Cultural Indicators for the Skeena Environmental Stewardship Initiative

Prepared by Tara Marsden, M.A.

Gitanyow Hereditary Chiefs Office and
Skeena Sustainability Assessment Forum Project Team

March 2021

SKEENA SUSTAINABILITY ASSESSMENT FORUM

Gitanyow Hereditary Chiefs

Gitxsan

Hagwilget Village Council

Lake Babine Nation

Nee Tahi Buhn Indian Band

Skin Tyee Nation

Office of the Wet'suwet'en

Witset First Nation

British Columbia

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Skeena Sustainability Assessment Forum –
BC Environmental Stewardship Initiative

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Acknowledgements

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This report is a compilation and analysis drawn from multiple SSAF reports written over the past five years. Many of these were summary documents from large community meetings, conferences, and workshops, including hundreds of people from each of the SSAF member First Nations, as well as provincial representatives. We thank everyone for their valuable contributions to that body of knowledge.

This report was guided by a Working Group that included: Valbert Williams (Gitanyow), Sandra Martin-Harris (Office of the Wet'suwet'en), Brian Williams (Gitxsan), Evelyn George (Lake Babine Nation), Victor Jim (Witset), and Shannon Haizimsque (Wet'suwet'en First Nation). Their input and wisdom have been incorporated and are appreciated.

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[logos pending endorsements]

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“Our people need to work closely with the scientific experts when they do their studies. Our degrees come from the land, our cultural knowledge and experience carried on for thousands of years. Our knowledge keepers are able to find things that science has not been able to, because we spend more time on the Lax’yip, not just a short study and then leave.” — Brian Williams, Gitxsan Hereditary Chiefs

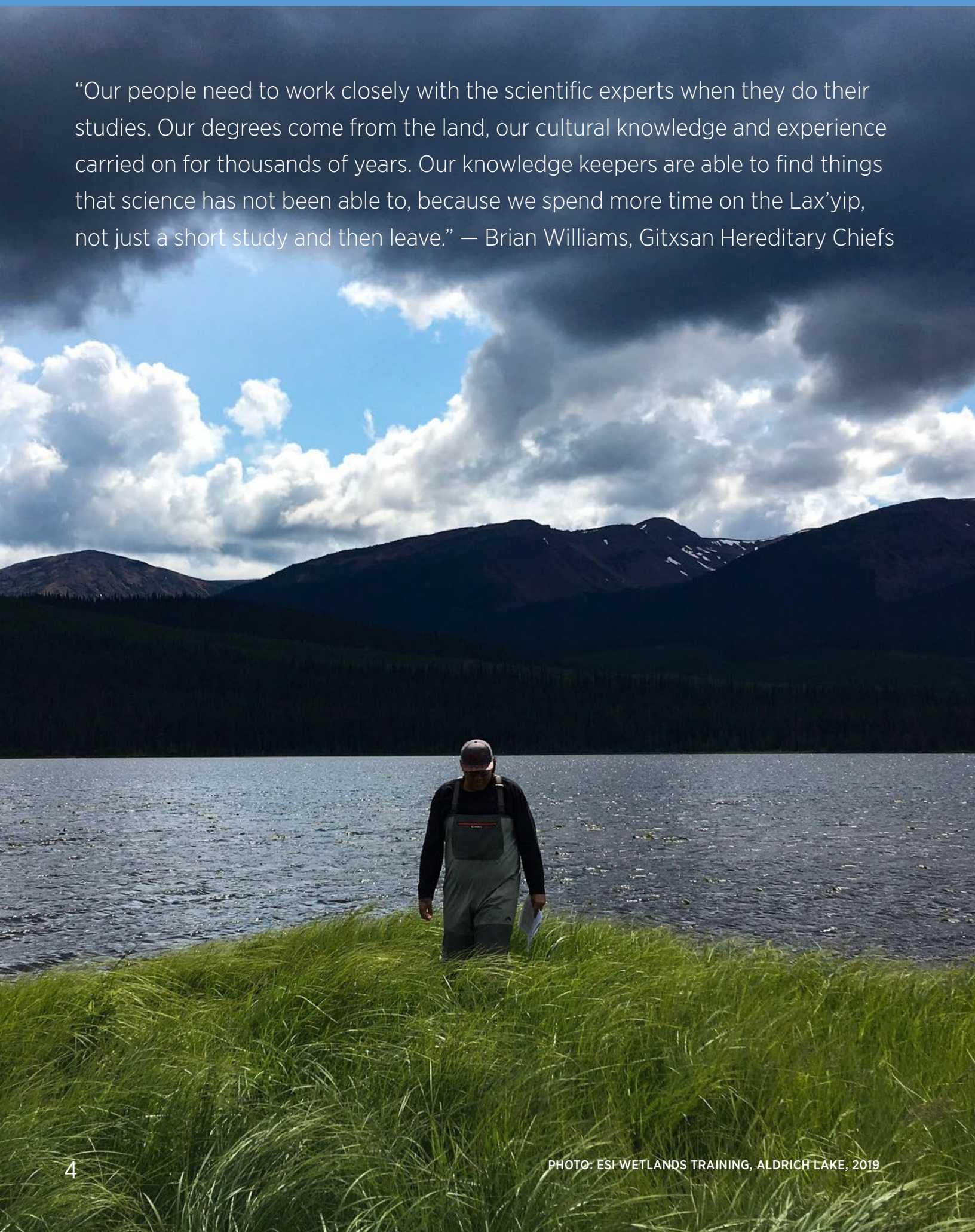


PHOTO: ESI WETLANDS TRAINING, ALDRICH LAKE, 2019

PART 1

INTRODUCTION

Background on the Environmental Stewardship Initiative

The Environmental Stewardship Initiative (ESI) is a true collaboration between the BC provincial government and First Nations in the northern areas of the province. The collaborative approach that has been developed through ESI incorporates western science and Indigenous knowledge and is working toward shared principles in land management. The goals of ESI are to develop a new, collaborative approach to establishing environmental legacies related to generating high quality, accessible, and trusted environmental information. The scope of ESI includes four key areas:

- Ecosystem assessment and monitoring;
- Ecosystem restoration and enhancement;
- Ecosystem research and knowledge exchange; and
- Stewardship education and training.[1]

The Skeena Sustainability Assessment Forum (SSAF) involves nine Skeena Nations and provincial agencies focused on creating shared and trusted data through the collaborative design and implementation of environmental monitoring of selected values, including medicinal plants, grizzly bear, fish and fish habitat, moose, and wetlands. The key elements of the SSAF include: to incorporate Indigenous perspectives, knowledge and science; to monitor the condition, status, and trends of shared resource values either directly or through indicators in a manner consistent with agreed upon protocols; to analyze data to assess the current condition and historic trend of the resource values including the development of targets and thresholds; and where appropriate, to develop management response recommendations.[2]

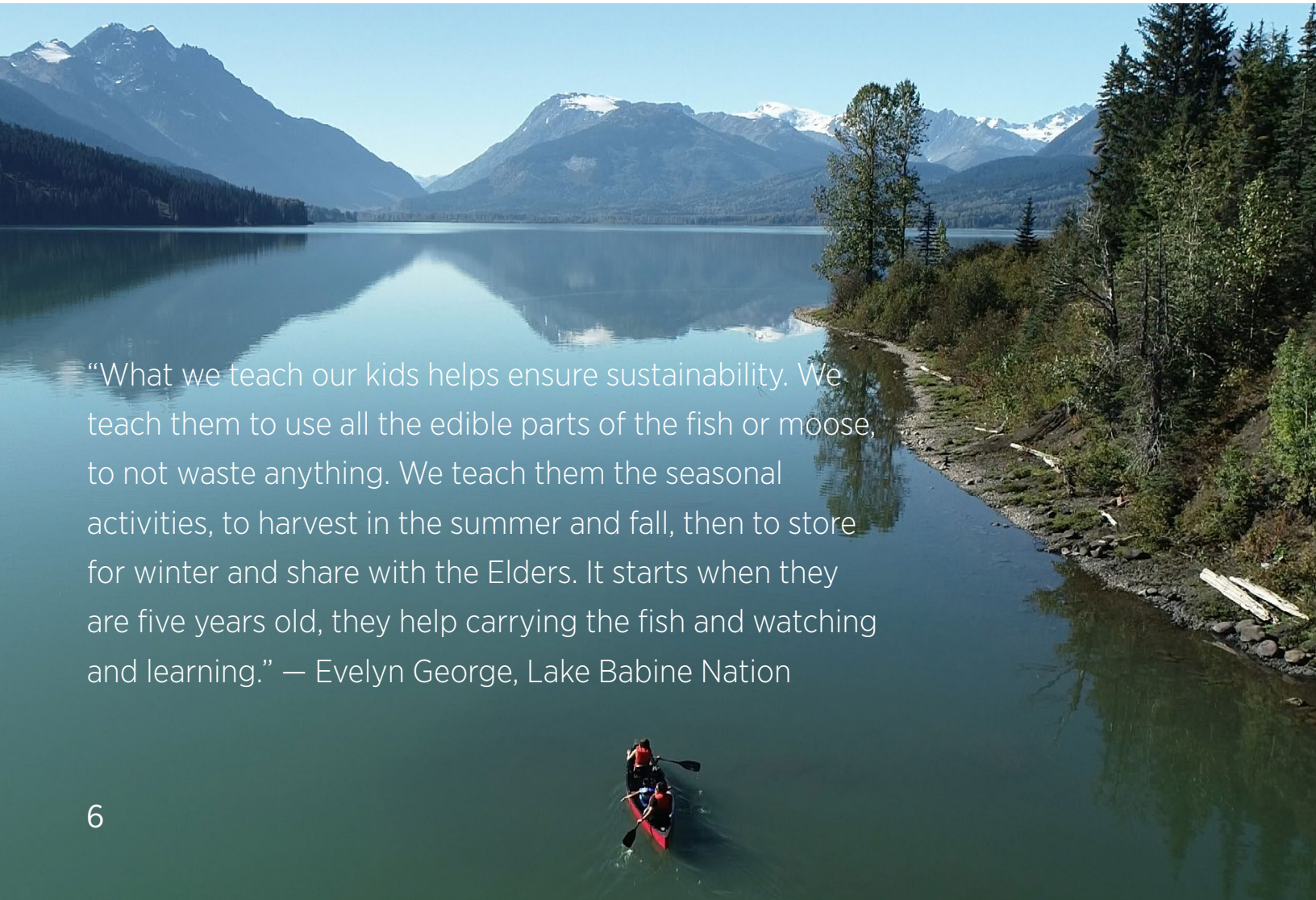
Over the past five years, the SSAF has collectively worked toward drafting a suite of "state of the value" (SOV) reports on each of the five values identified above. This work has been led largely by the Science Technical Team, with oversight provided by the Project Team.

1 Four Directions Management Services, *Environmental Stewardship Initiative — Investing in the Future,* 2018, p. 1.
2 Ibid, p. 11.

This report is intended to complement the results and monitoring protocols developed through the SOVs, with a focus on ongoing monitoring of indicators based on the cultural practices of the SSAF member First Nations.

Just as the scientific process measures the state of an environmental value through monitoring and study utilizing the development of protocols and data standards, so too does Indigenous knowledge assess the health of the five ESI values. While a significant amount of Indigenous knowledge has been lost through the process of colonization and the residential school system, the modern-day practices of hunting, gathering, and other territory-based activities still yield a wealth of knowledge on the state of Indigenous territories and the environmental values therein.

The SSAF member First Nations are a diverse and culturally-rich group of communities, traditional hereditary leadership, and elected band councils. The collaboration not only between the member First Nations and the provincial government, but also amongst the member nations, is relatively unprecedented. While each nation or community is distinct unto itself, there are many common cultural practices, knowledge systems, traditional laws, and principles of sustainability amongst all member First Nations. This has been recognized and appreciated throughout the duration of the Skeena ESI operation. Working from a common cultural foundation, while still maintaining and respecting nation sovereignty and autonomy, is integral to the successful function of the SSAF.



"What we teach our kids helps ensure sustainability. We teach them to use all the edible parts of the fish or moose, to not waste anything. We teach them the seasonal activities, to harvest in the summer and fall, then to store for winter and share with the Elders. It starts when they are five years old, they help carrying the fish and watching and learning." — Evelyn George, Lake Babine Nation

Methods to Develop Cultural Indicators

During the five years that the Skeena ESI has been in development and operation, a significant amount of time and resources have been dedicated to community engagement of the member nations. This includes: consensus-based participation by nation representatives in the work planning, scoping, and review of the state of the value reports; completion of annual Indigenous stewardship projects; participating and providing culturally relevant feedback on environmental monitoring training; several community meetings and regional conferences; participation of knowledge holders in expert workshops; and in some cases interviews and surveys conducted through the Indigenous stewardship projects. A notable library of work has now been amassed, and is the source for this cultural indicators report for the Skeena ESI.

Through the discussion at the Project Team leading up to this report, the following working definition of cultural indicators was developed:

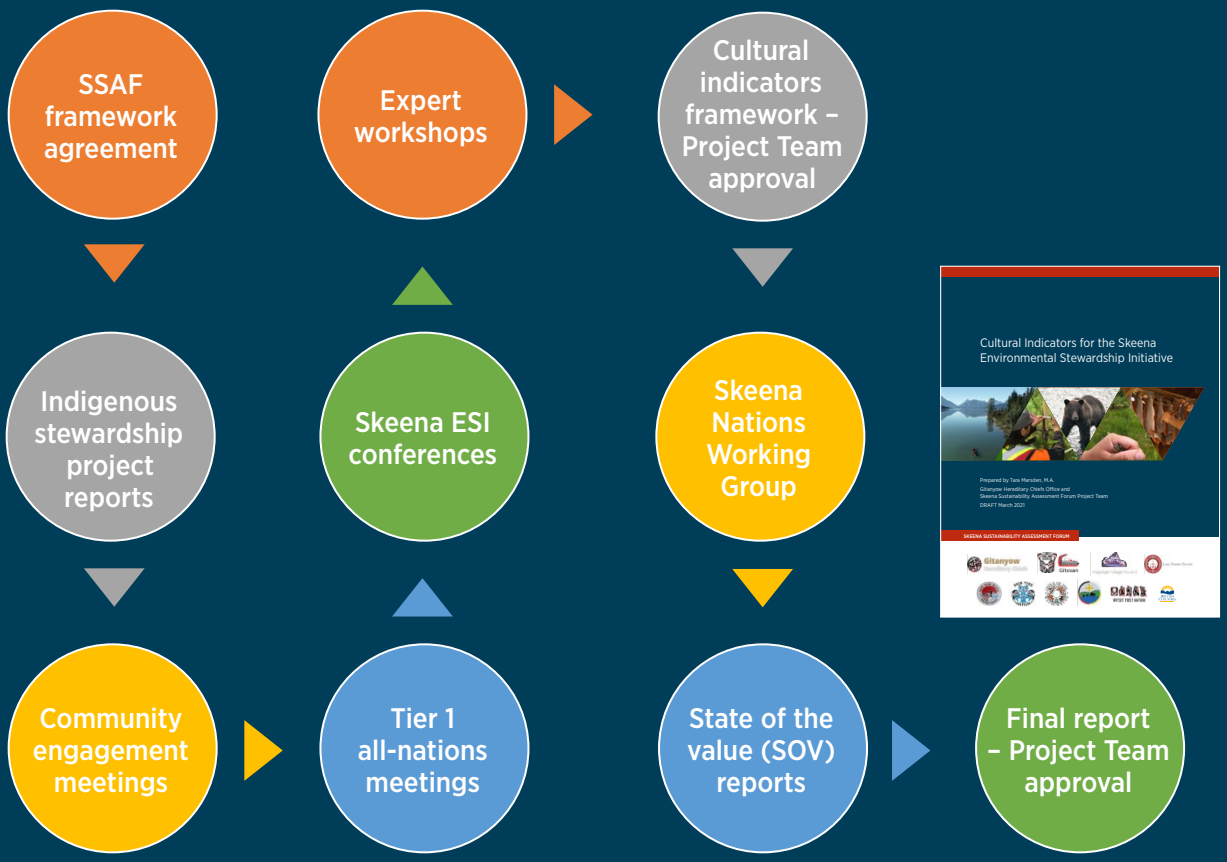
> *Observable, measurable facts about the state of the five Skeena ESI values that are derived from cultural practices of the Skeena ESI First Nations*.

The following steps were taken to develop the cultural indicators outlined in this report:

- Develop framework document and reference list for review and approval by the Project Team (June 2020);[3]
- Establish a Working Group of the SSAF Project Team to help guide the drafting process, including representatives of each SSAF member nation (First Nations only meetings are referred to as "Tier 1");
- Project lead convened initial meeting of the Working Group to go over and receive approval of framework document, reference list, and next steps for completion of this report;
- Project lead review of all relevant SSAF reports and documents to glean cultural indicators from the work of Skeena ESI to date, and identification of any gaps;
- As Indigenous stewardship projects are completed throughout 2020–2021, incorporation of any further relevant information made available (with a specific focus on field data);
- Preliminary draft report presented to the Working Group (January 2021);
- Modifications to preliminary draft by Working Group, followed by professional report layout and design; and
- Final presentation to the SSAF Project Team for endorsement (March 2021).

3 The project, along with all other ESI business, was put on hold temporarily as the provincial government and the SSAF member nations responded to the COVID-19 pandemic. Once more operational certainty was achieved, the project resumed in September 2020.

Figure 1: Cultural Indicators Framework and Sources



"It so important for our people to have our database to store the results from the cultural indicators, to store our traditional knowledge for decision-making and the future generations. Government needs to share their data with us, and we need to share our harvest and cultural data with government. That is the only way for decisions on the land to improve. Climate change affects us all, and its time to work together."
— Valbert Williams, Gitanyow Hereditary Chiefs

Methods for selection and composition of the cultural indicators are described in further detail below.

Criteria and Principles for Cultural Indicator Selection and Composition

Throughout 2017–2018, the SSAF convened expert workshops that included both scientific and cultural experts from government, independent consultants, and the SSAF member nations. Workshops were organized around the five SSAF values, and experts were designated according to their specific area of expertise. Through this process, the groups, along with guidance from Eco-Logical Resolutions, developed a series of overarching principles for monitoring metrics and indicators.

The following **PRINCIPLES** have further informed the development of the cultural Indicators for the Skeena ESI:

- Should inform land use decision-making at the landscape level, site level, and decisions around protection and restoration;
- Should identify impacts, direct restoration activities, and build joint-stewardship;
- Help build trust, transparency, and reconciliation;
- Should be cost feasible;
- Repeatable, transparent, and defensible for decision-making — this will be important to ensure that results can be accepted by a wide variety of people, government, industry, science, and others;
- Long-term viability of monitoring to detect change over time;
- Should be able to be collected with reasonable training, and data gathering should be simple but effective and informative;
- Data should be open for maximum use and applicability and able to be transferred in digital format;
- Should consider spatial scale;
- Emphasis on integrating indicators across scientific and cultural knowledge perspectives to support identifying complementarity and cross validation;
- Ability to capture climate differences over many years, linking expertise that already exists on climate change; and
- Ability to capture cumulative effects of land disturbance, and help to identify causes of the stressor.[4]

4 Eco-Logical Resolutions, *Expert Workshops for Skeena ESI Values Synthesis Report*, 2017, pp. 5-6.

The Skeena ESI Cultural Indicators Working Group identified the following **ADDITIONAL PRINCIPLES**:

- What we focus on measuring highlights importance culturally;
- Supports evidence-based decision making (not political or economic only);
- Supports reduction in land-based conflicts between First Nations and industry and government;
- Addresses lack of trust in sharing First Nation harvest data;
- Supports a wholistic way of learning and acknowledges interconnectedness of community health and health of land and water;
- Can align with other community health research and First Nation personal well-being indicators;
- Acknowledges that data tells a story, but not always the whole story — sometimes more in-depth inquiry is needed;
- Should be precise and focus on attributable change, but also take a nested approach; and
- Feasible and concise number of indicators to measure health of five values, recommend 10 indicators per value.[5]

5 Tara Marsden, *Meeting Notes, Skeena ESI Cultural Indicators Working Group*, December 14, 2020.

PART 2

Cultural Indicators

Cultural Indicators Framework — A Nested Approach

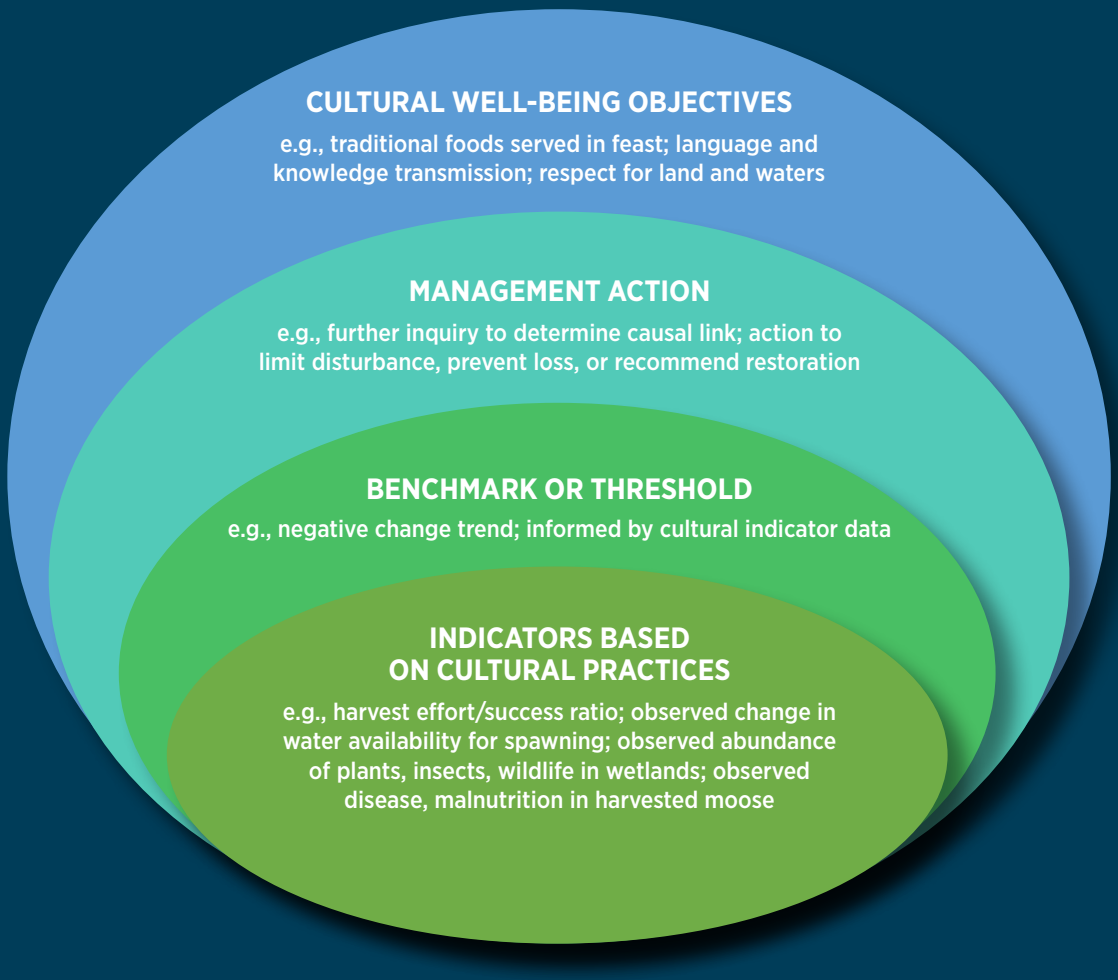
In drafting the cultural indicators for the Skeena ESI, there is a risk in developing indicators that are too broad in nature, and that are not based on clear causal links. For example, all the Skeena ESI literature indicate strongly that healthy ecosystems are needed for cultural survival and knowledge transmission. However, if we were to measure the percentage of traditional foods being served in feasts/bahlats as an indicator of fish habitat and moose health, this may not yield accurate results. Shifts in cultural practice, with the introduction of western foods, can be attributed to numerous factors, one of which *may* be disturbance of fish habitat or declining moose population.

What is proposed instead, is to take a *nested approach*, whereby cultural indicators are precise, and more directly linked, to land and water-based disturbance, impacts from development, climate change, and other factors. Further, that the cultural objectives that have been shared by the Skeena ESI member nations are captured as cultural well-being objectives (or targets/goals) that can be linked to more detailed cultural indicators. In the two central rings in the diagram on the following page, are benchmarks/thresholds and management action. Both of these are necessary to take the data gathered using the cultural indicators and analyze it for management change, where appropriate.

For each of the five values assessed by the Skeena ESI, the cultural indicators are broken down into three main categories:

- **HARVEST:** These are indicators based solely on harvest activity. For moose, fish and fish habitat, and medicinal plants this is fairly straightforward as these are traditional foods and medicines that are harvested by all of the Skeena ESI member nations. The cultural indicators are derived from cultural practice, and therefore data collection is focused on active harvesters only, and collected using a harvester survey (template examples in the appendices). For wetlands, harvest indicators are derived from more indirect harvest (e.g., medicinal plants or beaver harvested from a wetland). For grizzly bear, as these are not traditionally harvested regularly, there are more unintentional harvest indicators used.

Figure 2: Cultural Indicators Framework – Nested Approach



- **OBSERVATIONS ABOUT POPULATION AND HABITAT:** These are indicators based on annual observations of members of the Skeena ESI First Nations made as they travel within their own territories. Many First Nation members are active on their territories throughout the year, and will have valuable observations that will inform data on population and habitat of the five Skeena ESI values. Data collection for these indicators is conducted through both the harvester surveys and the community survey (template examples in the appendices). Observations are most valuable and instructive when community members are active in the same places at roughly the same time each year, so they can draw comparisons from one year to the next. One example would be community members who pick pine mushrooms each year at the same time, and who will have many valuable observations about not only pine mushroom health and habitat, but also moose and grizzly populations through observations such as tracks, droppings, and visual sightings.

- **COMMUNITY SATISFACTION AND EXPERIENCE:** These are indicators based on the importance of the *experience* of harvesting and being on one's traditional territory, as well as the level of satisfaction with the amount and quality of traditional foods and medicines consumed or used each year. Through the various gatherings of the Skeena ESI member nations, there was a lot of emphasis put on the experience, both culturally and spiritually, of gathering and harvesting on one's own traditional territory. Things like industrial development, higher numbers of non-Indigenous harvesters, and pollution can negatively affect the experience of harvesting. Satisfaction levels are important indicators, but must be viewed together with other more specific harvest indicators. Sometimes, people may not be getting access to the amount or quality of traditional foods and medicines they want, but it may be a result of barriers (e.g., transportation costs, loss of traditional knowledge) and not necessarily an environmental cause. Finally, community members may report a high level of satisfaction with access to traditional foods, without being an active harvester. In some communities, there are smaller numbers of very active harvesters who provide for their House group or Clan, or share with family and others. Some communities also have fish provided annually to members that is harvested elsewhere.

CULTURAL INDICATORS FOR MOOSE

All Skeena ESI member nations place a high cultural value on moose, for nutritious sustenance, cultural use, traditional knowledge transmission, and use of hides, hooves, and antlers for cultural tools and arts.[6] Community members also shared that not only is a healthy moose population important for cultural knowledge and practices, but also that traditional governance is important for the health of the population. Similar to other Skeena ESI values in the following sections, the cultural practices and laws around moose harvest are integral for the long-term population health of moose in the region. Elders and knowledge holders shared that permission to access and hunt in a territory, utilizing all the parts of the moose, and knowledge transfer between generations are essential to help ensure the population is not negatively affected by overharvest, waste, and loss of these principles from one generation to the next.

CULTURAL WELL-BEING OBJECTIVE: A healthy moose population and habitat that supports the food, social, and ceremonial needs of the Skeena ESI First Nations. Cultural harvest, processing, and other uses (e.g., hide, antlers) that contribute to the continued exercise of traditional governance, language preservation, and cultural well-being.

MOOSE: Harvest

- MH-1 Harvest effort to success ratio: measured as number of days or hours spent hunting per successful harvest of moose.
- MH-2 Percentage of moose harvested with healthy and full coats.
- MH-3 Percentage of moose harvested with healthy fat reserves.
- MH-4 Percentage of moose harvested with signs of disease or malnutrition.
- MH-5 Percentage of moose harvested with permission of House or Clan Chief.
- MH-6 Percentage of moose harvested with transfer of knowledge between generations (e.g., Elder to adult, adult to youth).
- MH-7 Percentage of moose harvested with all main organs and body parts utilized (e.g., liver, head, ribs, tripe, hide).
- MH-8 Percentage of hunters who have actively hunted in the past year with no success.
- MH-9 Percentage of hunters who have actively hunted in the past year with no success, and no sightings of any moose sign (e.g., tracks, droppings, fur).
- MH-10 Ratio of bull harvest to cow and calf harvest, from total number of harvests surveyed in a one-year period.

6 Four Directions Management Services, *ESI Community Engagement Workshops: Summary Report*, August 30, 2017.

PHOTO: PROVINCE OF BC CAMERA TRAPPING IN THE WHITESAIL AREA OF THE SKEENA

MOOSE: Observations About Population and Habitat

- MP-1 Percentage of survey (both harvester and community) respondents who have seen sightings or signs (e.g., tracks, droppings, fur) of moose on their territory at least once in the past year (calculated based on those who are present on their territory).
- MP-2 Percentage of survey (both harvester and community) respondents who have seen salt or mineral licks, moose forage, or calving areas on their territory at least once in the past year.
- MP-3 Percentage of survey (both harvester and community) respondents who have seen signs of moose habitat disturbance in past year, such as logging or road building, low water levels in wetland or other water sources, or declining browse.
- MP-4 Ratio of observed bulls to cows and calves, calculated from the total observed moose in a one-year period.

MOOSE: Community Satisfaction and Experience

- MC-1 Percentage of survey (both harvester and community) respondents who are satisfied with their access to moose meat over the past one-year period (e.g., can be harvested by someone else and given to respondent, shared at community gathering or feast).
- MC-2 Percentage of survey (both harvester and community) respondents whose experience (cultural and spiritual) on the territory was affected by higher numbers of non-Indigenous hunters or other land users, or disturbance of moose habitat.

CULTURAL INDICATORS FOR FISH AND FISH HABITAT

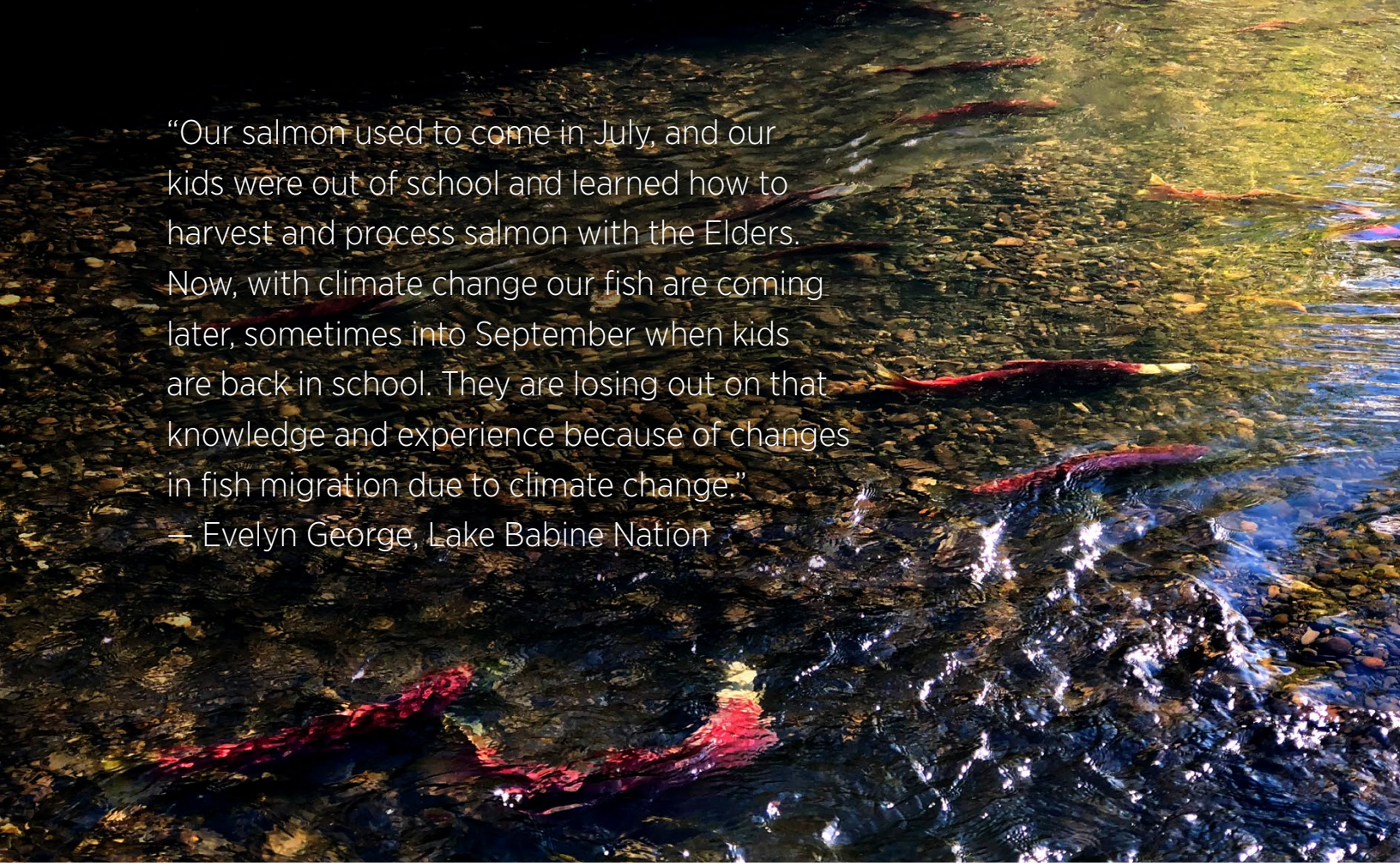
Similar to moose, Skeena ESI member nations all expressed a high cultural value on fish and fish habitat for food, social, and ceremonial purposes as well as cultural knowledge transmission (including Indigenous language preservation).[7] Fish — including all five salmon species (sockeye, spring/chinook, pink, chum, coho) as well as steelhead, trout, white fish, and others — are all integral to traditional diet and well-being. Similar to moose, community members shared that strong cultural practices and Indigenous laws are crucial for the health of the populations by emphasizing sustainable management at the House group or Clan level, and avoiding wasteful harvesting and processing.

CULTURAL WELL-BEING OBJECTIVE: Healthy fish populations and habitat that supports the food, social, and ceremonial needs of the Skeena ESI First Nations. Cultural harvest, processing, and other uses (e.g., trade) that contribute to the continued exercise of traditional governance, language preservation, and cultural well-being.

FISH AND FISH HABITAT: Harvest

- FH-1 Harvest effort to success ratio: measure of number of sets (by type) or hours spent dip-netting to the total number of fish harvested (by species).
- FH-2 Percentage of harvesters who report change in effort to success ratio over the past year, in comparison to previous years (results calculated and separated by positive and negative change).
- FH-3 Percentage of total harvested salmon with observed size change (larger or smaller than previous years, by species).
- FH-4 Percentage of total harvested salmon with observed poor quality of meat (colour, texture, firmness, taste, by species).
- FH-5 Percentage of total harvested salmon with observed change in exterior body colour in comparison to previous years (by species).
- FH-6 Percentage of total harvested salmon that were harvested later or earlier than normal (in comparison to previous years). Calculation including average amount of days or weeks that harvest was early or late (by species).
- FH-7 Percentage of harvested salmon with observed health concerns, such as worms, cysts, or abnormalities (by species).
- FH-8 Percentage of total fish harvested with permission of the affected House or Clan Chief.

7 Ibid, FDMS 2017.



- FH-9 Percentage of total fish harvested and/or processed with knowledge transmission between generations (e.g., Elders to adults, adults to youth).
- FH-10 Percentage of total fish harvested whose main organs were all utilized, avoiding waste (e.g., head, heart, bones jarred).
- FH-11 Ratio of successful harvests to unsuccessful. Calculated to reflect any fishing effort that was completely unsuccessful in comparison to overall success rate.
- FH-12 Percentage of total survey (both harvester and community) respondents who did not access fish from their territory because of fishing closures due to conservation concerns.

"Our fish are coming later each year because of the effect of global warming on our rivers. We have lower snow pack, warmer winters, and so in summer when the fish are running the water is lower and warmer. We see them coming in red, because they have been waiting for good water temperature. This is also affecting our grizzly bears, because they are waiting longer for their feed of fish."
— Valbert Williams, Gitanyow Hereditary Chiefs

FISH AND FISH HABITAT: Observations About Population and Habitat

- FP-1 Percentage of survey (both harvester and community) respondents who observed fish in their territory at least once in the last year (by species), and if they were juvenile, adult, migrating, spawning, or deceased.
- FP-2 Percentage of survey (both harvester and community) respondents who have seen abundant insects in and around fish habitat in their territory in the past year.
- FP-3 Percentage of survey (both harvester and community) respondents who have seen sufficient water levels for spawning and migration in their territory in the past year.
- FP-4 Percentage of survey (both harvester and community) respondents who have seen signs of fish habitat disturbance in their territory in the past year, such as high water/turbidity during migration and spawning, spills, landslides, industrial waste or pollution, or drought.

FISH AND FISH HABITAT: Community Satisfaction and Experience

- FC-1 Percentage of survey (both harvester and community) respondents who are satisfied with their access to fish over the past one-year period (e.g., can be harvested by someone else and given to respondent, or shared at community gathering or feast).
- FC-2 Percentage of survey (both harvester and community) respondents who accessed fish from another First Nation territory, due to limited availability or closure in their territory.
- FC-3 Percentage of survey (both harvester and community) respondents whose experience (cultural and spiritual) on the territory was affected by higher numbers of non-Indigenous fishers or other land users.

"We see so many recreational fishermen on our Lax'yip, they have not asked for permission from our Wilp Chiefs and many times harass or intimidate our own fishermen who are trying to feed their families and Wilp. This is affecting how our cultural practices are carried out and how we relate to our Lax'yip. We need all people fishing to seek permission, this is so the Chief can manage for a sustainable harvest and ensure not too much is taken." — Brian Williams, Gitxsan

CULTURAL INDICATORS FOR WETLANDS

Wetlands are unique in comparison to the other Skeena ESI values. One Cultural Indicators Working Group member noted importantly that "wetlands are themselves an indicator," as they act as freshwater filters in the respective territories of the Skeena ESI nations and provide critical services for overall ecosystem health.[8] Prior to ESI, very little data was known or collected on the state of wetlands in the Skeena ESI region. Wetlands serve as habitat for many wildlife and plant species of cultural significance, and arriving at an understanding of the state of wetland health requires a wholistic approach.

CULTURAL WELL-BEING OBJECTIVE: Healthy wetlands that support the food, social, and ceremonial needs of the Skeena ESI First Nations. Cultural harvest, processing, and other uses that contribute to the continued exercise of traditional governance, language preservation, and cultural well-being. Wetlands that have a diversity of plants, animals, and insects and provide habitat for species of cultural significance.

Wetland plants and wildlife species of cultural significance include:[9]

- Bear;
- Beaver;
- Bullrush plant;
- Ducks and duck eggs;
- Fish species (various, both directly and indirectly using wetlands as habitat);
- Horsetail;
- Labrador tea;
- Lily pad roots;
- Moose;
- Snowshoe hare;
- Wolverine; and
- Wild rice.

(See also cultural indicators for harvest of medicinal plants, moose, fish and fish habitat.)

8 Marsden, meeting notes, supra note 5.
9 FDMS, 2017, supra note 6; Lake Babine Nation and Ecofish, *ISP Wetland Assessment and Monitoring Report*, March 6, 2019.

WETLANDS: Harvest

- WH-1 Percentage of survey respondents who have harvested, or received from family/ community, wildlife, fish, or plant species that are dependent on wetlands for habitat in the past year in their territory.

Proximity to Cultural Features

- WH-1 Percentage of wetlands adjacent to or including cultural features (e.g., trails, ancient village sites, fishing sites, hunting grounds, spiritual sites, gathering areas) that are found to be in a functioning condition according to ESI wetland protocol assessments.

WETLANDS: Observations About Population and Habitat

- WP-1 Number of species of cultural significance observed in total number of wetlands from ESI field technician assessment, community survey respondents, and other relevant sources.
- WP-2 Percentage of respondents who observed population changes in wetland wildlife species within past year, positive or negative (by species).

WETLANDS: Community Satisfaction and Experience

- WC-1 Percentage of survey (both community and harvester) respondents who are satisfied with their access to wetland species and plants for cultural purposes (calculated from survey responses on moose, fish, and medicinal plants).
- WC-2 Percentage of survey (both harvester and community) respondents who reported either positive or negative cultural or spiritual experiences while harvesting or spending time in or around wetlands in their territory, based on the presence of other users or disturbances or damage to wetlands.

"We need to look at community health and how it relates to our principles of restoration. Environmental restoration is not new to our people, we have done it before and our cultural and spiritual health is bound to our ability to restore the land when it is damaged."
— Sandra Martin-Harris, Office of the Wet'suwet'en

CULTURAL INDICATORS FOR MEDICINAL PLANTS

The selection of medicinal plants as a Skeena ESI value was an important choice to include assessment of the state of various plant species, including fungi, that are important for the food, social, ceremonial, and medicinal needs of the member nations. The community engagement sessions and expert/knowledge holders included extensive discussion on the importance of respectful harvest, including asking permission of the plant and leaving an offering when harvesting.[10]

CULTURAL WELL-BEING OBJECTIVE: Healthy and thriving ecosystems supporting multiple medicinal plants, including fungi and berries, that support the food, social, and ceremonial needs of the Skeena ESI First Nations. Cultural harvest, processing, and sharing that contribute to the continued exercise of traditional governance, language preservation, and cultural well-being.

Medicinal plants (including berries and fungi) of cultural importance include:[11]

- Bear berries;
- Birch water;
- Blueberries (low bush and high bush);
- Bullrush;
- Cedar boughs and bark;
- Chaga;
- Cow parsnip;
- Crab apples (small, wild);
- Cranberries;
- Devil's club;
- Elderberries;
- Fiddleheads;
- Fireweed;
- Frog's blanket/plantain;
- Hawthorn;
- Hazelnuts;
- Hellebore;
- Huckleberries;
- Juniper;
- Kinnikinic;
- Mountain ash;
- Pine mushrooms;
- Pitch and sap — hemlock, pine, spruce, cottonwood;
- Red willow;
- Rosehips;
- Saskatoon berries;
- Soapberries;
- Spiny wood fern;
- Stinging nettle;
- Water lily roots;
- Wild onions;
- Wild raspberries (and leaves);
- Wild strawberries;
- Willow ash; and
- Yarrow.

10 Ibid., Lake Babine Nation and Ecofish, 2019.

11 The People of 'Ksan, *Gathering What the Great Nature Provided: Food Traditions of the Gitksan,* 1980; Four Directions Management Services, *ESI Community Engagement Workshops: Summary Report,* August 30, 2017; Simgiget'm Gitwangak Society, *Indigenous Stewardship Project Proposal & Shared Cost Arrangement,* 2019.

MEDICINAL PLANTS: Harvest

- PH-1 Harvest effort to success ratio: number of days or hours spent to total amount of medicinal plants harvested (by plant type, measurement units may vary according to plant type, e.g., buckets of berries, pounds of mushrooms, bags of fireweed).
- PH-2 Percentage of harvesters who report change in effort to success ratio over the past year, in comparison to previous years (results calculated and separated by positive and negative change, by plant type).
- PH-3 Percentage of harvesters who report change in quality of plant (size, colour, taste) over the past year in comparison to previous years (results calculated and separated by positive and negative change, by plant type).
- PH-4 Percentage of harvesters who report change in season timing of plant for harvesting over the past year, in comparison to previous years (results calculated and separated by earlier or later timing, by plant type).
- PH-5 Percentage of total plant harvest with permission of the affected House or Clan Chief.
- PH-6 Percentage of total plant harvest with knowledge transmission between generations (e.g., Elders to adults, adults to youth).
- PH-7 Ratio of successful harvests to unsuccessful. Calculated to reflect any plant harvesting effort that was completely unsuccessful in comparison to overall success rate (by target plant type).

MEDICINAL PLANTS: Observations About Abundance and Habitat

- PP-1 Percentage of survey (both harvester and community) respondents who have observed medicinal plants in their territory over the past year (by plant type).
- PP-2 Percentage of survey (both harvester and community) respondents who have observed climate or weather changes (more or less rain, drought, fire etc) affecting the abundance of medicinal plants in their territory (calculated and reported by both positive and negative change, by species).
- PP-3 Percentage of survey (both harvester and community) respondents who have observed disturbance (e.g., industrial activity, garbage left, pollution, pesticides, or damaging harvest practices) to medicinal plants habitat in their territory over the past year.

MEDICINAL PLANTS: Community Satisfaction and Experience

- PC-1 Percentage of survey (both community and harvester) respondents who are satisfied with their access to medicinal plants over the past year.
- PC-2 Percentages of survey (both harvester and community) respondents who reported either positive or negative (e.g., other harvesters, damage to habitat) cultural or spiritual experiences while harvesting medicinal plants in their territory over the past year.

"Looking at the health of the land, and how its connected to our people's health, that is our own integrated and wholistic approach. To ensure the well-being of our people, we need sustainable development. For the first time, all our nations and our Elders are coming together to work together for that prosperous state on the land. This is our resiliency, our adaptation to change. We need to continue to incorporate our traditional knowledge and share with our younger generations." — Shannon Haizimsque, Wet'suwet'en First Nation

CULTURAL INDICATORS FOR GRIZZLY BEAR

According to all of the Skeena ESI materials and documentation, Skeena ESI nations do not actively harvest grizzly bear for sustenance purposes. Grizzly bears are revered culturally, and afforded significant respect spiritually. Therefore, the *harvest* cultural indicators are not as comprehensive for grizzly bear, as with the other Skeena ESI values. However, traditionally grizzly bears were harvested sporadically and some organs and meat used for food, and claws and fur were used in regalia. Currently, many Skeena ESI nations experience challenges with human-bear conflicts in remote communities as bears become more habituated to humans. This was referenced in numerous community meetings, and forms the basis for one of the indicators below.

"The Grizzly Bear is sacred in our culture; we do not actively hunt it for food unless absolutely necessary. In our Wilp we have a Grizzly crest, there is a limk'oy [mourning song] where the Grizzly mother tries to swim across the river with two cubs on her back, and one falls off and doesn't make it. This informs our teachings, our crests and our history." — Valbert Williams, Gitanyow

Similar to wetlands, grizzly bears are linked to several other Skeena ESI values, and other values in the ecosystems. Grizzlies feed extensively on salmon and other fish, on young moose, and many of the same plants listed in the medicinal plants section. Therefore, a lot can be known about their population health by gathering information on those other values.

CULTURAL WELL-BEING OBJECTIVE: A healthy grizzly bear population and habitat that indicates broader ecosystem health, and thus sustainable co-management of territories by Skeena ESI nations and their provincial partners. Grizzly bears that have sufficient habitat, and are not unnecessarily drawn to First Nation communities where they risk being habituated, leading to mortality. Where mortality is unavoidable, that meat, fur, and body parts are not wasted and support cultural regalia and ceremonial items.

GRIZZLY BEAR: Mortality — Unintended Harvest

- GH-1 Percentage of community survey respondents who have seen habituated grizzly bears in or around their community in the past year.
- GH-2 Percentage of community survey respondents who have seen or are aware of grizzly bears who have been killed because of habituation in and around their community in the past year.
- GH-3 Percentage of community survey respondents who were able to salvage for cultural use some parts of a grizzly that was killed because of habituation in the past year.

GRIZZLY BEAR: Observations About Population and Habitat

- GP-1 Percentage of survey (both community and harvester) respondents who have seen grizzly bears or signs of them (e.g., tracks, fur, droppings) in their territory within the past year (can be more than one occasion and location).
- GP-2 Percentage of survey (both community and harvester) respondents who have seen changes in seasonal movement or patterns of hibernation of grizzly bears in their territory in the past year in comparison to previous years (e.g., hibernating later, in lower elevations earlier in the spring).
- GP-3 Percentage of survey (both harvester and community) respondents who have seen disturbance to grizzly bear habitat in their territory over the past year.

INDICATORS AT A GLANCE

CULTURAL INDICATORS FOR THE SKEENA ENVIRONMENTAL STEWARDSHIP INITIATIVE

MOOSE

MH-1 Harvest effort to success ratio
MH-2 Harvest with healthy and full coats
MH-3 Harvest with healthy fat reserves
MH-4 Harvest with signs of disease
MH-5 Harvest with House/Chief permission
MH-6 Harvest with transfer of knowledge
MH-7 Harvest with all parts utilized
MH-8 Hunters with no success
MH-9 Hunters with no sightings or signs
MH-10 Ratio of bull to cow and calf harvest

MP-1 Sightings or signs
MP-2 Habitat sightings
MP-3 Habitat disturbance signs
MP-4 Ratio of observed bulls to cows and calves

MC-1 Access to moose meat
MC-2 Experience affected by users/disturbance

FISH AND FISH HABITAT

FH-1 Harvest effort to success ratio
FH-2 Harvest change in effort to success ratio
FH-3 Salmon harvest observed size change
FH-4 Salmon harvest observed poor quality
FH-5 Salmon harvest observed change in colour
FH-6 Salmon harvest later or earlier than normal
FH-7 Salmon harvest observed health concerns
FH-8 Harvest with House/Chief permission
FH-9 Harvest with knowledge transmission
FH-10 Harvest with all parts utilized
FH-11 Ratio of successful to unsuccessful harvests
FH-12 Survey respondents with no access

FP-1 Sightings and observations
FP-2 Insect observations
FP-3 Water level observations
FP-4 Habitat disturbance signs

FC-1 Access to fish
FC-2 Access in another territory
FC-3 Experience affected by users/disturbance

WETLANDS

WH-1 Harvest dependent on wetland habitat
WH-1 Wetlands cultural features condition

WP-1 Species of cultural significance observations
WP-2 Population change observations

WC-1 Access for cultural purposes
WC-2 Experience affected by users/disturbance

MEDICINAL PLANTS

PH-1 Harvest effort to success ratio
PH-2 Harvest change in effort to success ratio
PH-3 Harvest change in quality of plant
PH-4 Harvest change in plant season timing
PH-5 Harvest with House/Chief permission
PH-6 Harvest with knowledge transmission
PH-7 Ratio of successful to unsuccessful harvest

PP-1 Observed medicinal plants
PP-2 Observed climate change
PP-3 Observed disturbance

PC-1 Access to medicinal plants
PC-2 Positive/negative experience

GRIZZLY BEAR

GH-1 Sightings of habituated grizzly bears
GH-2 Grizzly bears killed because of habituation
GH-3 Salvage of grizzly bear parts for cultural use

GP-1 Sightings or signs
GP-2 Observed changes in seasonal movement
GP-3 Observed disturbance of habitat

PART 3

Recommendations

Timing of Data Collection

To effectively assess the state of the five Skeena ESI environmental values — not only once, but in an ongoing and systematic way aimed at informing decision-making now and into the future — a comprehensive approach is needed. Conducting one community survey or one field assessment is not enough. Ongoing assessment at the territory/field level, community level, and decision-maker level is needed to ensure that decisions are made with the most current and accurate data available. Further, the cultural indicators captured here are a starting point, and subject to change based on changes in funding and resource commitments, climate change, prioritization of various species or values based on unpredicted change, and other factors beyond our collective control. However, in order to track patterns and trends over time, it is recommended that cultural indicators do not change significantly, so we are measuring using the same metrics to obtain reliable and transparently gathered data.

Table 1: **Recommended Timeline for Collection of Cultural Indicators Data**

Value	Data collection tool	Timeline for data collection
Moose	Harvester Survey	Annual
	Community Survey	Every 3-5 years
Fish and fish habitat	Harvester Survey	Annual
	Community Survey	Every 3-5 years
Wetlands	Harvester Survey (Moose, Fish and Fish Habitat, Medicinal Plants)	Annual
	Community Survey	Every 3-5 years
Medicinal plants	Harvester Survey	Annual
	Community Survey	Every 3-5 years
Grizzly bear	Harvester Survey (Moose, Fish and Fish Habitat)	Annual
	Community Survey	Every 3-5 years

The recommendations for timing and frequency of the harvester and community surveys are based on a number of factors and assumptions, both of which need ongoing confirmation and modification where needed:

- Harvest data will consistently provide more quantifiable information for decision-making, and for follow-up inquiry or study where necessary;
- Harvest data will provide more detailed information on the health of plant and animal species that more observational data cannot provide;
- Active harvesters spend the most amount of time on the territories compared to almost any other people in our region, and have intimate and rich information that is actionable for follow-up management direction or further study or assessment;
- Community members who are not active in harvesting on their territory are also very valuable sources of information, for example those people who might spend time at a fish camp helping with processing fish, but are not actively fishing; and
- Community-based data informed more by observation than harvesting practices is equally valuable and helps to round out the harvest data, but can be collected less frequently to save limited time and resources.

Distinguishing Between Community and Harvester Surveys

The rationale behind separating out community and harvester surveys is to target more specifically different community members, to obtain the most detailed and usable data possible. Staff, leadership, and community members all have limited time and completing a long survey that is not relevant to your activity, skills, or knowledge is not in anyone's best interest. Similarly, staff conducting, say, 100 surveys with harvest-focused questions with community members of which only 20 are active harvesters is not the best use of limited staff time.

In the appendices, surveys are categorized as either community or harvester, and for harvester surveys they are broken down further by what is being harvested to ask the most detailed questions possible to the appropriate people in each community that will provide cultural indicator data. Of course, many people will need to complete more than one harvester survey if, for example, they both hunt moose and fish on their territory.

"One of our main indicators of cultural well-being is how much traditional foods are being served in our feasts. In the past, every feast the host clan would serve moose and other traditional foods and announce which area of the territory it was harvested. We are losing this practice now as less foods are available."
— Victor Jim, Witset

Modifications to Data Collection Tools and Cultural Indicators

As ESI continues, or is modified to new directions or implemented at different levels, the cultural indicators and data collection tools proposed in this report can and should be modified to suit the needs of the First Nations and provincial partners. For example, if there is a concern about a specific medicinal plant in one area, the harvester survey for medicinal plants can be modified to focus only on that plant, and exclude others that are not facing a conservation concern. This would similarly apply to a fish species of concern, or a specific wetland species of concern.

Other modifications could include multiple First Nations partnering to conduct regional surveys to save resources and time in survey implementation and analysis of results. Based on the outcomes of the analysis of the Skeena ESI documents and materials, it is recommended that for the most part, data gathered using the Skeena ESI cultural indicators be gathered at the nation level, and not more broadly at the Skeena ESI regional level. The common theme for Skeena ESI, being 'distinctly Skeena,' has consistently been that the nations work best together when a healthy degree of independence for each nation is respected, while still working together on common objectives and data tools.

Finally, it is recommended that each nation use existing consent forms, or develop their own unique forms, to ensure informed consent of each survey respondent before participating in either the harvester or community surveys.

Resources to Gather Data

As the current provincial mandate for ESI winds down, and the Skeena ESI partners seek out renewed commitments to making ESI a permanent program within government, there is still a degree of uncertainty on how best to resource the data collection using the Skeena ESI cultural indicators. While there are no guarantees of long-term provincial funding to collect and analyze such data, First Nations and the provincial government can also look to existing programs for alignment and synergies, including but not limited to:

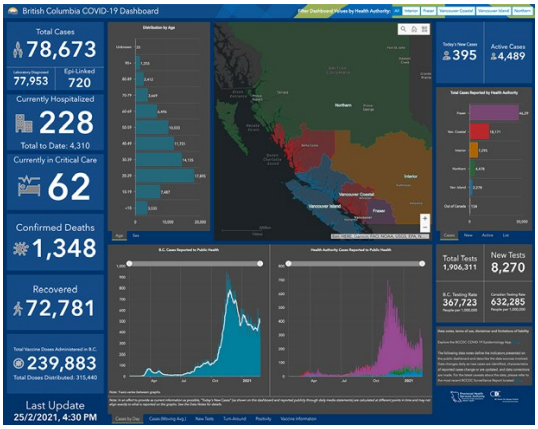
- Health and well-being surveys and data gathering, especially new funding opportunities focused on environmental health, culture, and climate change;
- Food security programs, in light of the COVID-19 pandemic;
- Fish harvest monitoring through nations' fisheries departments, and federal Aboriginal Fishing Strategy agreements and funding;
- Guardian programs and hunting permitting programs; and
- Major projects assessments (environment assessments) and monitoring.

For funding and resourcing purposes, implementation of the Skeena ESI cultural indicators surveys should consider and include where possible:

- **STAFF RESOURCES FOR PROJECT COORDINATOR:** Can be short-term, annual. Responsible for overseeing finalization of survey format, plan and implement budget, including resources for honoraria or gifts for survey completion, analysis, and writing up of survey results.
- **STAFF RESOURCES FOR SURVEY ADMINISTRATOR:** Part-time, short-term one or two people who will deliver and receive surveys, assist harvesters and community members with completion of surveys, and complete data entry. Surveys may be done online, where technology capacity allows, but should also provide opportunity for in-person completion.
- **HONORARIA, GIFTS, AND DOOR PRIZES:** Incentives and respectful compensation should be provided to those who complete surveys. Data and knowledge is needed for effective governance, and harvesters and community members should be compensated fairly for their contribution.
- **LEADERSHIP AND GOVERNMENT-TO-GOVERNMENT DIRECTION:** In-kind and financial resources to ensure that survey results do not sit on a shelf or in someone's hard drive, but are actioned where necessary, and appropriately linked to decision-making forums and tables.
- **HARDWARE AND SOFTWARE:** As cultural indicators are refined or expanded, data collection may shift to more technology in the field/territory, including harvesters with access to iPads or smartphones and the appropriate software to supplement survey data, such as photos or GIS points. If this shift does occur, data management needs will grow proportionally.

Dashboard for First Nation and Provincial Decision-Makers

If the COVID-19 pandemic has taught us anything, it is that accurate, up-to-date data is critical for decisions that affect public well-being. The *British Columbia COVID-19 Dashboard*[12] is an impressive example of how data can be shared with the public in an open and transparent manner, utilized in provincial decision-making and managed for the betterment of all British Columbians.



Just as the provincial public health officer is responsible for using data to make better decisions about health orders, such as travel restrictions, business closures, or school openings, so too do the provincial natural resource management ministries, along with their First Nations partners, have the responsibility to share and utilize data in an open and transparent manner. Just as the public health crisis has necessitated rapid deployment of resources and development of new data tools, so too does the climate change and biodiversity crises affecting lands and waters in many parts of B.C. necessitate leading edge technology and data management. The wholistic approach recommended by Skeena ESI First Nations shines a light on a path forward in linking public health and environmental health.

It is recommended that Skeena ESI, in collaboration with other ESI regions, develop a leading-edge decision-making tool, similar to the BC's Covid-19 Dashboard, to house and showcase data collected using the Skeena ESI cultural indicators, the results of the state of the values reports, and other outcomes from the Skeena ESI. A dashboard that can be used by provincial and Indigenous leaders alike, while also being transparent and open to the public, is well within our collective reach based on the achievements of Skeena ESI to date. If a plan for developing such a technological decision-making tool is not developed and acted on in the near future, the ESI runs the risk of producing a vast amount of data and consensus-based knowledge with no vehicle for action and evidence-based decision making on the lands and resources in the Skeena ESI region.

One example of such a data dashboard has been developed by the Saskatchewan First Nations.[13] The Saskatchewan First Nations Regional Dashboard is an online information tool that contains key data points relevant to First Nations in Saskatchewan, as well as a resources library. The data and data visualizations from many sources provide users a glance at over 100 indicators, and the resources library contains over 500 programs, services, and planning resources to support First Nations in implementing their priorities.

Discussion on this type of decision-making dashboard or tool is already underway at the Skeena ESI Project Team, and it is hoped there is an open and user-friendly landing site for the data that will be gathered using the Skeena ESI cultural indicators.

12 Government of British Columbia, British Columbia COVID-19 Dashboard, https://experience.arcgis.com/experience/a6f23959a8b14bfa989e3cda29297ded

13 Saskatchewan First Nations Regional Dashboard, http://skfn.ca.

PART 4

CONCLUSION

The Skeena ESI cultural indicators use a nested approach to gathering, collating, and analyzing data gleaned from the cultural practices of the member First Nations. The state of the values reports form the best available scientific data on each of the five skeena ESI values: moose, fish and fish habitat, wetlands, medicinal plants, and grizzly bear. As these reports are being concluded in March 2021, it is important to look to the next phase of ESI and plan for the gathering of culturally derived data in a systematic and comprehensive manner.

While anecdotal cultural information on changes in populations, habitats, or behaviour of various fish and wildlife species is abundant, more systematically gathered data is lacking in the Skeena region. Recommendations on the frequency of both community and harvester surveys can help guide the development of such a systematic approach, with an ultimate objective of development of a cultural indicators database that is either housed within a larger Skeena ESI dashboard, or is a standalone online inventory and tool.

Cultural indicators that are based on cultural practice, and tied to overarching cultural well-being objectives, can guide Skeena First Nations and government in ensuring that decisions made that affect the territories of the Skeena First Nations can be tracked over time and cumulative effects can be managed more effectively. Finally, as community members and harvesters become more accustomed to sharing their knowledge to inform improved decision-making, greater attention may be paid over time to the health and well-being of the five Skeena ESI values, and other environmental and cultural values on the land.

Ultimately, the significance of cultural indicators lies in the true recognition of Indigenous peoples' knowledge and skills as valuable and integral to informed decision-making. It is not enough to simply say that Indigenous traditional knowledge is important. Rather, it is the gathering, collating, and analysis of this knowledge that must be a long-term commitment by both government and First Nations' leadership.

APPENDIX 1

TEMPLATE FIELD CARD COMPONENTS — TECHNICIAN

Skeena Environmental Stewardship Initiative cultural indicators:
additions to all existing Skeena ESI field cards used by technicians in data collection (moose, grizzly, wetlands, fish and fish habitat, medicinal plants)

House, clan or Keyoh territory	Place name in Indigenous language	Name of ESI value in Indigenous language	Elder or knowledge holder comments
Sample:			
Wilp Gamlakyeltxw, Ganeda Clan	*Xsi'aksnagyalga (Aksnagelga Creek)*	*Xa'daa (moose)*	*Xa'adaa browse in area*

APPENDIX 2 **COMMUNITY SURVEY TEMPLATE**

Surveys can be accessed in fillable Microsoft Word format by contacting Tara Marsden at tara@hlimoo.ca

Template Community Survey

Background: This survey is being conducted to gather information on [First Nation name] territory and environmental values including moose, fish and fish habitat, medicinal plants, wetlands, and grizzly bear. Information will help inform the Skeena Environmental Stewardship Initiative, at both the nation level and regionally with provincial government partners and other First Nations in the region. Your participation is voluntary and your name will not be included in the final results. Please answer all questions to the best of knowledge and memory, if you are unsure please select 'unsure', add notes in the spaces provided, or skip question. Many of the questions can only be answered if some amount of your time is spent on your traditional territory, if you are not active on the territory but have access to traditional foods through family or others, you may focus on those questions. If you are an active hunter, fisherman, or harvester of medicinal plants please complete the Harvester Survey(s) instead of the Community Survey.

Q1. Do you spend time on your nation's traditional territory (circle one):

a. Frequently (regularly throughout the year)
b. Once in while (once or twice during the year)
c. Not at all

Moose

Q2. During your time spent on your nation's territory have you seen signs of moose in the past year? Circle one:

a. Yes
b. No

Q3. If you answered a. Yes to Q2, what signs of moose did your see? Please select all that apply:

a. Visual sighting (saw a moose on road, etc) and select
    a. Cow
    b. Bull
    c. Calf
    d. Unknown
b. Tracks
c. Fur or Bones

Q4. In the past year, while on your territory have you seen any of the following moose habitat features? Please select all that apply:

a. Mineral or salt licks
b. Calving areas
c. Moose browse (red osier dogwood, willow etc)

d. None
e. Other – please explain

Q5. In the past year, have you seen any signs of damage or disturbance to moose habitat in your territory? Please select all that apply:

a. Logging or road building
b. Low water levels in wetlands
c. Not enough browse or forage plants
d. Pollution, pesticides or herbicides
e. None
f. Other – please explain

Q6. Over the past year, how would you rate your satisfaction with your access to moose meat for food, social and ceremonial purposes? Please select one:

a. Very satisfied (I have enough moose meat for myself and my family, and other cultural uses like for feasts/bahlats, trade etc)
b. Somewhat satisfied (I have some access to moose meat, but not regularly or enough to meet my family's needs)
c. Not satisfied (I do not have access to moose meat, but would like to)
d. Other – please explain

Q7. Over the past year, has your cultural or spiritual experience of being on your territory been negatively affected by presence of other users (i.e., non-Indigenous hunters) or disturbance to moose habitat? Negative effects could include feelings of concern for moose, worry about population numbers, distress over lack of respect for moose and their habitat, or others.

a. Yes
b. No

If Yes, please explain

Fish & Fish Habitat

Q8. Over the past year, have you observed salmon migrating, spawning, or other in the water bodies in your territory? Please select all that apply:

a. Migrating
b. Spawning
c. Deceased after spawning
d. I have not observed any salmon in the past year

Q9. If you observed salmon in the past year, please select all that apply:

a. Juvenile (smolts)
b. Adults
c. Deceased

Q10. If you have observed salmon migrating or spawning in the past year in your territory, please select which species you have seen.

a. Sockeye
b. Spring/chinook
c. Chum
d. Pink
e. Coho
f. Steelhead

Q11. In the past year, when you observed fish habitat (streams, lakes, rivers) during spawning and migration times, did you observe abundant insects and other sources of food for fish? Please select one:

a. Yes
b. No
c. I did not observe fish habitat during spawning and migration times

Q12. In the past year, when you observed fish habitat (streams, lakes, rivers) during spawning and migration times, did you observe sufficient water levels for fish passage and spawning? Please select one:

a. Yes, water levels were high enough for fish passage and spawning
b. No, water levels looked too low
c. No, water levels looked too high (lots of sediment, higher than normal water etc)
d. I did not observe fish habitat during spawning and migration times

Q13. In the past year, did you see any signs of disturbance or damage to fish habitat in your territory? Please select all that apply, or provide details in the lines below:

a. Industrial spills into rivers, creeks, lakes (fuel, other contaminants etc)
b. Landslides or mudslides
c. Drought
d. Extreme high water/flooding
e. Sediment or other impact from logging
f. Other, please explain

Q14. Over the past year, how would you rate your satisfaction with your access to salmon or other fish for food, social and ceremonial purposes? Please select one:

a. Very satisfied (I have enough fish for myself and my family, and other cultural uses like for feasts/bahlats, trade etc)
b. Somewhat satisfied (I have some access to some fish, but not regularly or enough to meet my family's needs)
c. Not satisfied (I do not have access to fish, but would like to)
d. Other – please explain

Q15. Over the past year, has your cultural or spiritual experience of being on your territory been negatively affected by presence of other users (i.e., non-Indigenous fishermen) or disturbance to fish habitat? Negative effects could include feelings of concern for fish, worry about population numbers, distress over lack of respect for fish and their habitat, or others.

a. Yes
b. No

If yes, please explain,

Q16. In the past year, have you accessed or received fish from another First Nation's territory, due to a closure or conservation concern, or limited availability in your own territory? Please select one:

a. Yes, I have accessed or received fish from another First Nation territory due to conservation or limited availability in my own territory
b. No, I have not accessed or received fish from another territory
c. Yes, I have accessed or received fish from another territory for reasons other than conservation or availability in my own territory (i.e. trade, gift from family, preference for other species etc)

If yes, please explain (what species, if fish was provided by band or other organization etc)

Wetlands

Q17. In the past year, have you visited any wetlands (swamps, marshes, bogs) in your traditional territory? Please select one:

a. Yes
b. No

Q18. If you answered a. Yes to Q17, did you observe any of the following species or plants of cultural importance in or around the wetland? Please select all that apply:

a. Beaver
b. Moose
c. Ducks
d. Various fish species
e. Bear
f. Snowshoe Hare

g. Wolverine
h. Labrador Tea
i. Bullrush Plant
j. Wild Rice
k. Lily Pads (roots)
l. Horsetail
m. Other, please explain

Q19. If you have visited wetlands in your territory over the past year, and years previous to the past year, have you noticed any change (positive or negative) this year to the overall wetland health including number of species or plants, or to water levels or other changes from disturbance or weather change? If yes, please explain:

Q20. If you have visited wetlands in your territory over past year, was your cultural or spiritual experience negatively affected by presence of other users, or disturbance or damage to the wetland? Please select one:

a. Yes
b. No
c. I have not visited wetlands in my territory over the past year

Medicinal Plants

Q21. Over the past year, have you observed any of the following medicinal plants (including berries and fungi) in your territory? Please select all that apply:

1. Fireweed
2. Fiddleheads
3. Spiny Wood Fern
4. Hazelnuts
5. Water Lily Roots

6. Rosehips
7. Wild Raspberries
8. Wild Strawberries
9. Wild Crab-apples
10. Wild Cranberries
11. Soapberries
12. Saskatoon Berries
13. Chaga
14. Birch (for Birch Water)
15. Cedar Boughs and bark
16. Pine Mushrooms
17. Devil's Club
18. Elderberries
19. Blueberries (low bush or high bush)
20. Huckleberries
21. Juniper
22. Kinnikinic
23. Mountain Ash
24. Pitch and saps – hemlock, pine, spruce, cottonwood;
25. Bear berries
26. Stinging Nettle
27. Hellebore
28. Red Willow
29. Bullrush
30. Frog's Blanket/plantain;
31. Hawthorn
32. Cow Parsnip
33. Willow Ash
34. Yarrow
35. Wild Onions
36. Other, please list

_____

_____

_____

Q22. Over the past year, have you observed any change in the abundance (amount) of different medicinal plants based on weather/climate? Please select one:

a. Yes, there is less medicinal plants because of change in climate
b. Yes, there is more medicinal plants because of change in climate

c. No, I have not noticed a change in the amount of medicinal plants

If yes, please explain

Q23. Over the past year, have you observed disturbance or over harvest of medicinal plants in your territory? Please select all that apply:

a. Industrial activity (logging, mining, etc) affecting plants and habitat
b. Pollution or contamination (pesticides, herbicides)
c. Garbage left by harvesters
d. Over harvest (too many harvesters or poor harvesting practices)
e. I have not observed any damage or disturbance to medicinal plants
f. Other, please explain

Q24. Over the past year, how would you rate your satisfaction with access to medicinal plants for your food, social and ceremonial uses and needs? Please select one:

a. Very satisfied, myself and my family have access to meet our needs
b. Somewhat satisfied, myself and my family have some access but would like more
c. Not at all satisfied, myself and my family have no access to medicinal plants

Grizzly Bear

Q25. Over the past year, how often have you observed grizzly bears who are habituated to humans and are spending a lot of time in and around your community? Please select one:

a. Often, I see grizzly bears regularly in and around our community
b. Sometimes, I see grizzly bears once in a while in and around our community
c. Rarely or never, I do not see grizzly bears in and around our community

Q26. Over the past year, are you aware of any grizzly bears who have been killed or relocated away from your community because they were too habituated to humans? Please select one:

a. Yes
b. No

Q27. If any grizzly bears were killed because of habituation to humans in your community, do you know if any of the meat, fur, or other parts were salvaged in the community for cultural use? Please select one:

a. Yes
b. No

Q28. Over the past year, have you seen signs of grizzly bear in your territory? Please select all that apply:

a. Visual sighting (seen grizzly on side of road, at our cabin etc)
b. Tracks
c. Droppings
d. Fur or other parts
e. No, I have not seen any signs of grizzly bear in my territory

Q29. Over the past year, have you noticed any change in the seasonal movement and hibernation times of grizzly bears, in comparison to previous years in your territory? Please select one:

a. Yes, I have noticed grizzly bears active during winter (warmer winter)
b. Yes, I have noticed grizzly bears active earlier in spring
c. Yes, I have noticed grizzly bears active later in the fall/early winter
d. No, I have not noticed any change
e. Other, please explain

Q30. Over the past year, have you seen any damage or disturbance to grizzly bear habitat in your territory (can include old growth forests, fish spawning areas, berries, etc). Please select one:

a. Yes
b. No

If yes, please explain

10

APPENDIX 3 MOOSE (AND GRIZZLY) HARVESTER SURVEY TEMPLATE

Surveys can be accessed in fillable Microsoft Word format by contacting Tara Marsden at tara@hlimoo.ca

Template Harvester Survey – Moose (and Grizzly)

Background: This survey is being conducted to gather information on [First Nation name] territory and environmental values including moose and grizzly bear. Information will help inform the Skeena Environmental Stewardship Initiative, at both the nation level and regionally with provincial government partners and other First Nations in the region. Your participation is voluntary and your name will not be included in the final results. Please answer all questions to the best of knowledge and memory, if you are unsure please select 'unsure', add notes in the spaces provided, or skip question. This survey is intended for those community members who are active harvesters/hunters in their territory. If you are not a hunter, you can complete the Community Survey which has questions more suited for community members who have some knowledge, but not specific to hunting/harvesting.

Moose

Q1. How many days did you spend hunting moose in the past year in your own territory?

a. One or less
b. Two – seven
c. Seven – 14
d. More than 14

Q2. How many moose did you harvest in the past year in your own territory?

a. None
b. One
c. Two
d. Three
e. Four or more

How many bulls:
How many cows:
How many calves:

Q3. Of the moose that you did harvest in the past year, how many had healthy, full coats free of ticks and other health problems?

a. None
b. One
c. Two
d. Three
e. Four or more

Q4. Of the moose that you did harvest in the past year, how many had healthy fat reserves (did not look malnourished or starving)?

a. None
b. One
c. Two
d. Three
e. Four or more

Q5. Of the moose that you did harvest in the past year, how many appeared to have disease or illness?

a. None
b. One
c. Two
d. Three
e. Four or more

Q6. If you harvested one or more moose in the past year, did you seek permission from the territory holder (Clan or House Chief)? Please select one:

a. Yes
b. No

Q7. If you have harvested one or more moose in the past year, did you learn any traditional knowledge or hunting skills from your older family or community members, Elders or knowledge holders to help you harvest? Please select one:

a. Yes
b. No

If yes, please explain

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Q8. If you have harvested one or more moose in the past year, did you share or teach any traditional knowledge or hunting skills with younger members of your family or community to help them learn to hunt?

a. Yes

b. No

If yes, please explain

_____

_____

_____

Q9. If you did harvest one or more moose in the past year, did you utilize all main parts or organs, please select all the apply:

a. Liver
b. Head (tongue and nose)
c. Ribs
d. Tripe/guts
e. Hide (for regalia, drums etc)
f. Other, please explain

_____

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_____

Q10. If you hunted (successfully or unsuccessfully) for moose in the past year in your own territory, how often did you see or hear signs of moose including tracks, droppings, bones, antlers, visual sighting of live or dead moose (someone else's harvest), hearing moose during rut, or other? Please select one:

a. Frequently, I saw/heard signs of moose every time I went out hunting
b. Sometimes, I saw/heard signs of moose occasionally but not a lot
c. Rarely, I hardly saw/heard any signs of moose
d. Never, I did not see/hear any signs of moose when I was out hunting

Q11. When you were out hunting in the past year in your territory, did you see any moose habitat features including mineral licks, moose browse, calving areas? Please select one:

a. Yes
b. No

If yes please explain

_____

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_____

Q12. When you were out hunting in the past year in your territory, did you observe any damage or disturbance to moose habitat including logging or road building, pollution or spills, low water levels in wetlands, declining browse etc? Please select one:

a. Yes
b. No

If yes please explain

_____

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_____

Q13. Over the past year, how would you rate your satisfaction with your access to moose meat for yourself and your family?

a. Very satisfied, I have been able to harvest enough for myself and my family
b. Somewhat satisfied, I was able to harvest moose meat but not enough for our needs
c. Not at all satisfied, I was not able to harvest to meet the needs of myself and my family

Q14. If you answered b or c to Q13, what are the main barriers, in your view, to accessing or harvesting more moose?

a. Time, I have to work and cannot hunt as much as I like or need
b. Transportation, I do not have reliable transportation to hunt regularly
c. Firearms, I need my PAL or gun not working etc
d. Not enough moose, I have not seen moose or seeing lower numbers (not enough bulls etc)
e. Still learning, I am still learning to hunt and not always successful
f. Too many other hunters, seeing too many other hunters out at same time
g. Other, please explain

_____

_____

Q15. Over the past year, has your cultural or spiritual experience of hunting moose been negatively affected by other users on your territory also hunting, damaged habitat, low population numbers, or other factors? Please select one:

a. Yes
b. No

If yes please explain

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_____

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Grizzly Bears

Q16. Over the past year when you were out hunting in your territory, did you observe any signs of grizzly bear? Please select all that apply:

a. visual sighting (alive or deceased)
b. tracks
c. droppings
d. fur or other body parts
e. No, I did not see any signs of grizzly bear while hunting

Q17. Over the past year, have you noticed any change in the seasonal movement and hibernation times of grizzly bears, in comparison to previous years in your territory? Please select one:

a. Yes, I have noticed grizzly bears active during winter (warmer winter)
b. Yes, I have noticed grizzly bears active earlier in spring
c. Yes, I have noticed grizzly bears active later in the fall/early winter
d. No, I have not noticed any change
e. Other, please explain

Q18. Over the past year, have you seen any damage or disturbance to grizzly bear habitat in your territory (can include old growth forests, fish spawning areas, berries, etc). Please select one:

a. Yes
b. No

If yes, please explain

APPENDIX 4 FISH AND FISH HABITAT HARVESTER SURVEY TEMPLATE

Surveys can be accessed in fillable Microsoft Word format by contacting Tara Marsden at tara@hlimoo.ca

Template Harvester Survey – Fish and Fish Habitat (and Grizzly)

Background: This survey is being conducted to gather information on [First Nation name] territory and environmental values including fish and grizzly bear. Information will help inform the Skeena Environmental Stewardship Initiative, at both the nation level and regionally with provincial government partners and other First Nations in the region. Your participation is voluntary and your name will not be included in the final results. Please answer all questions to the best of knowledge and memory, if you are unsure please select 'unsure', add notes in the spaces provided, or skip question. This survey is intended for those community members who are active in fish harvest in their territory. If you do not actively fish, you can complete the Community Survey which has questions more suited for community members who have some knowledge, but not specific to fishing/harvesting. If you fish outside your territory (especially ocean fishing), please do not complete this based on fishing outside your territory, as the data is being gathered by First Nation territory only.

Q.1 In the most recent fishing season, approximately how many hours did you spend fishing? Please select one:

a. Less than 10 hours
b. 10-20 hours
c. 20-40 hours
d. More than 40 hours (please see Q2 for number of days)

Q2. In the most recent fishing season, approximately how many days did you spend fishing (one day = approx. 10 hours fishing). Please select one:

a. 1-5 days
b. 5-10 days
c. 10-20 days
d. 20+ days

Q3. What was your main method for fishing? Please select all that apply:

a. Set net (river)
b. Drift net (river)
c. Dipnet (river)
d. Beach seine (river)
e. Fish wheel (river)
f. Rod and reel (river)
g. Rod and reel (lake)
h. Ice fishing (lake and river)
i. Gaff (canyon)
j. Other, please explain

Q4. Approximately how many fish did you catch this past season, by species? Please fill in number beside each species, if none, please write '0':

a. Sockeye _____
b. Spring/Chinook _____
c. Chum_____
d. Pink_____
e. Coho_____
f. Steelhead_____
g. Rainbow Trout_____
h. Bulltrout_____
i. Cutthroat Trout_____
j. Kokanee_____
k. Whitefish (lake)_____
l. Ling cod (lake)
m. Char_____
n. Dolly Varden_____
o. Other, please list

Q5. How did your fishing success rate change in the past season, compared to previous seasons? Please select one:

a. No change, I spent roughly the same amount of time fishing and caught roughly the same amount of fish
b. Some change, I spent less time fishing but caught same amount or more of fish
c. Some change, I spent more time fishing but caught same amount of fish
d. Some change, I spent more time fishing but caught less fish
e. Significant change, I spent more time fishing and caught much less fish
f. Other, please explain

Q6. Of the fish you did harvest in the most recent fishing season in your territory, what was the average size of the fish in comparison to previous seasons? Please select one:

a. Fish were roughly the same size this season
b. Fish were bigger this season
c. Fish were smaller this season

If there was a change in size, please explain which species and any other observations:

Q7. Of the fish that you did harvest this season, how many had poor quality of meat (including colour, texture, firmness, taste)? Please select one:

a. None, all fish were healthy and had good quality of meat
b. Some, some fish had poor quality of meat
c. All, fish all had poor quality of meat

If you answered b or c, please explain including meat quality issues, and what species

Q8. Of the fish you did harvest this season, how many had different colourings (exterior) compared to previous years? Please select one:

a. None, all fish had normal exterior colour
b. Some, some fish had different colour
c. All, fish all had different colour compared to previous years

If you answered b or c, please explain colour change and what species

Q9. Of the fish you did harvest this past season, how many had health concerns including cysts, worms, deformities, or other health issues? Please select one:

a. None, all fish harvested were healthy
b. Some, some fish had health issues but not affecting overall ability to consume
c. All, of the fish harvested could not consume due to health concerns
d. Some to all, but were consumed anyways

If you answered b, c, or d please explain health issue and species

Q10. If you did harvest fish this past season, did you seek permission from the territory holder (House or Clan Chief etc)? Please select one:

a. Yes
b. No

Q11. In your harvest of fish in the past season, were you taught any skills or traditional knowledge by an Elder, older family member, or community member that helped you to successfully harvest? Please select one:

a. Yes
b. No

Q12. In your harvest of fish in the past season, did you share knowledge or teach skills to any younger members of your family or community to help them learn to fish? Please select one:

a. Yes
b. No

Q13. Of the fish you harvested, how many were fully utilized with no wasted edible parts (i.e. heart, head, bones in jarred fish, eggs for soups or bait, etc)? Please select one:

a. None, I do not use all edible parts
b. Some, I use all edible parts in some fish caught but not all
c. All, I or my family utilize all edible parts of all fish caught

If you would like to provide more info or methods for using all edible parts and avoiding waste, please do so:

Q14. As you were fishing this past season, did you observe abundant insects and other food for fish in their habitat? Please select one:

a. Yes
b. No
c. Unsure

Q15. As you were fishing this past season, did you observe sufficient water levels in fish habitat (streams, lakes, rivers) for fish passage and spawning? Please select one:

a. Yes, water levels were sufficient
b. No, water levels were low
c. No, water levels were too high (may affect spawning)

Q16. As you were fishing this past season, did you see any disruption or damage to fish habitat (streams, lakes, rivers)? Please select all that apply:

a. Fuel or other industrial spills
b. Landslides or mudslides
c. Sediment from logging or other causes
d. No, I did not observe any damage or disruption

If you selected a, b, or c please explain/share

Q17. Overall, how satisfied are you with your and your family's access to fish for food, social and ceremonial purposes over the last year?

a. Very satisfied, I was able to provide enough fish for myself and family needs
b. Somewhat satisfied, I was able to provide some fish but not enough for our needs
c. Not at all satisfied, I was unable to provide fish for myself and family needs
d. Satisfied, but received fish from other territory due to conservation concerns in my territory

Q18. If you were unsatisfied with your access to fish in the past year, what are the main barriers you see to accessing more fish? Please select all that apply:

a. Not enough fish, too many other fishermen, population low
b. Time, I work and do not have time to fish as much as I would like
c. Transportation, I do not currently have boat/vehicle
d. Gear or Fuel, I do not currently have net, or other gear/money for fuel needed
e. Conservation closure, fishing is currently closed in our territory
f. Still learning, I am still learning how to fish and not always successful
g. Other, please explain/share

Q19. Over the past year, has your cultural or spiritual experience of fishing on your territory been negatively affected by presence of other users (i.e., non-Indigenous fishers) or disturbance to fish habitat? Negative effects could include feelings of concern for fish, worry about population numbers, being harassed or intimidated by non-Indigenous fishers, distress over lack of respect for fish and their habitat, or others. Please select one:

a. Yes
b. No

If yes, please explain

Grizzly Bears

Q20. Over the past year when you were out fishing in your territory, did you observe any signs of grizzly bear? Please select all that apply:

a. visual sighting (alive or deceased)
b. tracks
c. droppings
d. fur or other body parts
e. No, I did not see any signs of grizzly bear while fishing

Q21. Over the past year, have you noticed any change in the seasonal movement and hibernation times of grizzly bears, in comparison to previous years in your territory? Please select one:

a. Yes, I have noticed grizzly bears active during winter (warmer winter)
b. Yes, I have noticed grizzly bears active earlier in spring
c. Yes, I have noticed grizzly bears active later in the fall/early winter
d. No, I have not noticed any change
e. Other, please explain/share

Q22. Over the past year, have you seen any damage or disturbance to grizzly bear habitat in your territory (can include old growth forests, fish spawning areas, berries, etc). Please select one:

a. Yes
b. No

If yes, please explain/share

APPENDIX 5 MEDICINAL PLANTS HARVESTER SURVEY TEMPLATE

Surveys can be accessed in fillable Microsoft Word format by contacting Tara Marsden at tara@hlimoo.ca

Template Harvester Survey – Medicinal Plants (including Berries and Fungi)

Background: This survey is being conducted to gather information on [First Nation name] territory and environmental values including medicinal plants and grizzly bears. Information will help inform the Skeena Environmental Stewardship Initiative, at both the nation level and regionally with provincial government partners and other First Nations in the region. Your participation is voluntary and your name will not be included in the final results. Please answer all questions to the best of knowledge and memory, if you are unsure please select 'unsure', add notes in the spaces provided, or skip question. This survey is intended for those community members who are active in medicinal plants harvest in their territory. If you do not actively harvest, you can complete the Community Survey which has questions more suited for community members who have some knowledge, but not specific to harvest of medicinal plants. In this survey, medicinal plants include a wide range of plants including mushrooms and other fungi and berries that are integral to First Nations sustenance, as well as more recent uses for economic purposes (i.e. market for pine mushrooms and chaga).

Q1. In the past year, approximately how many hours did you spend harvesting medicinal plants in your territory? Please select one:

a. Less than 10 hours
b. 10-20 hours
c. 20-40 hours
d. 40+ hours (if so, please answer Q2)

Q2. In the past year, how many full days (10 hrs) did you spend harvesting medicinal plants in your territory? Please select one:

a. 2-5 days
b. 5-10 days
c. 10-20 days
d. 20-30 days
e. 30+ days

Q3. In the past year, approximately how much were you able to harvest of each species, please fill in amount beside each type, in whatever measurement you use (i.e. number of buckets, pounds, bags etc)

1. Fireweed _____
2. Fiddleheads_____
3. Spiny Wood Fern_____
4. Hazelnuts_____
5. Water Lily Roots_____
6. Rosehips_____
7. Wild Raspberries_____

8. Wild Strawberries_____
9. Wild Crab-apples_____
10. Wild Cranberries_____
11. Soapberries_____
12. Saskatoon Berries_____
13. Chaga_____
14. Birch (for Birch Water) _____
15. Cedar Boughs and bark_____
16. Pine Mushrooms_____
17. Devil's Club_____
18. Elderberries_____
19. Blueberries (low bush or high bush) _____
20. Huckleberries_____
21. Juniper_____
22. Kinnikinic_____
23. Mountain Ash_____
24. Pitch and saps – hemlock, pine, spruce, cottonwood_____
25. Bear berries_____
26. Stinging Nettle_____
27. Hellebore_____
28. Red Willow_____
29. Bullrush_____
30. Frog's Blanket/plantain _____
31. Hawthorn_____
32. Cow Parsnip_____
33. Willow Ash_____
34. Yarrow_____
35. Wild Onions_____
36. Other, please list

_____

_____

_____

Q4. In the past year, did you notice a change in the amount you able to harvest in comparison to previous years? Please select one:

a. No change, I spent the same amount of time harvesting and harvested about the same amount as previous years
b. Some change, I spent less time harvesting but harvested more
c. Some change, I spent more time harvesting but got less

d. Significant change, I spent more time harvesting but did not harvest any

Please explain any changes you noticed, including which plant species and type of change

Q5. In the plants that you harvested in the past year, did you notice any change in any of the plant's characteristics in comparison to previous years? Please select all that apply:

a. Size was smaller
b. Size was larger
c. Taste was better
d. Taste was worse
e. Colour was different
f. Presence of worms or other insects
g. Absence of worms or other insects
h. Other, please explain

Q6. In the past year, in comparison to previous years, did you harvest plants:

a. Earlier than normal
b. Later than normal
c. About same time as normal

Please explain any changes, including what plant type and why you think they were ready earlier or later (i.e. warmer or colder weather, drier or wetter etc)

Q7. Of the plants you harvested, did you seek permission of the territory holder (House or Clan Chief)? Please select one:

a. I ask permission each time I harvest
b. I sometimes ask permission
c. I rarely or never ask permission

Q8. During your harvest of medicinal plants in the past year, how often were you taught traditional knowledge or skills from Elders or older family or community members that helped you in your harvest or in the preparation after? Please select one:

a. Sometimes
b. Often
c. Never

Q9. During your harvest of medicinal plants in the past year, how often did you share traditional knowledge or skills with younger family or community members that helped them learn and harvest or prepare medicinal plants? Please select one:

a. Sometimes
b. Often
c. Never

Q10. Overall, how would you rate your satisfaction in the past year with your access to medicinal plants (including those listed above and others) for yourself and your family for food, social, ceremonial and medicinal purposes? Please select one:

a. Very satisfied, I am able to provide for myself and my family for our needs
b. Somewhat satisfied, I am able to provide for most of our needs but would like access to more
c. Somewhat satisfied, I was unable to harvest but was given medicinal plants by a family or community member
d. Not at all satisfied, I was unable to harvest any this year but would like to
e. Other, please explain

If you have access to some medicinal plants (i.e. berries) but not others, please also explain which types you would like more access to

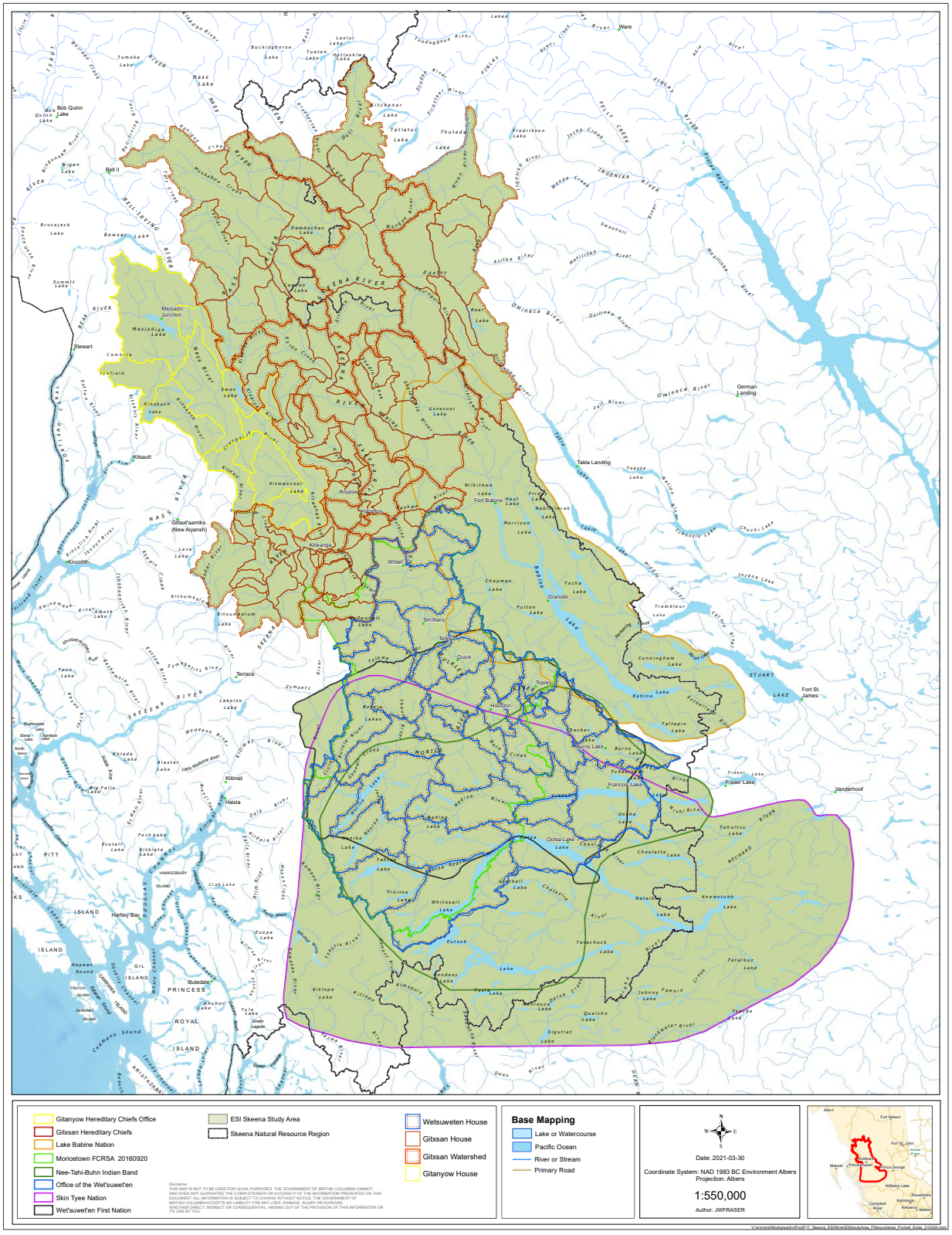
Q11. In the past year, has your cultural or spiritual experience in harvesting medicinal plants been negatively affected by other people on the land, disturbance to habitat, damage or pollution? Negative effects can include harassment or intimidation by non-Indigenous or other Indigenous people while harvesting, concern over damage to habitat, or others. Please select one:

a. Yes
b. No

If yes, please explain

APPENDIX 6

SSAF STUDY AREA MAP



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