

Chapter 14 - Strategic Direction Highlights

This chapter provides recommendations for management with abridged supporting rationale. It outlines general responsibilities and timelines, as well as deliverables, targets or indicators specific to each objective or action item.

14.1 Responsibilities

Primary Objective:

1. Urge CWS to lead a regional working group that adequately funds Canada Goose management plans and action items.

A key question is, who is responsible for goose management? Responsible managers will commit sufficient resources to implement long-term solutions, as failing to do so will inevitably result in reversing the successes gained through the addling program and other initiatives.

Managers include those who have regulatory responsibility for Canada Geese, i.e., CWS and MFLNRO, as well as landowners and land managers. As the problem of local overabundance stems from introductions or relocations of geese from other areas already experiencing adverse impacts, the agencies that initiated and implemented these hold most of the responsibility for damages today. Responsibility also rests on the non-profit organizations that urged governments to move geese to sites on Vancouver Island, although volunteers and lobbyists are mostly unaccountable. Several municipal leaders and others have suggested a class action lawsuit be launched to require senior governments to take action and to pay for damages caused by excessive numbers of geese. In the U.S., federal and state governments have led and implemented culling initiatives, enabled provision of geese to food banks, and paid for agricultural damages, among other things. Both leadership and just compensation packages should be contemplated by senior governments here. Nonetheless, community leaders and their staff have effectively created urban

meccas for Canada Geese, with grassy areas juxtaposed with settling ponds and beaches. The City and school district administrators have refrained from taking bold steps to keep geese out of play areas.

Ideally, CWS and MFLNRO will lead a regional working group in MABR that dedicates and pools senior and local government resources and leverages monies from other stakeholders (e.g., estuary property landowners and land managers, golf course managers, farmers) to address the full breadth of problems caused by geese. In other B.C. jurisdictions, local governments, non-profit organizations, and other stakeholders are leading localized or piecemeal initiatives, whereas geese are not constricted by jurisdictional boundaries. Senior government leadership of multiple regional groups will allow for cohesive, seamless management efforts, as committed staff familiar with goose impacts, management options and their responses minimize trial and error initiatives and polarization within communities.



Captive geese at the Englishman River estuary, July 2010.

14.2 Population Objectives

14.21 Population Abundance

Although we have learned a great deal about the abundance of our regional Canada Goose population and subpopulations, there is more work to do before we can develop accurate model projections. Collectively, the multiple datasets examined in this study exhibited weak (i.e., statistically insignificant) and sometimes conflicting population trends. The lack of a clear linear trend was attributed to a number of factors, such as shifting spatial coverage and survey effort, an insufficient period of data collection, and a poor understanding of other contributing factors. The Coastal Waterbirds Survey and Christmas Bird Count, external datasets produced by volunteers, showed weakly increasing or possibly cyclic trends. In the absence of a statistically significant weight of evidence, we cannot report that Canada Geese in the region are increasing or decreasing at a given rate.

In recent years, the size of our regional overwintering population has remained relatively static, showing no statistically significant inter-annual differences since 2011. The total number of Canada Geese observed during routine population surveys in the overwintering season ranged from 992 to 1,285 in 2012 and 2013, respectively. However, a winter count in 2014 documented just over 1,500 geese. While the peak observed

during the winter of 2005-06 (2,061 geese) remains unrivaled, this higher-than-usual winter count may be of management concern. Only continued population monitoring can determine whether this crest represents a new trend upwards, a peak in a recurring cycle, or a standalone high. In 2014, moulting populations were also high, reaching nearly 1,200 birds during routine population counts, and more than 1,500 birds during the moult count when the southeast shoreline of Nanoose Bay was included. Notably, Canada Goose surveys in January and July each year provide the best snapshot of the overall size of our regional population and its effect on specific sites.

The highest count for geese in the nesting season was 446 in 2013, based on routine population counts conducted over only two years. (Routine population counts during the nesting season were only conducted for 2012 and 2013.) This value probably represents the bulk of the breeding and non-breeding local resident population. However, it neglects undetected nesting birds and moult out-migrants. Should addling crews consistently survey both breeding and non-breeding geese on and near the nesting grounds, a trend for local resident populations might emerge.

In recent years, our breeding subpopulations have fluctuated

in different directions, likely contributing to the lack of an overall population trend. At the LQRE, the number of nests have declined, and densities of birds during the moulting period have remained flat. At the ERE, densities of moulting birds have increased. At the ERE and NBE, nest numbers have also increased. This suggests that we are, in the main, losing ground. For those who have partaken in the struggle to reduce Canada Goose populations, it is important to remember that twelve years of egg addling have prevented at least 2,088 birds from becoming breeding adults. Given an average clutch size of 5.8 eggs, the addling program has prevented more than 6,000 additional eggs *per year*. (This assumes that half the birds are female, and that they nest locally. Many factors are disregarded in the calculation, such as mortality rates, immigration/emigration etc., as described in Chapter 10.3, Life History by the Numbers.

14.22 Population Structure

One of the most important findings of our study was to discover that moulting birds were not necessarily 'resident', i.e., they encompassed a variety of migrant types, including visitors from the U.S. and Alberta, and from other parts of Vancouver Island and the Lower Mainland. Despite strong site fidelity, Canada Geese are on the

move, whether due to climate change, habitat preferences and availability, or some other force. Due to these voluntary movements, and forced movements through translocations, a local flock of Canada Geese at nearly any time of year probably represents a genetic fusion of North American subspecies. Even the purity of the red-listed Dusky Canada Goose is in question; it was introduced to Washington in the 1950s, and populations there are now considered to be of three types: migrants, residents, and hybrids.

Currently, CWS sets regional (i.e., province-wide) population objectives for temperate-breeding Canada Geese, meaning that the same objectives apply to Canada Geese across B.C. Population objectives are the same for areas that have always supported breeding geese and those that have not. They are the same whether management units have 2000 hunters or 200. Population objectives should be based on the capability of habitats to support them. Consideration should also be given to sociocultural limitations, such as the number of hunters or monies available to control overpopulations.

Notably, no Dusky Geese were observed in the region during our study. However, Dusky Canada Geese could be protected in Canada where they are known to occur, by requiring hunters to learn to properly identify them, as is the case in

Washington and Oregon. Related to the management of distinct subpopulations is the relevance of B.C. and Canada's participation on the Pacific Flyway Council, a self-proclaimed policy and regulation-setting body. Canada does not recognize or use the Pacific Flyway subspecies for management purposes, nor the subspecies-specific Canada Goose management plans that have been developed. Canadian regulatory definitions and programs are inconsistent with those across the border. Canada's representation on this Council should be clarified or made explicit, and a more thorough integration of Canadian and U.S. policies and regulations considered.

It is surprising to many that Canada Geese have not been formally evaluated for overabundance. CWS biologists have justified this by saying that an overabundance designation would have little effect due to insufficient numbers of hunters and access to hunting areas. Given that 1) resident Canada Geese are designated as 'overly abundant' in parts of the U.S., 2) hunter numbers and goose harvests have risen in several provincial management units in recent years, 3) survey respondents have expressed interest in hunting or allowing hunters access, and 4) the overabundance designation can be applied to geese in some areas while excluding other areas, this evaluation should

proceed. And, it should proceed for temperate-breeding geese only, rather than the entire species.

It is important to apply the lessons learned in the subarctic estuarine marshes. Once goose herbivory was deemed a significant conservation issue, and it was recognized that population sizes and the survival rate of adult goose populations were detrimental to estuarine ecosystems, the *Migratory Bird Regulations* were amended and new tools invoked to help manage overabundant species (CWS Waterfowl Committee 2013). As the additional hunting opportunities afforded the 'overabundant' designation quickly halted the growth of Greater Snow Geese populations, it is plausible that similar efforts would work in concert with egg addling to reduce Canada Goose populations. If the designation, and the tools that accompany it prove insufficient, then the regulations should be amended to invoke new tools, such as bait and capture, and mechanisms that allow for greater use of geese as a renewable resource.

Snow Goose managers have recognized that goose populations have not decreased (only stabilized) since the overabundance measures were invoked, that geese adapt quickly to different management measures, and that new approaches must be considered (Anonymous 2013). We should examine their recommendations, and even consider integrating

Population Objectives:

2. Urge CWS to amend the process to set population objectives for temperate breeding geese.
3. Urge CWS to designate temperate-breeding Canada Geese as overabundant.

certain Snow Goose and temperate Canada Goose management initiatives (e.g., communication platforms) to take advantage of economies of scale (see Anonymous 2013 at http://www.ec.gc.ca/nature/FB11C691-2F04-4E8F-B4BF-88B5441BD6F3/900_SnowGeeseinQuebec2013-2018ActionPlan_e%20-v6%20FINAL-s.pdf).

Coastal estuarine marshes are too rare and valuable to be shortchanged by protecting animals that are common, widespread, and in this case, of a bloodline that was mostly introduced to the region.

14.3 Spatial Objectives

14.31 Distribution

Our study identified a number of Canada Goose hotspots, but none supported greater, year-round numbers than our mid-island estuaries. Across all seasons, population surveys conducted from 2011 through 2014 indicated Canada Goose counts were highest at estuarine sites (i.e., Craig Bay/CCE, LQRE, NBE and ERE sites). The highest year-round densities of geese occurred on sites with freshwater. (Recall that estuarine marshes are also freshwater sites.) Goose densities were also high on City of Parksville sites. These areas deserve focused management attention.

Canada Geese concentrate on the estuaries during the nesting season and for many pre-nesting rituals (e.g., jockeying for nesting territories). During the moult, Canada Geese were found almost exclusively in estuarine, freshwater, and marine habitats. During the fall and winter, geese used estuaries, agricultural fields, and greens/lawns and meadows - particularly those associated with freshwater.

Introduced birds were the catalysts for escalating goose populations, and abundant conservation lands and urban goose habitats promoted residency and entrenched the current population size and distribution. Disturbances from people and dogs, hunting pressure, agricultural practices, weather, and climate change all influence goose mobility, yet site fidelities keep many of them close to home.

Mid-island estuaries, and the LQRE, ERE, and CCE in particular, have borne the brunt of Canada Goose impacts. They require restoration to enhance the functioning of marsh ecosystems and reverse some of the impacts from Canada Geese. This strategy outlines basic restoration needs ahead of a more comprehensive restoration plan. Implementation of Canada Goose management plans are essential to avoid frivolous restoration efforts, and protect remaining sensitive ecosystems from further damage.

Spatial Objectives:

4. Develop management plans that are specific to each management zone.

Spatial Objectives, LQRE:

5. Commit to a long-term egg addling program.
6. Promote hunting.
7. Explore limited, coordinated hunting on the LQRE.
8. Attach transmitters to a subset of LQRE-nesting geese and monitor by satellite telemetry.
9. Encourage farmers to pursue and use kill permits outside of hunting seasons.
10. To maintain existing wetlands, including seasonal wetlands, suggest alternate habitat modifications to farmers and others.
11. Maintain and monitor LQRE exclosures until the estuarine marsh has recovered. Apply experimental restoration techniques as necessary.

14.32 Management Zones

Based on the year-round distributions of LQRE, ERE, and CCE subpopulations, three management zones have been identified.

1. LQRE zone: Includes the LQRE, Town of Qualicum Beach west to Qualicum Bay, parts of French Creek and West and East Errington, south to Sunnymere fields and Hamilton Marsh (Figure 14-1).
2. ERE zone: Includes the ERE and City of Parksville, and parts of French Creek, West and East Errington (Figure 14-2).
3. CCE zone: includes the CCE and Craig Bay, Nanoose Bay, and west Lantzville. The CCE zone overlaps the ERE zone in the ERE, where CCE-banded birds are known to nest, and in east Errington (Figure 14-3).

Little Qualicum River Estuary Zone

As the number of nests on the LQRE have decreased, and all LQRE-banded birds were huntable in our region, this cohort may be managed by egg addling, hunting, and kill permits. A long-term commitment to the egg addling program and a more concerted hunting effort (e.g., incentives to participate in the early autumn and spring hunts) should be considered. Opening the LQRE to hunting, similar to the limited opening on the Somass estuary in Port Alberni, could expedite the reduction of this subpopulation and reduce the costs of egg addling and efforts to encourage and coordinate hunting.

As half of LQRE-banded birds were either emigrants (39% of LQRE

birds) or Vancouver Island migrants (11%), any management plan associated with this cohort should be developed in collaboration with managers in other regions, Comox Valley and Campbell River in particular. To determine whether our addling adversely affects other areas, a sample of Canada Geese nesting on the LQRE should be collared, and preferably fitted with tracking devices, and their movements monitored after they have abandoned their addled eggs. Sex and age should be determined, if possible. Do the geese stay in the region or moult-migrate? How far do they travel? Hunters must be discouraged from taking these birds until sufficient data have been collected. In 2012, the CWS initiated a study of Canada Geese in Toronto, using satellite transmitters to track their movements (Hughes 2012); this effort may be a suitable model to emulate.

To discourage drainage of wetlands, alternative habitat modification measures should be recommended. It may also be necessary to protect wetlands with bylaws and policies, and/or to finance alternate modifications.

Exclosures on the LQRE must be maintained until Canada Goose numbers have decreased and vegetative productivity within and outside of exclosures is similar. Additional planting and large woody debris (LWD) may be required.

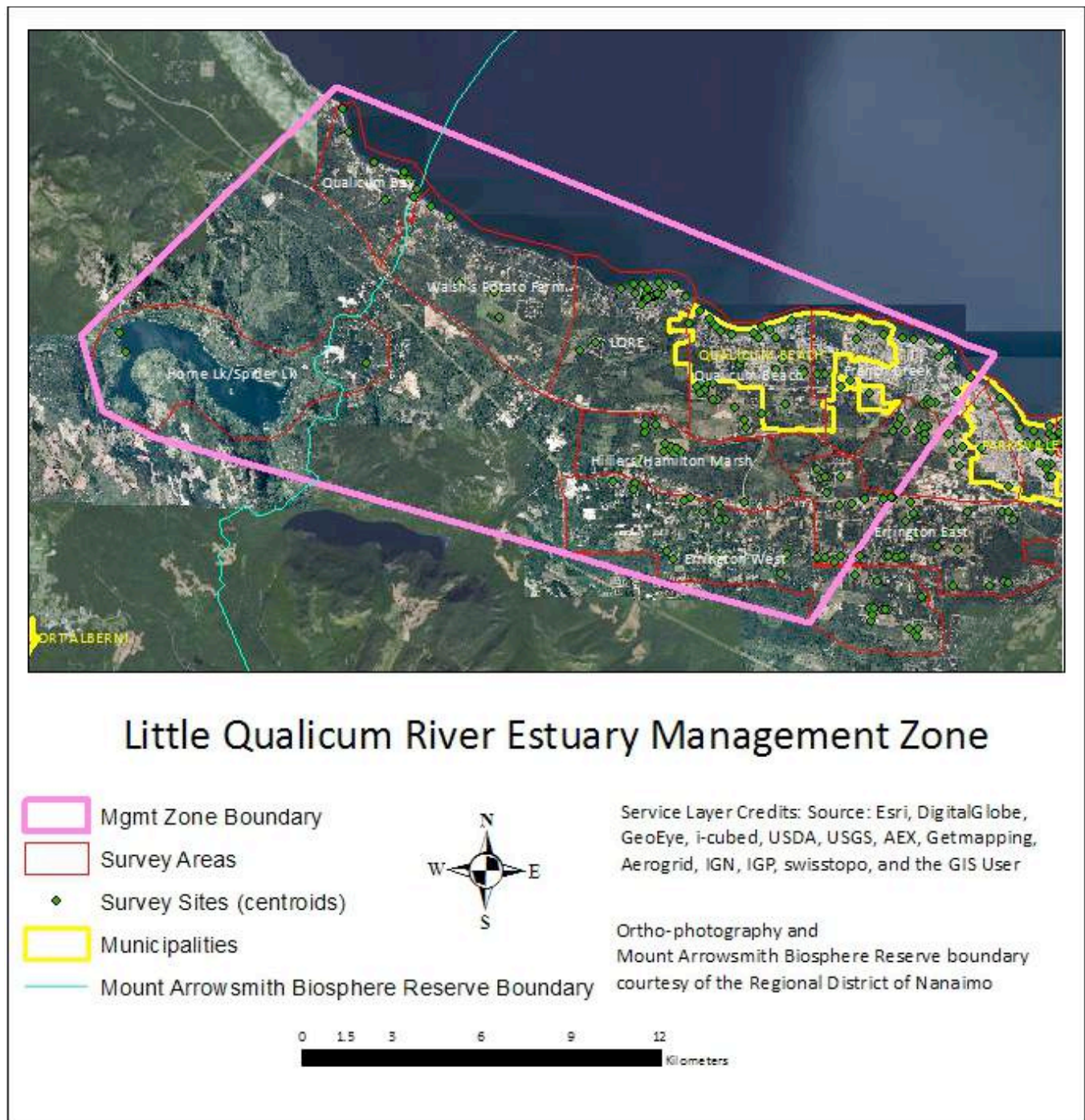


Figure 14-1. Little Qualicum River Estuary Management Zone

Spatial Objectives, ERE:

12. Capture and cull as many birds as possible during the moulting period.
13. As an alternative to culling, organize several large-scale hazing events to push geese into huntable areas.
14. Continue an egg addling program until the population is diminished.
15. Promote techniques to create goose unfriendly habitats and facilitate sharing of experiences and expertise.
16. Reduce exposure of children and seniors to goose feces.
17. Begin restoration of the ERE, using a variety of experimental techniques.

Englishman River Estuary Zone

The number of nests and moulting birds on the ERE have risen in recent years despite increased addling efforts. At least 45% of ERE-banded birds were local residents, and two-thirds of them were not huntable. Most stayed within the City, ERE, CCE and Craig Bay. Therefore, egg addling and hunting are insufficient to slow the growth of this cohort.

A roundup and cull is the most efficient way to decrease this subpopulation, with follow up to manage returning non-breeding geese, moult migrants, and in-migrants. A roundup during the moulting period is easier than attempting to capture geese when they can fly, and will remove resident as well as non-resident nuisance birds.

An alternative to culling is organized hazing into areas where the geese can be hunted. While this may be more acceptable to people, hazing geese from the estuaries and the City into areas that can be hunted will require extensive coordination, and cooperation from city staff, hunting groups, farmers, and other landowners. To achieve a significant reduction in the ERE subpopulation will likely require several such events. It will be challenging to sustain the interest and support needed.

The logistics of both methods are complicated and public acceptance will undoubtedly be contingent upon community members understanding the rationale and follow up for such control measures. If a cull is planned, policy changes to allow

the birds to be used for food will increase public acceptance.

The use of goose unfriendly habitats should be promoted, and expertise shared through workshops or a website. Goose avoidance of the new Parksville Community Parks sports fields should be formally monitored; if the grass-on-sand formula is successful in deterring geese over a period sufficiently long to be cost-effective elsewhere, it should be replicated on all fields used by young children.

Until a large reduction in Parksville's goose population is realized, a greater effort should be made to reduce the exposure of children and senior citizens to goose feces. This may require hazing on school fields, scheduling sporting events for children on the fields at Parksville Community Park, and washing walkways near facilities frequented by seniors, for example.

The ERE is heavily degraded and existing exclosures are doing little to restore it. This estuary requires a variety of bold experimental restoration efforts, such as large woody debris/exclosure structures to protect remaining stands of preferred species, structures to capture and deposit pulses of sediment from the river to rebuild the marsh platform, and planting in denuded areas with sufficient substrate. However, without a substantial decrease in goose numbers, most techniques are doomed to fail.

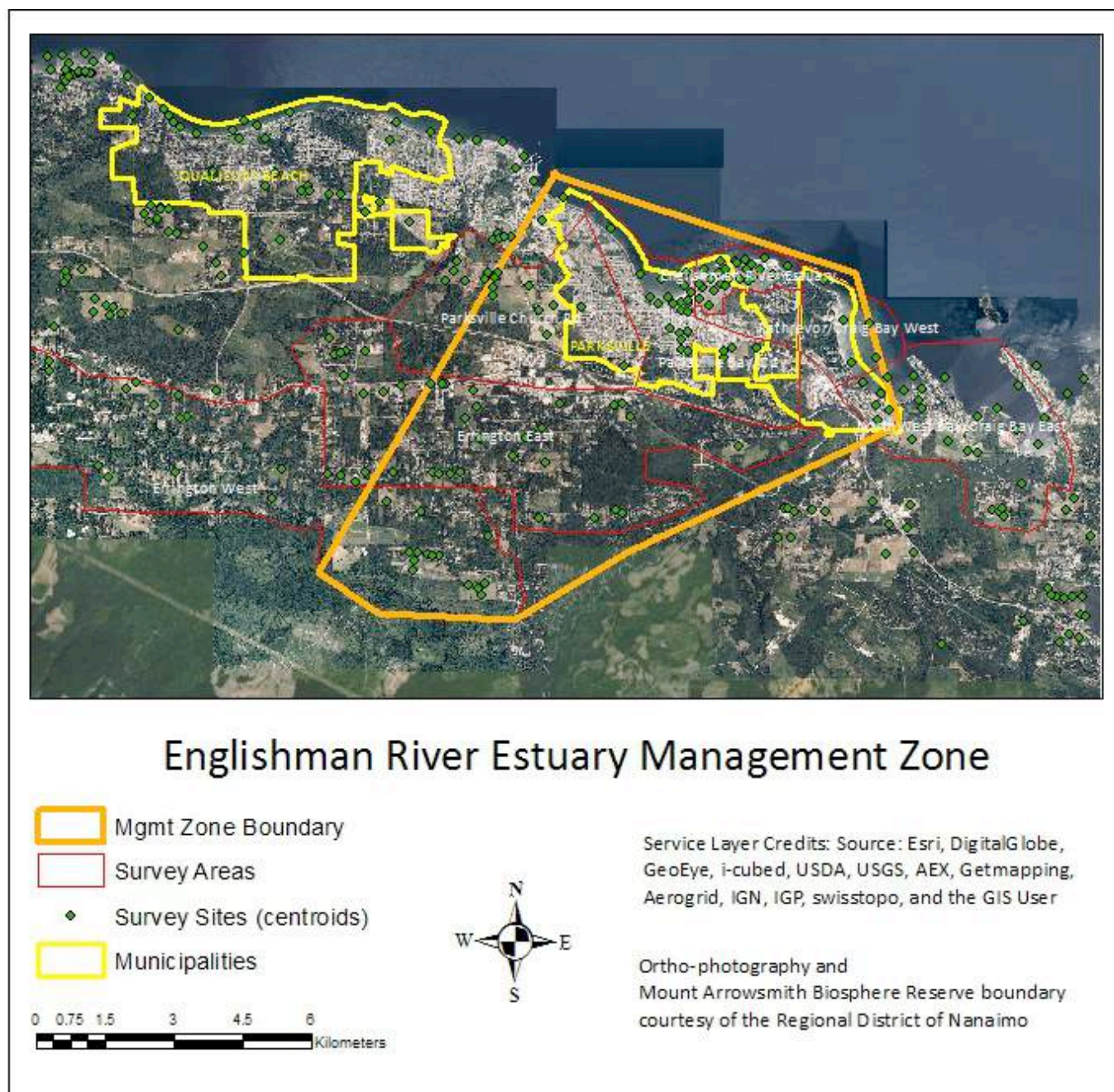


Figure 14-2. Englishman River Estuary Management Zone

Spatial Objectives, CCE:

18. In concert with ERE initiatives, plan a cull during the moulting period.
19. In concert with ERE initiatives, as an alternative to culling, organize hazing events to push geese into hutable areas.
20. Expand the egg addling program to encompass more areas and stakeholders.
21. Promote hunting.
22. Encourage limited, coordinated hunting of Canada Geese on the NBE.
23. Encourage hazing in non-hutable areas during hunting seasons.
24. Encourage affected farmers to pursue kill permits outside of hunting seasons.
25. Promote techniques to create goose unfriendly habitats and facilitate sharing of experiences and expertise.
26. Install goose exclosures on the CCE.

Craig Creek Estuary Zone

Mark-re-sight efforts have shown there is some mixing between CCE and ERE-banded birds, particularly on the estuaries. Fourteen 'T' birds nested on the easternmost part of the ERE, and one was paired with an ERE 'M' bird. Yet, this cohort was more widely distributed than the other two, and much more so than the ERE-banded birds - extending its reach to the NBE and Nanoose Peninsula, and to many farmlands in Nanoose Bay and Errington. It also had the highest proportions of moult migrant (15% of all CCE-banded birds), moult-winter resident (6%), and LR+ (27%) migrant types, suggesting its overall distribution lies beyond MABR boundaries.

Because CCE birds are already nesting on the ERE, culling ERE-banded birds without taking similar action at the CCE would likely result in more CCE birds using spaces vacated by ERE birds and an expansion of this subpopulation. Similarly, hazing to hutable areas would require simultaneous efforts in both jurisdictions. However, a broad distribution suggests that reducing this cohort will require greater diligence over a longer period, and more collaboration with managers outside of the region.

Here, a more comprehensive range of controls is necessary. The addling program should be expanded by enlisting the help of communities to find nests, ensuring the small outer islands are checked, promoting the use of addling permits among farmers, and collaborating with all permittees to

get a more complete picture of nesting CCE birds. Encouraging landowners to allow hunting, promoting hunting as an important means of control, and opening the NBE to hunting for short periods is recommended. Hazing geese out of non-hutable areas during hunting seasons can be encouraged to increase takes. Practices that create goose unfriendly habitats should be promoted, particularly along the periphery of Craig Bay.

The CCE is degrading, with overgrazed and denuded areas and some loss of the marsh platform. Goose exclosures, similar to those constructed at the LQRE and ERE, should be installed on the CCE estuarine marsh to protect remaining vegetation and the marsh platform, and to facilitate restoration of degraded areas.

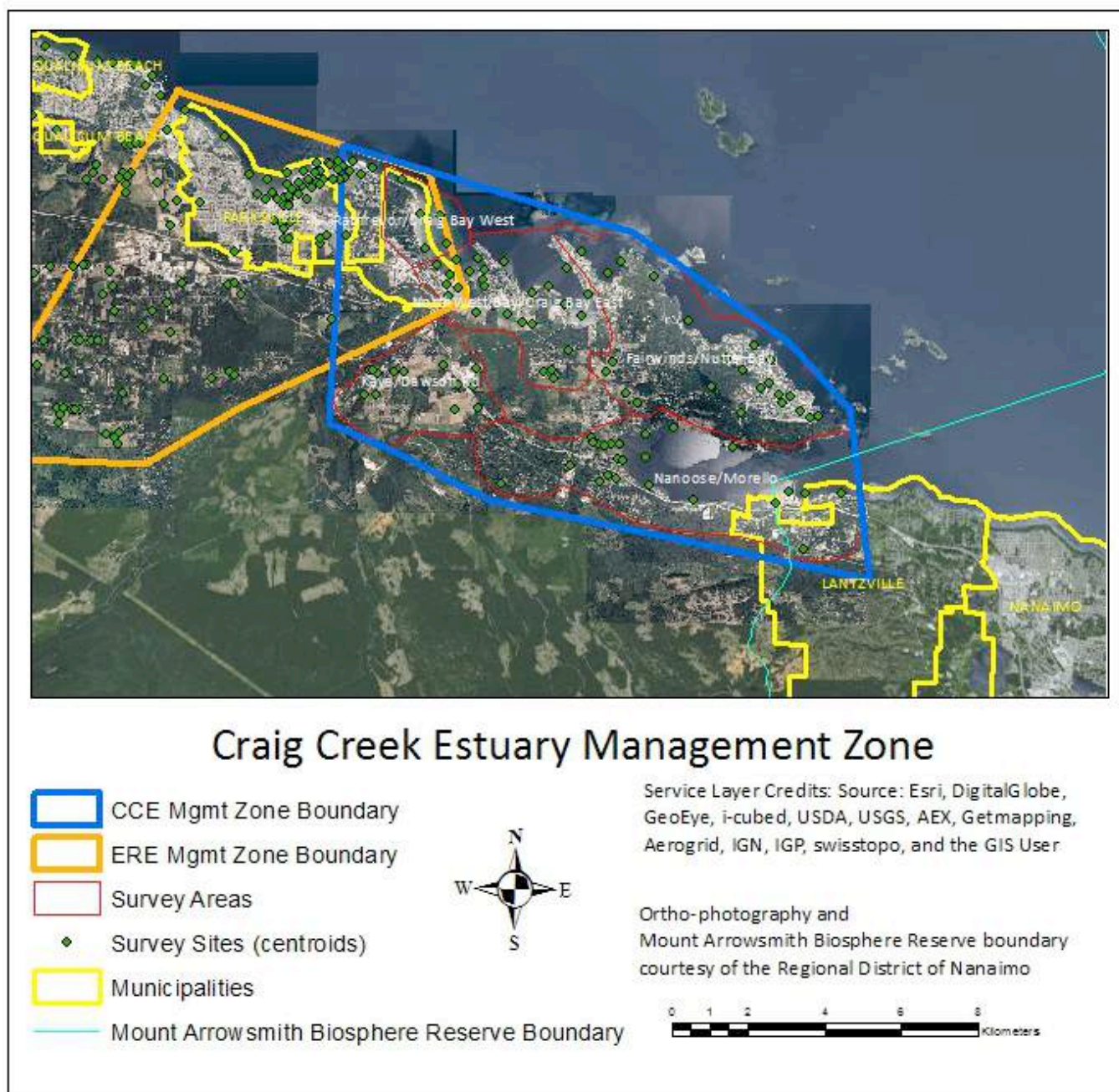


Figure 14-3. Craig Creek Estuary Management Zone

14.4 Temporal Objectives

Temporal Objectives:

27. Protect estuarine marshes year-round, with exclosures, fencing, LWD structures, and hazing until goose populations are substantially diminished.
28. Round up Canada Geese during the moulting period and transfer them to an appropriate farm or culling facility.
29. Capture Canada Geese at their nests for research purposes or to cull them.
30. Organize hunts on the LQRE and NBE during the spring hunting season.
31. Haze birds into huntable areas during the early autumn hunting season.
32. Promote hunting of traditional migrants during regular hunting seasons.

Canada Geese use the estuaries year-round. Marsh damage is a cumulative effect, stemming from large numbers of grazing geese over the summer growing season and moulting period. Overgrazed channel edges cause invertebrates, fish, and other species to seek overstream vegetation elsewhere, if they can find it. Then, outside of the summer months when above-ground vegetation is least available, resident and migratory geese grub the roots and rhizomes, damaging the marsh platform and reducing the area where vegetation can grow. Inputs to the detrital food web are reduced, and overall nutrient cycling is disrupted, affecting local and linked habitats. Channels fill with sediment or are flushed away with the tides. This cycle repeats, year after year.

Most terrestrial habitats, such as urban parks and agricultural fields benefit from an annual reprieve during the moulting season and the peak of the vegetative growing season. Estuaries only experience a reprieve of sorts after the moulting period, when flocks tend to forage elsewhere. Still, they return to roost, and will feed if other areas are exposed to hunting pressure. Large flocks of migrants arrive in the fall, and some stay for the winter. By the time geese begin to nest in the spring, the estuaries have had little time to recover. Therefore, reducing goose populations throughout the year is necessary to prevent further estuarine

damage.

Although we have identified 14 different migrant types, these can be amalgamated into three for management purposes: 1) full and part-time local residents (LR, LR+, MWR, a few M), 2) in-migrants (MM; M that revisit the region, including traditional migrants that stop in the area and move on; RJ; DJ and E that return as they reach breeding age), and 3) out-migrants (DJ, E, and M that do not return).

Management efforts should focus on reducing numbers of migrant types that cause the most damage in the area, namely full and part-time resident Canada Geese and in-migrants, and on preventing them from breeding and otherwise lingering on the estuaries and other areas where they are unwelcome. To target most non-breeding residents and in-migrants, and breeding residents that stay near the nesting grounds, population reduction should occur on the moulting areas. To target other breeding residents and potential offspring, population reduction must occur on the nesting grounds.

Roundups are best accomplished during the moult when birds cannot fly, and other methods, such as hunting and hazing are inappropriate at this time.

LQRE birds captured at the nest may be fitted with marks and/or transmitters and released. Only some birds can be captured at the nest by stealth and salmon

nets; the most aggressive will defend the nest and are easier to capture, while timid birds will fly away. As the less dominant birds are generally the least aggressive and most likely to leave the area after addling, other techniques such as trapping may need to be considered.

Hunting on the LQRE and NBE is best accomplished late in the spring hunting season, to take a

maximum number of breeding geese on their territories. Hazing into hunting areas is best accomplished during the first autumn hunt, when the majority of target birds are still in the area. Later hunts to target large flocks of traditional migrants are also necessary to reduce pressure on agricultural lands and some golf courses.

14.5 Social Objectives

Social Objective:

33. Examine health risks to people, livestock, and pets.
34. Urge senior governments to allow culled geese to be used for food.
35. Develop a communication protocol that includes interaction with other Canada Goose management committees or working groups and naturalist groups.
36. Engage stakeholders and the public regarding goose impacts and control techniques.
37. Urge CWS to make permits for controlling geese easier to obtain.
38. Consult and collaborate with First Nations.

In all management zones, there must be follow-up on the risk assessment commissioned by CWS (see Chapter 5, The Need for Action), to address important knowledge gaps identified by Fraser and Fraser (2010) on behalf of the Canadian Cooperative Wildlife Health Centre. Suggestions included improving traditional water quality indicators, and mitigating risks through fecal waste management and other strategies. They also recommended that the CWS invest in monitoring and research to develop an evidence-based risk assessment, and form a working group to develop national standards for the management of peri-urban goose populations.

While CWS should lead this effort, Island Health and Vancouver Island University could be encouraged to test shorelines near resorts as well as farm ponds, and frequently used terrestrial sites that attract geese (e.g., beach sand, grassy play areas) for harmful concentrations

of bacteria. In addition to helping assess risk to people and livestock, this is important to allay fears regarding the vulnerability of dogs used in hazing programs.

As other non-hunted wild game are consumed in Canada, and non-hunted migratory birds are donated as food in the U.S., it is without merit that senior government legislation and policies require or encourage managers to dispose of edible goose carcasses. CWS' concern that allowing birds killed under permit to be eaten would provide hunting opportunities outside of hunting seasons does not reconcile with the breadth of this problem nor the agency's assertion that there are fewer hunting opportunities due to a dearth of hunters and sites to hunt. An inspection system with standards for wild geese is needed and should be expedited to ease the burden on local governments and others concerned about opposition to managed kills.

Collaboration with other regions is necessary to discover where our part-time local residents are residing at other times of year, where our in-migrants are coming from, how many out-migrants our region is producing and where they are going. Sharing of management techniques and outcomes is also important.

Conversations with stakeholders prior to and during the development of this strategy have indicated the value and importance of meeting community needs, as well as ecological needs, with each management plan. Additional community members should be surveyed to identify other goose-related problems, to quantify damages and spending on controls, and to record attempts to control geese and the challenges and successes associated with those attempts. Impact surveys present a suite of opportunities for goose managers: to raise awareness of previously documented impacts and control techniques, to explore tolerances and attachments to Canada Geese, and to engage concerned citizens in open dialogue regarding the acceptability (e.g., humaneness)

of various methods of control.

Engagement should not end with a management plan. Rather, the management plan should promote ongoing communication. For example, hazing Canada Geese in most circumstances requires care and consideration for the birds and for other people. Given that Canada Geese are affecting conservation lands, urban and suburban areas, agricultural lands, etc., the availability and vulnerability of nearby habitats should always be considered. Hazing efforts should be coordinated with others who may be affected.

Survey respondents and others expressed some frustration over permitting processes to scare and kill geese. Not knowing how to apply for permits, applying too late to manage the processing time, having to provide extensive justification for permits, and trying to cope with permit restrictions (e.g., use of blinds) were some of the problems identified. Given the reports of expensive damage by Canada Geese, and the limitations of compensation programs, farmers require an easier road to controlling geese. Legislators and

farmers alike may benefit from a notification process similar to that used by the provincial government for straightforward changes in and about a stream (i.e., Section 9, *Water Act, 1996* applications) and Fisheries and Oceans Canada's Fish Protection Program. Applications are submitted online, and if the applicant does not hear from the Habitat Officer within a specified number of days, he or she may proceed without further ado.

Consultation and collaboration with First Nations groups and members are both important and valuable in goose management efforts. Canada Geese frequent reserve lands and adjacent estuaries and foreshores, and are likely to be a problem for First Nation communities. As these communities tend to have younger populations, health risks to children from goose feces must be considered. Importantly, First Nations have some latitude to manage geese by virtue of Aboriginal rights and title (e.g., through traditional harvesting rights and contemporary treaty agreements (See Chapter 4, Current Regulatory and Policy Framework)).

Guardians and CWS on the Little Qualicum River estuary, June 2014



Canada Geese are truly a part of Canadian culture. Honking geese during a TV interview in the lead-up to the 2015 federal election drew a spate of Tweets (CBC 2015, September 8). <http://www.cbc.ca/m/news/politics/canada-election-2015-trudeau-interview-geese-tweets-1.3220761>



Justine
@ChocolateGuitar

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I love the fact that there are Canada geese in the background of this #CBC interview. Very Canadian :D #elxn42 [youtube.com/watch?v=IkMa8U...](https://www.youtube.com/watch?v=IkMa8U...)

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14.6 Monitoring

Monitoring Objective:

39. Urge CWS to develop a monitoring program for temperate-nesting Canada Geese and a predictive population model encompassing multiple regions and interacting goose (sub)populations.

A standardized monitoring program, with indicators, will help assess the efficacy of management programs, better inform population models and predict future challenges and opportunities. A LAC and/or TPC program should be considered, that links monitoring to models to management actions to monitoring, in a cyclic fashion. In Ontario, the CWS has modeled the provincial temperate-breeding population and is using the results to improve management and monitoring programs (Hughes 2012). A similar program here should encompass all of the interacting goose (sub)populations on Vancouver

Island (and beyond, if necessary). Parts of this management strategy (e.g., 10.3, Life History by the Numbers) and survivorship estimates (from future University of Victoria math students, for example) offer a range of variables suitable for developing a comprehensive population model. When combined with estuarine monitoring, population thresholds can be determined, facilitating long-term management of geese and population numbers and trends that promote marsh rehabilitation. It is important that any monitoring program maintain consistency in its surveys and not rely on volunteers.

14.7 Timelines

This strategy focuses on solutions that provide long-term results, as most repetitive, short-term efforts (such as hazing) will prove largely inconsequential and costly. Although dialogue regarding controversial methods of control is necessary, the USDA (1999) showed that postponing lethal controls leads to substantially greater numbers of

geese being killed at a later date. Canada Goose populations grow, other methods are proven ineffective, and lethal controls are eventually implemented. Objectives should be incorporated into management plans and implemented within a 5-year period, with follow up as necessary.

14.8 Actions

Action items, in the form of management objectives, are prioritized with deliverables, targets, and indicators in Table 14-1.

Table 14-1. Management objectives.

Section	Objectives	Priority	Deliverables	Indicators/Targets
Responsibilities	1. Urge CWS to lead a regional working group that adequately funds Canada Goose management plans and action items.	1	Regional working group, management plans, funding agreements.	Amount of federal and leveraged funding for plans and programs, number of CWS and MFLNRO staff assigned to regional Canada Goose management
Population Objectives	2. Urge the CWS to amend the process to set population objectives for temperate-breeding Canada Geese.	1	Population objectives are set separately for temperate-breeding Canada Geese.	Population objectives are lower for temperate-breeding Canada Geese than objectives for migratory Canada Geese.
Population Objectives	3. Urge the CWS to designate temperate-breeding Canada Geese as overabundant.	1	Temperate-breeding Canada Geese are designated as overabundant.	Hunter use of new opportunities provided by an overabundance designation (survey), increase in numbers of hunters and harvested geese in the 1-5 and 1-6 management zones
Spatial Objectives	4. Develop management plans that are specific to each management zone.	1	Zone-based management plans	Number of management plans developed and implemented
LQRE Zone	5. Commit to a long-term egg addling program.	1	Egg addling program	Funding for program, recruitment is zero on LQRE
LQRE Zone	6. Promote hunting (LQRE zone outside of LQRE).	3	Consultation targeted to hunters, incentives for hunters	Increase in numbers of hunters and harvested geese in 1-5 and 1-6 management zones
LQRE Zone	7. Explore limited, coordinated hunting on the LQRE.	2	At least one hunt on the LQRE	Number of adults using the LQRE is reduced
LQRE Zone	8. Attach transmitters to a subset of LQRE-nesting geese and monitor by satellite telemetry.	3	Non-LR migrant types monitored over the seasons	Funding for satellite telemetry equipment and monitoring program, at least 5 birds tracked over 1+ years

Section	Objectives	Priority	Deliverables	Indicators/Targets
LQRE Zone	9. Encourage affected farmers to pursue and use kill permits outside of hunting seasons.	3	Farmers are protecting crops by controlling geese outside of the hunting season	Number of farmers using permits has increased, number of permits issued has increased
LQRE Zone	10. To maintain existing wetlands, including seasonal wetlands, suggest alternate habitat modifications to farmers and others.	1	Resources developed (e.g., fact sheet or brochure) re importance of wetlands and alternatives to drainage, distribution campaign	All wetlands are protected that were proposed for drainage because of geese, number of people contacted
LQRE Zone	11. Maintain and monitor LQRE exclosures until the estuarine marsh has recovered. Apply experimental restoration techniques as necessary.	1	Guardians maintain exclosures, monitor marsh recovery, and apply experimental restoration techniques such as anchored LWD.	Funding for maintenance and monitoring, vegetation and salinity data collected once every two years
ERE Zone	12. Capture and cull as many birds as possible during the moulting period.	1	At least one cull	Number of adults using the ERE is reduced
ERE Zone	13. As an alternative to culling, organize several large-scale hazing events to push geese into huntable areas.	1	At least one hazing/hunting event	Number of adults using the ERE is reduced
ERE Zone	14. Continue an egg addling program until the population is diminished.	1	Egg addling program	Funding for program, recruitment is zero on ERE
ERE Zone	15. Promote techniques to create goose unfriendly habitats and facilitate sharing of experiences and expertise.	1	Development of resources (e.g., webpages, guidebook), distribution plan (e.g., workshop, mailing list), ongoing sharing of experiences (e.g., dropbox, listserve, coordinator)	Number of goose unfriendly habitats in development, number of goose unfriendly habitats successfully created
ERE Zone	16. Reduce exposure of children and seniors to goose feces.	1	Mitigation plan	Plan developed and implemented, number of children and seniors protected from unnecessary exposure to goose feces

Section	Objectives	Priority	Deliverables	Indicators/Targets
ERE Zone	17. Begin restoration of the ERE, using a variety of experimental techniques.	1	LWD exclosures and sediment traps installed, sedges planted and protected from goose herbivory	Funding for installation, maintenance, and monitoring, number of LWD exclosures installed, species composition and forage height in exclosures in July, depth of sediment captured, occurrence of plants in sediment traps, number of sedges planted, survival of plants
CCE Zone	18. In concert with ERE initiatives, plan a cull during the moulting period.	1	see Objective 12	see Objective 12
CCE Zone	19. In concert with ERE initiatives, as an alternative to culling, organize hazing events to push geese into huntable areas.	1	see Objective 13	see Objective 13
CCE Zone	20: Expand the egg addling program to encompass more areas and stakeholders.	1	Egg addling program	Funding for program, recruitment is zero on NBE, numbers of nests found and eggs addled, number of goslings observed reduced
CCE Zone	21: Promote hunting.	2	Consultation targeted to hunters, incentives for hunters	Increase in numbers of hunters and harvested geese in the 1-5 management zone
CCE Zone	22. Encourage limited, coordinated hunting of Canada Geese on the NBE.	2	At least one hunt on the NBE	Number of adults using the NBE is reduced
CCE Zone	23: Encourage hazing in non-huntable areas during hunting seasons.	2	Hazing program during hunting seasons	Number of hazing initiatives during hunting seasons, increase in harvested geese in the 1-5 management zone
CCE Zone	24. Encourage affected farmers to pursue kill permits outside of hunting seasons.	3	See Objective 9	See Objective 9

Section	Objectives	Priority	Deliverables	Indicators/Targets
CCE Zone	25. Promote techniques to create goose unfriendly habitats and enable sharing of expertise.	1	See Objective 15	See Objective 15
CCE Zone	26: Install goose exclosures on the CCE.	1	Guardians install exclosures and monitor marsh recovery	Funding for installation, maintenance and monitoring, vegetation and salinity data collected once every year
Temporal Objectives	27. Protect estuarine marshes year-round, with exclosures, fencing, LWD structures, and hazing until goose populations are substantially diminished.	1	See Objectives 11, 17, and 26	See Objectives 11, 17, and 26
Temporal Objectives	28. Round up Canada Geese during the moulting period and transfer them to an appropriate farm or culling facility	1	See Objective 12	See Objective 12
Temporal Objectives	29. Capture Canada Geese at their nests for research purposes or to cull them.	1	See Objective 12	See Objective 12
Temporal Objectives	30. Organize hunts on the LQRE and NBE during the spring hunting season.	2	See Objectives 7, 22	See Objectives 7, 22
Temporal Objectives	31. Haze birds into huntable areas during the early autumn hunting season (all zones, with focus on CCE zone).	2	See Objectives 23	See Objective 23
Temporal Objectives	32. Promote hunting of traditional migrants during regular hunting seasons (LQRE and CCE zones, with focus on CCE zone).	3	Consultation targeted to hunters, incentives for hunters	Increase in numbers of hunters and harvested geese in the 1-5 and 1-6 management zones
Social Objectives	33. Examine health risks to people, livestock, and pets (all zones).	1	Standardized testing of beaches, ponds, heavily used terrestrial areas	Levels of bacteria are zero, follow up studies if levels are elevated

Section	Objectives	Priority	Deliverables	Indicators/Targets
Social Objectives	34. Urge senior governments to allow culled geese to be used for food (all zones).	1	Captured wild Canada Geese can be held in pens prior to transport and donation to food banks and/or other food distribution venues.	Funding for holding, processing, and transport of captured geese to food banks and/or other food distribution venues, number of geese held, processed, donated
Social Objectives	35. Develop a communication protocol that includes interaction with other Canada Goose management committees or working groups and naturalist groups.	2	Communication protocol with CWS	CWS central coordinator, number of meetings among working groups
Social Objectives	36. Engage stakeholders and the public regarding goose impacts and control techniques.	1	Stakeholder and public engagement in zone-based management plans	Number of surveys, number of communities with public open houses, number of stakeholders and members of the public engaged
Social Objectives	37. Urge the CWS to make permits for controlling Canada Geese easier to obtain.	1	Online permitting process, simple (e.g., one-page) guide	Increase in number of permit applications
Social Objectives	38. Consult and collaborate with First Nations.	1	First Nations represented on regional working group	Goose management on reserves is integrated with other sites in the region
Monitoring Objective	39. Urge CWS to develop a monitoring program for temperate-nesting Canada Geese and a predictive population model encompassing multiple regions and interacting goose (sub)populations.	1	Multi-region monitoring program	Predictive models for Vancouver Island