Kitasoo Xai'xais Cultural Feature Inventory

Standards Manual

Version 4

January 2022

Acknowledgements

This manual is an adaptation of the Council of the Haida Nation – Cultural Feature Inventory Standards Manual for the implementation of the Great Bear Rainforest Land Use Objectives Order.

Much gratitude to the Haida Nation for their pioneering work in developing cultural feature inventory standards and processes that have been adapted here for use in the Great Bear Rainforest. Special thanks to Robert Kennedy and Nick Reynolds for sharing their wisdom and experience during the adaption of the inventory standards.

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1. Background

1.1. Purpose of this Document

This document describes the field survey procedures and standards for carrying out a Cultural Feature Inventory (CFI) survey. The purpose of CFI surveys is to detect the presence, abundance, and quality of cultural features in an area where development or activity is planned. A CFI survey should be conducted prior to the preparation and approval of road and timber harvesting development plans and permits, or the approval of other major projects and activities within Kitasoo Xai'xais Territory (for map see Appendix B). CFI surveys may also be conducted as part of cultural feature inventory, research, and modelling projects.

The management objectives and requirements for cultural features as it relates to forestry development activities are set out in the 2016 Great Bear Rainforest (Land Use) Order (GBRO) and should be included in a Forest Stewardship Plan prepared by Forest Licensees along with any other formal guidance. Kitasoo Xai'xais may also require the management or protection of these features when other types of development or activities are planned for the Territory.

1.2. Connection to Higher Level Plans and Objectives

1.2.1. Great Bear Rainforest Land Use Order

The First Nations section[1] for the Central and North Coast in the 2016 *Great Bear Rainforest (Land Use) Order (GBRO)* includes requirements for forest management, including carrying out field reconnaissance or field assessments for cultural features. These surveys are required to maintain and protect cultural features that may be affected by harvesting, road construction and associated forest development activities. The cultural feature identification and inventory standards in this manual are designed to ensure the proper identification of cultural features and to support the successful implementation of the objectives found within the *GBRO*. The standards in this manual are also designed to be consistent with the Indigenous Heritage Features Standards Manual developed to support Schedule I of the *GBRO.*

1.2.2. Kitasoo Xai'xais Stewardship Plans

The protection of Kitasoo Xai'xais culture and heritage, including cultural features, is guided by the *Kitasoo Xai'xais Integrated Marine Use Plan* (2011) and the *Kitasoo Xai'xais Land and Resource Protection and Management Plan* (2000) in accordance with Kitasoo Xai'xais laws and customs. Core values and principles from these plans include:

- Kitasoo Xai'xais consent is required for all forest development activities within Kitasoo Xai'xais Territory.

[1] See Part 2, Division 2 of the 2016 Great Bear Rainforest Land Use Objectives Order.

- Forest development activities within Kitasoo Xai'xais Territory must protect or enhance the well-being of Kitasoo Xai'xais people, forests, fish, wildlife and the complex interactions of all life.
- Conservation of cultural and natural resources guides all activities in Kitasoo Xai'xais Territory. Forest development activities in ecologically or culturally sensitive sites may be prohibited.
- Protection of Kitasoo Xai'xais environmental and cultural values is paramount and will be carefully monitored and managed.
- Kitasoo Xai'xais legal principles of respect, reciprocity, interconnectedness, and intergenerational knowledge are foundational to all activity, planning and development.

To ensure these principles are followed, it is a requirement under the Kitasoo Xai'xais *Policy on Surveying Cultural Features* (2017) that an individual or company must conduct a CFI survey to identify cultural features within the Development Area as part of the site-specific planning work, and that this assessment must follow the survey standards in this manual.

1.3. Who Can Use These Standards?

This manual establishes the procedures that must be followed when conducting CFI surveys in potential Development Areas within Kitasoo Xai'xais Territory.

To conduct a CFI survey, a surveyor should successfully complete all the training modules designed to teach feature identification and associated field survey protocols and should be on a list of qualified surveyors for the Kitasoo Xai'xais Stewardship Authority (KXSA). Qualified surveyors can lead or direct the work of field crews who have some training and experience but who are not on the list of qualified surveyors. However, the lead surveyor must take full responsibility for the survey results.

More detail on qualifying as a surveyor is provided in Section 9 - Surveyor Training & Qualification.

2. Cultural Features

There are five types of cultural features that are described in this Standards Manual. These do not represent a complete or absolute list of features integral to the Kitasoo Xai'xais. Rather, these feature types are specific to the First Nation objectives in the *GBRO* (Part 2, Division 2, Objectives 5-9).

The five types of cultural features are:

- Indigenous Heritage Features;
- Indigenous Forest Resources;
- Culturally Modified Trees;
- Indigenous Tree Use; and,
- Western Yew.

The definition and keys for the identification of each type of cultural feature are provided in detail in Section 8 - Identification of Cultural Features.

3. Surveying for Cultural Features

Cultural features identification surveys are necessary, in part, to meet the requirements of the *GBRO* to identify and locate cultural features. Surveys should be conducted prior to final engineering of forestry blocks or roads to ensure that cultural features are protected when designing forestry activities, and to allow time for any additional archaeological surveys.

3.1. Preliminary Field Reconnaissance

Cultural feature inventory surveys are similar to provincial Heritage Branch Preliminary Field Reconnaissance (PFR) in that they both survey for archaeological features. PFRs are focused on assessing the potential for archaeological sites as defined under the provincial *Heritage Conservation Act* (*HCA*). CFI surveys for cultural features as defined under the *GBRO* and include a broader definition of archaeological features, known as Indigenous Heritage Features (IHF), as well as other types of cultural features. Carrying out CFI surveys does not remove a practicing forester or forest licensee's obligation to consult a professional archaeologist or comply with requirements under the provincial *HCA.* If an archaeological resource is disturbed during development all work must be stopped, and the *HCA* requires that a Heritage Inspection or Investigation Permit is acquired before work recommences.

3.2. Archaeological Impact Assessments

Archaeological Impact Assessments (AIA) are detailed inventories conducted by a professional archaeologist to determine the presence and impact on both surface and sub-surface archaeological resources. The need for a more detailed archaeological assessment may be identified during a CFI survey or by KXSA based on existing knowledge. While it is ultimately the responsibility of the practicing forester or licensee who is planning the project to determine when an AIA is required, this determination should be made in collaboration with KXSA.

4. Planning and Preparation for a Field Survey

This section provides instructions to guide KXSA and surveyors in preparing for a CFI survey.

4.1. Steps to Carrying out a Field Survey

Cultural feature inventory surveys always follow these basic steps at the responsibility of KXSA and the lead surveyor(s):

1. Carry out a pre-field assessment – including review of background information (*e.g.* traditional use and ethnohistorical data) and maps of the area.
2. Load all relevant spatial information regarding the Development Area to the data collection device (*e.g.* Trimble).
3. Note areas that may not require 100% coverage (to be verified in the field, see Section 6 - CFI Survey Coverage).
4. Establish survey route, including:
    a. Identify potential landing sites if accessed by helicopter or boat.
    b. Identify and mark a starting point in the correct Development Area.
5. Map and record cultural features in the field.
6. Upload the data immediately once in wifi coverage.

It is expected that every cultural feature inventory survey will have:

- correct identification and classification of features (see Section 8 - Identification of Cultural Features)
- appropriate survey coverage (see Section 6 - CFI Survey Coverage)
- accurate spatial location of features (see Section 5 - Data Gathering Standards & Section 7 - Carrying Out Field Surveys)
- identification of the need for additional surveys (see Section 3 - Surveying for Cultural Features)

4.2. Pre-field Site Assessment and Data Review

The pre-field assessment of the survey area will help establish the survey coverage needs. Pre-field assessments should include:

- Review of available maps, data, and predictive models for:
    - suitability for different cultural features
    - proximity to the coastline or major water bodies;
    - potential for raised beach features;
    - existence of known and/or registered archaeological sites in or adjacent to the Development Area; and

    - existence of known cultural features in or adjacent to the Development Area.

- Review of any relevant technical data, including (but not limited to):
    - timber type(s);
    - elevations;
    - mapped ecological Site Series;
    - surveyed streams, gullies, rock outcrops, and other features.

- Review of any specific instructions from KXSA regarding cultural features and interests that have been identified for this survey including community traditional use knowledge.

Based on this review KXSA and the lead surveyor can begin to build a strategic approach for how to best survey the proposed Development Area.

5. Data Gathering Standards

This section outlines required and optional data to be gathered during a CFI survey. CFI surveys require lead surveyors to report all data collected to KXSA where it will be maintained and stored. KXSA will disclose all relevant information to forest licensees to support meeting the management objectives established under the GBRO.

5.1. Data Collection and Management

All data will be collected using an electronic data collection device running the Coast Tracker application (Coast Tracker). However, an example paper copy cultural feature ID Data Sheet template is included in Appendix A. This datasheet contains the required data fields, and it may be used to record data (in tandem with a handheld GPS) in the field as a backup in the unlikely event that the electronic data collection system is not working.

All CFI survey data must be submitted to KXSA as soon as possible upon completion. Data should be uploaded daily (if possible). This information is necessary for development planning and for the effective management of cultural features. Having the data uploaded as soon as possible can allow for more efficient protection of cultural features during development planning.

5.2. Digital Spatial Data

The format for the submission of data collected in the field by a cultural feature surveyor must meet the format requirements and standards set out by KXSA. It is mandatory that spatial coordinates (*e.g.*, latitude and longitude) are recorded for all cultural features.

GPS tracks must also be recorded for every surveyor on a CFI survey so that the lead surveyor and KXSA can validate the survey coverage in a Development Area. If the lead surveyor is conducting a survey alone, they should carry a handheld GPS in addition to their Coast Tracker, so a backup GPS track is recorded.

6. CFI Survey Coverage

This section describes the standards for CFI coverage within a Development Area. It is the responsibility of KXSA to determine the appropriate survey coverage required for each Development Area.

6.1. Spacing and CFI Survey Coverage

Factors such as forest inventory, species types, known cultural features, or areas with high potential for cultural features should guide survey coverage decisions in the planning stage. A relatively inaccessible Development Area with hemlock as the dominant species would require less coverage than an easily accessible Development Area that has a known cultural feature within it.

Transects may be drawn beforehand to help the surveyor plan how to best achieve the required coverage of a Development Area (Figure 1). Following these transects in the field can be challenging due to terrain and landcover types. All surveys are assumed to provide a visual inspection of ~25 metres on each side of the transect centre line.

Figure 1. Example of 50m transects that follow the topography to achieve 100% coverage with one surveyor.

Generally, if transect lines are ~50m apart, then 100% of the Development Area will be covered (Figure 1, Table 1). Recorded tracks can be used to verify survey coverage achieved in each Development Area. All surveyors must record GPS tracks so that survey coverage can be assessed.

Table 1. Survey coverage guide with one surveyor.

Survey Coverage	Transect Spacing
25%	200m
50%	100m
100%	50m

For areas where a distance of 25 metres cannot be seen from the centre line, the distance between centre lines can either be reduced accordingly or a surveyor can leave a survey centre line to visually inspect the area, as shown in Figures 2 and 3.

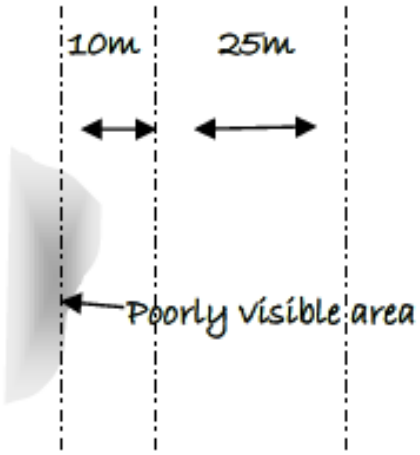


Figure 2. Narrow transect spacing to account for poor visibility.

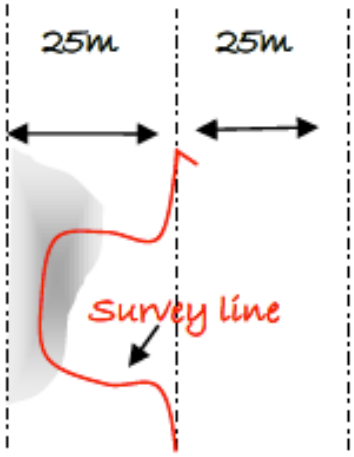


Figure 3. Survey off centerline to account for poor visibility.

It is the responsibility of the lead surveyor to ensure required coverage is achieved in each Development Area or work with KXSA and the Practicing Forester to provide rationale for where and why 100% coverage was not possible.

6.1.1. Stratified Survey Coverage

Survey coverage can be stratified for different areas within a survey. These areas can be marked out and uploaded to the Coast Tracker before the survey begins, with wider transects in one area than another, or they can be defined in the field (Figure 4). Transects with different coverage can be added in Coast Trackers during the survey.

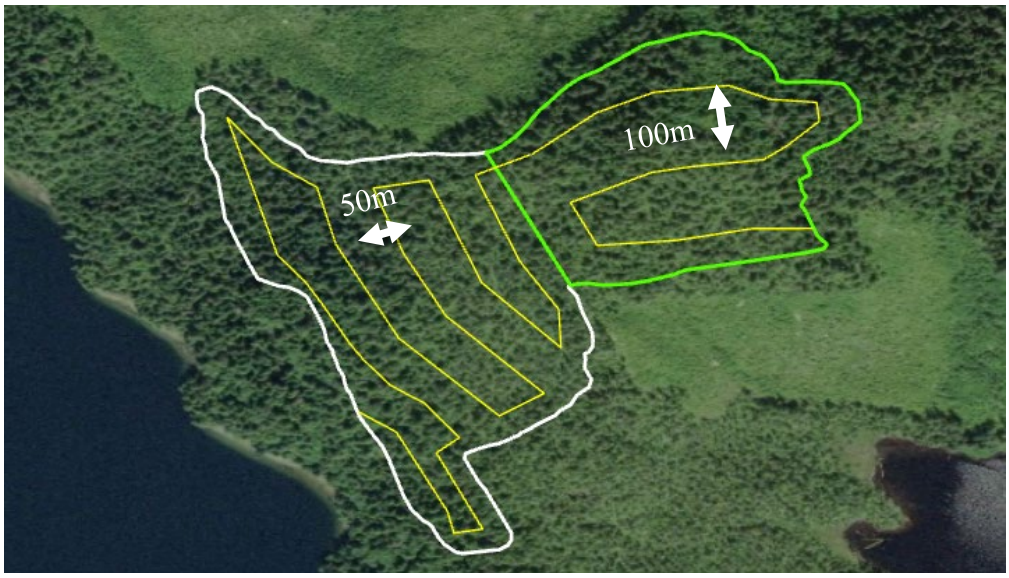


Figure 4. The western half of a survey area (white border) with 50m wide transects for 100% planned coverage and the eastern half (green border) with 100m wide transects for 50% planned coverage.

6.2. Altering CFI Survey Coverage

Deviation from the planned survey coverage within a Development Area is at the discretion of KXSA and the lead surveyor(s), who will work together to document reasons for altering survey coverage. The lead surveyor should notify KXSA of any changes to survey coverage as soon as possible (*e.g.,* at the end of the survey day). Circumstances where a change to survey coverage may occur include:

- Safety reasons (cliff bands areas or slide paths),
- Forest inventory or species types (*e.g.,* an area mapped as cedar dominant is predominantly hemlock and balsam, so coverage is reduced), or
- Cultural features are found in a Development Area with lower planned survey coverage necessitating a higher level of survey coverage.

To make a change to survey coverage within a Development Area, the surveyor should start a new transect and record the percent (%) coverage in the new area. If there is an area that cannot be surveyed at all, the surveyor should add an 'unsurveyed area', map the area boundary in the Coast Tracker and provide a reason in the comment field.

6.3. Managing Multiple Lead Surveyors in a Development Area

Multiple lead surveyors may work within the same Development Area, each with a data collection device, however great caution must be exercised to ensure that the same areas of the Development Area are not surveyed twice (*e.g.,* the same feature recorded by two different lead surveyors). Both lead surveyors should develop a plan prior to heading into the Development Area to define which portions will be covered by each lead surveyor

If there are multiple lead surveyors surveying the same Development Area, it is essential that they start recording features with different numbers so that all features recorded within a Development Area have a unique number. For example, one lead surveyor could start recording features at 001 and the other lead surveyor could start recording at 200.

If a lead surveyor has crew members that are assisting with data collection on a shared coast tracker, they can spread out up to 25m on either side of the lead surveyor to increase survey coverage and efficiency but should always remain within visible distance from the lead surveyor. A lead surveyor with a crew member 25m on each side of them would have a combined transect coverage of 100m. With this three-person crew, transects spaced 100m apart will result in 100% coverage.

7. Carrying Out Field Surveys

This section outlines minimum standards and recommendations to be used when doing a CFI survey including identifying whether each survey component is mandatory or recommended. In general, the methods for carrying out a CFI survey follow a transect-based survey protocol and the use of a Coast Tracker *and* a handheld GPS.

7.1. Point of Commencement

The Point of Commencement (POC) must be a map feature (*e.g.*, creek, road junction, falling corner) or GPS station that is accessible and within or on the edge of the Development Area. A new POC is established for each day of surveying.

A POC is a required attribute for data submissions under these standards. The location of the POC should include GPS coordinates and a written description of its location. The POC can be captured as a station at the start of a CFI survey in the Coast Tracker.

7.2. Marking and Mapping Features

7.2.1. Mapping Features

When a cultural feature is discovered, the feature will be mapped according to spatial accuracy standards outlined below and any feature-specific guidelines in Section 8 - Identification of Cultural Features. Data will be collected for each feature following the standards found in Section 8 - Identification of Cultural Features and documented in the cultural feature ID Data Sheet (paper form) in Appendix A and/or in the feature forms in the CFI Survey within the Coast Tracker application.

7.2.2. Spatial accuracy

Spatial accuracy for all GPS points should be as precise as possible (*i.e.,* ≤10m). Pairing the Coast Tracker with a GPS signal booster can increase GPS precision. The surveyor can re-take a point location several times within the Coast Tracker to see if the spatial accuracy improves.

7.2.3. Handheld GPS Protocol

A handheld GPS should be used in tandem with each Coast Tracker to record a backup of survey tracks, provide a backup navigational aid and record backup points for IHFs, CMTs, Monumental Cedar, and western yew. Backup points should be entered in the handheld GPS with the feature type and number (*e.g.,* MON001) saved as the name of the corresponding data point on the Coast Tracker.

The lead surveyor should ensure that GPS tracks and points are downloaded and saved after each survey day. The datum and projection for all GPS devices should be set to BC Albers.

7.2.4. Marking Features

To reduce the amount of flagging tape left in the field only IHFs, Historical and Contemporary Culturally Modified Trees (CMTs), Monumental Cedar, and exceptional yew trees will be flagged. Indigenous Forest Resources (IFRs) do not require flagging.

Surveyors must carry CMT tape to use only on identified CMTs. Both Contemporary CMTs and Historical CMTs should be flagged with CMT tape. Plain yellow tape should be used to mark IHFs, Monumental Cedar, and exceptional yew trees. When flagging trees, ensure that the flagging tape extends all the way around the trunk (*e.g.,* entire circumference of a CMT or Monumental, not a single branch).

Flagging must be labelled clearly with a permanent marker. Patches of yew trees should have a GPS coordinate taken from the centre of the patch and the tree closest to the centre of the patch should be marked with flagging tape. Labels on flagging tape must include the following information:

Project – Development Area – Feature Type – Feature # – Date – Surveyor(s) Initials

Example: ALEX 1B - CMT 003 - 2020/May/30 - VB, BD, RC

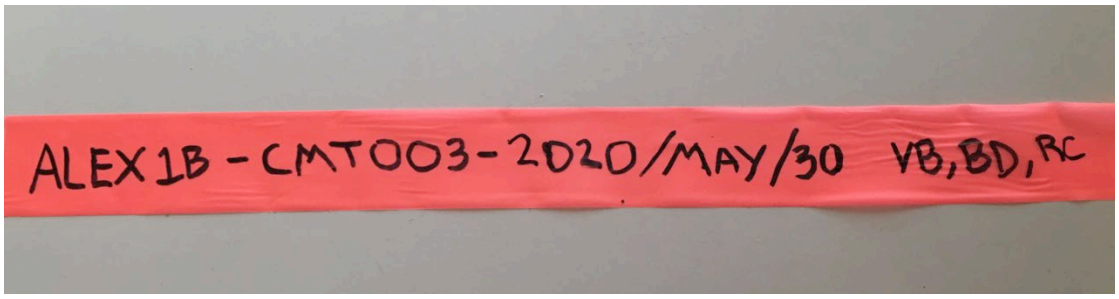


Figure 5. Flagging tape showing appropriate labelling of a feature.

8. Identification of Cultural Features

The cultural features identified in this section of the manual do not represent a full or absolute list of Kitasoo Xai'xais cultural features. Rather, these feature types are specific to the First Nation objectives in the *GBRO* (Part 2, Division 2, Objectives 5-9).

8.1. Indigenous Heritage Features

There are two types of Indigenous Heritage Features identified in Schedule I of the GBRO. Identification standards for IHF features should follow the guidelines in the Indigenous Heritage Features Standards Manual developed to support Schedule I of the *GBRO, 2016.* In the event of a discrepancy between the information in the standards manual and the information identified here, the Indigenous Heritage Features Standards Manual should take precedence.

Identification of either a Type 1 or Type 2 feature during a survey will likely trigger an independent Archaeological Impact Assessment. This will likely necessitate 100% survey coverage for that Development Area.

8.1.1. Type 1 Indigenous Heritage Features

Village Site – Nearly every headland and waterway that meets the ocean may have these important heritage sites in Kitasoo Xai'xais territory. These sites may have terracing or platforms, and are likely associated with significant midden deposits (*i.e.*, shell, faunal, and/or fire-altered rock).

Panoramic photograph of bighouse remains with visible terracing, posts and beams. Photo: Vernon Brown

Seasonal Camp Site – Important sites used continuously for travel, hunting, fishing, and harvesting. These sites may be associated with marine or lake shorelines, rivers, rock shelters, and inland places of work. There may be a light scatter of cultural artifacts and/or midden, cultural depressions, small posts or other culturally altered materials associated with the site.

Flattened and cleared site with remains of standing posts and fallen beams. Photo: Rosie Child

Burial Site – May include: a mortuary pole (*i.e.*, a carved pole with a hollow at the top where a box containing human remains was placed); tree burial (*i.e.*, a box or platform holding human remains that is placed in a tree); a rock shelter/cave; mortuary pole; burial cairn; grave house; memorial or interments.

Identified Oral History site (< 2 ha) – Identified through oral tradition and ethnography as significant historical cultural sites.

Identified Spiritual site (< 2 ha) – Areas of spiritual significance to the Kitasoo Xai'xais, as identified through current practice, oral tradition, and ethnography.

8.1.2. Type 2 Indigenous Heritage Features

Fish Trap – A fishing device built in shallow estuaries, rivers, and streams consisting of a barrier of rocks and/or wooden stakes that allows water to pass through but stops the movement of fish. These stone walls that may be under water especially at higher tides. The height and condition of the stone walls may vary due to weathering and the amount of time that has passed since they were actively utilized and maintained.

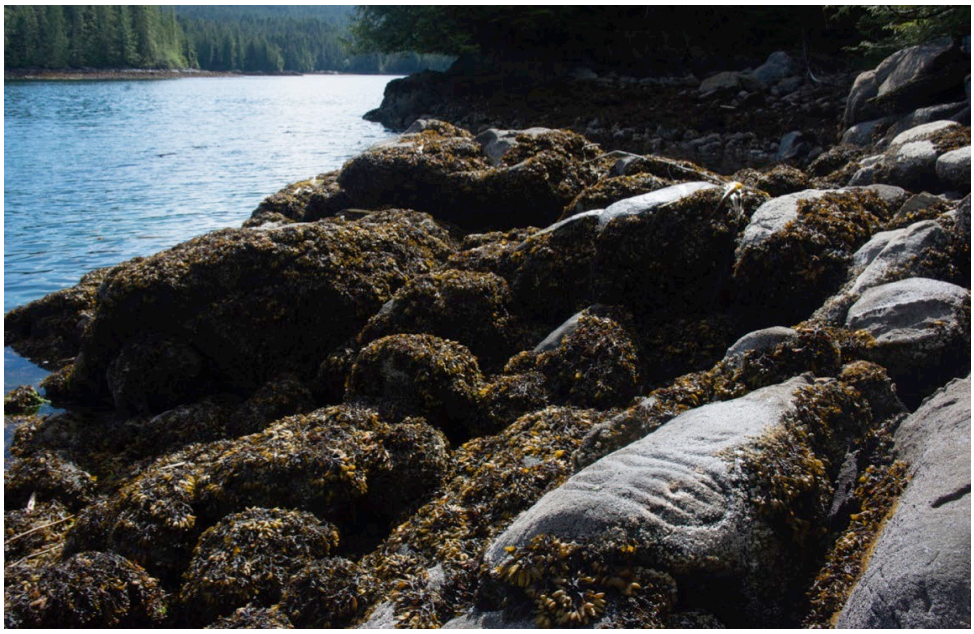
Aerial view of partially submerged stone wall fish traps. Photo: Vernon Brown

Stone wall fish traps located in the estuary of a river. Photo: Rosie Child

Fish Weir – A fishing device most often built of wooden stakes that form a fence-like barrier across part of a shallow river or stream channel. The fish weir allows water to pass through but constricts the paths that fish can travel. Indicators of fish weirs include short wooden stake knobs that often remain blackened where air has come in contact with them. Located in rivers, streams, or seeping freshwater at coastlines. Can occur several kilometres upstream from the mouth.

Wooden weir stake that eroded out from stream bank, with blackened top and carved pointed base. Photos: Bryant DeRoy

Petroglyph – Petroglyphs are symbols or designs pecked, carved, or incised on rock surfaces. Found on boulders or bedrock in the intertidal zone; also found on relatively smooth rock outcrops.



Petroglyph located below the high tide line. Photo: Bryant DeRoy

Pictograph – Pictographs are symbols or designs usually found painted on smooth rock faces. Pictographs are often found on smooth rock outcrops that are protected from rain or the elements by an overhang.

Pictographs on an overhanging granite wall, protected from direct rainfall. Photo: Bryant DeRoy

Historical Trail – Often marked with blazes on trees (*i.e.*, CMTs), exposed and compacted soil, and will often follow natural features such as rivers, valleys, or alpine ridges. These trails tend to be less meandering than game trails.

Canoe Run – A type of petroform where a strip of beach is cleared of stones so that the hulls of canoes are not damaged when hauled onto the beach. Usually in a sheltered or semi-sheltered location. Canoe runs can also be associated with canoe skids: a series of large sticks or planks laid parallel to the beach and held in place with stakes. These are seen as parallel lines of wooden stakes running between high and low tide lines. In some cases, one side of the canoe run may have rocks built up higher as a dock for use at various tides.

Left: A submerged canoe run, highlighted by shell hash. Right: Multiple canoe runs on a gently sloping beach. Photos: Bryant DeRoy

Midden Sites – One of the most common types of archaeological sites. May be either subsurface or surface features that are not necessarily located beside the ocean (paleo/raised beach and paleo/shoreline habitation sites). Indicators include dark soil, marine shells, mammal bone, fire-altered rock, charcoal, and artifacts. Commonly associated with village sites (seasonal and permanent), there are several ways to locate a midden: the most common way is to visually inspect the roots of a tree throw/blowdown, and exposures. Middens may include shell-free deposits, which can be identified by the colour and texture of soil (are commonly dark and greasy/silty), and occasionally associated with fire-altered rock.

Clam Beds – Clam beds (also known as clam gardens) are a beach terrace located in the tidal zones of a beach and are demarcated by a rock wall at the low tide line of the beach. These are areas that have been built up to increase the productivity of clams and other intertidal traditional foods by creating ideal growing conditions.

Plant Gardens – These are areas where culturally important plants grow in patches that have been intentionally cultivated to increase their abundance (e.g., orchards or berry patches). These plants are important for food, medicine, social and/or ceremonial purposes.

8.2. Culturally Modified Trees (CMT)

A Historical Culturally Modified Tree is defined by the GBRO as a tree that was modified at least 80 years ago by local Indigenous people as part of their cultural use of the tree. This is distinctly different from the definition of a CMT under the BC Heritage Conservation Act ([s.13(2)(d)(g)]), which only includes modifications to trees that occurred before 1846. For the purposes of the GBRO, modifications to trees that are 80 years or older were determined to better capture Historical Culturally Modified Trees.

Contemporary Culturally Modified Trees are those CMTs modified within the last 80 years and can be protected for current and future use under the objective for Indigenous Tree Use (Section 8.4 - Monumental Cedar).

Many different types of CMTs are found in Kitasoo Xai'xais Territory. The most commonly found CMTs on the Central Coast are bark-stripped trees (tapered or rectangular), trees with test holes, and felled trees with the medial (middle) section missing (often used for a canoe, house post, or totem pole). For the purposes of this feature identification manual, only a few of the most common CMTs are detailed here. Otherwise, detailed descriptions for the identification of CMTs can be referenced in *A Handbook for the Identification and Recording of Culturally Modified Trees* (2001)[2].

[2] Resources Inventory Committee. 2001. A Handbook for the Identification and Recording of Culturally Modified Trees. Version 2.0. Archaeology Branch B.C. Ministry of Small Business, Tourism and Culture, Victoria B.C.

8.2.1. Bark-stripped Tree (BS)

A class of CMT characterized by the presence of one or more areas of removed bark and exposed wood referred to as bark-strip scars (Figure 5,6). There are several types of bark-stripped trees, including tapered scar (BS-T), rectangular scar (BS-R), girdled (BS-G) or other (BS-O). Indicators for the most common types of bark-stripped trees on the Central Coast are as follows.

Tapered Bark-strip (BS-T)

Diagnostic features include:

- 'Scar-crust', which forms as smooth bark against a smooth wood face (most often dark/black in colour)
- Evenly tapered scar from the base of the tree to a tip (elongated triangle in shape)
- Scar on the clear face of the tree (often on the shaded side with few branches)
- Presence of healing lobes on either side of the scar
- Presence of tool marks, or
- Absence of bark on face of the scar
- Healing lobes have a slight kink or bend near where the bark was cut at the base
- The portion of the tree below where bark was cut (at the 'height above ground') is more rotten than the scar face above due to pooling water

Example of a tapered bark stripped CMT.
Photo: Bryant DeRoy

Rectangular Bark-strip (BS-R) (also known as ‘bark-board’)

Diagnostic features:

- Tool marks at the base and top of the scar
- Healing lobes taper, making the scar appear less parallel
- ‘Scar-crust’ present on inside of healing lobes, or
- Edges of the scar face (‘window’) run parallel to each other
- Healing lobes have a slight kink or bend where the bark was cut at the top and bottom of the scar
- The portion of the tree below the ‘height above ground’ can be more rotten due to pooling water

Three examples of rectangular (type) bark-strip (class) CMTs. Photo L to R: Rosie Child, Jacob Earnshaw & Bryant DeRoy

8.2.2. Aboriginally-Logged Trees (AL)

Logged trees are trees that were felled by Indigenous peoples. Types of Aboriginally-Logged Trees include: a tested tree (AL-T), undercut tree (AL-U), felled tree (AL-F), sectioned tree (AL-S), notched tree (AL-N), planked tree (AL-P), and canoe tree (AL-C). Descriptions of indicators of the most common types of Aboriginally Logged Trees are as follows.

Felled Trees (AL-F)

Also known as ‘stump and logs’, these typically have a stump and a log that has been felled beside it. Stumps may be:

- Flat (level or sloping on a single plain)
- Step (characterized by a level top with a higher and lower surface separated by a vertical step)
- Barber chair: a distinctive spike of wood on one side of the stump
- Basin: a concave top with sides that slope down gradually from the outside of the tree towards the centre

Example of adze or tool markings on an Aboriginally-logged (class - AL) CMT. Photo: Aaron Blake Evans

Sectioned Trees (AL-S)

As with felled trees, these features have stumps, but the logs have been cut into two or more sections. Often sections have been removed. Sections are commonly referred to as the butt section (closest to the stump), medial (middle) section(s), and crown section (section at the top of the tree, often with limbs). Use these section names when you are describing sectioned trees in your field notes (comments field in Coast Tracker) about the feature.

Canoe Trees (AL-C)

A felled or sectioned tree where the log is partially shaped into a canoe. These can have varying degrees of completion for a shaped bow or stern, sides and/or sheer line.

Example of a felled tree where the log is partially shaped into a canoe. Photo: Rosie Child

Tested Trees (AL-T)

A test hole is a four-sided hole cut into a standing tree. Normally the hole has a flat bottom and top that slopes down into the hole. Tool marks (wedge or splitting-adze marks) may be found. Test holes can range in size – widths and lengths can exceed 50cm. Note that if the two sides are not cut, but have healing lobes, and the hole is of significant size with a prominent and slanting top side, then it is recorded as an *undercut scar* (not recorded as a *test hole*).

Example of an Aboriginally-logged (class - AL) test tree (type - T) CMT.
Photo: Bryant DeRoy

Other Tree Modifications (OM)

There are various other ways that the Indigenous peoples of the Central Coast may have modified trees, including: delimbed tree (OM-D), message tree (OM-M), arborglyph tree (OM-A), arborgraph tree (OM-G), blazed tree (OM-B), sap collection tree (OM-S), and other (OM-O).

Example of an Other Tree Modification (class – OM) arborglyph (type – A) CMT.
Photo: KXSA

8.3. Indigenous Forest Resources

Schedule J of the GBRO (Table 2) identifies a list of specific IFRs including tree, shrub, plant, and fungi species that have food, social, medicinal, or ceremonial use and importance. These species are to be protected or enhanced during forestry activities. Additional species of importance may be identified and added to this list during discussions between forest licensees and KXSA.

The names listed include: Sgüüxs (the language of the Kitasoo, indicated by 'S'), Xai'xais (the language of the Xai'xais, indicated by 'X'), English, and the scientific name.

Table 2. List of specific Indigenous Forest Resources from Schedule J of the GBRO

Tree

Sgüüxs Name	**Xai'xais Name**	**English Name**	**Scientific Name**
sxán mó.lks[*]	*lhénxm'ás*	Pacific Crab Apple	*Malus fusca*

Shrub

Sgüüxs Name	**Xai'xais Name**	**English Name**	**Scientific Name**
ga m'a'I	*t'ilhás*	Saskatoon Berry	*Amelanchier alnifolia*
haláxsi n'axn'ox		Common Juniper	*Juniperus communis*
kw'alə ḿáxs	*púy'ás*	Labrador Tea	L*edum groenlandicum*
sxánwó.'ms	*wíq'ás*[*]	Devil's Club	*Oplopanax horridus*
wáe.kyil	*q'ísm'ás*	Stink Current	*Ribes bracteosum*
	tsn'y'ás	Black Swamp Gooseberry	*Ribes lacustre*
		Trailing Black Currant	*Ribes laxiflorum*
k'ó7o	*l'qáxell'ás*	Thimbleberry	*Rubus parviflorus*
mi7ó.st	*gúl'ás*	Salmonberry	*Rubus spectabilis*
ló7ots	*k'íp'ás*[*]	Red Elderberry	*Sambucus racemosa*
çnçáe.ngm m'a7í	*siák'wnalh*	Oval-Leafed Blueberry	*Vaccinium ovalifolium*
wiłíis	*gwát'ás*	Red Huckleberry	*Vaccinium parvifolium*
sxánłháiya	*t'ély'ás*	Highbush cranberry	*Viburnum edule*

Herbs & Geophytes

Sgüüxs Name	**Xai'xais Name**	**English Name**	**Scientific Name**
siyáe.n	*tlxsa'aém*	Silverweed	*Argentina anserina*
sxánmiyú.p	*xwúk'wás*	Northern Riceroot	*Fritillaria camschatcensis*
layó.n	*gísdm*	Cow Parsnip	*Heracleum maximum*
		Cloudberry	*Rubus chamaemorus*
	*t'x^{w}sús**	Springbank Clover	*Trifolium wormskioldii*
státç	*dúxwa*	Stinging Nettle	*Urtica dioica*
hú.łns	*a7aúxwsúlí**	Indian Hellebore	*Veratrum viride*

Ferns & Lichens

Sgüüxs Name	**Xai'xais Name**	**English Name**	**Scientific Name**
7a7	*t'íbám*	Spiny Wood Fern	*Dryopteris expansa*
ts'igə7aém	*ts'ga'ám*	Licorice Fern	*Polypodium glycyrrhiza*
naga ganá.w	*hapa7*	Oregon Lung Lichen	*Lobaria oregana*

Fungi

- Edible Mushrooms (Various)

8.3.1 **Identification and Description**

To facilitate the identification and description of IFRs during the field survey process, surveyors should consult relevant literature such as "Food Plants of Coastal Peoples" by Nancy J. Turner (Royal BC Museum, 2006) and the species photographs and descriptions available in the Coast Tracker. KXSA reserves the right to add to or adapt the species listed in Schedule J of the GBRO.

8.3.2 **Recording and Classification of Indigenous Forest Resources**

This section provides the criteria for classifying the IFR species and a description of how to record the presence of each species.

Generally, IFRs will fall under two categories:

- Category 1 - For species that are rare or are particularly vulnerable to the impacts of logging, each individual occurrence is treated as a feature regardless of density or distribution.
- Category 2 - For species that are more common, less threatened by logging, or where it is impractical to record individual plants, a patch of plants can be

recorded as a feature with a single spatial coordinate marking the centre or edge of the patch (automatically captured in Coast Tracker) then the patch boundary can be drawn in the Coast Tracker (map patch boundary).

Instructions for when and how to record IFR features:

Category	Record when:	What to record:
1	individual or group of plants	Feature with spatial coordinates
2	group of plants	Feature with spatial coordinates at centre or edge of patch and patch boundary

When recording and mapping an IFR, surveyors must provide a detailed description of the plant(s) they have found, including (but not limited to): an estimate of the number of plants in a patch; the approximate size of the patch; observations on the health and quality of the plants; a picture of the plant or patch; other notes on the location and quality of the plant or patch.

8.3.3 Category 1 – Record Individual or Group of Plants as a Feature

Every occurrence of a Category 1 species is treated as a feature. When there is only one individual plant the surveyor should record this sighting as an individual plant.

KXSA Category 1 Plants

- **Pacific Crab Apple** (*Malus fusca*)
- **Highbush cranberry** (*Viburnum edule*)
- **Thimbleberry** (*Rubus parviflorus*)

Where there is more than one plant, these features can be recorded as a single patch when the distance between plants is less than or up to approximately 20 meters (see Figures 6 and 7). In these cases, patches can be recorded with a single spatial coordinate and the centre or edge of the patch, and the patch boundary can be drawn in the Coast Tracker (map patch boundary).

When recording patches, the number of individual plants in a patch should be recorded in the following groupings:

- 2-10 stems
- 11-30 stems
- 31-50 stems
- > 50 stems

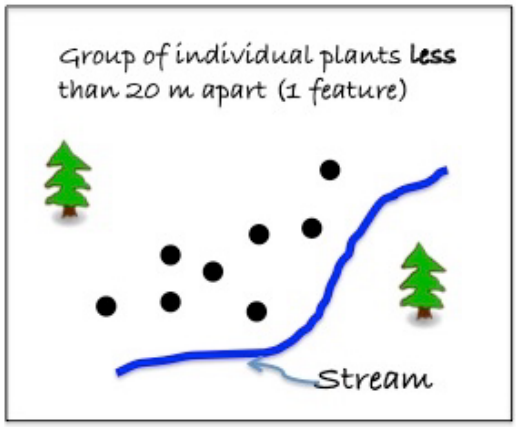


Figure 6. A group of individual plants that constitute one feature.

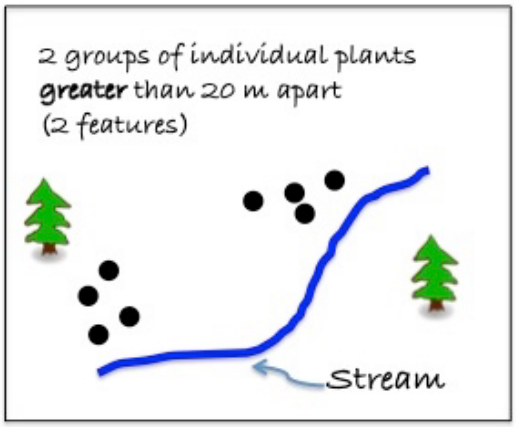


Figure 7. Two groups of individual plants that constitute two features.

8.3.4 Category 2 - Record Only Groups of Plants as a Feature

Category 2 species are typically abundant or common and provide the greatest benefit for cultural use in larger quantities. Therefore, individual occurrences of Category 2 species are not considered a feature and are not recorded. Only patches of category 2 species will be recorded in the field. Multiple groups of plants can be considered one patch where the distance between them is less than 20 metres (Figures 6 & 7).

KXSA Category 2 Plants

- **Devil's Club** (*Oplopanax horridus*)
- **Salmonberry** (*Rubus spectabilis*)
- **Saskatoon Berry** (*Amelanchier alnifolia*)
- **Black Swamp Gooseberry** (*Ribes lacustre*)
- **Red Elderberry** (*Sambucus racemosa*)
- **Oval-Leafed Blueberry** (*Vaccinium ovalifolium*)
- **Red Huckleberry** (*Vaccinium parvifolium*)
- **Stinging Nettle** (*Urtica dioica*)
- **Labrador Tea** (*Ledum groenlandicum*)
- **Indian Hellebore** (*Veratrum viride*)
- **Stink Currant** (*Ribes bracteosum*)
- **Northern Riceroot** (*Fritillaria camschatcensis*)
- **Silverweed** (*Argentina anserina*)
- **Springbank Clover** (*Trifolium wormskioldii*)
- **Licorice Fern** (*Polypodium glycyrrhiza*)
- **Spiny Wood Fern** (*Dryopteris expansa*)
- **Oregon Lung Lichen** (*Lobaria oregana*)
- **Trailing Black Currant** (*Ribes laxiflorum*)
- **Cloudberry** (*Rubus chamaemorus*)
- **Common Juniper** (*Juniperus communis*)

- **Cow Parsnip** (*Heracleum maximum*)
- **Edible Mushrooms** (Various)

Feature: A patch is considered a feature. A patch is either where:

- There is a continuous uniform layer of plants, OR
- The distance between several sporadically occurring individuals is less than or up to 20 metres of each other OR
- Multiple patches have a distance between them of less than or up to 20 metres (Figures 6 & 7).

8.3.5 Field Identification of Indigenous Forest Resources – Seasonality/ Plant Phenology

Depending on what time of year a survey is completed, plants can be identified in a variety of life stages with winter identification being the most difficult and sometimes not possible. Fortunately, many of the IFRs are woody perennials (Devil's club, Highbush cranberry, Pacific crab apple, Stink currant, Black swamp gooseberry and trailing black currant) and therefore may be recognizable throughout the year. Otherwise, forest planning (from the administrative onset through final engineering of cutblocks) should occur 6 months to 1 year prior to harvest to ensure species can be identified. Plan (or encourage a forest licensee to plan in advance) so that surveying can occur within the optimal time period of May 15th to September 31st.

The IFRs that are seasonally present and most likely to be missed during an out of season field survey include:

Most easily missed most of the year:

- Edible Mushrooms (Various)

May be missed if out of optimal season:

- Thimbleberry (*Rubus parviflorus*)
- Northern Riceroot (*Fritillaria camschatcensis*)
- Silverweed (*Argentina anserina*)
- Springbank Clover (*Trifolium wormskioldii*)
- Cloudberry (*Rubus chamaemorus*)
- Stinging Nettle (*Urtica dioica*)
- Indian Hellebore (*Veratrum viride*)
- Cow Parsnip (*Heracleum maximum*)
- Spiny Wood Fern (*Dryopteris expansa*)

8.4 Monumental Cedar

The *GBRO* includes an objective for Indigenous Tree Use, which is designed to protect sufficient quantities and quality of cedar and other tree species for present and future use to meet the needs of the Kitasoo Xai'xais (including shelter, transportation, tools, fuel, and art).

The primary types of forest features surveyed for and protected under this objective include:

- Contemporary CMTs (both living and dead); and
- Monumental Cedar and Monumental Cedar Stands.

For the purposes of this manual, Contemporary CMTs and Monumental Cedar have detailed notes for field identification (CMTs discussed in Section 8.2 - Culturally Modified Trees (CMT)). Monumental Cedar Stands will be identified by KXSA after fieldwork. The remainder of this section speaks to Monumental Cedar. Other cultural cedar or other types of tree species for Indigenous Tree Use may be identified by KXSA and added to a CFI survey.

8.4.1 Monumental Cedar Identification and Attributes

This section outlines the criteria for a tree being classified as a Monumental Cedar for the purposes of implementing Ecosystem Based Management in Kitasoo Xai'xais territory. Carving needs will vary between carvers and over time, and as such, the criteria outlined in this section are subject to change. The GBRO defines a monumental as:

"*A large old western red-cedar or yellow-cedar tree that has the attributes necessary to fulfill the Indigenous Tree Use needs of the First Nation, primarily for totem poles, canoes, or long beams and poles to build long houses, community halls or similar community structures*."

The following sections includes descriptions of important attributes for a Monumental Cedar, including minimum standards to qualify a tree as a Monumental Cedar, and standards for evaluating the potential Monumental Cedar for signs of rot and other defects. All these steps for identifying a Monumental Cedar are summarized in a flowchart on the next page (Figure 8).

8.4.2 8.4.2 Minimum Standards for a Monumental Cedar

These are the minimum standards that must be met by a cedar tree for that tree to be recorded as a Monumental Cedar. If a tree meets these standards, it should be recorded and may be protected; however, it is also important to protect the best quality cedar trees. To ensure quality the surveyor should be familiar with identifying the signs of defects and take any observed defects into consideration when classifying a tree as a Monumental Cedar. The surveyor should follow the decision-making flow chart (Figure 8) so that the identification process and standards are consistent across surveyors.

Monumental Cedar Identification

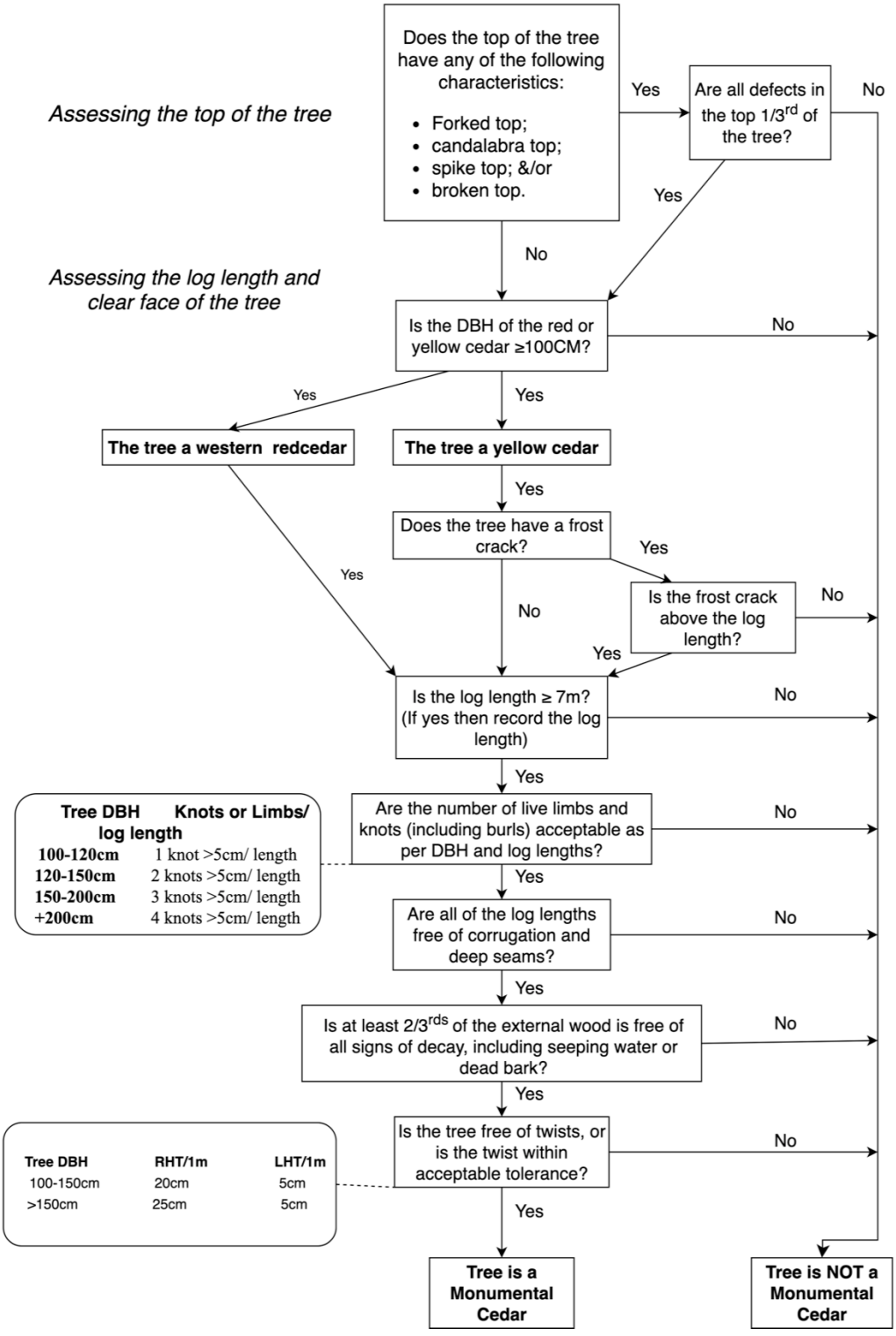


Figure 8. A decision-making flowchart to consistently evaluate and identify Monumental Cedar.

Minimum Diameter at Breast Height: A Monumental Cedar should have a diameter at breast height (DBH) equal to or greater than 100 cm. Breast height is approx. 1.3m above the ground, regardless of flare[3] and is measured when standing on the high side of the tree.

Visibly Sound: A Monumental Cedar should be visibly sound, meaning it has externally sound wood (outer 2/3rds of tree). Heart rot may be acceptable for some cultural uses, however, a tree with heart rot has a higher risk of damage during falling and transport, which may render it unusable. A tree with heart rot may be less suitable for protection over the long term as it may be more susceptible to death and disease.

Suitable Face: At least one face of the log is suitable for cultural use, where a face is measured as 1/3rd of the circumference of a log (Figure 9).

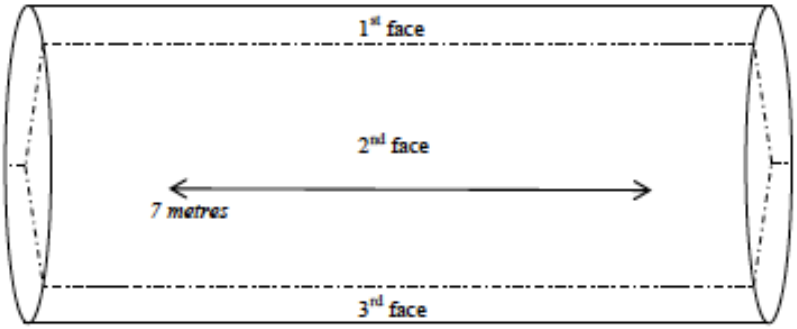


Figure 9. Face of a monumental log is one-third of its circumference, and the log length is minimum of 7 metres with one face that meets the defect allowances.

8.4.3 Measuring Log Length

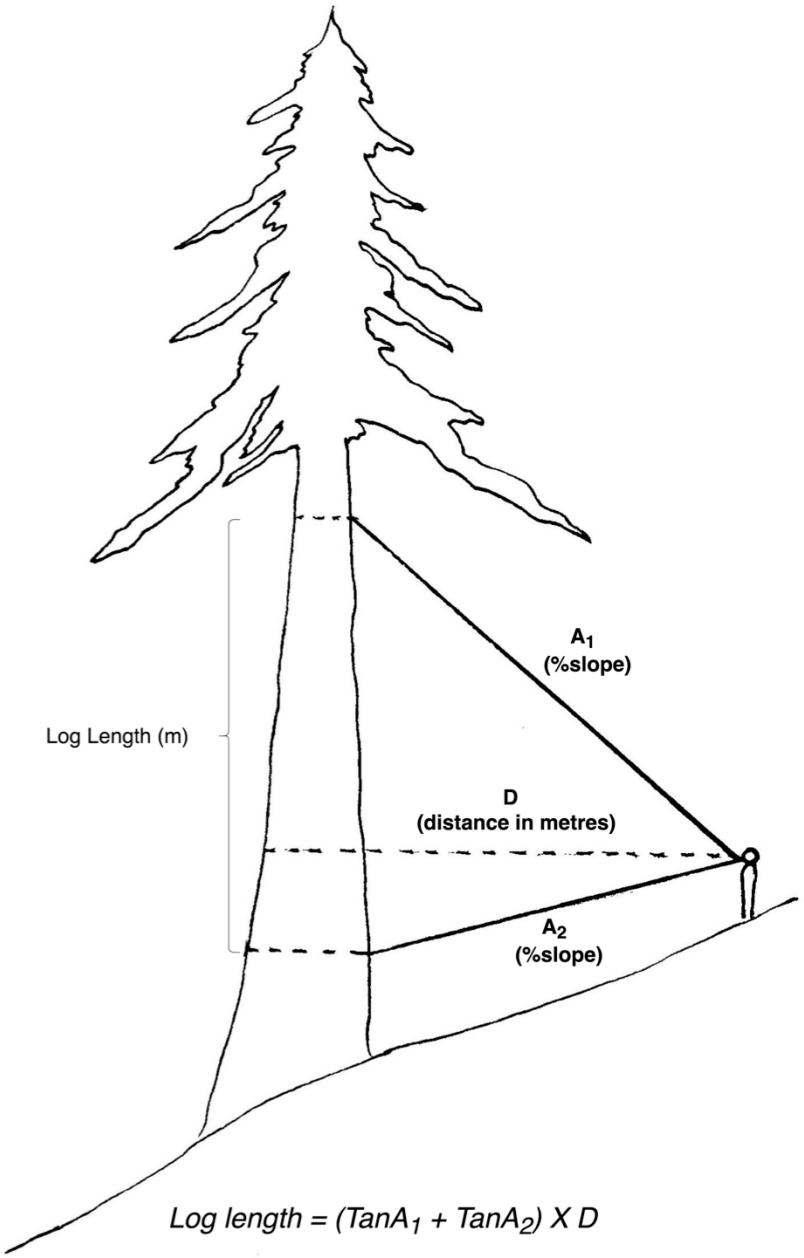
The log length must be precisely measured for each Monumental Cedar that is recorded. Monumental Cedar logs are measured from the top of the flare of the tree to the maximum height of the useable log (e.g., below the acceptable amount of branching that occurs on the clear face). This can be done by using a clinometer to measure percent slope and either a tape or rangefinder to measure the distance from the surveyor to the tree (Figure 10). Log length will automatically be calculated when the following measurements have been entered in the appropriate fields on the Coast Tracker.

Top Slope (A1). Aim the clinometer at the top of the log length you are measuring. Record the percent (%) slope and whether the measurement was above or below the surveyor's horizon.

Bottom Slope (A2). Aim the clinometer at the bottom of the log length you are measuring. Record the percent (%) slope and whether the measurement was above or below the surveyor's horizon.

[3] Flare is the bottom part of the stem (tree trunk) that is typically wider than the main trunk.

Distance to tree (D). Using a measuring tape, hip chain, or range finder, measure from the trunk of the tree at your eye level to a place where you can see the main stem of the



tree. If measuring to the top of the tree, you should be able to see the top of the tree where you stand. Ideally, the surveyor will stand at least equal to the height they are measuring.

Figure 10: A diagram showing how a surveyor can take measurements to calculate the log length for Monumental Cedar in the field.

To determine the log length, use the following equation:

$$Log\ length = (Tan\ A_1 + TanA_2)\ \times\ D$$

$$Where\ A_1 = \%slope\ from\ surveyor\ to\ top\ of\ log\ \ Length$$
$$Where\ A_2 = \%slope\ from\ surveyor\ to\ base\ of\ log\ Length$$
(A_2 can be a negative value if the base of log is below surveyor)
$$Where\ D = distance\ in\ meters\ from\ the\ surveyor\ to\ the\ tree$$

Exceptional quality: A Monumental Cedar tree may be considered of exceptional quality at the lead surveyor's discretion, based on the following criteria:

- DBH>120cm
- >10m of log length
- Minimal taper
- Healthy crown and bark (no signs of interior decay)
- The tree is in a location that is accessible for future extraction if:
    - it is in location where it will not be severely damaged when felled (e.g., perched on a cliff or boulder), AND
    - the tree is in proximity to a road or shoreline

8.4.4 Tree Defect Guidelines for Monumental Cedar

This section outlines tolerances for tree defects. The tolerance for each type of defect should not be judged in isolation of other defects. While this section describes allowable tolerances for individual defects, a combination of multiple defects may contribute to a tree not being classified as monumental. This consideration should weigh whether the tree is suitable for cultural use now, or suitable for cultural use into the future (if reserved for a prolonged period). Observed defects can be signs of vulnerability to rot and decay. In this way, defects may serve as indicators that the tree may not be suitable for use in the future.

Live Limbs: Live limbs create knots in the wood that may make a tree less suitable for certain uses. Occasional sound knots less than 5 cm diameter (estimated as the diameter **inside** bark thickness) are acceptable. Burls also count as live limbs. The **allowable tolerance for live limbs/knots greater than 5cm diameter on a log length** (≥ 7m) – is as follows:

tree DBH	**# allowable knots**
100-120cm	1 knot >5cm
120-150cm	2 knots >5cm
150-200cm	3 knots >5cm
+200cm	4 knots >5cm

Candle Limb(s): A candle limb should be counted as a regular live limb (see above). Candle limbs are sometimes called candelabra limbs but note: candle limbs should not be mistaken for candelabra tops.

Candle limbs may be a sign of a branch that is not strongly attached to a tree (also known as *epicormic branching*). *Epicormic branches* are branches that do not originate from the heart of a tree and are not strongly secured to the trunk. They form as a result of injury or stress and can signal defects that may affect the quality of the wood for cultural uses.

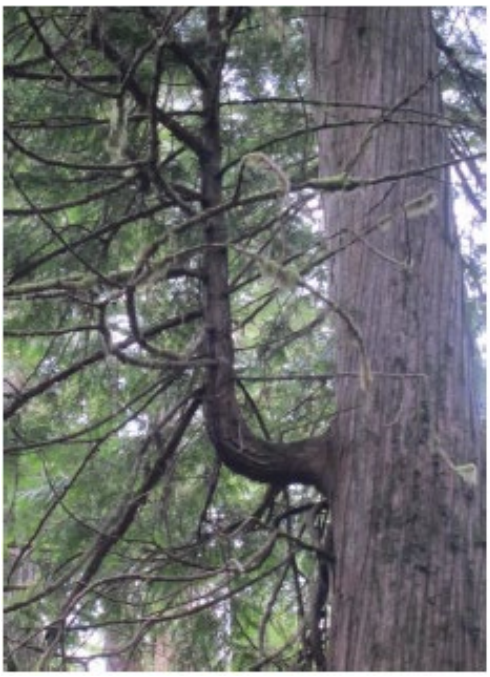


Figure 11. Example of a candle limb.

Corrugation: Seams of bark, or creases of bark that are deep into the trunk of a tree, will influence the aesthetics of the log. While the lower portion of a trunk may have some corrugation, the suitable face (1/3 circumference, see Figure 9) of the log length must be free of significant corrugation. If corrugation or seams cover more than 1/3rd of the log length, then the tree is not a Monumental Cedar.

Scar: Scars can be caused by damage from falling limbs or nearby trees. Scars are acceptable if there is no visible decay or rot and the scar covers less than 1/3rd of the log length.

Sweep: If the trunk of the tree is curved or bowed it is called a sweep. Sweep is a defect that will cause a reduction in the diameter of usable wood. Moderate sweep in logs over 120cm DBH may be considered on the condition that you can get a straight 7m section out of the tree. Likewise, if a full log length can be measured above the sweep, then the tree can be considered Monumental.

Forked Top: If the tree has 2 leaders it is considered a forked top. A forked top is acceptable if it is in the upper one-third of the tree and does not significantly affect the wood quality of the log length.

Candelabra Tops*:* Candelabra tops are when a tree has more than 2 leaders (either live or dead) or has multiple forked tops (either live or dead) (Figure 12). If the tree has at least a 1/3rd reduction in diameter (taper) due to leader growth and the leaders are similar in diameter to the main stem, the tree has a candelabra top (Figure 12). If the tree has more than 2 leaders or multiple forked tops it may only be considered Monumental if the DBH is over 100cm and the leaders occur in the upper one-third of the tree.

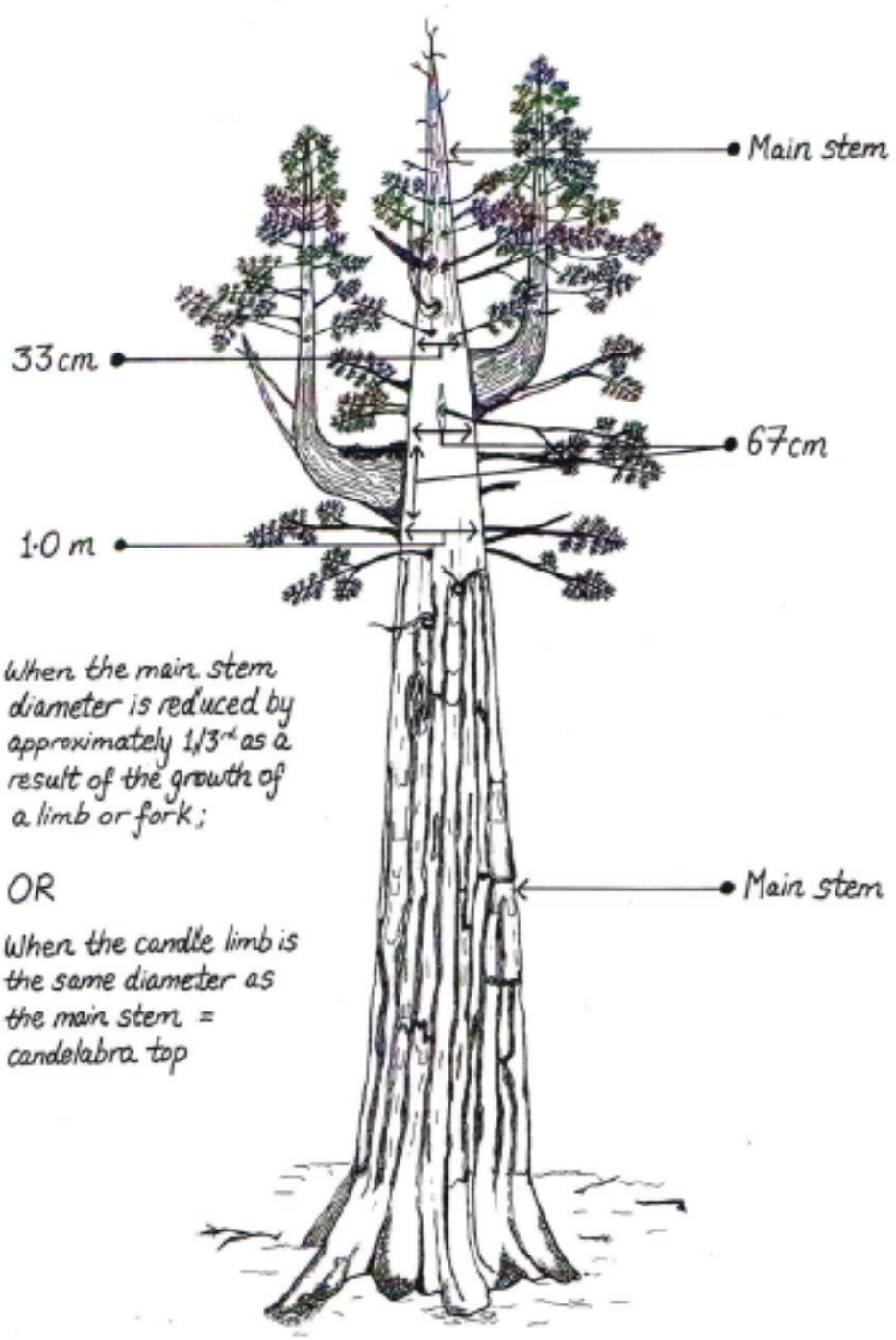


Figure 12. General rules for candelabra top classification. The conditions displayed would disqualify this tree from being considered a Monumental Cedar (illustration by A.Geraghty).

Spike Top: A spike top is the pointed dead tip on a living tree from which most of the needles and branches have fallen off the dead top. A cedar with a spike top up to one-third of the height of the tree can be considered Monumental. If more than 1/3rd of the tree is dead the tree should not be considered Monumental.

Figure 13. Examples of spike tops on cedars.

Broken Top: If a western red cedar has a broken top and is exposed for long enough, it may affect the internal soundness of the wood. However, if the broken top is in the upper one-third of the tree and does not significantly affect the quality of the log length (meaning there are no visible cracks), then it can be considered Monumental.

Twist: Twist, or spiral grain, is divided into different tolerance classes for right-hand (Figure 14) and left-hand (Figure 15) twist. A tree with significant twist or spiral grain is not considered Monumental (see maximum tolerances outlined in Table 3 and Figure 8).

Table 3. Maximum acceptable twist

Diameter Class	Right-hand Twist	Left-hand Twist
100-150 cm DBH	20 cm over 1m length	5 cm over 1m
Greater than 150 cm DBH	25 cm over 1 m length	

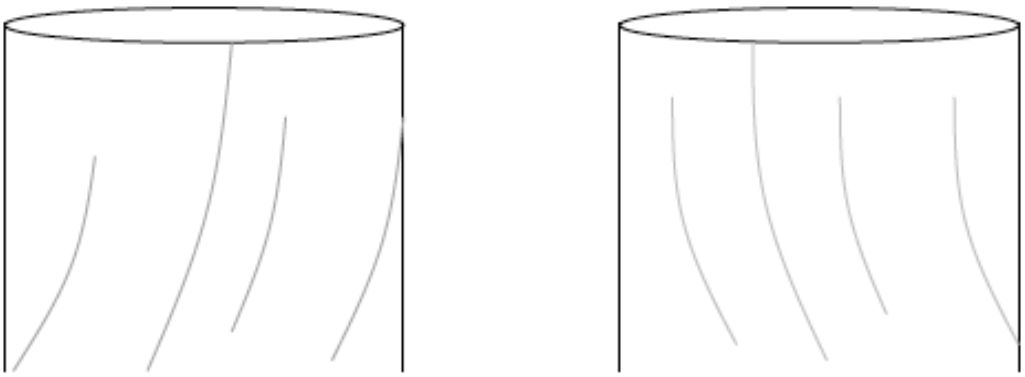


Figure 14. Example of right-hand twist.

Figure 15. Example of left-hand twist.

8.4.5 Additional Defects for Yellow Cedar

Frost Cracks: Yellow cedar trees with frost cracks above the log length are not considered Monumental Cedar.

8.5 Western Yew

The GBRO includes an objective for western yew that calls for the retention of yew trees. Individual western yew trees are considered a feature if they are **>2m tall and >5cm DBH**. Spatial coordinates are not required for individual yew trees when the distance between trees is less than or equal to 20 metres. In these cases, spatial coordinates can be taken at the geographic centre of a group of trees (Figure 16). The tree closest to the centre point should be marked with yellow flagging tape. In all cases, the number of stems must be recorded. When counting stems only count those stems that meet the minimum requirement. Layering or epicormic/adventitious rooting sometimes occurs with western yew trees. This is when a branch or stem sends new roots into the ground and establishes a semi-independent tree, as shown in Figure 17. In these cases, each new stem is considered a separate tree for the purposes of patch identification.

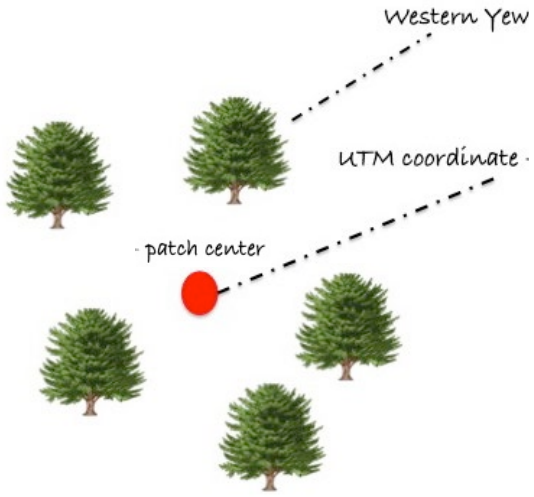


Figure 16. Recording a patch of Yew trees from the centre of the patch.

Layering or epicormic/adventitious rooting sometimes occurs with western yew trees. This is when a branch or stem sends new roots into the ground and establishes a semi-independent tree, as shown in Figure 16. In these cases, each new stem is considered a separate tree for the purposes of patch identification.

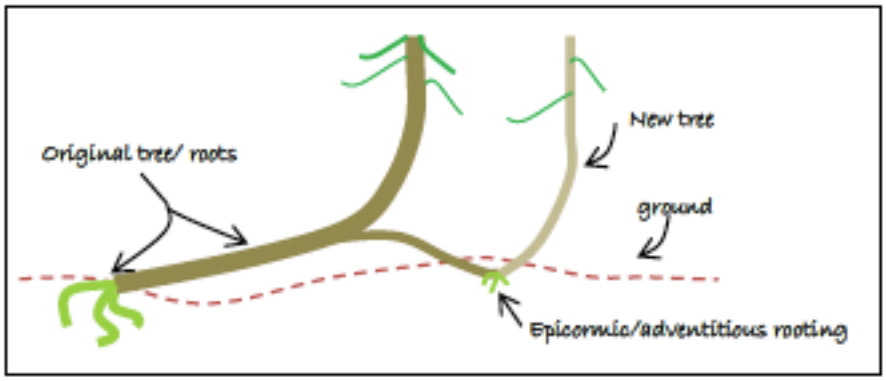


Figure 17. Epicormic rooting in western yews.

Exceptional quality: Some yew trees may exhibit exceptional quality for cultural uses, such as medicine or carving. Exceptional yew trees can occur as individuals or in a patch. Surveyors should check ☐ if at least one yew tree within a patch is exceptional. KXSA may wish to protect certain yew trees or patches if at least one tree in the patch exhibits **all of the following characteristics:**

- DBH > 15 cm
- >4 m in height
- Straight growth (minimal sweep and twist)
- No visible signs of rotting

9 Surveyor Training & Qualification

9.3 Qualifications for Cultural Feature Inventory Surveyors

To be qualified to conduct cultural feature inventory surveys, it is a requirement that the surveyor has:

1. Successfully completed a RISC – Archaeology and Culturally Modified Tree Inventory Training for Crew Members;
2. Successfully completed all the additional training modules,[4] and
3. Demonstrated competency in the material to the course instructors.

The names of individuals who have met these requirements will be kept in a registry of qualified surveyors maintained by KXSA.

It is recommended that qualified surveyors participate in regular professional development courses, and mentorship opportunities, as they are available.

9.4 Right to Revoke

KXSA retains the right to remove a surveyor from the list of qualified surveyors if their work is found to not meet the standards outlined in this document.

[4] Training courses that cover the identification of ecotypes, plant identification and ethnobotany, forestry skills, and survey standards and methodology.

10 Glossary of Terms

"**Indigenous Forest Resource**" means a forest plant resource listed in Schedule J of the GBRLUO, or other forest plant resource identified by the Kitasoo Xai'xais during First Nation Engagement. An IFR is utilized for food, social, medicinal or ceremonial purposes.

"**Indigenous Heritage Feature**" means an artifact, feature, or site of the general types listed in Schedule I, other than a Contemporary Culturally Modified Tree or a Historical Culturally Modified Tree. An IHF may be previously known, found during a survey, or identified during First Nation Engagement and is important to the cultural practices, knowledge or heritage of a First Nation.

"**Indigenous Tree Use**" means the use of Monumental Cedar, other cedar, or other tree species to fulfill the domestic needs of the Applicable First Nation for such things as shelter, transportation, tools, fuel, and art, but does not include the use of Monumental Cedar, other cedar or other tree species for purposes of commercial production.

"**Contemporary Culturally Modified Tree**" means a tree that was modified less than eighty years ago by First Nations people as part of their cultural use of the tree.

"**Cultural feature**" means a feature with cultural significance for the Kitasoo Xai'xais including, but not limited to: Indigenous forest resources, Indigenous Heritage Features, culturally modified trees, Monumental Cedar trees, yew trees, and other tree species of value for the Kitasoo Xai'xais.

"**DBH**" means diameter at breast height (where breast height is approx. 1.3 meters above the ground).

"**Development Area**" means a specific location defined by boundaries shown on a site plan or multiple site plans where an activity (*i.e.,* timber harvesting and/or road construction) is planned or carried out. It includes any area that is being protected from disturbance, including: management zones, reserve zones, mapped reserves or other areas where timber harvesting is restricted or managed.

"**First Nation Engagement**" means reasonable efforts to communicate, share information, engage in dialogue, and identify and resolve issues with Applicable First Nations and includes provision and consideration of all relevant information about potential impacts on Indigenous Interests.

"**GPS**" means Global Positioning System.

"**Historical Culturally Modified Tree**" means a tree that was modified more than eighty years ago by First Nations people as part of their cultural use of the tree.

“**Monumental Cedar**” means a large, old, western red cedar tree or a large, old, yellow cedar tree that has the attributes necessary to fulfill the Indigenous Tree Use needs of the Applicable First Nation primarily for totem poles, canoes, or long beams and poles to build longhouses, community halls or similar community structures.

“Monumental Cedar Stand” Three or more Monumental Cedars within 30m of each other. Monumental Cedar Stands will be identified by desktop GIS analysis using an average measurement error buffer

“**Point of Commencement**” is commonly used as a reference point in forest surveying.

“**Transect**” means any straight line survey that crosses an area that is to be surveyed. Transects can be laid parallel to one another and are used to sample a site strategically and methodically.

“**Site Series**” means a site capable of producing the same late seral or climax plant communities within a biogeoclimatic subzone or variant.

11 Minimum Data Requirements

11.1 Minimum Survey Information

1. Date: yyyy/mmm/dd

2. Development Area: name of the Development Area (e.g. JMS)

3. Cutblock ID: Cut block identifier (e.g. 001)

4. Surveyors: name of the lead surveyor(s) (on the list) as well as any assisting surveyors. On paper forms circle the name of the lead surveyor;

5. Point of commencement (POC): coordinates of a reference point that is accessible and within or on the edge of the Development Area. POC should include coordinates and a written description of its location.

6. GPS tracks: the Coast Tracker will automatically record the surveyor's track once a survey has been started, however each person on the survey should carry a handheld GPS recording their tracks as a backup.

11.2 Minimum Feature Information

For all features, it is mandatory to record the Feature Type for each observation. Additional minimum feature information is described below.

11.2.1 Indigenous Heritage Features (IHFs)

Select or record the type of Indigenous Heritage Feature and describe the site and its location in the comments section.

V/VS	Village/Seasonal Village
SC	Seasonal Campsite
BS	Burial Site
IOHS	Identified Oral History Site
ISS	Identified Spiritual Site
M	Midden Site
FT	Fish Trap
FW	Fish Weir
PTG	Petroglyph
PCG	Pictograph
T	(Historic) Trail
CR	Canoe Run
CB	Clam Bed
G	Plant Garden
O	Other – (include description)

Note: For trails, the surveyor should also record: trail direction (with a compass bearing), condition, and other characteristics under "Description" for paper forms or under the trail description field for the digital data form.

11.2.2 Culturally Modified Trees (CMTs)

- Select or record the type of Culturally Modified tree from the form
- Select or record the tree species
- Select or record if the CMT is historic (>80 yrs) or contemporary (<80 yrs)
- Select or record the DBH (in cm[5])
- For Bark Stripped CMTs only – record the healing lobe thickness (cm), scar length (cm) and width (cm), and the height of the scar above the ground (cm)
- Record the diagnostic features that aided in the identification of a CMT

CMT Type Codes:

BS-T	Bark-stripped, tapered scars
BS-R	Bark-stripped, rectangular scars
BS-G	Bark-stripped, girdled scars
BS-O	Bark-stripped, other scars
AL-T	Aboriginally logged tree, tested tree
AL-U	Aboriginally logged tree, undercut tree
AL-F	Aboriginally logged tree, felled tree
AL-S	Aboriginally logged tree, sectioned tree
AL-N	Aboriginally logged tree, notched tree
AL-P	Aboriginally logged tree, planked tree
AL-C	Aboriginally logged tree, canoe tree
OM-P	Other modified tree, pitch collection tree
OM-K	Other modified tree, kindling collection tree
OM-D	Other modified tree, delimbed tree
OM-M	Other modified tree, message tree
OM-A	Other modified tree, arborglyph tree
OM-G	Other modified tree, arborgraph tree
OM-B	Other modified tree, blazed tree
OM-S	Other modified tree, sap collection tree
OM-O	Other modified tree, other

Tree Species Codes:

CW	Western red cedar
YC	Yellow cedar
HW	Western hemlock
PL	Lodgepole pine
BA	Amabilis fir
SS	Sitka spruce
HM	Mountain Hemlock
FD	Douglas Fir
EP	Paper birch
O	Other (include species)

[5] When measuring DBH always round measurement to the nearest whole cm.

Tapered Bark stripped CMT Diagnostic Features Codes:

TM	Tool marks present
HR	Height above ground is more rotten than scar face
SC	Scar crust present
KL	Healing lobes are kinked
ET	Evenly tapered scar from the base of the tree to a tip (elongated triangle in shape)
CF	Scar on the clear face of the tree (often the shaded side with very few branches or knots on the scar face)
NB	Complete absence of bark on the scar face
OF	Other archaeological features nearby

Rectangular Bark Stripped CMT Diagnostic Feature Codes:

TM	Tool marks present
HR	Height above ground is more rotten than scar face
SC	Scar crust present
KL	Healing lobes are kinked
PL	Edges of scar face ('window') and healing lobes run parallel to each other
CF	Scar on the clear face of the tree (often the shaded side with very few branches or knots on the scar face)
NB	Complete absence of bark on the scar face
OF	Other archaeological features nearby

Aboriginally Logged- Felled CMT Diagnostic Features Codes:

TM	Tool marks present
FL	Flat (level or sloping on a single plain)
ST	Step (characterized by a level top with a higher and lower surface separated by a vertical step)
BC	Barber chair: a distinctive spike of wood on one side of the stump
BT	Basin top: a concave top with sides that slope down gradually from the outside of the tree towards the centre
TP	The whole tree is still present in place on the ground
TA	The whole tree is absent or missing
PE	Pyramid or pointed shape at the base of the fallen tree

Aboriginally Logged- Sectioned CMT Diagnostic Feature Codes:

TM	Tool marks present

SP	Tree has been cut into sections, but all of the sections are still in place
SM	There is a missing section of the tree (note which section is missing)
PE	Pyramid or pointed shape at the base of the fallen tree

Aboriginally Logged- Canoe CMT Diagnostic Feature Codes:

TM	Tool marks present
SF	Partially shaped features such as bow, stern, sides or sheer line
HS	The log section has been hollowed out

Aboriginally Logged- Tested CMT Diagnostic Feature Codes:

TM	Tool marks present
FL	Flat or straight top and bottom gently angled inward

Aboriginally Logged- Undercut CMT Diagnostic Feature Codes:

TM	Tool marks present
HL	Healing lobes present
ST	Prominent and slanting topside where wood has been removed

Aboriginally Logged- Planked CMT Diagnostic Feature Codes:

TM	Tool marks present
HL	Healing lobes present
VG	Vertical grain exposed where a plank was removed
KL	Healing lobes kink or bend at the top or bottom of the scar

11.2.3 Indigenous Forest Resources (IFR)

- Select the plant species name from the form. Acceptable attribute values include those listed under the instructions for paper forms.
- Record the number of plants. Acceptable numbers include those listed under the instructions for paper forms.
- (optional) For Category 1 and 2 IFRs record:
    - observations on the health and quality of the patch.
      e.g. is the patch of exceptional quality? Describe why.

11.2.4 Monumental Cedar (MON)

- Feature Number: Begin at 1 for each new survey. Ensure that feature numbers are continuous across the Development Area. For digital data collection this number will be auto-generated;
- Species (CW or YC)
- Diameter at Breast Height (DBH in cm[6]).
- Log Length
- Observations of quality
    - E.g., is the tree of exceptional quality? Or is the tree a borderline call?
    - Will the tree be severely damaged when it is felled or is it in an inaccessible area that will make it difficult to extract?

11.2.5 Yew Trees (YEW)

- Record the number of stems in

01-99	The number of individual stems in the patch

- Check ☐ if an individual yew tree or at least one yew tree in a patch meets the criteria for exceptional quality.
- Record the DBH of exceptional quality trees and comment on their quality.

[6] When measuring DBH always round measurement to the nearest whole cm.

Appendix A: Cultural Feature ID Data Sheet

Cultural Feature ID Data Sheet

Development Area: _____ Block ID: _____

Lead Surveyor: _____ Crew: _____
initials *initials*

POC: _____ (E), _____ (N) _____
description

Date: _____ Start Time: _____
yyyy/mm/dd

End Time: _____

Weather/comments:_____

_____

Minimum data requirements:

Monumental Cedar: Flow chart checklist, species, DBH, log lengths, GPS coordinates

CMT: Species, subtype, DBH, HAG, healing lobe (left and right), scar width, scar length, confidence level, GPS coordinates, GPS accuracy, diagnostic features, comments

IHF: Type, subtype, GPS coordinates, comments

IFR: Species, stem count, GPS coordinates, quality

Yew Tree (> 2m tall and >5cm DBH): Stem count (exact number of stems), GPS coordinates, exception quality? (**EQ**)

Species Codes:
Red Cedar (**Cw**)
Yellow Cedar (**Yc**)
Amabalis Fir (**Ba**)
Mountain Hemlock (**Hm**)
Western Hemlock (**Hw**)
Pine (**Pl**)
Spruce (**Ss**)
Yew (**Tw**)
Alder (**Dr**)
Hellebore (**HB**)
Devils Club (**DC**)
Highbush Cranberry (**HC**)

Feat. #	Feature Type						SPECIES CODE	SUBTYPE CODE For CMTs and AHFs (look in orange notebook)	*STEM COUNT 1-4 5-10 11-20 21-30 31-50 >50 Exact # of stems for Yew*	DBH (cm)	HAG (cm)	Healing lobe thickness (cm)		Aspect of Scar Face	Slope (%)	Scar Width (cm)	Approx. Scar Length (cm)	Confidence Level (L, M, H)	Log Lengths (m)	GPS Coords		GPS Accuracy (m)	Diagnostic Features Present: -Toolmarks (TM) -Scar Crust (SC) -HAG Rotten (HR) -Kinked Lobes (KL) -Other features Nearby (OF) Features that decrease Confidence: -Windfall (WF) -Very Rotten (VR) -Healed Over (HO) -Hand Logging (HL) FSC patch? (FSC) High quality yew? (HQ)
	AHF	H-CMT	C-CMT	AFR	Mon	Yew						L	R						Easting	Northing		
																			_ _ _ _ _ _ _	_ _ _ _ _ _ _ _		

Appendix B – Map of Kitasoo Xai’xais Territory