



# Little Qualicum River Estuary Regional Conservation Area 2010-2019 Management Plan

## Appendices

June 2010



Guardian of the Estuary

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## Appendix A User Survey Results and Other Feedback

In the end, 75 people completed the user survey mounted on the LQRERCA Management Plan project page on the RDN's web site. All survey responses are presented below. Note that some questions permitted multiple answers, so percentage figures shown for any one question may not add up to 100. In the case of multiple choice questions like #2, individual surveys were analyzed in order to obtain some of the results presented in the main document of the management plan.

		Response (%)
Q1	The beach and waters around the LQRERCA form part of the Province's WMA. Do you ever visit the beach or waters in this part of the WMA?	
	Yes	89
	No	11
Q2	How do you usually get to the WMA at the Little Qualicum River estuary? Please check all answers that apply.	
	On foot	54
	By bicycle	18
	By vehicle	67
	By kayak or canoe	11
	By power or sail boat	4
Q3	If you visit the WMA at the Little Qualicum River estuary by foot, bicycle or vehicle, where do you usually enter the WMA? Please check all answers that apply.	
	At the Province's public water access at the western edge of Surfside Drive	94
	From your own property along the WMA beach	8
	Other	5
	Other	
	Property adjacent to Crown land & LQRERCA (south bank of river)	
	Neighbouring farm	
	Flamingo Drive	
Q4	For those who visit the WMA at the Little Qualicum River estuary by boat, please list where you usually launch your boat to start.	
	Somewhere along Qualicum Beach	
	Surfside Drive (2)	
	Deep Bay (2)	
	Little Qualicum River	
	Canoe under the 19A bridge	
	LQ River, upstream off Waters Drive	
	Kayak from Columbia Beach	
	Surfside Drive	

		Response (%)
Q5	Approximately how often do you visit the WMA at the Little Qualicum River estuary?	
	Every day	4
	Once a week	15
	Once a month	49
	Once a year	32
	23 Comments	
	Sometimes more often	
	Every couple of months	
	5 to 6 times per year	
	Approx 6 times per year	
	Every 2 years	
	Sometimes more than once per year	
	Two to three times per year	
	5-6 times per year	
	Once a week in the late summer, autumn to observe s	
	Approx six times a year	
	Twice a year	
	3 or 4 times a year	
	2 or 3 times a year	
	Every few years	
	Occasionally; a few times per year	
	Every day in certain seasons, once a week in others. Probably average 75 visits per year.	
	Three or four times a year	
	Six times a year	
	Irregularly. A few times per year.	
	Several times in August and September to fish.	
	As landowners of recreational home/property on McFeely we usually visit the estuary area many times during our cottage time.	
	When I am at my summer place on Flamingo Drive.	
	Two or three times a year.	
Q6	At what time of year do you usually visit the WMA at the Little Qualicum River estuary? Please check all answers that apply.	
	Just during the Brant Wildlife Festival	9
	Just when the WMA is not closed to dogs	3
	Just during the late summer-early fall salmon spawning season	22
	In the spring	72
	In the summer	75
	In the fall	78
	During the winter	52

		Response (%)
Q7	What do you usually do when you visit the WMA? Please check all answers that apply.	
	explore the beach	78
	view wildlife in or on the water	91
	view wildlife on the land	75
	exercise	30
	walk the dog	15
	fish	9
	relax	45
	have a picnic	16
	socialize	13
	have a campfire on the beach	3
	6 Comments	
	Observe	
	Take photos	
	We are thankful for such a beautiful, and to us, magical place to enjoy nature.	
	Swim	
	Pick up shells for crafts	
	This is a wonderful sanctuary for bird watching which I do either by myself or with a group.	
Q8	The Little Qualicum River Estuary Regional Conservation Area or LQRERCA consists of the small spit of mostly fenced land on the east side of the Little Qualicum River estuary, and is only readily accessible by way of the WMA beach. Have you ever crossed the fence or otherwise gone into the LQRERCA?	
	Yes	39
	No	61
Q9	At what time of year do you usually go into the LQRERCA? Please check all answers that apply.	
	Only during the Brant Wildlife Festival	3
	Only when the WMA is open to dogs	0
	In the spring	79
	In the summer	69
	In the fall	76
	During the winter	45
Q10	What do you do in the LQRERCA? Please check all answers that apply.	
	View Wildlife on the water	97
	View wildlife on the land	86
	Visit the cairn	21
	Fish	7

		Response (%)
Q10 cont'd	What do you do in the LQRERCA? Please check all answers that apply.	
	4 Comments	
	Seek unusual shells	
	Photo and video work	
	Wildlife photography	
	I was only there once for the DUC dedication	
Q11	Would you be interested in volunteering as a park warden at the LQRERCA?	
	Yes	16
	No	84
	11 Comments	
	Mainly interested in birdlife. I am not available full time nor until after 04/10.	
	Not physically able to do so.	
	Citizens on Patrol - we visit the area as on almost every patrol.	
	We would need more information before answering question #11.	
	Interested in preserving integrity of Little Qualicum River forest cover up stream to protect integrity of the estuary, wildlife, biological diversity, and cultural treasures.	
	As long as the expectations on participation are not onerous. Have a great deal of interest in improving fish habitat -- water and riparian area.	
	Wildlife protection from disturbances caused by dogs.	
	I am already a steward on the Arrowsmith Massif and have no extra time for other areas.	
	Pretty well anything that would ensure the environmental sustainability of the area.	
	We overlook the estuary from the south bluff and transportation plus time restraints make it difficult for us to access the estuary on a regular basis; however we do take an active interest in preserving this valuable area.	
	Our property overlooks the LQRERCA, we wish to see its beauty kept.	
Q12	Q12. What do you value most about the Little Qualicum River estuary as a whole? Please check only one answer or provide your own.	
	The beach	26
	The biodiversity	41
	The rare and fragile upland ecosystems	41
	The wildlife viewing opportunities	51
	The peacefulness and tranquility	51

		Response (%)										
Q12 cont'd	Q12. What do you value most about the Little Qualicum River estuary as a whole? Please check only one answer or provide your own.											
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Q13	Are you interested in learning more about natural and cultural environments at and around the LQRERCA?											
		Yes 85										
		No 15										
Q14	Would you participate in free guided tours of the LQRERCA?											
		Yes 84										
		No 16										
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		Response (%)
Q15	How can we best communicate about the natural and cultural features of the LQRERCA? Please check all answers that apply.	
	Interpretive signage along the LQRERCA fence	70
	General information about the LQRERCA contained within a brochure about all RDN parks and trails.	42
	A detailed RDN brochure about the LQRERCA.	24
	Interpretive signage at the Surfside Drive access to the WMA that addresses the LQRERCA and the WMA.	62
	A detailed brochure on all three conservation areas at the Little Qualicum estuary.	58
13 Comments	Establish controlled public access from the south side Hwy 19A side with appropriate signage.	
	Take care not to publicise to the point of turning it into just another beach for funseekers.	
	RDN does not seem able to produce concise brochures, they concentrate on promotion!	
	Occasional tours of the area would be interesting.	
	All three of the areas signage is old, and faded...also there is nothing that has been printed about where all this started, who looks after it, and what is being done for these areas in the future.	
	Talks to interested/community groups.	
	Video, photos, website, special events like rivers day, media coverage....	
	Advertise on TV - make a movie.	
	Do not spend money on features that need constant updating or that are vulnerable to vandalism. Create a level of respect for the area such that most people will have a willing reluctance to venture into the area. Be mindful that we do not want to increase vehicular traffic into the residential area that has been (unwisely) allowed to be developed out towards and onto the spit.	
	On site enforcement of laws pertaining to disturbance of wildlife by dogs.	
	Public signage best gets the message out.	
	Articles in local newspapers from time to time. A tour by Shaw Cable to view on Channel 4.	
	Are you looking for a way to deter people.	
Q16	Are you concerned about any aspect of the LQRERCA or Little Qualicum River estuary? If yes, please describe those concerns.	
	Yes	79
	No	21



		Response (%)
Q16 cont'd	Are you concerned about any aspect of the LQRERCA or Little Qualicum River estuary? If yes, please describe those concerns.	
51 Comments	<p>I am always concerned that our small pieces of protected land and water will remain protected and safe from degradation by any number of possible sources.</p> <p>Proliferation of overwintering Canada Geese. Absence of elevated duck nests. Any thought to adding wood duck nesting boxes? (or cavity nesting bird boxes) Why has no effort been made to solicit and integrate all adjacent properties &amp; property owners?</p> <p>The health of the estuary. Concerned that the estuary cannot or will not be restored to its original or healthier state. That activities further up LQR will damage the health of the estuary, the watershed and aquatic habitat of the river.</p> <p>I think it should be managed as is. It was designed to protect the area, if you let the public in you/and we lose!</p> <p>Development of any kind.</p> <p>The need to protect whatever natural environments we have left in the RDN.</p> <p>Dogs running loose in the area chasing wildlife.</p> <p>Despite two conversations with the person(s) responsible for the bird sanctuary no one appears to care about the birds. There is a home owner across the street from the sanctuary who owns up to 8 cats which freely roam the sanctuary and do what cats do, kill birds. We now have no pheasants, no quail and I don't know how many the other bird populations have been affected. There is a onsite caretaker who could be given instructions to live trap the cats, return them to the owner and if they return have them destroyed. This I was advised by the person in charge is within their rights. This is a bird sanctuary not a cat playground.</p>	



Q16 Cont'd	51 Comments	<p>In particular, I am concerned about the up-stream impact of development and forestry practices which may impact the LQRERCA. For the LQRERCA to remain healthy, the whole area which impacts the reserve is of vital concern.</p>	
		<p>Concerned about First Nations sites on the estuary. Concerned about the Little Qualicum River all the way to Labour Day Lake and Mt. Moriarity. Concerned about the salmon stock of the LQR.</p>	
		<p>I've seen dogs roam through the area flushing and harassing wildlife. Educating people about why they shouldn't allow dogs to run loose only goes so far. If the area is to be conserved, then there should be stronger protection as in fences that dogs can't get through or around.</p>	
		<p>Inappropriate human and domestic pet behaviours. Local residents using it as an exercise area for themselves and pets. Partying.</p>	
		<p>My concern is that after living here for more than 2 years, this is the first I have heard of this area. All I knew was that it seemed to be inaccessible -- not public friendly. there were no signs that I noticed. If I had any idea that such an area existed, I could have tried to find the information.</p>	
		<p>I would like to see it maintained as a sanctuary for wildlife in the fenced area, and maintained for people outside the fence and along the beach and river.</p>	
		<p>The preservation of the whole area.</p>	
		<p>The whole L.Q. watershed is of vital importance to the health of the environment. Preservation should not be restricted just to the estuary.</p>	
		<p>Leave it the way it is. A viewing platform would be a big help, similar to Englishman River estuary. At present, it is quite difficult to view any wildlife except by kayak.</p>	
		<p>Rising sea level or heavy runoff down the river after a heavy rain can destroy it.</p>	
		<p>Over use could damage habitat. Development of larger homes along this area could change the atmosphere of the region.</p>	
		<p>Environmental pollutants.</p>	
		<p>I want to see it preserved/protected and maintained in its natural state as much as possible. Would that mean restricted access? Not sure. Need to know more.</p>	
		<p>Nothing has been done for a long time for any of the three areas, LQRERCA, OR WMA OR NWA. The signage is old, and although I respect the area greatly, it needs work and a cleanup. I would be happy to spend some time doing this. We used to have an eagle's nest which blew down a few years ago. It was wonderful to watch the resident eagles have their family and to be able to watch them every day "in our own back yard" was a Blessing. Let's look after Mother earth or we will lose it.</p>	

		Response (%)
Q16 Cont'd	51 Comments	
	Concerned that more residential building may take place.	
	Possible rise in level of tidal waters due to global warming.	
	It's one of the best kept secrets. Why advertise? Play it low key and keep it peaceful there. The less people the better for the environment and those critters living there. Signage is pollution in a place like that.	
	I am a locally born and raised Qualicum person, with personal ties to the Little Qualicum River, with a keen sense of responsibility to not disturbing wildlife. I am a dog owner, and I am very annoyed with people being allowed to take ANY dog off leash at anytime in the Surfside Drive area, whatsoever. There is just no need for that and I would like the area signed as completely ONLY ON LEASH for DOGS at any time all year long for that area. It would be pretty clear and the word would get around and eventually people would come to respect that that is the acceptable behaviour for areas near sanctuaries. It makes sense. Set a precedent. I do enjoy allowing my dog loose on the Qualicum main beach to run on the sand when allowable, yet would continue to always keep my own dog on leash near sanctuaries and perhaps even wetlands like Hamilton Marsh trail.	
	Impacts to the hydrology, sedimentation, archaeological sites, wildlife, vegetation....by industrial logging in the watershed of the Little Qualicum River. Management of the salmon hatchery may have water quality impacts when unnaturally large quantities of carcasses are disposed of.	
	Need better public access, but in a way that maintains the integrity of the environment and ecosystems of the estuary.	
	Quality of life is in direct proportion to the quality of the natural environment we choose to protect. This is a good beginning. However, more information is required. The area being protected appears too small. All properties in the spit area should be protected. Construction or reconstruction should not be allowed. Fair value should be paid to owners as time and money permits. Much more sensible project than paying for a swimming pool in QB with our tax money. Time QB grows up and pays for its own pool. This would allow more tax money to be available for projects like this one.	
	That is might become "overmanaged" to the point of losing its wildness and natural ecosystem.	
	We continue to lose more and more sensitive habitat. The estuaries are hotbeds of biological activity. We lose them at our peril.	
	Would like to see rehabilitation from impacts such as Canada Geese and then left as a healthy functioning ecosystem. Once fully rehabilitated then only sustainable plant harvest for First Nations traditional use should be considered.	

			Response (%)
Q16 Cont'd	51 Comments	It is very troubling to hear about the difficulties that biologists are having in rehabilitating the area. Some of the recent efforts, although well-intentioned, seem questionable and do not appear to anticipate negative outcomes - thus wasting (volunteer???) time and money.	
		Upriver developments such as the Little Qualicum Village could have a negative impact on the estuary/river.	
		HADD	
		Pollutants from ground sewer surrounding the WMA LANDS.	
		Use of the beach by dogs who I often see chasing and harassing wildlife. In my view there should be a complete ban on unleashed dogs using this beach at all times, enforced by heavy fines, in addition to the bans that apply during Brant season.	
		I am concerned about the pressure from dog walkers to have the spit opened as a dog run area. We need to protect our wildlife from such disturbance, not sanction it. Can we not leave even our wildlife areas undisturbed? We have already destroyed and degraded far too much habitat. Wildlife cannot afford this extra disturbance. NO dog walking! No Boat Launch!!	
		People walking dogs off leash on the beach causing stress to wildlife especially birds. Also people not picking up their dogs' shit. The potential for increased access by fisherman to the estuary. Typically this causes great disturbance to wildlife and additional litter to the area. Walkers smoking on the beach and dropping butts.	
		Danger of motor boats and dogs running off leash disturbing the wildlife and delicate ecosystem.	
		I would hope that this area will remain protected as a wildlife area and not be released for general recreation which would destroy the area. We have more than adequate recreation area on Vancouver Island without releasing our most important sanctuaries and wildlife areas to boaters and dog owners. This would eventually destroy it all.	
		I really think that this area should be left as an area for wildlife and the enjoyment of viewing in its natural state. Please no dogs, commercial activity or anything to take away from the wildlife values...there are enough developed areas and areas for dogs and dog-walkers already!! There are huge economic spinoffs to natural areas being kept natural, and this will only increase!	

		Response (%)
Q16 Cont'd	51 Comments	
	I am concerned that the area will be popularized even more and that there will be a boat launch or off leash dog walking area considered for the area either of which will be detrimental to the wildlife of the area. There are so few areas like this left on the east central part of Vancouver Island as so many have become grassy parks, campgrounds, or trailer parks. This spot and several others in the area should in my opinion be managed for the preservation of wildlife and other natural features rather than making yet more areas for the general recreation of fishermen, boaters, dog walkers, and partiers all of which care more about themselves and their fun than the natural environment. Nature should come first!!	
	Human impact on the area. The fence helps with this. Human and pet impacts on wildlife. Off leash dogs are a big concern for impacts to waterfowl and shorebirds, especially during migration.	
	The area has become an unofficial off-leash dog park. Dogs should be banned from the entire area, year round. Sports fishing may also be having a detrimental effect upon the ability of wildlife in the area to make use of the habitat.	
	Get rid of dogs off leash.	
	I have concerns that recreation will not be held in check, to the detriment of wildlife.	
	Invasive plant species, any attempt to develop the area into a people-friendly park (it should be managed as a natural area), Canada Goose impacts to the estuary (erosion of vegetation and loss/degradation of habitat.	
	Populations of Canada Geese are increasing and I understand this is devastating the tidal grasses. Has any thought been given to organizing a hunt to reduce the population. If you could obtain a scare permit from CWS I would be pleased to organize a local hunt.	
	It should not be advertised as a regional "attraction" so as to draw hoards of tourists to the area. Generally people that are interested in this type of conservation area seek out and visit the lands individually or in very small numbers. The Marshall Stevenson area is a good example of how the area should be "advertised". It is there, noted on maps, but not with flashing neon signage to make it an "attraction". The areas for parking should not be enlarged or changed in any way. Status quo is the word. "pets"..as a property owner of beachfront on McFeely and after having walked from our property to the estuary many, many times over the last 16 years, I honestly say that a "pets" must be on a leash and under control at all times would be sufficient, as in other parks.	
	The main ones are people who trespass in restricted areas, & people who allow their dogs to run loose. Also, the proliferation of the goose population appears to be a problem. At one time there was a sign at the mouth of the LQ River prohibiting boats from going further up river using motors. The sign seems to have vanished and there is some increase in motor boat traffic proceeding up the river.	

Q17	We welcome any comments you may have about the LQRERCA and its management. Thank you for participating in this survey.		
	31 Comments	<p>Brant.... The Brant “Festival” seems to overshadow all other waterfowl initiatives in the area. The “Festival” is also highly commercialized and does not interface with other programs and initiatives. As such it compromises all the others!</p> <p>Strengthen the fencing and increase the signage explaining the protection aspect.</p> <p>On all brochures re Parks, Reserves, Marshes etc., there needs to be a brief, written description of how to reach it by road and/or walking trail, and location of nearest parking.</p> <p>This is a very fragile ecosystem and probably the best management is no manipulation of the landscape in any way and restricted public access.</p> <p>It is too sensitive and fragile an area to be “advertized” for its “recreational” attributes.</p> <p>Thank you for your work.</p> <p>See above.</p> <p>Try for an acronym that sounds better than LQRERCA!</p> <p>I would welcome more information on this area and the management of same.</p>	



		Response (%)
Q17 Cont'd	31 Comments	<p>Brant.... The Brant “Festival” seems to overshadow all other waterfowl initiatives in the area. The “Festival” is also highly commercialized and does not interface with other programs and initiatives. As such it compromises all the others!</p> <p>Why does accessibility to the conservation area appear so limited?</p> <p>Great job in protecting this land. Thank you.</p> <p>We know nothing about the association or its management.</p> <p>I am glad I attended the very well presented Open House on Sep 15 at Oceanside Place and will report on what I learned to other members of the Nanoose Bay Parks and Open Space Committee and urge them to be informed by visiting the site.</p> <p>I do think it would be wise to have patrols that can sometimes, now and then, throughout the year, check the shorelines and people’s properties very close to tidelines, for campers’ human waste....squatters....illegal additions without proper septic... fuel dumping on properties or water...garbage dumping on shorelines...etc. Any type of possible pollution that could somehow get to the waterways through the ground. With so much building and construction and people’s desire to be near water, there are most likely a few offenders that really do not care and are doing illegal, inconsiderate disposal of any waste. It is something that has always had me wondering, “who keeps an eye open for pollution sources in the immediate area, either side of the river, by making investigations and enquiries”?</p> <p>Although I welcome conservation efforts I would be offended by a complete ban on human visitation. Being able to experience magical places first hand privately and respectfully can inspire love of natural places and consequently contribute to their preservation.</p> <p>Management activities need to be better publicized and explained.</p> <p>Good beginning but much more needs to be done.</p> <p>We do not think that enough is being done to protect sensitive areas.</p> <p>Estuaries are apparently some of the most “productive” habitat for plant and animal organisms. Only about 3 per cent of the coast is made up of estuaries. Most are badly ruined (primarily by human activity) particularly in the E&amp;N land grant area. Is it too much to ask that given this estuary has been provided with some form of environmental protection by way of covenant that it be allowed to revert to a perfectly natural area, and protected as such -- just like the Burgess Shales of Field BC?</p> <p>I would like to see as much done as possible to preserve this area as a functioning habitat for wildlife.</p> <p>Just keep it as pristine as possible and try to allocate some funds for the education of the public.</p>

		Response (%)
Q17 Cont'd	31 Comments	Please, just leave it alone except for the addition of interpretive signage and upgrading the fence that is already there.
		I cannot stress enough my concerns about dogs charging along beach areas such as this and doing damage to the area and scaring away birds or doing damage to nesting birds and their young, as well as bothering people trying to enjoy the natural beauty...this should be a dog-free zone...no questions asked!! I really like dogs, but not in this kind of an area at all!!
		I would like to see pet dogs either excluded from the LQRERCA entirely, or no-leash rules enforced more stringently. Off-leash dogs are a concern for wildlife as well as children in the area.
		Canoes and kayaks should be discouraged from entering the estuary.
		All dogs to be on leash. Have signage for dog owners to clean up after their dog.
		While I am a proponent of recreation in natural areas, I feel that some special ecological zones need added protection from human impact. In my mind, wildlife values trump recreational values and while it is desirable to have people allowed to observe and record, to promote wilderness values, sometimes it is needed to re-route humans around these areas, in order to preserve the original habitat in its pristine state.
		Your plan makes sense and I appreciate your efforts.
		Congratulations on this aquisition and we all look forward to seeing nothing change.
		A heartfelt Thanks and Congratulations to all involved in presenting a very comprehensive and impressive report. It's a shame that use of the estuary has to be restricted because some people seem to lack good common sense but it is a fact, and many very useful suggestions have been made to preserve the area, e.g. a viewing platform, more signage, fence improvements, and curtailing the reproductive capabilities of the pesky Canada goose among them. It makes me hopeful that this beautiful area will be protected and preserved for future generations.
		At present my wife and I are newcomers who purchased property overlooking the LQRERCA and hope to see it maintained.



As part of the draft management plan review process, a comment form was made available on the project web page. Five respondents completed this form. Note that some respondents skipped some of the questions.

Q1	Are you satisfied that all major concerns about the LQRECA have been examined in the draft Management Plan?		Response (#)
	Yes		4
	No		0
	Comments	I am not an expert so do not know if something is missing. All I know is that we humans have not taken very good care of the ecosystems that sustain the plants, animals, birds, fish and humans. Let's get moving and implement.	
Q2	Do you support the vision and management goals set out for the LQRECA in the draft Management Plan?		
	Yes		4
	No		0
	Comments	If your vision is to prevent any further habitat destruction then my answer would be yes. It is unfortunate that people (small groups) cannot enjoy this conservation area.	
Q3	The draft Management Plan concludes with a list of actions for the 2010-2019 period that are aimed at reaching the LQRECA vision and management goals. Would you add or delete anything from this list of proposed actions?		
	Yes		0
	No		4
Q4	Do you agree that the primary conservation action in favour of the LQRECA 2010 to 2019 should be helping to resolve the goose problem at the Little Qualicum estuary?		
	Yes		4
	No		1
	Comments	Also prioritize getting dogs permanently prohibited. We don't feel that the geese are a problem.	
Q5	The draft Management Plan recommends delaying development of limited restricted public access to the LQRECA until priority conservation actions can be advanced. Do you agree with this approach?		
	Yes		5
	No		1
	Comments	As priority conservation actions will take a decade or more to develop, perhaps installation of a board-walk could allow some public access and encourage public cooperation. Yes & No. Yes, delay public access in perpetuity. We have exploited almost everywhere so I think humans should restrict access.	

Q6	What thoughts or ideas do you have about eventually developing limited restricted public access to the LQRERCA?		Response (#)
	Comments	As above. Limited access could be allowed on a guided tour basis for educational purposes.	
		No. Too many humans do not acknowledge that humans are the most destructive predator on the planet.	
		Never improve/increase parking opportunities. This is a priority CONSERVATION area so no more “promotion” required. Wildlife need privacy and undisturbed spaces. Many alternate recreational and wildlife viewing opportunities are already available e.g. QB Brant viewing stand/Q Beach main/Eaglecrest beach/French Creek Marina/Columbia Beach/Rathrevor et. etc. etc. For same as above reasons no “group” organized tours are needed.	
		Keep dogs away. Leashed dogs may be acceptable.	
		May be only limited public access to a lookout platform would be good, all other areas fenced.	
Q7	On-site signage and brochures about the estuary and LQRERCA are important means of communicating about natural values and appropriate user behaviour in these sensitive areas. Do you think creating a virtual estuary experience on the web would go further in helping to limit or at least influence recreational use taking place at and around the LQRERCA?		
		Yes	1
		No	4
	Comments	I think it would only encourage more human traffic in the sensitive area.	
		People want to come and see. Too much publicity draws more people and more imprint.	
		Virtual experience = just another way of “advertising” this area. Put all efforts into signage on site re appropriate behaviour.	
Q8	Has reading the draft Management Plan helped dissuade you from going onto the fenced LQRERCA spit or confirmed your reluctance to do so?		
		Yes	3
		No	1
	Comments	Confirmed reluctance to do so.	
		Never did anyway.	
		But I’m still disappointed that I can’t enjoy it.	
Q9	Does the draft Management Plan encourage you to play a role in monitoring conservation values or public use at and around the LQRERCA?		
		Yes	3
		No	2
	Comments	Already working full time to protect what little natural habitat is left.	
		Would volunteer to help out anytime.	
		I don’t live right in the area but I do have a vested interest in it.	

Q10	Please provide us with any other thoughts you have about the draft 2010-2019 Management Plan for the LQRERCA?		Response (#)
	Comments	Looks realistic.	
		Let's implement this plan, it is good.	
Q11	The LQRERCA User Survey is accessible from the same Management Plan project page as this comment form. The User Survey helps us understand how people recreate at and around the LQRERCA, and what value they place on the estuary lands and waters. Have you completed the LQRERCA User Survey?		
		Yes	3
		No	1
Q12	Please tell us where you live.		
		Electoral Area G -- in the vicinity of the Little Q estuary	2
		Electoral Area G -- other	0
		Town of Qualicum Beach	1
		City of Parksville	1
		City of Nanaimo	0
		Other Regional District of Nanaimo	1
		Outside the Regional District	0



**Michel, Joan**

**From:** Andy Pickard [andy.pickard@nucleus.com]  
**Sent:** April 16, 2010 4:10 PM  
**To:** Michel, Joan  
**Subject:** LQRERCA - BELATED INPUT

Joan, I regret that I was unable to complete and submit the questionnaire on the LQRERCA earlier this year. My wife and I have a very strong interest in this area – we overlook the western end of the estuary and thoroughly appreciate the view and wildlife we see daily.

I want to strongly encourage continued conservation of this area, with minimal development or advertising. Specifically, I recommend:

- There is a need for 'no trespassing' signs to be posted down the side of the Little Qualicum River from below the bridge to the mouth of the river. We see fishermen during the spring and fall, and campers during the summer, walking or boating down the river, and entering the sanctuary. In most cases, I expect they have no idea that it is a wildlife sanctuary.
- Great Blue Herons are again nesting in the sanctuary – all people, including naturalists, should stay right out of the sanctuary for the next few months. The herons are readily disturbed if people walk past their nest, and they leave the nest unprotected at such times, as we saw two years ago.
- If staff must enter the sanctuary to remove old debris, they should do it after all nesting activity has finished.
- By all means, discourage Canada Geese, but don't disturb the Great Blue Herons to addle the geese eggs or to take other measures.

I'll be glad to become a 'steward' for the sanctuary – we have an excellent view over much of the area all day.

As an aside, regarding the Brant Geese and the 'no dogs on the beach' policy. I'd recommend changing that to "no dogs on the beach, and no people, especially photographers, within 300 metres of Brant Geese or feeding areas at low tide." I have not seen any dogs on the beach in front of us, disturbing the Brant, but I have certainly seen people, usually photographers and sometimes clam diggers, approaching Brant or going out to feeding areas so Brant won't go there to feed.

Thanks and best wishes.

Andy Pickard  
3789 Island Highway West  
Qualicum Beach, B.C. V9K 2C7  
Canada  
andy.pickard@nucleus.com  
250-752-3364

27/05/2010

Michel, Joan

**From:** Terry Mobberley [thmobb43@hotmail.com]  
**Sent:** February 26, 2010 2:38 PM  
**To:** Michel, Joan  
**Subject:** RE: Draft Management Plan Now Available for Little Qualicum River Estuary Regional Conservation Area

Firstly...thank you for what to me has been generally speaking...a well-organized & coordinated...albeit informative solicitous...overall program.

My own comments are strategic rather than technical & based on some practical experience (s), to wit;

1. With such a large (potentially "confusing") body of stakeholders...it is imperative that only one spokesman cum acronym/pointy-top of the pyramid)...be identified...& have publicly have carriage & be seen as being "responsible"...or have "authority" on behalf of the stakeholder consortium. This is especially important when it comes to...signage (effective/cohesive), issues around "seasonality"/access restrictions or even enforcement...and in terms of promulgating information or news releases. *Present "arrangements" & trying to understand who/what/how/why is like unscrambling an omelet...at least to me.*

2. I had a truly unpleasant (rude/belligerent/bullying attitude) encounter (south side of estuary)with an individual who was (I'm not clear) either a self-appointed -or- stakeholder appointed "warden". The attitude and heavy handed abuse by this officious individual was absolutely unacceptable...especially if he had any legitimate authority. To risk inflicting this type of behaviour on the public at large (rather than politely informing)...is to put at risk the very best conservation/protection program...especially in smaller community environments.

2.1 Therefore...I suggest cancelling all present enforcement, policing or prohibitive administrative arrangements... and re-constituting them on a basis from which to engender good-will & public understanding/education (& potentially support or in the very least...respect).

2.2 Similarly...all signage (especially) along the south margins of the estuary...needs to be clear, properly established/located...with an appropriate understandable message (per #1 above).

3. A program of encouraging appropriate access...needs to be established, especially for birders, photographers, school visits (& source of clean-up help) & those having more of a vested interest. Out & out "Prohibition" is passe (& damaging in my opinion). "Stress" in migratory or local waterfowl in particular is over-rated. In looking to establish more contemporary access parameters...look to the programs at Point Pelee Ontario, Oak Hammock & the Fort Whyte Nature Conservancy in Manitoba, Aransas Pass Texas (where Whooping Cranes overwinter), Crane Lake Idaho...and their "versions" of public access cum management that is species/seasonally appropriate before reviewing or establishing "prohibitive policies". (Blue Herons with their unusual courtship/pairing has been going on for at least a month now although colony nesting takes place somewhere else...& is probably the most "sensitive" species in the estuary. Unfortunately eagle proliferation has become nesting heron's greatest risk factor).

4. Can a local (sponsorship) program be initiated to provide tree nesting boxes to attract Wood & other cavity nesting ducks as well as Owls, Kestrels & the like? This ideally should be extended further along the river's watershed into the Federal Governments Salmon

spawning channels upriver...which would benefit the estuary & engender public goodwill. (I was able to re-introduce many such species really successfully right in the City of Winnipeg)

Finally...I'm confident I saw 2 American Woodcock in flooded brush at the estuary margin on at least 2 occasions.

Thank you again for this opportunity to comment.

Cordially

*Terry Mobberley*



**QUALICUM BEACH STREAMKEEPERS**  
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Qualicum Beach BC V9K 1G8  
250 752 9297 phone 250 752 0531 fax  
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RDN RECREATION AND PARKS	
GMR & P	
MCR Parks	
Arena	
FEB 25 2010	
Parks	AM
POSAC	Commission
Director	Other

RDN Recreation and Parks  
Oceanside Place  
830 W. Island Highway  
Parksville, B.C.  
V9P 2X4

February 25, 2010

Attention: Joan Michel, Parks and Trails Coordinator

Little Qualicum River Estuary Regional Conservation Area Management Plan

The Qualicum Beach Streamkeepers Society appreciates the opportunity to comment on the draft LQRECA management plan.

Overall, we view the draft management plan as a balanced report which has effectively identified the major concerns. Rather than go through each item we agree with, we strongly suggest it go through as is, except for one major alteration. We recommend that the development of a comprehensive watershed management plan for the Little Qualicum River be included as a high priority.

As you may be aware, Qualicum Beach Streamkeepers - with the financial support of the BC Real Estate Foundation - completed a community consultation process in 2006 which indicated a strong community consensus for development of such a watershed plan. The draft LQRECA plan notes, in Section 5.41, that a watershed plan would be ideal, but suggests that it will be some years before this could be achieved. We believe that such a plan can be undertaken much sooner.

Our own organization's work in protecting and enhancing the local aquatic environment has reinforced our belief that it is becoming increasingly important to have a watershed plan within which all the stakeholders and concerned organizations can make decisions with respect to each element of the Little Qualicum River and its watershed.

Qualicum Beach Streamkeepers Society is prepared to partner with other agencies in the development and implementation of such a watershed plan.

Yours sincerely,

Faye Smith  
On behalf of Board of Directors,  
Qualicum Beach Streamkeepers Society

## Appendix B Estuary History



Thomas Kinkade Jr., son of the first landowner at the Little Qualicum estuary, documented Aboriginal use of the estuary from the late 1880s. There were no Aboriginal People living there by that time, though there was evidence of a large (80' x 400') stockade recently built and burned down and the bones of many bodies lay about the spit. Kinkade Sr. was told that the people had succumbed to small-pox, and the stockade had been burned by the few remaining survivors before they left. Other bodies were found in canoes or in cedar boxes placed on the limbs of spruce trees. Kinkade Sr. interred the remains on his property.

Kinkade Jr. noted that Qualicum, Nootka and Haida people continued to visit the Little Qualicum estuary and camped along Qualicum Beach. They built fish traps in the estuary by driving rows of cedar posts into the ground to form multiple compartments. Willow switches were woven between the posts and long wings were used to guide the fish to one main entrance. When the tide went down, the fish were gathered. In July and August, the people collected cockles, horse and other clams, and wove them onto slender sticks which were placed on racks and sun-dried. If the weather was wet, they built smokehouses with cedar, and used maple and alder wood to smoke the shellfish.

Thomas Kinkade Sr.'s first look at the Little Qualicum River in 1867 was from a whaling vessel, when he and other crew members harpooned a whale at the river mouth. In 1882-83, he and his Aboriginal wife wintered on a sloop in the estuary; years later it sunk while anchored there. In 1887, Thomas Kinkade was granted Lots 9 and 11, including the spit, thus ushering in one of the oldest settlements on Vancouver Island. The Kinkades constructed a dyke 125 feet long, 12 feet wide and 10 feet high across the main slough to keep the water from surrounding their house. The family raised cattle and ran a fish oil business for the servicing of machinery.

In 1903, Japanese fishermen holding a drag-seine license collected 17,000 fish in one haul at the Little Qualicum estuary. A 130 foot by 60 foot saltery was constructed there from split cedar, and many large boxes each containing about 450 lbs of salt fish were transported to Chinese markets. In 1907, the fishermen began using gasoline-powered purse seiners. Within a few years, the number of seining vessels harvesting at the Little Qualicum, Big Qualicum and Englishman Rivers estuaries had increased from three to 75, and the rivers were almost depleted of fish. The Board of Trade and Fish and Game Club worked with the federal MP and Senator to prohibit seining in the area and delay gill net fishing until after October 10th. Eventually salmon populations recovered to some degree. Records from the Shady Rest Hotel showed that fishermen who caught 32 lb salmon were given gold buttons, and salmon up to 20 lbs were considered so insignificant that they were not even weighed.

The Kinkade farm was sold, subdivided into numerous lots and in the 1930s, partially re-consolidated. In 1940, Sherwood and Maureen Marshall purchased about 80 acres of the original farm; they bought the spit itself in 1962. The low marsh area at the estuary was a log booming ground from the 1930s to the early 1950s, with a sawmill operating on the spit for a few years after the war. Cattle grazed the marsh for many years after the war.

In 1974, the Marshalls donated 29 ha (72 acres) of their estuary lands to the

### At One Time...

“There were deer, elk, bear, ducks, geese, brant and grouse as tame as chickens,” Thomas Kinkade Jr. recalled. “Wolves were very often plentiful... Trout were very plentiful... they could be caught at any time of year and they were not choosy in regard to bait... Every river in this district was crammed full of salmon, from the sea to the falls.”

Canadian Wildlife Service for use as a migratory bird sanctuary, and the Qualicum National Wildlife Area - Marshall Stevenson Unit was born. The CWS also managed the undeveloped portion of the Marshall's spit and obtained informal tenure over foreshore Lot 379 (the former log booming area) in 1982. In 1993, the WMA was created and MoE took over management of the river mouth and lower estuary.

In 1985, a portion of the old west access road used to haul logs to the storage area by the mill pond was removed to restore tidal flow to the southern marsh. Log culverts had restricted estuarine circulation and the cycling of detritus, and discouraged the use of this area by wintering migratory birds. Although there had been no vehicular traffic on the road since it was officially closed in 1974, there was considerable opposition to the physical removal of the road from fishermen and other pedestrians. Because the estuary is small and wintering birds easily disturbed, CWS viewed the restriction of pedestrian access as an additional benefit.





## Appendix C Estuary Conservation

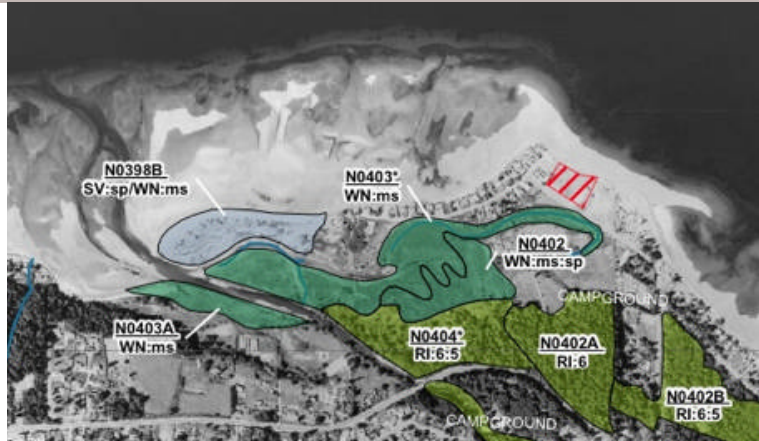
### C-1 Ecosystems

Comprehensive habitat and ecosystem studies of the Little Qualicum estuary began with the inauguration of the National Wildlife Area. In the late 1970s, Dawe & White (1982) mapped vegetation communities, and Jones (ref missing) mapped vegetation and substrates.

Figure C1 shows the 2004 Sensitive Ecosystem Inventory (SEI) classification of lands at the Little Qualicum estuary. Figure C2 shows results for the estuary from a 2008 Terrestrial Ecosystem Mapping (TEM) project completed for the entire Coastal Douglas-fir biogeoclimatic zone. The seashore saltgrass site association noted in the 2008 study is red-listed in BC. For a complete definition of BC's red and blue listed species and ecological communities, see [www.env.gov.bc.ca/atrisk/red-blue.htm](http://www.env.gov.bc.ca/atrisk/red-blue.htm). In short, red-listed communities, species and sub-species are extirpated, endangered or threatened in BC, and those blue-listed are of special concern and at risk but not extirpated, endangered or threatened.

Figure C3 presents a list of rare ecological communities that may be found at the Little Qualicum estuary. This list was produced by H. Clermont for this management plan using the Species and Ecosystems Explorer web tool available on the BC Conservation Data Centre home page ([www.env.gov.bc.ca/cdc](http://www.env.gov.bc.ca/cdc)), E-Flora ([www.eflora.bc.ca](http://www.eflora.bc.ca)), Mackenzie & Moran (2004) and Pojar & Mackinnon (1994). Based on the work of Dawe & White (1982) and the 2008 TEM study,

it is argued that five of these rare ecological communities are almost certainly present at the estuary today.



**Figure C1: Sensitive Ecosystem Inventory (SEI) of the Little Qualicum River Estuary (2004)**

SEI Polygon	SEI Code	Ecosystem
NO398B	SV:sp	Sparsely Vegetated: Coastal gravel and sand spits
	WN:ms	Wetland:Marsh
NO403	WN:ms	Wetland Marsh
NO402	WN:ms:sp	Wetland:Marsh:Swamp
NO404	RI:6:5	Riparian:Mature coniferous-deciduous forest (80-250 yrs old): Young deciduous forest (40-80 yrs old)



**Figure C2: Terrestrial Ecosystem Map (TEM) of the Little Qualicum River Estuary (2008)**

TEM Code	Description
BE	Beach
Em03	Seashore saltgrass ( <i>Distichlis spicata</i> var. <i>spicata</i> ) site association

**Figure C3: Rare Ecological Plant Communities Possibly at the Little Qualicum Estuary, Showing Those Almost Certainly Present at the Estuary**

Scientific Name English Name	Habitat	BC List	Almost Certainly Present
<i>Carex lyngbei</i> Herbaceous Vegetation Lyngbye's sedge herbaceous vegetation	Estuarine Herbaceous Wetland	Blue	•
<i>Carex macrocephala</i> Herbaceous Vegetation Large-headed sedge herbaceous vegetation	Sparsely Vegetated Herbaceous	Red	
<i>Deschampsia cespitosa</i> ssp. <i>beringensis</i> - <i>Aster subspicatus</i> Tufted hairgrass - Douglas' aster	Estuarine Herbaceous Wetland	Blue Endemic	
<i>Deschampsia cespitosa</i> ssp. <i>beringensis</i> - <i>Hordeum brachyantberum</i> Tufted hairgrass - Meadow barley	Estuarine Herbaceous Wetland	Blue Endemic	•
<i>Distichlis spicata</i> var. <i>spicata</i> Herbaceous Vegetation Seashore saltgrass herbaceous vegetation	Estuarine Herbaceous Wetland	Red	•
<i>Eleocharis palustris</i> Herbaceous Vegetation Common spike rush herbaceous vegetation	Wetland Herbaceous	Blue	•
<i>Juncus arcticus</i> - <i>Plantago macrocarpa</i> Arctic rush - Alaska plantain	Estuarine Herbaceous Wetland	Red	
<i>Ruppia maritima</i> Herbaceous Vegetation Beaked ditch grass herbaceous vegetation	Estuarine Herbaceous Wetland	Red	•
<i>Salicornia virginiana</i> - <i>Glaux maritima</i> American glasswort - sea milkwort	Estuarine Herbaceous Wetland	Rec	

## C-2 Flora and Fauna

The flora and fauna of the Little Qualicum estuary were documented in Dawe (1976), Dawe and Buechert (1995). The biodiversity of the WMA and viability of specific natural values found there were documented in the 1996 and 2003 WMA management plans (Clermont, 1996, Lanarc, 2003).

### C-2.1 Birds

At least 44 species of birds nest in the vicinity of the Little Qualicum estuary, including Bald Eagles. The Wildlife Tree Stewardship Program (WITS) has identified four Bald Eagle nests in and around the estuary as late as 2008, however the sites may not still exist or be active. As noted in the main section of this management plan, herons have been recently nesting at the spit. The BC *Wildlife Act* protects all bird nests while the birds are nesting, and protects heron and eagle nests year-round.

Fall migrant dabbling ducks arrive as early as August and peak in November. In winter, waterfowl including Trumpeter Swans and Canada Geese spend long hours in the estuary. Both species are known to cause damage to estuarine vegetation by overgrazing. Diving ducks such as Surf Scoters (blue-listed) make extensive use of the outer estuary. Loons, grebes and other waterbirds can be observed offshore. The Little Qualicum estuary is considered crucial to rebuilding the Brant population.

## C-2.2 Fish

The Little Qualicum estuary is an important rearing area for salmon, particularly in May and June. Chum begin to gather at the mouth of the river in late September, and by the end of November, there are many carcasses and scavengers to be seen in the estuary. Escapement data, that is numbers of fish that have escaped the fisheries and arrived at their natal stream for spawning, is available for chinook, chum and coho fall runs in the Oceans, Habitat and Enhancement section of the DFO Pacific Region website; search for Mapster in the Maps and Data section. Estimates of steelhead populations are available from BCCF. Numerous salmonid enhancement initiatives have been undertaken on the Little Qualicum in order to bolster salmon and trout populations. DFO maintains the Little Qualicum Hatchery facility with its network of artificial spawning channels located approximately five kilometres upstream from the estuary; see Map 1 in the main section of this Management Plan.

In addition to salmon, trout and herring, other fish sited at the Little Qualicum estuary include spiny dogfish, copper rockfish, shiner sea perch, Pacific hake, Pacific sanddab, three-spined stickleback, high cockscomb, prickly sculpin and coastrange sculpin. Provincially, the Little Qualicum estuary part of the Georgia Strait has become an increasingly important major herring spawning area. Herring spawning habitat is declining in the face of waterfront development.

## C-2.3 Species at Risk

There are many rare animals and plants at the Little Qualicum estuary, and possibly at the LQRERCA. These are listed in Figures C4 (animals) and C5 (plants) below. The following table explains the abbreviations used for Presence with respect of birds in Figure C4.

Abbreviation	Description
R	Resident, present year round
R	Transient, spring or fall migrant
W	Winter (December - February)
Sp	Spring (March - May)
S	Summer (June - August)
F	Fall (September - November)
Ab	Abundant: species almost always seen, occurring in very large numbers
Co	Common: species almost always seen, occurring in large numbers
Fc	Fairly common: species usually seen, occurring in moderate numbers
Un	Uncommon: occurring in small numbers, 10 or more records per year
Ra	Rare: normally occurs annually, seen fewer than 10 times per year
Ca	Casual: record on file, not seen most years
Ac	Accidental: species out of its range, unlikely to be seen again
Hy	Hypothetical: undocumented sighting
*	Breeding record for the NWA

**Figure C4: Rare Animals Documented at the Little Qualicum Estuary and Possibly Using the LQRERCA**

Derived by H. Clermont from CDC's Species and Ecosystems Explorer web data base (2008), pared down using E-fauna. Bird presence based on data for the NWA. Global, BC and COSEWIC rank information for this table available upon request.

Scientific Name	English Name	Class	BC List	Presence
<i>Rana aurora</i>	Red-legged Frog	Amphibian	Blue	
<i>Aechmophorus occidentalis</i>	Western Grebe	Bird	Red	CoW, FcT
<i>Calidris canutus</i>	Red Knot	Bird	Red	
<i>Accipiter gentilis laingi</i>	Northern Goshawk, laingi subspecies	Bird	Red	RaW
<i>Brachyramphus marmoratus</i>	Marbled Murrelet	Bird	Red	UnS, RaW
<i>Eremophila alpestris strigata</i>	Horned Lark, strigata subspecies	Bird	Red	RaT
<i>Falco peregrinus anatum</i>	Peregrine Falcon, anatum subspecies	Bird	Red	RaT?
<i>Melanerpes lewis pop. 1</i>	Lewis' Woodpecker (Georgia Depression population)	Bird	Red	Vancouver Island populations extirpated
<i>Phalacrocorax penicillatus</i>	Brandt's Cormorant	Bird	Red	CaW
<i>Pooecetes gramineus affinis</i>	Vesper Sparrow, affinis subspecies	Bird	Red	
<i>Sialia mexicana pop. 1</i>	Western Bluebird (Georgia Depression population)	Bird	Red	CaT
<i>Sturnella neglecta pop. 1</i>	Western Meadowlark (Georgia Depression population)	Bird	Red	UnW
<i>Ardea herodias fannini</i>	Great Blue Heron	Bird	Blue	CoR
<i>Asio flammeus</i>	Short-eared Owl	Bird	Blue	RaT
<i>Botaurus lentiginosus</i>	American Bittern	Bird	Blue	
<i>Branta Bernicla nigricans</i>	Brant	Bird	Blue	AbSp T, CaFT
<i>Branta hutchinsii</i>	Cackling Goose	Bird	Blue	+
<i>Bubo scandiacus</i>	Snowy Owl	Bird	Blue	RaW
<i>Buteo lagopus</i>	Rough-legged Hawk	Bird	Blue	CaFT
<i>Butorides virescens</i>	Green Heron	Bird	Blue	RaT
<i>Contopus cooperi</i>	Olive-sided Flycatcher	Bird	Blue	CaS
<i>Cygnus columbianus</i>	Tundra Swan	Bird	Blue	RaW
<i>Dendragapus fuliginosus</i>	Sooty Grouse (Blue Grouse)	Bird	Blue	
<i>Falco peregrinus pealei</i>	Peregrine Falcon, pealei subspecies	Bird	Blue	RaT?
<i>Falco rusticolus</i>	Gyr Falcon	Bird	Blue	RaW
<i>Gavia adamsii</i>	Yellow-billed Loon	Bird	Blue	RaW, CaT
<i>Glaucidium gnoma swarthi</i>	Northern Pygmy-Owl, swarthi subspecies	Bird	Blue	
<i>Hirundo rustica</i>	Barn Swallow	Bird	Blue	CoS*
<i>Larus californicus</i>	California Gull	Bird	Blue	FcT

**Figure C4: Rare Animals Documented at the Little Qualicum Estuary and Possibly Using the LQRERCA -- continued**

Scientific Name	English Name	Class	BC List	Presence
<i>Limnodromus griseus</i>	Short-billed Dowitcher	Bird	Blue	RaS
<i>Megascops kennicottii kennicottii</i>	Western Screech-Owl, kennicottii subspecies	Bird	Blue	RaR
<i>Melanitta perspicillata</i>	Surf Scoter	Bird	Blue	RaS, CoW
<i>Patagioenas fasciata</i>	Band-tailed Pigeon	Bird	Blue	FcS
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	Bird	Blue	UnR
<i>Phalaropus lobatus</i>	Red-necked Phalarope	Bird	Blue	RaFT
<i>Progne subis</i>	Purple Martin	Bird	Blue	
<i>Ptychoramphus aleuticus</i>	Cassin's Auklet	Bird	Blue	RaT
<i>Tringa incana</i>	Wandering Tattler	Bird	Blue	CaT
<i>Tyto alba</i>	Barn Owl	Bird	Blue	RaR
<i>Fossaria vancoverensis</i>		Gastropod	Red	
<i>Hemphillia dromedarius</i>	Dromedary Jumping-slug	Gastropod	Red	
<i>Nearctula sp. 1</i>	Threaded Vertigo	Gastropod	Red	
<i>Physella heterostropha</i>	Pewter Physa	Gastropod	Red	
<i>Carychium occidentale</i>	Western Thorn	Gastropod	Blue	
<i>Hemphillia glandulosa</i>	Warty Jumping-slug	Gastropod	Blue	
<i>Monadenia fidelis</i>	Pacific Sideband	Gastropod	Blue	
<i>Pristiloma johnsoni</i>	Broadwhorl Tightcoil	Gastropod	Blue	
<i>Promenetus umbilicatellus</i>	Umbilicate Sprite	Gastropod	Blue	
<i>Prophysaon vanattaie</i>	Scarletback Tail-dropper	Gastropod	Blue	
<i>Zonitoides nitidus</i>	Black Gloss	Gastropod	Blue	
<i>Erythemis collocata</i>	Western Pondhawk	Insect	Blue	
<i>Sympetrum vicinum</i>	Autumn Meadowhawk	Insect	Blue	
<i>Myotis keenii</i>	Keen's Myotis	Mammal	Red	
<i>Orcinus orca pop. 5</i>	Killer Whale (Northeast Pacific Southern Resident population)	Mammal	Red	Occasionally offshore
<i>Sorex palustris brooksi</i>	American Water Shrew, brooksi subspecies	Mammal	Red	
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	Mammal	Blue	
<i>Eschrichtius robustus</i>	Grey Whale	Mammal	Blue	Occasionally offshore
<i>Eumetopias jubatus</i>	Steller Sea Lion	Mammal	Blue	Offshore - seasonal
<i>Mustela erminea anguinae</i>	ermine, anguinae subspecies	Mammal	Blue	
<i>Phocoena phocoena</i>	Harbour Porpoise	Mammal	Blue	Occasionally offshore

**Figure C5: Rare Plants Documented at the Little Qualicum Estuary and Possibly Found at the LQRERCA**

Derived by H. Clermont from CDC's Species and Ecosystems Explorer web data base (2008), pared down using E-fauna. Global, BC and COSEWIC rank information for this table available upon request.

Scientific Name	English Name	BC List
<i>Lotus pinnatus</i>	yellow sand-verbena	Blue
<i>Allium amplexans</i>	slimleaf onion	Blue
<i>Allium geyeri</i> var. <i>tenerum</i>	Geyer's onion	Blue
<i>Anagallis minima</i>	chaffweed	Blue
<i>Aster curtus</i>	white-top aster	Red
<i>Bartramia stricta</i>	apple moss	Red
<i>Bidens amplissima</i>	Vancouver Island beggartick	Blue
<i>Bulbostylis capillaris</i>	densetuft hairsedge	Red
<i>Carex feta</i>	green-sheathed sedge	Red
<i>Carex tumulicola</i>	foothill sedge	Red
<i>Chamaesyce serpyllifolia</i> ssp. <i>serpyllifolia</i>	thyme-leaved spurge	Blue
<i>Cuscuta campestris</i>	field dodder	Blue
<i>Entosthodon fascicularis</i>	banded cord-moss	Blue
<i>Epilobium densiflorum</i>	dense spike-primrose	Red
<i>Isoetes nuttallii</i>	Nuttall's quillwort	Blue
<i>Juncus oxymyris</i>	pointed rush	Blue
<i>Juniperus maritima</i>		Blue
<i>Limnanthes macounii</i>	Macoun's meadow-foam	Red
<i>Meconella oregana</i>	white meconella	Red
<i>Microseris bigelovii</i>	coast microseris	Red
<i>Psilocarphus tenellus</i> var. <i>tenellus</i>	slender woolly-heads	Blue
<i>Ranunculus alismifolius</i> var. <i>alismifolius</i>	water-plantain buttercup	Red
<i>Rupertia physodes</i>	California-tea	Blue
<i>Schoenoplectus americanus</i>	Olney's bulrush	Red
<i>Senecio macounii</i>	Macoun's groundsel	Blue
<i>Sidalcea hendersonii</i>	Henderson's checker-mallow	Blue
<i>Toxicodendron diversilobum</i>	poison oak	Blue
<i>Trifolium dichotomum</i>	Macrae's clover	Blue
<i>Triglochin concinna</i>	graceful arrow-grass	Red

### C-3 Little Qualicum Watershed

Estuarine and other wetland ecosystems respond to small changes in hydrology such as reduced summer flows or lowering of the water table. Run-off from residential development and agricultural lands, as well as sediment from road building and forestry activities can affect water quality. Changes in water chemistry alter substrates and productivity within a watershed. Consequently, the structure and health of an estuary is largely dependent upon the ecological integrity of the watershed.

Map C1 shows the Little Qualicum River Watershed, along with adjacent French Creek and Englishman River watersheds. The Little Qualicum River is a Sensitive Stream under the BC *Fish Protection Act* and Sensitive Streams Designation and Licensing Regulations (Brandes and Curran, 2008). When a stream is designated as sensitive, the sustainability of fish receive highest priority; recovery plans may be required if fish are unable to rehabilitate naturally; water managers must consider the needs of fish before issuing a water license; water license applicants may be required to provide water flow and fish habitat information or find a reasonable alternate source of water; and water license applicants may be required to develop mitigation or compensation measures.

Biophysical inventories conducted to assess steelhead habitat capability in eastern Vancouver Island watersheds have noted changes over time in the form and structure of rivers such as the Little Qualicum. The river channels are wider, there are extensive gravel bars, pools are filling in and there are fewer of them. As well, there is little functional in-stream large woody debris. The harvesting of large conifers from riparian areas of mainstem and tributary channels, along with agricultural and residential development, have contributed to this change in river morphology over the years.



**Map C1: Little Qualicum River Watershed**

Map produced by RDN, November 2009

## Appendix D Bibliography

The following bibliography supports both main management plan document and appendices.

Austin, M.A., D.A. Buffett, D.J. Nicholson, G.G.E. Scudder & Stevens, V. (Eds.). (2008). *Taking Nature's Pulse: The Status of Biodiversity in British Columbia*. Biodiversity BC, Victoria. 268 pp. Retrieved from <http://www.biodiversitybc.org>.

Bernick, K. (1980). A site catchment analysis of the Little Qualicum River site, DiSc1: A wet site on the east coast of Vancouver Island, BC. A thesis submitted in partial fulfillment of the requirements for the Degree of Master of Arts in the Department of Archeology. University of Victoria.

Birdlife International. (N.d.). Important Bird Area Site Listing. Retrieved April 7, 2008, from <http://www.bsc-eoc.org/iba/site.jsp?siteID=BC056>.

Bornhold, B.D. (2008). Projected sea level changes for British Columbia. Retrieved May 10, 2009 from <http://www.env.gov.bc.ca/epd/climate/pdfs/sea-level-changes-08.pdf>.

Brandes, O. & Curran, D. (2008). Water licenses and conservation: Future direction for land trusts in British Columbia. Prepared for The Land Trust Alliance of B.C. University of Victoria. Retrieved February 9, 2009, from [http://www.waterdsm.org/pdf/Water\\_Licence\\_Report\\_FINAL2.pdf](http://www.waterdsm.org/pdf/Water_Licence_Report_FINAL2.pdf).

B.C. Conservation Data Centre. (2003). Imap. Retrieved May 9, 2009 from <http://webmaps.gov.bc.ca/imfx/imf.jsp?site=imapbc>.

B.C. Conservation Data Centre. (2008). BC Species and Ecosystems Explorer. B.C. Ministry of Environment. Victoria, BC. Retrieved April 29, from: <http://a100.gov.bc.ca/pub/eswp/>.

B.C. Conservation Foundation [BCCF]. (N.d.). Greater Georgia Basin Steelhead Recovery Plan watersheds. Retrieved April 26, 2009 from <http://www.bccf.com/steelhead/focus6.htm>.

BCCF. (2002). Watershed Summaries. Retrieved September 21, 2009 from <http://www.bccf.com/steelhead/pdf/Region1tables092702.pdf>.

B.C. Ministry of Community Services. (2006). Primer on Regional Districts in British Columbia.

B.C. Ministry of Environment [MoE]. (N.d.). Designation of Sensitive Streams Under the FPA. Retrieved April 27, 2009 from [http://www.env.gov.bc.ca/habitat/fish\\_protection\\_act/sensitive\\_streams/documents/senstrms-designation-licensing-regis.pdf](http://www.env.gov.bc.ca/habitat/fish_protection_act/sensitive_streams/documents/senstrms-designation-licensing-regis.pdf).

MoE. (2005). Provinces, partners expand MacMillan Provincial Park. News release, March 15. Retrieved April 24, 2009 from [http://www2.news.gov.bc.ca/nrm\\_news\\_releases/2005WLAP0019-000294.htm](http://www2.news.gov.bc.ca/nrm_news_releases/2005WLAP0019-000294.htm).

MoE. (2006). Estuaries in British Columbia. Ecosystems at Risk brochure.

MoE. (2008). Great Blue Herons. Develop with Care Fact Sheet #11.



- B.C. Parks. (N.d.). Spider Lake Provincial Park. Retrieved April 24, 2009 from [http://www.env.gov.bc.ca/bcparks/explore/parkpgs/spider\\_lk/index.html](http://www.env.gov.bc.ca/bcparks/explore/parkpgs/spider_lk/index.html).
- B.C. Parks. (N.d.a). Wildlife Management Areas. Retrieved May 2, 2009, from <http://www.env.gov.bc.ca/bcparks/explore/wma/index.html>.
- B.C. Parks. (1986). Master Plan for Little Qualicum Falls Provincial Park. Retrieved April 24, 2009 from [http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/littlequal/litqual\\_mp.pdf](http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/littlequal/litqual_mp.pdf).
- B.C. Parks. (1992). Master Plan for MacMillan Provincial Park. Retrieved April 24, 2009 from <http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/macmillan/macmillan.pdf>.
- B.C. Parks. (2002). Spider Lake Provincial Park Purpose Statement and Zoning Plan. Retrieved April 24, 2009 from [http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/spider/spider\\_ps.pdf](http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/spider/spider_ps.pdf).
- Bottom, D. and C. Simenstad. (2009). Guiding ecological principles for restoration of salmonid habitat in the Columbia River Estuary. Retrieved September 20, 2009 from [http://www.fish.washington.edu/research/wet/.../ecol\\_principles.doc](http://www.fish.washington.edu/research/wet/.../ecol_principles.doc).
- Campbell, C. (1984). Qualicum National Wildlife Area Interpretation Program, Annual Report.
- Canada Goose Hall of Shame. (2009). Home page. Retrieved September 22, 2009 from <http://www.hallofshame.lovecanadageese.com/>.
- Canadian Biosphere Reserve Association [CBRA]. (2005). Business proposal 2005 -2008.
- Canadian Wildlife Service [CWS]. (N.d.). Qualicum National Wildlife Area: Marshall Stevenson Unit. Brochure.
- CWS. (N.d.a). Bird checklist, Qualicum National Wildlife Area, Marshall-Stevenson Unit.
- CWS. (1986). Management Plan: Qualicum National Wildlife Area.
- City of Kelowna. (2009). Goose Management. Retrieved September 22, 2009 from <http://www.city.kelowna.bc.ca/CM/Page1268.aspx>.
- Clermont, T. (1996). Parksville-Qualicum Beach Wildlife Management Area Management Plan. Prepared for Ministry of Environment, Lands and Parks, Nanaimo, on behalf of the Habitat Conservation Fund, DUC, TNT, Wildlife Habitat Canada and CWS.
- Cooksey, M. (2003). *Carex lynbyei*. University of Washington, College of Forest Resources, Native Plant Production. Retrieved May 12, 2009 from <http://depts.washington.edu/propplnt/Plants/Clyngby.htm>
- Dawe, N.K. (1976). Biological inventories of National Wildlife Areas in British Columbia: Flora and fauna of the Marshall-Stevenson Unit, Qualicum National Wildlife Area, August, 1976.
- Dawe, N.K. (1980). Ecological inventories of National Wildlife Areas in British Columbia: Flora and fauna of the Marshall-Stevenson Unit, Qualicum National Wildlife Area (update to June 1979). CWS.

- Dawe, N. (1984). Qualicum National Wildlife Area - Marshall Stevenson Unit - Estuarine marsh rehabilitation: A project proposal.
- Dawe, N.K. & Buechert, R. (1995). Bird use of the Little Qualicum River estuary, Vancouver Island, 1975-1979. CWS Technical Report Series Number 240.
- Dawe, N.K., G. Monty & Clermont, T. (2006). Nanoose, Parksville, Qualicum Beach & Area Canada Goose Surveys. 23 November 2005 & 18 January 2006.
- Dawe, N.K. & White, E.R. (1982). Some aspects of the vegetation ecology of the Little Qualicum River estuary, British Columbia. *Can. J. Bot.* Vol. 60: 1447-1460.
- Deakin, M. (2006). Little Qualicum River Watershed Plan: A Feasibility Study. For Qualicum Beach Streamkeepers.
- Environment Canada. (2005). Sustaining marine resources: Pacific Herring fish stocks. Retrieved May 7, 2009 from [http://www.ec.gc.ca/soer-ree/English/Indicators/Issues/Herring/Bulletin/ph\\_iss\\_e.cfm](http://www.ec.gc.ca/soer-ree/English/Indicators/Issues/Herring/Bulletin/ph_iss_e.cfm).
- Environment Canada. (2007). Arctic habitats threatened by Snow Geese. Retrieved September 22, 2009 from <http://www.mb.ec.gc.ca/nature/migratorybirds/dc00s10.en.html>.
- Environment Canada. (2008). Ecological Monitoring and Assessment Network. Retrieved September 24, 2009 from <http://www.eman-rese.ca/eman/>.
- Fisheries and Oceans Canada [DFO]. (2008). Pacific Region Sanitary Closure 14.16. Retrieved April 30, 2009 from <http://www.pac.dfo-mpo.gc.ca/fm-gp/contamination/sani/area-secteur-14/14.16-eng.htm>.
- Gaboury, M. & McCulloch, M. (2002). Fish habitat restoration designs for east Vancouver Island watersheds. Prepared for the BC Conservation Foundation and BC Ministry of Water, Land and Air Protection, Nanaimo.
- Golder Associates Ltd. (2003). Report on Level 1 environmental audit, 1117 Surfside Drive, Qualicum Beach, B.C. Submitted to Ducks Unlimited Canada.
- Hathaway, C. (2008). Columbia River estuary restoration effectiveness monitoring. Columbia River Estuary Conference April 25. Retrieved September 23, 2009 from <http://cerc.labworks.org/2008/Proceedings/18%20Hathaway.pdf>
- Hutchinson, I. & Smythe, S.R. (1986). The effect of antecedent ambient salinity levels on seed germination in populations of *Carex lyngbyei* Hornem. *Northwest Science*, Vol. 60(1): 198. Retrieved September 23, 2009 from <http://research.wsulibs.wsu.edu:8080/dspace/bitstream/2376/1783/1/v60%20p36%20Hutchinson%20and%20Smythe.pdf>.
- Integrated Land Management Bureau [ILMB]. (N.d.). Resource Information Standards Committee. Retrieved September 24, 2009 from <http://ilmbwww.gov.bc.ca/risc/index.html>.
- Kennedy, K. (N.d.) Untitled report: dissolved solids, dissolved oxygen, pH and plankton at 5 stations in the Little Qualicum River estuary.
- Kinkade, T. Jr. (1946, November 23). Untitled notes of speech to Canadian Legion.

Kinkade, T. Jr. (1949, September). The Kinkade Story: An Upper Island Epic. Parksville Qualicum Progress.

Lanarc Consultants Ltd. [Lanarc]. (2003). Parksville-Qualicum Beach Wildlife Management Area Management Plan.

Lapi, C. (N.d.). Wayfarer to the Past. Parksville Qualicum Progress.

Lister, D.B., Harris, G.D. & Hickey, D.J. (1979). Juvenile salmon downstream migration study at Little Qualicum River, British Columbia. Prepared for DFO by D.B. Lister and Associates, West Vancouver.

Living Rivers Georgia Basin Vancouver Island. (2008, July 8). Salmon and steelhead in the Little Qualicum River on Vancouver Island will have more water to swim in this summer. Retrieved September 27, 2009 from <http://www.livingrivers.ca/gbvi/dox/Microsoft%20Word%20-%20Cameron%20Lake%20Storage.pdf>.

Lower Columbia River Estuary Partnership. (N.d.). Criteria for identifying and prioritizing habitat protection and restoration projects on the Lower Columbia River and estuary. Retrieved September 23, 2009 from <http://www.lcrep.org/pdfs/Salmon-Specific-Estuary%20Project%20Criteria.pdf>.

Lynch, L. (2008). Canada Goose Egg Addling Program 1999-2007 within or adjacent to mid-Vancouver Island Conservation Areas.

Mackenzie, W.H. & Moran, J.R. (2004). Wetlands of British Columbia: A guide to identification. Res. Br., B.C. Min. For., Victoria, B.C. Land Manage. Handb. No. 52.

Madrone Environmental Services Ltd. [Madrone]. (2008). Terrestrial ecosystem mapping of the coastal Douglas-fir biogeoclimatic zone. Prepared for ILMB. Retrieved April 29, 2009, from MoE EcoCat.

McKay, B., Moore, L. & Kinkade, T. (1984, July 3). Nostalgia: How it all got started. The News Advertiser.

McPhee, M., P. Ward, J. Kirkby, L. Wolfe, N. Page, K. Dunster, N.K. Dawe & Nykwist, I. (2000). Sensitive Ecosystems Inventory: East Vancouver Island and Gulf Islands 1993-1997, Volume 2: Conservation Manual. Canadian Wildlife Service Technical Report Series 345.

Okanagan Valley Goose Management Program. (2009). Home page. Retrieved September 22, from <http://www.okanagangooseplan.com>.

Peterson, C.H., R.T. Barber, K.L. Cottingham, H.K. Lotze, C.A. Simenstad, R.R. Christian, M.F. Pehler & Wilson, J. (2008). National Estuaries in Preliminary review of adaptation options for climate-sensitive ecosystems and resources. A report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research [Julius, S.H., West, J.M. (Eds.), J.S. Baron, B.Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson & Scott, J.M. (Authors)]. U.S. Environmental Protection Agency, Washington, DC. pp. 7-1 to 7-108. Retrieved May 21, 2009 from <http://www.sciencedaily.com/releases/2008/06/080620115843.htm>.

Pike, R.G., D.L. Spittlehouse, K.E. Bennett, V.N. Egginton, P.J. Tschaplinkski, T.Q. Murdock & Werner, A.T. (2008). A summary of climate change effects on water hydrology. B.C. Ministry of Forests and Range, Forest Science Program. Extension Note 87.

Polster, D.F. (2009). Management of invasive plants: An ecological approach. Polster Environmental Services Ltd.

- Pojar, J. & A. Mackinnon. (1994). *Plants of Coastal British Columbia*. B.C. Ministry of Forests and Lone Pine Publishing, Vancouver.
- Rand, J. (N.d.). *Shades of the Shady Rest*. Newspaper article.
- Regional District of Nanaimo [RDN] (N.d.). 2006-2009 Strategic Plan. Leadership in Creating Sustainable Communities. Retrieved April 20, 2009 from <http://www.rdn.bc.ca/cms/wpattachments/wpID489atID1463.pdf>.
- RDN. (2003). *Regional Growth Strategy, Bylaw No. 1309*.
- RDN. (2004). *RDN Bylaw No. 1399. A bylaw to provide for the regulation of park use in the RDN*.
- RDN. (2005). *Regional Parks & Trails Plan 2005-2015*.
- RDN. (2008). *Regional Parks & Trails Guide*.
- RDN. (2009). *Surfside Water Local Service Area Annual Report*. Retrieved April 24, 2009 from <http://www.rdn.bc.ca/cms/wpattachments/wpID901atID2268.pdf>.
- RDN. (2009a). *RDN Bylaw No. 1399.01. A bylaw to amend RDN Park Use Regulations Bylaw 1399 (2004)*.
- Sensitive Ecosystem Inventory. (2004). *Sensitive Ecosystems Inventory of East Vancouver Island and Gulf Islands: Disturbance Mapping and Re-evaluation of Major Riparian Corridors*. Map 92F038. Retrieved April 27, 2009 from <http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=2124>.
- Simenstad, C., C. Tanner, C. Crandell, J. White & Cordell, J. (2004). *Challenges of habitat restoration in a heavily urbanized estuary: Evaluating the investment*. *J. of Coastal Research, Special Issue*.
- Simonsen, Bjorn. (1975). *The Little Qualicum River site (DiSc 1): An attempt at wet site conservation*. Archaeological Sites Advisory Board, Victoria, B.C.
- Streamside Native Plants. (2008). *Plant Selection Guide*. Retrieved May 12, 2009 from [http://members.shaw.ca/nativeplants/streamside\\_guide.htm](http://members.shaw.ca/nativeplants/streamside_guide.htm).
- The Land Conservancy. (2005). *Little Qualicum River Estuary*. Retrieved May 11, 2009 from <http://www.conservancy.bc.ca/content.asp?sectionid=126>.
- Town of Qualicum Beach. (2007, April 16). *Minutes of the Town of Qualicum Beach Regular Council Meeting*. Retrieved April 3, 2008, from [http://qualicumbeach.com/pdf/meetings/minutes/07\\_04\\_16min\\_council.pdf](http://qualicumbeach.com/pdf/meetings/minutes/07_04_16min_council.pdf).
- United States Geological Survey (USGS). 2009. *Coastal Water Intrusion*. USGS Washington Water Science Center. Retrieved May 12, 2009 from <http://wa.water.usgs.gov/projects/saltwaterintrusion/>.
- McFarlane-Tranquilla, L., D.W. Smith, G. Grigg & White, G. (2008). *Canada Geese: Control and Management in Southwestern British Columbia*. Retrieved May 10, from [http://www.cws-scf.ec.gc.ca/publications/pyr/index\\_e.cfm](http://www.cws-scf.ec.gc.ca/publications/pyr/index_e.cfm).

U.S. Environmental Protection Agency. (2008). Indicator development for estuaries. Retrieved September 27, 2009 from <http://www.estuario.org/downloads/updatemarch/indicators.pdf>.

Urban Systems. (2005). Background paper: Best practices for moving toward change in the delivery of Local Government services. Prepared for Task Force on Community Opportunities.

Ward, P., G. Radcliffe, J. Kirkby, J. Illingworth and C. Cadrin. (1998). Sensitive Ecosystems Inventory: East Vancouver Island and Gulf Islands, 1993 - 1997. Volume 1: Methodology, ecological descriptions and results. Technical Report Series No. 320, Canadian Wildlife Service, Pacific and Yukon Region, British Columbia.

Wildlife Tree Stewardship Program [WITS]. (2008). Wildlife Tree Report. B.C. Nature and Community Mapping Network.