The Pacific Yew Tree
Taxol
Sustainability
and the Yakoun Lake Basin
Ecological Reserve

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Pacific Yew Description

The Pacific Yew is also known as the Western Yew, Bow Plant, and Medicine Tree, or as Taxus brevifolia Nutt.,to biologists. It is undoubtedly the rarest of all the coniferous trees in B.C. . It's range is limited to the coastal temperate rainforest from Alaska to northern California, with some occurrence in the Columbia forest region of the Kootenays, with some occurrence also in Alberta, Montana and Idaho. It has a preference for mid elevation, with some growth observed from near sea level to below upper tree lines. Primarily it likes wet sites, and on the coast occurrs in a band of the temperate rainforest that is of a climax nature, that is , a forest that is long established with a multi-storied canopy and fairly shady. These trees do not favour bog conditions nor sandy soils such as dunes. I have observed the Pacific Yew in sites that are primarily deciduous, and even on rocky lands standing almost alone, as well amongst weed species of brush. In each of these cases the size and expected age of the tree would correspond to a situation of that specific site showing evidence of fire, logging,or other land clearing events that left the yew tree alive while its surrounding conifer stands had been removed.

The Pacific Yew tree is very long lived, and very slow growing. Though it is possible, I have never seen a piece of yew wood that has less than 30 rings to the inch, and generally one needs a magnifying glass or very good eyesight under good lighting conditions to count the rings at all. Each hard and soft, or narrow and wide ring set,of course, corresponds to one year of growth. Generally the ring sets are of the order of from 40 to 120 rings per inch in the coastal stands. I have never identified a yew tree that is smaller than 2 inch diameter, nor have I spoken to anyone who has seen one much smaller than that. I have seen thousands of yew trees alive and also pieces from thousands of felled ones. Certainly the younger they are, the harder they are to identify as the bark can appear very similar to Western Red Cedar, Yellow Cedar,Mountaian and Western Hemlock, and even some varieties of pine , or fir, particularly when young. Bark is generally reddish to brown, and ranges from smooth like an arbutus, to stringy like a cedar, but is usually reddish and somewhat scaled , though often lightly ridged and flaky somewhat like a hemlock when young. The older trees are sometimes quite distinct in bark appearance with reddish and large flake scaled look, but also may be somewhat ridged-stringy like the Western Red Cedar.

The largest Pacific Yew trees that generally have been discovered are in the 1 to 2 foot diameter range. The largest that I have seen was about 3 foot diameter and very tall for a Yew tree. It was in the Yakoun area. " The largest example of the species currently recorded in B.C. is 3.1 feet, 90 cm., in diameter and 73 feet, 22.3 meters tall..." (P.49 Hiking Guide to the Big Trees of Southwestern B.C. , 2nd Ed.,1991, Randy Stoltmann W.C.W.C. Vancouver, B.C.) Randy notes that one Capilano River example is slightly larger in circumference by 2 inches, and a another is slightly taller by 11 feet. Consevatively estimated these 3 foot diameter giants of the species would be 800 years old, and possibly over 2000 years old.

Pacific Yew Description

The needles of the Pacific Yew are of a darker green colour than those of virtually any other conifers in our coastal forests. They have a very shiny appearance on the top sides and the under side is a slightly lighter green , while of a slightly duller hue. The needle configurations are quite flat and very regularly spaced along the outer twigs. The needles also occur along the inner parts of the branch and even sprout out of the trunk often. They are about 5/8 to 1 inch long, and quite even in length at any one part of the tree.

Pacific Yew is often a fairly scragly looking tree. It usually has a lot of branches, with sometimes several trunks originating from a common base, and often many large branches starting low on the tree. Similarly with spruce, and firs, it has many small sprout branchlets coming out of the main trunk(s), but yew often can be seen with very large numbers of these small branchlets ,often originating from a small area of the trunk, this also occurs along the larger branches. On an older tree, particularly on drier sites, or in dense overstory cover, these small branchlets are rare on the lower parts of the tree. Sometimes one will find an older tree that is relatively straight and well proportioned like other conifers, but usually it is bent, and or quite twisted in its growth shape.

Yew trees propagate in nature in two ways. Primarily the distinct, and unique to conifers, is the production of a berry rather than a cone. The berry is about 3/16 to 1/2 inch long and about 5/32 to 7/16 inch wide, round when viewed from above , and slightly oblong when viewed from the side . It almost looks like a red huckleberry, sometimes slightly pink but generally quite a clear red. It has one or two seeds within its soft flesh, and the seed is a creamy yellow tan to tan brown in colour. The flesh, though possibly toxic has a very pleasant flavour,something like a combination;red huckleberry, kiwi fruit, watermellon,combined taste. I have eaten the flesh of up to 20 of these at a time with no ill effects. The seed which is very hard, is quite another story, I cracked one once, and that will be the last time. It gives off an immediate toxic flavour , something like 1000 bitter almonds all at once. It is best to be avoided, and much mouth rinsing should accompany any accidental seed cracking.

Yew trees like most conifers, are of the female genus, or of the male genus with pollen flowers. Probably as with most conifers, both occur on the same tree occasionally. The berries occur on the female trees during mid to late summer, and seldom if never occur on the same tree every year. Generally a tree will produce only a few berries in its cycle year, though I once saw a tree in a thick yew grove at Yakoun Lake which had thousands of berries on it. This tree is about 1 foot plus in diameter and near 50 feet tall, it is a very conical and regular shaped tree, and covered with berries looked like the original Christmas tree. After a few months of development and ripening, the berries fall off , or are ingested by birds or other animals and the seed is thus spread. Given the rarity of these trees, obviously the seeds germinate only in very specialized conditions. Perhaps too, since these trees seem to have few surviving seedlings, particularly on the Charlottes, the seedlings are being eaten by deer or other animals.

Pacific Yew - Uses

Pacific Yew is used by people in our society for items other than medicinal. The wood is used for decorative furniture and trim. It takes considerable air drying, and must be longitudinally cut small to prevent continued warpage from changes in air humidity. It should also be well sealed for similar reasons. It is highly prized for its colour, hardness, bendability, and natural preservative qualities. It is also used to some extent on boats for trim and on heavy use surfaces. Occassionally carvers make fine wood pieces from it, and handles for many uses have been crafted from yew. Tools for several applications are regularly made due to its unique properties. Some of these are fish clubs, gaffs, shake block mallets, woodcarvers mallet heads; rake,hoe and shovel handles, and even axe handles. It is still used by native people in traditional ways,including the carving of some of the finest canoe paddles. Hand made bows are created of great durability and strength.

Commercially it is used in the manufacture of bows, both single and compound, generally in a laminated form.

Internationally the Japanese value it highly for ceremonial puposes.

People that end up with huge stacks of it left over from logging waste practices, often can find no other ready use than to cut it up and use it for firewood,as it burns very hot, so hot it warps good stoves.

In B.C. and elsewhere on the west coast it has been called iron-wood and in the past was occasionally used by people as bearing blocks.

Traditionally, coastal native peoples used the wood for many practical items. It was the main wood used to make their short , strong bows, also for spears, and for atl -atl: a sling like device used to magnify strength and accuracy while spear throwing. As now , it was used to make fine canoe paddles by the Haida,and for fish clubs. Among other woods,such as knots from large coastal trees it was used for war clubs. It was the preferred wood for digging sticks, pry bars, and numerous tool handles. It was used for bark and hide scrapers, fiber softeners, including bark, and for weaving and spinning tools: including the unique coastal spindle whorls. As a hard beautiful wood it made fine decorative items related to dress and jewelery. It was common among kitchen utensils, though generally kept away from food. Men used slats of yew for body armour in battles. It was also used in fish traps, wiers, snares, fish hooks, animal snares, and for other items of the hunt.

Indian medicines that incorporate yew are generally made by breaking the bark into small pieces, and then simmering for several days to make a concentrate medicine extract. When scarce, the wood and other parts of the tree were also used. Depending on the sort of cancer or other serious illness, and the condition and needs of the patient, various amounts were given orally to the patient over weeks or months. To alieviate side effects of the taxol, and to more effectively target certain cancers , other particular plant parts were prepared and mixed with the yew medicine. Commonly a mix of three including yew was given.

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Taxol

The most recent development by corporate pharmaceutical laboratories reguarding Taxol was reported by Bristol-Meyers Squibb on Friday Jan. 29, 1993. They said they"had made speedier progress than expected in synthesizing the drug from a Taxol precursor found in European and Himalayan Yew trees." As a result , "no yew harvest will be necessary on public lands in 1993" in the U.S.A., Bristol-Meyers Squibb,"two years ago were given exclusive rights to all yew on Federal land. " (New York Times Jan 31, 1993.)

According to their figures it takes about 60 pounds of bark from approximately 4 Pacific Yew trees to completely treat one ovarian cancer patient with Taxol. Other estimates range from 3 trees to 6 trees to provide enough yew bark to extract and refine the taxol for a cancer treatment of one patient. Obviously the size of the tree and the size of the trunk, branches and the amount of bark removed vary greatly with these generally small coniferous trees. The Haida Indians claim it takes the bark from approximately 2 yew trees,with their process , mixed with other medicinal plants , to cure one cancer patient.

In the U. S. last year 1.6 million pounds of bark was harvested for the early trials of these treatments. In B.C., Tower Phytochemicals aquired 60,000 pounds of bark in 1992. (The Province, Jan 6, 1993) In 1991, Bristol -Meyers needed about one- half of the 1992 amount, only 750,000 pounds of bark for its clinical studies. It takes 22 pounds of bark from the Pacific Yew tree to make 0.04 oz.,or 1 gram of taxol.

The first time that I heard of the bark of the "Medicine Tree", or Pacific Yew being used for cancer treatment was in 1976 on the Queen Charlotte Islands. An older man had a bad case of lung cancer, and was near death with other treatments having failed him. After some time with treatment by the "Indian Medicine", he was completely cured. That medicine he told me,contained yew bark plus other ingredients. The first major paper that I have heard of that outined the "Indian Medicine " and it's uses,was about 1979, by a Dr. Deagle practicing out of Masset, B.C., now of Toronto. He received his information from Haida people, most notably from Florence Davidson of Masset; and also from his observations of various people who had taken the medicine as a cancer cure.

Other west coast natives have also used "Indian Medicine" containing yew bark and other parts of the tree. "We have used yew medicine for centuries", but it's only considered a drug when the drug companies come along. " said Ellen White, an Elder and Healer with the Nanaimo Indian Band (Macleans Magazine May 1990) The mix of medicinal plants used by the natives still remains a secret to virtually all except a few select healers. However they generally use less than the drug companies do,of the Yew bark component. And it sounds like they have a more complete success rate, using less bark, more of other medicinal plants, and with fewer bad side effects. Perhaps the native healers should be the ones given any exclusive rights to yew harvest, or for that matter; the production and distribution of the medicines so derived.

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Taxol, is a drug derived in laboratories from the Pacific Yew tree , or Western Yew (Taxus brevifolia Nutt). It was first derived pharmaceutically in the late 1960's.(Macleans Magazine May 1990) By "1979 researchers had discovered that taxol killed cancer in a unique way.(Newsweek Aug. 5, 1991)

As of April last year, only 10 to 20 B.C. women were to be treated for ovarian cancer with taxol, and only 300 worldwide in 1991. (CBC) As recently as 1990 only 40 women in all of Canada were treated for ovarian cancer with taxol.(Macleans May 1990) There are over 2000 women in Canada suffering from this 60% plus fatal disease. 12,000 women in the U.S. will die from it this year, and breast cancer will kill another 45,000 women in the U.S.(Newsweek Aug 5,1991). Thousands of women in Canada, and untold thousands worldwide will die from breast cancer this year alone. Thousands more from ovarian cancer worldwide. As well millions of people worldwide suffer and are dying from other cancers that probably can be treated by this drug.

Health and Welfare Canada, and the U.S. Food and Drug administration, in their recent approvals of taxol use , have reported that studies have shown taxol use can shrink tumors in about one-third of ovarian cancer patients whose tumors resisted conventional treatments. (Province Jan. 6, 1993) As well, taxol " halted or slowed progression of tumors in more than half of twenty five breast cancer patients enrolled in a study" (Vancouver Sun Jan. 4, 1992). In addition, early studies suggest that it may be useful in treating cancers of the breast , lung, head, and neck."(N.Y.Times Jan.31,1993) Other early reports indicated that taxol may be most useful in treating otherwise untreatable child-hood Leukemia, that claims many thousands of victims annually.

There are side effects experienced by many,in the use of taxol. "Side effects included muscle aches, numbness in hands and feet, and hair loss" (Vancouver Sun, Jan.4, 1992). Other " known side effects, including extreme nausea and low blood pressure , that can be so severe as to prevent up to 10 percent of patients from useing taxol " (Macleans May 1990).

Some of the side effects are not experienced by those using the original "Indian Medicine",I am told by reliable informants. Hair loss is one of those that can be minimized by treatment with the original potions. However, the entire process is scary and not without risks, as evidenced by many Haida and other natives that will not risk the treatment, and instead choose to go to approved health clinics. This of course is one of several reasons that the "Indian Medicine " formula and its administration have been closely guarded secrets for centuries, and still are. One other main reason for this guardedness has been the realization by the healers that there are only a few million yew trees in existence, they take a long time to grow, can only grow well on undisturbed soil, in climax forests, and do not regenerate or spread easily even then. As well, the current methods of harvesting yew and other conifers certainly bear out their concerns. As well,the healers have long recognized that there are a lot of people out there with cancers, and the numbers continue to grow phenomenally. When our society regularly treats the land, plants, animals, and waters with respect, then the native healers will undoubtedly reveal many more of their secrets

There are not enough yew trees out there to cure everyone that could potentially be treated with "Indian Medicine " , especially if the yew is harvested as it is currently being done. As well, the other ingredients in the " Indian Medicine " are also rare. What chance is there that these other ingredients would be harvested with any more respect than is currently given to the Pacific Yew or "Bow tree ", or any other of the innumerable species in our irrepaceable rainforests.

With so many uses in cancer treatment , yew medicine will continue to be used increasingly with great success. However, with such limited supplies available, and much environmental controversy surrounding the harvesting, pharmaceutical companies continue to seek out various substitutes and synthetics. Meanwhile "the United States Forest Service and the Bureau of Land Management... only this month... had published a plan for selectively harvesting ten percent of all Pacific Yew trees over the next several years for Bristol - Myers, which two years ago was given exclusive rights to all yew on Federal land." (N.Y. Times)

Bristol-Myers has not stated that it will stop cutting Pacific Yew on private lands , or in Canada, but it has mostly switched harvesting to European Yew and Himalayan Yew. However, the supplies of these trees are limited also, though the European Yew is easier to grow and probably more abundent. Will the supply of these trees be sufficient to supply the ever increasing human suffering wrought by yew treatable cancers ? Probably not, and in a few years Bristol -Myers and other international concerns will be back at it, harvesting like there is no tomorrow. The current demand is great, but when word really gets out, I would expect the value of a single yew tree could rise to upwards of a million dollars per tree.

At this time I expect that Bristol - Myers is targeting primarily the Himalayan Yew (Tibetan Yew) . This too is a rare tree, and very important to land stability, moisture collection, biodiversity, eco-system integrity, and of indigenous cultural importance. The lands that support this variety of yew have very few trees left at all. As well I am sure that many in these impoverished lands would be quite willing to harvest their Himalayan Yew, for the few dollars that would be offered for their harvest, and before the locals realize their loss.

Should we be implicit in responsibility for the further demise of the Himalayan biogenetic environment simply because our B.C. and American coastal governments will not adopt a policy of only sustainable harvesting of regenerative parts of the Pacific Yew tree ? I hope not! We need to protect some of the most vital stands of these rare Pacific Yew trees in ecological reserves , for future enjoyment, study, and understanding. And we also need positive government policies of protecting the trees while harvesting needles, and regenerative branches, while allowing the main part of these healthy trees to continue growing for the future.

Other than only an occasional outcropping of berries on the Pacific Yew,another method of propagation seems to be fairly prevalent with this extremely hardy and long lived tree. During its slow growth and long life,a yew tree,is subjected to many forces of nature in the old growth forest that is its usual home. Some of these forces include; sliding soil base, heavy winds, floods, heavy snow covering, soil and rock slides, avalanches; trees,limbs,and tops falling on them, fire, large animals such as bear or deer rubbing against them, and beaver partially or completely cut some. Also these trees are often growing on a slope, or they grow out of the ground at an angle. In any of these situations over the many decades or centuries of their life span,the tree will often end up with branches or even the main trunk of the tree lying on the ground, and covered over by soil or rotting vegetation. Thus earth bound, parts of the tree will send up shoots, becoming branches, which then may become independently rooted, similar to red cedar. Over time the old trunk rots away and the newer rooted parts become independent trees. I have seen dozens of such trees in my thousands of miles of travels in coastal forests.

A third possible method of natural propagation may be occuring with yew trees. In ideal conditions, pieces of the live tree that break of under various conditions may become rooted, much like greenhouse cloning. Further study needs to be done to confirm this.

Recent studies of plant propagation, including cloning,indicates that this may be possible with yew in greenhouse conditions. It may even be possible to clone yew trees from cell cultures, in a process known as "organogenesis ". (N.R.C. Science Dimension #6 , 1985 , Ottawa) Also, recent trials have shown that the Pacific Yew can probably be grown from seed in greenhouse conditions that are heavily shaded. Of course , since these trees are very slow growing, and would require extensive tending for decades, any harvest is at least twenty to fifty years away using such methods.

Harvesting

Currently in B.C. and elsewhere,the Pacific Yew is harvested the regular course of clear cut logging operations. The trees that have been cut and are left lying on the ground to rot after regular yarding, are noted or sought out, and if they have only been cut for one year or less the bark is stripped off of the larger parts. Also, now timber cruisers are noting where the yew is growing, and in cut blocks that have been approved for felling, yew bark gatherers are sent in to fell and strip the yew trees in advance of the regular logging crews. Again the harvesters strip off the bark from the larger parts of the tree, leave the rest , and sell the bark for about $1.50 per pound (1992 prices Vancouver Island, Queen Charlotte Islands) The rest is left to rot, except for some that is taken by loggers for exotic firewood, and the occasional piece taken for decorative furniture. Unfortunately for the firewood burners, this wood burns so hot that it has warped many a good wood stove.

Pacific Yew is still mostly left to rot on the ground as has been the case for over a century of careless clear cut logging.

Harvesting

Other more sustainable harvest methods of the Yew - Medicine Tree are possible and desireable, leading to a sustainable resource. Recent research has indicated that taxol can be derived from the needles of this tree. The Haidas claim that they have used the needles and even the wood to make their highly potent cancer cure. However, the bark remains as the most concentrated and easily available source of the taxol extract, or derivative, at least using current harvest methods.

If the needles only are harvested, then with care, and only some of the needles removed, the tree will continue to grow , and within a year or two, another needle harvest can take place, from the regrown needle crop. This assuming that the tree is not completely or overly stripped each time or too often.

Another method of sustainable yew harvest is probably even more practical and sustainable, and would undoubtedly yield even more taxol per tree ,, per harvest. This involves leaving the tree growing but harvesting only the branches. If the Pacific Yew has only one , or even a few of its branches removed, while leaving a large majority oof the tree growing, then it will continue to grow and thrive. Indeed, several factors of the trees unique properties ensure much new growth from this method.

The taxol that is present throughout the tree acts as a natural fungicide and pesticide, as well as a preservative. It is so strong that broken off trunks lay on the ground mostly intact for what appears to be a hundred years or more in some places, and still hard as wood. Some mosses and lichens do survive on old or dead yew, however most do not. Fungus does not take hold on these dead parts, and insects do not eat up these dead tree parts , unless very old and finally rotting after centuries.

Another factor that allows continued harvest of the yew tree is one that I noted in the general description of the tree. That is the abundent presence of small shoots that grow out of the tree from its trunk and branches. These branchlets, when given more light or nutrient , or adjacent larger branches are removed or break off , then these little shoots take off and become true branches. Hence if the tree is properly pruned of some of its branches , then it will continue to grow, and produce more new branches, to replace those that have been removed. The remaining trunk and the large portion of the growing needle covered tree continue to provide photosynthesis, and soil nutrient to the fledgling branchlets. Of course one should not crop all of the side branches or much of the top branches, but a mix of reasonable size branches , ensuring continued vital growth and a new crop for the not too distant future.

If the yew is thus harvested, the removed branches can be stripped of needles, and twigs, and all of the needles, twigs, branch ends, and the main limb parts can be carried from the forest for complete harvest processing. Undoubtedly more taxol can be provided from each tree, each time this is done, than is now provided from an equivalent size tree using the current one time only harvest method. Using this method the same tree can be harvested time and time again, with a wait in between of anywhere from ten to fifty years.

Certainly such Haida use examples of selective cutting of yew branches can be seen at several places around the Queen Carlotte Islands - Haida Gwaii. This can be seen in the Yakoun Lake Basin, also in a grove near the Haida village abandoned in Kootenay Inlet, and on a small island in Skidegate Inlet.

The best example that I have seen of this traditional ongoing sustainable harvest of yew is on one small one hectare island in Skidegate Inlet. Of all conifers, only yew trees grow on this island. (plus one;10 to 20 year old spruce sapling.) There are many other species of deciduous trees and shrubs , plus grasses, and lichens, ferns, and mosses, but of conifers;only yew trees. A dozen or so Pacific Yew thrive there. It is adjacent to another equal sized small island that has no yew trees on it,but most other local conifers and deciduous trees,plus shrubs,etc. The yew tree island has been used extensively in pre -historical times, and perhaps even since contact. The base stumps on this island are up to 1.5 feet in diameter, and they are only about 30 feet tall at the tallest. Looking at them , they are very branchy, and quite alive. The base of the trees have been worked. The branches have been removed regularly when they were about 2 inches plus in diameter. There are dozens of 2 inch diameter branch stubs left on some of these. As one gets closer to the ground, each stub appears to have been cut at an earlier time than the ones above, though there are exceptions to this. As the yew toxin is strong it is hard to tell how long such proceedures were administered, or exactly which branches were taken first. However the trees remain strong and healthy, and many new shoots still sprout from these trees. In fact these trees have at least as many large branches and associated foliage as on the average undisturbed yew tree in old growth forests elsewhere. It appears that these trees haven't been harvested for at least 50 years. Many of the branches are now 3 inches or more in diameter. This island is probably part of a Haida family,traditional woodlot and medicine gathering plot, though I have not done an extensive inquiry in to this particular islands heritage history. It is in an area that was heavily fought over in past centuries.

Thus the discoverers of taxol also discovered and maintained the sustainable regrowth and harvest method most suitable for maximum continued availability for the uses of yew. This particular site was probably harvested for both bark and for tools,

The Haida Indians also used the berry of the tree for a particular medicinal use. However, these can also be harvested sustainably, and probably like many other native use berry plants, the more that the berries are harvested, the more that they regrow.

Clearly though,the current method of harvesting only the bark of the Pacific Yew , while cutting and killing the entire tree , is a crime that can be avoided. The harvest of the entire branch, several from each tree, while leaving the better part of the tree to regrow and fourish, can provide much taxol from this great natural source for generations to come.

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It is clearly evident that the demand for both the bark and for other parts of the yew will continue, and undoubtedly increase. " "Scientists hail taxol as one of the most promising cancer drugs of the past ten years. " (Macleans May 1990) Cancers are definitely on the increase both with incidence and with death, worldwide as well as in Canada. "'But the diappointing statistics on cancer mortality are no longer in dispute, and there's growing recognition that a whole new approach is needed. "' (John Bailar of McGill University: Vancouver Sun Feb 22, 1993) "Some, such as breast cancer, brain cancer, and melanoma, are rising rapidly " (Ibid.) The patients and drug companies are near desparate for solutions. '"We will try every possible way to get this drug "' (Spokesman for Bristol-Myers Squibb ;Macleans 1990) Towers Phytochemicals Ltd. of B.C. will buy"two to three times that amount this year " , compared to their 60,000 pounds of last year. (The Province Jan.6 ,1993) "Its harvest can be managed in a way that allows for the production of taxol without endangering the continued survival of the yew tree. ... No resource can be more valuable or more important than a human life." (Sally Christensen , Newsweek Aug. 5, 1991)

Yakoun

The Yakoun Lake Basin and upper River Corridor are important in many ways. The biodiversity there is incredible in and around this second largest body of freshwater on the Queen Charlotte Islands. This is the headwaters of the largest river of Haida Gwaii. Sockey s salmon, spring salmon, and all of the other fish species that come to fresh water on the Charlottes com to this lake and its tributaries to spawn and let their young grow. Seabirds, and land birds frequent this warm basin, sometimes lots, sometimes just a few. Species of plants that are not found elsewhere or are rare on the archipelago are found here. Orchids, lillies, mosses, grasses, lichens, herbs, and medicinal plants that are seldom seen elsewhere on the Charlottes thrive here. Mountain Hemlock and varieties of hemlock, perhaps mixes with other varieties, perhaps unique, thrive here. Of the three kinds of sitka Spruce identified by the Haida are present here. Most of the 9 kinds of Red Cedartthat are recognized by the Haida are found here. Yellow Cedar, Shore Pine, and rare to the Charlottes Black Cottonwood, are also found here in large examples. And the Pacific Yew is abundent. These are some of the reasons that the Haida called this the Medicine Bowl.

The incredibly rich presence of yew in this basin makes it the most favoured candidate for a Pacific Yew ecological reserve. Until the north-west shore around to the south end and back to the east side is given strong protection, the very large numbers, and large yew trees are threatened here with the prospect of collection by commercial yew harvesters. However, the lack of roads to the lake makes access to these trees dificult. Their presence to the tops of the hills at tree line makes the need for Basin protection necessary. On close examination of this basin the varieties of mini environments there is incredible. Within short stretches of less than a kilometer, one can find several different ecological type changes, as well as changing

viewscapes. There are even three major weather patterns to be found over the length of the lake basin.

Recreational possibilities in this area are recognized and of great potential. However the incredible richness of this bio-reserve cannot be ignored, and the strong presence of the yew is vital in this matter.

If the methods for sustainable harvest of the Pacific Yew are implemented as I have outlined here in this paper, then an everlasting supply of this great medical resource can be assured . Indeed, most of the yew that is not given special protection in parks or ecological reserves will be harvested or at least modified somewhat over the next several decades. This bowl can be the best preserved example of the Pacific Yew in its natural state that we can hope to provide.

We must attempt to create a successful sustainable harvest of our rich natural renewable resources in this province and worldwide. If we are to ensure such sustainability then we definitely need to preserve our best examples of species in their best environments, such as the yew in the Yakoun Lake Basin for future generations, and for continued study and education.