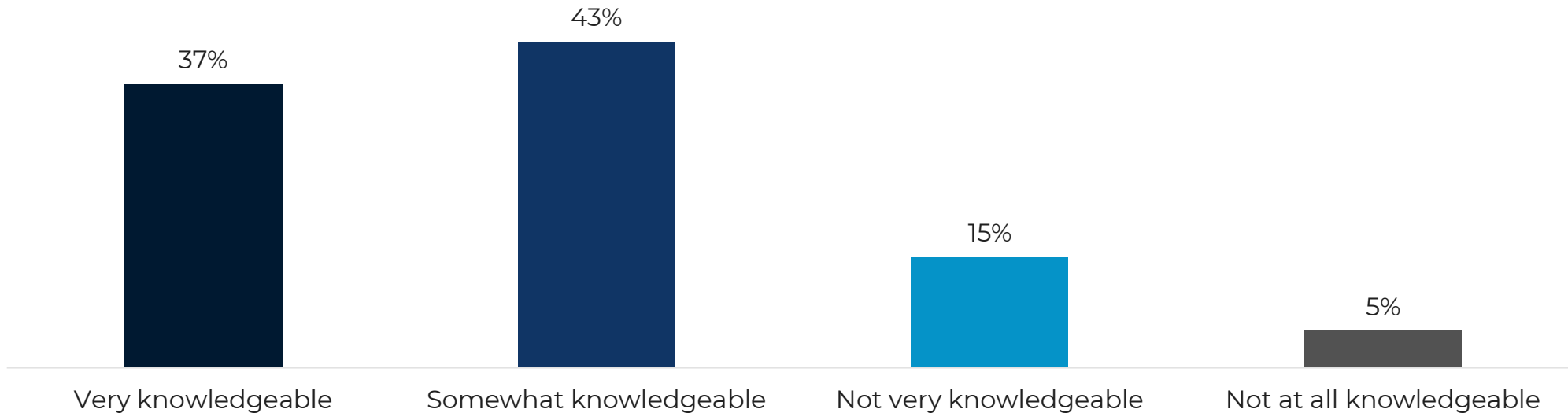
About this code of practice

- This code of practice outlines Fisheries and Oceans Canada's (DFO) national best practices for the repair, maintenance and construction of **residential docks, moorings** and **boathouses** that are not intended for commercial and public use.
- Docks and boathouses are common features on the Canadian aquatic landscape, and they are integral to the recreational use of our waterways.
- This code of practice applies to the repair, maintenance and construction of docks, moorings and boathouses that are either floating or supported by **pipes, piles, poles, anchors, concrete blocks**, or **cantilever arms**.
- You can protect fish and fish habitat when proceeding with the repair, maintenance, and construction of a dock, mooring or boathouse by following the measures listed below.
- When implemented correctly, these measures can manage the risk of harmful impacts associated with the repair, maintenance and construction of docks, moorings, and boathouses, which can include:
 - Disturbance of water body bed and banks
 - Release of sediments or other deleterious substances
 - Changes to aquatic habitat

Docks, Moorings & Boathouses | **Level of knowledge**

Approximately one in four respondents were somewhat (43%) or very (37%) knowledgeable about the repair and maintenance of in-water structures.

Q. 21 *How knowledgeable are you about repair, maintenance and construction of docks, moorings, and boathouses and the terms used in the code of practice above? (n=267)*



LIST OF MEASURES

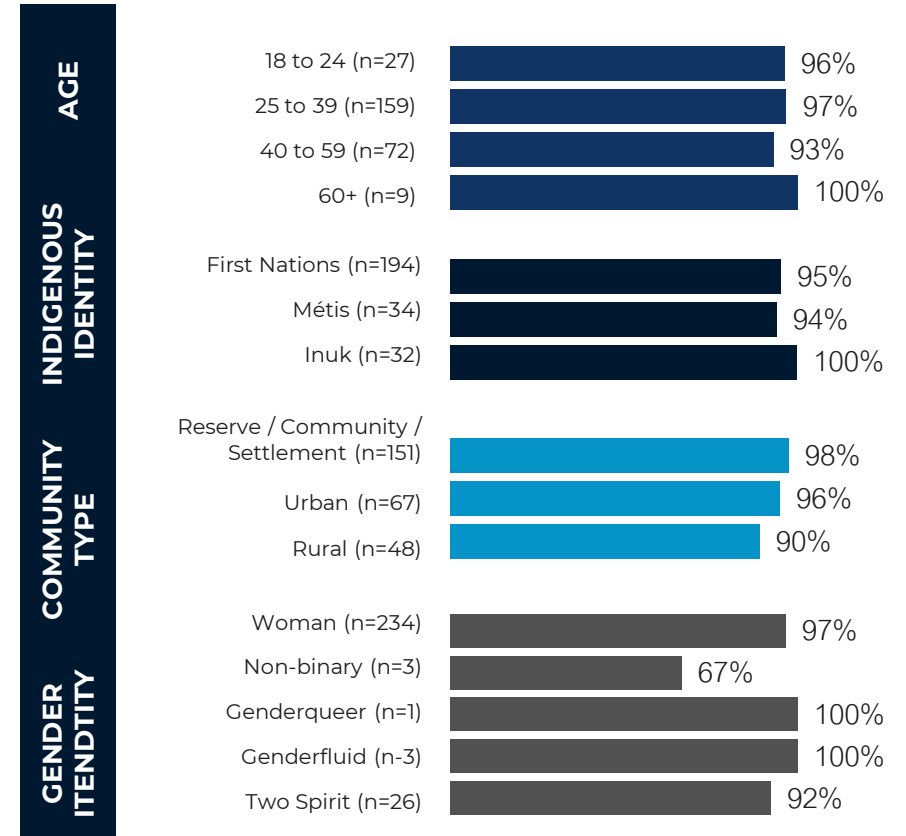
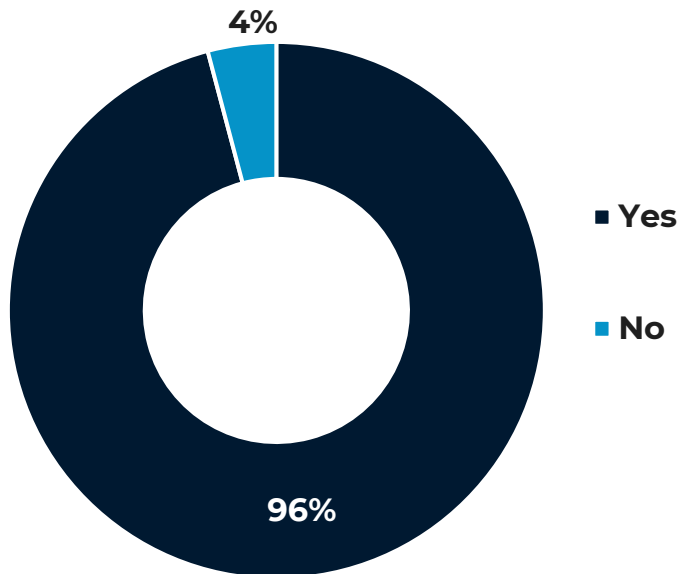
- Carry out the project in accordance with **timing windows**.
 - Limit the duration of in-water works, undertakings and activities.

Docks, Moorings & Boathouses | Perception of measures

Almost all respondents felt the measures listed are enough to protect fish during the repair, maintenance and construction of docks, moorings, and boathouses (96%). Those living on a First Nations Reserve, Inuit Community, or Métis settlement are more likely to say this than those living in rural environments.

Q. 22 Do you think the measures listed above are enough to protect fish during the repair, maintenance and construction of docks, moorings, and boathouses? (n=267)

% Feel Measures are Sufficient



Docks, Moorings & Boathouses | **Open-ended suggestions**

Q. 22a *Please list other measures that can help in the protection of fish during the repair, maintenance and construction of docks, moorings, and boathouses. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Implement fish-friendly drainage systems** that include fish ladders or screens to prevent fish from entering drainage channels and becoming trapped during maintenance check
- 2. Limit the number of projects** that are allowed in the same or nearby areas at a time.
- 3. Use fish passages** to provide safe migration routes for fish, thereby reducing damage to fish populations.
- 4. Use eco-friendly materials** to reduce pollution of the environment and thus protect fish habitat.
- 5. Use barriers** around the work site, such as a knitted non-toxic frame.
- 6. Limit machinery on site.** Only allow low-risk machinery on-site to reduce the risk of pollution and spills.

LIST OF MEASURES

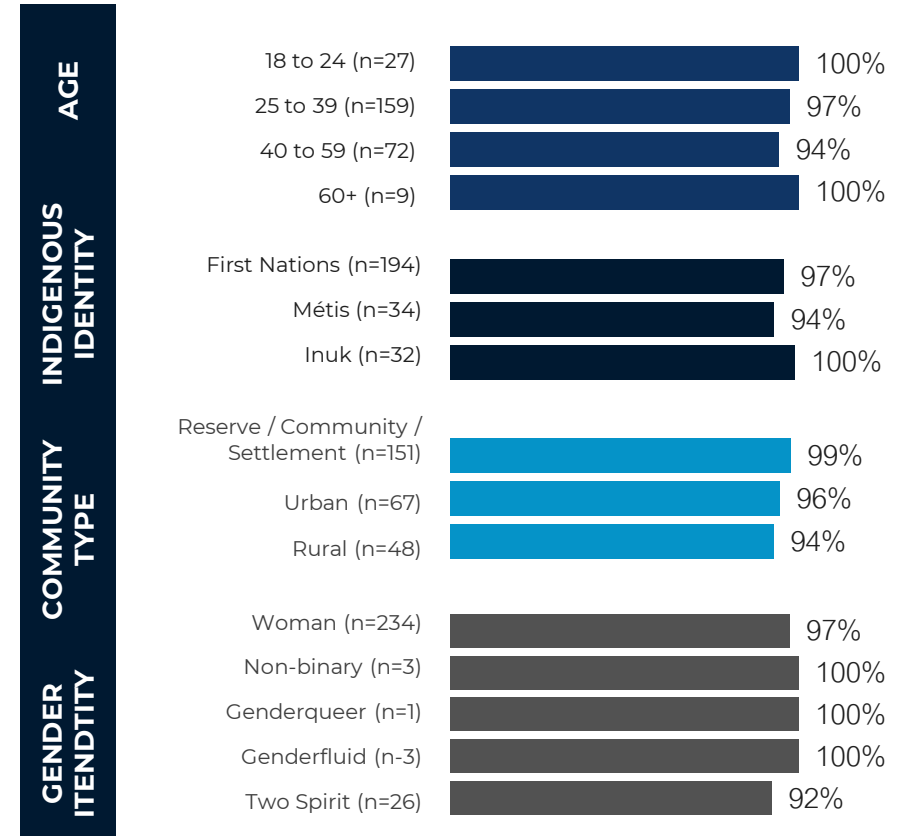
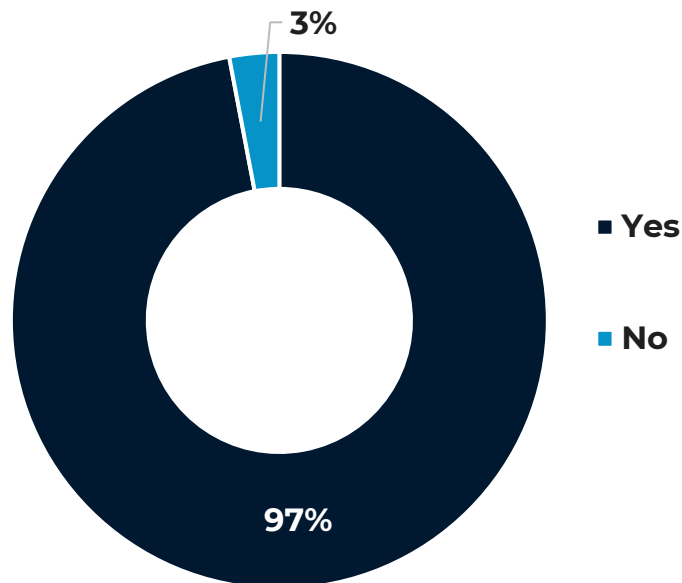
- **Limit vegetation removal**, pruning and grubbing to the area required for accessing the project site.
- **Use existing trails**, roads, access points or cut lines.
- **Reinstate stream banks** and **slopes** of the affected riparian zone.
- **Re-vegetate** the affected **riparian zone** with native or suitable species for the project site.

Docks, Moorings & Boathouses | Perception of measures

Nearly all respondents (97%) felt the measures listed are enough to protect riparian zones during the repair, maintenance and construction of docks, moorings and boathouses.

Q. 23 Do you think the measures listed above are enough to protect riparian zones during the repair, maintenance and construction of docks, moorings and boathouses? (n=267)

% Feel Measures are Sufficient



Docks, Moorings & Boathouses | **Open-ended suggestions**

Q. 23a *Please list other measures that can help to protect riparian zones during the repair, maintenance and construction of docks, moorings, and boathouses. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

1. **Limit dredging** to move docks closer to buildings/homes. This happens a lot in the Georgian Bay Area where people have cottages and want to shorten their dock.
2. **Use seine nets:** These are large, vertical nets that can be used to encircle fish in a specific area for capture or relocation.
3. **Stop the development** and logging around water in general.

LIST OF MEASURES

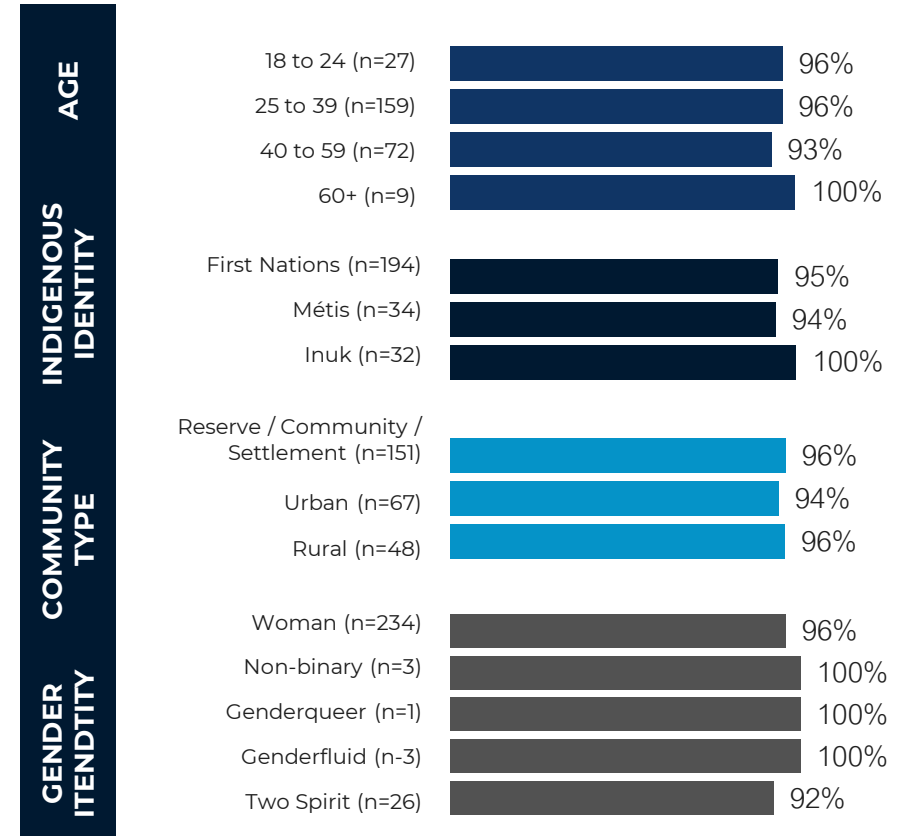
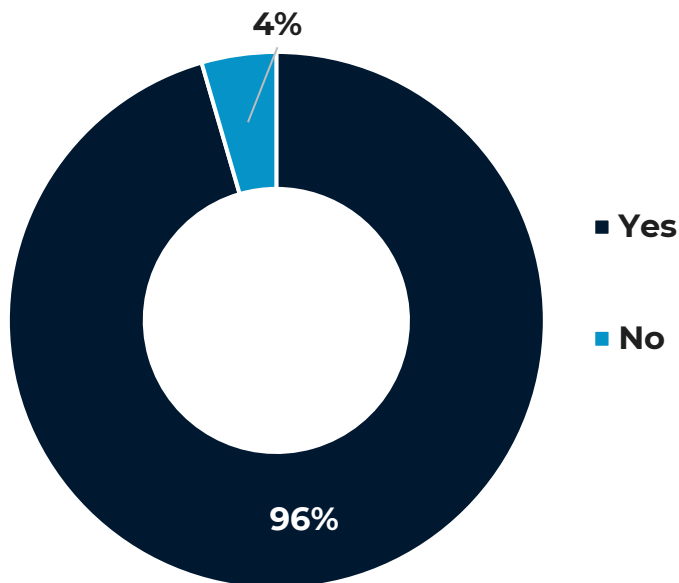
- **Limit** the **operation** of **vehicles** and **machinery** to the area required to carry out the project.
- **Mooring anchors** and **chains** are to be **adequately sized** to secure vessels or structures and prevent the anchor or chain from shifting or dragging along the bed of the watercourse or water body.

Docks, Moorings & Boathouses | Perception of measures

The majority of respondents felt the measures listed are enough to protect aquatic habitat during the repair, maintenance and construction of docks, moorings, and boathouses (96%).

Q. 24 Do you think the measures listed above are enough to protect aquatic habitat during the repair, maintenance and construction of docks, moorings, and boathouses? (n=267)

% Feel Measures are Sufficient



Docks, Moorings & Boathouses | **Open-ended suggestions**

Q. 24a *Please list other measures that can help to protect aquatic habitats during the repair, maintenance and construction of docks, moorings and boathouses. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Use turbidity curtains** to contain sediment and debris stirred up by in-water work.
This prevents pollution and allows fish to avoid affected areas.
- 2. Limit the operations of the range of vehicles and machinery.** Noise, vibration and chemical emissions may be generated during the construction process, which may negatively affect the survival and reproduction of aquatic life. In addition, water agitation, sediment suspension and sediment disturbance during construction may also affect aquatic organisms.
- 3. Use seine nets** to encircle fish in a specific area for capture or relocation.
- 4. Temporary fish tanks or holding facilities:** In some cases, fish may be temporarily held in tanks or holding facilities.
- 5. Use proper containment and disposal of paints, tools, and construction materials**

to prevent aquatic contamination that could harm fish health and habitat quality.

- 6. Strengthen the public's awareness** of aquatic life protection and raise the importance of aquatic life protection.

LIST OF MEASURES

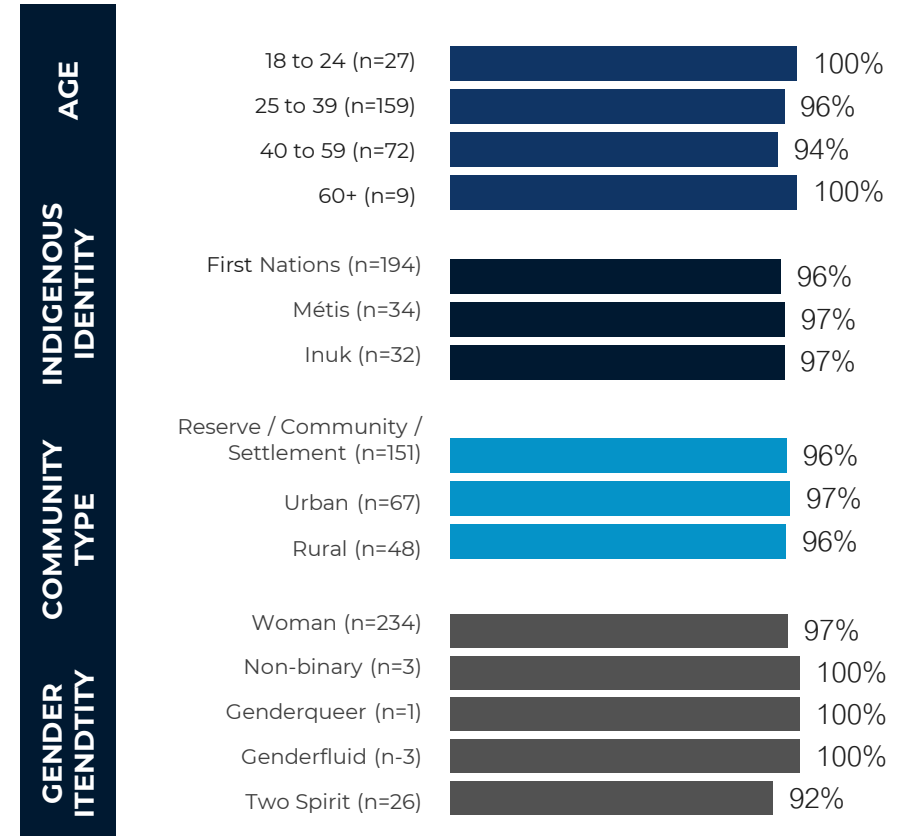
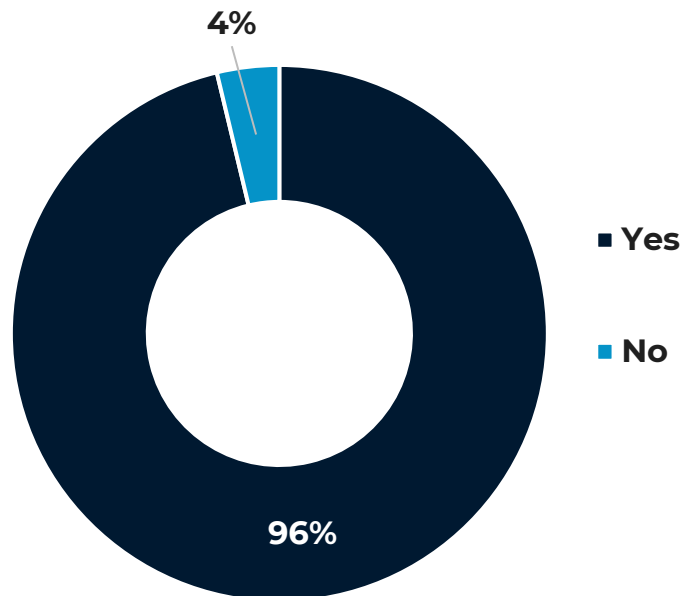
- **Manage sediment-laden water** flowing onto or through the site during all phases of the project.
 - **Install erosion** and **sediment controls** prior to beginning the project.
 - **Develop** and implement an **erosion** and **sediment control plan** for all phases of the project.
- **Regularly observe** the **watercourse** or water body for **signs of sedimentation** during all phases of the project and take corrective action if required.
- **Inspect** the **erosion** and **sediment controls** regularly during all phases of the project.
- **Repair** the **erosion** and **sediment controls** during all phases of the project.
- Operate machinery on land in **stable areas**.
- Use **biodegradable materials** for **erosion** and **sediment controls** whenever possible.
- **Remove** all **sediment controls** (unless biodegradable) once the **project site has been stabilized**.
- **Dispose** of, and **stabilize all excavated material** above the ordinary high-water mark or
 - top of the bank of any nearby watercourse or water body
- **Keep** the **erosion** and **sediment controls** in place until all **disturbed ground** has been stabilized and **suspended sediments** have settled.

Docks, Moorings & Boathouses | Perception of measures

Most respondents felt the measures listed are enough to protect fish and fish habitat from sediment during the repair, maintenance and construction of docks, moorings and boathouses (96%).

Q. 25 Do you think the measures listed above are enough to protect fish and fish habitat from sediment during the repair, maintenance and construction of docks, moorings and boathouses? (n=267)

% Feel Measures are Sufficient



Docks, Moorings & Boathouses | **Open-ended suggestions**

Q. 25a *Please list other measures that can help to protect fish and fish habitats from sediment during the repair, maintenance and construction of docks, moorings, and boathouses. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Implement clean construction techniques** like sweepers to contain dust and debris.
- 2. Stabilize soils and use buffers to filter runoff.**
- 3. Low-disturbance construction methods**, such as underwater cutting and welding, can be used to repair piers, and caissons and interceptor nets can be placed in the construction area to control sedimentation.
- 4. Inspect structures regularly and repair promptly** to prevent degradation and leaching of preservatives.
- 5. Regularly inspect the waters around docks, moorings and boathouse** to clean up garbage and pollutants to keep the waters clean.

LIST OF MEASURES

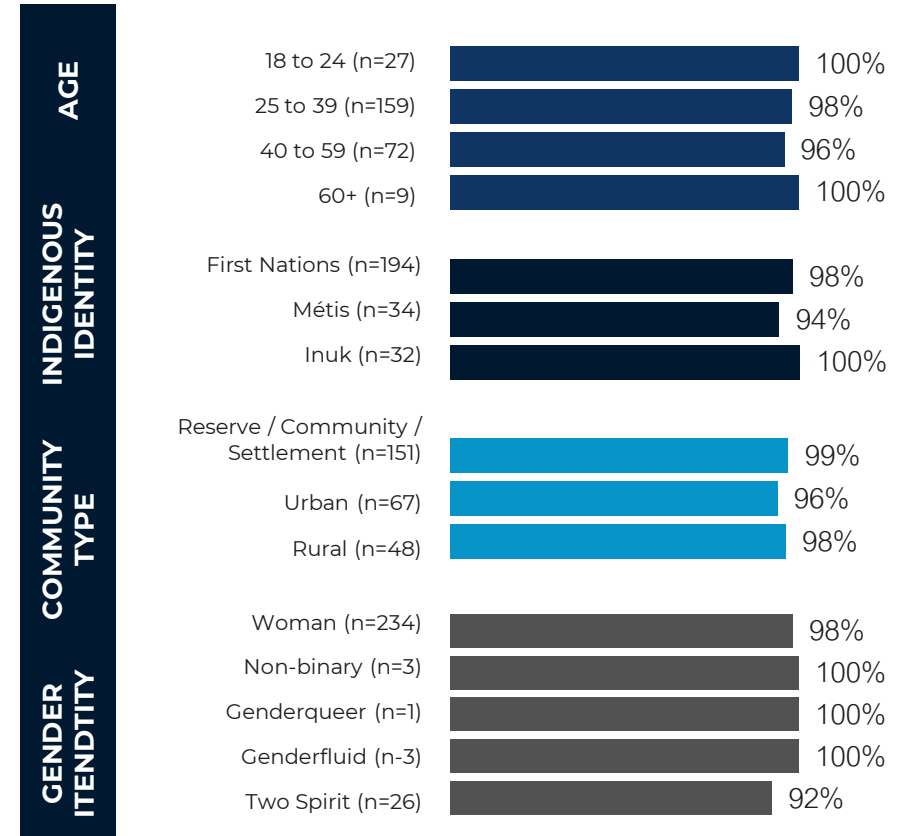
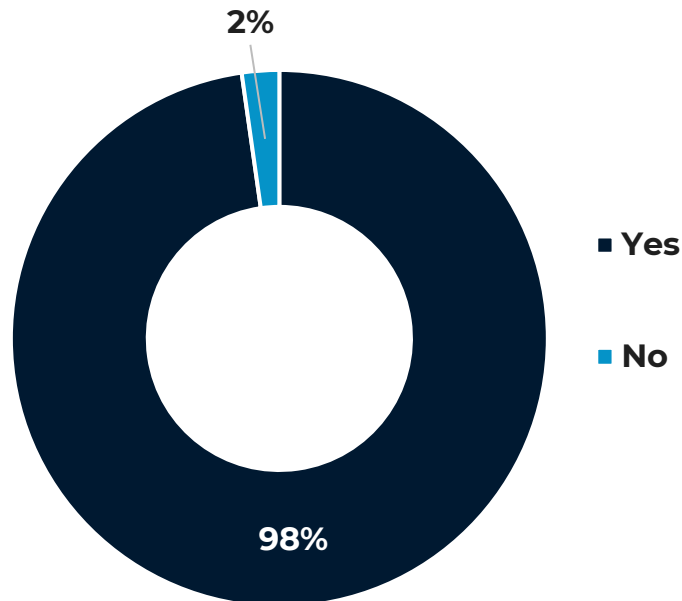
- **Develop a plan** to prevent deleterious substances from entering a watercourse or water body.
 - **Maintain all machinery** on site in a **clean condition** and free of fluid leaks.
 - **Wash, refuel** and **service machinery** in such a way as to prevent any deleterious substances from entering a watercourse or water body.
 - **Store fuel** and **other materials** for the machinery in such a way as **to prevent** any deleterious substance from **entering a watercourse or water body**.
 - **Dispose** of all **waste materials** on land in a designated area **away** from the **ordinary high-water mark** of any watercourse or water body.
 - **Use untreated materials** (e.g., cedar, tamarack, hemlock, rocks, plastic, etc.) as **supports for dock structures** that will be **submerged in water**.
 - Ensure **plastic barrel floats** are **clean** prior to use in water.
 - Use only **pre-cast, cured concrete** for **mooring anchors**.

Docks, Moorings & Boathouses | Perception of measures

Nearly all respondents felt the measures listed are enough to protect fish and fish habitat from deleterious substances during the repair, maintenance and construction of docks, moorings, and boathouses.

Q. 26 Do you think the measures listed above are enough to protect fish and fish habitat from deleterious substances during the repair, maintenance and construction of docks, moorings, and boathouses? (n=267)

% Feel Measures are Sufficient



Docks, Moorings & Boathouses | **Open-ended suggestions**

Q. 26a *Please list other measures that can help to protect fish and fish habitats from other deleterious substances, resulting from repair, maintenance and construction of docks, moorings, and boathouses. If possible, state how each of the measures you listed might help to improve fish conservation outcomes.*

Suggested Measures

- 1. Post-construction restoration:** After the work is completed, restore the site to its original condition or as close to it as possible, including replanting vegetation and stabilizing the shoreline.
- 2. Conduct outreach and education** to construction workers and the public to raise awareness of the importance of protecting fish and fish habitat.
- 3. Focus on human behavior** to mitigate the need to protect fish habitats.