Council of the Haida Nation

Cultural Feature Identification

Standards Manual

Version 5.0

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Contents

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These standards have been developed by the Council of the Haida Nation to facilitate the protection of Haida values and for the implementation of the Haida Gwaii Land Use Objectives order.

Due to the nature of adaptive management, and 2007 adoption of Ecosystem Based Management principles on Haida Gwaii, it is expected that these standards will change over time.
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The Haida Nation is the rightful heir to Haida Gwaii.

Our culture, our heritage, is the child of respect and intimacy with the land and sea.

Like the forests, the roots of our people are intertwined such that the

greatest troubles cannot overcome us.

We owe our existence to Haida Gwaii.

The living generation accepts the responsibility to ensure that our

heritage is passed on to following generations.

On these islands our ancestors lived and died, and here too we will make

our homes until called away to join them in the great beyond.

– from the Constitution of the Haida Nation

Glossary of Terms

"**Black Bear Den"** means a cavity within a tree, a snag, a stump, or a log greater than 0.8m in diameter which shows evidence of use by black bears for winter hibernation;

"**Cultural Cedar Stand"** means three or more culturally modified trees, monumental cedar, or a combination thereof, where each tree is within 50 metres of another tree;

"Cultural Feature" means any Haida traditional forest feature, Haida traditional heritage feature, culturally modified tree or monumental cedar;

"Culturally Modified Tree" means, for the purposes of the HGLUOO, a tree that was modified prior to 1920 by Haida people as part of their cultural use;

"Development Area" means a specific location defined by boundaries shown on a site plan where timber harvesting is planned or carried out, and includes any stand level retention, management zones, reserve zones, mapped reserves or other areas where timber harvesting is restricted or managed;

"DBH" means diameter at breast height that is measured 1.3m from the Point Of Germination

"Feature Density Ranking" is a way of determining the applicable survey intensity (survey type) based on the occurrence of Cultural Features over a given area surveyed;

"**GPS"** means Global Positioning System;

"Monumental Cedar" means a visibly sound western red cedar or yellow-cedar tree that is greater than 100 centimetres in diameter at breast height and has a log length of 7 metres or longer above the flare with at least one face that is suitable for cultural use;

"Offsets" are strip-lines perpendicular to a survey centerline, also known as radial shots;

"POC" means Point of Commencement and is commonly used as a reference point in forest surveying;

"Strip-lines" are a series of survey transects than typically run parallel to one another;

"Tie-point" means a specific location, marked or identified, that can be used to locate a survey Point of Commencement or a point along a survey/transect;

"Traditional Heritage Feature" means a feature that is listed in Schedule 2 of the HGLUOO and requires special management measures as outlined in the HGLUOO;

"Traditional Forest Feature" means a feature that is listed in Schedule 2 of the HGLUOO and requires special management measures as outlined in the HGLUOO;

"Site Series" means a site capable of producing the same late seral or climax plant communities within a biogeoclimatic subzone or variant;

"UTM" means a Universal Transverse Mercator position format or units for determining geographic location;

"Western yew patch" means five or more Western yew trees where each yew tree is within 5 metres of another yew tree.

Purpose of this Document

This document specifies the field survey procedures that must be followed when a field assessment, referred to as a **Cultural Features Identification Survey**, is conducted to identify the presence of Cultural Features prior to approvals for road construction or timber harvesting on Haida Gwaii to meet the requirements of the **Haida Gwaii Land Use Objectives Order (HGLUOO)**.

The standards are designed to be used by a person who has been certified by the Council of the Haida Nation (CHN) to carry out such field assessments. A detailed knowledge of these standards, and their application in different field situations, is part of the training and certification of cultural feature surveyors. The standards are also designed for use by field staff of the Council of the Haida Nation in situations where field assessments of Cultural Features must be carried out by CHN staff.

These standards have been derived from survey techniques developed over a number of years by the CHN for Cultural Features Identification Surveys with forestry licensees on Haida Gwaii.

Background and the Connection to Higher Level Objectives

These standards for the identification of Cultural Features have been developed as a result of the **Strategic Land Use Agreement (SLUA)** and the subsequent Haida Gwaii Land Use Objectives Order. These two documents outline a series of objectives and required practices that form the basis for Ecosystem Based Management (EBM) on Haida Gwaii. The cultural sections of the HGLUOO prescribe a series of forest management requirements, including Cultural Feature Identification Surveys, to maintain and protect Haida Cultural Features that are negatively affected by logging, road construction and associated activities.

Use of the Standards

The standards establish the procedures that must be followed when an individual who is certified to carry out Cultural Features Identification Surveys, conducts the surveys that are required by the Haida Nation through the HGLUOO. The standards apply to surveys carried out in two different situations described in the HGLUOO.

First, the HGLUOO (Section 3) directs that Cultural Features must be identified, prior to logging or road construction, in **Development Areas** where these activities are planned to occur.

Second, the HGLUOO establishes **Cedar Stewardship Areas (CSA)** (Section 9 and Schedule 3*)* in order to help perpetuate a long term supply of cultural cedar for the Haida Nation. Logging in these areas is restricted, but there is a provision in the HGLUOO that up to 10% of the total area of the CSA may be removed for commercial development provided that certain requirements are met. One of the requirements before there can be any removal of trees from a CSA is that there must be a field assessment of Cultural Features in the CSA completed by a person who has been certified by the Council of the Haida Nation. Other Cultural Features that are not specifically identified in the HGLUOO, such as cedar recruitment and bark-stripping, are also being managed for in these Cedar Stewardship Areas. **For this reason, field staff of the Council of the Haida Nation will implement these standards to survey Cultural Features in the Cedar Stewardship Areas**

where removal of trees is proposed. CHN are also in the process of completing baseline inventories of cultural features, aquatic and wildlife habitat in CSAs.

Due to the nature of adaptive management it is expected that these standards will change over time.

1.0 Cultural Features

There are several broad types of **Cultural Features** that are described in this Standards Manual. These do not represent a full or absolute list of features integral to Haida culture. The listing of these features is specific to the HGLUOO and the management requirements for these features are set out in the Order. Under the HGLUOO, Cultural Features are identified in Sections 5, 6, 7, 8, and 18. These Cultural Features are:

- Haida Traditional Heritage Features;
- Haida Traditional Forest Features;
- Culturally Modified Trees;
- Monumental Cedar;
- Yew Trees;
- Bear Dens

For the purposes of cultural feature identification, individual Western yew trees and Western yew patches are also included in these standards. Objectives for Western yew retention are provided in Section 8 of the Order. Likewise, the identification of Black Bear dens (section 18 of the HGLUOO) are also included in these standards.

Each of these 6 types of Cultural Features are briefly described below. More detail on the identification of each is provided in Appendix D- Feature Identification.

Archaeological Impact Assessments
Identifying when an Archaeological Impact Assessment (AIA) is required is not the sole responsibility of a Cultural Feature Identification surveyor, but inevitably the responsibility of the practicing forester, or licensee who is planning the development and the CHN who are the holders of data on traditional habitation and use areas. However, cultural feature identification surveyors are often the first in an area, and as such need to be able to recognize when to call in Archaeological professionals. Cultural Feature Identification surveys are equivalent to what the Provincial Heritage Branch may term a non-permitted Preliminary Field Reconnaissance and the application of these surveys does not negate a licensee's obligation to consult a professional archaeologist or comply with requirements under the Provincial *Heritage Conservation Act.* Resource management direction for a licensee can be further informed by a more detailed Archaeological Inventory Study or assessment by a professional archaeologist, resulting in a potential AIA. AIA's are detailed inventories conducted under permit from the Provincial Heritage Branch that can determine the presence and impact to both surface and sub-surface archaeological resources.

At a minimum, AIAs or the consultation of a professional archaeologist should be recommended within the Cultural Feature Identification report if any of the following describe a development area:

- The development area or part of it is at or below 25 meters in elevation;

- Any Haida Traditional Heritage Features are found
- Any Culturally Modified Trees are found
- Where known development is planned to occur between at least two archaeological features (i.e. CMTs) that are within 100 meters of each other.
- Where the surveyor suspects a likelihood of subsurface features.
- Where archaeological evidence is documented in an adjacent area (*ex.* known traditional use site, village, camp, trail, or an area specifically identified in an Archaeological Overview Assessment).

Other variables may inform the need for an AIA, based upon the discretion of the CFI surveyor, practicing archaeologist, forester, the Council of the Haida Nation, or Provincial Heritage Branch.

While a Cultural Feature Identification survey may identify an archaeological resource, it is the responsibility of the proponent (e.x. Forest Company) to solicit the support of a registered professional archaeologist for any further assessments, and it is the responsibility of the archaeologist retained to prepare a report and to record the sites under the provincial archaeological site registry. This is the case for features both within and outside block boundaries, so that features will be made known and afforded legal protection.

1.1 Haida Traditional Heritage Features

There are two classes of Haida Traditional Heritage Features (HTHFs) described in Schedule 2 of the HGLUOO. Identification of any of these features during a survey necessitates an independent Archaeological Impact Assessment. Features are described in detail in Appendix D.

Class 1 Haida Traditional Heritage Features

- Village/ Seasonal Village
- Identified Oral History site
- Burial Site
- Inland Camp/ Camp
- Identified Spiritual site

Class 2 Haida Traditional Heritage Features

- Midden
- Bear trap
- Fish Weir
- Cave
- Petroglyph
- Lithic Production Site
- Trails
- Lookout Site
- Fort
- Cache
- Canoe run
- Shoreline Habitation Site
- Rock Shelters
- Karst Features

1.2 Haida Traditional Forest Features

There are two classes of Traditional Forest Features (HTFFs) described in Schedule 2 of the HGLUOO.

Class 1 Haida Traditional Forest Features

Class 1 HTFFs are plant species that have been identified as being extremely important to the Haida and particularly rare, because they were impacted by historical logging, are threatened by future

logging and/or are threatened by introduced species. There are currently eleven species that are Class 1 HTFFs. Each individual occurrence of these plants is treated as an HTFF regardless of density or distribution. Both Skidegate (S) and Massett (M) names are given.

- skil taawaatllxaay (S), skil taw (M), **False Ladyslipper / Fairy-slipper** (*Calypso bulbosa)*
- k'anhll (S), xaayuwaa hlk'a.aay (M), **Black hawthorn** (*Crataegus douglasii)*
- 7inhllng (S), stla k'iist'aa (M), **Northern riceroot** (*Fritillaria camschatcensis)*
- ts'iihllnjaaw (S), ts'iihlanjaaw (M), **Devil's club** (*Oplopanax horridus)*
- hlaayaa hlk'a7ii (S), hlaayaa hlk'a.aay (M), **Highbush-cranberry** (*Viburnum edule)*

    - Narcissus anemone (Anemone narcissiflora var. villosissima)
    - One-and-a-half flowered reedgrass (Calamagrostis sesquiflora)
    - Hlunhit, hlunxid, Richardson's geranium (Geranium richardsonii)
    - Wright's filmy fern (Hymenophyllum wrightii)
    - Calder's lovage (Ligusticum caldera)
    - Western cowbane (Oxypolis occidentalis)

Class 2 Haida Traditional Forest Features

Class 2 HTFFs are some plant species that have been identified as being of importance to the Haida, but may be either less rare or less threatened by logging and/or introduced species. Unlike Class 1 HTFFs where each individual occurrence is the equivalent of a feature (*i.e.* an individual Devil's club plant equals one feature), Class 2 HTFFs depend on the species and their density and/or distribution. Some Class 2 species may or may not be considered features when they are individual occurrences. For example, a single occurrence of Common Juniper is a Class 2 feature, but a single occurrence of a cloudberry or a stinging nettle is not a Class 2 feature. Other species are considered features when they occur in small groups or patches. This *classification* of Class 2 Traditional Forest Features is detailed in Appendix D- Feature Identification- for each of the 10 species listed in the Schedule.

The following 10 species are Class 2 HTFFs.

- **d**al(xil)-guhlahl (M), **Common Harebell** *(Campanula rotundifolia)*
- kaayda kaxawaay (S), hlk'am.aal I (M), **Common Juniper** (*Juniperus communis*)
- k'anhl7l (S), k'ayanhla (M), **Pacific crabapple** (*Malus fusca)*
- xil gaaydllgins (S), xil giidlagang (M), **Yellow pond lily** (*Nuphar lutea)*
- galgun xil (S), gal.un hlk'a.aay (M), **Stink Currant** *(Ribes bracteosum)*
- gudga gi gayd (S), xaayuwaa (M), **Black swamp gooseberry** (*Ribes lacustre)*
- kaigigunlkai (S), k'iit'agwaandaa hlk'a.aay (M), **Trailing black currant** (*Ribes laxiflorum)*
- k'aaxu ts'alaang.ga (S), k'a.àw ts'alaangaa xil (M), **Cloudberry** *(Rubus chamaemorus)*
- gudang.xaal (S), gudang.aal (M), **Stinging nettle** (*Urtica dioica)*
- gwaayk'yaa (S), gwaayk'aa (M), **Indian hellebore** (*Veratrum viride)*

1.3 Culturally Modified Trees

A Culturally Modified Tree (CMT) means, for the purposes of the HGLUOO, a tree that was modified prior to 1920 by Haida people as part of their cultural use. This is distinctly different than the definition of a CMT under the BC Heritage Conservation Act ([s.13(2)(d)(g)]), which only manages for a CMT that is older, or thought to be older than 1846. For the purposes of the HG LUOO, this locally relevant date was deemed necessary to define CMTs in the context of a heritage feature. By 1920, some of the most sacred elements of the Haida culture had been systematically outlawed, including the right to gather, give potlaches, speak the language or be governed by traditional hereditary leadership. Legal and institutional pressures on Haida traditional social fabric helps to distinguish pre-1920 as a time where traditional practice was common and less criminalized. The value of CMTs is not determined or provisional to a date for the Haida. However, 1920 offers a local context for defining a heritage feature for the purpose of forest planning and management.

There are several types of CMT's; however, the most commonly found on Haida Gwaii are bark stripped trees, bark boards, CMT test holes, and occasionally a felled tree with the medial section missing (often for a canoe, house post, or totem pole). See Appendix D for further descriptions of these common CMT types.

General descriptions for the most common CMTs are outlined in Appendix D- Feature Identification. Otherwise, detailed descriptions for the identification of CMTs can be referenced in *A Handbook for the Identification and Recording of Culturally Modified Trees* (2001)[1].

1.4 Monumental Cedar

This section outlines the criteria for a tree being classified as a monumental cedar for the purposes of implementing Ecosystem Based Management on Haida Gwaii and addressing the requirements of Section 9 of the HGLUOO. The quality of wood required by carvers varies between individual artists and over time. As such the criteria outlined in this section are subject to change. For purposes of Ecosystem Based Management, the HGLUOO defines a monumental as:

"A visibly sound Western red cedar or yellow-cedar tree that is greater than 100 centimeters in diameter at breast height and has a log length of 7 meters or longer above the flare with at least one face that is suitable for cultural use."- Haida Gwaii Land Use Objectives Order, December 16, 2010.

Descriptions of visibly sound, log lengths, a face of a tree, and tolerances for defects are outlined in detail in Appendix D- Feature Identification.

1.5 Cultural Cedar Stands

Cultural Cedar Stands, for the purpose of Cultural Feature Identification, are defined in the HGLUOO as three or more culturally modified trees, monumental cedar, or a combination thereof, where each tree is within 50 meters of another tree.

[1] 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.

1.6 Western Yew trees

Section 8 of the HGLUOO includes management measures to protect Western yew, but does not specify that a cultural feature survey identify western yew or Western yew patches. However; they are included in these standards because of their importance to Haida culture.

Western yew patches are defined in the HGLUOO as five or more western yew trees where each yew tree is within 5 meters of another yew tree.

For the purposes of Cultural Feature Identification surveys, **all western yew trees** (individuals and patches) must be identified to the standards outlined in this manual.

1.7 Black Bear Dens

Section 18 of the HGLUOO includes management measures for Black Bear dens, but does not specify that a cultural feature survey identify dens. However; they are included in these standards because of their importance to Haida culture.

Black Bear dens are defined in the HGLUOO as "a cavity within a tree, a snag, a stump or a log, greater than 0.80 meters in diameter which shows evidence of use by Black Bears for winter hibernation."

Coastal black bears den in large old trees, logs and stumps, and are typically dry with small entrances for protection from other bears. Some dens are accessed by bears that climb the outside of trees to use "elevated" tree cavities. Coastal black bears do not use trees, rock overhangs, caves, or man-made structures such as metal culverts that are not dry, warm and secure. Additional security may be provided by snow, but snow cover is not essential. Dens are found in forests at all elevations.

See Appendix D section 1.8 for a description on the identification of Black Bear Dens.

The absence of immediate bear presence or sign of immediate bear use does not disqualify a site from being a bear den. Old dens that have been compromised due to tree damage or rot resulting in excessive moisture in the den may disqualify the den for future suitability.

All surveyors must have a certificate of completion for Black Bear Den identification training on Haida Gwaii. Training must be recognized by the Council of the Haida Nation. Surveyors have until June 30th, 2020 to provide proof of training to the Council of the Haida Nation.

2.0 Survey Methodology

Who can carry out a Cultural Features Identification Survey

To meet the requirements of the HGLUOO, Cultural Features Identification Surveys must be carried out by surveyors who are certified by the Council of the Haida Nation. Certified surveyors can direct the work of field crews who are not certified. However; the certified surveyor must take full responsibility for the quality of the survey and survey results.

The surveyors work will be audited on a regular basis by auditors accredited by the CHN.

Because Cedar Stewardship Areas (CSA) protect other Cultural Features that are not specifically identified in the HGLUOO, such as cedar recruitment and bark-stripping, any proposal to remove trees from a CSA requires a survey conducted by field staff of the Council of the Haida Nation and completion of an intergovernmental process (IGP).

Plan ahead (or encourage a forest licensee to) so that surveying can occur within the optimal time period between May 15th and September 31st when plants are most visible.

Survey Intensity

There are two (2) levels, or types of surveys:

- **Level 1 Survey** – Is a less intensive site level reconnaissance that involves visual inspection of at least 25%[2] of the Development Area or the stratified portions of a Development Area, but less than 100% of that area;

- **Level 2 Survey** – Is the most intensive site level survey that involves visual inspection of 100% of the Development Area, the stratified portions of a Development Area, or a CSA. Any proposal to remove trees from a CSA requires a Level 2 survey.

Surveys using minimum block coverage would only occur when an area has almost no features and the likelihood of identifying features is considered very low. For both survey levels, a rationale must be provided and detailed tracks to illustrate coverage must be submitted so audits can occur. An example may be a mid-slope, gently sloping, closed canopied, low to medium nutrient second growth hemlock/spruce stand at the back end of a watershed where historical surveys in adjacent stands have found none of the cultural features identified for protection under the Land Use Objectives Order. Surveying only 25% of an area would be considered risk-managing but acceptable to the surveyor given the stand type, geography, knowledge of the area and supporting information (such as a feature density calculation, and/or survey results from adjacent stands).

While the minimum block coverage must meet the survey level standards, the method of meeting that minimum block coverage is at the discretion of the surveyor. Correct feature identification and data collection, appropriate block coverage and accurate spatial location are the required outcomes of the survey. The surveyor may choose either of two survey methods to meet that goal: hand-traversing using compass, clinometer and chain, or; surveying with the use of differential GPS systems.

It is highly recommended that surveyors use strip-line transects when conducting a Cultural Features survey. Transects are assumed to provide a visual inspection of an average of 25 metres on each side of the survey centre line. Thus, the minimum 25% block coverage that is evenly distributed over the proposed Development Area can be accomplished by transects where the spacing between centre lines is 200 metres. A 100% coverage (Level 2) requires that the centre lines of transects are no more than 50 metres apart.

The intent of allowing two different survey types or levels is to match the concentration of survey effort with the potential concentration of Cultural Features. While minimum survey requirements are acceptable

[2] it is always the responsibility of the surveyor to identify the cultural features within a development area

in some cases, it is always the responsibility of the surveyor to identify the cultural features within a development area.

All surveys begin as a Level 1. A Level 2 survey is required when:

- The Development Area is less than 5 hectares;
- The Development Area is below 25m elevation;
- Any Culturally Modified Trees are encountered;
- A Class 1 Traditional Forest Feature is encountered;
- Any Monumental Cedar is encountered;
- A Class 1 or 2 Traditional Heritage Feature is encountered;
- A feature density greater or equal to 0.5 per hectare averaged over 2 hectares is identified (see Section 2.3 for details on calculating feature density) for each strata in a Development Area. The qualifications for features are defined in Appendix D of this manual
- There is a proposal to remove trees from a CSA.

Other variables that lead to a change in survey type are at the discretion of the surveyor. **In the end, it is the surveyor's responsibility to ensure that Cultural Features are identified.** If there is any question that there is a higher probability of feature occurrence based on site type/ecology, or where the survey does not meet or exceeds Level 1 criteria, then a Level 2 survey should be conducted. Surveyors are to document their reasons for selecting the final survey intensity.

When establishing a second strip-line and if in doubt about a survey intensity level, and a survey of 2 hectares (400m traverse) has not been completed, then use a Level 2 survey until such time as a feature density calculation can be made (see Section 2.3).

2.1 Level 1 Site Level Reconnaissance Survey

The objective of a Level 1 Survey is to identify Traditional Forest Features, Traditional Heritage Features, Monumental, Culturally Modified, Black Bear dens and Western yew trees by surveying only part of the Development Area so that a minimum coverage of at least 25%[3] of the Development Area, or 25% of the stratified portions of a Development Area can be met.

Data collection transects should not be more than 200 metres apart (i.e. 200 metres between survey center lines), unless other survey methods are used as part of other forest planning activities and meet the minimum block coverage under Section 2.4.

Increasing block coverage is at the discretion of the surveyor. The more features that are being identified generally indicate a higher probability of features throughout a block or block strata and should trigger tighter transect spacing or more block coverage (i.e. higher survey intensity), as illustrated in Figure 1.

[3] it is always the responsibility of the surveyor to identify the cultural features within a development area

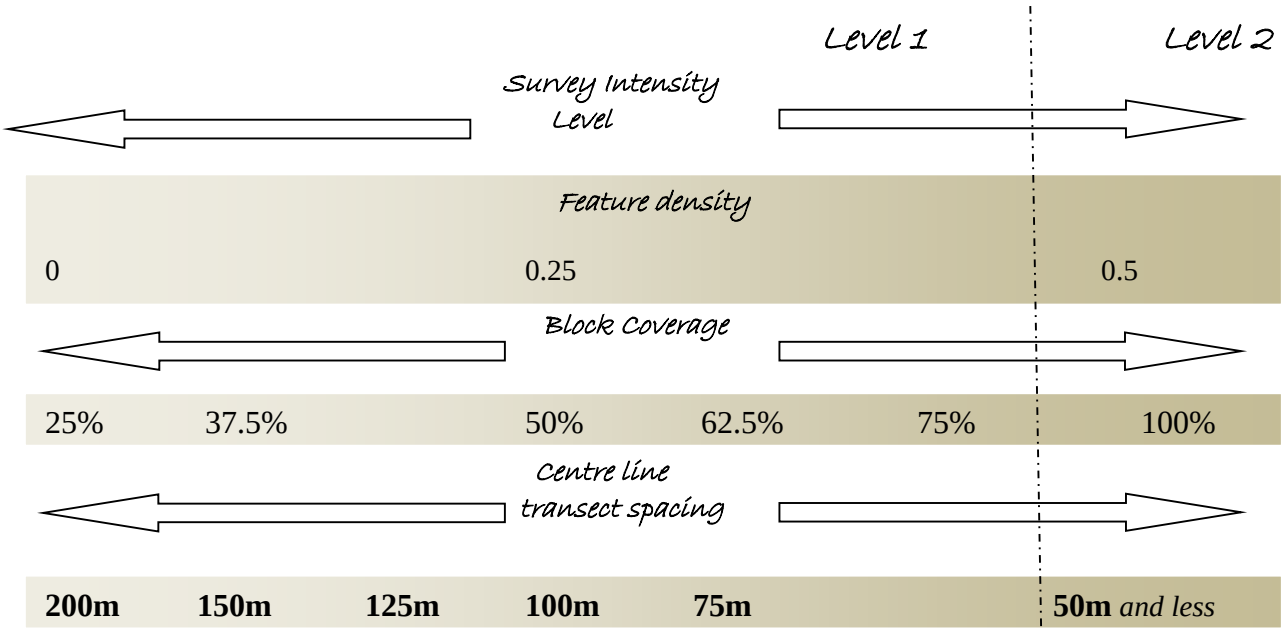


Figure 1. Survey Intensity Level in relation to block coverage.

2.2 Level 2 Intensive Site Level Survey

The objective of a Level 2 survey is to identify Traditional Forest Features, Traditional Heritage Features, Western yew trees, Black Bear dens, Monumental and Culturally Modified Trees by visually surveying for these features in 100% of the Development Area, a stratified portion of a Development Area, or a CSA where the removal of trees is proposed. When the transect method is used, the maximum required spacing between centerlines is 50 meters. Some surveyors may cover 100% of a Development Area or CSA through other engineering or forest planning work. Transects are highly recommended and will be the method used to audit a block or block strata.

When transects are used, they are assumed to provide a visual inspection of an average of 25 metres on each side of a survey line. For areas where a Level 2 survey is required and a distance of 25 metres cannot be seen from a centre line, the distance between transect lines can either be reduced accordingly or a surveyor can leave a survey centre line to visually inspect the area, as shown in Figure 2 and 3.

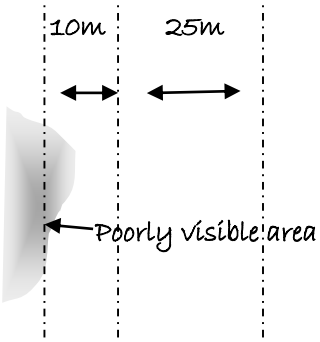


Figure 2. narrow grid spacing to account for poor visibility

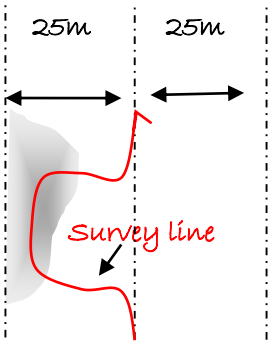


Figure3. survey off centre line to account for poor visibility

2.3 Calculating Feature Density

Feature Density is used to help determine what survey intensity should be applied in a Development Area or stratified portion of a Development Area (i.e. Level 1 or Level 2). Feature density is calculated by summing the weighted feature score (Figure 4) and dividing it over the area covered by the survey.

Feature type	Weighted feature score
Class 2 Traditional forest features	0.5
Western yew trees	0.5
Monumental cedar	1
Culturally Modified Tree	1
Traditional Heritage Feature[4]	2

Figure 4. Weighted feature scores for density calculations.

Example A[5]

An initial survey of 600m in length and 50m in width (assuming 25m visibility on either side of a centerline) covers a 3 hectare area and 2 Traditional Forest Features (0.5 points) are found:

The density would be:

$$\frac{(0.5 + 0.5)}{3} = 0.33$$

Example B

An intial survey of 800m in length and 50m in width (assuming 25m visibility on either side of a centerline) covers a 4 hectare area and 8 Traditional Forest Features (0.5 points each) are found along with 4 monumental (1 point each):

The density would be: $\frac{(0.5 \times 8) + (4 \times 1)}{4} = 2$

Example A has a final Feature Density score of 0.67, therefore a Level 1- Reconnaissance Site Level survey is adequate for the site. Example B has a Feature Density score of 2, therefore a Level 2 Intensive Site Level survey is required.

[4] To be aware of known Traditional Heritage Features a surveyor will need to engage with CHN's Heritage and Natural Resource Department.

[5] To calculate the area (hectares) covered by a transect: (width x length) ÷ 10 000

2.4 Minimum Block Coverage

At least 25% of each Development area, or 25% of each stratified portion of a Development area must have an evenly distributed survey, unless a Level 2 survey is required to meet the criteria in Section 2.0 for a Level 2 survey. Any proposal to remove trees from a CSA requires a Level 2 survey – 100% coverage. Surveying only to minimum block coverage would only be used when an area has almost no features and the likelihood of identifying features is considered very low. **Note that it is always the responsibility of the surveyor to identify all the cultural features within a development area.** Surveying at an intensity less than 100% is sometimes appropriate (see section 2.1), but is a measured risk at the discretion of the surveyor following the protocols and guidelines outlined in this standards manual.

2.5 Block Stratification

Development Areas and CSAs may cover a variety of ecological site series. Each cultural feature can be strongly correlated with a Biogeoclimatic Ecosystem Classification (BEC) site series. Different site series or timber types may have higher concentrations of features and merit higher survey intensity. The type of survey can be divided (stratified) within a Development Area or CSA as long as the minimum block coverage is met. Block stratification is not mandatory, but may prove to be efficient.

Determining stratification in a Development Area or CSA is at the discretion of the surveyor. Pre-existing divisions in the blocks can be used, for example: blocks may be divided by site series, terrain types (often following timber type or site series breaks); by Standard Units; or by forest inventory types. Data collection standards, outlined in this manual, require the surveyor to justify the stratification of a block. See Figure 5 for an example.

The survey type for each strata can be determined by calculating the Cultural Feature Density in each strata, or by meeting criteria outlined in Section 2.0.

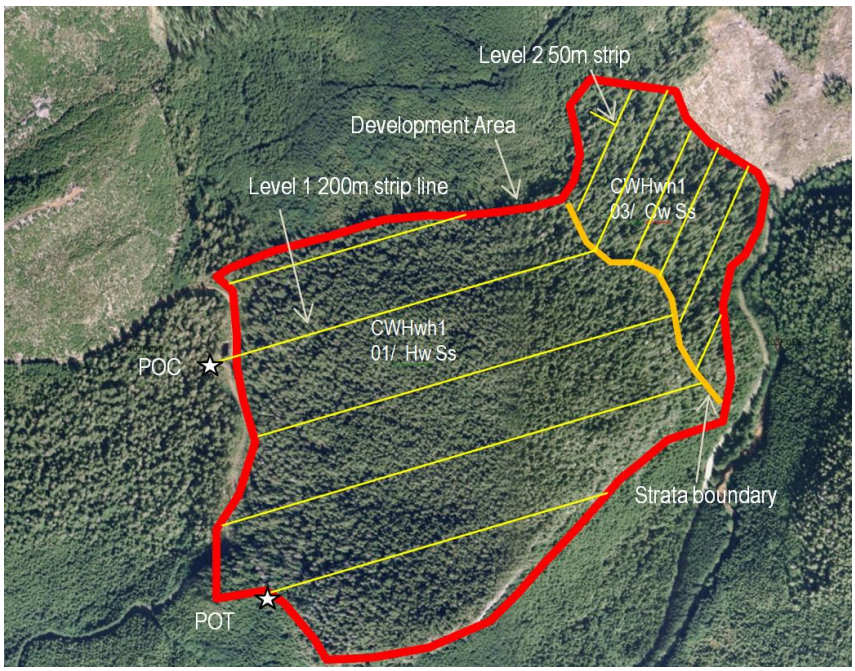


Figure 5. Block stratification example. In this case, the left or western most area, denoted by the 01 Site Series, is a Level 1 survey type and requires **less than** 100% block coverage. The right, or eastern most area, denoted by the 03 Site Series with a high concentration of Cultural Features, is a level 2 survey type and **requires 100%** block coverage.

3.0 Survey Establishment

This section outlines minimum standards and recommendations for establishing a cultural feature identification survey. There are several techniques for conducting traversing and data collection that may be used through the course of forest engineering.
However, when cultural feature identification surveys are standalone surveys (not associated with other forestry engineering/planning), methods must follow either the hand-traversing protocols or the protocols for the use of differential GPS (DGPS) established in Sections 3 and 6 of this manual. Different quality assurance standards are outlined for each survey method. This section outlines whether each survey component is mandatory, or recommended.

3.1 Pre-field Assessment

The pre-field assessment of Development Areas and CSAs will help establish the survey type and block stratification needs. Pre-field assessments will also identify adjacency or inclusion of existing archaeological sites or known Cultural Features (CHN HNRD GIS Administrator has relevant data). The assessment may also include a review of available maps and data to determine proximities to coast or major water bodies, and potentiality of raised beach sites or karst features. In addition, the surveyor should also review technical data. Such data may or may not include information on timber type, elevations, mapped ecological site series, surveyed streams, gullies, rock outcrops or other operational scale features.

3.2 Tie-Points

A Cultural Feature Identification survey tie-point should be a permanent topographic feature distinguishable on air photos and on the ground. The tie-point can be a location like a creek junction, road location, or falling corner. Once identified, choose a healthy tree closest to this tie-point as the tie-point tree.

The tie-point or reference point of each transect should be well marked (*ex.* three strands of plastic flagging tape).

The tie-point is the navigation tool used by the surveyor to locate the Point of Commencement (POC). While the tie-point is an important point for survey establishment, it is <u>not</u> a required attribute for data submissions under these standards.

3.3 Point of Commencement (POC)

The point of commencement must be a map feature (creek, road junction, falling corner etc.) or GPS station, which is accessible and within or on the edge of the Development Area.

One POC must be used in the case of multiple openings (patches) in the Development Area.
A POC <u>is</u> a required attribute for data submissions under these standards.

3.4 Strip-Lines

When hand-traversed transects are used, the strip-line must be run using compass, clinometric and metric surveyor tape (hip-chain) or electronic measuring devices. Allowances for slope must be made since all distances must be horizontal. Strip-lines must run parallel or perpendicular to one another.

The strip-line should be marked with plastic marking tape so it is easily visible and at set distances (ex. 25m).

While strip-lines are recommended, they are not required if the survey method uses GPS.

3.5 Stations

Stations are fixed points with recorded co-ordinates (distance and bearing to a known location) along a strip-line. Stations are used to help a surveyor identify where they are along a strip-line transect.

For Cultural Features surveys, it is highly recommended that stations are marked throughout the survey, however stations are only **required** when a feature is present along a strip-line transect **and** when the survey method is hand-traversing. This allows a feature to be tied to a known reference point along the survey in the event that there are errors with the spatial location of the feature. The recommended spacing for stations is approximately 50 metres or less.

Stations that are the reference points for **offsets (**also called radial shots) that tie in a feature to a strip-line must be well marked (flagged with station information) (see the example in Figure 6 and 7).

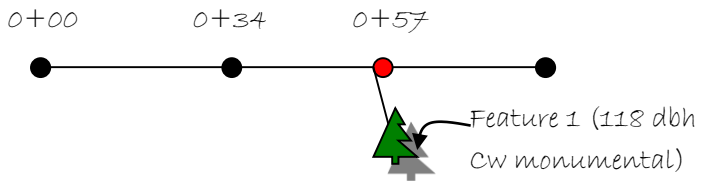


Figure 6. Tying in a feature (monumental in this case) with a station on a strip-line (ex. 0+057). Make sure to flag and mark the station information when hand-traversing.

Traverse Notes					start point			easting (x) 679000	northing (y) 5934200	Date 10/22/2010 Traverse
						N-S (cos)	E-W (sin)			
S.L	STA	Azimuth	SD	Slope%	HD	LAT	DEP	x	y	Comment
1	0+00									
		92	34	15%	33.6	-1.2	33.6			
	0+33.6							679033.6	5934199	
		92	24	26%	23.2	-0.8	23.2			
1	0+56.8	~	~	OFFSET	~			679056.8	5934198	station for offset
		177	17	23%	16.6	-17	0.9			
feature 1								679057.7	5934181	monumental cw 118 dbh

Figure7. Example of station points along a strip-line in traverse notes. Note that X and Y coordinates are often calculated in the office using post-processing tools (such as RoadEng).

3.6 Offsets

Offsets, also known as radial shots, are lines used at the surveyor's discretion in order to either: a) extend the coverage of a survey to an area of a polygon to meet the minimum block coverage requirements, or b) to tie in identified features to a centerline. The offset bearing can be anything in relation to the centerline bearing, however are typically perpendicular to the centerline bearing.

3.7 Marking Features

3.7.1 **All monumentals, and CMT's must be marked with flagging tape so they are visible.** When flagging trees, if possible ensure that the flagging tape extends all the way around the feature (ex. entire circumference of a CMT or Monumental).

3.7.2 Class 1 or 2 Haida Traditional Forest Features and western yew features **must either be flagged in the field and/or mapped** according to spatial accuracy standards outlined in these standards (see section 6.5).

a) A banner flag[6] with the feature number is hung in the centre of the patch at all times .

b) When patch features are flagged in the field, patch features must be flagged around the perimeter of the patch, while a geographic coordinate is taken from the centre of the patch. It is useful to have the feature number written on the flagging that delineates the outside of a patch.

c) Where mapping features instead of flagging the outside/perimeter of a patch, ensure mapping symbolizes the feature type and associated feature number. For patches with no outside flagging, mapping should include polygonal representation. An example of a circumstance where the outside of a patch is not flagged in the field but is mapped may be when a patch is found within a known reserve or no-harvest area and where detailed field delineation (for communication with harvesting crews) is not necessary.

[6] A banner flag is flagging that is horizontally hung between two trees or posts.

3.7.3 Feature identification or their reference points, must be marked in the field in such a fashion so as to provide a reasonable level of identification to support the audit function. Flagging should, at minimum, note the feature type and associated feature number.
A development area boundary should never bisect a patch of features, rather an identified patch should be entirely within the boundary of a development area. For hand-traversing, bearings or 'shots' should be taken from the station to the central coordinate of the patch because a patch (or even a feature) can extend over a wide area.

4.0 Data Gathering Standards

4.1 Data collection

The identification of Cultural Features requires the collection of a series of data that licensees must report to the Council of the Haida Nation and the Province of BC to meet reporting requirements established under the HGLUOO.

This section outlines both required and optional data to be gathered during a survey. A *Cultural Feature Identification Field tally sheet* is included in Appendix A. While this tally sheet contains the required and optional data fields the formatting of the tally sheet is provided as guidance. The tally sheet may be modified by the surveyor but the mandatory reporting fields must be filled in and the tally sheet content must be consistent with the attributes outlined in this section.

The mandatory and optional information is identified in Appendix A. Surveyors should document the reasons for decisions about survey intensity or methodology so that they are clear to subsequent auditors.

4.2 Minimum Reporting Requirements

Appendix C is a template that includes the minimum reporting requirements for a Cultural Feature Identification Survey once a survey has been completed in a Development Area. While **the data fields and report content are mandatory**, the reporting format is only a recommendation and may be modified by the surveyor.
All Cultural Feature Identification survey reports must be submitted to the Council of the Haida Nation's Heritage and Natural Resource Department upon completion. This information is necessary to monitor surveys for auditing purposes, and to contribute to general effectiveness monitoring for the management of cultural values. Having survey data and/or reports submitted as soon as they are completed allows for audits to occur prior to the development planning being complete or major road building or timber harvesting has commenced. Completed CFI survey reports must be submitted at least one month in advance of cutting permit (CP) and road permit (RP) applications being submitted to Front Counter Haida Gwaii.

4.3 Digital Spatial Data

The format for the submission of data collected in the field by a cultural feature surveyor to a license holder is made by agreement between the surveyor and the license holder. Digital spatial data in the form of a File Geodatabase feature classes, is a CHN requirement that Cultural Feature Identification surveyors must deliver, to facilitate our audit process. **Spatial locations (ex. UTMs) of features are a mandatory** responsibility of the CFI surveyor, and digital spatial data about cultural feature information must also be submitted annually by license holders to the CHN and the Province under the HGLUOO. If data is not

submitted in the correct format a fee will be charged for processing of the data. File Geodatabase template available from the HNRD GIS Administrator.

5.0 Cultural Feature Identification Certification

Cultural Feature Identification certification is awarded by the Council of the Haida Nation based on competency, as proven through testing.

Training courses that cover the identification of cultural plants, monumental cedar, heritage features, culturally modified trees, survey standards and methodology, and Black Bear den identification will be offered through the Council of the Haida Nation (approximately 10-12 participants required). A pre-requisite for challenging both the written and practical exams is that an individual must have successfully completed a course in Archaeological and CMT Inventory Training for Crew Members (administered by the BC Association of Professional Archaeologists) and the Black Bear den identification training. Certified surveyors shall participate in professional development courses, such as archaeological or monumental feature refresher training when hosted by the CHN (exemptions from professional development courses are only granted by the Heritage and Natural Resource Committee).

5.1 Testing

Testing for Cultural Feature Identification certification will include both a written (or oral) examination and a practical examination.

The passing grade for both examinations is 65%.

A passing grade in both the written (or oral) examination and the practical examination is required for certification. Examinations will focus on feature identification, feature classification and appropriate adherence to survey standards (survey intensity levels, stratification, data collection, reporting and accuracy).

5.2 Certification Timeline

Cultural Feature Identification certification is valid for 5 years from the date of issuance. Any surveyor who has not participated in a CFI survey for two consecutive years over the period of certification will have their certifications revoked. Re-certification requires a passing grade from a written (or oral) and practical examination or two successive audits classified as acceptable surveys (>65% score) during the final year of certification.

6.0 Quality Assurance and Auditing

Cultural Feature Identification Surveys carried out by certified surveyors are subject to audits to ensure standards are being met. This section outlines auditing standards and quality assurance standards.

6.1 Auditor Qualifications

Auditors will hold a valid Cultural Feature Identification certification from the Council of the Haida Nation. A CHN HNRD designated lead auditor is responsible for the final results of the audits.

6.2 Audit Frequency

Audits may be in two forms: spot checks or full audits.

6.2.1 Spot Checks: Spot checks are a low intensity, random reconnaissance type audit, whereby an auditor will review the quality of a Cultural Feature survey in accordance to the acceptable limits of error (outlined in Section 6.5), prior to road building and timber harvesting. Spot checks will only occur for Development Areas where cultural feature surveys are being completed and may occur without the knowledge of the original surveyor. Field notes or data collected during the cultural feature survey may or may not be required to be given to an auditor. Random spot checks may lead to a full audit.

6.2.2 Full Audits: Full audits are comprehensive reviews of Cultural Feature survey areas, including data and report submissions, and are to be conducted prior to road building or timber harvesting. Choosing Development Areas that will have full audits will primarily be random, however non-random audits may occur based on the findings from spot checks.
The auditor reserves the right to identify a survey area boundary in the event that it is not identified or clarified by the original surveyor.
Stratified sampling will occur to ensure that the auditing of the surveyors will be proportionately divided among certified surveyors (probability proportional to size sampling). Audit efforts will also be distributed across tenure boundaries in proportion to the number of areas being developed by tenure holders. **Note that it is not the tenure holders or the Development Areas that are being audited, rather the work conducted by the surveyor that is being audited.**

Approximately 30% of CFI surveyors' development areas will be fully audited annually.

6.3 Audit Process

The following outlines the auditing process for full audits.

- Completion of Cultural Features identification survey in a given Development Area;
- Communication with Cultural Features surveyor regarding an audit for a specific Development Area;
- Appropriate data and/or report submissions given to auditor;
- Audit occurs prior to road building or timber harvesting;
- The full audit (not including spot checks) will be carried out and reported in a transparent and statistically defensible manner.
- When completed, audit reports will be submitted to the surveyor and the surveyor will be granted an opportunity to ask any questions for clarification;
- Any questions that arise, must be from the surveyor in question and not their organization or contract holder, this is to ensure the auditor/auditee relationship is not compromised by outside sources.

6.4 Audit Principles

The following summary outlines the general principles that guide the process for auditing cultural feature identification surveys:

- The CHN determines that the auditor has the necessary experience and knowledge to perform the audit.
- The auditor will take responsibility for the Cultural Feature survey by signing and dating the original data collection card and any subsequent changes they made to that data.

- The auditor will select plots to audit using a random or targeted process or by a process using best available information;
- The auditor will audit at least 30% of all surveys completed annually by a surveyor;
- At minimum, 20% of the surveyed development area, or 20% of each strata, will be audited based on a minimum of 3 random transects
- Targeted transects can be completed in addition to the 3 random transects.
- The auditor will notify the surveyor and licencee of the audit;
- A copy of the audit report will be provided to the surveyor;
- Feature identification or their reference points, must be marked in the field in such a fashion so as to provide a reasonable level of identification to support the audit function;
- Following the audit, surveyors will have an opportunity to revisit the development area with the audit team if they wish to review audit report results.

6.5 Acceptable Limits of Error

The following outlines the acceptable limits of error for a given survey:

a. **Block coverage**: At least 25% coverage of a Development Area or the stratified portions of a Development Area is surveyed.

b. **Spatial Accuracy**: Two types of surveys are recognized: hand-traversed surveys, or; surveys using Global Positioning System (GPS), preferentially a differential GPS system (DGPS). Spatial accuracy for all points should be within ± **10 metres** regardless of survey method. This is achievable using the following hand traversing or differential GPS protocols:

i. **Protocols for the use of differential GPS**

The GPS must store data, which can be differentially corrected and points must be fixed with the following minimum specifications /configurations for all static (point) surveys:

(Position Dilution of Precision) PDOP=	8
General DOP (only if PDOP is not available)=	10
Minimum of satellites	4
Degrees elevation angle	15
Signal to Noise Ratio (SNR) =	33
Minimum occupation time=	30 seconds

ii. Protocols for the hand traversing

Locating points using strip-lines and stations:	
Horizontal distance =	+/- 2%
Bearings=	+/- 2 degrees

6.6 Failed audits

Should the result of the audit lead to a survey being classified below these standards then:

i. The surveyor may be asked to re-survey a Development area or areas; or,

ii. The auditor may recommend a higher proportion of non-random audits for that surveyor; or,
iii. If multiple audits consistently indicate that the surveyor falls below the standards identified in this document, then the CHN may:
    i. Suspend a surveyor's certification for a specified period;
    ii. Place reasonable conditions on re-certification, such as identifying specific training or professional development;
    iii. revoke the surveyors' certification.

In addition to these data collection standards, reporting requirements will need to be consistent with standards provided in Appendix C.

6.7 Appealing an audit

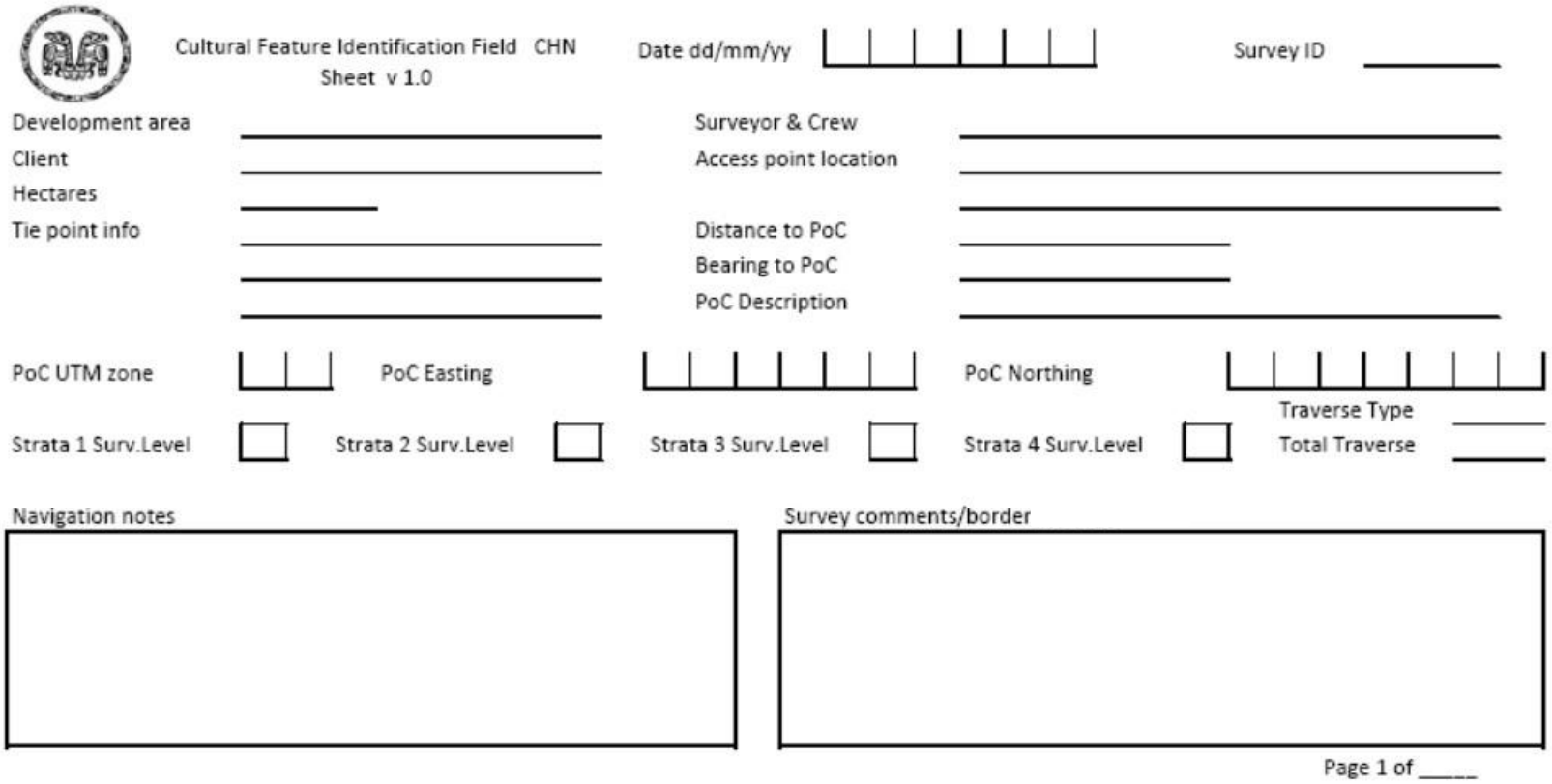
Should a surveyor disagree with the results of an audit, a suspension or revocation, the certified surveyor in question may appeal the audit in the following way:

1. The **surveyor** informs the CHN of the disagreement or grievance by letter or email to the Manager of the Heritage and Natural Resource Department (P.O box 589, Masset BC V0T 1M0);
2. The Manager of the Heritage and Natural Resource Department (HNRD) informs the CHN's Heritage and Natural Resource Committee (CHN elected representatives);
3. If necessary, and upon the request of the surveyor (not a licensee), the manager of the HNRD organizes a field review to the development area in question. The field review will consist of the CFI surveyor, the CFI audit team, and a third party who has a valid CFI accreditation.
4. The results from the block review will be documented and forwarded by the third party to the CHN's HNRD Manager for review by the Heritage and Natural Resource Committee (HNRC) for deliberation.
5. The results from the HNRC will be communicated in a timely manner to the CFI surveyor.

6.8 Right to Revoke

The CHN retains the right to revoke certification if a surveyor consistently falls below the standards outlined in Section 6 of this document.

Appendix A FIELD TALLY SHEET



Strata no.	Strip line	Feat no.		Feature type								Description	DBH			UTM Zone		Easting	Northing
				CMT	CLS1 HF	CLS2 HF	MON	CLS1 FF	CLS2 FF	CLT STND	YW TREE								
Survey comments																			

Appendix B Field Tally DATA FIELDS

HEADER INFORMATION

1. **(Mandatory)** Date dd/mm/yy

2. **(Mandatory)** Development Area: name of the block or Development Area;

3. **(Mandatory)** Client: name of the licensee with FSP authorized by CHN and FLNRORD for cutting under the Forest Act and/or Forest and Range Practices Act;

4. **(Mandatory)** Hectares: area in hectares of the entire block or Development Area (including in-block reserves and retention areas);

5. **(Mandatory)** Surveyor and crew: the name of the surveyor certified by the Council of the Haida Nation as well as assisting field crew;

6. **(Optional)** Access point location: general description of the point of access. *Ex. North side, 4km Bragg main;*

7. **(Optional)** Tie Point Info: description of tie point. *Ex. Double flagged, yellow-25cm Hw.* Coordinates for tie point can be put under the Navigation Notes section;

8. **(Optional)** Dist to POC: distance in metres from the tie point to the Point of Commencement (POC);

9. **(Optional)** Bearing to POC: bearing from the tie point to the Point of Commencement;

10. **(Optional)** POC UTM Z: the UTM zone of the POC;

11. **(Mandatory)** POC easting: the UTM or BC Albers easting of the POC;

12. **(Mandatory)** POC northing: the UTM or BC Albers northing of the POC;

13. **(Mandatory)** POC description: description of the POC. *Ex. Triple flagged, red- 33cm Ss.*

14. **(Optional)** Navigation notes: General descriptions of access to the POC. *Ex. Creek crossing at 0+75m- go upstream 40m for log crossing;*

15. **(Mandatory)** Strata 1 Survey Level *to* Strata 4 survey level: the survey type per stratum identified in the block. Mark with either a *L1* or *L2;*

16. (**Mandatory)** Traverse Type: the method for surveying, either Hand Traversing or DGPS.

17. (**Mandatory)** Total traverse: The aggregate number of metres covered by all the strip-lines in the survey (sum all strata). The rule of thumb for determining hectares surveyed is 200m equals 1 hectare (assuming 25m visibility on both sides of centerline);

18. **(Optional)** Survey comments: Any survey comments or description of features (*ex.* Strip-line 1, Sta 0+99 (*or UTM/BC Albers*) = possible bear den).

FEATURE INFORMATION

1. **(Mandatory)** Strata No.: The number that represents the stratified portion of a block. Note that there may be as little as 1 strata for a block;

2. **(Optional)** Strip-line: The number that represents the strip-line on which the feature is located;

3. **(Mandatory)** Feat No.: The feature number. Begin at 00 for each block. Ensure that feature numbers are continuous across block strata;

4. **(Mandatory)** Feature types:

i. CMT: check □ if the feature is a Culturally Modified Tree. Acceptable attribute values to be entered under #5 *Description* include:

BS-T	Bark-stripped, tapered bark strip scars
BS-R	Bark-stripped, Rectangular bark strip scars
BS-G	Bark-stripped, Girdled bark strip scars
BS-O	Bark-stripped, Other bark strip 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

ii. CLS1 HF: check □ if the feature is a Class 1 Heritage Feature: Acceptable attribute values to be entered under #5 *Description* include:

V/SV	Village/Seasonal Village
IC/C	Inland Camp/Camp
BS	Burial Site
IOHS	Identified Oral History Site
ISS	Identified Spiritual Site

iii. CLS2 HF: check □ if the feature is a Class 2 Heritage Feature: Acceptable attribute values to be entered under #5 *Description* include:

M	Midden
BT	Bear Trap
FW	Fish Weir
C	Cave
PG	Petroglyph
LPS	Lithic Production SIte
T	Trails
LS	Lookout Site
F	Fort
C	Cache
CR	Canoe Run
SHS	Shoreline Habitation Site
RS	Rock Shelters
KF	Karst Features

iv. MON: Check □ if the feature is a Monumental cedar: Acceptable attribute values to be entered under #5 *Description* include:

CW	Western redcedar	Ts'uu
YC	Yellow cedar	Sgaahlan

v. CLS1 FF: check □ if the feature is a Class 1 Traditional Forest Feature: Acceptable attribute values to be entered under #5 *Description* include:

Fairy-slipper / False Ladyslipper	skil taawaatllxaay	skil taw
Black hawthorn	k'anhll	xaayuwaa hlk'a.aay
Northern riceroot	7inhllng	stla k'iist'aa
Devil's club	ts'iihllnjaaw	ts'iihlanjaaw
Highbush-cranberry	hlaayaa hlk'a7ii	hlaayaa hlk'a.aay
Narcissus anemone		
One and a half flowered reed grass		
Richardson's geranium	Hlunhit	hlunxid
Wright's filmy fern		
Calder's lovage		
Western cowbane		

vi. CLS2 FF: check □ if the feature is a Class 2 Traditional Forest Feature: Acceptable attribute values to be entered under #5 *Description* include the following:

Common harebell	dall(xil)-guhlahl	dall(-xil)-sgid
Common juniper	kaayda kaxawaay	hlk'am.aal
Pacific crab apple	k'anhl7l	k'ayanhla
Yellow pond-lily	xil gaaydllgins	xil giidlagang

Stink currant	galgun xil	gal.un hlk'a.aay
Black swamp gooseberry	gudga gi gayd	xaayuwaa
Trailing black currant	kaigigunlkai	k'iit'agwaandaa hlk'a.aay
Cloudberry	k'aaxu ts'alaang.ga	k'a.àw ts'alaangaa xil
Stinging nettle	gudang.xaal	gudang.aal
Indian hellebore	gwaayk'yaa	gwaayk'aa

vii. CLT STND: check □ if the feature is a CMT or Monumental cedar and is part of a Cultural Cedar Stand. Acceptable attribute values to be entered under #5 *Description* include:

01-99	The Cultural Stand Number

AND

CW	Western redcedar
YC	Yellow cedar

Example in the #5 *Description* column: 01 CW

viii. YW TREE: check □ if the feature is a Western yew tree or patch. Acceptable attribute values to be entered under #5 *Description* include:

01-99	The number of individual stems in the patch

5. **(Mandatory)** Description: Fill out the descriptor for the feature, as defined in the previous section 4 (i-ix);

6. **(Mandatory)** DBH: Diameter at breast height. This field is only filled out for the Monumental and CMT features (Where applicable). Note that there are different management objectives for monumental trees greater than (>) 120 cm DBH, therefore care must be taken to ensure accurate measurements;

7. **(Optional)** UTM Zone: Enter the Universal Transverse Mercator zone;

8. **(Mandatory)** Easting: Enter the UTM/BC Albers easting;

9. **(Mandatory)** Northing: Enter the UTM/BC Albers northing.

Appendix C REQUIRED REPORTING INFORMATION

Surveyors are to contact CHN HNRD GIS Administrator to find out if there are known HTHF's in the development area prior to CFI survey.

Cultural Feature Identification Report

Report number ___ ___

General Location (*watershed*) _____

Block/Development Area name _____

Surveyor name _____

Crew names _____
_____
_____

Block hectares ___ ___

Survey start date ___ / ___ / ___ (mm/dd/yy)

Survey end date ___ / ___ / ___ (mm/dd/yy)

Total Traverse (m) ___ ___ ___ ___

Percent surveyed (%) ___ ___

Survey level by stratum

Strata no	Survey level (1 or2)	Strata description	Traverse (m)	Area (hectares)

Survey comments

Page __ of __

Feature report

Feat no.	Feature type	Description	DBH	UTM Zone	Easting	Northing	Strata

I certify that the identification of cultural features was completed to the Standards set out by the Council of the Haida Nation:

_____ (signature)

Page __ of __

In the *Feature Type* column of the report, make sure to sort features by type. For example, record all the monumental cedars in a group (ex. features #1 through #6).

Appendix D FEATURE IDENTIFICATION

Traditional Cultural Features identified in this section of the manual do not represent a full or absolute list of features used in the Haida culture. The listing of these features is specific to the Haida Gwaii Land Use Objectives Order (HGLUOO) as it describes criteria for the management of these values.

1.1 Traditional Heritage Features
People who are certified to conduct Cultural Feature Identification surveys have access to cultural data or requests for access through the Remote Access to Archaeological Data (RAAD) and through the Council of the Haida Nation's Heritage and Natural Resource Department.

There are two classes of Traditional Heritage Features identified in Schedule 2 of the HGLUOO.

Class 1 Traditional Heritage Features

Village/Seasonal village – nearly every headland and waterway that meets the ocean have these important habitation/heritage sites on Haida Gwaii.

Inland Camp/Camp- important sites used for travel, hunting, fishing, and harvesting. These sites may be associated with lakeshores, rivers, rock shelters, and inland places of work.

Burial Site- may include a mortuary pole- a carved pole with a hollow at the top where a box containing human remains were placed, or; tree burial (box or platform holding human remains that is placed in a tree), or; rock shelter/cave, or; internments.

Identified Oral History site- identified through oral tradition and ethnography as significant historical cultural sites throughout Haida Gwaii.

Identified Spiritual site- Areas of spiritual significance to the Haida, as identified through current practice, oral tradition and ethnography.

Class 2 Traditional Heritage Features

Bear Trap- a baited trap used to catch bears. A log was set to fall on the game when the bait was taken, often weighted with large rocks to increase the force. Indicators include a pile of large cobbles or boulders, possibly stumps of frame or post molds. Also could include pitfall traps: a hole up to 3m deep used to capture bear. Sharpened sticks may have been placed in bottom, often placed alongside a fallen tree so that when an animal jumps over the log it falls in the hole. While rope snares were also used, their identification in the field is difficult due to material decomposition. Traditional knowledge and ethnographic histories indicate that bear traps were historically commonly found on Haida Gwaii.

Fish Weir- a fishing device built in shallow estuaries, rivers, and streams consisting of a barrier of rocks or wooden stakes which allows water to pass through but directs the movement of fish. Indicators 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.

Cave - a physical feature of natural origin utilized on a temporary or permanent basis for shelter or other significant social or ceremonial purposes. Caves were used for habitation as well as for burials, storage, etc. The living space of caves included the area in front of and outside the caves. Caves often contain very fragile material. Indicators include hearths, cultural material including lithics, fire cracked rock, faunal remains. Perishable materials such as basketry, ropes, adzed wood chips etc. may be preserved in dry caves.

Petroglyph- 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.

Lithic Production Site- These are commonly surface sites. Lithics are stone objects that either include flakes as waste products formed while manufacturing a tool, may have been sharpened for use as a tool, or may have been used as is for cutting or scraping. Indicators include stones or tools that have been culturally altered, flake scards, points of percussion and sharp, thin edges. A quarry is a source of lithic materials from which the rock must be dug or cut, usually for geological properties such as basalt for stone tools (such as obsidian), ochre sources for painting, or argillite for carving. Associated with rock outcrops, boulders or rocky floats left by glaciers. Indicators include lots of lithic material, formed tools, and rounded rocks that may have been used as hammerstones.

Trail- Often marked with blazes, CMTs; exposed and compacted soil; and will often follow natural features such as rivers, valleys or alpine ridges.

Lookout Site- A prominent view point used continuously over time for travel, hunting or defensive purposes. Often associated with a point of topographic high relief such as a hill or ridge top.

Fort – A defensive structure usually located on islands with steep sides or high hills along shorelines; areas easily defendable. Used principally as defense locations, or used for everyday activities, such as drying fish and planting gardens, given they were commonly located in wind and sun exposed locations.

Cache – Most often a subsurface feature, described as a pit in which food, equipment, etc. was placed for safekeeping; often circular but also square or rectangular. Soil stratigraphy differs from surrounding soils. Indicators are burnt bark at bottom. Unlikely to have artifacts or ash, but are likely to be rich in other information such as pollen or seeds (requires a special expertise and is important not to disturb unnecessarily).

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.

Shoreline Habitation Site- Includes raised beach sites, which may be located several kilometers inland at major drainages and are very vulnerable to forestry and road construction activities. The potential for raised beach sites at locations at and below 25m above sea level (asl) on Haida Gwaii is significant, particularly adjacent to ancient marine bays, estuaries or creeks. LiDAR is a useful tool to identify possible shoreline habitation sites.

Karst Feature- This feature is made up of carbonate bedrock (limestone). These soluble rocks are associated with subterranean cave systems, sink holes (doleans), fragile soils and unique ecosystems. These physical features are associated with high potential habitation sites, utilized on a temporary or permanent basis for shelter or other significant social or ceremonial activity. These sites also often contain important paleontological remains that inform the cultural and natural heritage of Haida Gwaii.

Midden: One of the most common archaeological site types. 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-cracked rock, charcoal, and artifacts. Commonly associated with village sites (seasonal and permanent), there are several ways to identify 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 color and texture of soil (are commonly dark and greasy/silty), and occasionally associated with fire cracked rock.

Rock Shelter: Usually a rock overhang large enough to be used for shelter, or ceremonial purposes such as burials. Commonly associated features can include visible stone tool debitage, animal bones used as tools, occasionally a hearth feature is visible, and occasionally a bentwood box, etc.

1.2. Traditional Forest Features

There are two classes of Traditional Forest Features identified in Schedule 2 of the HGLUOO.

1.2.1 Class 1 Traditional Forest Features (HTFFs)

Class 1 HTFFs are plant species that have been identified as being particularly rare, threatened by logging or introduced species as well as being extremely important to the Haida. The following lists the species that are Class 1 HTFFs. Each individual occurrence of these plants is treated as a feature regardless of density or distribution.

- sk̲il taawaatllx̲aay (S), sk̲il taw (M), **Fairy-slipper / False Ladyslipper** (*Calypso bulbosa)*
- k'anhll (S), x̲aayuwaa hlk̲'a.aay (M), **Black hawthorn** (*Crataegus douglasii)*
- 7inhllng (S), stla k̲'iist'aa (M), **Northern riceroot** (*Fritillaria camschatcensis)*
- ts'iihllnjaaw (S), ts'iihlanjaaw (M), **Devil's club** (*Oplopanax horridus)*
- hlaayaa hlk̲'a7ii (S), hlaayaa hlk̲'a.aay (M), **Highbush-cranberry** (*Viburnum edule)*

- Narcissus anemone (Anemone narcissiflora var. villosissima)
- One-and-a-half flowered reedgrass (Calamagrostis sesquiflora)
- Richardson's geranium (Geranium richardsonii)
- Wright's filmy fern (Hymenophyllum wrightii)
- Calder's lovage (Ligusticum caldera)
- Western cowbane (Oxypolis occidentalis)

Groups of features for **fairy slippers**, **northern riceroot** or **devil's club** can be recorded as a patch when the density is greater than 5 plants /m^2 or when few to several sporadically occurring individuals occur and the distance between plants are less than or up to approximately 20 metres

(figure 8, distribution code 2). In these cases, patches can be recorded with a single spatial coordinate. See section 3.7 for feature *marking* standards.

1.2.2 Class 2 Traditional Forest Features

Class 2 HTFFs are plant species that have been identified as being of importance to the Haida, but may be either less rare or less threatened by logging. Unlike Class 1 HTFFs where an occurrence is the equivalent of a feature (*i.e.* an individual Devil's club equals one feature), a Class 2 feature can be comprised of more than one individual occurrence, depending on the species and their density and/or distribution. This has been done to reflect the difficulty of surveying for certain plant species, the impractical nature of collecting data on individual plants, and to account for the general abundance of some species. Figure 8 outlines the types of plant distribution used to help classify Class 2 HTFFs.

For the purposes of retaining 50% of class 2 Haida Traditional Forest Features and to simplify harvest layout, surveyors will strive to balance the numbers of features in patches, providing the opportunity for a reasonable equality of plants both inside and outside harvest areas.

In all cases, patches can be *recorded* with a single spatial coordinate. See section 3.7 for feature *marking* standards.

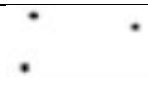
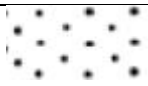
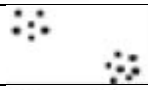
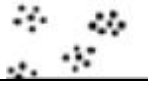
Distribution Codes		
Code	Image	Description
1		Individual, a single occurrence
2		Few sporadically occurring individuals
3		Several sporadically occurring individuals
4		Continuous uniform occurrence of well-spaced individuals
5		Single patch or clump of a species
6		A few patches or clumps of a species
7		Several well-spaced patches or clumps

Figure 8. Distribution codes used for identifying a feature.

Class 2 Traditional Forest Feature Species and their Classification as a Feature
The following 10 species are listed as Class 2 Traditional Forest Features in the HGLUOO *Schedule 2.* This section gives the name of the HTFF species and the criteria for their feature classification. Note that (S) and (M) denotes the Haida names in both Skidegate and Massett.

Name: dall(-xil)-sgid (M), dall (-xil)-guhlahl (S), **Common Harebell** *(Campanula rotundifolia)*

Feature Classification: A patch is considered a feature. Few to several sporadically occurring individuals (figure 8, distribution codes 2 and 3) where the distance between plants are less than 20 metres, is considered a patch.

A patch (distribution code 5) is also where the density is greater than 5 plants /m^2. Individual occurrences are not considered a feature.

Name: kaayda kaxawaay (S), hlk'am.aal I (M), **Common Juniper** (Juniperus communis)

Feature Classification: Individual occurrences and patches are considered a feature. Few to several sporadically occurring individuals (figure 8, distribution codes 2 and 3) where the distance between plants may be less than or up to approximately 20 metres are considered a patch (see figure 9 and 10). In other words, as long as the features are within 20 metres of each other, the patch size is at the discretion of the surveyor.

Name: k'anhl7l (S), k'ayanhla (M), **Pacific crabapple** (*Malus fusca)*

Feature Classification: A patch (distribution code 5) is considered a feature.

Few to several sporadically occurring individuals can be considered a patch where the distance between each crabapple tree may be less than or up to approximately 20 metres. In other words, as long as the stems are within 20 metres of each other, the patch size is at the discretion of the surveyor.
Patches should be recorded in the following groupings:

5-10 stems
11-20 stems
21-30 stems
31-50 stems
> 50 stems

Individual occurrences are not considered a feature.

Name: xil gaaydllgins (S), xil giidlagang (M), **Yellow pond lily** (*Nuphar lutea)*

Feature Classification: Any occurrence of this plant (regardless of density and distribution) is considered a feature.

Name: gal.un hlk'a.aay (M), galgun xil (S), **Stink Currant** *(Ribes bracteosum)*

Feature Classification: Any occurrence of this plant (regardless of density and distribution) is considered a feature. A patch (figure 8, distribution code 5) is where the density is greater than 5 plants /m^2. Few to several sporadically occurring individuals where the distance between plants are less than or up to approximately 20 metres is also considered a patch.

Name:gudga gi gayd (S), xaayuwaa (M), **Black swamp gooseberry** (*Ribes lacustre)*

Feature Classification: Any occurrence of this plant (regardless of density and distribution) is considered a feature. Few to several sporadically occurring individuals where the distance between plants are less than 20 metres, are considered a patch.

A patch, (figure 8, distribution code 5) is also where the density is greater than 5 plants /m^2.

Name: kaigigunlkai (S), k'iit'agwaandaa hlk'a.aay (M), **Trailing currant** (*Ribes laxiflorum)*

Feature Classification: Individual occurrences and patches are considered a feature. A patch (figure 8, distribution code 5) is where the density is greater than 5 plants /m^2 .

Few to several sporadically occurring individuals where the distance between plants are less than or up to approximately20 metres, is considered a patch.

Name: k'aaxu ts'alaang.ga (S), k'a.àw ts'alaangaa xil (M), **Cloudberry** *(Rubus chamaemorus)*

Feature Classification: Individual occurrences are not considered a feature.

A patch (figure 8, distribution code 5) where the density is greater than 5 plants /m^2 is considered a feature, and when there are a few sporadically occurring individuals (see figure 8) that are less than or up to approximately 20 metres of one another.

Name: gudang.xaal (S), gudang.aal (M), **Stinging nettle** (*Urtica dioica)*

Feature Classification: A patch (figure 8, distribution code 5) where the density is greater than 5 plants /m^2 is considered a feature.

Multiple patches (figure 8, distribution code 6 or 7) can be considered one feature where the distance between them is less than 20 metres.

Individual occurrences (figure 8, distribution code 1) are not considered a feature.

Name: gwaayk'yaa (S), gwaayk'aa (M), **Indian hellebore** (*Veratrum viride)*

Feature Classification:

A patch is considered a feature. A patch (figure 8, distribution code 3 to 7) is either where

- There is a continuous uniform layer of plants (distribution code 4), or
- the density of a clump of stems is greater than 5 plants /m^2, or

- where the distance between several sporadically occurring individuals (distribution code 3) is less than or up to approximately 20 metres, (see Figure 9 and 10). In other words, as long as several sporadically occurring individuals or clumps of stems are within 20 metres of each other, the patch size is at the discretion of the surveyor.
- Multiple patches (figure 8, distribution code 5 to 7) can be considered one patch where the distance between them is less than approximately 20 metres.

Record patches into the following groupings:

5-10 stems
11-20 stems
21-30 stems
31-50 stems
> 50 stems

Individual occurrences or few sporadically occurring individuals (figure 8, distribution code 1 and 2) are not considered a feature.

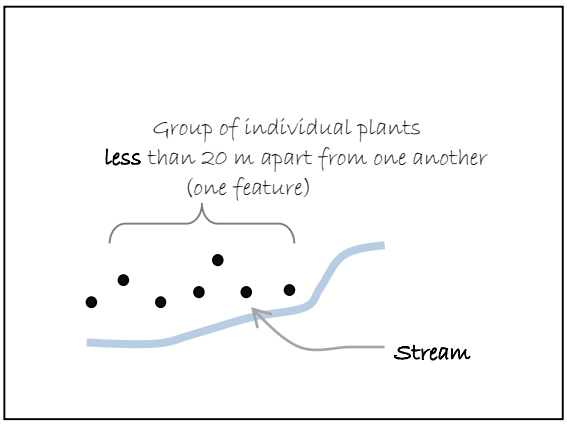


Figure 9. A group of individual plants that constitute 1 feature.

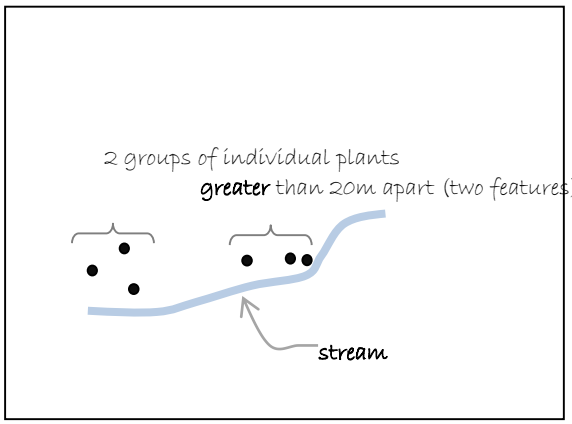


Figure10. Two groups of individual plants that constitute 2 features.

1.2.3 Field Identification of Traditional Forest Features

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. For that reason, CFI surveys should not be scheduled for winter. Some of the Class 1 and 2 Traditional Forest Features are woody perennials (*Black hawthorn, 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 engineering of cutblocks), typically occurs 6 months to 1 year prior to harvest. If possible plan ahead (or encourage a forest licensee to) so that surveying can occur within the optimal time period between May 15th and September 31st.

Traditional forest features for the most part are:

- significantly rare, or;
- occur on the edge of or within non-forested ecosystems, or;
- grow in early successional forests or along forest edges, or;
- are associated with special coastal sites, or;
- grow in areas that are afforded protection through other Ecosystem Based Management measures.

Due to these reasons, there are relatively few species that might be identified in closed canopied old growth forests, and fewer found in closed canopy second growth forests. For this reason, pay particular attention to Devil's club (Class 1), Pacific crabapple, Stink currant, Trailing black currant and Indian hellebore (all Class 2).

1.3 Culturally Modified Trees (CMTs)

Many different types of CMTs are found on Haida Gwaii. For 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)[7].

Bark-stripped Tree:

A class of CMT where the bark has been partially removed by Haida for social or ceremonial use. Characterized by the presence of one or more areas of removed bark and exposed wood referred to as bark-strip scars. Several types of bark stripped trees including tapered scar, rectangular scar, girdled or other. Indicators for the most common types of bark stripped trees on Haida Gwaii are as follows:

Tapered Barkstrip

Indicators include:

- 'scar-crust', which forms as smooth bark against a smooth wood face (most often dark/black in colour)
- Tapered scar from the base of the tree to a tip (elongated triangle in shape)
- Scar on the clear face of the tree (often the shaded side with fewer branches)
- Presence of healing lobes on either side of the scar
- Presence of tool marks, or
- Absence of bark on face of scar

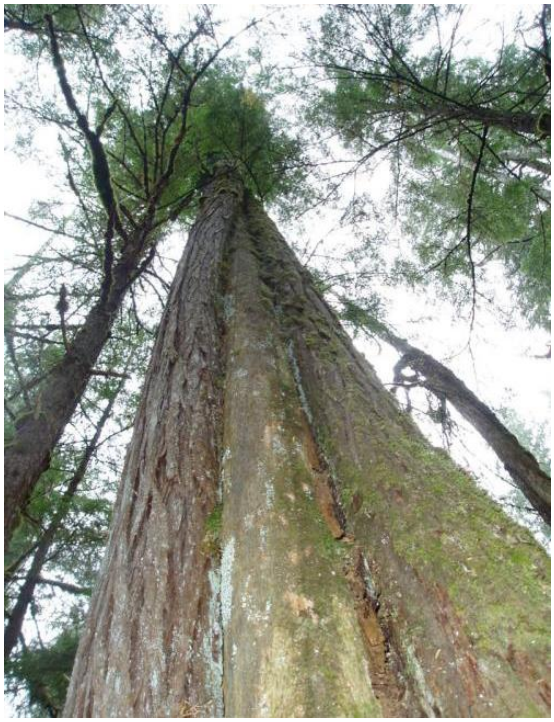


Photo 1. Example of a tapered (type) bark-strip (class) CMT.

[7] Resources Inventory Committee. 2001. A Handbook for tl Trees. Version 2.0. Archaeology Branch, B.C. Ministry of

Rectangular bark-strip also known as 'Bark-board'
Indicators include:

- Tool marks at the base and top of scar
- Healing lobes taper, making the scar appear less parallel
- 'scar-crust' present on inside of healing lobes, or
- Edges of scar face ('window') run parallel to each other

Photo 2. Example of a rectangular (type) bark-strip (class) CMT.

Haida Logged Trees/Aboriginally logged trees:

Felled Trees

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 on two planes separated by a vertical step
- Barberchair: a distinctive spire 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

Photo 3. Example of a felled (type) aboriginally-logged (class) CMT.

Sectioned Trees

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 section (s) and crown sections (section with live limbs and crown).

Canoe Trees

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.

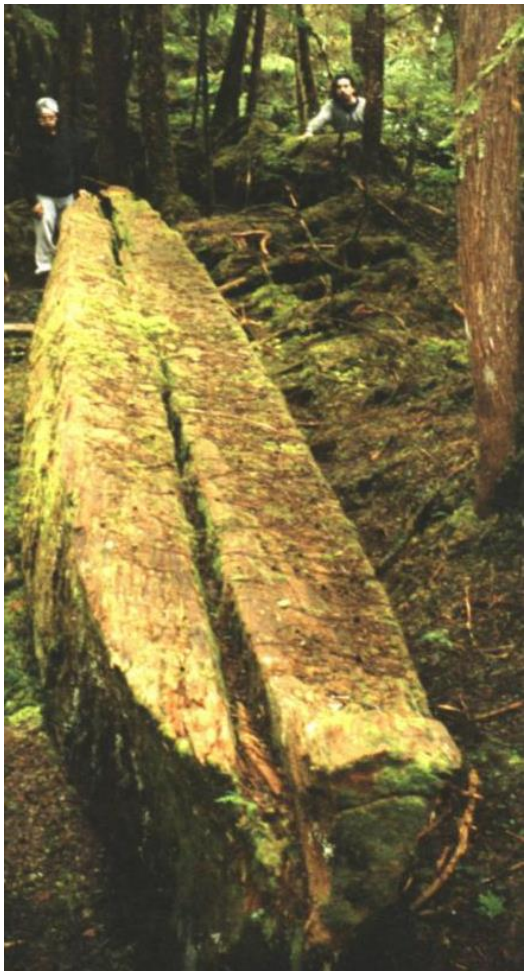


Photo 3. Example of a canoe (type) aboriginally-logged (class) CMT.

Tested Trees
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 aren't 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*)

Photo 4. Example of a tested (type) aboriginally-logged (class) CMT.

1.4 Monumental Cedar Identification

This section outlines the criteria for a tree being classified as a monumental cedar only for the purposes of implementing Ecosystem Based Management on Haida Gwaii. Carving needs will vary between carvers and over time, and as such the criteria outlined in this section is subject to change. For purposes of Ecosystem Based Management, the Haida Gwaii Land Use Objectives order defines a monumental as:

"A visibly sound western red cedar or yellow-cedar tree that is greater than 100 centimeters in diameter at breast height and has a log length of 7 meters or longer above the flare with at least one face that is suitable for cultural use." – Haida Gwaii Land Use Objectives Order.

Note that previous versions of the CFI Standards allowed for the discretion of the surveyor to identify 'borderline' calls: trees that had qualities classified as unacceptable by the surveyor based on measured or estimated criteria. 'Borderline' judgements are no longer acceptable: trees are either monumental or not monumental.

1.4.1 Definitions

Diameter at Breast Height: Breast height must be measured parallel to the bole of the tree at 1.3m on the high side and above the base of the tree. The high side (or high side ground) is the highest surface point of humus or mineral soil (forest floor) at the base of the tree and above the Point of Germination (POG). If the POG is above the forest floor or high side ground, measure 1.3m above the POG (see figure 12[8]).

[8] Adapted from the Forest Productivity Council of British Columbia. 1999. Minimum Standards for the Establishment and re-measurement of Permanent sample Plots in British Columbia. Victoria. B.C.

If the diameter measurement needs to be adjusted to account for a branch, record the offset distance (cm) and diameter below the 1.3m line.

Diameter at breast height is recorded to the nearest 0.1cm. Measures that are within ±5cm of 100cm DBH must be marked on the tree with a horizontal line at 1.3m and POG dot-marked (if applicable).

Remove obstacles (including snow) at the base of high side ground before measuring.

Point of Germination is the point in which the midpoint of a transect line between the centre of the roots (A and B in figure 11) intersect the pith or centre of the tree.

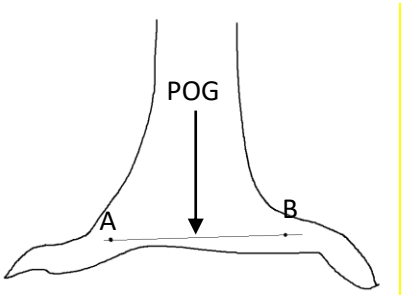


Figure 11. Measuring the point of germination (POG).

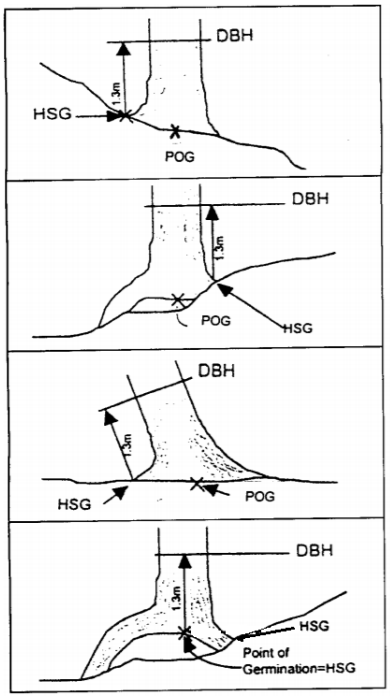


Figure 12. DBH relative to the high side ground (HSG). *Adapted from (FPCBC 1999)*[1]

Face: Face is measured as 1/3rd of the circumference of a log (Figure 11).

Flare: The flare of the tree is the bottom of the stem typically wider than the trunk that may result in greater stability and general wind firmness. **Diameters are taken at breast height regardless of flare**.

Log Length: Log length is measured as a minimum 7 metre length with at least one face that meets the defect allowances set out in this section.

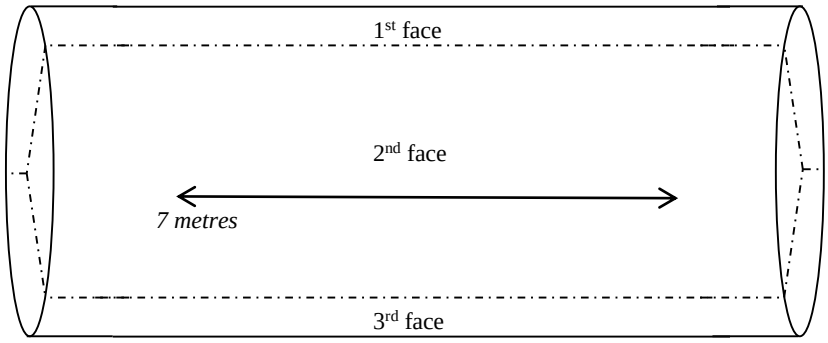


Figure 11. 'Face' of a monumental log is one-third of its circumference and the log length is minimum of 7 metres with one face that meets the defect allowances.

1.4.2 Tree Defects

This section outlines tolerances for tree defects. Note that tolerance for each type of defect should not be judged in isolation of any other defects. **While this section describes allowable tolerances for individual defects, a combination of multiple individual unacceptable defects may contribute to a tree not being classed as a monumental. This consideration should weigh whether the tree is suitable for cultural use now (haaksda tree), or is suitable for cultural use into the future (if reserved for a prolonged period).**

Knots or Limbs: Occasional knots or limbs less than 8 cm diameter are acceptable.

The allowable tolerance for limbs/knots greater than 8cm on a **log length** are as follows:

Tree DBH	
100-120cm	4 knot >8cm
120-150cm	8 knots >8cm
150-200cm	10 knots >8cm
+200cm	12 knots >8cm

Candle Limb(s): Candle limbs should not be counted as a regular knot or limb. They are epicormic, growing on the outside of the tree and do not extend to the heart wood.

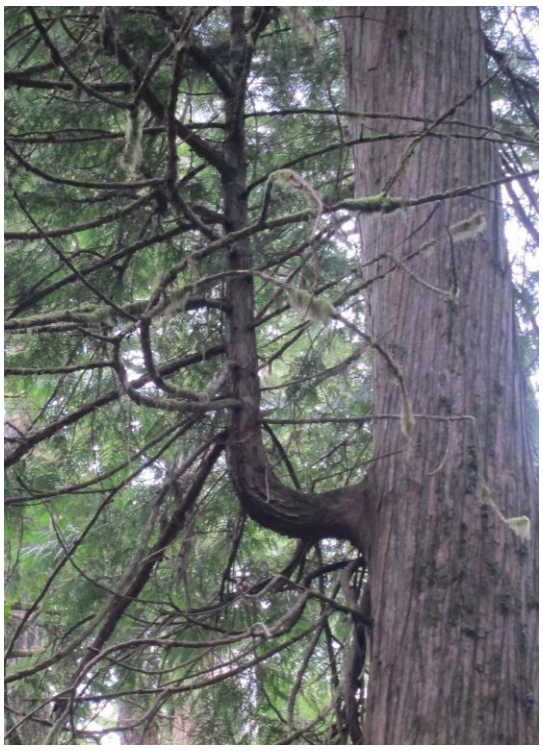


Photo 6. Example candle limb on a Western red cedar tree.

Visibly Sound: Except in extreme situations, heart or butt rot will not affect the cultural use for Monumental cedar.

Visibly sound means that equal or greater than one half (≥50%) of the volume of the log length has sound wood. If less than one half of the volume of the log length has sound wood, then the tree is a *Haaksda* tree if log length meets the other acceptable defects

Excessive rot (>50%) below the Point of Germination (POG) is acceptable.

Geometrically, the greatest volume of a circle is nearest the outside. For example, a 100cm DBH tree with a depth of sound wood of 15cm from the outside has 51% sound basal area.

The following calculation can be used to estimate the proportion of rot in the basal area (cross section of the tree) or refer to figure 15 look-up table.

1. Basal area of a tree= $\frac{\pi r^2}{10\,000}$ 2. Basal area of sound wood= $\left(\frac{\pi r^2}{10\,000}\right) - \left(\frac{\pi(r_x - r_i)^2}{10\,000}\right)$ 3. Percent sound= $\frac{basal\ area\ of\ sound\ wood}{basal\ area\ of\ tree}$	Where: r_x= *radius of tree* r_i= *depth of sound wood*	Example x=100cm i=15cm $\left(\frac{\pi 50^2}{10\,000}\right) - \left(\frac{\pi(r50_x - 15_i)^2}{10\,000}\right)$ =0.785 - 0.384= 0.40 Percent sound= $\frac{0.40}{0.785} = 51\%$ Therefore an estimate of 51% of this tree is sound

Figure 14. Calculating proportion of rot of the basal area of a tree

Diameter of tree (cm)	***Depth of sound wood (cm) rounded***
100	15
110	16
120	18
130	19
140	21
150	22
160	24
170	25
180	27
200	29
220	31

Figure 15. Depth of sound wood needed to maintain 50% sound wood (at basal area) for a tree relative to diameter

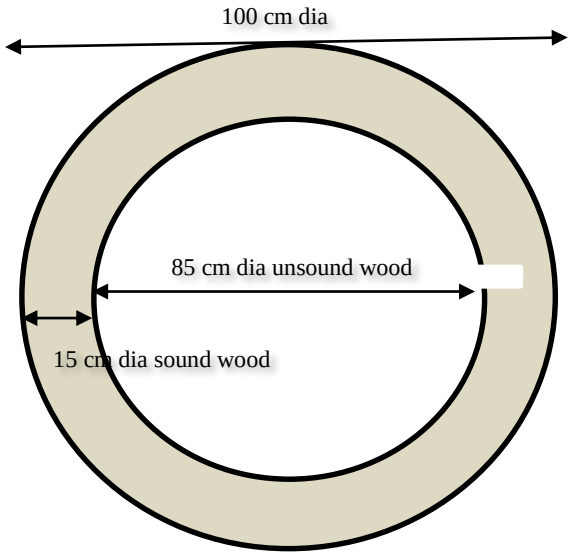


Figure 16. basal area of tree with 50% sound volume

If the sound wood (at basal area) is estimated to be near the 50% threshold, you will need to estimate the volumetric proportion of rot at the log length. To do this you will need to:

a) estimate the diameter of rot (inside) (DR),

b) the diameter of the tree (bottom) (DB),

c) the estimated diameter of the tree at the top of the *log length* (DT),

d) the *log length* (L);

e) the defect length (DL), and;

f) Know the (F) factor, which is the constant used in the Smalians volume formula (0.0001570796)

Defect length from rot in coastal areas of British Columbia can be estimated as[9]:Where rot measures	**Defect length penetrates**	**Rot type**
≤¼ of the recorded diameter of the tree	2.4m	Butt or heart
¼-½ of the recorded diameter of the tree	4.2m	Butt or heart
½ -¾ of the recorded diameter of the tree	6.0m	Butt or heart
≥¾ of the recorded diameter of the tree	7.8m	Butt

The formula for calculating the gross volume of **butt rot conical defect** is as follows[8]:

$$V= [(DB^2 + DT^2)xLxF] - \left[\frac{(DR^2+DR^2)X\ DL\ x\ F}{3}\right]$$

Equation 1. Gross volume of conical butt rot

This calculates the volume of the total log length minus the volume of the rot in the log length.
Using an example from figure 15, for a tree with a:

a) diameter of defect (DR) of 85cm (100cm-15cm of sound wood or >3/4 of the diameter of the bottom)
b) bottom diameter (DB) of 100cm,
c) a top diameter (DT) of 95cm,
d) A log length of 7m, and;
e) the length of the defect of 7.8m

The gross volume of sound wood for a tree with conical butt rot would be calculated as follows:

[9] Adapted from Timber Pricing Branch. 2018. Scaling Manual. Chapter 7, Ministry of Forests, Lands and Natural Resource Operations and Rural Development.

$$\left[\left(\mathbf{100^2 + 95^2}\right)\boldsymbol{x7xF}\right] - \left[\frac{\left(\mathbf{85^2 + 85^2}\right)\boldsymbol{X\ 7.8\ x\ F}}{\mathbf{3}}\right]$$

In this example the volume of conical butt rot is 28% of the volume of the log length.

For heart rot defects, the shape of the defect is cylindrical (not conical). The maximum length of heart rot is estimated to be 6m**.** The formula for calculating the gross volume of **heart rot defect** is as follows[8]:

$$V = \left[\left(DB^2 + DT^2\right)xLxF\right] - \left[A\left(DR^2 + DR^2\right)X\ DL\ x\ F\right]$$

Equation 2. Gross volume of heart rot

Using an example from figure 15, for a tree with a:

a) diameter of defect (DR) of 85cm (100cm-15cm of sound wood or >3/4 of the diameter of the bottom)
b) bottom diameter (DB) of 100cm,
c) a top diameter (DT) of 95cm,
d) A log length of 7m, and;
e) the length of the defect of 7.8m

The gross volume of sound wood for a tree with cylindrical heart rot would be calculated as follows:

$$\left[\left(\mathbf{100^2 + 95^2}\right)\boldsymbol{x7xF}\right] - \left[\left(\mathbf{85^2 + 85^2}\right)\boldsymbol{X\ 7.8\ x\ F}\right]$$

In this example the volume of cylindrical heart rot is 85% of the volume of the log length.

If a tree is visibly unsound, and if quantifying rot using increment bores to estimate the depth to unsound wood, a minimum of 3 measurements must be completed at equal distance around the stem at DBH. When increment boring ensure you record the results of your measurements (3 samples, depth of sound wood in cm) and the results of your calculations. Ensure the initial bore is taken at diameter at breast height, on the face and in what appears to be sound wood.

Bark seams: however can extend deep into the heart wood and are formed when lobes of the tree have closed together. However; most bark seams are limited to the base (flare or flute) or the tree (see photo 7). If bark seam or seams extend through 50% of the log length and meets the other acceptable defects within the log length then it is considered a Monumental. If bark seam or seams extend more than 50% through the log length and meets the other acceptable defects within the log length then it is considered a *Haaksda tree*.

Corrugation does not affect a monumental trees cultural use. It tends to diminish as you go up the log length (most intense at the base of the tree), can be milled off, or in the case of a totem pole, is buried.

Photo 7. Butt of a tree with multiple bark seams. The highlighted example is from healing lobes that have joined. This example at the flare of the tree, would be considered an acceptable defect.

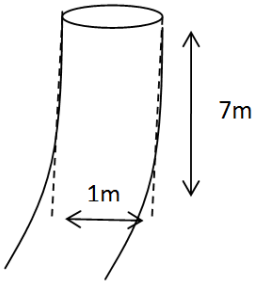


Figure 12. Potentially acceptable sweep in a log.

Sweep: If the trunk of the tree is curved or bowed it is called a sweep. If you can get your **log length** above or below the sweep then it is considered a Monumental.

Forked/candle Tree: If the tree has 2 leaders it is considered a forked top.
When a tree has more than 2 leaders or stems (either live or dead) or has multiple forked top (either live or dead) it is called a candle (or candelabra) tree.
A forked/candle tree is acceptable as long as the **log length** meets the criteria set in these standards. If a split or crack greater than 1m in length originates from a fork/candle which originates in the lower 2/3 of the tree then it should be considered a Haaksda tree.

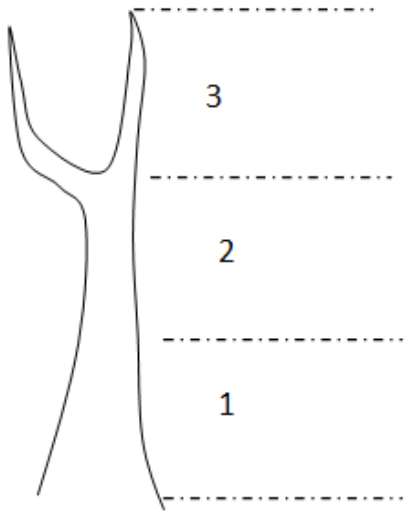


Figure 13. Division of a tree into 3rds for measuring broken tops

Broken stem: If a Western red cedar has a broken stem and is exposed for long enough, it may affect the soundness of the wood (see visibly sound section). It is still a monumental cedar as long as:

a. the **log length** meets the criteria set in these standards, and;
b. the breaking point is in the upper third of the tree (section 3 in figure 13).

If the breaking point is below the upper 3rd section of the tree, it is still a *Haaksda tree* (see *Haaksda tree* section above).

If a Yellow cedar has a broken top, and meets the other acceptable defects it may be considered a ***Haaksda tree.***

Spike Top: A cedar with a spike top can be considered a Monumental.

Figure 15. Examples of spike tops on cedars.

Twist: Twist, or spiral grain, is divided into different tolerance classes based on size. Twist is only measured on the **log length** of the tree.

Diameter class	Twist
100-120 cm DBH	25 cm over 1m on the log length
121-150 cm DBH	30 cm over 1m on the log length
150-200 cm DBH	35 cm over 1m on the log length
200+ cm DBH	40 cm over 1m on the log length

Figure 16. Maximum acceptable twist.

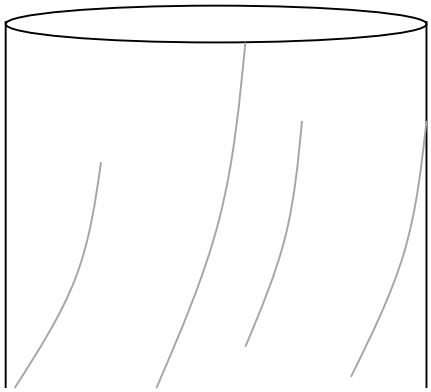


Figure 17. example of right hand twist

1.5 Cultural Cedar Stands Identification

Cultural Cedar Stands, for the purpose of Cultural Feature Identification, are defined as three or more Culturally Modified Trees, Monumental Cedar, or a combination thereof, where each tree is within 50 metres of another tree. Figure 18, example A, shows two trees within 50 metres of each other, and a third that is a greater distance, therefore not qualifying it as a cultural cedar stand. Example B shows 3 trees where each tree is within 50 metres of at least one other tree, therefore qualifying as a cultural cedar stand.

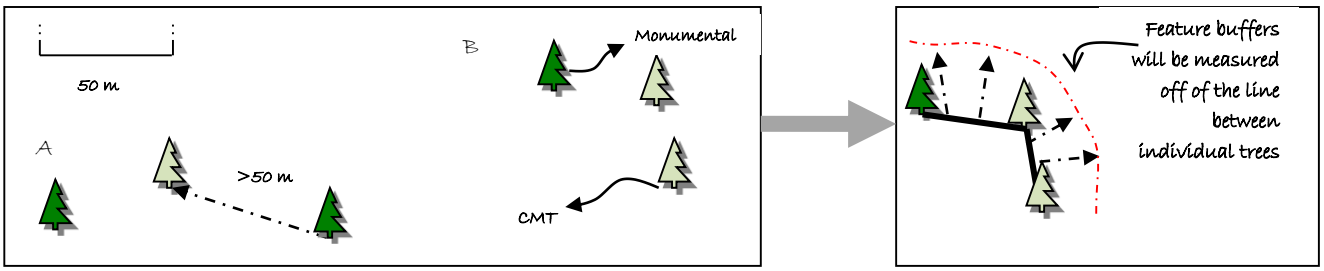


Figure 19. Example A is *not* a cultural cedar stand. Example B *is* a cultural cedar stand.

Distances between trees are measured between the tree centres, as shown in Figure 19.

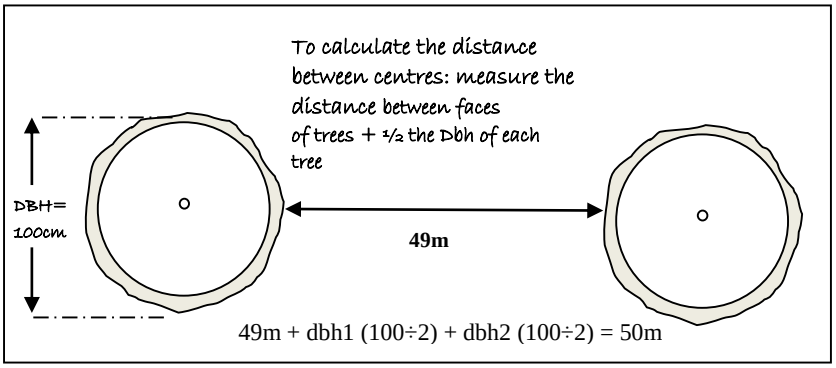


Figure 20. Measuring 50 metre distance between trees.

For identifying a cultural cedar stand, ensure that location coordinates are measured for each tree.

1.6 Haaksda Trees and Monumental Quality Wood

Haaksda Trees*:* Haaksda trees are a class of cultural cedar that are Monumental-sized cedar which are in a state of decline. These could be retained on site with a reserve and management zone buffer or recommended by the CFI surveyor to be removed and provided to the Haida Nation for cultural use.

Indications of decline are as follows:

A forked/candle tree: is considered a *Haaksda tree* where:

c. A fork occurs in any section of the tree below the top third but the log length meets the other acceptable defects in this standard, **and;**

d. The tree has a visible split or crack that originates from the fork/candle and is longer than 1 metre. A split or crack should not be confused with a bark seam.

Broken stem: If the broken or snapped stem is below the 3rd section in figure 13 (i.e. the lower 2/3rds of the tree) and meets the other acceptable defects within the log length it is considered a ***Haaksda tree.***

Visibly sound: Trees that are less than 50% visibly sound and meet the other acceptable defects within the log length may be considered a ***Haaksda tree.***

Corrugation: If a bark seam or seams cover more than 50% of the log length and meets the other acceptable defects within the log length then it is considered a *Haaksda tree*.

Frost Cracks: Yellow cedar trees with frost cracks above the log length and meet the other acceptable defects within the log length then it is considered a *Haaksda tree*.

Flat Tops: Yellow cedar trees with frost cracks (regardless of its placement on the tree) **in addition** to flat tops and meet the other acceptable defects within the log length are considered a *Haaksda tree*.

Western red cedar and yellow cedar can last for decades (or centuries) if dead and standing or dead and down on the ground. Haida artists, including woodworkers, carvers or carpenters can use high quality cedar for cultural use, regardless of whether it is harvested live or salvaged dead wood.
This section is therefore meant to address dead or down trees, typically encountered during commercial salvage operations. These trees, for the purpose of administering commercial forestry development, are considered Monumental Quality Wood as described below (dead snags, dead or down wood). In the event these are encountered during CFI surveys, they should be documented and made available to the Council of the Haida Nation through the Cultural Wood Access Program administered by the CHN and the Ministry of Forests, Lands and Natural Resource Operations.

Dead Snag: if the tree is dead it is not discounted as having monumental quality wood as long as it is visibly sound and is not in advanced stages of decay. While the 'dead top' defect does not apply, acceptable snags (illustrated as the middle tree in Figure 20) will have:
no foliage present; up to 50% of twigs lost; most branches present; and a possible broken top.

Figure 21. Stages of decay. left image is a suspect living tree; middle image is dead tree with foliage missing (snag); right most image is a snag in a more advanced stage of decay (no twigs).

Dead or down wood:
Dead or down western red cedar or yellow cedar logs that can be qualified as having monumental attributes can be considered as being Monumental Quality Wood. These logs must be qualified as being free from defect, or as having acceptable defects listed in this manual. This applies to any log or tree that is not self supported, including recent blow down.

1.7 Western Yew

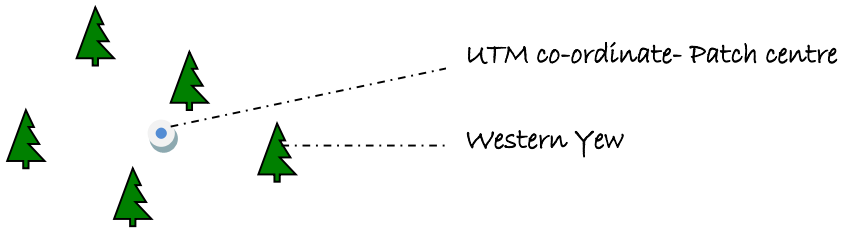
Individual western yew trees are considered a feature. Spatial coordinates are not required for individual yew trees when the distance between trees is less than or up to approximately 20 metres. In these cases a spatial coordinate can be taken at the geographic centre of a group of trees and trees are either flagged or

the area is mapped in the report. In all cases, the number of stems must be recorded. In these cases it is still intended for the trees to be managed as individual yew stems (as per the Haida Gwaii Land Use Objectives Order).

While individual Western Yew trees are considered a feature and must be documented, further clarification is given here regarding Western Yew patches. Western Yew Patches are defined as five or more Western yew trees where each yew tree is within 5 metres of another yew tree. In this case, much like Cultural Cedar Stands, the feature can be linear (straight lined) as long as one tree is within the required distance on another tree.

Note that a Western Yew Patch is a polygonal feature made up of 5 or more separate points. Individual stems do not require spatial coordinates. Rather the UTMs or BC Albers for the estimated geographic centre of the patch should be recorded. See section 3.7 of the CFI Standards manual.

Ex.



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 21. In these cases, each new stem is considered a separate tree for the purposes of patch identification.

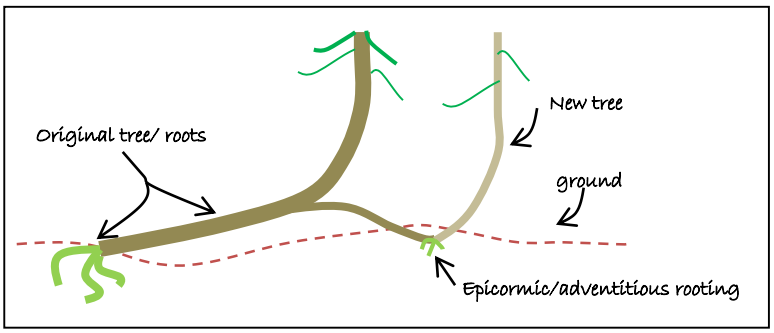


Figure 23. Epicormic rooting in Western yews

1.8 Black Bear Dens
Four types of black bear dens are:

1. Hollow trees: Dens are typically located in the inner cavities of hollow trees ; they generally provide the best dens for coastal black bears. Most live and dead hollow trees used as dens are in western redcedar (*Thuja plicata*), yellow-cedar (or cypress, *Chamaecyparis nootkatensis*) trees and western hemlock (*Tsuga heterophylla)*, These species tend to rot inside while retaining a hard outer shell, creating an empty centre. Natural openings often occur in the butts of these trees (but occasionally at candelabras or branch-holes) and are often further modified by bears to gain entry to the interior cavities (look for the bite and claw marks and hair, see below). Some hollow western or mountain hemlock trees (*Tsuga mertensiana*) have above ground entrances accessed through branch-holes.
2. Logs: Dens are sometimes located inside, or under, pieces of logs, including un-merchantable wood left behind after logging. Cedar logs decay slowly and can be used for decades whereas hollow logs of other species tend to decay much more quickly.
3. Root boles: Dens are occasionally found under the root mass of overturned trees, typically caused by windthrow. Root boles can be formed by any tree species.
4. Large old growth stumps: Dens can be found inside the base of large high-cut stumps. Sitka spruce (*Picea sitchensis*), andWestern hemlock stumps are more likely to be used than Cedar or Cypress, which, being hollow, typically lack a "roof" after logging.

Identification of Dens

Dens can often be identified by the presence of hair, claw and bite marks (both on the entrance and inside the walls of tree cavities). The presence of hair is the strongest indicator that the cavity has been used as a den. Other signs of use include marking on surrounding trees, the presence of vegetation used as a bedding inside the structure and the absence of any scats nearby except a first defecation or "fecal plug" containing hair from grooming, prey, bone chips or salmon bones. Numerous claw marks that extend up the outside of a tree may indicate repeated climbing to and from an elevated black bear den. It is very unusual for a bear to use a den at any other time of year aside from the den period. If there is recent sign of a bear utilizing a cavity outside the denning period, such as multiple scats at a bed, it is likely not a den. The exception is that females with newborn cubs may linger near the natal den until the cubs are old enough to leave safely.

Entrances to black bear dens may be very small (40 cm tall, 20 cm wide), which makes them easy to overlook. Bears likely select for dens that have entrances that are just large enough for them to fit through for security from potential predators. A large adult male black bear can fit through an entrance as small as 42 by 32 cm.

It is often difficult to determine how recently a den has been used. The colour and amount of decay of the vegetation in the bedding material can be used to estimate recent use. However, because cavities are typically very dry, normal vegetative decomposition does not occur. Bite and claw marks may likewise look fresh, especially when bark has been removed, but should not be used as the only indicator of recent use. Recently used dens will look freshly dug, with little or no plant, moss or lichen establishment near the entrance or on downslope material.

Den reuse by bears across years is not uncommon. Field crews should be aware that the signs they observe and record may be from the same bear across multiple years or from multiple bears, including family members. During the winter, coastal black bears have been known to move between a number of dens.