Dogs, Shorebirds, and Conflict Management:

Recreation and Ecological Integrity at Long Beach, Pacific Rim National Park Reserve, B.C.

by

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Abstract

This study is an interdisciplinary investigation of the apparent conflict between recreation and ecosystem protection in Canada's national parks. Parks Canada is committed to both management goals through its mandate. Canada's national parks are part of the world heritage network, which the International Union for the Conservation of Nature and Natural Resources (IUCN) – World Commission on Protected Areas oversees. The credibility of Canada's national parks depends on the assumptions that all areas are protected, that there is no conflict between ecosystem protection and recreation, and that the *Canada National Parks Act* is implemented successfully. Pacific Rim National Park Reserve (PRNPR) serves as a case study in which these assumptions are challenged. The interactions between migrating shorebirds, human visitation with and without pets, law enforcement, and indigenous peoples were investigated to see whether shorebirds were displaced by human activity, to determine conflicts between recreation and ecosystem protection, and to assess how well the leash-regulation of the *Canada National Parks Act* was implemented at Long Beach. Dog walking as a recreational activity was also assessed for its appropriateness at PRNPR. Shorebirds were displaced locally from areas adjacent to the parking lot, especially during times of high human activity resulting in a conflict between recreation and ecosystem protection. The leash-regulation is ignored by 62% (spring) to 80% (late summer) of visitors who bring their pet to the park. PRNPR relies on voluntary compliance, that is, no tickets were given out and no beach patrols were observed. Experiments showed that the speed and direction of an approach by a human or dog determined birds' escape behaviour,

not the presence of dogs. Dog walking is recommended to be treated as an allowable use, which must be managed carefully. None of the assumptions underlying how the *Canada National Parks Act* is implemented could be supported by this study. Shorebirds as a group of non-charismatic migratory species without an obvious ecosystem function have little chance of being protected using a single-species approach. If a demand for the ecosystem services provided could be conceptualised to the average person, using economic instead of political arguments, not only shorebirds but also humans would have higher quality living spaces.

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I am amazed when I look at the long list of people who have supported and helped me throughout this adventure. First of all, a big thank you to the best thesis committee I could have hoped for, with Paul Wilkinson, Nigel Waltho, and Dawn Bazely. Paul gave me the best piece of advice during an introduction class at FES. He said, "Whatever you do, make sure you have fun!" It was not always easy to follow this advice, but Paul and Nigel were there to listen. Thanks. Without Wendy Szaniszlo's enthusiasm for the west coast and everything that lives in or near the ocean I would not have found this project opportunity. She also became a great friend at the warden office and we shared each other's Master student experiences during many late nights. Bob Hansen and Pete Clarkson were crucial throughout the initial project planning and design stage. Thanks to Pete I also found my temporary home at the park. I owe many thanks to Angus Simpson, who was always helpful especially with anything dog related. He also allowed me to use his dog for the experimental work. Sequoia was a wonderful research assistant and companion, especially during lonely times at the park. John McIntosh and Brock Fraser always made sure that evening entertainment was provided by bringing in movies to go with popcorn and rainy nights. Brock was also always available for any GIS and mapping question. Thanks to Bob and Michelle Redhead for an open ear at the park and for welcoming me at their home. Bob also provided valuable information about the on-going water testing at the park. Thanks to chief park warden Larry Harbidge for his advise and for allowing me to "borrow" his dog Kate. Thanks to all park wardens, surf guards, and resource conservation officers for sharing their workplace. The Young Canada

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Foreword

This thesis is part of the MES degree requirements and the highlight of my chosen area of concentration at the Faculty of Environmental Studies: "Recreation Ecology". The components of my plan of study are recreation ecology, recreation planning and management, and tourism.

My learning objectives in the recreation ecology component were environmental impacts of recreation, ecosystem hierarchy, and resource management. The impact of beach recreation on migrating shorebirds at Pacific Rim National Park Reserve was assessed in this study. I created a hierarchy of protected area management from the global scale of the world heritage system to the local scale of different beach sections at Long Beach. In my conclusion, I emphasize the need to value the ecosystem services provided by national parks as a resource that is required to run the economic system that humans have established.

The learning objectives of the second component in my plan of study were recreation planning, recreation management, and programme implementation. One of the outcomes of this thesis is a set of recommendations for further recreation management, especially in relation to dogs. Programme implementation was the core theme of the study. A great idea, such as the Parks Canada mandate, is only great if it is implemented successfully. Ecosystem protection and recreation can co-exist if the priorities are clear and limits are set. The key to its success is the implementation process. The entire project of finding a study site, writing a proposal, finding funding, doing the actual research in the field, dealing with local unexpected

problems, analysing the data, and finally writing the thesis was one of the most valuable lessons. Things do not always happen the way one might wish they would. It is important to be flexible and adjust to the unexpected. This is what adaptive management means.

The last component of my plan of study includes nature tourism and protected area management as learning objectives. National parks are nature tourism in action. The challenge is to manage nature tourism within the protected area and balancing the impacts with the stories and experiences that nature tourists take away from national parks into their every-day lives.

This thesis has covered all the components and learning objectives in my plan of study. In hindsight, I should have added one more component: people and politics. I would have never imagined that a seemingly straightforward and simple project as the impact of dog walkers on shorebirds would turn into such a complex political undertaking. The interdisciplinary nature of my enquiry sometimes resulted in small sample sizes, but I felt that it was more important to tackle the problem from more than one angle despite limited resources. Small samples were also the result of an unexpected change in schedule and loss of one month field work.

Throughout the three months I spent at Pacific Rim National Park Reserve I had the privilege of living in a small trailer by the park warden office and was able to observe the coming and going of its staff. I got to know park wardens as enthusiastic individuals, who joined the Warden Service to manage wildlife and make an active contribution to ecosystem conservation. More often than not, their job entails having

to rescue visitors who had entangled their high-heeled shoes in the board-walks and broken their ankles. They have to wear a bullet-proof vest on duty and talk to people who are drinking alcohol on the beach or who are making noise on the campground. They search for lost children and return them to their parents. Every day they have to explain over and over again why campers must not leave their coolers outside: bears will be attracted otherwise. The lengthy procedure of getting permission to close an area due to a wildlife advisory, doing the paperwork, and making the actual sign does not seem to fit this dream of managing wildlife. The frequency of resignations is high and, perhaps, avoiding situations of conflict becomes a way of keeping sane. I also met many seasonal staff at Greenpoint campground and the visitor centre, as well as contract security service personnel. They all struggle to deal with the limited support that they have to solve many everyday problems and to provide services to park visitors. Without the efforts of these individuals, national parks would not have become a Canadian symbol.

My vision is that this thesis may inspire some people to ask themselves why they care about their national parks and how much they really do pay for and appreciate their ecosystem and park services.

Chapter 1: Problem Statement and Thesis Outline

Problem Statement

The "parks in peril" slogan has become known with the publication of case studies from the Parks in Peril Conservation Partnership program for protected areas in Latin America (Brandon *et al.* 1998). The synthesis of nine Latin American national parks was a disturbing picture of protected areas that are ruled by politics and merely protected on paper. The term "paper park" is associated with South America, Africa, and perhaps South East Asia, not Canada.

Canada's national park system is one of the largest and most diverse protected area networks in the world. Millions of visitors from all over the world and Canada are drawn to the country's 40 national parks, which currently represent examples of coastal and marine areas, mountains, grasslands and the Arctic, covering more than 200,000 square kilometres (about 2.5% of Canada's total area) in 15 different ecozones (Parks Canada 2003). Canadians are proud of their national park system: they have claimed their national parks to be the third most important symbol of Canada following the national anthem and flag (Parks Canada 2000).

Figure 1 shows the role of Canada's national parks in the worldwide framework of protected area management. The framework is organized in a hierarchical system, where the International Union for the Conservation of Nature and Natural Resources - World Commission on Protected Areas (IUCN-WCPA) World Heritage Network is

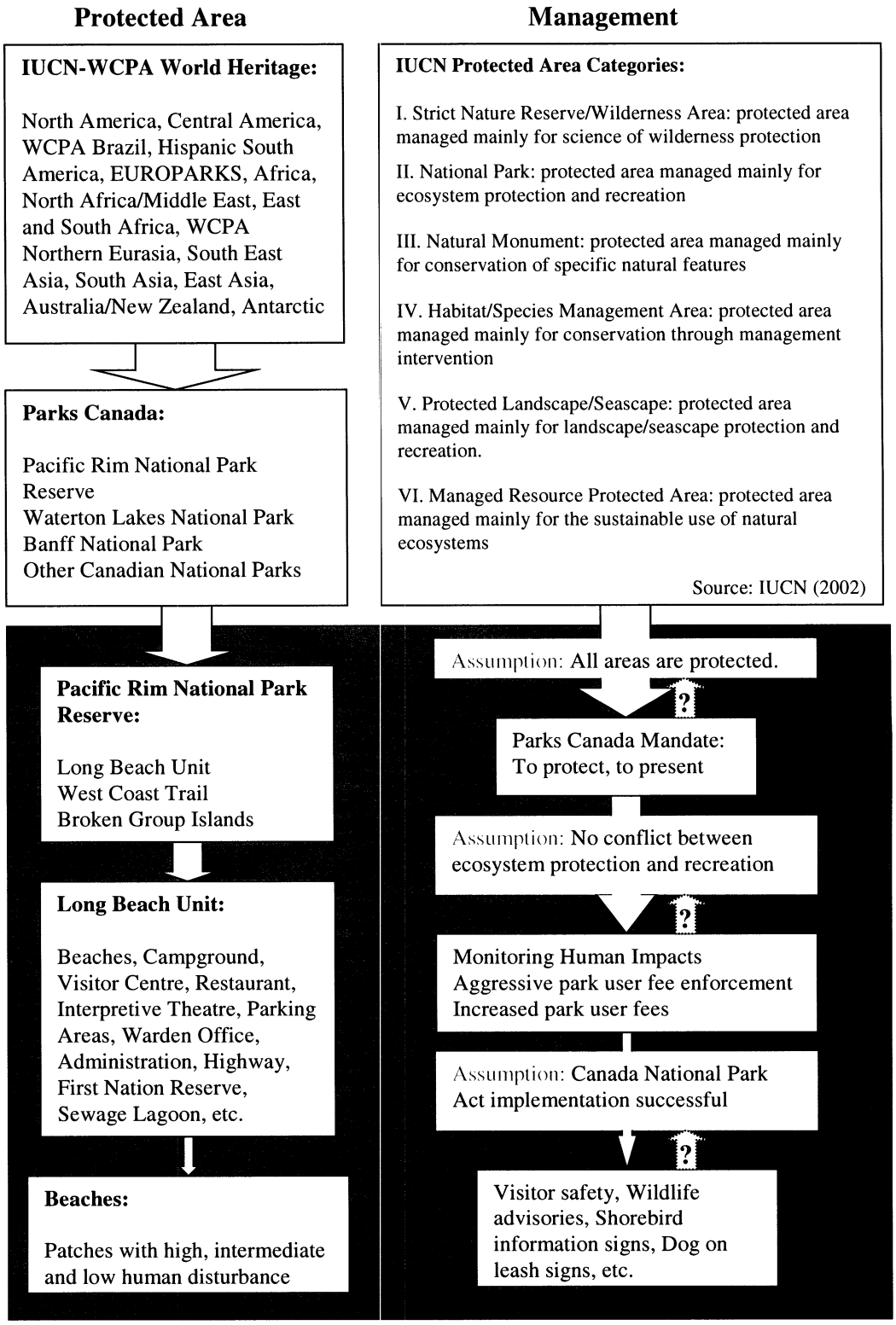


Figure 1: Hierarchy of world heritage protected area management including case study. Arrows represent decreasing protected area and management for ecological integrity as the resolution increases from an international focus to the local level of consideration.

the highest level of protected areas, covering all terrestrial and marine areas worldwide. All of Canada's and the United States' protected areas are part of the North American world heritage region. Other regions of the worldwide network are Central America, Brazil, Hispanic South America, EUROPARKS, Africa, North Africa/Middle East, East and South Africa, Northern Eurasia, South East Asia, Australia, New Zealand, and the Antarctic (IUCN 2002).

All protected areas in the world heritage network are allocated to one of six IUCN protected area categories: I Strict Nature Reserve/Wilderness Area, II National Park, III Natural Monument, IV Habitat/Species Management Area, V Protected Landscape/Seascape and VI Managed Resource Protected Area (IUCN 2002). Each category has its own management goal (Figure 1).

The level of protection in a protected area depends on the scale or hierarchical level of consideration: on an international and national level, national parks appear as if the entire park area were protected from human disturbance. A country map would show the area of a national park in green implying full protection. On the park level, however, only a portion of a national park is realistically protected, while the rest serves recreational purposes and is less protected from human developments and disturbance. Thus, a local visitor map of the same park would show areas such as visitor centres, restaurants, parking areas, etc. separately from areas with restricted access. Protection may not only be limited spatially, but also on a temporal scale: a protected area may be disturbed during the summer and left undisturbed from visitors during less popular winter months.

The problem is evident: the entire park area is accounted for as protected on an international level, but only a proportion of the park is protected at the local level. This results in a top-down reduction of real protection from the world heritage point of view to the local level of individual patches on the beach (Figure 1).

The level of active protected area management reflects this top-down reduction in actual protection by a discrepancy of management goals and the assumption that these goals will be implemented successfully. Management goals are shown in Figure 1 as they correspond to the respective hierarchical level of protected areas.

This research focuses on national parks in Canada whose management goals are reflected in their mandate, within the IUCN category II protected area framework. Pacific Rim National Park Reserve (PRNPR) is an example of a Canadian national park. A national park is "a protected area managed mainly for ecosystem protection and recreation" (IUCN 2002). Parks Canada administers all of Canada's national parks, and the IUCN management goal is reflected in Parks Canada's mandate: "On behalf of the people of Canada, we protect and present nationally significant examples of Canada's natural and cultural heritage and foster public understanding, appreciation and enjoyment in ways that ensure their ecological and commemorative integrity for present and future generations" (Parks Canada 2002).

National park management is based on three assumptions, which this research challenges. The first assumption has been elaborated above: all areas are protected (IUCN World Heritage Level in Figure 1).

The second assumption is based on the Parks Canada mandate. The mandate assumes that there is no conflict between ecosystem protection and recreation. The *State of the Parks 1997 Report* has only given one national park in Canada a first-class overall ecological integrity ranking: Vuntut National Park in the northern Yukon Territory. "Most southern parks have development including roads, transportation and communication corridors, and buildings to accommodate visitors and park management" (Parks Canada 1998, p. 23). Clearly, there is reason to suggest that ecosystem protection and recreation are in conflict. After this wake-up call, the Panel on the Ecological Integrity of Canada's National Parks (EI-Panel) was formed in 1998 to assess the strengths and weaknesses of the Parks Canada approach to maintaining ecological integrity. One of the many recommendations of this EI-Panel (2000, ch. 1 p. 15) was to redefine ecological integrity as follows: "An ecosystem has integrity when it is deemed characteristic for its natural region, including the composition and abundance of native species and biological communities, rates of change and supporting processes". The definition of ecological integrity actually incorporated into the *Canada National Parks Act* is slightly different from this recommendation:

> Ecological integrity is a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes. (*Canada National Parks Act* 2000)

At the same time, the Act requires parks to be dedicated to the public:

> The national parks of Canada are hereby dedicated to the people of Canada for their benefit, education and enjoyment, subject to this Act and the regulations, and the parks shall be maintained and made use of so as to leave

> them unimpaired for the enjoyment of future generations. (*Canada National Parks Act* 2000)

When considering this definition of ecological integrity and the commitment of national parks to serve for conservation and recreation at the same time, the question that arises is: are conservation and recreation a realistic win-win-solution that can be implemented?

The third assumption is related to the implementation process of park management goals defined by the *Canada National Parks Act*. Brandon *et al.* (1998) suggest that many parks, especially in developing areas, turn out to be protected merely on paper without any active management. Active management is also absent from many Canada's national parks turning them into potential paper parks. The EI-Panel (2000, ch. 5 p. 1) defines active management as covering:

> ...a range of possible actions in such areas as fire restoration, periodic flooding, restoration of key disturbances, species re-introduction, management of harvested species, and management of hyperabundant native or non-native species.

The Panel (2000, ch. 5 p. 1) noted that active management had been "a difficult concept to put into operation across the national park system" resulting in laissez-faire management. The assumption that the *Canada National Park Act* is implemented successfully may be an illusion.

Recreation management is almost exclusively limited to monitoring and mitigating direct impacts of people on the environment. Biology journals are filled with studies of many kinds of recreational activities on certain species or ecosystems, where

humans are traditionally outlined as a "disturbance", which has to be eliminated as much as possible from the protected area. Examples include Lafferty (2001a, 2001b), who studied the disturbance of shorebirds in Southern California by human activity including dogs. He finds that humans and dogs were disturbing plovers once every 27 minutes at the weekend and that prohibiting dogs and establishing a buffer zone on the beach would protect plovers best. Lafferty does not include any evaluation of the social consequences of these recommendations. Miller *et al.* (2001) are also concerned by the "escalating participation in outdoor recreational activities" and investigate wildlife responses to pedestrians and dogs. The response of a wildlife species or an ecosystem is the factor that determines whether an activity has a significant impact on the species or ecosystem in question. Gill *et al.* (2001) question the validity of wildlife response studies. They argue that conservation priorities cannot be assessed with studies that demonstrate that animals will avoid areas where humans are present. If an alternative site without human disturbance were not available, species would remain in the study area and appear as if they did not suffer from disturbance. Thus, wildlife response studies would become meaningless.

National park management is largely opportunistic, carried out by non-specialists and often focuses on threat status alone assuming a linear relationship between a threat and the status of biodiversity (Parrish *et al.* 2003). The good news of ever-increasing numbers of protected areas covering nearly 10% of the Earth's terrestrial surface is diminished by Ervin (2003, p. 1), who has reviewed the current situation of the world's protected areas:

> While some studies demonstrate that parks can provide a basic safeguard against losses in biodiversity (e.g. Bruner *et al.* 2001), many other studies confirm that, as a whole, protected areas worldwide have inadequate design and coverage, lack sufficient management to address a host of threats, and face increasing levels of environmental degradation.

Although protected area management has been assessed as poorly implemented worldwide, one might think that Canada would stand out as one of the better examples in protected area management. Searle (2000) has probably found and written the most extensive and perhaps the most disturbing collection of Parks Canada's inside stories. Few resources and severe internal communication deficits leading to high levels of frustration amongst employees are suggested as barriers for conservation efforts. Searle (2000) gives numerous anecdotes to make this point. Two examples are a confidential e-mail of a Parks Canada employee:

> Ecological integrity is nothing but a bunch of pious verbiage without placing people in the context. Parks only exist in a human world, they are a human concept, and we are not an altruistic species despite what some zealots might say.

and the explanation a former superintendent of a western park gave for his resignation:

> The reason I quit was that senior management doesn't have the guts to make strong decisions. Whenever we stood up for park values and caused some forest company grief they would complain to their elected representative. First thing we knew, the message would come down from above, 'What the hell are you doing?' instead of asking 'How can we help?' it doesn't take long before you stop speaking out. (Searle 2000, pp. 145-146)

These acounts are an inspiration to look into an example of such a "phantom park", as Searle would call it, and confirm some of his findings. One of the actions which

Searle (2000) recommends for Parks Canada is to include both ecosystem science and social science in park management decision making. So far, few studies do include both ecosystem science and social science. One example, however, stands out: a member of the Atlantic Service Centre of Parks Canada, Tompa (2003) has developed an appropriate activities assessment tool as a guide for park management decision-making. In an effort to actually use the tool rather than letting it sit in the archive, it will be applied in this research and used to guide the decision making process in the recommendation section. The tool includes three levels of enquiry: visitor experience, park scale, and spatial specificity.

Tompa (2003) defines appropriate activities as

- consistent with National Park policy and the protection of ecological and/or commemorative integrity as the first priority of protected heritage areas
- especially suited to the particular conditions of the specific national park
- activities that provide opportunities to appreciate, understand and enjoy park themes, messages and stories.

She defines inappropriate activities as those that

- have significant constraints which render the activity incompatible with the management goals of the national park
- may not be consistent with National Park policy
- pose significant actual or potential threats to ecological integrity
- may offer limited opportunities for appreciation and understanding of park messages and environment; require more than a minimum of built facilities; have potential or actual visitor conflict; and/or, compete with existing opportunities outside the park.

Public consultation plays a major role in this approach, which is an important effort to build trust with the community and make management decisions more acceptable.

At the same time, Tompa recognizes that the tool is value laden and subjective, therefore to be used only as a guide.

Pacific Rim National Park Reserve (PRNPR) will serve as a case study to explore the relationship of recreation and ecological integrity at a Canadian national park. Recreational usages of the Long Beach unit at this park include dog walking, playing on the beach, and surfing. Dog walking in particular has been identified by park staff and local people as a questionable activity. Dogs not only disturb some of the visitors, but have also been suggested a source of disturbance to migrating shorebirds (e.g., Lafferty 2001a). Of course, dog owners are not happy with these accusations and seem to ignore the leash-regulations almost entirely. People without a dog and children chasing birds were also identified as potential sources of shorebird disturbance, which will be addressed in this research.

Thesis Outline

The problem of recreation and ecological integrity in the context of Canada's national parks has been outlined in this first chapter. The second chapter introduces PRNPR, the study site, and study species. Chapter 3 focuses on park users: an inventory of use patterns by shorebirds, humans, and dogs demonstrates park activities quantitatively and qualitatively in space. Interactions between shorebirds and humans with and without dogs have been tested experimentally and short visitor interviews gave a good picture of visitor attitudes at the park. Chapter 4 shines light on the

PRNPR community, that is, the people who are living and working within the park boundaries. Although the *Canada National Parks Act* does apply to PRNPR, its nomination as a national park (as opposed to a national park reserve) is still subject to pending land claims negotiations with First Nations. The Esowista First Nation Reserve is located inside the study area, which makes a discussion of First Nation issues affecting reserve dogs and shorebird disturbance on Long Beach imperative. Parks Canada at PRNPR, including their management practices and attitudes, will also be covered in this chapter. Chapter 5 will combine and structure the previous segments into the appropriate activities assessment and lead to recommendations at the park. The last chapter will be dedicated to conclusions and further recommended research.

Chapter 2: Case Study Introduction

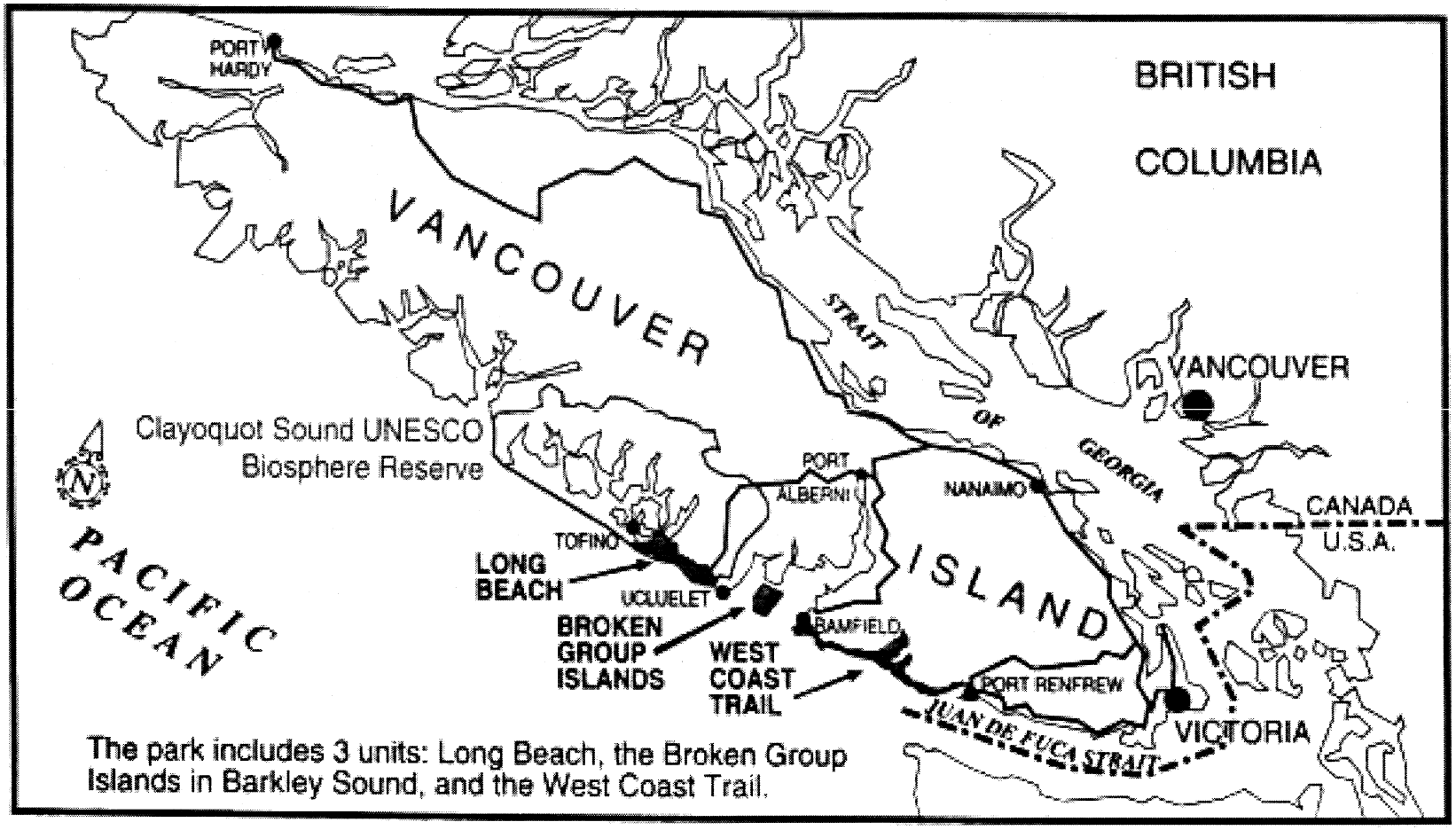
Introduction

Pacific Rim National Park Reserve (PRNPR) was Canada's first national park on the Pacific coast, located on the west coast of Vancouver Island, British Columbia. The park consists of three sections: Long Beach, Broken Group Islands and the West Coast Trail (Figure 2). The Long Beach unit is the most heavily visited unit of the park and PRNPR is also one of the most heavily-visited national parks in Canada; it receives approximately 700,000 visitors every year.

One of the park's objectives is "to maintain the ecological integrity of Pacific Rim's terrestrial and marine natural heritage as the priority in park management" (Pacific/Yukon Region Canadian Heritage 1994, p. 15).

This research targets the ecological integrity of the Long Beach unit. The Long Beach unit offers resting and feeding opportunities for migrating shorebirds, such as plovers (*Charadriidae*) and sandpipers (*Scolopacidae*), and for nesting territorial birds, such as bald eagles (*Haliaeetus leucocephalus*).

Shorebird populations are threatened by the loss or degradation of habitat in breeding, wintering, and staging areas due to development, human disturbance, pesticide use, water pollution, and oil spills (British Columbia Ministry of Environment, Lands and Parks 1997; Myers 1988; Senner and Howe 1984).



(Source: Parks Canada, Pacific Rim National Park Reserve)

Figure 2: Map of Pacific Rim National Park Reserve

Shorebirds are a highly mobile bird family and their habitat is extremely dynamic. Migratory shorebirds spend the winter in tropical countries of South America and fly to the arctic tundra to breed. Therefore, these birds deal not only with the local dynamics of Long Beach, but also with the highly variable habitat features of the tropics, the arctic tundra, and of course the air space itself. It has been estimated that shorebirds spend as few as three days at their stopover sites. The Western sandpiper, for example, spends most of the year in the tropics, flies for one month with a three-day break at a stopover site, and stays in the Arctic for about six weeks to breed (Ydenberg 2003). This life history trait should be kept in mind when trying to manage an area for migrating shorebirds. These birds do not have much time to adapt to local conditions.

Local residents who live near the Long Beach unit and are interested in natural history have observed that shorebirds, once very common on beaches adjacent to the park, have become a rare sight. This is, for example, the case of Chesterman beach located north of the park: this beach has become more and more significant for recreational uses such as surfing and walking. One resident believes that shorebirds have been displaced from Chesterman Beach by excessive human use and argues that the beaches inside the park should be protected more to avoid a similar outcome (anonymous pers. comm. 2003). Such traditional knowledge adds to more scientific reports that shorebirds can be displaced by humans, especially when accompanied by a dog (e.g. Lafferty 2001a; Thomas, Kvitek and Bretz 2003). Dogs are permitted access to all areas of the Long Beach unit except walk-in campsites and indoor interpretive areas.

The National Parks Domestic Animals Regulations of the *Canada National Parks Act* (Government of Canada 2000) states:

> In a park, every keeper of a domestic animal shall have it under physical control at all times

and

> In a park, no keeper of a domestic animal shall permit it to (a) chase, molest, bite or injure any person, other domestic animal or wildlife.

The regulations define "physical control" as "restraint by a leash that does not exceed 3 meters in length or confinement in a container, enclosure or motor vehicle suitable for keeping the animal". The Act also allows the superintendent or park warden to impound a dog at large or when found chasing wildlife.

Although dogs must be kept on a leash at all times, observation suggests that only about 30% of all owners do so. Such low compliance is claimed to be overwhelming for the limited park warden resources, as wardens do not have enough time to enforce the leash-regulation. Thus, the rule becomes very ineffective. Park wardens and wildlife managers at PRNPR are concerned that those park visitors who take their dogs to the beach may disturb shorebirds to a degree, which is unacceptable in terms of preserving ecological integrity.

Current management includes public education to keep dogs on leashes by signage on beach access points, for example, at the parking lot. Most park staff have been trained

for law enforcement duties. However, the option to fine visitors is not realistic, because court appearance is mandatory for a dog off-leash offence (Harbidge 2003 pers. comm.). Having to appear in court would be impractical especially for visitors from outside BC and park staff are reluctant to burden the courts with such minor cases. Although the chief conservation officer at the time, Harbidge (2003 pers. comm.), claims that everyone does receive a written warning for a first offence, almost no official warnings are actually given.

This case study evaluates the value of the leash-regulation and explores more realistic management options, which would be easier to implement successfully.

Fieldwork was carried out through 3 April to 30 May and from 4 to 30 August 2003 to cover the spring migration north and the early fall migration south.

Study Area

The study area is part of the Long Beach unit of PRNPR. The beach stretches for about 19 km from Ucluelet to Tofino on the west coast of Vancouver Island (Figure 2). The study area is a 7.16 km section divided into Combers Beach, Long Beach (Greenpoint to Incinerator), and Esowista (Esowista Reserve at the North end of Long Beach). For simplicity, in this study the beaches will be called Combers, Long Beach and Esowista (Figure 3).

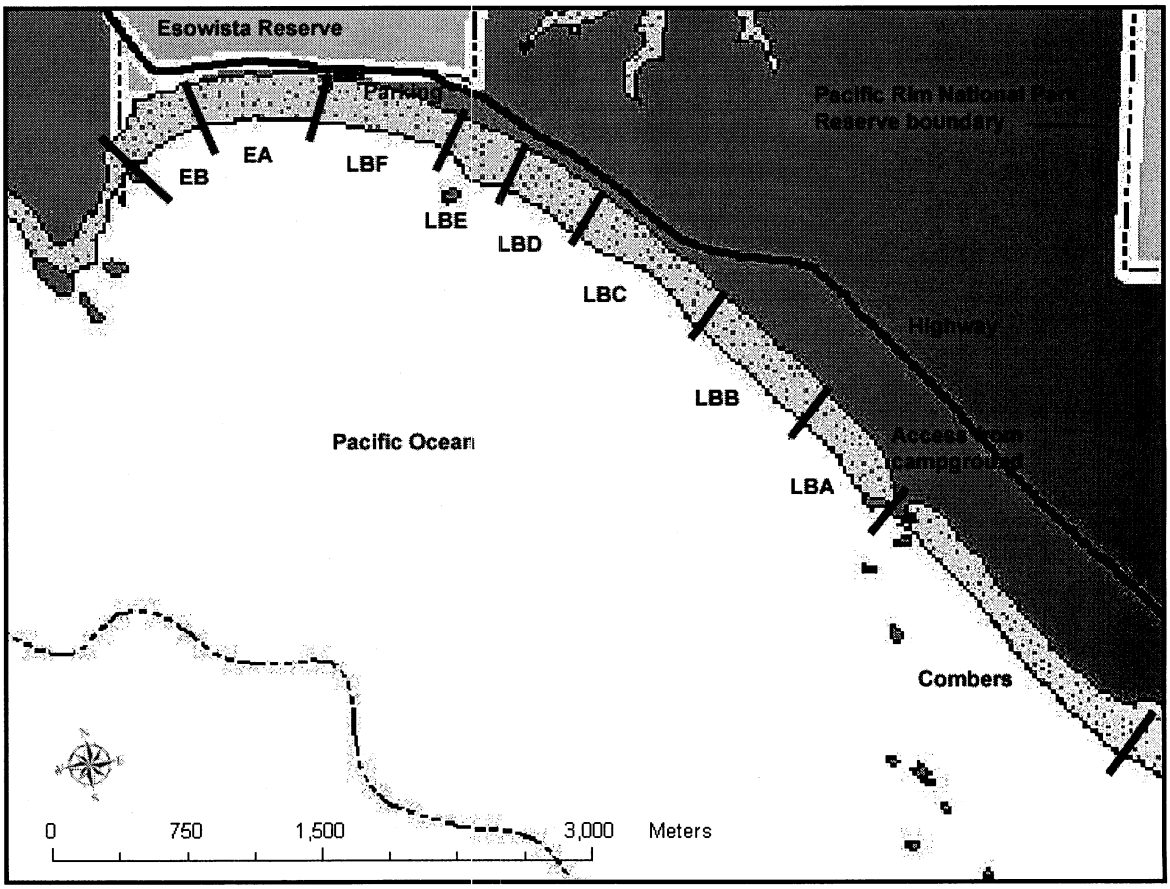


Figure 3: Long Beach study area (Adapted from Parks Canada map)

Large rocks divide all three beaches physically, which blocks the view to the adjacent beach (Figure 4). However, all beaches are connected and visitors can either walk around the rocks or climb over them. For most of the spring season, Combers is also separated by drift logs, which act as an additional obstacle to cross. For safety reasons, these logs are cleared in late May, creating a path from Long Beach to Combers. A highway runs parallel to the beaches and is separated from the beach by rainforest. Parking areas close to the beach are located at the north end of Long Beach and the south end of Combers. Long Beach and Esowista are accessible directly from the parking area or by walking trails through the rainforest. A campground is situated near the highway and the south end of Long Beach.

A small Second World War airport is located behind the Esowista Reserve on the other side of the highway. The airport is still used for small planes.

The three beach sections consist of tightly packed sand, which makes cycling or driving a vehicle possible. Driving on the beach is restricted to Parks Canada vehicles, usually for public safety purposes. The Long Beach unit is surrounded by rainforest and other beaches and mudflats, which are located in the Tofino area north of the park.

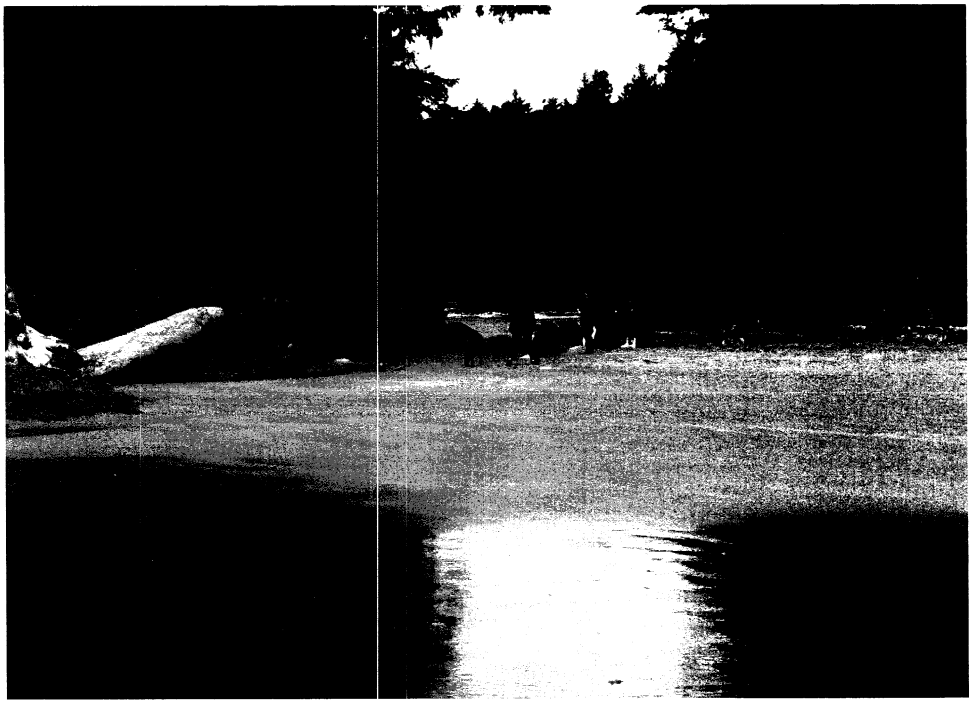


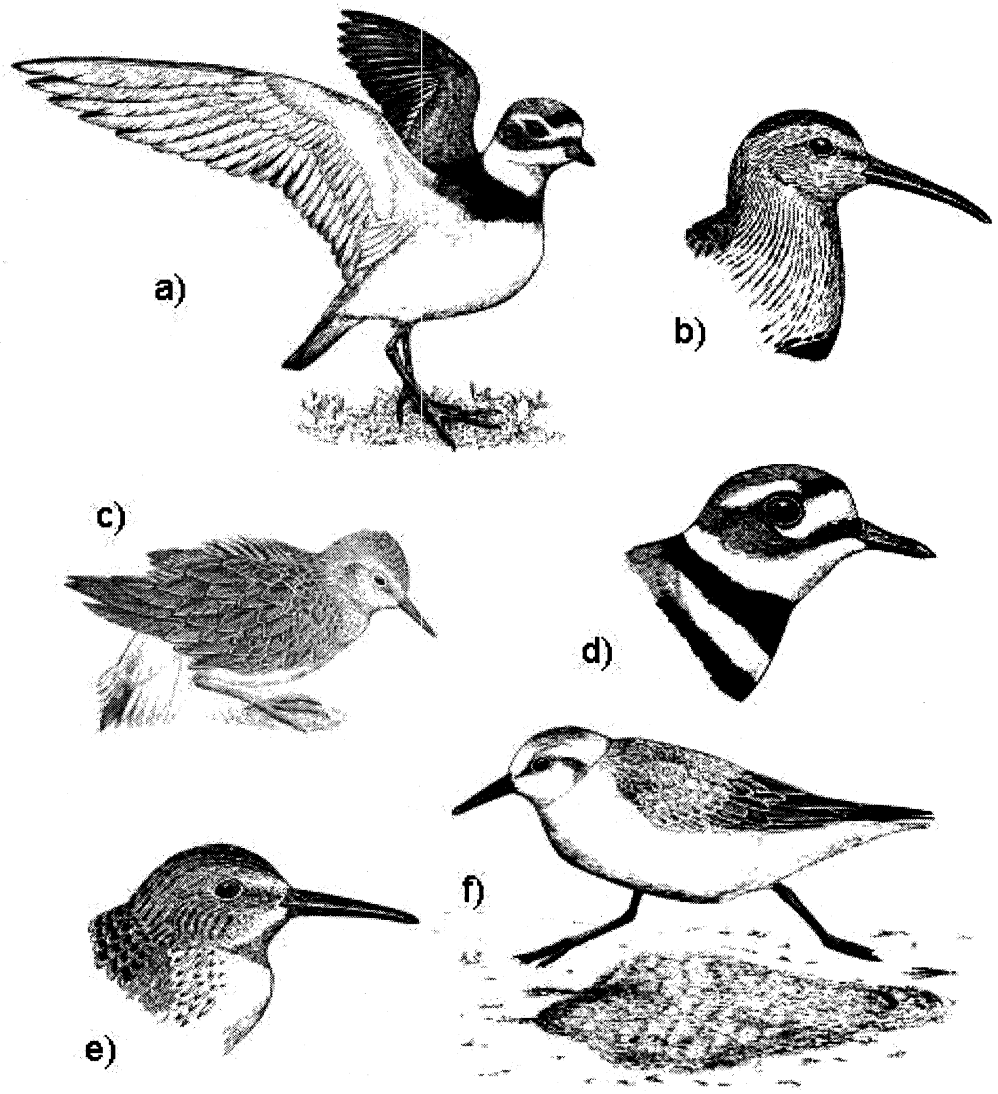
Figure 4: Rocks between Long Beach and Esowista

Study species

The species of this study include shorebirds, raptors, humans, and domestic pet dogs, as well as a group of semi-feral dogs.

Paulson (1998, p. 7) defines the shorebird guild as "the major group of birds that run, walk, and wade along the water's edge". All shorebirds observed on Long Beach were included in the study. These were most commonly small migrating shorebirds adapted to exposed sandy shores: western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*), sanderling (*Calidris alba*), dunlin (*Calidris alpina*), semipalmated plover (*Charadrius semipalmatus*), and breeding killdeer (*Charadrius vociferous*) (Figure 5). Other shorebird species more commonly seen on mudflats or rocky shores occasionally visited Long Beach: black-bellied plover (*Pluvialis squatarola*), black oystercatcher (*Haematopus bachmani*), greater yellowleg (*Tringa melanoleuca*), whimbrel (*Numenius phaeopus*), and long-billed dowitcher (*Limnodromus scolopaceus*).

Bald eagles (*Haliaeetus leucocephalus*) and ospreys (*Pandion haliaetus*) are common raptors on Long Beach and they were included during observations. The uncommon peregrine falcon (*Falco peregrinus*) was of interest and observed near the park, but never at Long Beach.



a) Semipalmated plover (*Charadrius semipalmatus*) (threat display) b) Dunlin (*Calidris alpina*) c) Least sandpiper (*Calidris minutilla*) d) Killdeer (*Charadrius vociferus*) e) Western sandpiper (*Calidris mauri*) f) Sanderling (*Calidris alba*) (Adapted from Johnsgard, P.A. 1981)

Figure 5: Common shorebirds on Long Beach

The majority of dogs (*Canis familiaris*) seen on Long Beach belong to visitors, who keep their dogs as pets, usually in their homes. Local visitors from the Tofino or Ucluelet area often walk their dogs at Long Beach, while tourists may bring their dog on their trip to the Pacific Rim.

The Esowista First Nation Reserve also has dogs, which are left loose on the reserve and the beach section adjacent to the reserve. These dogs are not kept indoors as pets and no individual ownership in the Western sense is claimed for the reserve dogs. They belong to the Esowista First Nation community; individuals, such as children living on the reserve, may look after the dogs.

Although visitor dogs and reserve dogs were treated the same during data collection, their differences in ownership and role at the park suggest that their management will be discussed separately.

Chapter 3: Pacific Rim National Park Reserve Visitors

Introduction

The purpose of this chapter is to establish a user profile of the Long Beach study area at PRNPR. Visitors are defined as people who do not work or live in the park and who use the park for recreation. This includes residents of the adjacent communities, Tofino and Ucluelet. Domestic pet dogs that accompany their owners and shorebirds using the beach for stopover are also included in this profile.

Beach surveys, experiments, and visitor interviews were conducted during two field seasons in spring and late summer 2003 when birds were migrating, first north and then south.

The following research questions related to park users were addressed during the first field season:

- Do preferred feeding and resting areas used by shorebirds occur in an undisturbed (i.e., in the absence of humans or dogs) setting?
- Are shorebirds displaced from preferred feeding and resting areas by human activity on Long Beach?
- What are visitor use patterns on Long Beach?
- What are visitor perceptions of why dogs should be kept on a leash?

The second field season was dedicated to finding ways of directing human behaviour, which is easier to control than animal behaviour. Preliminary research results lead to the following research question:

- Which activities are most likely to cause shorebirds to flush (i.e., result in flight behaviour of one or more birds) and which management measures would be most realistic in terms of implementation and successful shorebird conservation?

The following hypotheses were stated as a basis to answer the above questions.

Beach survey hypothesis

Compliance with the leash-regulation is independent from visitor density.

Experimental hypotheses

- Passing birds at a distance of about 10m and at walking speed triggers the same escape behaviour as walking through a flock of shorebirds.

- The presence of a dog does not affect shorebird escape behaviour.

- Shorebird take-off is independent from speed and direction of the approach.

Visitor interview questions

- If dogs were banned from Long Beach, the park could expect the same number of visitors than without a ban.

- Taking away dogs from irresponsible dog owners would be a very effective way of enforcing a dog ban.

- Dog owners have varying interpretations of what a "dog in control" means.

- Visitors are unaware of the mandate of Canada's national Parks.

Methods

Flush Rate Survey Methods

During pilot studies, flush rate surveys were designed as a measure of potential shorebird disturbance. This method was replaced by controlled experiments in the following season. Shorebird flocks were selected randomly and observed for one-hour time periods during low tide. The number of total flushes, time in air, flock composition, and the flush reason were recorded. A "flush" was defined as more than half of all birds flying due to an obvious or not-obvious disturbance. Note that flush rate surveys were only conducted as pilot studies during the spring season, due to the lack of control and because shorebird flocks were difficult to track. The average time spent in the air was associated with the reason for take-off and presented graphically. No further statistical analysis was conducted because flush rate surveys were used during pilot studies only.

Beach Survey Methods

Beach surveys were carried out in order to answer the initial research questions related to preferred beach areas by shorebirds and the extent of human activity at Long Beach. Compliance with the leash-regulation was also measured through beach surveys.

The full length of the survey area was monitored approximately every second day at low tide. A bicycle was used to transverse the beaches at moderate speed without disturbing shorebirds. The survey area was divided into nine survey sections (Figure 3). Each group of people, dogs, and shorebirds encountered was recorded. Human encounters were separated into people walking, people playing, people stationary, kayakers, and surfers. Leashed dogs were noted separately from unleashed dogs. The number and species composition of shorebirds were also recorded. Observations were associated with the waterline, lower beach, middle beach, upper beach, and drift logs. Time of day, tide height, wind, and precipitation were also recorded. Shorebird composition and abundance in spring and early fall were compared. Human and dog densities were also compared with observed shorebird densities and plotted against the nine survey sections identified above. For this purpose, density data were log transformed. A regression analysis was carried out to determine if compliance with the leash-regulation was dependent on visitor density.

Experiment Methods

Controlled experiments were carried out to test the experimental hypotheses stated. Semipalmated plovers, Western sandpipers, and sanderlings, which are the most abundant species on Long Beach, were approached. The observer recorded the flock size, and approached birds in the following ways:

- approach a flock of shorebirds with a dog on a leash
- approach a flock at jogging speed
- approach a flock at walking speed
- approach a flock at walking speed holding a surf-board horizontally (pilot studies)
- pass (keeping 10m distance from the closest bird) a flock with a dog on a short leash
- pass a flock at jogging speed
- pass a flock at walking speed.

The observer or volunteer recorded the response as follows: distance of disturbance to closest bird when first bird moves away and when first bird flushes and time in air. The experiments were carried out in no particular order and depending on dog-availability with a time period of at least 15 minutes between tests to allow birds to re-settle. The unpredictable nature of shorebirds made a constant testing area almost impossible.

Therefore, tests were conducted in areas and at times when no visitors were present and flocks of shorebirds were available.

A white Samoyed and a black Labrador/Collie mix were used for experiments involving a dog. Both dogs were extremely well-trained to heel or walk loosely on a 3m leash without attempting to chase birds.

Anecdotal events of visitor dogs chasing birds as well as children chasing birds were recorded in addition to controlled experiments. Such disturbing behaviour was considered unnecessary to be replicated in an experimental situation. Using a loose dog walking close to the handler was also not an option as a control treatment, because park managers considered this practice as unethical.

Visitor Interview Methods

Visitors were interviewed throughout the study period in order to determine their attitudes towards leashing dogs in the park and which measures would be realistic to enforce the leash-regulation more effectively. Focused interviews with a set of questions and open answers were initially made in the parking area by approaching a dog-owner followed by a visitor without a dog. However, due to the low visitor numbers, people were approached on the beach in no particular order. If people wished to make further comments, these were also recorded.

During summer 2003, PRNPR employed Young Canada Works youth, who wished to

gain experience in Canada's national Parks. Volunteers were able to help carrying out interviews during the second field season.

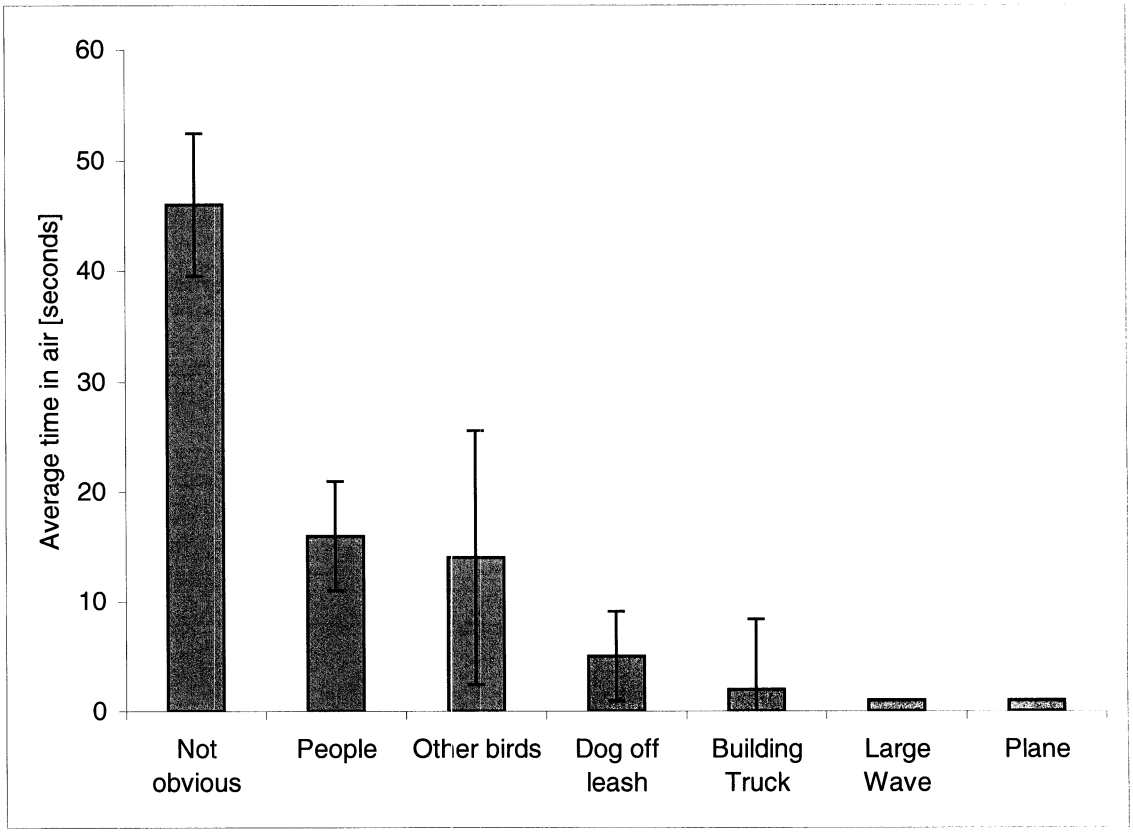
The time and resources available for this research was not sufficient to get a sample size that would allow an extensive statistical analysis. Therefore, the data analysis was of qualitative nature including the use of anecdotal material.

Results

Flush Rate Survey Results

Flush rate surveys show that shorebirds are highly mobile and unpredictable birds. Even without human disturbance, flocks of birds are moving constantly and often flush for no obvious reason. Often, it is difficult to keep track of a flock, because smaller groups of birds would leave or join the flock. Also, distances between birds vary considerably during surveys, and birds would "wander off" on their own or in small groups and thus disperse themselves gradually. To capture this dynamic behaviour, observed flock composition was recorded every 15 minutes.

On average, shorebirds flushed 6.4 times (SD = 4.5 times) during one hour. The most time spent flying was due to reasons that were not obvious to the observer (Figure 6). In this case, flight behaviour may have been due to a real "disturbance" or simply flight to another feeding area. Birds spent an average of 46 seconds (SD = 6.5 seconds) in the air



Average time in air [seconds] ±S.D. during 14 one-hour observations in April and May

Figure 6: Reasons for shorebirds flushing

for no obvious reason during a one-hour observation period. People and other birds, mostly crows or gulls, were the second most important disturbance to birds. Shorebirds spent an average of 55 seconds (SD = 32 seconds) flying during one-hour observations. Dogs were only the fourth largest reason for birds to flush. An average of 5 seconds (SD = 4 seconds) was spent flying due to unleashed dogs. No birds flushed due to leashed dogs. These results reflect the conditions during the rainy season, when visitor pressure was low compared to the busy holiday season in August.

It should be noted that there were only two occasions when birds were flushed by dogs. In the first case, visitors came onto the beach with their dogs leashed. The first dog was taken off the leash as soon as the middle of the beach was reached and the dog took off to chase the birds repeatedly. Shortly after that, the birds returned. The second dog-owner released his dog from the leash and this dog also chased the birds. Again, the birds returned. The second case of a dog chasing a flock of birds was very different. The dog was a small puppy off leash for the whole time. The owners had been playing and walking with the dog and passed the flock of birds several times. The dog was always busy playing Frisbee with its owners. The birds did not react and even moved into the same direction as the visitors were walking. Only when they returned and walked towards the birds again did the puppy notice the birds and slowly trotted towards them, causing the birds to flush for 13 seconds.

Even though it was difficult to quantify people's movements towards birds, it seemed as if the birds were more likely to flush when people would either stop or move towards the

birds. This usually happened shortly after people did notice small shorebirds and wanted to investigate further. The experiments were designed to quantify this observation.

Beach Survey Results

The majority of beach use surveys was conducted during the rainy spring season in April and May. A total of 12,010 shorebirds of 16 species (Table 1) was recorded during 30 spring surveys. August was significantly drier with much larger visitor numbers and reduced shorebird species richness. A total of 2,679 shorebirds of only five species were recorded during seven beach surveys in August. The species list compiled from both field seasons is shown in Table 1.

The most abundant species during spring were semipalmated plover (*Charadrius semipalmatus*), Western sandpiper (*Calidris mauri*), and dunlin (*Calidris alpina*). During August, semipalmated plover (*Charadrius semipalmatus*) and sanderling (*Calidris alba*) were the dominant species (Figure 7).

Shorebird distribution was relatively unpredictable in both seasons. Even though some areas may seem more favourable than others considering mean abundances, the variance is high (Table 2 and 3). The only areas that are clearly avoided by shorebirds during August are Combers Beach and Long Beach sections E and F (Figures 7, 8 and 9). These sections are located close to parking areas.

Family/Tribes	Scientific name	Common name	Acronym
Plovers *Charadriidae*	*Charadrius semipalmatus*	Semipalmated Plover	SEPL
	Charadrius vociferus	Killdeer	KILL
	Pluvialis squatarola	Black-Bellied Plover	BBPL
Tringines *Tringini*	*Tringa melanoleuca*	Greater Yellowleg	GRYE
Curlews *Numeniini*	*Numenius phaeopus*	Whimbrel*	WHIM
Calidridines *Calidridini*	*Calidris mauri*	Western Sandpiper	WESA
	Calidris alpina	Dunlin	DUNL
	Calidris alba	Sanderling	SAND
	Calidris minutilla	Least Sandpiper	LESA
	Calidris bairdii	Baird's Sandpiper	BASA
	Calidris pusilla	Semipalmated Sandpiper	SESA
	Calidris canutus	Red Knot	REKN
Godwits *Limosini*	*Limosa fedoa*	Marbled Godwit*	MAGO
Oystercatchers *Haematopodidae*	*Haematopus bachmani*	Black Oystercatcher	BLOY
Phalaropes *Phalaropodini*	*Phalaropus lobatus*	Red-Necked Phalarope*	PHAL
Unidentified small shorebirds			PEEP

(*observed once only)

Table 1: Shorebird species recorded

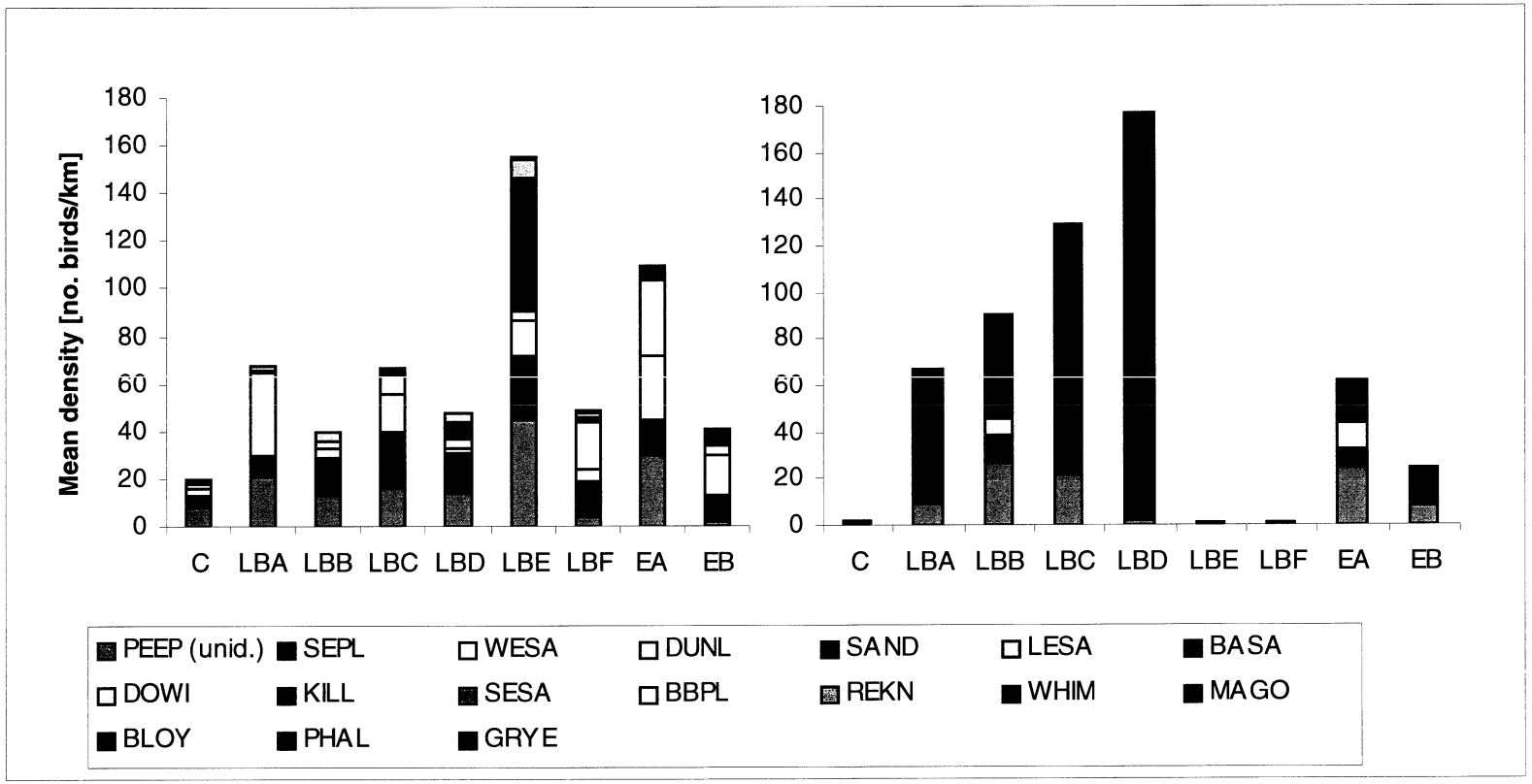


Figure 7: Shorebird species composition in April/Mai (left) and August (right) and distribution on beach sections Combers (C), Long Beach (LBA to LBF) and Esowista (EA and EB).

	Mean density [number of birds/km]																			
Beach	PEEP	SEPL	WESA	DUNL	SAND	LESA	BASA	DOWI	KILL	SESA	BBPL	REKN	WHIM	MAGO	BLOY	PHAL	GRYE	Number of species	Mean density	SD
C	7.8	5.6	3.0	1.7	0	0.2	0	0.8	0.0	0	0.2	0	0.04	0.2	0.1	0	0	9	19.5	45.8
LBA	20.4	8.9	35.4	1.0	0	1.6	0	0	0	0	0	0	0	0	0	0	0.05	5	67.4	259.7
LBB	13.0	15.6	4.4	3.2	0	3.2	0.3	0	0	0	0	0.1	0	0	0	0	0	6	39.9	79.2
LBC	15.9	23.7	15.7	8.6	0	0.6	1.5	0	0.0	0	0	0.2	0.1	0	0	0	0	8	66.0	153.3
LBD	13.4	17.9	1.3	4.0	6.7	4.0	0	0	0	0	0	0	0	0	0	0	0	5	47.4	131.2
LBE	44.8	26.9	14.4	4.4	55.6	8.5	0.2	0	0	0.5	0	0	0	0	0	0	0	7	155.3	394.7
LBF	4.2	14.2	5.6	19.9	1.3	2.2	1.0	0	0.6	0	0	0	0	0	0	0.09	0	8	49.2	145.3
EA	30.3	14.8	27.1	31.0	0	1.5	4.1	0	0.4	0	0	0	0	0	0	0	0	6	109.2	240.9
EB	2.5	10.7	16.5	4.0	0	0.6	6.1	0.6	0.1	0	0.2	0	0	0	0	0	0	8	41.2	59.1

Table 2: Shorebird composition observed in April and May 2003

	Mean density [number of birds/km]								
Beach	PEEP	SEPL	WESA	SAND	REKN	BLOY	Species no.	Mean density	SD
C	0.8	0.5	0.9	0	0	0	3	2.1	1.7
LBA	9.3	4.5	0	53.6	0	0	3	67.4	97.7
LBB	26.7	12.2	6.8	44.4	0	0	4	90.1	43.9
LBC	21.6	11.7	0	95.5	0	0	3	128.7	82.0
LBD	2.3	28.5	0.3	146.0	0	0	4	177.1	124.8
LBE	0	0	0	0	0	1.5	1	1.5	0
LBF	1.1	0	0	0	0	0	1	1.1	0
EA	24.1	8.8	10.5	18.1	0.2	0	5	61.7	32.2
EB	8.0	14.6	0.5	1.3	0	0	4	24.4	27.3

Table 3: Shorebird composition observed in August 2003

The distribution of park visitors was more predictable than shorebird distribution. During the two field seasons and 37 surveys, 3,079 visitors and 111 dogs were recorded at Long Beach (926 visitors and 71 dogs in April and May; 2,153 visitors and 40 dogs in August).

The spring season was significantly less busy than the late summer; on average 31 visitors and two dogs were encountered per survey in spring compared to 308 visitors and six dogs in August. The parking area adjacent to Long Beach section F (LBF) was used most frequently. People usually stay within a few hundred meters of the parking lot. It seems to be the most popular parking area, because it is possible to see the water without having to walk through forested areas. In fact, many surfers like to check the waves without leaving their car and, during the rainy season, visitors seem to like watching the ocean while sitting in the dry car. Long Beach is a very popular surfing site and almost 100% of all surfers use this parking lot and cross the beach section F to enter the surf.

Many surfers bring their campervans and stay nearby when not surfing to have barbeques and "hang out". While walking and surfing were the most popular activities in spring, weather conditions in August allowed for more stationary usages of the beach. Activities such as sunbathing, playing on the beach, and swimming were more popular during the warm and dry season in late summer. Figures 8 and 9 show that most people did not walk farther than a few hundred meters from the parking area in Long Beach section F and from the path leading to the campground in Long Beach section A.

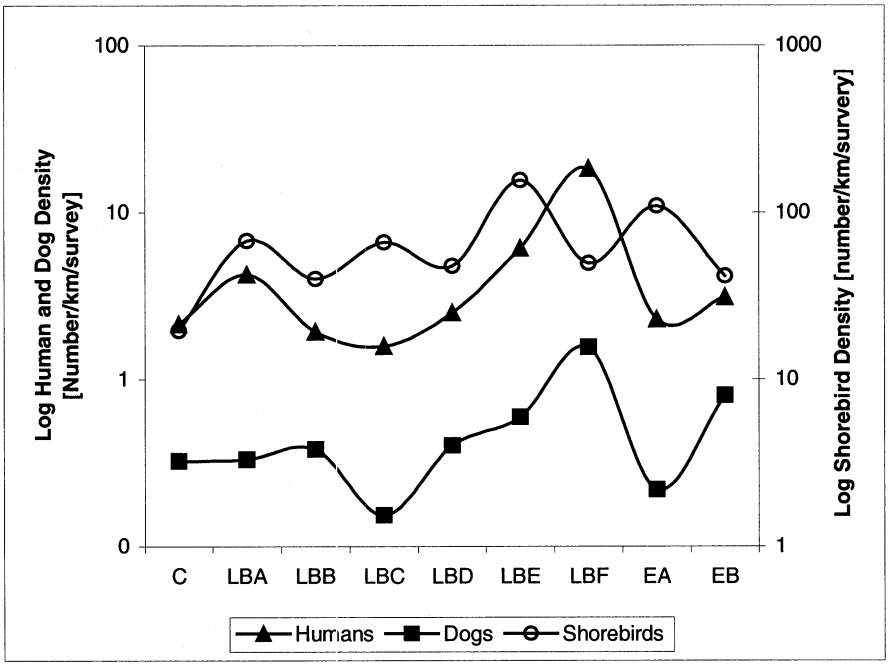


Figure 8: Beach use in May and April 2003

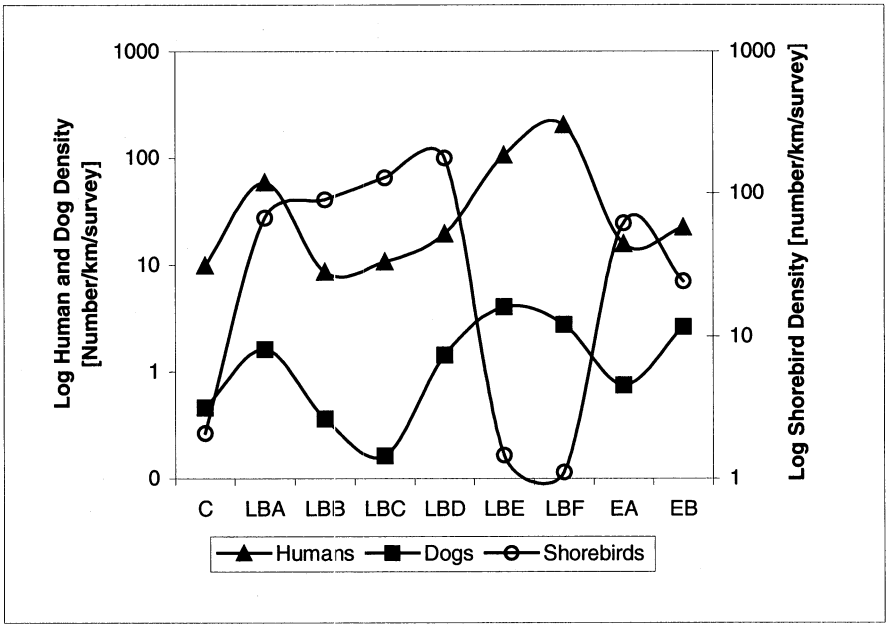


Figure 9: Beach use in August 2003

Although the number of dogs increases proportionately with the number of visitors ($F=31.4$; $df = 36$; $p = 0.000$), the proportion of dogs on leash itself does not increase with increasing visitor numbers ($F = 0.091$; $df = 26$; $p = 0.766$) (Figure 10). The null-hypothesis that compliance with the leash-regulation is independent from visitor density is therefore accepted.

Experiment Results

The average reactions of shorebirds that were approached in different ways (as defined in the methods section) are shown in Table 4. Distance between the closest bird and the observer when the first bird moved, distance when the first bird flushed, air time, and the proportion flushed differed amongst the treatments of approaching or passing with a dog, approaching or passing at jogging speed without a dog, and approaching or passing at walking speed without a dog (ANOVA distance to first bird to move $F = 2.819$; $p = 0.004$; distance to first bird to flush $F = 3.587$; $p = 0.001$; air time $F = 5.018$, $p = 0.000$; percentage flushed $F = 9.317$, $p = 0.000$). The distance to the new area flown to during the experiment was intended to be included in the analysis, but occasionally it was impossible to measure when birds flew out of sight. Therefore, this measure was excluded from the analysis.

Experiments that involved a dog were conducted with a long and a short leash. These treatments were combined in the analysis because the dogs usually did not usually use the full length of the leash and there was no statistical difference in the effects.

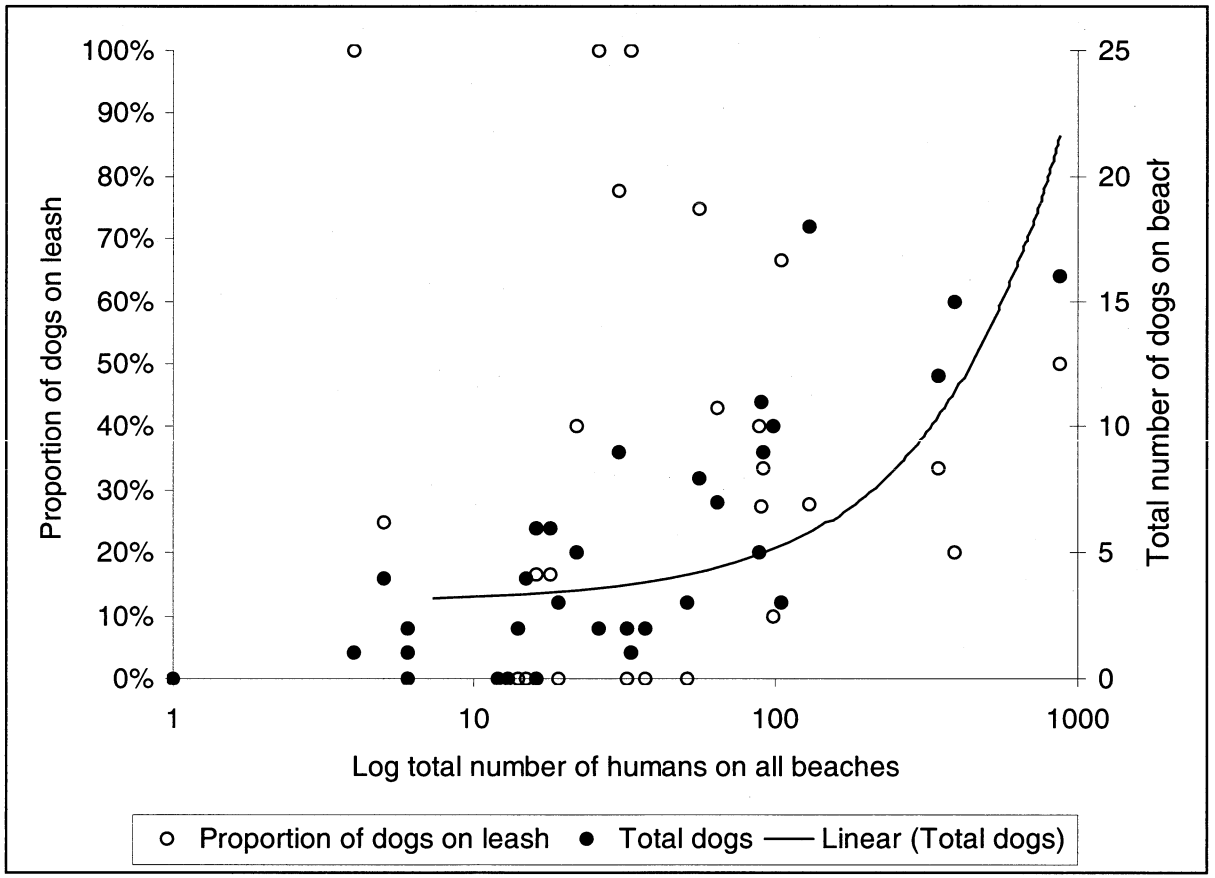


Figure 10: Relationship between the number of visitors and dogs in all beach sections

Treatment	Mean distance to 1st moving bird [m] (±S.D.)	Mean distance to 1st flushing bird [m] (±S.D.)	Air time [sec] (±S.D.)	Proportion flushed [%] (±S.D.)
Approach with dog* n=32	24 (14) A	12 (11) A	2 (2) A	59 (41) A
Approach jogging n=10	24 (11) A,B	15 (9) A	6 (6) B	71 (43) A
Approach walking n=15	21 (11) A,C	13 (11) A	4 (4) A,B	48 (41) A
Pass dog short n=19	14 (13) C	4 (10) B	0 (1) C	6 (23) B
Pass jogging n=10	13 (12) B,C	1 (0) B	0 (0) C	0 (0) B
Pass walking n=10	13 (11) C	1 (3) B	2 (5) A,C	10 (32) B
Anecdotal observations:				
Visitor dog chasing n=14	n/a	n/a	n/a	100 (0)
Child chasing n=7	n/a	n/a	n/a	100 (0)
Pilot study only:				
Approach surf board n=6	36 (16)	18 (15)	5 (4)	73 (43)

*long and short leash

(Same letters indicate no significant difference ($p>0.05$) between means (format adapted from Miller 2001)).

Table 4: Experiment results

Approaching shorebirds directly usually resulted in a stronger response than passing flocks in a parallel fashion at a distance of about 10m, regardless of speed or the presence of a dog. Birds would usually move away from the disturbance first and only flush as a second means of escape. Thus, moving away was sufficient in 82% of all passing treatments to avoid the disturbance. Walking through a flock always triggered the flushing of one or more birds. When approaching shorebirds directly, the first bird would move sooner than when a person would pass the birds in a parallel way (Table 4). Only twice (5% of all pass treatments) did the entire flock of shorebirds flush when the observer passed the birds in parallel fashion. In 95% of all approaches, birds that had flushed would return and settle down within sight of the original position. This resulted in visitor dogs and children being able to chase the same flock of shorebirds over and over again. One visitor dog was observed to chase the same flock eight times.

The presence of a dog did not make a statistically significant difference compared to jogging or walking except for airtime, which was greater during jogging treatments. Passing a flock of shorebirds with or without a dog also made no statistical difference.

Flock behaviour was also recorded in an informal way. Approaching shorebirds directly often resulted in the division of a flock. The flock would either divide, more or less equally, and thus result in smaller groups of birds feeding together, or two or three individual birds would get separated from the main flock and return to the original flock after the observer has continued walking. Occasionally, flocks also moved in the same direction as the observer as if herded. This behaviour occurred when shorebirds were

approached close to the waterline and one of the escape routes was blocked by water.

Visitor Interview Results

Visitor Profile

A total of 83 visitor interviews were conducted during both field seasons (n=35 spring; n=48 late summer). The majority of interviewed visitors did not own a dog (n=38), while twelve interviewees left their dog at home (Table 5). Of the 33 interviewed dog-owners, 47% were at the park as singles, 30% couples, 16% families, and 9% mixed groups of adults. Although the sample size is not large, there may be a tendency that more singles bring their dog to the park rather than leaving the dog behind: 55% of visitors who brought their dog were singles, while only 25% of dog-owners who did not bring their dog were at the park alone.

Visitors interviewed were mostly from the region of Vancouver Island and BC. In spring, 49% of interviewees were from BC, 17% Ucluelet or Tofino, 17% other Canadian provinces, 9% Europe, 5% the United States, and 3% Australia. In August, 63% of visitors interviewed live in BC, 19% other Canadian provinces, 8% Ucluelet or Tofino, 6% the United States, and 4% Europe.

		Number of groups without a dog					Number of groups with dog at home					Number of groups with dog at park				
	Age	Spring	Fall	Total	%	Singles vs Families	Spring	Fall	Total	%	Singles vs Families	Spring	Fall	Total	%	Singles vs Families
Single male	18-24	1		1	3%			1	1	8%			1	1	3%	
	25-34	2	2	4	11%				0	0%		3	3	6	18%	
	35-49	3	4	7	18%				0	0%				0	0%	
	50-65		2	2	5%			1	1	8%			1	1	3%	
	over 65			0	0%				0	0%				0	0%	
Single female	18-24	1		1	3%				0	0%				0	0%	
	25-34		1	1	3%				0	0%		1		1	3%	
	35-49		1	1	3%			1	1	8%		1	4	5	15%	
	50-65			0	0%				0	0%			3	3	9%	
	over 65			0	0%				0	0%			1	1	3%	
	25-34			0	0%	45%			0	0%	25%			0	0%	55%
Mixed adults	all	4	3	7	18%	18%			0	0%	0%	3	1	4	12%	12%
Couples	18-24		2	2	5%			2	2	17%		1	1	2	6%	
	25-34	3		3	8%		1		1	8%				0	0%	
	35-49	1		1	3%		1	1	2	17%		1	3	4	12%	
	50-65	2	1	3	8%				0	0%		1	1	2	6%	
	over 65			0	0%	24%			0	0%	42%			0	0%	24%
Young family	18-24			0	0%				0	0%				0	0%	
	25-34		1	1	3%				0	0%				0	0%	
	35-49	1	3	4	11%		3	1	4	33%		1	2	3	9%	
	50-65			0	0%				0	0%				0	0%	
	over 65			0	0%	13%			0	0%	33%			0	0%	9%

Table 5: Interview Profiles

Reasons for Visiting Long Beach

The main reason for visiting Long Beach was to go surfing (18.5%) (Figure 11). Several respondents also enjoyed previous visits so much that they came again (16.3%). Other common reasons for a visit at Long Beach were holiday-making (10.9%), enjoying the beach (8.7%), showing friends and family (8.7)%, and natural beauty (8.7%). One visitor decided to visit Long Beach with her boyfriend, because she had seen a photo of the beach on her screen-saver. The Internet, post cards, and word-of-mouth accounted for 6.5% of reasons given.

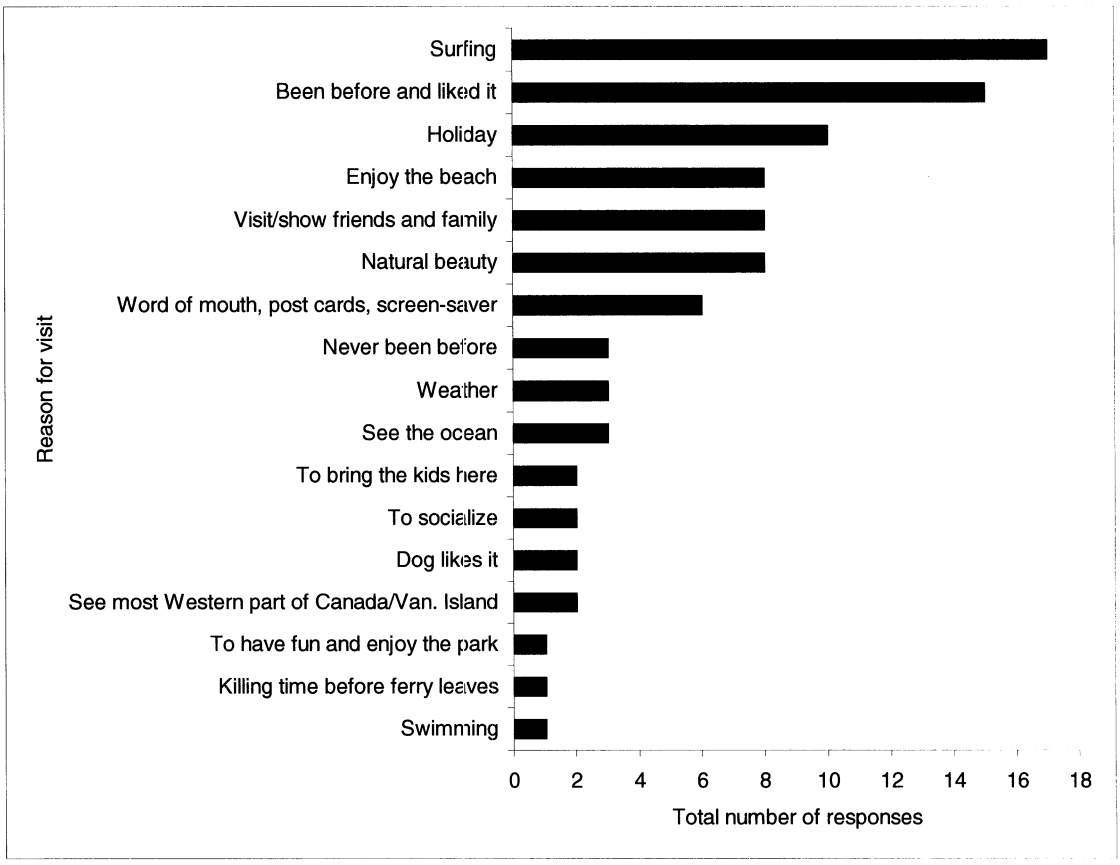


Figure 11: Reasons for visiting Long Beach

Characteristics of Dog-owners

Dog-owners who did bring their dog to the park mostly lived in BC (79%) and 12% lived in other Canadian provinces. In the spring, dogs were only left at home due to travelling distance or, in one case, age of the dog. During the fall, visitors also left their dog at home because they were uncertain about the regulations; one dog-owner felt that is was inappropriate to bring a dog to a park, where he would have to be on a leash at all times.

The interviews conducted with dog owners who did bring their dog (n=33) showed clearly that the dog always played an important social role and was considered a part of the family or a companion for single people. The responses "She's my best friend. I can't leave her at home!" or "You don't leave home without the dog!" reflect the voice of dog owners. Dogs may also contribute to their owners' physical or mental health and well-being. One senior lady said that her dog had kept her sane for the last five years. For 80% of all interviewed visitors who brought their dog in August, it was very or most important to bring their dog to the park (Figure 12).

For some visitors, a dog is not only a best friend, but also becomes a substitute for a child. A couple who treated their dog as a family member said: "Dogs become part of the family. It's like having children. You can't kick out children". This particular couple was very upset that they were turned away from the interpretive theatre at the campground. They also pointed out that many people, especially children, who do not own their own dog, did enjoy spending time with their dog. Other dog-owners also felt

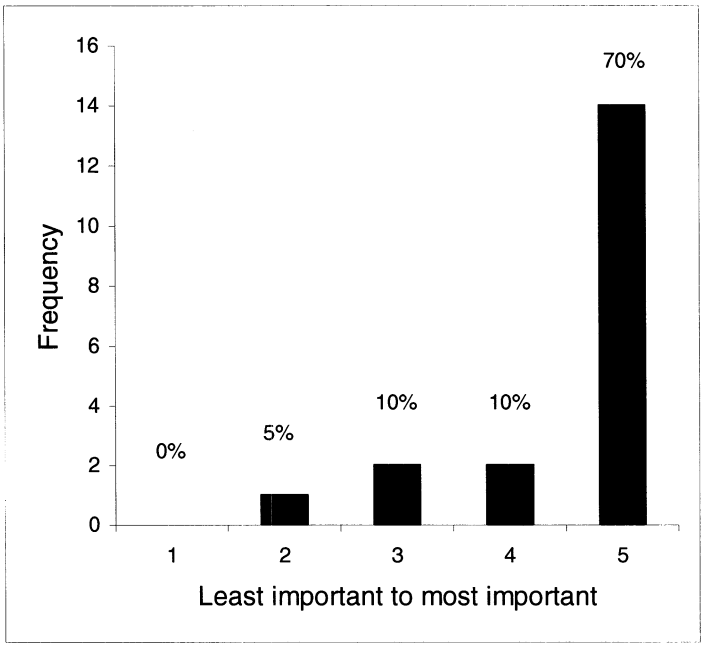


Figure 12: Importance of taking the dog to the park

treated unfairly, not only at the park, but also in their home cities, where they had to deal with on-going conflicts about leash-regulations. A local dog-owner, who was used to dealing with the conflict of dog-owners and bird-lovers in the Tofino area, speculated that the number of people at Long Beach would scare away the shorebirds more than a dog.

Other notable findings were that in spring almost all dog owners consciously did not keep their dog on a leash. There was only one occasion when the respondent was somewhat embarrassed to say she did not keep her dog on a leash at all times. Only two out of 12 respondents claimed they always kept their dog on a leash. This is confirmed by the beach surveys, where 80% of all dogs were off leash, despite signage at access points (Figure 13).

In contrast to the spring interview results, fall visitors seemed to be less conscious about their leashing habits. None of the interviewed dog-owners with a dog at the park said that they never kept their dog on a leash. Half of the respondents in this group claimed to keep their dog at least sometimes on a leash and the other half claimed to keep their dog on a leash at all times (Figure 14). Nevertheless, 62% of all observed dogs were unleashed and only 38% of observed dogs were leashed during the fall season. Of course, some of the observed unleashed dogs may have only been off the leash for some of the time spent at the beach. Vice versa, not all observed dogs on a leash will have been leashed at all times. In addition, dogs off leash were defined as 'without an attached leash' including those dogs, which may have been sitting stationary instead of running at

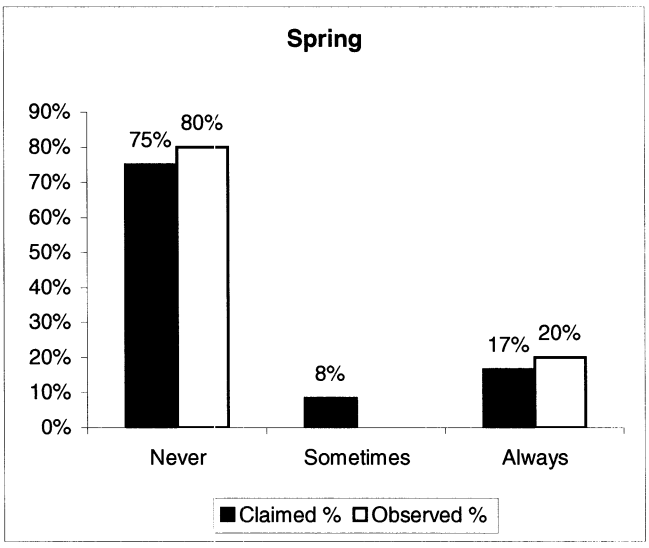


Figure 13: Responses to 'Did you keep your dog on a leash?' compared to observed leashed and unleashed dogs during April and May

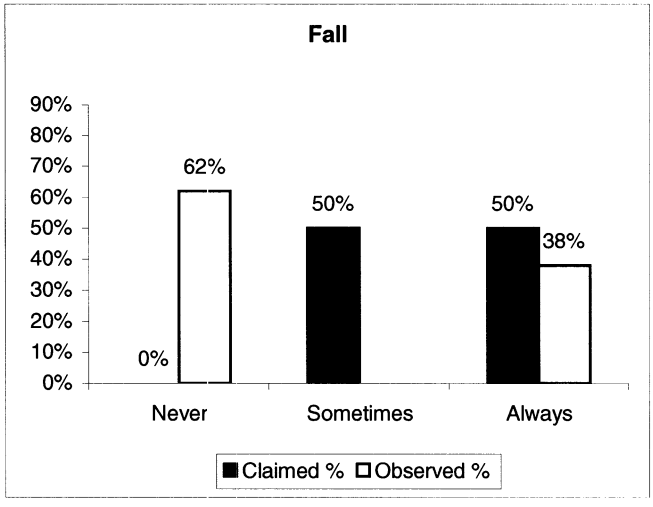


Figure 14: Responses to 'Did you keep your dog on a leash?' compared to observed leashed and unleashed dogs in August

large.

Similarly to previous results that show how many dog-owners are very attached to their companions, more than half of the interviewees would choose to go somewhere else outside the park if dogs were banned at Long Beach (Table 6). The category 'other' includes one person, who said she would stay at home if she could not bring her dog to Long Beach and a couple, who said they would leave the dog at the cabin, but not agree with a dog ban.

Even though three respondents said that they would still take their dog to the beach despite a ban, they changed their mind when the penalty was changed from a ticket to impounding the animal.

Dog-owners gave varying definitions about what "my dog is in control" means. Seven people interviewed (35%) mentioned the word "leash" in their definition. However, the interpretations ranged from "people-friendly" and "verbal control" to "on a leash". Some dog-owners (25%) did not define their understanding of a dog in control, but were defensive about their own dog. One person said that "she won't bother other people, she does chase the birds, total control". Others simply said "very" or "in control" relating the question to their own ability to keep their dog in control. Only one respondent thought that it was impossible to control a dog unless the animal was on a leash. Three visitors who thought that it was possible to control a dog verbally were able to give a more detailed definition than more vague statements such as "well-behaved". These definitions

	Number of responses	%
Go somewhere outside the park	13	59%
Risk the chance of getting a ticket	3	14%
Leave dog in the car	2	9%
Leave dog at home	2	9%
Other	2	9%

Table 6: If dogs were banned from Long Beach, owners would choose to do above.

were "that I feel confident that she would respond to my commands", "the dog would be within hearing distance and would unfailingly respond to my commands" and "the owner needs to know their animal, either verbal or leash control". These definitions relate not to the dog itself, but to the relationship and interaction between the dog-owner or handler and the dog.

Awareness of Shorebirds and Other Wildlife

Shorebirds are not charismatic species and very few people are aware of their presence. There was very little awareness of potential shorebird disturbances in all three groups (people with a dog at the park, with a dog at home, or no dog). Most respondents thought that dogs should be kept on a leash because of other people and other dogs. Waste was a common theme and people seemed to think that a dog on a leash would leave behind less waste than a dog off leash. If a wildlife issue was recognized, wolves and cougars were often mentioned. Only one dog-owner mentioned the ecosystem as a whole to be a reason to keep dogs on a leash. One respondent without a dog realized that the Long Beach unit was a park and, therefore, dogs should not run loose.

Interestingly, the only person who did mention shorebirds as a reason for keeping dogs on leash and who was able to explain the connection of migrating birds and Long Beach as a stopover did not agree with the leash-regulation. His comments somewhat represent the general mood of the local surfing culture at Long Beach: "I used to think this is bullshit, but migratory birds go on a 2000 km trip and stop-over here. I don't give a shit

about the other reasons. I kind of disagree with it. Why are people different from dogs?"

The last most noteworthy result of the interviews was that many respondents do not seem to consider shorebirds or birds in general as wildlife. The first answer was often that they had not seen any wildlife (18% in spring and 34% in the fall) (Figure 15). Although birds should have been one of the most obvious wildlife regardless of the tide, less than 20% of all responses in fall included at least one bird. The proportion of birds seen in spring was almost 50%. However, the two seasons are not comparable, because birds were included as a second question during pilot studies, while in fall, birds were excluded entirely from the question about wildlife.

Only five visitors remembered to have seen shorebirds in the spring and only four visitors mentioned shorebirds or plovers in the fall, which were included as wildlife. Shorebirds were sometimes noticed as "those little birds", "small beach birds" or "little tiny birds" without associating the guild of shorebirds or any particular species with the observed flocks.

Wildlife that would have been less visible at Long Beach was named relatively often compared to almost guaranteed sightings. Thus, bears (7%), sea lions (4%), and whales (4%) — which are relatively rare sights — were noted on average as much or even more often than barnacles (0.5%), crabs (4.5%), star fish (4%), sea anemones (1.5%), and snails or slugs (1.5%), which one can be sure to see at Long Beach, at least at low tide. Other wildlife noticed by visitors included clams, deer, insects, a porpoise, seals, snakes,

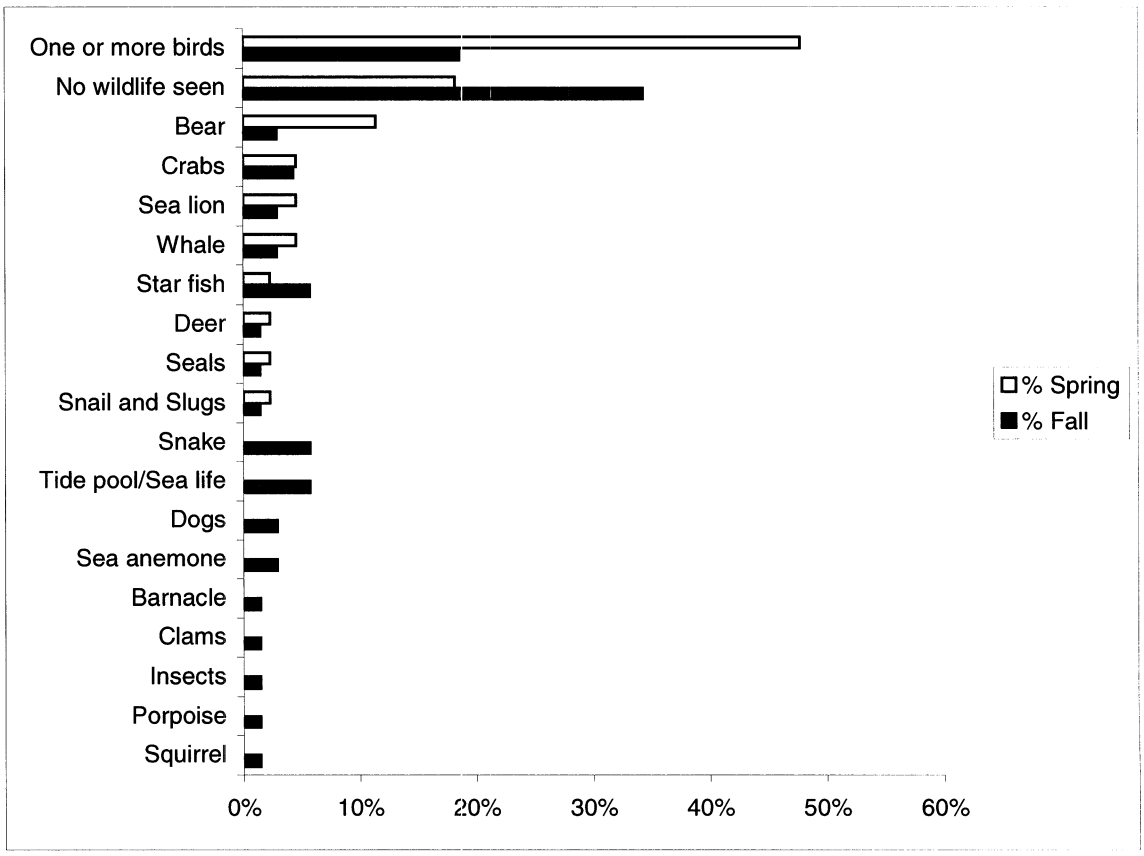


Figure 15: Wildlife seen by visitors at Long Beach

squirrels, and sea life in tide pools (Figure 15). Some visitors (3%) included dogs in their definition of wildlife. When specifically asked about birds, many respondents said that they had seen gulls, crows, ravens and other birds (Figure 16), even though they had not mentioned these sightings in the previous question about wildlife.

Steller's jays were a common sight at Long Beach, especially at the Greenpoint campground, where the majority of interviewees in the fall was staying. However, five visitors claimed to have seen blue jays, which are common in Eastern Canada. It is likely that those visitors who did not recognize the Steller's jay associated its blue colour with the blue jay.

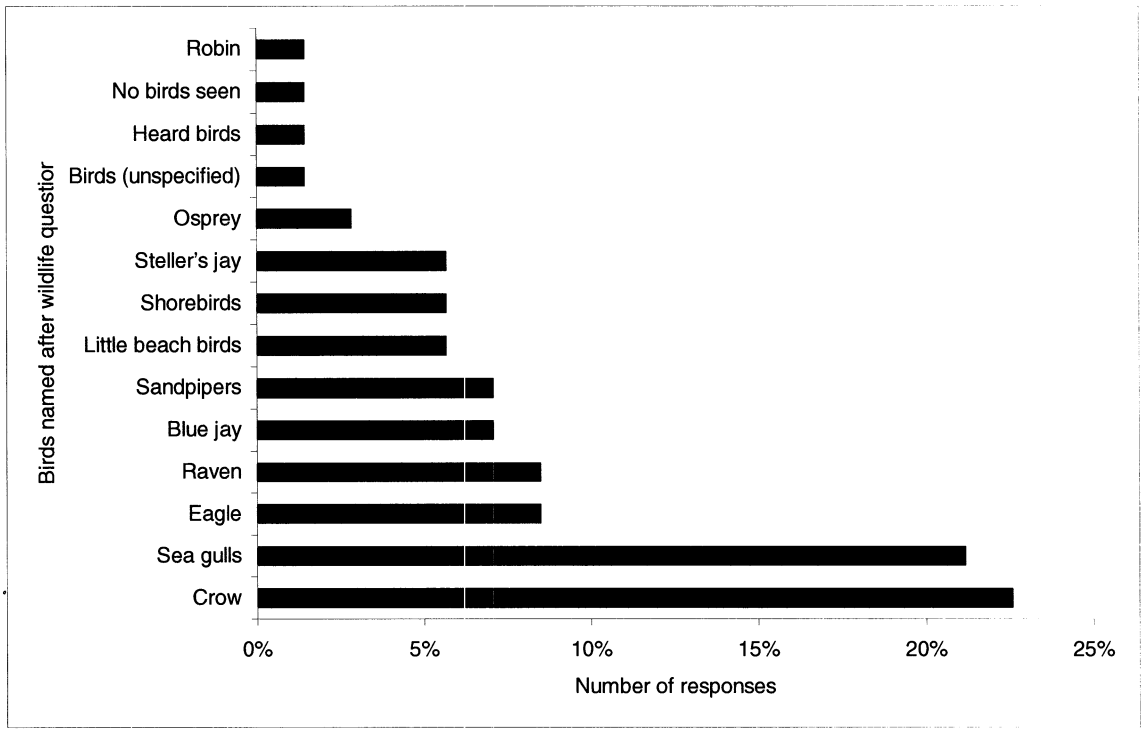


Figure 16: Birds noted by visitors, who did not include birds in wildlife

What Being at a Canadian National Park Means to Visitors at Long Beach

People who came to Long Beach often associated Canada's national parks with preservation and the provision of clean facilities. Natural beauty, cleanliness, and "keeping things natural" were common responses. Some visitors also had negative feelings about parks, because it meant that they had to pay a ten-dollar parking fee. In one case, visitors from Alberta were unhappy with the way "they [Parks Canada] made it difficult to enjoy the park". "They don't let this generation use it. Can't we see it too?" Other visitors, however, were happy to pay for the enjoyment of national parks and felt that their "tax dollars went to good use" or "tax dollars at work". The responses given are listed below.

Visitors without a dog:

> Our tax dollars went to good use
> It's great to have the reserves for recreational uses, we enjoy the interpretive programme, The bear staff [bear awareness patrol officers] is really friendly
> Protected area, conservation of the environment
> It's my heritage, we got to look after it
> Don't know
> Preserve as much nature as we can
> A clean and natural environment
> Tax dollars at work
> Protected area
> Canada wants to preserve beauty for everyone
> We appreciate that the government preserves the area for future generations, save some wilderness
> It means conservation
> I don't know, natural beauty
> A certain level of standard, it should be clean, I expect better than that [the current level of cleanliness]
> Clean and nice and beautiful, preserved, it should still be here in 50 years, no McDonalds or Walmart
> Didn't know it was a national park [not Canadian]

Part of our heritage
User fees
Somewhat pristine area
Nice place

Visitors with dog at home:

I don't know. We live in Banff National Park. It doesn't mean much to me.
Glad it's here
The government is helping to keep places natural
No different to a provincial park, it's kept natural
Preserved, good shape
It's protected, it's clean
Nice place, well kept

Visitors with dog at park:

Land reserved for everybody's use for everybody for conservation and recreation
Good quality facility, beautiful natural surroundings
Preservation
Support Canada
It means we have to pay a $10 parking fee.
A clean beach and no developments
It belongs to Canada and hopefully they will look after it
They are always good, it's nature, facilities
Protection against development, natural resources
Mixed feelings, we live in Alberta, they make it difficult to enjoy the park, they don't let this generation use it, can't we see it [the park] too?
It's great, because it's preserved
Part of our heritage Canada
Wildlife and nature to enjoy
It's a park
Nature comes first
Special place with preserved history
The beauty of nature
It's good to see there is still nice places being preserved.
It's crowded, clean, well-run
Protected, offers more than private sights

Discussion

Beach Survey and Pilot Study Discussion

The beach surveys give an overview of the spatial distribution of the beach users in question, shorebirds, and humans with their dogs. The results show that in spring there is no clear preferred feeding and resting area used by shorebirds. In the spring, shorebirds used almost all the beach sections at more or less the same intensity, where the two sections on either side of Long Beach F were perhaps slightly more favoured than the rest of Long Beach and the Esowista beach sections. Combers Beach was distinct from the rest of the study area and certainly the least favoured section. During the busy month of August, however, shorebirds showed a much stronger pattern of favoured feeding and resting areas. Both Combers and two sections (LBE and LBF) close to the main parking lot were avoided by the shorebirds. Interestingly, the closest area northwest of the parking lot remained relatively undisturbed by humans and was favoured by shorebirds. The most likely reason is that a very large rock acts as a visual barrier and separates the Long Beach sections from the Esowista sections. Even though it is easily possible to walk through a gap in the rock (Figure 4), visitors seemed to prefer turning southeast, perhaps because the beach itself seems longer and more open. The same situation is true at the exit of the campground near Combers Beach and the south end of Long Beach (LBA). Large rocks act as a barrier between the two beaches, so that most visitors decided to turn northwest at the exit from the campground path. In addition, a large pile-up of logs acted as an additional obstacle for visitors during the first month of the spring

season.

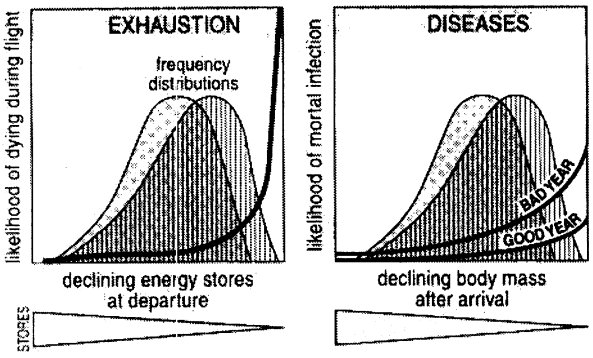
Shorebird abundances inversely mirror the average density of humans at the various beach sections. Most people stayed within a few hundred metres of their vehicle. This is the area that was avoided by shorebirds when human density was high. Therefore, humans in this beach section affect shorebirds negatively. Human use has reduced the space available for shorebirds to feed and rest.

Long Beach is only one of several cases where shorebirds are disturbed frequently. Lafferty (2001a), for example, observes how humans walking a beach in California disturbed shorebirds several dozens of times per day. Burger (1995) also showed the negative effects of beach recreation on the nesting piping plover in New Jersey. She recognizes that the presence of humans does not necessarily mean that shorebirds are affected negatively and emphasizes that the response always has to be recorded together with the potential disturbance. Therefore, the experiments conducted for this thesis bring more insight into the direct response of human actions. When a human approached shorebirds, they usually moved out of the way before the approaching person would come so close that they would have to flush. This in itself has no direct negative effect. However, the more crowded the beach, the less likely it is that an escape route is available and the more time has to be spent by individual birds to move or flush if necessary. It is likely that the effect is cumulative and that a large frequency of disturbances would have a negative influence on the refuelling efforts to prepare for the next leg of the migration route. Piersma and Baker (2000, p. 120) point out that the result

of such a cumulative negative effect may not be linear. "A small man-made ecological change, negatively affecting the quality of the habitats where refuelling takes place" could reduce average refuelling rates slightly. These small reductions in energy stores and body mass may enter a threshold, where the likelihood of exhaustion, disease and failed reproduction increases steeply (Figure 17).

In contrast to the theory that shorebirds cannot tolerate any level of disturbance are the observations during the pilot studies. These studies confirmed that small shorebirds, which were observed at Long Beach, are a highly mobile group of birds. Flush rate surveys showed that shorebirds do not just sit, eat, and rest all day until a visitor comes by and chases them away. They turned out to be very difficult to track or observe for long periods of time because they were constantly on the move. Not only humans may be putting stress on these birds, but other creatures also cause escape behaviour in the form of moving out of the way or flushing. Other birds, such as crows and also the occasional raptor, played a significant role in causing flocks to move or flush. Changing the feeding areas frequently could be a strategy to avoid predation and offset the cost of energy required to fly to a different area.

Behavioural observations during the pilot studies also showed that a flock is very difficult to define. Flock dynamics were extremely complex. The size of a flock could change quickly when part of it was separated and wandered into a different direction.



(Source: adapted from Piersma and Baker 2000, p. 122)

Figure 17: The non-linear effect of declining energy stores on the likelihood of death due to exhaustion and disease

Although the results from the second field season show a clearer picture of the relation between human beach use and shorebird usage of the beach, the experiments proved a valuable tool to answer the question whether shorebirds are displaced from preferred feeding and resting areas by human activity at Long Beach. In addition, ways of reducing potential negative impacts on energy reserves have been suggested by the experiment results.

The apparent avoidance of Combers Beach by shorebirds may be the most difficult result of the beach surveys to interpret. Although Combers beach has its own parking area, visitors tend to prefer the larger Long Beach parking area. Surfers are rarely seen on this beach and personal communication with the surf guard confirmed that the waves on Combers are unsuitable for surfing. The beach itself is of open and convex shape and therefore relatively unprotected compared to the concave shape and protected areas of the Long Beach and Esowista sections. Shorebirds seemed to prefer nearby creeks to feed. The majority of creeks in the study area are located in the Esowista and Long Beach sections. However, a small stream leads into the ocean at the south end of the Combers study area. It is only possible to wade through this inlet at low tide. A large flock of glaucous-winged gulls (*Larus glaucescens*) is almost a guaranteed sight in this area. The water of this stream shows a brown discoloration reflecting tannins from cedar trees and copper. Such substances as well as other chemicals may contribute to an avoidance of the area by shorebirds. A native person (Sam 1997, pp. 89-91) explains this issue in simple words:

> There should be research on the effect of logging roads. When they blast the rock it exposes all the chemicals in the rock, including copper, zinc and lead, to the air and water and the water washes these chemicals into the stream and into the ocean. ... The bark from trees grown on dry lands and the mountain sides is poisonous. ... When a tree is felled, some of its bark comes off. When the rains wash all this bark from the logged mountain sides into the river it kills all the salmon eggs because they depend on oxygen.

Such traditional knowledge should perhaps have been taken more seriously when the highway was built parallel to the beach contributing to further run-off from logging activities nearby. Water quality testing at the Long Beach Unit has been conducted and showed elevated levels of aluminium, cadmium, arsenic, copper, chromium, iron, titaniuim, and zinc in some parts of the area. Major concerns for water quality are the Tofino airport, the Esowista First Nation Reserve, and the West Coast Landfill which are all adjacent to the park boundaries. The results are still preliminary and unpublished (Redhead pers. comm. 2004). None of the results point to higher levels near Combers Beach compared to the other sampling areas. It is important to note that the park is not able to test the water for PCBs because funding is not sufficient (Redhead pers. comm. 2004).

Discussion of beach experiments

Despite the fact that shorebirds seem to be displaced from busy beach areas, the experiments gave a strong indication that it is not the presence of a human or a dog *per se* which causes disturbance to the shorebirds. It is the way in which a flock is approached. That is, if a visitor does not realize or care that he or she is heading towards and

eventually through a flock, the escape response is stronger than when a visitor shows foresight and walks past a flock. Therefore, the first null hypothesis stated at the beginning of the experiments can be rejected. Passing birds at a distance of about 10 metres and at walking speed does not trigger the same escape behaviour than walking through a flock does. Passing birds at a distance can minimize stress on shorebirds, while walking through a bird flock adds stress. Visitor interviews and observation suggest that the majority of visitors are unaware of the shorebirds and walked into the flocks without noticing. Hence, shorebirds were displaced during heavy beach use.

The presence of a dog alone made little difference, which leads to the rejection of the second hypothesis. The results indicate that the presence of a dog did not affect shorebird escape behaviour significantly, as long as the dog was walking on a leash and did not engage in chasing behaviour. This result compares to the work by Miller *et al.* (2001) who carried out similar experiments with pedestrians, dogs, and vesper sparrows and western meadowlarks, where the flush distance and distance moved was shortest for dog-alone treatments. The authors point out that two interpretations are possible. First, dogs may resemble coyotes and foxes, which are not considered significant predators on song-birds. Wolves on Long Beach cannot be considered significant predators for shorebirds, since their scats would be able to indicate such predation. Certainly, domestic dogs are no direct threat to a shorebird's life, because even when dogs are chasing birds it is an end in itself rather than a way of finding food. Budiansky (2000, p. 61) describes how domestic dogs lack the "seriousness of purpose". Thus, "retrievers will endlessly chase

but will not bite hard on the object of their pursuit" and "poodles readily chased things, but their choice of 'prey' was indiscriminate — birds, leaves, bicyclists — and it was clearly a game, an end in itself, very much as with young wolves at play". The second interpretation that Miller *et al.* (2001) offer is that birds may be waiting until the last minute in an attempt to remain undetected. This may be true for some species in this case, but there was still no significant difference between a human alone and a human with a dog. Therefore, birds may also be waiting until the last minute when a human alone is approaching.

The third experiment null hypothesis is also rejected, because the experiment results show clearly that passing shorebirds triggers a much weaker response than approaching flocks directly. Therefore, shorebird escape behaviour depends on the speed and the direction of the approach. It seems as though the speed can have either a positive or a negative influence on escape behaviour. Approaching birds at jogging speed resulted in the largest proportion flushed and longest time spent in the air before settling back on the beach. In contrast, it seems as though jogging past shorebirds resulted in the smallest proportion flushed and shortest time spent in the air. It is therefore not surprising that a chasing dog or child would both result in a much stronger escape response than when walking with their owner or parent. There should be no difference for the individual bird if it is a dog or a child running towards the birds. Adults are not mentioned in this example, because only children or dogs were seen to have chased birds.

Discussion of Visitor Interviews

Visitor interviews have been a valuable tool to assess visitor attitudes at Long Beach. There is an obvious user conflict between visitors without dogs and visitors with dogs. One key finding is that dog-owners visiting the park tend to be very attached to their pet, sometimes to the extent of including the dog as a family-member. The academic as well as non-academic literature has numerous examples that confirm the importance of "man's best friend" to the social life of humans as well as to their health. Perhaps one of the less well-known findings about human-dog relationships is that dogs encourage humans to talk to other humans, thus acting as a "catalyst for social interactions" (McNicholas and Collis 2000). The comment made by one park visitor that her dog has kept her sane for the last five years adds to findings that patients suffering from coronary heart disease recovered better than those without a pet (Friedmann *et al.* 2003). Considering the feelings of attachment that many dog-owners show, it comes to no surprise that many dog-owners would prefer to go somewhere outside the park rather than leaving their dog at home if dogs were banned from Long Beach. Although the sample size was relatively small for this particular question, this result is unlikely to change with a larger sample.

The observation that dogs are often treated as a child or member of the family is interesting given the fact that both dogs and children were observed to behave similarly when interacting with shorebirds. Only children and dogs were seen chasing birds. The effect on the shorebird flock being chased was always the same, regardless of the individual that chased. In this context, it is also interesting that, due to noise concerns,

dogs are not allowed into the interpretation theatre at the campground, but children of course are permitted. Banning dogs from interpretation areas and the beach itself effectively means excluding dog owners. This may have the desired effect of reducing conflict between dog-owners and those visitors who dislike dogs, but it would have no significant effect on shorebird stress. In addition, there would be a real chance that political support for the park may be reduced.

A second key finding is that shorebirds may not be considered a charismatic species, but they do seem to be recognized as an important part of the park's ecological integrity. Some visitors explained that, without shorebirds, something would be wrong, which relates to the idea of using certain species as indicators for deteriorating environmental conditions. However, other visitors also noted that they had not seen shorebirds and would therefore not care if they were not visiting Long Beach anymore. Reid and Beazley (2003) point out that "one-time questionnaire style surveys" may inadequately reflect the respondents' actual behaviour. Therefore, concluding that most visitors translate their concern for shorebirds, which they expressed when asked on the spot, into action could be wrong. Biodiversity conservation may be considered as a moral value for Canadians, which few park visitors would dispute, especially during a survey. Reid and Beazley (2003, p. 6) did conduct several longer interviews with land-owners in Nova Scotia and found that "the direct impact of extinction of species on humans was typically considered to be minimal, and was generally interpreted as a loss in terms of the opportunity for humans to interact with those species". Most of the shorebird species

observed at Long Beach are not currently classified as "at risk", which ironically reduces the likelihood of these species to receive attention. Nevertheless, shorebirds do share their feeding and resting areas at Long Beach with other species that may be characterized as charismatic. One of the bird species that was identified by many of the interviewees who had noticed birds was the bald eagle. The image of the bald eagle is in the visitor's mind and this large bird shares the same beach habitat as shorebirds do. Therefore, the bald eagle may be a suitable focal species to raise awareness of bird disturbances at Long Beach. Observations suggest that bald eagles may be less tolerant to approaching humans than shorebirds. These birds were usually only seen sitting on the beach for longer periods of time when it was empty.

The third key finding of the visitor interviews relates to the effectiveness of how the park communicates its mandate. The common themes of protection, cleanliness, beauty, and keeping things natural show that visitors have an idealistic view of what a national park should look like. Complaints by some visitors to the park management that logs should be removed from the beach add to the view that nature has to be kept clean and tidy. Park wardens have also pointed out a common problem, when visitors report dead animals and request that wardens should remove them. Current practise is to remove carcasses only if they pose a hazard, which some visitors may find difficult to understand. While it seems as if the two management goals — protection and recreation — are understood to some degree, there is a need to emphasise that the highest priority is protection and that visitors are allowed to be part of the park as visitors. Thus, all

inhabitants of the park should be served first and visitors accommodated accordingly.

Implications of Results Related to Park Users

During the less busy spring season, visitor pressure may not be high enough to disturb shorebirds sufficiently to displace them. During the late summer, however, shorebirds seem to be displaced, at least locally. Those birds that are disturbed can either move to other areas on Long Beach or find areas outside the park which are less disturbed. It may be too costly in terms of energy required to find such a place, especially if these are either already crowded with shorebirds or if there simply are not any other suitable places nearby. In order to be able to associate a true cost of visitor disturbance, one would have to count the entire populations of individual shorebird species. The Canadian Wildlife Service has attempted to give at least an estimate of shorebird populations. The Canadian Shorebird Conservation Plan (Donaldson *et al.* 2000) shows that all shorebird species (except Greater yellowlegs) observed at Long Beach are declining. Four species of high concern (black oystercatcher, whimbrel, red knot, and sanderling) and five species of moderate concern (black-bellied plover, killdeer, greater yellowlegs, Western sandpiper, and dunlin) were observed at Long Beach. This indicates that the latter conclusion should not be excluded. In fact, there may be a true cost of disturbance to shorebirds (i.e., declining population numbers), but no better place for disturbed shorebirds to go.

The mandate of Parks Canada states that the first priority is ecological integrity. Parks

Canada (2002, p. 1) has committed to "protecting the natural and cultural heritage of our special places". Shorebirds may not suffer an immediate cost of human disturbance inside the park, because they may be able to find other places inside or outside the park, but they are guaranteed protection inside the park. Therefore, the extent of a true cost of displacing shorebirds from Long Beach should not affect management decisions. Shorebirds are part of the ecological integrity of Long Beach and are therefore guaranteed protection.

Chapter 4: The Local Community of the Long Beach Unit

Introduction

One of the aims of this study is to make a recommendation on recreation management at Long Beach. However, a recommendation is only valuable when it can be implemented successfully given the local circumstances. The purpose of this chapter is therefore to give an overview of the local community at the Long Beach unit at Pacific Rim National Park Reserve and how it relates to recreation and ecological integrity. This includes the First Nation community living on the Esowista Reserve and those people working within the park boundaries, mainly staff members of the Parks Canada Agency.

Methods

Research was done informally through observation, reviewing local literature, and casual conversation while living at the park for a period of three months.

Local First Nation Community

The Esowista Reserve

The Esowista Reserve is located at the North end of the study area (Figure 18). Residents

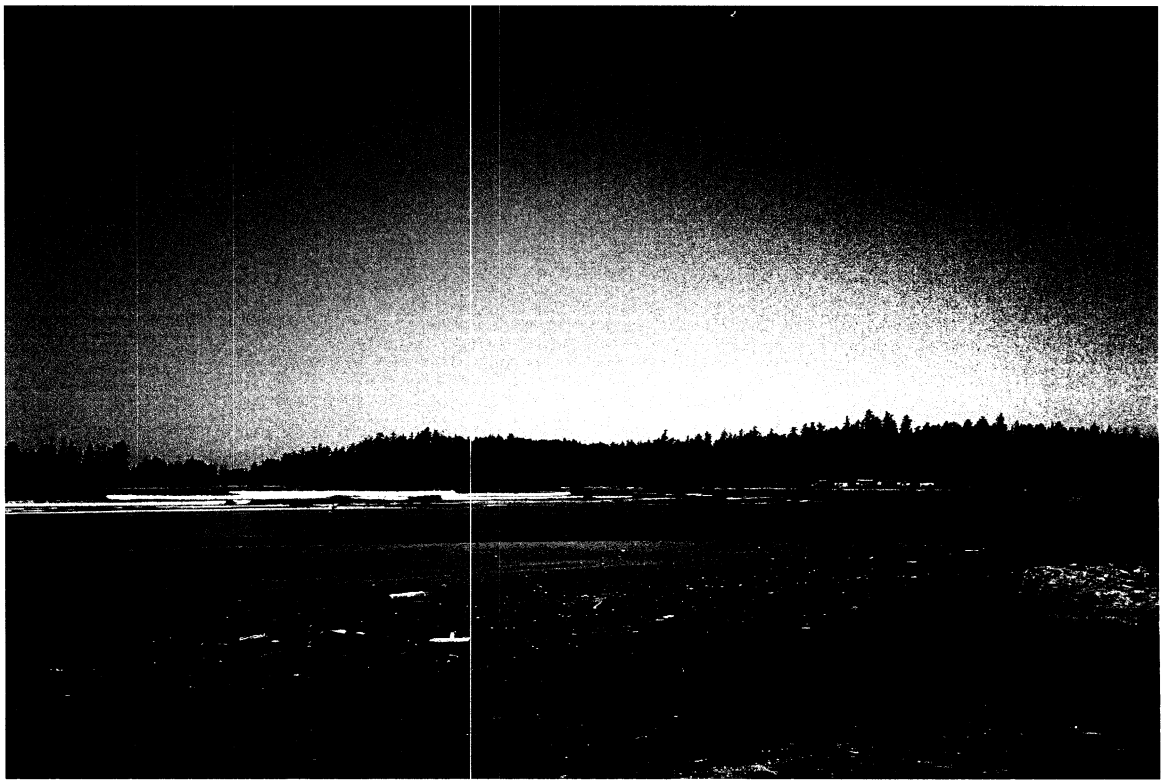


Figure 18: Esowista Reserve adjacent to study area

are part of the Tla-o-qui-aht First Nation, which belongs to the Nuu-chah-nulth tribe. The reserve is a relatively small area of 0.11 square kilometres, completely surrounded by the park. With 34 dwellings and a population density of 1,333 persons per square kilometre, it is the most crowded reserve in the Alberni-Clayoquot area (Government of British Columbia 2001). This will change within the next few years because the federal government and the Tla-o-qui-aht First Nation have settled on the terms for an expansion of the reserve in 2003. Wiwchar (2003) reported to the British Columbia and Yukon First Nation communities that an additional 160 houses would be accommodated in an area north of the existing reserve to bring an end to the chronic housing shortage. Negotiations had been particularly difficult and emotional because the new land to be allocated for housing is within park boundaries.

It is not the first time that First Nations of the Nuu-chah-nulth have come into conflict with national park advocates. The Friends of the Clayoquot Sound are celebrating their ten-year anniversary of logging road blockades in 2004. While this event is used in the activist literature as a positive example of environmentalism worth the celebrations, there may be valid criticism that the environmental activists did not necessarily share the same interests as the native community. Wallner (1998) points out that First Nations are demanding control over resources, while environmentalists were demanding parks. She (1998, p. 63) cites a communication between the local Nuu-chah-nulth and environmentalists to illustrate the point:

> "This was like dating: they come here and talk to us then they leave. We're just dating, but we're not in bed with them". The environmentalists themselves

> declared after the meeting that it had been very successful: "The meeting has been very constructive, the understanding was great".

Despite the privilege of living as a neighbour of the Esowista Reserve during the study period, initial efforts to make contact with the chief were discouraged by park staff. Prior to this study, members of the Esowista community had disturbed shorebird counts conducted by park staff wearing uniform. Bird counts and observations during this study were never interfered with. Experiences such as these generate the impression that there is a considerable amount of distrust between park representatives and at least some individuals of the native community. In contrast, the elected band councillor of the Tla-o-qui-aht First Nation, Ben Williams, did not seem unsupportive of the park wardens' work. He said that wardens were there to protect the public (Williams pers. comm. 2004). At the same time, Williams believes that the expansion of the reserve was needed, but should proceed at a slower pace to ensure that things like recycling were in place.

Reserve Dogs

Several dogs were seen at the Esowista reserve more or less frequently. Occasionally, up to five dogs would be moving along the beach or adjacent forest as a pack. Each beach survey ended at the far end of the Esowista beach section in front of the houses of the reserve (Figure 18). Occasionally, the dogs would approach barking, but there never was any sign of aggression towards the observer. The warden service occurrence report of a

park warden (PRNPR 2003) confirms that the reserve dogs were all domesticated and responded to his commands. However, visitors who are not comfortable being around large dogs would likely feel intimidated. In fact, visitors do feel frightened or disturbed at times and complain to the park management. One letter of complaint received in 2003 reads:

> While walking on the beach with our dog leashed, two other dogs charged out from the group of houses located a short distance from the point where the trail emerges on to the beach. We managed to avoid a confrontation by skirting them and eventually retreating back the way we had come. ... As before, the three dogs ran directly toward us in an aggressive manner putting our dog at a decided disadvantage being that she was leashed. A brief standoff ensued and when the couple came within speaking range I asked them to call their animals off. The young woman dismissed me with a flick of her head and the young man muttered something unintelligible. As they passed I stated that I was of the understanding that dogs were supposed to be leashed in the park generally and on the beach specifically. He laughed at me saying that I could let our dog off leash if I wished to which I reiterated my understanding of the rules. Again, they just dismissed us by laughing and he yelled, "Welcome to Tofino", as they carried on.

In addition to this complaint, the park warden responsible for wildlife issues confirmed that there were eight reported incidents of reserve dogs disturbing visitors, for example by begging for food. Hansen (pers. comm. 2003) points out that First Nations do not get a warning directly, but through their manager.

These incidents illustrate why reserve dogs should be considered somewhat differently compared to pet dogs brought by visitors. Two factors are worth highlighting. Firstly, the reserve dogs pose a different "nuisance" to park visitors than do other pet dogs, which

are usually accompanied by their owners. The conflict is between visitors and local residents and is not related to ecological integrity. Visitors are using the park for recreational purposes and are guests at the park. In contrast, native people live on the reserve immersed inside the park rather than using the park for recreation. Secondly, reserve dogs are accustomed to the beach environment including shorebirds. While these small birds are certainly a novelty for visitor dogs and therefore "fun" to chase, there has been no observed incident of reserve dogs chasing shorebirds.

The main difference between a visitor dog and a reserve dog is that the latter belongs to the reserve as a whole. Although there has not been explicit mention of a traditional use of dogs at this reserve, one could suggest that they might be used as guard dogs.

Cameron (2002, p. 94) recorded the stories of the Nuu-chah-nulth elder women. One of these elder women told her how she felt about tourists:

> The government is always going on about eco-tourism. I don't see much future in it. Not unless the ones who come supposedly to appreciate the beauties of the coast learn how to keep their crap to themselves. And how to keep their touchy-feely fingers off the shellfish leases. But they seem to think they're doing us a huge favour. One guy, when told he was stealing other people's oysters and leaving a mess, got real indignant. Well, he says, I travelled all the way from Montreal to learn about your culture. No, said Fred, you travelled clear across the country to make a damn fool of yourself.

Given this attitude towards so-called eco-tourists, dogs acting as guardians would have the function of keeping visitors from intruding on the First Nation people's privacy. Cummins (2002) has investigated the traditional role of dogs in First Nation

communities. Although he (2002, p. 299) claims that dogs in the Nuu-chah-nulth (or Nootka) society were not normally used for hunting or rituals, the "concept of property ownership was exceptionally elaborated in Nootka thought". While dogs cohabitated with the community and were given names, their function of companions may have changed to guard property and serve today's needs to keep curious visitors off the reserve.

These arguments are in contrast to Councillor Williams, who does not know why the people on the reserve keep the dogs. "They are defending their dogs left and right" but "they are not treating them as family, they don't take care". He thinks that the dogs often run in a pack because they are hungry most of the time (Williams pers. comm. 2004).

Parks Canada

Informal and unstructured interviews with members of staff working at the park show a considerable degree of frustration. A recurring issue was the perception that visitors view the beach as a recreational area only, rather than as a conservation area, and that they would frequently ignore the regulations. Some park wardens, however, recognize that 2003 was the first season when dog signs were posted and wardens could actually enforce the rules according to the *Canada National Parks Act*. There was a general feeling that more dogs were kept on leash compared to observations during the previous years. The wildlife management specialist believes that it is a matter of changing people's perception that the beach is not a disposable area and should receive as much respect as the

rainforest. This would set the stage for the actual enforcement work (Hansen pers. comm. 2003).

An example of visitor misunderstanding was given by a patrol officer, who was talking to a woman at the campground while conducting bear awareness checks. The woman had told him how tired her dog was from chasing the birds. She was obviously not aware at all that a dog could disturb and possibly harm shorebirds even without physically biting them (Jack pers. comm. 2003). The parks representative was considerably frustrated with this level of ignorance.

Park staff members also had difficulty understanding and, moreover, explaining the potential impacts of dogs and people on shorebirds. One interpreter said, "Shorebirds were the hardest to get my head around" (Thew pers. comm. 2003). A seasonal interpreter experienced similar difficulty in explaining why birds may suffer from being chased. She said that "It's nice to be able to bring your dog to the beach, but if they chase the birds that's not good". This interpreter was unable to give a reason why chasing birds would not be good (anonymous pers. comm. 2003).

The chief park warden at the time (Harbidge pers. comm. 2003) explained that the park staff did not choose to exclude the dogs from the front country. However, the difficulty was the lack of legal basis for fining visitors who let dogs run at large. His interpretation of the problem is that wildlife in general and shorebirds in particular would suffer. The Esowista dogs would also pose a safety-issue. "The biggest offenders are surfers and

Esowista". He believes that education should be the first priority and finding ways to corral dogs that are running at large a second priority.

A former park warden (anonymous pers. comm. 2003) has expressed an equal amount of frustration with visitors, especially those that are "poking their fingers in tide-pools". His negative experiences within the Parks Canada system resulted in his retirement from the park warden job. While working at a different Canadian national park, he was discouraged from giving out tickets to visitors who let dogs run at large. Allegedly, it was bad for the business to upset visitors. He also recalls wardens from PRNPR ridiculing his bird-watching and interpretation activities on Long Beach. In an effort to keep a hummingbird nest adjacent to a boardwalk from unnecessary disturbance, he requested temporary closure of the boardwalk section, but he was ignored. Not only did this avid bird-watcher feel prejudiced against by other wardens, but also by many visitors. While he would be walking along the boardwalk carrying a spotting scope, the occasional visitor enquired what there was to see and showed disappointment that there were "only" birds. One of the main concerns he has is that there are "no no-go-areas" in the park at all. Tidepooling is encouraged during interpretive sessions, but it is a serious concern for oystercatchers nesting on the rocks where tidepools are found. He feels that things have to structurally change and that park wardens should be re-trained.

Another concern of this person is the expansion of the Esowista Reserve, which he feels is inappropriate in a national park. The problem he sees is that park wardens have little power to enforce any national park regulations. "All of their [First Nation's] tribes have a

different history. Our system of government has really corrupted them. There are two different legal systems. They don't have to listen to the white man's laws" (anonymous pers. comm. 2003).

Discussion

Although this research did not include formal interviews and is therefore based on anecdotal information, the total picture fits the description of other authors very well. In particular, the interviews confirm Searle's (2000, p. 63) insight that co-operative solutions to mutual problems "are overshadowed by a general attitude of distrust between Parks Canada and local landowners that is found at nearly every national park". PRNPR is yet another Canada's national park where distrust is present.

The solution applied is to avoid the problem of confronting visitors. While wardens are concerned that visitors do not comply with the regulations, no patrolling wardens were seen on the beach during observations. A dog plan for domestic/feral animal control at the park indicates that targeted law enforcement patrols of two wardens are scheduled "as resources permit and when evidence of non-compliance exists" although "emphasis will be placed on voluntary compliance rather than charges" (PRNPR 2003).

Pendelton (1998) has followed PRNPR wardens on duty and recorded how the park was policed. His conclusion is that soft enforcement in form of "encouraging", "bluffing",

"avoiding" and "bargaining" was predominant. He (1998, p. 10) describes a warden explaining how the rules have been enforced to date:

> We are operating here on a big bluff. Most people who come here think we can force compliance because they assume we have the National Parks Act... the same authority as wardens in other parks. Well we don't. The locals know we don't and often they use the park and the trail as they wish.

In addition, Pendelton (1998) finds that soft enforcement was a key component of the mandate to ensure visitor enjoyment, which underlines the emphasis on voluntary compliance. This was likely the reason why the retired park warden interviewed in this study was discouraged from ticketing visitors. Nevertheless, visitor satisfaction may actually be diminished by the lack of enforcement. Letters of complaint and visitor interviews have shown the level of dissatisfaction with the Warden Service.

The relationship between the local First Nation community and park wardens appears to result in an even greater degree of avoidance. The national park rules effectively do not apply to the First Nation residents. Negotiations need to be approved by parliament and the park is yet to be proclaimed a national park as opposed to a national park reserve. Having to deal with a dog complaint near the reserve was never received well by any duty warden, because their hands are tied. Pendelton (1998) gives an example of illegal mushroom harvesting by natives, which is routinely not enforced:

> We just look the other way. It is hard because we know they are having an impact on the park environment. Yet it has been made clear to us not to enforce the harvesting laws until the native land claim issues are resolved.

The same caution applies for the leash-regulation for Esowista dogs running at large on the beach and off the reserve. In light of the political situation and the fact that the reserve itself does not fall under the jurisdiction of the park, wardens would be hard-pressed giving out warnings on the beach adjacent to the reserve.

In conclusion, the political situation of the local community has become clear and will have implications on which recommendation will be realistic in terms of implementation.

Chapter 5: Case Study Recommendations

Introduction

The purpose of this chapter is to use the results presented in the previous chapters and apply the appropriate assessment tool created by Tompa (2003) to make recommendations for future recreation management at Long Beach.

Methods

The appropriate activities assessment is a series of questions designed as a guide through the decision making process. The questions are grouped within themes that are relevant to the activity in question (in this case dog walking): activity background and context, management framework, ecological and commemorative integrity, heritage presentation, visitor experience, and regional and market contexts. These short questionnaires lead to a preliminary assessment whether the activity is appropriate or inappropriate. Additional considerations are made for inappropriate activities. A rationale is then given for the recommendations made based on the previous questionnaire.

Pacific Rim National Park Reserve Appropriate Activities Assessment

Activity Background and Context

Activity	Dog walking
Area or Location of Activity Location in the park: front or backcountry, a specific area or site	Pacific Rim National Park Reserve, Long Beach Unit, front country
Period	Year-round activity, special concern during shorebird migration in spring and fall
Level of Use Relative percentage of visitors engaging in activity in relation to all visitors, main user groups, trends in use	Less than 10% of approximately 700,000 visitors per year
Support Services and Facilties	Dog waste bag dispensers were in storage but not yet installed in 2003
Brief Historical Context Date the activity was established, reasons behind establishment, past trends, etc.	Dog walking has been a common activity before the establishment of the park. Trend of total visitor number increasing

(A) Management Framework

A Criteria	Yes	No
Is the activity consistent with Parks Canada's Guiding Principles and Operating Policies (1994)?	Yes, walking with or without a dog builds public support for, and awareness of, Canadian heritage. Many dog-owners would go elsewhere and not support the park if they were not allowed to bring their dog.	
Is the activity registered on Parks Canada's list of Allowable Outdoor Recreation Activities (1994)?	Hiking/Walking and Dog-sledding are registered allowable outdoor activities	
Is the activity consistent with direction and objectives of the current Park Management Plan?	The last park management plan has been reviewed and the most recent version has not been released to date.	
If NO to above questions, answer questions below		
Is the activity permitted as a result of a Government of Canada commitment, requirements of a park establishment agreement, and/or legislation?	n/a	
Is the activity permitted as an accepted "historic use", specifically golf courses and ski hills?	n/a	
If YES to above two questions, proceed to Step G		
Satisfies Management Framework Criteria?	**Yes**	
Comments/Notes		

(B) Ecological and Commemorative Integrity

B Criteria	Yes	No
Is the activity generally suited to the park's geographical and biophysical landscape?	Yes	
Is the impact of this specific activity on a (or a number of) specific species, habitats, natural processes and/or cultural resource acceptable or mitigable?	Yes, as long as the dog is kept on a leash	
Is the cumulative impact of this specific activity (plus associated services and facilities) on biodiversity, particular ecosystems and cultural resources acceptable?	Yes, dog-walkers are the minority of park visitors.	
In combination with all the other activities, is the contribution of this activity to the overall cumulative impact of human use in the Park acceptable?	Dog-walkers are more likely to use the beach during the shoulder and off-season than during peak-season. The cumulative impact of all visitors (with or without a dog) may reach an unacceptable level at certain times of the year.	
Overall, is the impact of this activity on the Park's ecological integrity and commemorative integrity acceptable?	Yes, if seen in relation to the number of visitors without a dog	
Satisfies EI/CI Criteria?	**Yes**	
Comments/Notes	**N/A**	

(C) Heritage Presentation

C Criteria	Yes	No
Does the activity foster awareness of and respect for the environment?	Yes	
Does participation in the activity contribute towards increased understanding and appreciation of Parks Canada's mandate?	Yes	
Does participation in the activity significantly contribute to awareness, understanding and appreciation of the park's natural and cultural heritage?	Yes	
Satisfies Heritage Presentation Criteria?	**Yes**	
Comments/Notes	**N/A**	

(D) Visitor Experience

D Criteria	Yes	No
Is the activity compatible with the park visitor experience goals and/or does it contribute to achieving visitor use objectives?	Yes	
Are existing and/or potential visitor use conflicts mitigable?	Yes	
Are the inherent risks to participants and others acceptable?	Yes	
Satisfies Visitor Experience Criteria?	**Yes**	
Comments/Notes		

(E) Regional and Market Contexts

E Criteria	Yes	No
Do we anticipate an increased demand for this activity?	Total visitor numbers are rising.	
If yes, can we respond to this increased demand within the existing level of service (and/or facilities) without compromising ecological integrity objectives, and/or increasing significantly the cumulative impact of human use in the park?	n/a (no extra facilities required)	n/a
Is the experience offered by this activity unique to this park?		No
Does this activity complement existing services and opportunities offered in the region? (i.e. does not compete with external services)	If the main purpose of the visit is to see the park, then this activity cannot be done elsewhere in the region.	If the purpose of the dog-walk is to let the dog run, then this activity can be done elsewhere in the region.
Is the activity compatible with the cultural context of the park and surrounding region?	Yes	
Is the activity compatible with the socio-economic context of the region?	Yes	
Does this activity generate significant economic benefits for the region?		No
Satisfies Regional and Market Contexts Criteria? (Does the activity "fit in" or contribute positively to the Park and region's service offers?)	**Inconclusive**	

Preliminary Analysis

Based on the assessment chart in Figure 19, dog walking can be classified as a manageable impact on the park. Criteria for heritage presentation, visitor experience, and regional and market contexts are less conclusive, because the purpose of visiting the park determines if the dog can be walked elsewhere in the region or not. If the owner wishes to learn about the park's natural and cultural heritage, the dog is secondary to the visit and taken as a family member. If instead the owner only wants to exercise the dog he or she can do so outside the park boundary.

If the park managers do not want to lose political support for the park and avoid conflict especially amongst locals, the activity should be tolerated as historic use. This leads to additional considerations for inappropriate use (See Table G).

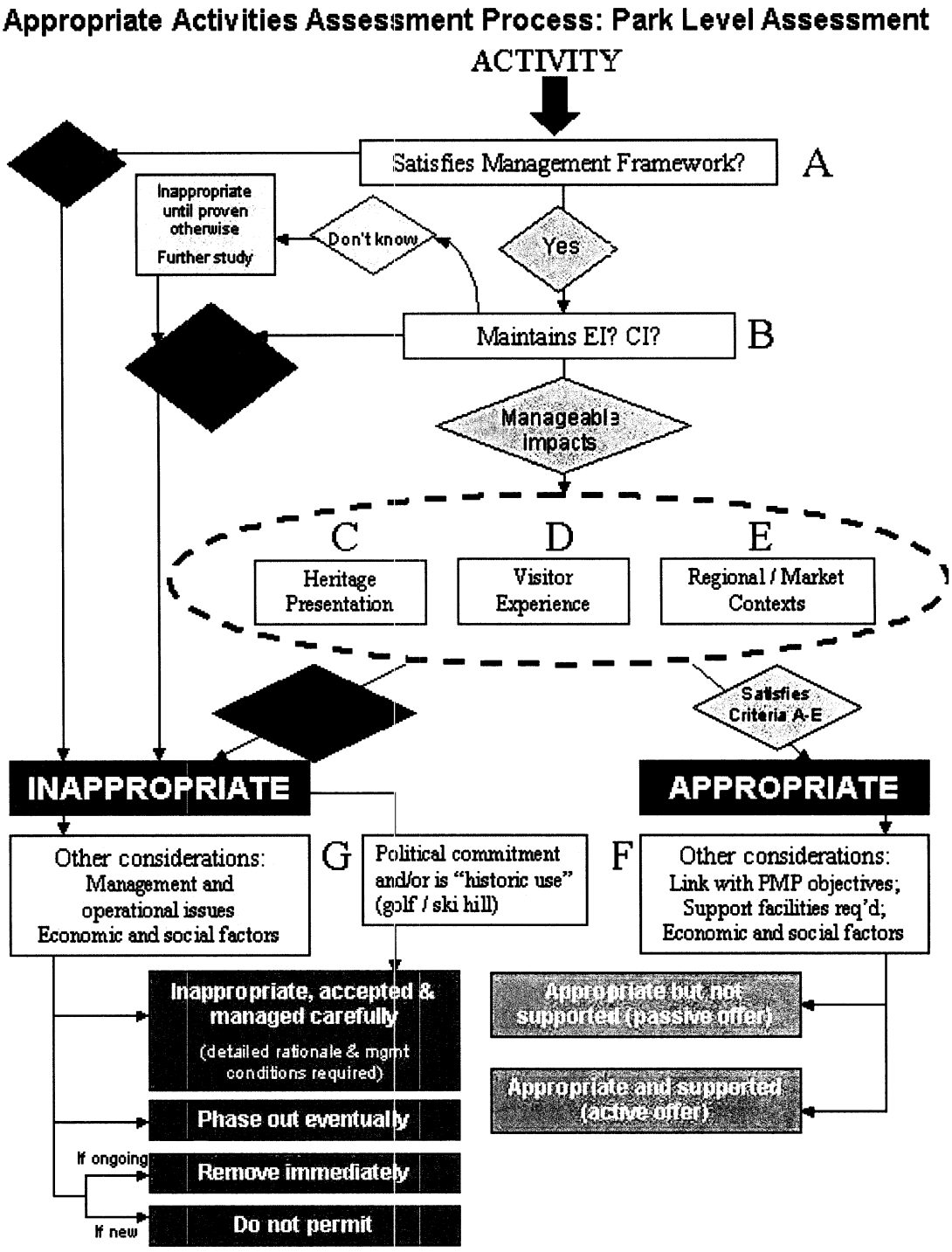


Figure 19: Appropriate Activities Assessment Chart (Source: Tompa 2003)

(G) Inappropriate – Additional Considerations

G Considerations		Yes	No
Ecological Impact	Does participation in this activity or the presence and use of associated facilities cause or have the potential to cause serious and immediate ecological concern?	Yes, if the leash-regulation remains not enforced.	If the leash-regulation is enforced effectively.
If YES to above, then activity must be removed immediately.			
Management and Operational Issues	Does the park management plan advocate removal of the activity?		New management plan has not yet been released.
	Does participation in this activity or the presence and use of associated facilities cause serious and immediate public safety concern?		No
	If supporting facilities already exist, do they require significant maintenance or repair?		No supporting facilities are needed
	Is there a sustained demand for this activity?	Yes	
	Are stakeholders directly involved in this activity? (i.e. concessionaires/NGOs)		No
Economic and Social Effects	Are there significant costs to remove this activity and the associated facilities?	Law enforcement costs	

	Is the activity a long-standing traditional use of the park?	Yes, visitors have come to walk their dogs and enjoy the beach before the park was established.	
	Will removing the activity positively affect the public image of the national park?	On a national or international scale	On a regional or local scale
	Will removing the activity negatively affect the public image of the national park?	On a regional and local scale	On a national or international scale
	Will removing the activity have serious, negative economic impacts in the region?	Potentially up to 10% fewer visitors paying user fees including seasonal passes	
Based on analysis of above factors and those considered earlier in the framework, should this inappropriate activity be removed immediately from the park (existing activity) or not permitted (new activity)?			The activity should be accepted and managed carefully.
Based on analysis of above factors and those considered earlier in the framework, should this inappropriate activity be phased out over time?			No, the leash-regulation must be enforced as a means of careful management.
Comments/Notes			

Recommendation and Rationale

The status quo of recreation management at Long Beach is not sufficient enough to maintain ecological integrity. Two factors need to be revisited. First, dogs running loose

and chasing birds would cause an unacceptable level of disturbance. Second, children chasing birds and the cumulative number of visitors during peak times displace birds from some parts of the beach.

If all visitors taking their pet adhered to the leash-regulation, concerns would be negligible. The data show that this is not reality. Banning dogs from Long Beach would pose the same problem as the current leash-regulation does. If the leash-regulation has not been enforced, it is unlikely that a dog ban will be enforced. A ban without further management action would likely result in visitors either ignoring the ban or going to other beaches in the region and potentially disturbing the same birds that the park is trying to protect. In addition, political support for the park on a local or regional scale could be lost. The only option to improve the level of ecological integrity at the park is to review current law enforcement strategies.

Therefore, dog walking as an activity should be viewed as an allowable activity, which is appropriate only if managed carefully. Careful management must be defined clearly. Soft law enforcement has proven to be not efficient and more effective ways including on the spot tickets are recommended. According to a contract law enforcement officer at the park, more than fifty parking tickets are given out each day during the peak season at Long Beach parking lots (anonymous pers. comm. 2003). Especially, local visitors know that the parking fee will be enforced. The same understanding must be established for the leash-regulation.

A park warden (Simpson pers. comm. 2003) has prepared a proposal for a kennel to be built beside the warden office. This would give the resources necessary to remove dogs running at large from the beach. The proposal raises two concerns. First, most loose dogs running at large are within calling range of their owners and it is unlikely that wardens would take away these dogs on a regular basis. Second, the capacity to hold dogs would not be sufficient for the scale of enforcement required. Nevertheless, the kennel may be an appropriate warning that could accompany a ticket. If a visitor repeatedly lets his or her dog off leash despite a ticket, a warden could take the dog to the kennel and the owner would have to pick it up at the warden office in exchange for a larger fee.

The First Nation councillor Williams (pers. comm. 2004) welcomed the proposal of a kennel for dogs running at large. It may be a useful interim measure to reduce the number of dogs running loose in a pack. Nevertheless, it is important to address the underlying problem of unresolved First Nation-park relations. Other interim measures, while negotiations are concluded and the extension is implemented, are recommended to reduce user conflict at the park. Declaring the beach section adjacent to the reserve a no-go zone for visitors may solve several problems at the same time and should be fairly easy to implement. This would give the reserve a buffer area between external park users and First Nation residents reducing conflict and at the same time give shorebirds an area that is relatively undisturbed from visitors. The rocks already act as a visual barrier between the Long Beach parking area and Esowista beach. Other no-go areas are also

recommended. Visitors are encouraged during interpretation shows to explore the tide pools. Although, interpreters advise visitors not to touch or remove any intertidal creatures, visitors are not discouraged to climb on the rocks. The 2003 Shore Hiker's Tide Guide (Parks Canada 2003) is a free booklet for tourists and it recommends that hikers "step very carefully on the rocks around tidepools because mussels, barnacles & even sea anemone can be crushed". Tide pools can be viewed easily without climbing onto the rocks and disturbing oystercatchers. Therefore, it is recommended that all rocks along the shore should be no-go zones and visitors should be discouraged from climbing such protected areas.

Visitor numbers at the Long Beach unit are increasing year after year, which is clearly affecting the ecological integrity at the park negatively because shorebirds are being displaced from feeding areas during the busy holidays. Parking capacity should not be increased and under no circumstances shifted towards Combers beach. Bald eagles are nesting at the forest fringe at Combers Beach and were seen on the beach on an almost daily basis in the spring. The park's ecological integrity would not benefit from any further increases in visitor numbers.

In conclusion, dog walking is recommended to be treated as an allowable use, which must be managed carefully. Visitors should not be allowed to enter the Esowista beach or climb on any rocks along the entire Long Beach unit. Total visitor numbers should be reduced.

Chapter 6: Conclusions and Further Research

The Pacific Rim National Park Reserve case study was about the interaction of shorebirds, humans, and dogs. This thesis is about the lessons learned from the case study and their implications for Canada's national parks and Parks Canada as a whole. The case study reflects on the assumptions that the Parks Canada mandate is based on (Figure 1).

Assumption 1: All areas are protected

None of the areas at Long Beach are protected from human activity. The implications of human activity at the park depend on the visitor patterns in time and space. The impact is likely to be cumulative until a certain threshold is reached.

Assumption 2: There is no conflict between ecosystem protection and recreation

Human activity at Long Beach is clearly in conflict with shorebirds using the beach as a stopover on their long migratory route. Dogs are a minor problem compared to the large number of visitors using the beach each day, especially during the peak holiday season.

Assumption 3: Canada National Parks Act implementation is successful

The *Canada National Parks Act* has not been implemented successfully. Those rules that generate revenue are strictly enforced, while those rules that contribute towards the protection of ecological integrity remain largely unenforced. The current management

priority is visitor satisfaction and safety (Figure 20). In practice, ecological integrity comes second.

Pacific Rim National Park Reserve faces the same challenges that Brandon *et al.* (1998) identify for Latin American protected areas: people and politics. Rules are in place, but rules are ignored. Sometimes the reason is lack of funding, sometimes it is the lack of willingness to take responsibility, and sometimes it is a game of delegating job descriptions back and forth as seen in law enforcement duties of the warden service. Effectively, the park becomes a paper park. Thus, Pacific Rim National Park Reserve becomes a park in peril.

Two issues emerge from this rather blunt statement. First, what contribution is Canada making towards protecting a sample of the World Heritage? Second, and perhaps more important, what can the Government of Canada do better to help Parks Canada carry out its mandate? If the next generation is to enjoy Canada's national parks, active management needs to shift the level of action to the appropriate scale. Shorebirds are an excellent example to show why it is impossible to conserve individual species effectively on a park level and what kind of shifts would be necessary to implement the Parks Canada mandate. The results of this case study confirm that shorebirds do not enjoy the same charismatic status that bears or cougars have, even though these species are much less likely to be seen on a regular basis. This is one barrier for shorebird conservation. A second barrier is that shorebirds are not a keystone species, whose removal would result

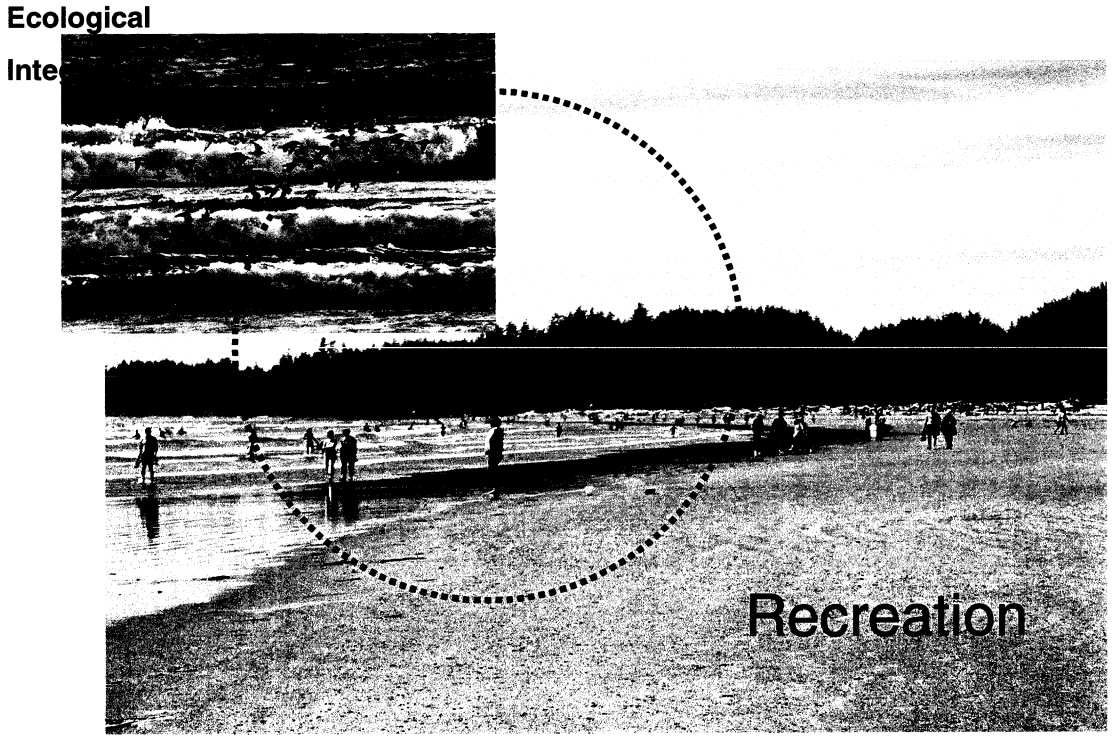


Figure 20: Management priorities at Long Beach

in a cascade of changes in species composition. If shorebirds were not visiting Long Beach any more, major changes in the beach community are unlikely. From an ecological point of view, there is no obvious reason why shorebirds need to be conserved. Exclusion experiments have shown that the lack of shorebird predation does not result in a cascading effect throughout the shore community (Raffaelli and Hawkins 1996). The emphasis is on "no *obvious* reason". Ecology is a young discipline and the authors caution that such experiments were assuming a two-level system. Even though researchers today may recognize that ecological knowledge lacks behind conservation needs, there is no convincing argument available to explain to the average person why shorebirds are relevant to human lives. A third barrier to shorebird conservation is that these migratory birds are not confined to the legislative boundaries of Pacific Rim National Park Reserve.

If these conservation barriers are viewed within an active management framework (Table 7), they can be translated into political, economic, and ecological factors that are associated with different scales in time and space. A non-charismatic species has little political value, a species without a known ecosystem function has little economic value, and a species that migrates from South America to the Arctic is far beyond the legislation of a single national park.

Politics operates on a timescale of only a few years, usually a four-year election period. If the next generation is to enjoy Canada's national parks, management must be shifted to

Active Management Motivation	Time Scale	Conservation Barrier for Shorebirds	Protect shorebirds indirectly via changing park values
Political	Years	Not charismatic	Maintain park charisma by maintaining its ecological integrity
Economic	Years to Generations	Species function unknown	Translate highest park values biodiversity, air and water quality into economic values
Ecological and Evolutionary	Generations and beyond human survival	Migration across legislative boundaries	Nature as a whole is not endangered, humans are endangered on a global scale

Table 7: The need to shift the level of active management

a timescale of generations. Thinking in terms of the next few generations means thinking economicly and long-term. It means recognizing the highest economic value of protected areas as Costanza *et al.* (1997) and Buckley (2003, p. 63) did: "For parks, their highest value to the human economy is conservation of biodiversity and air and water quality, to maintain a global ecosystem capable of supporting a human economy at all". Maintaining the charisma of the park on a political level would facilitate this approach.

There would be little point in thinking on an evolutionary scale longer than the next few hundred years. Without doubt, the human species will join the many species that have already gone extinct. It is more important to recognize that nature can change and needs no protection to survive, but humans can only change to some extent and will certainly not survive nature.

In conclusion, Canada's national parks are in peril and ecological integrity is currently not the highest priority for Canada's national parks. Recreation does not need to be abandoned completely in order to secure ecological integrity, but it should be viewed secondary inside national parks. A major shift from political thinking into economic long-term thinking will be necessary within the Government of Canada as a whole to turn paper parks into real protected areas. Ultimately, this means creating a demand for ecosystem services including recreational space in urbanized areas and thus reducing the demand for isolated protected areas. If national park characteristics were not so rare, they would not need to be put into a museum.

This leads to further research required in this relatively new field of interdisciplinary research. Very few relevant and truly interdisciplinary studies were found to support this research. Here, interdisciplinary research is defined as tackling a problem from as many angles as possible. Many problems need to be solved locally at the park and on a nation and global level.

Locally, other recreational activities should be reviewed under the appropriate activities assessment. The experiences at the park show that many visitors come to the park to go surfing. The main purpose is, therefore, not to appreciate and learn about the natural heritage at PRNPR, but to catch the best waves. This can be done elsewhere and surfing as an activity inside the park should be reviewed critically. Classes on the beach and surfers crossing the beach from the parking area to the waterline are disturbing shorebirds as much as other park visitors. In addition, resources are used to employ full-time surf guards during the summer months.

The highway at PRNPR may be one of the most pressing concerns and can even be related to the visitor pressure that shorebirds are exposed to. The easier it is to access the beach with a car, the more people will use the park. It seems almost absurd that dog-owners are unwelcome, but cars are perfectly acceptable at the park. Two examples illustrate the need for research here. A German couple came to Greenpoint campground by bike during the peak-season. The campground attendant had to turn away the couple because all sites were taken. They could not understand that cyclists would be turned away from a national park and expected that a number of sites would be set aside for

cyclists arriving later in the day. The cyclists were used to a much more flexible and bike-friendly booking system at campgrounds. The provincial highway itself has only a very small shoulder for cyclists and many campervans driven on the park highway are rental vehicles with inexperienced drivers. This is a danger not only for cyclists, but also for wildlife. A near-miss with a black bear crossing the highway was witnessed during the study period and previous occasions resulted in the death of animals. Studies and recommendations for the long-term (generations) economic benefits of a park with restricted car use may show that visitor satisfaction would rise considerably. Free shuttle-buses, speed limits, and smaller parking areas would be ways to restrict traffic. In recognition of the fact that the highway itself is not part of the park and therefore an external threat, cooperation with the province and local transportation operators would be required.

Other research should concentrate on shorebird distribution in the region. Logistics were the main reason why shorebirds were observed in the relatively limited area of Long Beach. A comparison between Chesterman Beach, adjacent to the park, and Long Beach was suggested, but was not feasible given the resources available. Exposed sandy beaches have been disregarded by researchers for a long time as lifeless deserts not worthy to be researched. More than a decade ago, Brown and McLachlan (1990) pointed out that most beach research has been conducted on protected beaches. Not much seems to have changed since. Although this thesis did not take the shorebird population visiting the Tofino mudflats into account, it would be very interesting to find out if there is traffic

between the open beaches of the park and the enclosed mudflats. Species that are highly specialized to the exposed surf areas include small shorebirds such as sanderling or the semipalmated plover. A comparison of mudflat areas, open and less exposed sandy beaches would give further insights into the value of exposed beaches. Making these beaches a conceptual part of national parks rather than only a recreational area would have perhaps even changed the US National Park Service veteran Hummel's (1987, p. 12) mind that beaches *are* what one would think of when he or she says "national parks". He argued that recreational impacts on US national parks were overestimated because large numbers of visitors accounted for beach areas and were therefore negligible.

Perhaps the most important research need on a global scale that emerges from this study is to find ways to cross borders of departments and disciplines and to change decision-making processes from a political short-term scale to a long-term economic scale. Research into the function of ecosystems and its translation into goods and services that are tangible for the person on the street is what many researchers are already puzzling about. Allocating funds to such research requires political willingness and this may be where the "catch22" cycle begins.

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