



# PACIFIC RIM

NATIONAL PARK RESERVE OF CANADA

*State of the Park Report*

*August 22, 2008*





**APPROVAL**

*I hereby recommend this State of the Park Report:*

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*Kim Seward-Hannam  
Superintendent  
Pacific Rim National Park Reserve of Canada*

*I hereby approve this State of the Park Report:*

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*Steve Langdon  
Superintendent  
Coastal British Columbia Field Unit*



## EXECUTIVE SUMMARY<sup>1</sup>

This report is an assessment of the current condition of Pacific Rim National Park Reserve that captures the state of:

- Aboriginal relationships, governance structure and the land;
- Ecological integrity;
- Cultural resources, and;
- Visitor experience, outreach education and stakeholder relations.

The report is intended to help raise awareness among key partners and visitors of the condition and status of park resources, activities and relationships. It also identifies key issues and challenges to consider in park management planning to be completed by 2010.

Spanning 125 km (525 km<sup>2</sup>) along the rugged outer west coast of British Columbia's Vancouver Island, Pacific Rim's three geographically distinct units – the Long Beach Unit (LBU), Broken Group Islands (BGI), and West Coast Trail (WCT) – protect and present significant examples of Canada's lush coastal temperate rainforest and diverse marine environments. Vancouver Island's west coast is also the traditional home of the 14 bands of the Nuu-chah-nulth First Nations, The park is found within the traditional territories of nine Nuu-chah-nulth First Nations.. Pacific Rim National Park Reserve is a relatively recent land-use designation within these long-established First Nations traditional territories.

Pacific Rim was established in 1970. However, it was not until 1999, when the Canada National Parks Act came into effect, that it became an officially designated national park reserve. The first Park Management Guidelines were approved in 1994 (PCA 1994) with an updated draft produced in 2003 (PCA 2003). The 2003 draft Interim Management Guidelines lacked specific actions and targets. Regardless, most management actions have been responsive to current priorities as reported within each of this document's sections: Aboriginal Voices, Ecological Integrity, Cultural Resources and Visitor Experience and Public Education. In recognition of the importance of ongoing treaty negotiations, the 2003 IMGs were not formally approved.

Pacific Rim is currently engaged in treaty negotiations at five separate treaty tables: 1) the Maa-nulth: which includes Huu-ay-aht, Ucluelet, Uchucklesaht and Toquaht First Nations, 2) the Hupacasath First Nation, 3) The Ditidaht and Pacheedaht First Nations, 4) the Nuu-chah-nulth: which includes the Tseshaht First Nation, and 5) the Tla-o-qui-aht First Nation. With the expected ratification of the Maa-nulth Treaty in the Fall of 2008 and the signing of the Co-operative Management side agreement with four First Nations, Pacific Rim continues to build relationships in working towards formalizing co-operative management of the park. The park also continues to forge strong working relationships and partnerships with the other five First Nations. Despite many accomplishments, it is commonly recognized that there is still much to do.

The overall state of ecological integrity in the national park is fair and stable in the terrestrial environment and fair to poor with some deteriorating trends in the freshwater and marine environments. Streams suffered historically due to logging on the landscape and their current

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<sup>1</sup> A number of individuals contributed in important ways to the production of this state of the park report, including principal authors: Arlene Armstrong, Barb Brittain, Karen Haugen, John McIntosh, Ed Paleczny, and Yuri Zharikov; important contributors: Mike Collyer, Heather Holmes, Tanya Hunter, Phil Lee, Bob Redhead, Cliff Robinson, Wendy Szaniszló, Nadine Crookes, Louanne Ralston, William Fox, Dan Vedova, Bob Hansen, Silva Johansson, Editors and Reviewers: Jason Boire, Crystal Bolduc, Alison Manley, Steve McCanny, Mary Watson, Susan McLeod O'Reilly, Andrée Chartier; Graphic Design: Alice Gavin

status is “fair”. Some of these impacts have lessened naturally as areas logged in the mid-1900s have re-grown. In other cases, active stream restoration projects have successfully restored damaged salmon spawning and rearing habitat and re-established the connectivity of stream ecosystems supporting migrating salmon. Forest state, as assessed from remotely sensed data, remains good. The amount of suitable habitat for several species of wildlife has remained stable or has increased. In the subtidal ecosystem, the decline of fish stocks and several seabird populations represent a general degradation of biodiversity. While the state of ecological integrity of intertidal ecosystem varies throughout the park, the overall assessment is “fair”. The shoreline ecosystem fares relatively well, as it continues to support healthy populations of breeding shorebirds. Management of the marine ecosystem, as noted by the decline in biodiversity in the subtidal ecosystem and increased proliferation of invasive species in the intertidal ecosystem represents a significant priority for the park and local communities.

The identification of 42 species at risk in or migrating through the park creates a significant challenge to assess priorities for action, to develop a site-based ecosystem approach to action planning and to engage First Nations and other partners in planning and implementing recovery actions.

Overall, the status of the cultural resources is good. The majority (~75%) of archaeological sites have a good status, 75% of the historic objects have fair & good status and the status of 85% of the archaeological objects are good. However, many of the archaeological sites have not been revisited in over a decade, and a number of historic objects have yet to be assessed. As well, landscapes and landscape features have yet to be designated and evaluated.

Visitor experience is considered to have a good status; however, this assessment is based on limited survey information. While overall visitor satisfaction is high in all three units of the park and is assessed as stable in the LBU and BGI, visitation is declining in the WCT unit. With over 800,000 visitors to the park each year, there are ongoing challenges with aging and outdated visitor facilities and infrastructure. Permanent staffing levels do not match the increase in visitation to the LBU’s visitor centre and the lengthened season. In addition, the increase of urban visitors unfamiliar with ocean environments continues to present a challenge to public safety, particularly with the growing interest in off-season surfing and winter storm watching in the LBU. There are no data available to assess the status and trend of the outreach education or stakeholder relations.

The key issues and challenges facing the park include its evolving relationships with First Nations, managing marine ecosystems, protecting ecological integrity specifically linked to the recovery of 42 species at risk, spread of invasive plants, water contamination, stream rehabilitation and development pressures, monitoring of cultural resource values and providing infrastructure to meet visitor needs.

A summary table of the status and trend for each indicator is provided in Appendix 1.

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# 1. INTRODUCTION

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## 1.1 Purpose of this Report

The Parks Canada Agency is pleased to provide Canadians with a report on the current condition of Pacific Rim National Park Reserve of Canada. This is Pacific Rim's first state of the park report, and one of the first in the Parks Canada Agency to assess the three key elements of Parks Canada's mandate: heritage resource protection, visitor experience and public education, as well as aboriginal voices.

State of the park reporting, which is a relatively new and evolving initiative, will be completed every five years. The purpose of this report is to capture a current assessment of the state of:

- Aboriginal relationships, governance structure and the land;
- Ecological integrity;
- Cultural resources, and;
- Visitor experience, outreach education and stakeholder relations.

The report is intended to help raise awareness among key partners and visitors of the condition and status of park resources, activities and relationships. It also identifies key issues and challenges to consider in park management planning to be completed by 2010.

## 1.2 Geographical Setting

Pacific Rim National Park Reserve of Canada (Pacific Rim) was the first national park on Canada's Pacific coast. With its significant marine component, Pacific Rim protects a wealth of natural features representing the coastal plain portion of the Pacific Coast Mountains Natural Region and the near shore waters of the Vancouver Island Shelf Marine Region, characterising it as a meeting place of land and sea.

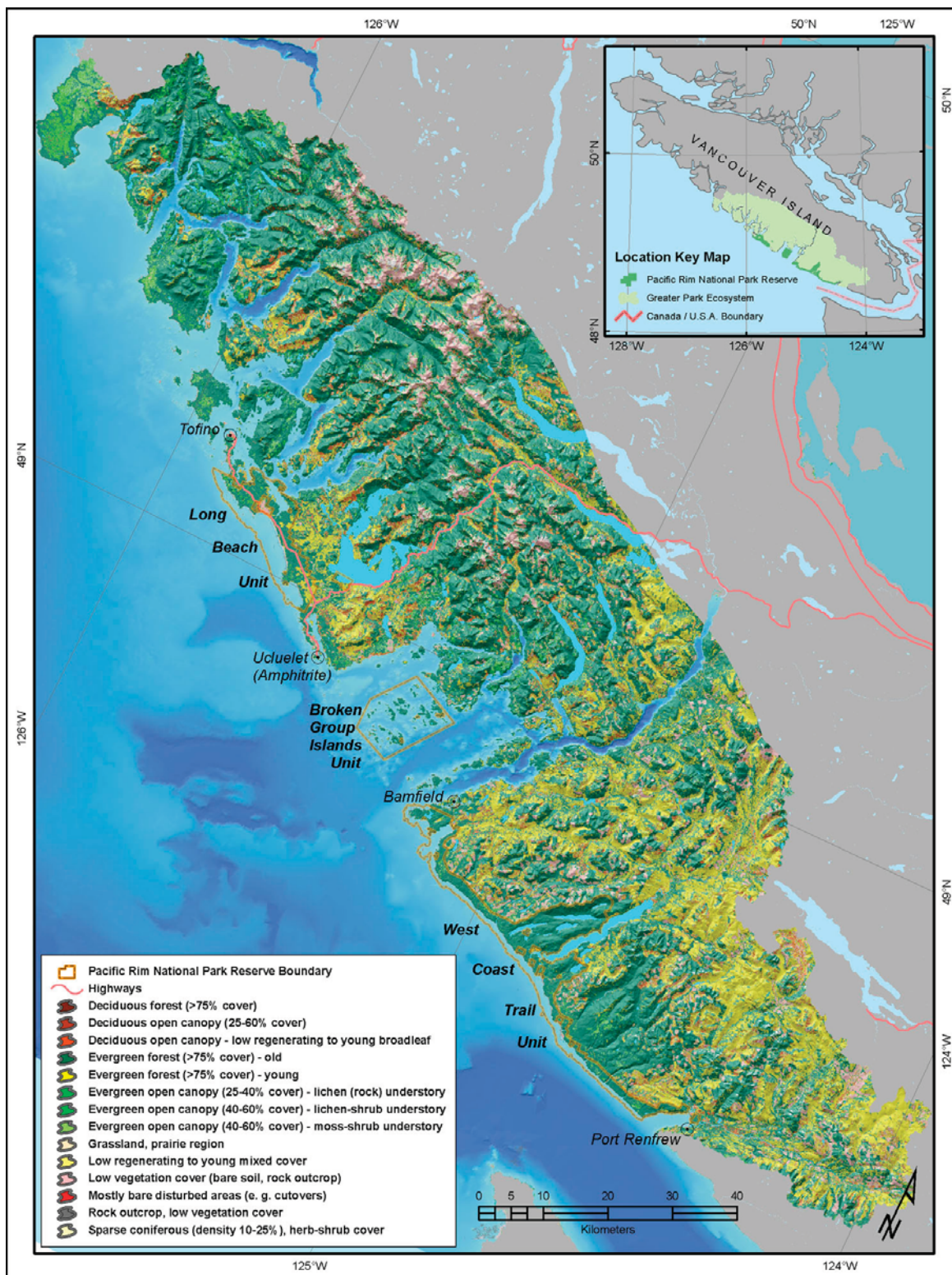
Spanning 125 km (525 km<sup>2</sup>) along the rugged outer west coast of British Columbia's Vancouver Island, Pacific Rim's three geographically distinct units – the Long Beach Unit (LBU), Broken Group Islands (BGI), and West Coast Trail (WCT) – protect and present significant examples of Canada's lush coastal temperate rainforest and diverse marine environments. The park's marine component extends to the 10-fathom mark, making it one of the largest marine components in Canada's southern national parks (Fig. 1.1).

Everything in the park from ecological integrity to visitor experience to cultural resources to infrastructure is directly or indirectly affected by the maritime climate. The weather pattern of Pacific Rim is characterised by cool summers and rainy winters with an annual precipitation of 3.5 to 4 m. The long narrow configuration of land and ocean along the coastline with watersheds that extend beyond the park boundary creates challenges for protecting and presenting park resources.

## 1.3 Management Park Planning

Although Pacific Rim was established in 1970, it became an officially designated national park reserve in 1999 when the Canada National Parks Act came into effect. In 1994, the first Park Management Guidelines document was approved with an updated draft produced in 2003; however, these Interim Management Guidelines lacked specific actions and targets. In recognition of the ongoing treaty negotiations, the 2003 document was not formally approved. The State of the Park Report is the first step towards completing a management plan for the park by 2010. In assessing the status and trend for all indicators and effectiveness of management actions, it will

Fig. 1.1. Landcover classification (year 2005) of Pacific Rim National Park Reserve and the Greater park ecosystem<sup>2</sup> produced by the GRIP programme.



<sup>1</sup> Greater Park Ecosystem is defined as all watersheds draining into Pacific Rim waters within 50 km of the external park boundary

inform decision-making in the management planning cycle (Fig. 1.2).

The “state of” report is a fact-based document. It provides a synopsis of the current condition of a National Park (NP), National Historic Site (NHS) or National Marine Conservation Area (NMCA), and assesses performance in meeting established objectives for indicators associated with the Agency’s mandate. The ‘state of’ reports and complementary internal analysis are the basis for the scoping document and five-year management plan review.

### 1.4 The Monitoring Framework – Reporting on Indicators and Measures

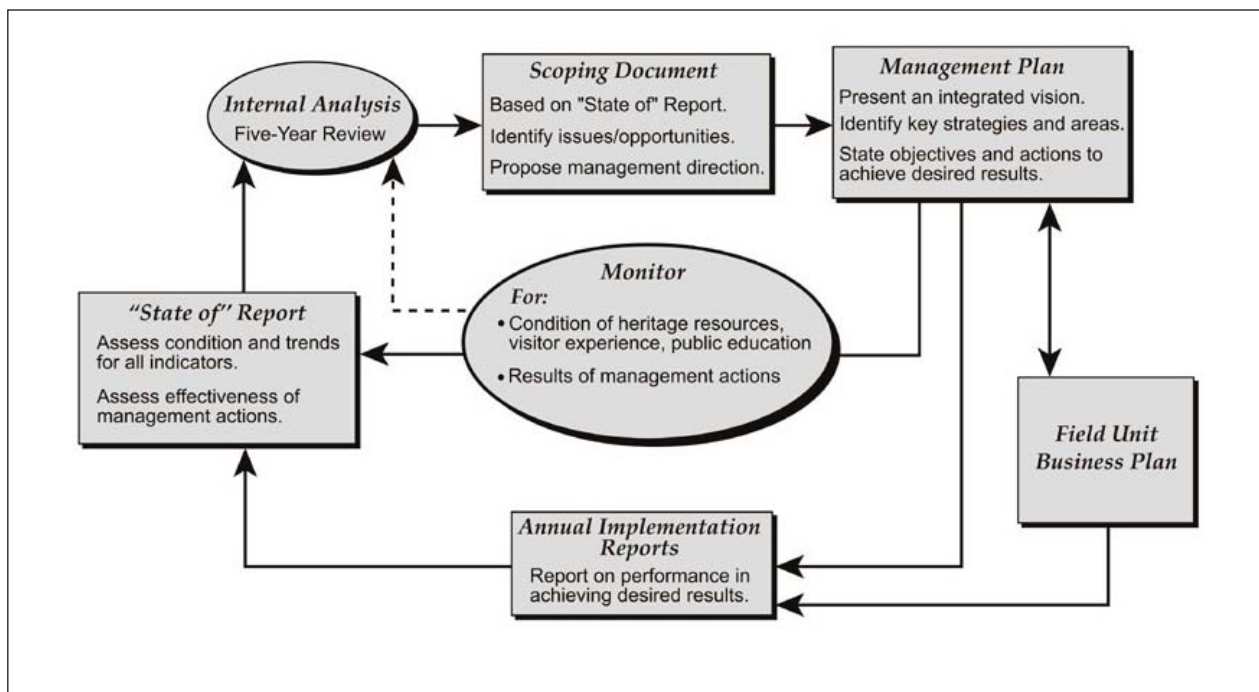
Monitoring provides essential information for evaluation of the state of the park, planning of management actions, ensuring that the actions are effective in achieving desired results and for adjustments, if necessary.

Monitoring covers two aspects: condition and effectiveness. Condition monitoring is designed to answer the question, “What is the state of the protected heritage place?” Condition monitoring is done through the on-going process of collecting and analyzing data on a suite of carefully selected monitoring indicators in a rigorous and consistent manner, and comparing and reporting the results to pre-identified management targets. Effectiveness monitoring, on the other hand, looks at what actions were taken and whether those actions were effective (PCA 2007a).

Parks Canada is currently working to identify indicators and measures to assess how all mandate elements (protecting heritage resources, facilitating visitor experiences, and providing public education) are being implemented. This work includes establishing measurable targets to permit the Agency to monitor and assess its progress toward achieving the vision for each protected heritage place.

Pacific Rim has developed an Ecological Integrity Framework and completed a long-term

Fig. 1.2. Parks Canada Management Planning Cycle.







monitoring plan to report on its state of ecological integrity. Information gaps will be addressed in subsequent reporting cycles. As well, indicators and measures for First Nations, Visitor Experience and Cultural Resource Management programs are proposed in this report and will be further developed for the next reporting cycle.





Each indicator is supported by a number of data-driven ‘measures’. In situations where insufficient data exist, professional judgement has been used to assess status. This report focuses on the condition of indicators and does not contain all the background analyses. This approach is known as the ‘iceberg model’ (Fig. 1.3).

Each indicator and supporting measure(s) is assessed and reported on for status and trend as described in the Ecological Integrity section and shown below (Table 1.1).

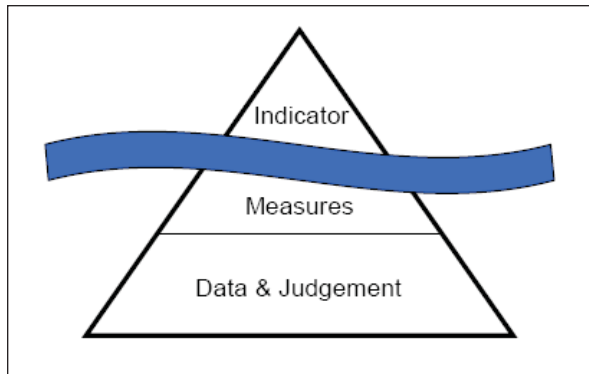
**Table 1.1. Reporting on status and trend in a Parks Canada State of the Park Report**

STATUS			
			
GOOD	FAIR	POOR	UNDETERMINED

TREND			
			
IMPROVING	STABLE	DECLINING	UNDETERMINED

**Fig. 1.3. The ‘Iceberg Model’ of indicators and measures.**



## 2. EVALUATION OF STATE OF THE PARK

### 2.1 Aboriginal Voices

#### i. Aboriginal Context

Since time immemorial, the west coast of Vancouver Island has been the home and traditional territory of the Nuu-chah-nulth First Nations, an ancient people proud of their unbroken lineage and culture. Pacific Rim's establishment as a national park reserve in 1970 is a relatively recent land-use designation that sites it within the traditional territories of nine First Nations. Over the last 10 years, the park has made a concerted effort to create a welcoming environment for First Nation partners in anticipation of the successful completion of modern-day treaties and the advent of cooperative management.

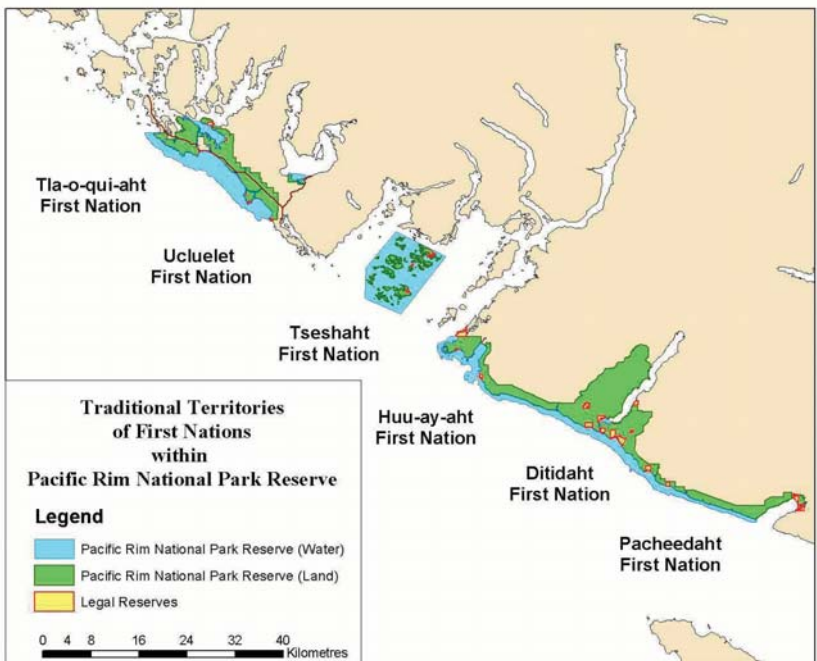
The territory the Nuu-chah-nulth people call home stretches from Kyuquot to Port Renfrew. The Nuu-chah-nulth share language, culture, and family connections with the Makah Nations that live along the west coast of Washington State. Resources derived from the ocean and the coastal temperate rainforest have supported the social,

cultural and economic well being of the Nuu-chah-nulth people for millennia.

Parks Canada lands surround 21 Indian Reserves (approx. 768 ha) belonging to seven different First Nations. The LBU is entirely within the traditional territories of the Ucluelet and Tla-o-qui-aht First Nations. The Tseshaht First Nation's traditional territory encompasses most of the BGI. The one reserve on Nettle Island belongs to the Hupacasath First Nation although the Ucluelet, Uchucklesaht and Toquaht First Nations also continue to use resources within the BGI. The Huu-ay-aht, Ditidaht and Pacheedaht First Nations' traditional territories envelop the WCT.

In preparing for treaty signings, Pacific Rim has worked to create a post-treaty environment through recognising First Nations interests and making a concerted effort to include their values in all aspects of park operations and management. Pacific Rim has committed to engage our privileged First Nation partners, to learn from one another and to forge lasting collaborative relationships based on mutual respect and trust.

Traditional territories of First Nations within Pacific Rim National Park Reserve



## ii. Aboriginal Governance

Pacific Rim is currently engaged in treaty negotiations at five separate treaty tables. The Maa-nulth Treaty which includes the Huu-ay-aht, Ucluelet, Uchucklesaht and Toquaht First Nations is in the final stage of approval through Parliament. The Hupasaht First Nation is nearing the Agreement in Principle stage. The Ditidaht / Pacheedaht First Nations are together in negotiations. The Ditidaht First Nation has filed a claim of Aboriginal Title within their traditional territory that includes a portion of Pacific Rim's WCT unit. The Tseshaht First Nation participates at the Nuuchahnulth treaty table. The Tla-o-qui-aht First Nation is initiating negotiations.

With the Maa-nulth Treaty in the final stages of ratification, Pacific Rim has begun meeting with two of the four First Nations in co-operative management discussions.

Pacific Rim will also begin negotiations with the Tseshaht and Ditidaht First Nations to establish a co-operative management board with each nation.

Pacific Rim has developed several working groups with local First Nations. Within the LBU, an informal Tla-o-qui-aht First Nation and Parks Canada working group has been established to work on issues such as the Esowista (Indian Reserve) Expansion Project, Tribal Park initiative and economic opportunities within Pacific Rim. This working group consists of a four-member team: two from Pacific Rim and two from the First Nation.

Within the BGI, a Cultural Resources Management working group has been established between Pacific Rim and the Tseshaht First Nation consisting of six people: one Tseshaht archaeologist and two additional Tseshaht staff, plus one Parks Canada archaeologist and two additional Parks Canada staff.

Within the WCT, there is a co-operative management board established with the Huu-ay-aht First Nation, which has two Huu-ay-aht members and two Parks Canada staff from Pacific

Traditional territories.



Rim. There are also two other working groups, one with the Ditidaht First Nation, and the other with the Pacheedaht First Nation.

Pacific Rim works closely with the Central Region Language group, which is a partnership between the Central Region Nuuchahnulth Nations of Ahousaht, Hesquiaht, Tla-o-qui-aht, Toquaht, and Ucluelet. The Central Region Nuuchahnulth Nations are using the language group as an opportunity to express common interests, shared values and to tell their stories through Parks Canada venues.

On an annual basis, a Parks Canada archaeologist works with the First Nations communities to re-visit and assess cultural sites and recommends remedial action that is needed to maintain the integrity of the sites. These recommendations are taken with full consultation and collaboration with the nations in whose traditional territory the work takes place.

Timber agreements have been successfully negotiated with Huu-ay-aht First Nation and Ditidaht First Nation. The agreements have ensured the continued ecological integrity of these reserves within park boundaries.

Pacific Rim and the Ucluelet First Nation have successfully reached an agreement for the land transfer of Lot 469 and the protection and preservation of two Ucluelet First Nation reserves within the LBU.

Memorandums of Understanding (MoUs) have been signed with Ditidaht, Huu-ay-aht, and Toquaht First Nations. The MoUs outline the First Nations' and Parks Canada's shared commitment to park management planning, interpretation, economic opportunities, and operational issues. A protocol agreement with Tla-o-qui-aht First Nation was reached during negotiations for the Esowista reserve expansion. This agreement outlines the co-operative working relationship of Tla-o-qui-aht First Nation and Parks Canada for both the expansion of the reserve and the subsequent management of ecological integrity issues arising from the development. In 1995, an access agreement was reached with Ditidaht First Nation to address hiker access across five Ditidaht reserves along the WCT.

### iii. State of the Land

Although many accomplishments ensure there is much to be proud of, both First Nations and Parks Canada recognize that there is still much to do. Foundations have been built for a strong partnership between Parks Canada and the nine Nuu-chah-nulth nations. As one step to building this foundation, Pacific Rim and the First Nations held a two-day workshop in 2007 called *In the Spirit of Partnership* (Parks Canada Agency. In the Spirit of Partnership), which brought together Parks Canada staff and First Nation partners to share experiences and get to know one another. Now to move forward another step and build on this relationship, Pacific Rim is collaborating with Parks Canada's Social Science Department to conduct a survey in 2008-09 with all nine First Nation partners. This survey will guide and direct Pacific Rim on new steps in creating a positive co-operative management and post-treaty environment.

The survey will help Pacific Rim in the following areas:

1. Ecological Integrity/ Cultural Resource Management
2. Interpretation/Heritage Communications

3. Economics/Tourism
4. Employment/Training
5. Partnership / Relationship

This survey will also allow Pacific Rim to better prepare future work and management plans.

The nature, strength and commitment of the relationship between Pacific Rim and the local First Nations directly supports the Parks Canada priorities of Protection (Ecological Integrity & Cultural Resource Management), Education and Visitor Experience. The success of these relationships has been demonstrated through the success of many projects and workshops, including:

1. RESOURCE PROTECTION – ECOLOGICAL INTEGRITY & CULTURAL RESOURCE MANAGEMENT
  - Traditional Harvest Workshop
  - Archaeological and Cultural Resource inventory, assessment and monitoring
  - Establishment of and park support to Kiix'in National Historic Site
  - Benson Island and Dice Box Island Archaeological Projects
2. VISITOR EXPERIENCE
  - Aboriginal Interpretation along the WCT and the Nuu-chah-nulth Trail
  - Aboriginal Day celebrations and Aboriginal School Day
  - Restoration of WCT after the devastating 2006 winter storms
  - Wickaninnish-Nuu-chah-nulth Working Group – Refit project of the Wickaninnish Interpretive Centre

West Coast Trail interpretation.



### 3. EDUCATION

- First Nations Relationship outreach
- Aboriginal Career Fairs
- First Nations Language Preservation with the Nuu-chah-nulth Central Region Language group

As Pacific Rim is new to co-operative management with First Nation partners, how it will evolve with respect to First Nation requirements, constraints, and capacities are unknown. As a result, Pacific Rim can only elaborate on known park issues and challenges.

Pacific Rim is now beginning a new journey with First Nation partners, a journey of co-operative management with both Treaty Implementation, and Aboriginal Title and Rights boards. However, determining the roles of these boards will depend

on the varying capacities existing within Parks Canada and the communities of our First Nations partners.

Some key challenges and issues for First Nation program management will be:

1. Co-operative Management board;
2. Aboriginal Title cases;
3. Treaty Implementation that includes but is not limited to, marine management, traditional harvesting, interpretation and heritage and cultural resource management.

The future will bring many more challenges to face as we deal with important issues. Although First Nations and Parks Canada may or may not always share a common vision, we are optimistic that we will be successful in working together by trusting existing relationships and showing respect for one another.

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## 2.2 Ecological Integrity

### i. Ecological Context

Pacific Rim's approach to monitoring and reporting on the state of its ecological integrity is guided by the Hishuk-ish ts'awalk (all-is-one) philosophy of those First Nations on whose traditional lands the park is located. Ecologically, the park can be conceptually divided into six ecosystems that readily interchange energy and nutrients: the Subtidal; Intertidal; Shoreline; Streams; Lakes and Wetlands; and Forest (Fig. 2.1).

The *Subtidal ecosystem* is by far the most diverse biome, accommodating a myriad of life forms. These include both macroinvertebrates (larger species without spines) and vertebrates such as fish, marine mammals and birds. Kelp forests found in near-shore waters throughout the park are the most ecologically complex and valuable element of the marine environment. This is a realm that is tightly integrated through nutrient and energy flows via sediment deposition, larval transport and predation with the coastal biomes.



The *Intertidal ecosystem* represents a narrow band of sea-bottom cyclically covered and uncovered twice daily by tides. It contains many habitats including rocky shores, eelgrass beds and soft sediments. Within these, many invertebrates thrive, such as echinoderms, snails, crabs and clams. At low tide, plant and animal resources are uncovered, becoming available to land birds and mammals that first consume them, then transport their nutrients and energy inland. In turn, intertidal and subtidal ecosystems are important carbon and sediment sinks that originate inland.

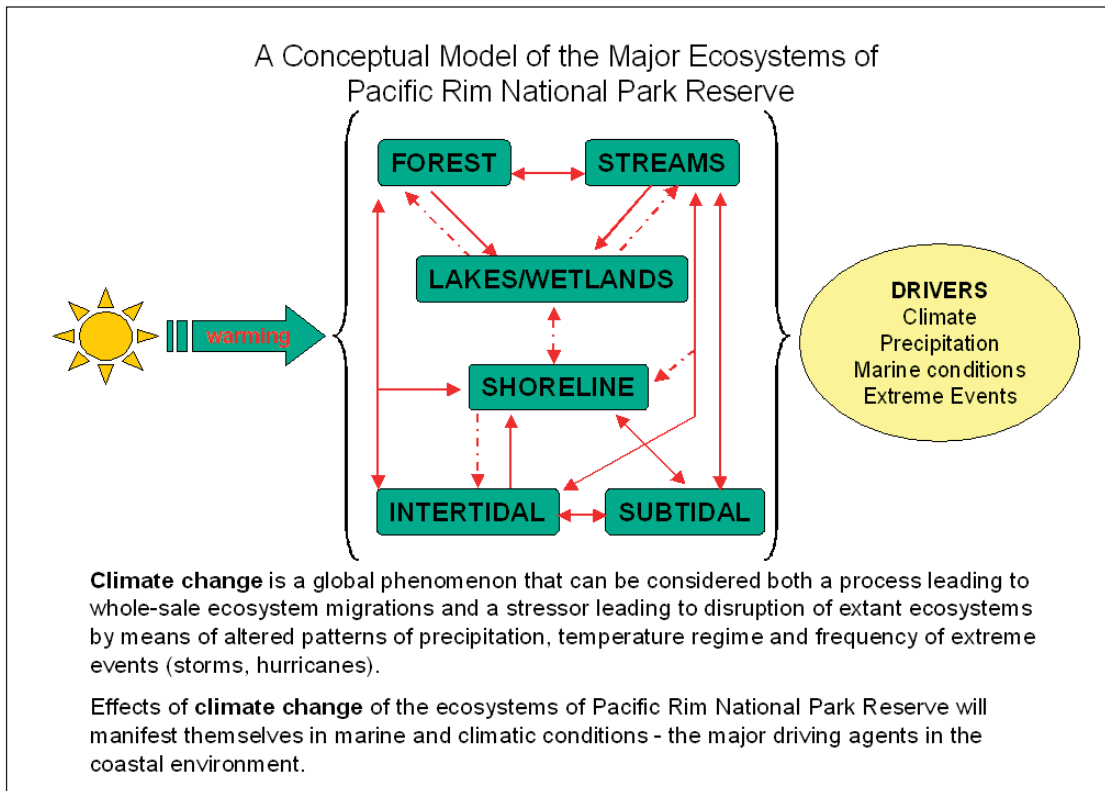
The *Shoreline ecosystem* serves as a transparent boundary across which the transport and exchange of nutrients and energy between terrestrial (forest and freshwater) and marine (intertidal and subtidal) ecosystems takes place. Unique plant communities dwell here, such as pink sand-verbena (*Abronia umbellata*) and

Subtidal macroinvertebrates at Pacific Rim National Park Reserve



yellow sand-verbena (*A. latifolia*), while animals find shelter and sustenance in the ephemeral environment of shifting sand-dunes. Many bird species (gulls, oystercatchers, passerines) nest along these rich shorelines.

Fig. 2.1. A general conceptual model of the ecological space of Pacific Rim National Park Reserve with the key ecosystem drivers, ecosystems, energy and nutrient flows among them, and general impact of climate change



The *Stream ecosystem* is important to the coastal temperate rainforest. They carry forest organic matter, nutrients and sediment into lakes and wetlands, as well as to shoreline, intertidal and subtidal ecosystems. Salmon — for which the west coast is famous — move in the opposite direction: from the ocean into the streams, ultimately delivering ocean-derived nutrients into the forest.

Lakes and wetlands contain foraging sites for aquatic birds (ducks, herons, osprey), forest mammals (bear, mink, otter, deer) and also serve as sinks for carbon and sediment originating in the terrestrial environment. Rare fish (cutthroat trout [*Salmo clarki*]) and amphibians (red-legged frog [*Rana aurora*]) breed in the park's lakes.

The Forest ecosystem is dominated by old-growth stands of Sitka spruce (*Picea sitchensis*), western red-cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*), the forest is home to many uncommon plants (redwood sorrel [*Oxalis oregana*]), invertebrates (dromedary jumping-slug [*Hemphyllia dromedarius*]), amphibians (north-western salamander [*Ambistoma gracile*]), birds (northern goshawk [*Accipiter gentilis*]) and mammals (Roosevelt elk [*Cervus elaphus roosevelti*]). Nutrient flows, life cycles, predator-prey interactions and scavenging comprise the dynamic web of life connecting the forest ecosystem with Pacific Rim's streams, lakes and wetlands, shoreline and intertidal ecosystems.

Pacific Rim's maritime climate affects ecological integrity both directly and indirectly. Cool summers and rainy winters with an annual precipitation of 3.5 to 4 m have historically shaped the park's ecosystems. But climate is changing. The 2007 report of the United Nations Intergovernmental Panel on Climate Change warns that climate warming is unequivocal and that regional climate changes, notably temperature increases, will affect natural systems. Nearly a century of climate data for Pacific Rim confirms warming marine and terrestrial

Steller's jay – a common forest bird in Pacific Rim National Park Reserve



environments in line with global trends. One consequence will be an increase of frequent and severe winter storms (Fig. 2.2).

Climate change may affect park ecosystems in several major ways, mostly through a deteriorating ocean environment and shoreline erosion. Pacific Rim is adapting to these changes and their consequent issues in terms of ecological integrity through a monitoring program. While climate change is not monitored per se, park ecosystem responses to climate change are. This ensures that Pacific Rim is in a strong position to inform both park visitors and the broader public of climate change impacts, understanding which can lead to more sustainable life styles and practices both within and beyond the park.

#### **SPECIES AT RISK**

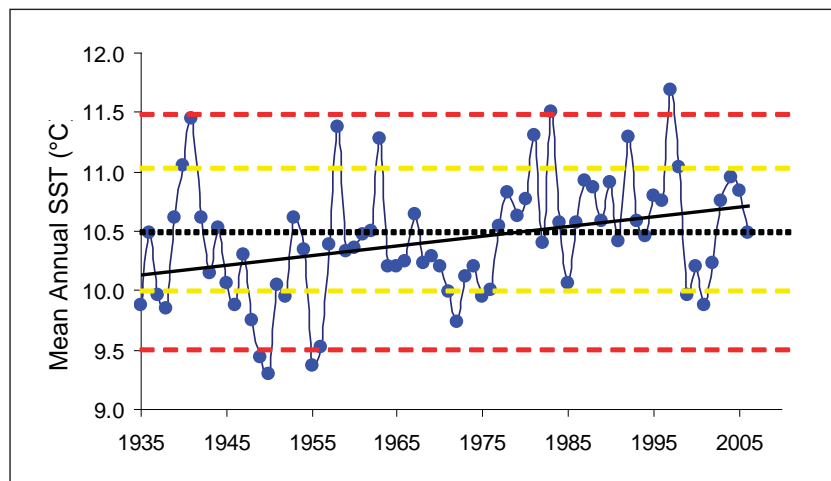
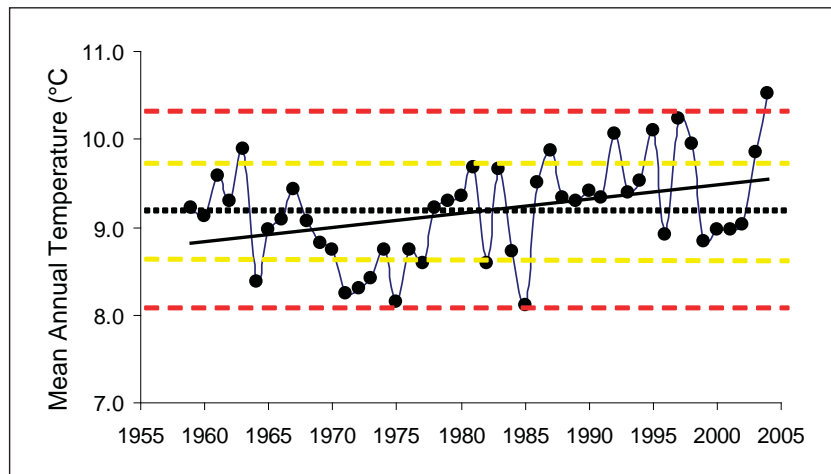
Currently, 42 COSEWIC assessed species at risk are found within Pacific Rim, although not all of them occur regularly (see Technical Compendium for details). The subtidal ecosystem contains the highest number (25), including these high-profile species: the marbled murrelet [*Brachyramphus marmoratus*], the sea otter [*Enhydra lutris*], and the killer whale [*Orinichus orca*]. Two species at risk, the Olympia oyster (*Ostrea conchaphila*) and the

great blue heron (*Ardea herodias*), occur in the park's intertidal ecosystem. Five other species at risk use the shoreline, including the extremely rare seaside centipede lichen (*Heterodermia sitchensis*). No species at risk are found in the streams proper, while lakes and wetlands provide a home for three listed species (cutthroat trout, western toad [*Bufo boreas*], and red-legged frog). Finally, the forest houses seven species of special concern that include birds such as the northern goshawk (*Accipiter gentilis*) and olive-sided flycatcher ( and invertebrates such as the dromedary jumping-slug and warty jumping-slug (*Hemphillia glandulosa*).

Parks Canada is responsible for the completion of recovery strategies for four listed species that are found in Pacific Rim (Table 2.1), and the Agency participates in the recovery and management planning processes for many of the 38 additional species recorded within or around the park.

At present, Pacific Rim has limited quantitative information on the population status and trends for the majority of its species at risk populations. Data are insufficient even for regularly seen populations such as basking sharks (*Cethorinus maximus*), red-legged frogs, northern goshawks, killer whales and humpback whales (*Megaptera novaeangliae*). However, there are exceptions.

Fig. 2.2. Long-term-trends in mean annual air and sea surface temperature (SST) at Pacific Rim National Park Reserve. The solid black line represents a trend in the data. The dotted black line represents an overall mean, while dashed yellow and red lines respectively represent one and two standard deviations of the mean.



Assessments are provided in this report for the Olympia oyster, marbled murrelet and grey whale (*Eschrichtius robustus*) populations. Several other species, particularly in the subtidal ecosystem, are rare and/or both locally and globally declining such as northern abalone (*Haliotis kamtschatkana*) and sea otters. For some species (some whales and off-shore seabirds), Pacific Rim represents an

edge of their natural distribution; therefore they have a more limited role in ecosystem function. The ecological integrity monitoring program endeavours to capture information about most of the species at risk regularly found in the park, thus enabling staff to objectively report on their status and to forecast population trends.

Table 2.1. Species at risk found in Pacific Rim for which Parks Canada is the Responsible Authority.

Common Name	Latin name	Status	Description
Pink Sand Verbena	<i>Abronia umbellata</i>	Endangered	A perennial herb with a thick, deep taproot and narrowly egg-shaped leaves. The flowers are pink. Habitat in Pacific Rim is restricted to upper sand beaches, just below the driftwood zone along the outer coast.
Seaside Centipede Lichen	<i>Heterodermia sitchensis</i>	Endangered	Small- to medium-sized, this lichen is dark brown with conspicuous pale margins and its narrow lobes are almost always fringed with cilia. Has remarkably stringent habitat requirements. Occurrence determined by the combination of four ecological factors: 1) proximity to the ocean and seaward orientation; 2) old Sitka spruce trees with defoliated twigs in the lower canopy; 3) slow-growing branches; and 4) nitrogen and calcium enrichment from seabird guano and/or sea lion excrement.
Dromedary Jumping-Slug	<i>Hemphillia dromedarius</i>	Threatened	A relatively large (60 mm) slug, grey with cream-coloured mottling, a pronounced hump and part of the internal shell-plate visible through a slit in the mantle. It is found in mature and old-growth forest in association with decayed logs or stumps. Jumping-slugs derive their name from a remarkable anti-predator behaviour, exhibiting “violent writhing and leaping” when disturbed.
Northern Goshawk ( <i>laingi</i> subspecies)	<i>Accipiter gentilis laingi</i>	Threatened	A resident medium-sized raptor, with broad, short wings and a long tail nesting in mature or old-growth forest. Hunts small- to medium-sized birds and mammals. As few as 300 pairs are thought to dwell on Vancouver Island.

## ii. Evaluation of Ecological Integrity

The Parks Canada Agency describes and assesses the state of ecological integrity of national parks by rolling up measures into indicators. In this somewhat unique system, a measure represents field-monitoring data collected following a protocol to evaluate the status and trend in the state of ecological integrity relative to set thresholds. A measure can be a single measurement, such as population abundance, or water temperature, or it may combine several measurements into an index, such as an index of biodiversity. Put simply, an indicator is an index comprised of several measures representing an ecosystem. For example, stream water quality, riparian (i.e. streamside) landscape and salmon abundance are the three measures that together, comprise the stream indicator. A park will typically have 6 to 8 indicators, one for each of the major ecosystems (forest, streams, lakes) containing respective suites of measures.

The State of the Park Report for Pacific Rim reports on five indicators of ecological integrity comprised of 21 measures (Table 2.2). Monitoring has started but no data are currently available for one complete indicator (*Lakes and Wetlands*) comprised of two measures (**NATIVE** and **INVASIVE AMPHIBIAN POPULATIONS**), three measures in the *Subtidal indicator* (**KELP FOREST**, **KELP MACROINVERTEBRATES**, and the **KELP FISH COMMUNITY**), and one measure in the *Intertidal indicator* (**ANTHROPOGENIC DISTURBANCE INDEX**). Monitoring of four additional ecological integrity measures is proposed to start in 2008-2009. The overall ecological integrity monitoring program for Pacific Rim has 6 indicators and 27 measures.

Where sufficient data is available, a trend is assigned to each measure to describe whether the state of ecological integrity of a population or an environmental parameter stable, improving, or deteriorating. To determine the trend for each measure, a statistical method known as regression analysis was applied. In a few cases,

where quantitative data were lacking, a measure's trend was assessed based on qualitative and circumstantial evidence. Otherwise, that trend was described as undetermined. Unless stated otherwise, a trend was assessed when 5 or more years of data were available.

The status of each measure is depicted by a colour. **GREEN** represents good/unimpaired ecological integrity, **YELLOW** represents fair/moderately healthy ecological integrity, while **RED** represents a measure's poor state of ecological integrity. Pacific Rim's ecological integrity thresholds, against which status was defined, were determined according to one of the five following approaches:

1. When thresholds were already defined by other agencies or had been described in peer-reviewed literature, they were either adopted or modified to suit the park conditions.
2. Where organisms or properties of the environment are prone to broad fluctuations, then 2 standard deviations of the long-term mean was used as the red (lower) threshold, and 1 deviation of the mean as the yellow (upper) threshold.
3. For organisms with slowly changing population numbers (most vertebrates), the threshold criteria from the International Union for Conservation of Nature (IUCN) Red List were used as outlined in the Parks Canada guidelines.
4. For declining populations without a stable period to establish a baseline, the lower and upper ecological integrity thresholds respectively were defined by a 50% or 30% population reduction over 5 years.
5. Finally, in cases that did not fit scenarios 1 – 4, set percentiles relative to the baseline year or baseline long-term mean were designated as thresholds. For example, 50 – 74% percentile = fair (yellow), while  $\geq 75\%$  = poor (red).










































STATUS				TREND			
							
GOOD	FAIR	POOR	UNDETERMINED	IMPROVING	STABLE	DECLINING	UNDETERMINED

Table 2.2. The status and trend of indicators and measures used to define the state of ecological integrity at Pacific Rim National Park Reserve<sup>3</sup>.

INDICATOR	STATUS	TREND	MEASURE	STATUS	TREND
subtidal (40% of park)		↓ <sup>4</sup>	KELP DENSITY		?
			KELP MACROINVERTEBRATE COMMUNITY		?
			KELP FISH COMMUNITY		?
			PACIFIC HERRING BIOMASS		↓
			MARbled MURRELET POPULATION		↔
			SEABIRD POPULATION		↓
			GREY WHALE POPULATION		↔
intertidal <sup>5</sup> (4% of park)		↔	NATIVE INTERTIDAL BIVALVES		↔
			INVASIVE INTERTIDAL BIVALVES		↑
			ANTHROPOGENIC DISTURBANCE INDEX		?
			EELGRASS HEALTH		?
			EELGRASS FISH COMMUNITY		?
shoreline <sup>6</sup> (435.3 km)		↔	BLACK OYSTERCATCHER POPULATION		↔
			GLAUCOUS-WINGED GULL POPULATION		↔
			EUROPEAN DUNEGRASS EXTENT		↓
streams <sup>7</sup> (313.5 km)		↔	RIPARIAN HABITAT		↔
			RIPARIAN LANDSCAPE DIVERSITY		↔
			FRESH WATER QUALITY		↔
			SALMONID POPULATIONS		↓
forest <sup>8</sup> (53% of park)		↔	ANTHROPOGENIC DEVELOPMENT		↔
			OLD-GROWTH COVER		↔
			WILDLIFE HABITAT FRAGMENTATION		↔
			MARbled MURRELET NESTING HABITAT		↔
			CARNIVORE HABITAT		↔
			INVASIVE PLANT EXTENT		↓
Lakes <sup>9</sup> & wetlands (3% of park)		?	NATIVE AMPHIBIAN POPULATION		?
			INVASIVE AMPHIBIAN POPULATIONS		?

<sup>3</sup> A formal roll-up of the subtidal indicator suggests a stable trend, which however is not consistent with global assessments of the state of marine environment, and may reflect lack of data rather than genuine stability in the system

<sup>4</sup> The intertidal zone has not been mapped in detail, the percentage given represents an order of magnitude estimate<sup>5</sup> Based on 1:20,000 TRIM 2 database; including definite, indefinite and intermittent streams

<sup>6</sup> Based on 1:20,000 TRIM 2 database

<sup>7</sup> Based on 1:20,000 TRIM 2 database; includes definite, indefinite and intermittent streams

<sup>8</sup> Based on GRIP landcover classification

<sup>9</sup> Lake area is given excluding wetlands

Generally, the status of a measure was defined by the last data point's position relative to a threshold or the position of a majority of data points within the last 5 years of sampling – whichever was lower (i.e. further from the mean).

A *Technical Compendium* (PCA 2008) complements the State of the Park Report, providing detailed

background information that includes references, accounts on the origin and quality of the data, and the analytical approaches and manipulations applied to data for each ecological integrity measure reported here. The *Compendium* also contains the rationale behind the determination of ecological integrity thresholds, as well as the reasoning behind status and trend assignments.

## Subtidal Ecosystem Indicator

Intense harvesting of fin-fish has historically stressed the Subtidal ecosystem, with cascading effects on seabird populations. Most recently, climatic effects have further exacerbated the stress on marine communities, and so the decline continues, reflecting the trend towards the poor ecological integrity of marine ecosystems globally.

### Monitoring Measure

#### PACIFIC HERRING BIOMASS



##### Threshold:

**green** status: The pre-spawning biomass for Vancouver Island's west coast is at or above 18,800 tonnes as assessed by the Department of Fisheries and Oceans (DFO)

**red** status: The pre-spawning biomass for Vancouver Island's west coast drops below 18,800 tonnes

**Status:** RED

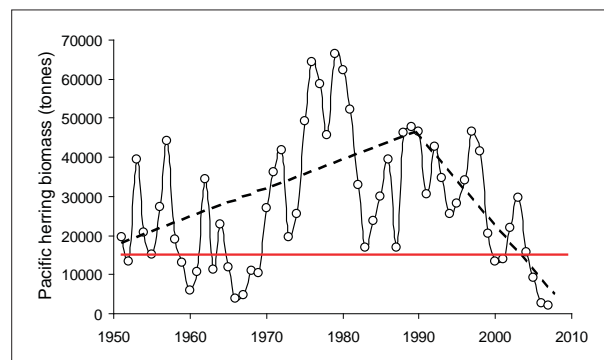
**Trend:** DECLINING

Pacific herring (*Culpea pallasii*) is a keystone species in near-shore marine environments of the Northern Pacific because of its very high productivity and interactions with a large number of predators and prey. According to the annual State of the Pacific Ocean Report, Pacific Herring biomass off Vancouver Island's west coast was very low in 2006, having dropped further from the low biomass recorded in 2005 and below the previous record low of 1966 - 67. The fishery has been closed for the past three years as the estimated biomass has remained below the DFO threshold, giving it RED status.

DFO data for the central-west coast of Vancouver Island from 1951 to 2007 suggest increasing herring biomass from 1951 to 1990 followed by a steady DECLINE from 1991 to the present (Fig. 2.3).

Given the 17-year stretch of declining abundance in Pacific herring stocks in the waters of and adjacent to the park, the trend is declining. This population trend is likely driven by a combination of climatic and broad-scale ecological factors operating throughout the North Pacific region. These include warmer water temperatures, declining zooplankton abundance, northward expansion of potential predators (Pacific hake [*Merluccius productus*]) and competitors (Pacific sardine [*Sardinops sagax*]).

Fig. 2.3. Pre-spawn biomass of Pacific herring off the central-west coast of Vancouver Island.



## Monitoring Measure

### MARBLED MURRELET POPULATION



#### Threshold:

- |                       |   |
|-----------------------|---|
| <b>green</b> status:  | < 30% population change over 30 years (3 generations) |
| <b>yellow</b> status: | ≥ 30% population decline over 30 years                |
| <b>red</b> status:    | ≥ 50% population decline over 30 years                |

**Status:** RED

**Trend:** STABLE

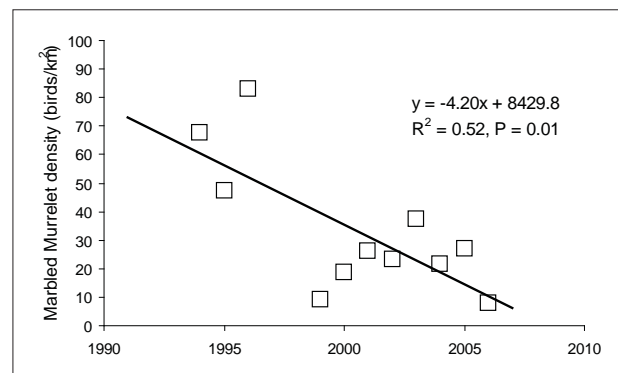
Seabirds, prominent members of inshore marine ecosystems, are considered sentinels of both local and broad environmental change. A conservation status of threatened or endangered has been given to many due to threats to their nesting habitat and/or declining populations. Seabird data collected at the park were broken into two ecological integrity measures: Marbled murrelet population and Seabird populations. The marbled murrelet was singled out owing to its unique ecology and conservation status. Its population in park waters has declined at the rate of 10% per annum with a total reduction in the population between the mid-1990s and mid-2000s of 68% (Fig. 2.4). Much of this decline is linked to the collapse of local Pacific Herring stocks (see above).

Fig. 2.4. Inter-annual trend in the mean at-sea density of marbled murrelets during the breeding season (May – July) in the waters of Pacific Rim National Park Reserve.

Marbled Murrelet adult



In park waters, the population levels of this species at risk are largely determined by factors operating at regional (fish) and global (sea-surface temperature) scales. It is also likely that the birds move in and out of the area depending on the foraging conditions, as opposed to the population being in decline strictly due to mortality rate exceeding recruitment or habitat loss. Despite a stable population in 1999 – 2006, current numbers are significantly below population levels observed in the mid-1990s. This species is known to have declined throughout its range from Alaska to California. With continued logging outside the park boundary, the gradual warming of the ocean and deteriorating ocean productivity trends, the species (as with many other seabirds), remains in a precarious position and so has a **RED** status with a **STABLE** trend.





## Monitoring Measure

### SEABIRD POPULATIONS



#### Threshold:

**green** status: < 30% population change over 10 years

**yellow** status: ≥ 30% population decline over 10 years

**red** status: ≥ 50% population decline over 10 years

**Status:** YELLOW

**Trend:** DECLINING

This measure encompasses five common seabirds, other than the marbled murrelet, dwelling in the waters of Pacific Rim:

- the pigeon guillemot,
- pelagic cormorant (*Phalacrocorax pelagicus*)
- Brandt's cormorant (*P. penicillatus*),
- rhinoceros auklet (*Cerorhinca monocerata*),
- the common murre (*Uria aalge inornata*).

Pigeon guillemot



#### Pigeon guillemot

At-sea density in the species demonstrated no significant trend and remained within or above one standard deviation of the mean ( $0.80 \pm 0.30$  birds/km<sup>2</sup>) over the reporting period.

#### Cormorants

Both cormorants were combined for this analysis. When the data were corrected for the effect of sea-surface temperature, it became apparent that in fact the species has been declining at a rate of 6% per annum (or 43% over 10 years).

#### Rhinoceros auklet

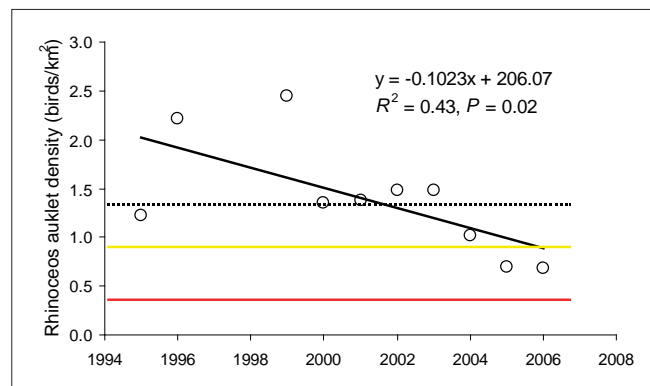
The species has demonstrated an overall negative population trend at the rate of 4% per year (31% per 10 years) (Fig. 2.5).

#### Common murre

The species displayed no temporal trend but varied strongly and positively with Pacific Herring biomass and sea-surface temperature. Thus, if the herring declines further, so will the murres.

The combined four measures resulted in a **YELLOW** status and **DECLINING** trend for seabird populations.

Fig.2.5. Mean annual at-sea density of rhinoceros auklets in the waters of Pacific Rim National Park Reserve. Dashed line represents the overall mean. Yellow and red line – 1 and 2 standard deviations of the mean respectively.



## Monitoring Measure

### GREY WHALE POPULATION



#### Threshold:

**green** status: at any given year the population abundance falls within 50% of the 10-year mean

**yellow** status: 50 – 75% below the 10-year mean

**red** status: > 75% below the 10-year mean

**Status:** YELLOW

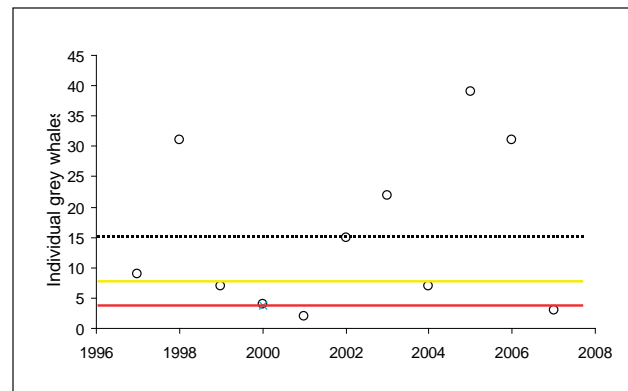
**Trend:** STABLE

The grey whale, one of several large marine mammals, is a top predator foraging on sea-bottom organisms found within Pacific Rim's waters. An annual migrant along Vancouver Island's west coast, the total number of individually identified grey whales in park waters over the past 10 years has varied greatly (Fig. 2.6). In 1998, 2005, and 2006, 30 or more grey whales were observed, while in 2001 and 2007 only 2 and 3 individuals were recorded respectively. There is no annual trend in the data.

Of grey whale population counts in the past five years, three put the measure in the green, one in the yellow, and the last one in the red; this would indicate a red status. Populations are presently estimated to be at their historic levels (22,000 for the Eastern Pacific Region from Bering Sea to Baja California). On the other

hand, recent reports suggest that the population of grey whales migrating along North America's west coast has been stressed energetically (undernourished). To balance the high global population estimate with apparently deteriorating foraging conditions and a low count in the last year of park observations, this measure was given the YELLOW status.

Fig. 2.6. Total numbers of individually identified grey whales detected in the waters of Pacific Rim National Park Reserve. Dashed line represent the overall mean ( $15.5 \pm 13.2$ ). Yellow and red lines represent 50th and 75th percentiles of the mean.



Grey Whale



Photo: Jennifer Yakimishyn

## Intertidal Ecosystem Indicator

The intertidal ecosystem straddles the marine and terrestrial environments. Its state of ecological integrity is mixed; some measures are in the green (bivalves – molluscs with two shells), others are in the yellow (fish, exotic species) and one is in the red (Olympia oyster). One key issue in this ecosystem may be the establishment and proliferation of exotic species. To date, the effects of exotic species on this ecosystem have been benign or imperceptible; however, the potential for future conflict with native species cannot be ruled out.

### Monitoring Measure

#### NATIVE INTERTIDAL BIVALVES



##### Threshold:

- |                       |  |
|-----------------------|--|
| <b>green</b> status:  | within 1 standard deviation of the established baseline (long-term mean) bivalve density |
| <b>yellow</b> status: | > 1 but ≤ 2 standard deviations from the established baseline                            |
| <b>red</b> status:    | > 2 standard deviations from the established baseline                                    |

**Status:** YELLOW

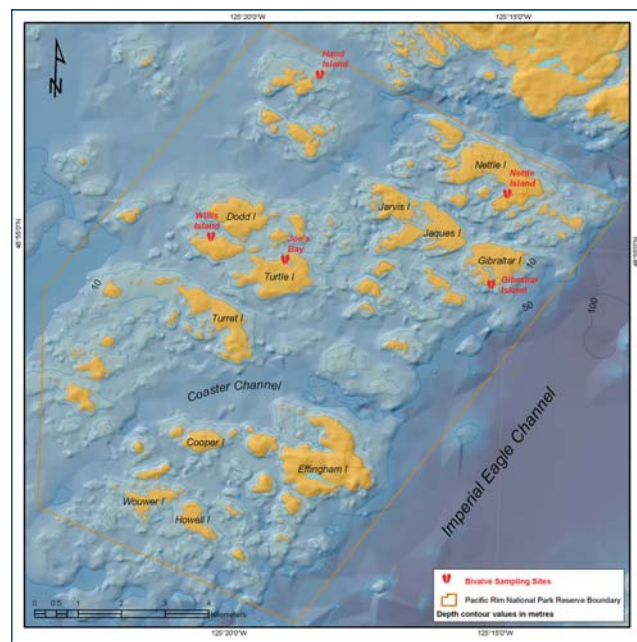
**Trend:** STABLE

Healthy populations of native bivalve molluscs are a key ecological integrity measure of soft-bottom intertidal ecosystems as the size, distribution, and abundance of bivalves are closely linked with local environmental conditions. Oceanographic conditions (El Nino), severe winters and changes in sea-surface temperature have discernable effects on the survival, recruitment success and growth rates in these species. Several bivalve mollusc species have been monitored in Pacific Rim at four sites (Fig. 2.7), contributing data to two ecological integrity measures: Native bivalve molluscs and Invasive bivalve molluscs. The Native bivalve molluscs measure encompasses three species: the butter clam (*Saxidomus giganteus*), littleneck clam (*Protothaca staminea*), and Olympia oyster.

#### Butter clam

The population of mature butter clams did not display a trend. As population estimates during the last five years mostly fall within 1 standard deviation of the mean, this measurement is in the **GREEN** and **STABLE**. A survey conducted in the BGI in 1976 as part of park establishment recorded a mean density of 10.2 ( $\pm 46.0$  SD) butter clams (both mature and immature) per m<sup>2</sup>. The value is similar to that recorded in 1997 – 2007 (9.2  $\pm 11.6$  clams/m<sup>2</sup>), suggesting little change in abundance over the past 30 years.

Fig. 2.7. Bivalve monitoring sites in the Broken Group Islands Unit.



### Littleneck clam

The population of mature littleneck clams did not display a trend. In the past five years, three data points including the most recent lie within 1 standard deviation of the 10-year population mean, giving this species green status. Again, data from 1976 of 13.7 ( $\pm 45.3$  SD) both mature and immature littleneck clams per  $m^2$  are in the same range of values recorded today ( $39.1 \pm 47.2$  clams/ $m^2$ ).

### Olympia oyster

This species showed a steep population decline at the most important of sampled sites - Joe's Bay Two (Fig. 2.8).

Given the steep population decline in the species, and a reduction of 60% in the mean population density over the past five years (1.7 oysters/ $m^2$  in 2002 to 0.7 oysters/ $m^2$  in 2007), this species' status is **RED**. In the past few years, densities have fluctuated between 0 and 1 individuals/ $m^2$  (there is no trend in the 2002 – 2007 data). This suggests that the population may have stabilized

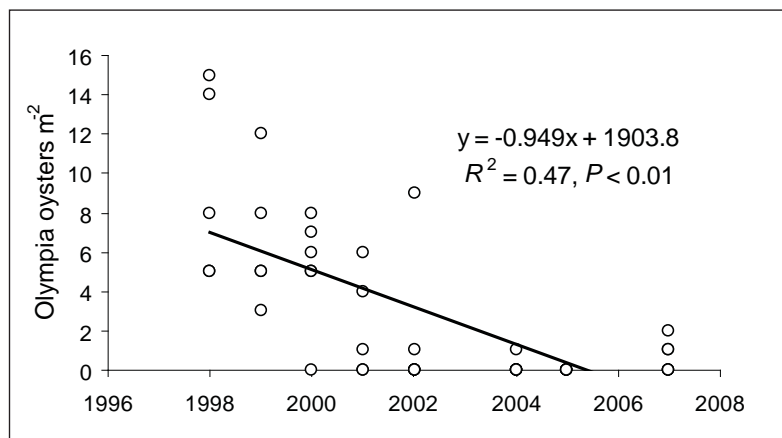
### Native oyster



at this low level giving this species a stable trend. However, the 1976 survey also detected relatively low Olympia oyster densities ( $1.4 \pm 5.2/m^2$ ); thus the red status reflects a degree of caution.

Of the three native bivalves, two have good status and one has poor, resulting in an overall status of **YELLOW** for this measure. The trend is **STABLE**.

Fig. 2.8. Population trend in Olympia oysters at Joe's Bay Two, Broken Group Islands – the only location with detectable densities of the species



## Monitoring Measure

### INVASIVE

### INTERTIDAL BIVALVES



#### Threshold:

<b>green</b> status:	within 1 standard deviation of the established baseline (long-term mean) bivalve density
<b>yellow</b> status:	> 1 but ≤ 2 standard deviations from the established baseline
<b>red</b> status:	> 2 standard deviations from the established baseline

**Status:** YELLOW

**Trend:** IMPROVING

The measure includes three measurements: Manila clam (*Venerupis philippinarum*), varnish clam (*Nuttallia obscuratum*), and Japanese oyster (*Crassostrea gigas*).

#### Manila clam

Manila clams did not display an overall population trend. The most recent data point (2007) falls below the 1 standard deviation threshold giving resulting in a yellow status and stable trend. Compared to 1976, when only  $2.6 \pm 8.4$  manila clams/m<sup>2</sup> were recorded, an order-of-magnitude increase in density has occurred ( $44.5 \pm 52.6$  clams/m<sup>2</sup> today). However, it is not apparent that this increase has had a negative impact on ecological integrity. Although an introduced species, the Manila clam's effect on the ecosystem appears benign. The yellow status reflects uncertainty about its future role in the intertidal environment rather than any decline in ecological integrity.

#### Varnish clam

Few varnish clams were found at the BGI in late 1990s, but the numbers increased dramatically towards the later part of the first decade of the 20th century (Fig. 2.9). The clam is increasing in density across the BGI at a rate of 1 - 10 clams/m<sup>2</sup> per year, or at an average rate of 15% per annum.

The varnish clam is an introduced species (post 1976); even so, it does not appear to have had a

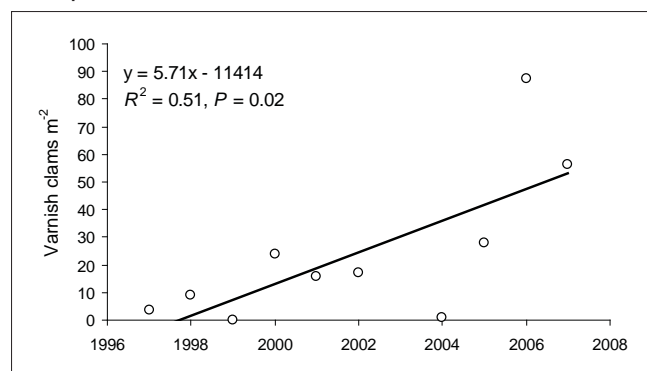
negative effect on the ecological integrity of the ecosystem. Varnish clams are typically found higher in the intertidal zone than native clams, and also provide alternative and important prey for vertebrates, such as seaducks. Owing to an absence of information on its relevance to ecological integrity, the varnish clam is assigned yellow status to flag its presence in the ecosystem in large numbers. However, the population trend is unknown at this time.

#### Japanese oyster

Very few Japanese oysters were present in the park in the mid-1970s ( $\ll 1/\text{m}^2$ ). Presently the species is common (10-year mean density  $29.9 \pm 24.2$  oysters/m<sup>2</sup>) but its abundance is declining at some sites (32 – 38% decline over five years). The assumption that the Japanese oyster sometimes excludes or out-competes native oysters may not apply to all situations. For example, in Pacific Rim both oyster species (the native *Olympia* and the exotic Japanese) are in decline. Also, they appear to use slightly different niches, with the Japanese oyster occurring higher on shore. Given our mandate to conserve biodiversity representative of this ecoregion, caution for exotic clams is warranted. Since this species is still widespread and abundant in the park, its status is assigned as yellow but with an improving trend to reflect declining numbers.

The combined assessment of these three measures resulted in a **YELLOW** status and **IMPROVING** trend for invasive intertidal bivalves.

Fig. 2.9. Population trend in the varnish clam at the Broken Group Islands Unit.



## Monitoring Measure

### EELGRASS HEALTH



#### Threshold:

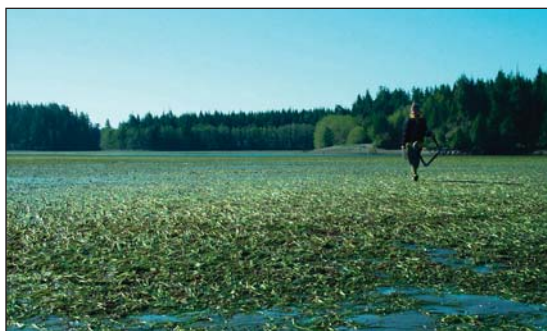
- green** status: at any given year the value falls within the inter quartile range (25th – 75th percentile)
- yellow** status: < or > the inter quartile range (25th – 75th percentile)
- red** status: threshold remains to be established

**Status:** GREEN

**Trend:** UNDETERMINED

Eelgrass meadows straddle the intertidal and subtidal zones down to a maximum depth of 5 to 10 m below the lowest tide line. Being in near-shore waters positions them at the land-sea interface, rendering them particularly vulnerable to the negative effects of human activities. Habitat monitoring does offer early detection of eelgrass degradation before irreparable loss occurs. Eelgrass health is a composite measure comprised of two measurements: *eelgrass biomass* and *epiphyte load*. The former is the actual mass of eelgrass plants per unit area, while the latter represents the amount of algal growth on eelgrass leaves. At Grice Bay, most values of eelgrass biomass and epiphyte load were within the previously observed range. In Barkley Sound, Joe's Bay had low eelgrass biomass, while Turret and Pinkerton Islands had a high epiphyte load. The overall assessment of eelgrass ecological integrity is **GREEN** with a presently **UNDETERMINED** trend.

Eelgrass meadow in Grice Bay.



## Monitoring Measure

### EELGRASS FISH COMMUNITY



#### Threshold:

- green** status: within 1 standard deviation of the established baseline (long-term mean)
- yellow** status: 1 but  $\leq$  2 standard deviations from the established baseline
- red** status: 2 standard deviations from the established baseline

**Status:** YELLOW

**Trend:** UNDETERMINED

This is a composite measure comprised of two measurements: fish community persistence and fish community stability. Persistence is defined as the constancy of fish species in the ecosystem over time. Stability represents their constancy in abundance over time. *Fish community persistence* – The fish communities found in two of the three Grice Bay meadows and one of the three Barkley Sound meadows are persistent. *Fish community stability* – Two of the three Grice Bay meadows (Kootowis and Auseth) and one Barkley Sound meadow (Turret) show lower stability values for 2006-2007 compared to the available range of values. At Auseth Meadow (Grice Bay), 3 of the 8 most common species caught in Grice Bay have decreased greatly in abundance over the time series. No Bay Pipefish were caught in 2006 or 2007 (down from 80 caught in 2001), while Three-spine Sticklebacks have declined from a few hundred to < 10, and Kelp Clingfish have declined from 30-80 to fewer than 20. The reduction in species diversity (18 to 11) at Auseth is due to fewer of the rarer species being caught. The overall status of ecological integrity of the eelgrass fish community is **YELLOW** with the trend presently **UNDETERMINED**.

## Shoreline Ecosystem Indicator

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The shoreline ecosystem fared relatively well as it continues to support healthy populations of breeding shorebirds. An emerging issue in this ecosystem is the establishment of invasive dune grass, which has come to dominate many sand-dune areas in the park. Its impact on native sand-dune plant communities has not yet been assessed but it may be considerable.

### Monitoring Measure

#### BLACK OYSTERCATCHER POPULATION



##### Threshold:

**green** status: < 30% population change over 30 years (3 generations)

**yellow** status: ≥ 30% population decline over 30 years

**red** status: ≥ 50% population decline over 30 years

---

**Status:** GREEN

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**Trend:** STABLE

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Pacific black oystercatcher – quintessential rocky shoreline resident in the Pacific Northwest



Black oystercatchers (*Haematopus bachmani*) are generally good measures of high-quality rocky intertidal habitat in the Northwest Pacific Region of North America and are used as measures of ecological integrity in a number of coastal monitoring programs. While available data do not presently allow for a formal area-wide assessment of their population trend, data collected in the early 2000s at two important nesting sites in the park (Seabird Rocks and Florencia Island),

suggest an increasing and thus presumably healthy population. Qualitative assessment of the oystercatcher distribution in the park also suggests: (1) a near continuous occupation of historically known nesting sites and (2) a gradual expansion and occupation of new nesting sites. If the recent trend observed at Seabird Rocks and Florencia Island is representative of the entire park, then the state of the black oystercatcher population in Pacific Rim is green and the trend is stable.

*monitoring measure*

**GLAUCOUS-WINGED GULL POPULATION**



**Threshold:**

**green** status: < 25% change in the nesting population over 10 years relative to the 600 pair baseline

**yellow** status: 25% - 50% population change over 10 years

**red** status: > 50% population change over 10 years

**Status:** GREEN

**Trend:** STABLE

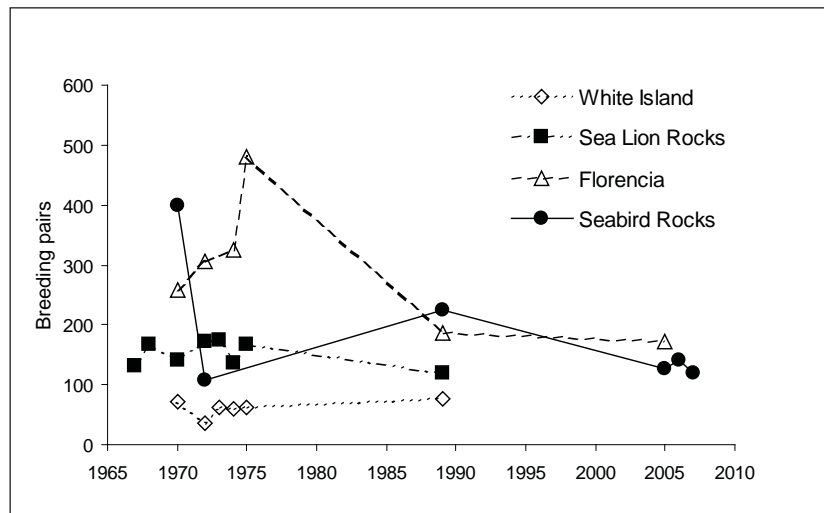
Glaucous-winged gulls with a fledgling



Being strongly dependent on coastal and marine food sources, glaucous-winged gulls (*Larus glaucescens*) may serve as a sentinel of broad-scale changes in the marine environment, such as fish stock collapse or recovery. The very high abundance of these gulls may lead to a competitive displacement of other native shoreline nesting species such as the black oystercatcher. Data available at present allow for a qualitative examination of population trends at four important colonies within park boundaries.

Sharp population reductions occurred in the late 1960s at two of the four colonies (Florenzia Island and Seabird Rocks), probably associated with the concurrent collapse of herring stocks off Canada's west coast (Fig. 2.10). Ongoing observations suggest that: (1) after the mid-1970s the population stabilised at a new level of 600 pairs and, (2) historically known nesting sites continue to be occupied and thus the bird remains a common breeding species in the park. The measure is therefore GREEN and STABLE.

Fig. 2.10. Population trends at four glaucous-winged gull nesting colonies in Pacific Rim National Park Reserve.





monitoring measure

EUROPEAN DUNEGRASS EXTENT



Threshold

<b>green</b> status:	> 95% of known dunegrass extent cleared
<b>yellow</b> status:	95 – 80% of known dunegrass extent cleared
<b>red</b> status:	< 80% of known dunegrass extent cleared
<b>status:</b>	RED
<b>trend:</b>	DECREASING

The invasion of exotic plant species such as European dunegrass (*Ammophila arenaria*) has been recognised as one of the most serious global risks to natural plant communities. Dune systems are particularly susceptible to invasion. First, they typically possess open natural vegetation, which permits the introduction and establishment of invasive species. Second, dune ecosystems are frequently disrupted by windstorms and tidal surges, which both introduce propagules (seeds, root fragments, etc.) of invasive species from other infested sites and open up space for their establishment.

In Pacific Rim, the European dunegrass infestation is most significant along Wickaninnish Beach. Consequences are serious; at the beach’s southernmost end, sensitive dune plant species are actively threatened by habitat loss, while in northern areas (near Combers Beach Trail) the sand stabilized by the dunegrass may be the single most significant factor causing Sandhill Creek to flow parallel to the beach, thereby eroding park infrastructure (Fig. 2.11).

The complete extent of European dunegrass in the park including patches that have been eradicated, have not been mapped. As a result it is not possible at this time to calculate the ratio between eradicated and cumulative dunegrass extents. However, it is clear that: (1) over the past 35 years, dunegrass has proliferated extensively (for example at Combers Beach, from 0.88 ha in 1969 to 5.69 ha in 2005), and (2) the majority of dunegrass patches remain intact. The measure is therefore red, while the trend is decreasing because the park’s dunegrass area is likely still on the increase, and is thus undermining ecological integrity despite the initiation of eradication efforts.

Fig. 2.11. Gradual occupation of the Combers Beach spit by European dunegrass.



## Stream Ecosystem Indicator

Historically, streams suffered due to area logging. Some of these impacts have naturally healed as areas logged in the mid-1900s became reforested. In other cases, active stream restoration projects carried out both in the park and its immediate vicinity have had consequent positive effects on stream connectivity. Even so, human activity originating outside park boundaries is responsible for chemical pollution within a number of streams flowing throughout the park. While attempts to rectify the issue have been made and continue to be made via co-operative efforts with local land managers, chemical pollution remains a problem in some streams. Ecological integrity also continues to suffer owing to low salmon stocks as a result of earlier impacts on the stream and subtidal ecosystems.

### monitoring measure

### FRESH WATER QUALITY



#### Threshold:

The thresholds are tentative and in the future will be aligned with the Environment Canada Water Quality Indexing system

**green** status: < 1% exceedances<sup>10</sup>

**yellow** status: 1 – 5% exceedances

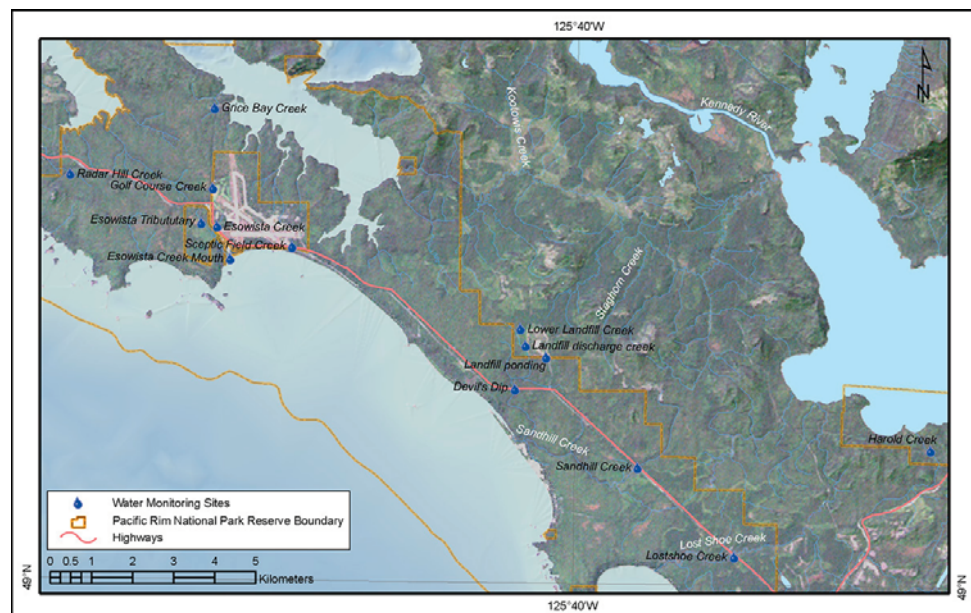
**red** status: > 5% exceedances

**status:** YELLOW

**trend:** STABLE

Freshwater streams are the arteries of temperate rainforest ecosystems and conduits for the nutrient and energy exchange between the ocean and terrestrial environments. As such they reflect much of the human-caused chemical impact in and around these rainforest ecosystems in which Pacific Rim's LBU is situated. This report includes water quality information for 16 creeks sampled twice a year in 2002 – 2007 (Fig. 2.12).

Fig. 2.12. Distribution of sites sampled for water quality in the Long Beach Unit of Pacific Rim National Park Reserve.



<sup>10</sup> An exceedance refers to an event when the value of a water quality parameter, such as pollutant concentration, exceeds the prescribed threshold. For each freshwater quality measurement (contaminant), exceedance values were obtained from *A Compendium of Working Water Quality Guidelines for British Columbia or The Canadian Environmental Quality Guidelines* as appropriate; exact thresholds see: <http://www.env.gov.bc.ca/wat/wq/BCguidelines/working.html> and [http://www.ccme.ca/publications/ceqg\\_rcqe.html](http://www.ccme.ca/publications/ceqg_rcqe.html)

### Nutrients (Ammonia, Nitrate and Nitrite)

Three sites with telling names - Landfill Discharge, Septic Field Creek and Lower Landfill Creek – had a high proportion of samples that exceeded safe levels of nutrient concentrations: 72%, 25% and 14% respectively. At the most organically polluted site, Landfill Discharge, mean readings for ammonia (6.32 mg/L) and nitrate (0.99 mg/L) were 4 and 3 times above their respective Federal Freshwater Aquatic Life Standards. Nitrate readings above 0.3 mg/L are considered to be human-caused and therefore deleterious to natural ecosystems.

### Metals (Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Molybdenum, Nickel, Selenium, Silver, Sodium, Thallium, Titanium, Vanadium, Zinc)

The highest level of metal contamination was recorded at three sites heavily used by humans: Landfill Discharge, Landfill Ponding, and Sewage Lagoon, where 17%, 16%, and 5% of all readings exceeded their respective water-quality thresholds. None of the sites was completely free of metal pollution. For example, at the Landfill Discharge, Landfill Ponding, and Sewage Lagoon sites, the concentration of cadmium, a well-known carcinogen, exceeded the Federal Freshwater Aquatic Life Standard by 21, 6 and 18 times, respectively.

### Physical conditions (Hardness - concentration of CaCO<sub>3</sub>, dissolved oxygen (ppm), conductivity)

Water hardness did not exceed safe limits in 10 out of 16 streams, resulting in their good physical condition. At two sites, however, Landfill Ponding and Landfill Discharge, water hardness exceeded safe limits in 12% and 29% of samples respectively.

Overall, water quality was outside of safe water quality limits in 5% of samples across all three water quality categories, with two sites far exceeding the mean. A few sites were close to pristine condition with safe limits only exceeded by one or two metal readings above the standard.

The mouth of Lost Shoe Creek – a cleaner water source in the Long Beach Unit



Water quality status is therefore **YELLOW**. It is worth noting that several water sources within the park boundary have low water quality in all three categories (nutrients, metals and physical properties) and no creeks completely satisfy water quality requirements for freshwater aquatic life. The trend for this measure is **STABLE**.

## monitoring measure

### SALMONID FISH POPULATIONS



#### Threshold:

Only a tentative threshold can be provided at present

**green** status: in any given year the population is within 30% of long-term average

**yellow** status: the population is > 30% below the long-term average

**red** status: the population is > 50% below the long-term average

---

**Status:** RED

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**Trend:** DECLINING

---

Of the six indigenous Pacific salmon living in the waters of Pacific Rim, Coho (*Oncorhynchus kisutch*) and sockeye (*O. nerka*) are the more abundant species. Salmon act as a key ecological process vector, transporting energy and nutrients between the ocean, estuaries, and freshwater environments with a significant contribution of nitrogen to coastal forest communities. Pacific Rim does not currently monitor salmon, although plans are underway to implement in situ salmon monitoring in the future. According to the DFO's State of the Pacific Ocean Report, in both 2005 and 2006 Barkley Sound sockeye salmon returns remained well below the long-term (from 1975) average due to poor conditions in 2003 and 2004.

#### Salmon run in the Pacific Northwest



In the spring of 2005, sea-surface temperature anomalies were unfavourable for salmon survival. Consequently, the 2007 return of adult sockeye to Barkley Sound and other stocks associated with Vancouver Island's west coast was expected to remain below average. Given the description provided in the annual State of the Pacific Ocean Report, the ecological integrity status of the measure is defined as **RED** because in 2005 – 2006 the Barkley Sound stock was estimated at 300,000 fish, which is > 50% below the long-term average of 800,000 fish. Data suggest a **DECLINING** population for the 5 years following 2001.

*monitoring measure*

**RIPARIAN  
OLD-GROWTH FOREST EXTENT** 

**Threshold:**

Only a tentative threshold can be provided at present.

**green** status: A constant or increased amount of riparian (streamside) old-growth forest

**yellow** status: A net decrease of 1% - 5% in the area over a 5-year period

**red** status: A net decrease of > 5% in the area over a 5-year period

**Status:** GREEN

**Trend:** STABLE

Wildlife use the riparian forests for food, water, cover, nesting sites, and as travel corridors. The importance of a particular riparian area to various wildlife will depend on the size of the riparian area, adjoining land uses, riparian vegetation, and features inside the riparian area (woody debris, wetlands). Just as riparian forests are important to land animals, they are important to the aquatic community. Riparian forests contribute large woody debris to streams, thereby playing a particularly important ecological role by creating favourable spawning conditions for salmon. The extent of riparian old-growth forest in the park has changed only negligibly over the past 15 years. In 1990, 5,704 ha of land belonged to this class, the extent was 5,668 ha (0.6% loss) in 2000 and 5,721 ha (0.3% gain) in 2005. Thus, the extent

Riparian forest at Cheewhat Creek, West Coast Trail Unit of Pacific Rim National Park Reserve



has not changed relative to the baseline year and the measure is **GREEN** with a consequently **STABLE** trend. An important caveat and limitation of this analysis is that the baseline (1990) is relatively recent in historic terms. Approximately 26% of Pacific Rim’s current territory was clear-cut prior to park establishment in 1970, much of it in the riparian zone where larger trees and easier access offered the highest returns per unit investment. Without precise information regarding the amount of old-growth forest that existed prior to the park’s establishment, it is difficult to define a pre-logging condition baseline for this measure. Still the analysis does demonstrate that the amount of riparian forest during the most recent park history has remained stable.

monitoring measure

RIPARIAN LANDSCAPE DIVERSITY



Threshold:

- green** status: A constant level of landscape diversity
- yellow** status: A net change of 1% - 5% over a 5-year period
- red** status: A net change of > 5% in landscape diversity over a 5-year period

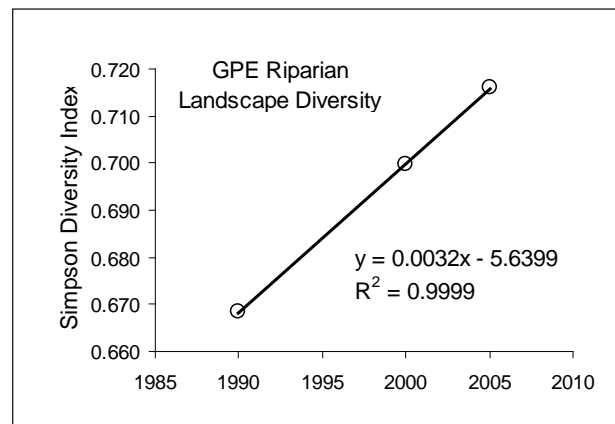
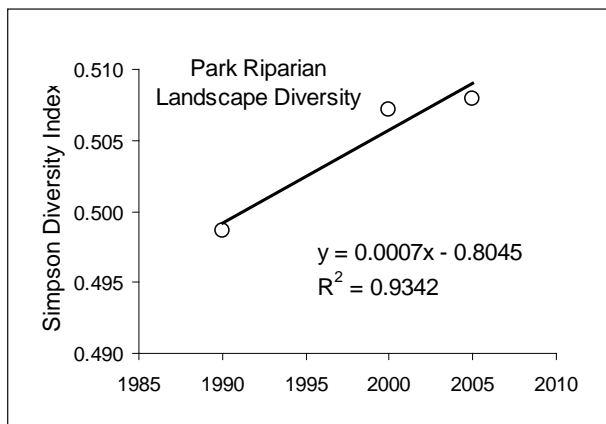
**Status:** YELLOW

**Trend:** STABLE

The diversity of habitats in the riparian zone is a companion measure for the extent of riparian old-growth forest. A typical coastal old-growth landscape in the Pacific Northwest Region will have a low diversity of habitat classes with old-growth forest as the dominant class. Both an increased and decreased diversity of landcover classes in the riparian zone may be indicative of degradation (e.g. due to climate-related change in vegetation). The Riparian landscape diversity measure is used as a sentinel of change in the vegetation and landcover patterns of Pacific Rim’s riparian zones. In the park, the value of

landscape diversity (expressed as the Simpson Diversity Index (SIDI)) increased by 1.7% in 2000 and by 1.9% in 2005 relative to the SIDI value of 0.499 recorded in 1990 (Fig. 2.13). The change was primarily due to a reduction in the extent of the Old evergreen forest (>75% canopy cover) landcover type, and to increases in extents of the Deciduous forest (25-60% canopy cover) and Deciduous, young regenerating forest landcover types within the riparian zone. The ~2% increase in the diversity index between 1990 and 2000 but little change since has resulted in a YELLOW status and STABLE trend.

Fig. 2.13. Temporal change in the Simpson Diversity Index value for Pacific Rim National Park Reserve and Greater Park Ecosystem riparian zones.



## Forest Ecosystem Indicator

The extent and condition of Pacific Rim's forests remains good as assessed from remotely sensed data. Amounts of suitable habitat of several species of wildlife (Marbled Murrelet, Black Bear, Wolf, Cougar, River Otter) remain stable for the most part or have even shown an increase. Invasive plants are an emerging issue in the system, although their present distribution is mostly restricted to old (pre-park) homestead sites and roads. Eradication programs are actively addressing this latter issue.

### monitoring measure

#### EXTENT OF OLD-GROWTH FOREST



##### Threshold:

- |                       |  |
|-----------------------|--|
| <b>green</b> status:  | A constant or increased amount of old-growth forest            |
| <b>yellow</b> status: | A net loss of 1% - 5% of old-growth cover over a 5-year period |
| <b>red</b> status:    | A net loss of > 5% over a 5-year period                        |

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**Status:** GREEN

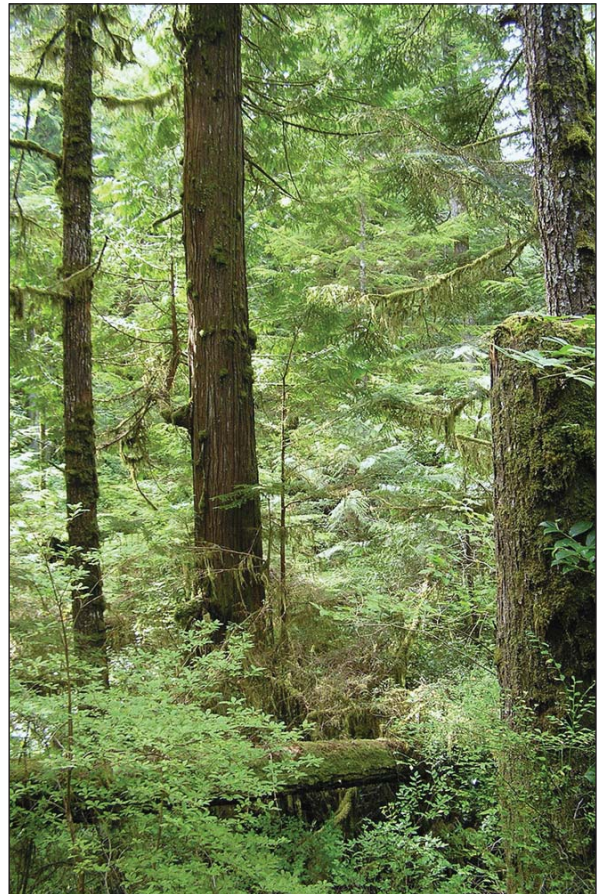
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**Trend:** STABLE

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Historically, the landscape of Pacific Rim and the Greater Park Ecosystem was dominated by old-growth temperate rain forest permeated by small, disturbed patches. Commercial logging in the 1950s extensively reduced the old-growth cover. In Pacific Northwest forested landscapes, most forest species of wildlife are found in old-growth forests (> 250 years old). Thus, the loss of old-growth forest results in an equal loss of bioregion-specific and endemic biodiversity. The extent of two landcover classes is of primary interest: the old-growth forest, which should not decrease in the park, and the human footprint, which should not increase. Old-growth forest occupied 86.6%, 86.4% and 87.1% of Pacific Rim's

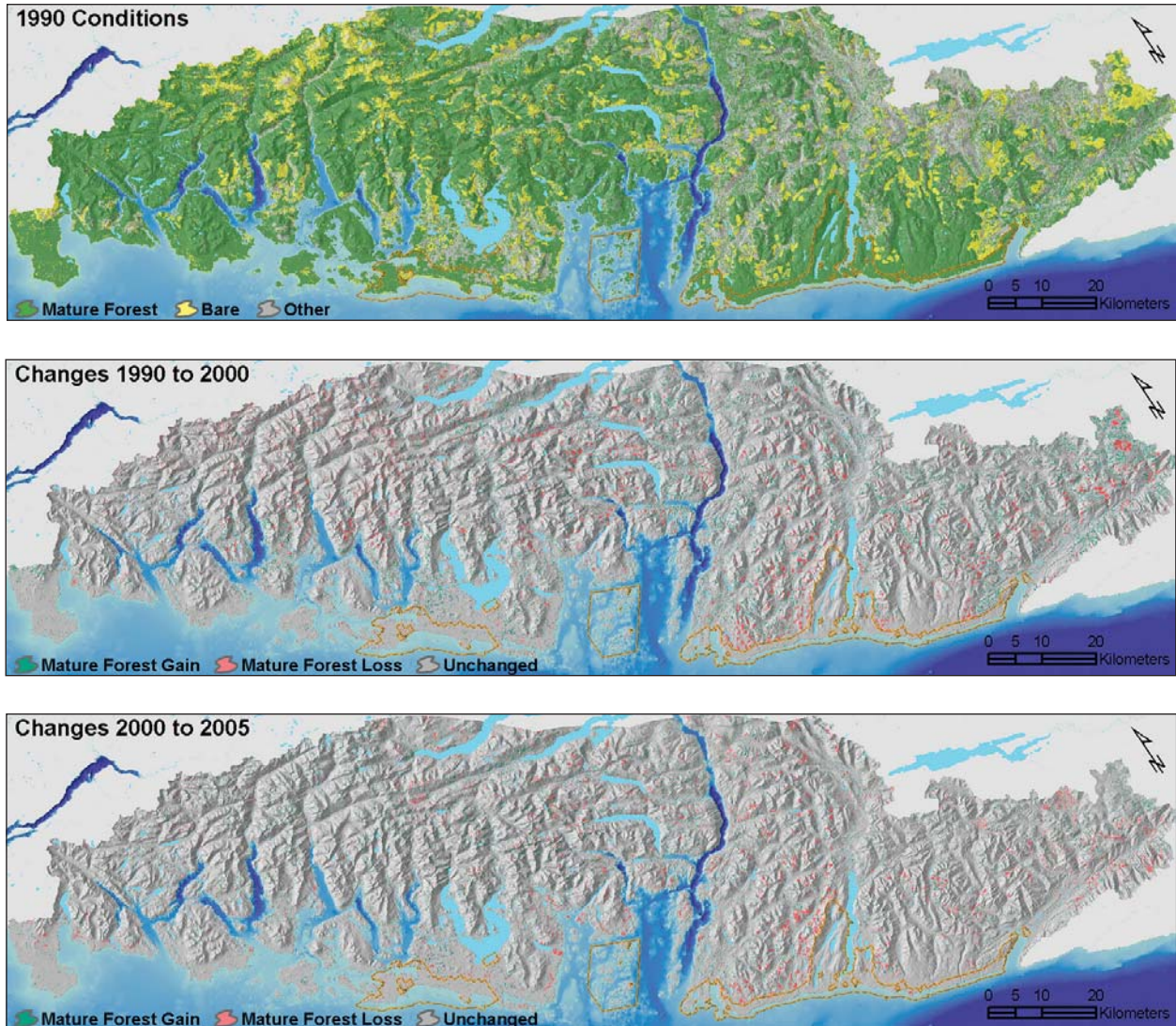
Modern day old-growth forest in the Long Beach Unit of Pacific Rim National Park Reserve



terrestrial landscape in 1990, 2000 and 2005 respectively. Thus, the extent of old-growth forest in the park has remained stable over the past 15 years and has not changed relative to the baseline year of 1990, resulting in its green status and stable trend. However, the same caveat applies to this measure as that mentioned in the Riparian old-growth forest extent, namely that the baseline does not capture any pre-park logging in the area, but represents the situation "as is" after park establishment. It is worth noting that in the Greater Park Ecosystem, the old-growth forest occupied 64.5%, 62.8% and 60.2% of the terrestrial landscape in 1990, 2000 and 2005 respectively.

Relative to the 1990 baseline this equals decreases of 2.7% and 6.7% for 2000 and 2005, therefore the amount of forest classified as old-growth has been steadily decreasing outside of the park (Fig. 2.14).

Fig. 2.14. Temporal changes in the extent of old-growth forest in Pacific Rim National Park Reserve and the Greater Park Ecosystem.





## monitoring measure

### ANTHROPOGENIC FOOTPRINT EXTENT



#### Threshold:

**green** status: A constant or decreased anthropogenic footprint indicates

**yellow** status: An increase of 1 - 5% over a 5-year period

**red** status: An increase > 5%, over a 5-year period

---

**Status:** GREEN

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**Trend:** STABLE

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According to satellite-derived data, the human footprint occupied only 1.2%, 1.2% and 0.5% of Pacific Rim's terrestrial landscape in 1990, 2000 and 2005 respectively. Given the methodology used, differences of less than 1% are not observable; the value probably remained unchanged across the observation period. Based on the lack of change in the footprint area relative to the area of the park between 1990 and 2000, the status of the measure is **GREEN** and the trend is **STABLE**.

Vicinity of the current boundary of Pacific Rim National Park Reserve impacted by early logging practices



The measure should work better for the Greater Park Ecosystem, where large features such as clear-cuts and housing developments (detectable via satellite imagery) would be present. Unexpectedly, the footprint area in the Great Park Ecosystem remained stable between 1990 (13%) and 2000 (12.7%) and it decreased slightly in 2005 (9.4%). In absolute terms, the 2005 footprint decreased by 27.8% relative to 1990, i.e. from 95,994 ha to 69,325 ha. The decrease was almost exclusively due to replacement of clear-cuts with deciduous forest.

*monitoring measure*

**HABITAT FRAGMENTATION**



**Threshold:**

**green** status: when the value of Pacific Rim's fragmentation index falls within the bottom range of values defined by 1 standard deviation of the mean (i.e. minimum value + 1 SD) for the Greater Park Ecosystem in the baseline year

**yellow** status: range of values between 1 and 2 standard deviations

**red** status: when the range of values is more than 2 (> 2) standard deviations

**Status:** GREEN

**Trend:** STABLE

The Northwestern salamander



Logging, its associated road construction and the building of other infrastructure in the Pacific Northwest has markedly reduced and fragmented the total amount of old growth forest, including that of Vancouver Island's west coast. To characterize the magnitude of fragmentation in Pacific Rim, the focus was placed on those ecological groups most likely to be impacted by old-growth fragmentation: old-growth lichens, mosses, invertebrates, and amphibians, which are all species with poor dispersal ability and small-to-medium habitat patch size requirements.

It appears that for the needs and sustainability of these species, some areas were highly fragmented. Such fragmentation, however, was associated only with areas of recent logging, and around the towns and places of human settlement outside Pacific Rim. The park itself is little affected by fragmentation at this scale. The combined fragmentation scores for the park across the three time frames showed no detectible trend in habitat fragmentation (Table 2.3) denoting its GREEN status and STABLE trend.

Table 2.3. Combined fragmentation status scores for two ecological groups of organisms. Values 0 – 33 indicate high fragmentation (red), 34 – 66 suggest moderate fragmentation (yellow) and > 66 low fragmentations (green).

Profile	1990	2000	2001
A. (invertebrates, amphibians)	99.0	99.0 (0%)	99.0 (0%) ↔
B. (lichens, mosses)	99.0	99.0 (0%)	99.0 (0%) ↔

*monitoring measure*

**EXTENT OF SUITABLE  
MARBLED MURRELET  
NESTING HABITAT**



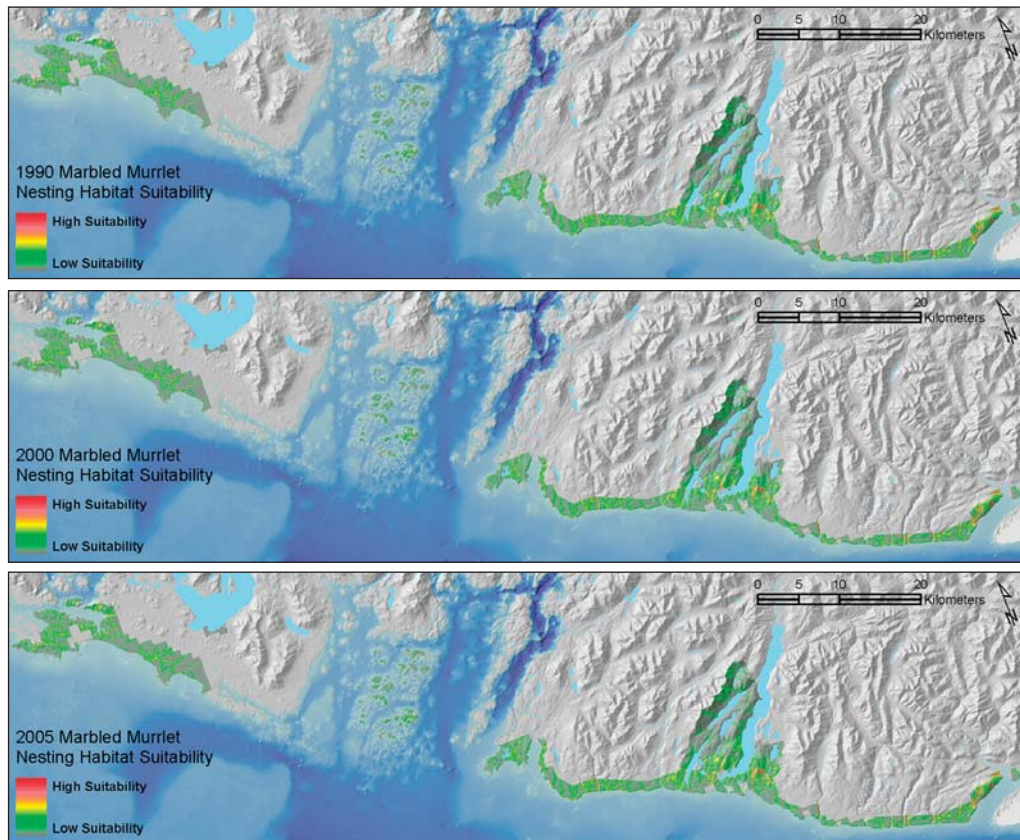
**Threshold:**

<b>green</b> status:	A constant or increased amount of marbled murrelet habitat
<b>yellow</b> status:	A net loss of 1 - 5% of suitable habitat over a 5-year period
<b>red</b> status:	A net loss of > 5% of suitable habitat over a 5-year period
<b>Status:</b>	<b>GREEN</b>
<b>Trend:</b>	<b>STABLE</b>

The marbled murrelet is a unique seabird in that, unlike most other seabirds nesting on cliffs or in burrows, it nests predominantly on thick mossy branches of old trees in the coastal coniferous forests of the Pacific Northwest Region. Previous research has shown that these birds are strictly associated with structurally complex old-growth forest. In Pacific Rim, suitable nesting habitat for marbled murrelets is mostly found within the WCT unit (Fig. 2.15).

The total estimated amount of suitable nesting habitat in the park was 4,290 ha in 1990, 4,270 in 2000 and 4,260 in 2005. As the difference between 1990 and 2005 is -1%, it is unlikely to signify a trend. Likewise in the past five years (2000 – 2005) the change in the amount of suitable habitat has been negligible. Thus the status of the measure is green and the trend is stable.

Fig. 2.15.  
Distribution of  
marbled murrelet  
nesting habitat in  
Pacific Rim National  
Park Reserve



*monitoring measure*

**EXTENT OF SUITABLE  
CARNIVORE HABITAT**



**Threshold:**

<b>green</b> status:	A constant or increased amount of carnivore habitat over a 5-year period
<b>yellow</b> status:	Net losses of 1 - 5% of suitable habitat over a 5-year period
<b>red</b> status:	A net loss of > 5% of suitable habitat over a 5-year period

<b>Status:</b>	<b>GREEN</b>
<b>Trend:</b>	<b>STABLE</b>

Carnivore species have broad habitat associations and opportunistically explore most landcover types within their range seeking food. This measure includes habitat suitability estimates (derived from habitat modelling) for four species of medium-to-large mammals within Pacific Rim: the river otter (*Lontra canadensis pacifica*), grey wolf (*Canis lupis crassodon*), cougar (*Felis concolor vancouverensis*), and black bear (*Ursus americanus vancouveri*). The river otter’s total estimated habitat area increased relative to the baseline but has remained stable over the past 5 years. For wolves, a slight loss of suitable habitat has been detected. Cougars had a negligible increase in the amount of their habitat over the past 5 years and essentially no trend in the past 15 years. Finally, black bear habitat (Table 2.4) has expanded considerably in the past 15 years.

Table. 2.4. Estimates of suitable habitat area (hectares) in Pacific Rim National Park Reserve for four species of carnivorous mammals. Percentage values reflect change relative to the baseline year of 1990. Sample size and year in parentheses indicate the size of the model training data set and the landcover classification on which the model was built.

Species	1990	2000	2005
River otter (n = 106, 2005) <sup>11</sup>	5,920	6,390 (+8%)	6,390 (+8%) ↔
Gray wolf (n = 81, 2005)	4,370	4,370 (0%)	4,280 (-2%) ↓
Cougar (n = 112, 2005)	3,680	3,760 (+2%)	3,800 (+3%) ↔
Black bear (n = 117, 2005)	5,780	6,370 (+10%)	6,450 (+12%) ↑

<sup>11</sup> Sample size and year in parentheses indicate the size of the model training data set and the landcover classification on which the habitat model was built.

## monitoring measure

### INVASIVE FOREST PLANT EXTENT



#### Threshold:

**green** status: > 95% of known invasive plant distribution (number of sites) or extent cleared

**yellow** status: 95 – 80% of known invasive plant distribution or extent cleared

**red** status: < 80% of extent cleared

**Status:** RED

**Trend:** DECREASING

English ivy (*Hedera helix*) and Scotch broom (*Cytisus scoparius*) are the two species assessed in this section.

#### English Ivy

Most of Pacific Rim's English ivy sites today originate from ivy deliberately planted by settlers or residents in their gardens prior to park establishment in 1970. While the complete extent of ivy in the park as well as eradicated patches still remain to be mapped, two things are clear: (1) the plant has been present in the area for several decades and (2) although up to 50% of known patches have been eradicated, the plant has considerable potential to expand its area of distribution. Given that more ivy sites will likely be added to the total cumulative area, this measure has a **RED** status and a **DECREASING** trend.

#### Scotch broom

In Pacific Rim this large shrub is found along the seashore fringe, road edges, trail edges and in former logging or house clearings. While the park has begun the process of eradicating this species, as with the other two invasive plants, European dunegrass and English ivy, mapping of infested and cleared areas requires completion before a final assessment of the measure's ecological integrity status and trend can occur. At present this measure has a **RED** status and a **DECREASING** trend.

### iii. Key issues and planning considerations

The overall state of ecological integrity at and the suite of issues faced by Pacific Rim National Park Reserve are not unlike those of other coastal national parks in British Columbia (Gwaii Haanas, Gulf Islands). In terms of ecological integrity, the park features a relatively robust and stable forest ecosystem; a good but tending towards fair (less robust) shoreline ecosystem, a fair intertidal and stream ecosystems, and poor subtidal ecosystem. The long narrow configuration of the park creates a challenge to manage ecological integrity as a self-contained unit. Many activities outside the marine and terrestrial boundaries of the park have a significant impact on park ecosystems and biota. For example most polluted streams flowing through the park are impacted by facilities (the landfill and the septic field) immediately outside of park boundaries. Still other ecological integrity issues were inherited by Pacific Rim along with the landbase. Invasive plants, currently flourishing in sand-dunes and at old homestead sites, pre-exist park establishment; today they undermine the park's ecological integrity. In other cases, some park streams were degraded by logging in the mid-1900s, compromising their connectivity and reducing the extent of salmon-spawning habitat. These issues are relatively small-scale, local in nature and amenable to restoration measures.

What is taking place in the subtidal ecosystem may be a different story altogether. Its red and deteriorating status highlights a system strongly influenced by factors operating on local (sports fishery), regional (salmon harvest, upwelling) and global (El Nino, climate change) scales. While the park can regulate some of the local impacts (e.g., fisheries) many changes effected by global trends such as climate change creates a significant challenge to restoring the subtidal ecosystem of Pacific Rim. Ongoing monitoring will help to increase understanding and awareness of the extent of the impacts that may help effect

social change and inform decisions related to the management of the marine portion of the park.

Climate change is an emerging issue that may affect all six of the park’s key ecosystems, although to differing degrees. The marine environment is being hit hardest; negative trends (declines in fish stocks, proliferation of invasive bivalves) are directly attributable to warmer oceanic water conditions.

A separate issue – not with ecological integrity proper but more in terms of reporting on the State of the Park – is a lack of relevant information in some cases. For example, the assessment of the status of the forest and stream ecosystems is biased towards landscape-level measures, which are 1) limited in their time horizon (the year 1990 was the baseline) and 2) may not fully represent all the key biological processes occurring in these ecosystems. This imbalance is being tackled through establishment of a comprehensive ecological integrity monitoring and reporting program, which in future will track the status and trend of ecological integrity in our ecosystems on several levels of biological organization (e.g. population – community – landscape). This may lead to reassessments of ecological integrity for these indicators.

## 2.3 Cultural Resources

### i. Overview

The primary goal of the heritage/cultural resource management program at Pacific Rim is the protection and long-term stewardship

of cultural sites, objects and archaeological resources. Achieving this aim involves monitoring (Table 2.5) and protecting them where possible in their original contexts, in addition to documenting and applying traditional Nuu-chah-nulth knowledge to Pacific Rim’s management.

Cultural site types found in Pacific Rim vary from pre-European contact Nuu-chah-nulth habitation- and spiritual-use locations to an array of non-aboriginal post-contact sites.

Comprehensive inventories of archaeological sites (Haggerty & Inglis 1985; Fedje et al. 2001) and the Archaeological Resource Description and Analysis report (Environment Canada 1993) inform park management. Furthermore, up-to-date site inventory records for each location are securely stored both at the park and at the Western & Northern Service Centre (Victoria). These records include site management data, plan drawings, photographs, and ethnographic and historic information, and are updated as new condition assessments are completed.





### ii. Resource Condition

#### LANDSCAPES AND LANDSCAPE FEATURES

**Status:** UNDETERMINED

“Landscape-scale” refers to clearly defined or recurring cultural, geographic or ecological patterns or units that represent cultural or traditional uses in watersheds, basins, bays, or animal home-ranges.

Table 2.5. Status of cultural resources at Pacific Rim National Park Reserve.

INDICATOR	MEASURE	STATUS	FUTURE MEASURES
Resource Condition	LANDSCAPE AND LANDSCAPE FEATURES	not rated 	to be determined
	BUILDINGS AND STRUCTURES	not rated 	
	ARCHAEOLOGICAL SITES	fair 	
	OBJECTS (OWNED BY PC)	fair 	

In the absence of a Cultural Resources Values Statement, there has not been an assessment of landscapes and landscape features. However, a number of sites of great cultural-heritage potential including the West Coast Trail (WCT), and landscapes pertaining to several First Nations' traditional territories have been identified.

## BUILDINGS AND STRUCTURES ◆

**Status:** UNDETERMINED

Historic buildings and structures within the National Park have been inventoried and recorded in Pacific Rim's Cultural Sites database, several were evaluated under the Federal Heritage Building Review Office (FHBRO) guidelines but were determined not to be of heritage value. Currently, there are no heritage buildings for which Pacific Rim is directly responsible. In future, responsibility for FHBRO-designated structures at two Canadian Coast Guard (CCG) light stations (Pachena Light and Carmannah Light) located on land leased from Parks Canada by the Department of Fisheries and Oceans Canada may eventually be transferred to Parks Canada.

Fur seal bone



Photo: Jennifer Yakimishyn

## ARCHAEOLOGICAL SITES ▼

**Status:** YELLOW

The 380 archaeological sites identified in Pacific Rim fall into two categories: First Nations sites and Non-First Nations sites. Different site types are identified within each category (Table 2.6). First Nations' sites range from former habitation locations (villages), food-resource harvesting sites (shell middens, fish traps), to spiritual places (burials, rock art). Non-First Nations heritage sites include European-Canadian homesteads,

Table 2.6. Summary of cultural sites (and site types/traditional use features) in Pacific Rim National Park Reserve.

(Note\* A single site may possess several features)

PACIFIC RIM CULTURAL SITE INVENTORY		BGI	LBU	WCT	TOTALS
FN Sites (*20 site locations contain both First Nations and Euro-Canadian features)		136	56	78	270
Euro-Canadian Sites only		14	101	32	147
<b>TOTAL</b>		<b>165</b>	<b>157</b>	<b>113</b>	<b>435</b>
First Nations Site Types	Burials	25	3	4	32
	Canoe Skids	25	4	2	31
	Culturally Modified Trees	24	16	33	73
	Fish Traps	43	2	8	53
	Shell Middens	58	30	25	113
	Village Middens	19	6	10	35
	Rock Art (Pictograph, Petroglyph)	0	1	6	7
European Site Types	Homesteads	8	43	4	55
	Linesman Cabins (Life Saving Trail)	0	0	8	8
	Military (Early DND sites)	0	13	0	13
	Shipwrecks	0	13	18	31

Department of National Defense (DND) Cold War military installations, late 19th/early 20th century shipwrecks, and features associated with the former Life Saving Telegraph trail (today's WCT). Of the total, 74% are considered to have a good status. However, many of the cultural sites (~75% of all known sites in the park) have not been re-assessed in over a decade, & 35% have not been re-assessed in over 20 years.

Complete evaluations of each mapped site's heritage value is included in the site files. Every year, a targeted site-condition assessment-monitoring program is implemented that is proportional to the available program resourcing. Targeted sites are those facing high levels of threat through either natural or human caused disturbance. Regardless of the continued attention given to the high priority sites, monitoring of the balance of the sites is falling behind schedule.

An archaeological inventory of Pacific Rim's modern shoreline is complete and files are updated as information is available. First Nations cultural sites were initially inventoried in the early 1980s. The inventory focused on areas of high potential for habitation: midden, fish trap, and canoe-run sites. Gaps exist in our inventories because at the time, less attention was given to the recognition and documentation of traditional Nuu-chah-nulth landscape use (e.g. inland spiritual sites, forest resource utilisation, and culturally modified trees). Nor was much focus placed on the survey and examination of landscapes (including elevated landforms and intertidal areas) dating to the early Holocene period. Euro-Canadian sites were inventoried in 1989. Additional mapping and evaluative studies are necessary at ~20 Euro-Canadian sites in the LBU that have yet to be authenticated. Finally, shipwrecks documented along the WCT by the Parks Canada Marine Archaeology Unit (Ottawa) in 1988 have not been monitored since that time; thus their present condition is unknown.

A coastal shoreline erosion-monitoring project will begin at threatened cultural sites in 2008. It will include the detailed recording of eroding midden embankments followed by installment of shoreline erosion monitoring stations. This work will determine the rate of annual shoreline and coastal cultural site erosion and will be reported on in the next SoPR

## OBJECTS ▼

**Status:** YELLOW

Pacific Rim's artefact collections include:

- historic objects (From the post European contact era)
- archaeological objects : (Objects originating in pre-European contact era, that have been excavated from an identified archaeological site.)

These are stored at Pacific Rim and at the Western & Northern Service Centres (Victoria, Calgary and Winnipeg).

## HISTORIC OBJECTS

**Status:** YELLOW

The historic objects collections at Pacific Rim consist of over 400 items (406 listings, ~420 individual objects). The status of the majority (75%) of these objects is fair-to-good. Only a few objects are in poor condition (< 10). A number of artefacts have yet to be assessed.

About 50% of this collection pertains to Nuu-chah-nulth First Nations culture. Items include a full-scale ocean-going canoe, cedar paddles, woven cedar mats and baskets, sealskin whaling floats, and yew-wood spears.

The collection's remaining artefacts pertain to maritime history (particularly that of the WCT) and to early European settlements in the region. These are primarily items donated to Pacific Rim by local historians and residents (e.g. R.



Bruce Scott Archives collection consisting of taped interviews with lighthouse keepers, and pioneers in Clo-oose; and the Richard Wells collection consisting of original artwork depicting shipwrecks along the WCT and historical information about each vessel).

Other objects were acquired during the process of park establishment, such as items from the purchase of Abbott’s Store, a small convenience store that catered to the early 1960’s tourist market at Long Beach. These include tourist baskets with the words “Long Beach” woven into the side, beaded necklaces, and small-scale carved totem pole replicas. Still other items have come from Parks Canada staff, such as glass telegraph wire insulators dating from the WCT’s era as a lifesaving trail.

The status of these historic objects should be re-evaluated when the inventory is updated.

**ARCHAEOLOGICAL OBJECTS**

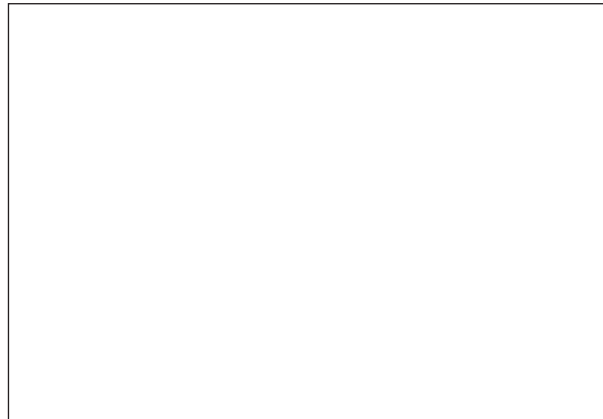
**Status:** GREEN

Pacific Rim’s archaeological objects collection includes ~18,000 items (Table 2.7). These objects (remnants of vertebrate fauna, marine invertebrates, sediment samples & artefacts) are collected in partnership with the local

Table 2.7. Summary of archaeological object collections at Pacific Rim National Park Reserve.

ARCHAEOLOGICAL OBJECT TYPES	NO. OF ITEMS
FAUNAL TOTAL: the sum of all faunal material (vertebrate bone, teeth, marine shell, etc) excluding worked bone.	13,546
OTHER: includes all remaining material types: lithic, glass, inorganic, organic, metal, ceramic, composite, and worked bone.	876
TOTAL (Catalogued Material)	14,422
Uncatalogued Material (estimate)	~3,600

Photo - Midden



First Nations in whose traditional territory the archaeological site is located. In cases where First Nations have requested objects, arrangements have been made to develop long-term loan agreements. For example, ~10 artefacts from the 1999-2001 Benson Island archaeological project are currently on loan to the Alberni Valley Museum for a display prepared by a Tseshaht anthropologist. This agreement will eventually be transferred to the Tseshaht First Nation so that these loaned objects and other materials may be put on display at the new Tseshaht band office in Port Alberni.

Of the archaeological objects, 85% have a good status, catalogued, and stored according to the current standards at various locations within stable facilities (Winnipeg SC, Calgary Reference Collection, Victoria Archaeology Laboratory). The remaining 15% of the collection is in fair condition, and is comprised of uncatalogued material residing at the Calgary Service Centre. This collection consists primarily of midden samples (bone and shell assemblage) representing approximately 3,600 artefacts. According to the direction given by National Office on cultural resources, until the work identifying the faunal remains is completed, the highest ranking that may be attributed to these items is “FAIR”. Although uncatalogued, this material is **STABLE**

and stored in proper conditions, but will require attention in the near future to meet the standard requirements noted above.

### **iii. Key Issues and Planning Considerations**

The ongoing assessment of the state of cultural resources and the protection of these resources continues to be a challenge. Further work is required to develop a cultural resource values statement that would include an assessment of landscape features and buildings and structures. The potential future transfer of the Pacheena and Carmanah Lighthouse stations to Parks Canada would require significant resources to manage these historic buildings and structures over the long term.

Many cultural sites are located in close proximity to the coastline. While active management steps are being taken to mitigate negative impacts from human disturbance (e.g., Superintendents' Orders and site monitoring to protect sacred burial caves), threats from natural disturbance are more difficult to gauge and to mitigate. The inventory and monitoring programs for cultural objects requires ongoing attention and updating.

## **2.4 Connection to Place – Visitor Experience and Public Education**

### **2.4.1 Visitor Experience**

#### **i. VISITOR EXPERIENCE CONTEXT**

Visitors come to Pacific Rim to enjoy a rugged west coast experience: pounding surf, sandy beaches, quiet inlets, a rich intertidal, towering rainforest and abundant wildlife. Some visitors enjoy the comfortable frontcountry opportunities others seek out the more challenging backcountry adventures both on land and in the marine environment. Although the easily accessible, frontcountry Long Beach Unit (LBU) attracts the majority of Pacific Rim's visitors, the Broken

Group Islands Unit (BGI) and West Coast Trail Unit (WCT) are distinct destinations in their own right. These two backcountry units draw a combined visitation that is the highest backcountry use of any national park in Canada. Each unit has something different to offer the visitor.

#### **The Long Beach Unit**

The Long Beach Unit is primarily a day-use area although the park does operate a campground on a seasonal basis. Visitation to the LBU remains relatively steady at ~800,000 annually. While the availability of overnight accommodation in the adjacent communities limits summer visitation, winter- and shoulder-season visitation, heavily promoted by the local communities, continues to show a slow, steady increase. Though operated as a seasonal park, with full services offered from mid-March to mid-October, approximately 25% of the LBU visitation, or ~190,000 users, come to the park during what is considered the off season when many services are not available.

The adjacent communities offer a variety of activities to capture visitor interest: whale watching, fishing, day-trip excursions into Clayoquot and Barkley Sounds, art galleries, gift shops, restaurants and spas. Local surfing

South Long Beach



companies that hold park business licences, now rent gear and provide lessons in the park year-round leading to a significant increase in water-based recreational activities within the park. The service offer inside the park includes:

- 22 km of beaches accessible from six parking areas. The Combers Beach parking lot was relocated from a high erosion site, with a new parking lot and access trail completed in 2005.
- Seven trails (six boardwalk) totalling ~9 km. Traditionally, the LBU offered nine trails but two trails are now closed due to structural deterioration. Four trails provide interpretive signage.
- The Wickaninnish Interpretive Centre provides exhibits and films about the park and surrounding region. Exhibits are currently being redesigned with project completion scheduled for September 2010. Open mid-March to mid-October, over 100,000 people visit the interpretive centre annually. (insert image of Wickaninnish Centre here)
- Public safety services are available in the park year-round with surf-guards stationed at Long Beach through July and August.
- A variety of personal interpretation programs are offered, with an increasing emphasis on First Nations cultural interpretation in recent years. The majority of personal interpretive programs are scheduled in July and August.
- 113 sites at Green Point Campground. Reservations are made through the Parks Canada Campground Reservation Services for this high-demand campground open mid-March to mid October.

In 2005, Pacific Rim's park information centre was moved from inside the park to a much more prominent location just outside the park at the Port Alberni-Tofino-Ucluelet junction off Hwy 4. In partnership with the Ucluelet Chamber of Commerce, Parks Canada welcomes over 100,000 visitors annually to the relocated information centre, now called the Pacific Rim Visitor Centre

A variety of personal interpretation programs are offered



(PRVC). As a trial in the winter of 2007-2008, park staff joined chamber staff in providing information services to visitors at the Visitor Centre two days a week. On average, winter visitation was 80 people/day. In the peak summer season 1,000 visitors/day is not uncommon in this facility.

LBU visitors are primarily Canadian (64%) and of the Canadians over 60% are from British Columbia. Many visitors live within a day's drive of the park (southern Vancouver Island, the Greater Vancouver Region and the Puget Sound area of Washington State). As illustrated in the 2006 Canadian census, general population demographics are changing—approximately 40% of the greater Vancouver population are noted as immigrants—and this is mirrored in changes to the park's visitor population.

#### The Broken Group Islands Unit

The Broken Group Islands Unit is a marine archipelago of outstanding beauty. A boater's paradise, the BGI offers both sheltered and open waters that can be accessed by boat from Port Alberni, Bamfield, Ucluelet and Toquart Bay. Within the unit, Parks Canada maintains 8 designated backcountry camping areas. A warden is also stationed on location during the summer season. Throughout the year, numerous private and commercial motorboats travel daily through

the area, while in summer, sailboats anchor in a variety of locations, and kayakers enjoy day trips as well as overnight camping. Records indicate 10,000 user-nights a season in the designated campsites.

### The West Coast Trail Unit

The West Coast Trail Unit is comprised of the Nitinat Triangle, the Cape Beale Headlands and the WCT. The Nitinat Triangle is a series of remote lakes used as a rigorous canoe and portage route. No services or facilities are available. Staff presence is negligible as area use is minimal.

The Cape Beale Headlands offers two hiking trails (totalling 9 km) and overnight backcountry camping in the Keeha Beach area. Parks Canada staff provide information from the West Coast Trail Information Centre located at Pachena Bay. While primarily a day-use area, overnight camping does occur.

The WCT is a 75km historic coastal route that began as a First Nations trade route, and then later became a lifesaving trail for shipwrecked mariners. The trail is open to overnight backpacking from May to October, with the average visitor spending 6-7 days hiking the

Kayaking - Broken Group Islands, Pacific Rim National Park Reserve



length of the trail. The trail is closed to overnight use outside of these times.

Canadians are the primary users of the WCT (63%) although a significant proportion comes from elsewhere: Germany 12%, other European countries 8%, United States 6%. In 1990, 8,461 backpackers camped along the trail, with the majority arriving in July and August. Pacific Rim implemented a quota for the trail in 1992 to reduce environmental damage, and to provide a quality visitor experience. Visitation has steadily declined since then: the quota of 60 hikers per day rarely fills outside of July and August. In 2007 only 4,273 visitors hiked the trail.

Hiking - West Coast Trail, Pacific Rim National Park Reserve



### ii. STATUS AND TRENDS OF THE INDICATORS AND MEASURES

The measures and targets used in the table on the following page (Table 2.8) are based on the November 11th 2007 Parks Canada Performance Framework.

<sup>12</sup>Parks Canada. 2007. 2006 Visitor Use Study Long Beach Unit Pacific Rim National Park of Canada. Social Science Unit Western and Northern Service Centre Parks Canada, Vancouver, British Columbia.

<sup>13</sup>Rollins, Rick, and Carleigh Randall. 2001. Broken Group Islands Pacific Rim National Park Reserve Visitor Survey 2000 Report. Malaspina Recreation and Tourism Research Institute Malaspina University- College. Nanaimo, British Columbia.

<sup>14</sup>Parks Canada. 2007. 2007 WCT Statistics Summary.

**Table 2.8. Pacific Rim National Park Reserve's Visitor Experience indicators, measures, targets and evaluations**

INDICATORS	MEASURES	TARGETS	EVALUATION
PERSONAL CONNECTION	Visitors consider the place as meaningful to them.	Visitors at surveyed locations consider the place is meaningful to them.	Baseline data not established. However, repeat use gives a sense of connection to place. Repeat use for each unit is: <ul style="list-style-type: none"> <li>• LBU - 54% of Canadian visitors<sup>12</sup></li> <li>• BGI - 28% total users<sup>13</sup></li> <li>• WCT - 13% total users<sup>14</sup></li> </ul>
MARKETING AND PROMOTION	Canadians visit Pacific Rim NPR.	<ul style="list-style-type: none"> <li>• Visitation is stable in the BGI and LBU and</li> <li>• Visitation increases in the WCT</li> </ul>	<ul style="list-style-type: none"> <li>• LBU - stable in summer with a slight increase in the shoulder and winter seasons</li> <li>• BGI - stable</li> <li>• WCT - declining</li> </ul>
INTERPRETATION	Visitors at surveyed locations learn from experience and active participation.	50% of visitors at surveyed locations take part in learning activities.	In 2007: <p>LBU - 264,500 visitors, or 35% of the annual visitation accessed a learning activity (information services, guided event, interpretive displays, exhibits and trails).</p> <p>BGI - 1,200 visitors participated in orientation sessions.</p> <p>WCT unit - 100% or 4273 of overnight hikers participate in a park orientation presentation</p>
VISITOR ACTIVITIES AND SERVICES	Visitors enjoyed their visit.	85% of visitors enjoyed their visit to Pacific Rim.	98% of visitors were satisfied overall with their visit
	Visitors are satisfied with the availability and quality of activities.	85% of visitors are satisfied with the availability and quality of activities.	<p>LBU 2006 Visitor Use Survey indicates that 85% or more of the respondents were satisfied with the following activities:</p> <ul style="list-style-type: none"> <li>• Unique beaches;</li> <li>• Recreational experiences;</li> <li>• Exploring the outdoors on their own;</li> <li>• Spending time with family and friends;</li> <li>• Learning about the natural environment.</li> </ul> <p>Respondents were less satisfied with:</p> <ul style="list-style-type: none"> <li>• Opportunities to see wildlife;</li> <li>• Opportunities to learn about the area's First Nations culture and human history.</li> </ul> <p>89% of visitors were satisfied with the quality of service in the LBU. Satisfaction levels were greater than 85% for the:</p> <ul style="list-style-type: none"> <li>• Wickaninnish Interpretive Centre;</li> <li>• Beaches;</li> <li>• Hiking trails;</li> <li>• The Pacific Rim Visitor Centre;</li> <li>• Picnic areas;</li> <li>• Hwy 4.</li> </ul> <p>Respondents were less satisfied with:</p> <ul style="list-style-type: none"> <li>• Secondary roads in the park;</li> <li>• Traffic in the park;</li> <li>• Information prior to visit;</li> <li>• Campsites;</li> <li>• Park washrooms;</li> <li>• Value for park use fee.</li> </ul>
PUBLIC SAFETY	<ul style="list-style-type: none"> <li>• Visitors have a safe visit.</li> <li>• Reduced numbers of public safety incidents.</li> </ul>	<ul style="list-style-type: none"> <li>• Update the 1996 Visitor Risk Assessment and Public Safety Plan and interagency coordination.</li> <li>• Proactive planning and communications to reduce the number of incidents.</li> <li>• Training and standards in place to ensure response capacity and safety of responders.</li> </ul>	<ul style="list-style-type: none"> <li>• 80 – 100 search and rescues on the WCT per year.</li> <li>• 60 – 80 visitor-assistance responses in the BGI; 10% involve a search or rescue.</li> <li>• up to 10 serious injuries in the LBU involving surfers, beach walkers caught in high-tide log rolling or motor vehicle accidents.</li> <li>• Wardens responded to 1 in-park fatality, and 3 ocean-related fatalities outside the park (2007).</li> <li>• 58 responses to bear/cougar/wolf interactions per year (based on a 10-year average).</li> </ul> <p>A demographic shift to older, urban-based visitors is increasing demands on Search and Rescue, as is the increase in low-season surf and storm watching when response capacity is low.</p>

### iii. KEY ISSUES AND PLANNING CONSIDERATIONS

Key issues relating to visitor experience that should be considered in the creation of the management plan include:

1. Trails- whether the Goldmine and Spruce Fringe Trails should be re-opened or permanently closed and dismantled.
2. The service offer in the LBU in the shoulder and winter seasons.
3. Gathering social science information to:
  - Establish baseline data relating to the new indicators and measures such as personal connection to place and memorable experiences;
  - Reassess the service offer related to the WCT.

## 2.4.2 Outreach Education

### i. OUTREACH EDUCATION CONTEXT

Outreach education includes a variety of activities undertaken by staff and partners to promote public appreciation, understanding, support and engagement with respect to Pacific Rim National Park Reserve and Parks Canada's mandate to audiences outside the park (non visitors). Pacific Rim's outreach education program is evolving and developing with the efforts of staff from a variety of sections. It includes formal and targeted programs such as school programs as well as programs that are informal and opportunistic. Audiences for outreach education are local, regional, national and international.

Local audiences include the Tla-o-qui-aht, Ucluelet, Toquaht, Tseshaht, Huu-ay-aht, Ditidaht and the Pacheedaht First Nations as well as the communities of Port Alberni, Tofino, Ucluelet, Bamfield and Port Renfrew. Over the last five years, the park has targeted youth, families and hospitality-industry staff. Local outreach education takes many forms as outlined below:

- Staff have developed strong ties with the Tofino and Ucluelet elementary schools. Parks Canada dedicated bulletin boards in Tofino and Ucluelet schools are updated

Ucluelet Elementary School Beach Day at Big Beach



quarterly highlighting a variety of current park-related topics and activities. In addition to in-park programming, staff also go directly to schools in the adjacent communities to deliver programs targeted at students and occasionally for teachers.

- Programs are also occasionally delivered for general audiences within each community;
- Presentations at local career fairs;
- Since 2004, park staff have worked closely with the Nuu-chah-nulth community, teachers, the Parent Advisory Council and the Clayoquot Biosphere Trust to host Aboriginal School Day. Aboriginal School Day hosted 343 students from kindergarten to Grade 6 in 2007. Invitations are made to Port Alberni, Bamfield, Ucluelet, Tofino, Ahousaht and Hesquiaht students for a full day of Nuu-chah-nulth crafts, stories, games and activities led by approximately 40 staff and volunteers. This in-park event further strengthens park

Stealing Sticks Aboriginal School Days.



relationships with school board staff and First Nation community members, enriching understanding for all;

- Junior naturalist programs are offered to youth through the Ucluelet Parks and Recreation department;
- Parks staff have also been guest speakers at a variety of special events including the Bamfield Marine History conference, the Valencia Commemoration and at Bamfield Arts Council events;
- The Wildcoast Project has taken park staff into the local communities to work with the non-profit Pacific Rim Bear Smart Committee to further their conservation message reach. The same project has staff working directly with the hospitality industry in an effort to reduce human/carnivore interactions;
- Park staff assist and participate in the coordination of a variety of festivals both in and outside the park, including: the Shorebird Festival, Whale Festival, Heritage Day, Forest Days, Aboriginal Day, Aboriginal School Day, and Shoreline Clean-up week;
- Park staff continue to work with First Nations communities to address species at risk in the region;
- A biweekly park update called *Beach Break* appears in Tofino and Ucluelet's weekly newspaper *The Westerly* and the *Alberni Valley Times*;
- Public safety preparedness also integrates outreach education activities. Park wardens work with community partners to create and produce public safety information under the title of Prevent Net. Prevent Net

Parks Canada at Carl Seiber Forest Days.



Study design workshop Wildcoast Project



materials focus on delivering marine safety messages and resource conservation messages throughout the Ucluelet/Tofino region.

- Parks Canada staff created the brochure, *Exploring the Seashore*, with printing funded through the Clayoquot Biosphere Trust. This enabled other venues in the community, the Ucluelet Aquarium Society and the Rainforest Education Society, to also distribute the brochure among community members and visitors in an effort to promote marine education and protection.

Regional audiences are those located within a day's drive of the park: Vancouver Island, the Greater Vancouver area and the Puget Sound area of Washington State. The rapidly growing population of this region is now six million people.

The 2006 Canadian Census indicated that approximately 40% of the population of the greater Vancouver area are immigrants. The growing, and changing population of this region means a changing outreach education audience for Pacific Rim. Through working in partnership with Parks Canada staff in Vancouver, Pacific Rim is reaching out to urban and immigrant audiences through a variety of outreach education programs including:

- Consumer shows such as the Vancouver Outdoor Adventure Show and the Seattle Boat Show;

- Speaker series' at Mountain Equipment Coop, the Vancouver Public Library, and at museums including the Royal BC Museum;
- The BC Ferries Coastal Naturalist program;
- Presentation to university students at a variety of colleges and universities.

Outreach education efforts that reach beyond our regional and local audiences include:

- Participation in Parks Canada's formal education outreach program at schools. Currently in development for students is a marine eelgrass program linking ecological integrity issues in the three west coast marine parks: Gwaii Haanas, Gulf Islands and Pacific Rim;
- Parks Canada's Connectivity Program Phase I<sup>15</sup>, which was piloted in Pacific Rim. Phase II is currently underway with Pacific Rim as a hosting park once again;
- Canadian Geographic for Kids which featured an episode focused on Pacific Rim;
- The Pacific Rim website provides educational information about the natural heritage of the park.

**ii. STATUS AND TREND OF THE OUTREACH EDUCATION INDICATORS AND MEASURES**

The outreach education specialist position was staffed in October 2007. There are no indicators and measures developed for outreach education at this time. The following indicators and measures are proposed:

INDICATOR	MEASURE
AWARENESS	<ul style="list-style-type: none"> <li>• Awareness of the national network of Canada's natural and historical places</li> </ul>
UNDERSTANDING	<ul style="list-style-type: none"> <li>• Learning about natural and historical heritage.</li> <li>• Understanding of why the park was created.</li> <li>• Understanding the importance of protecting and presenting the natural and cultural heritage.</li> <li>• Learning how to contribute to protecting and presenting the natural and cultural heritage</li> </ul>
APPRECIATION	<ul style="list-style-type: none"> <li>• Appreciating the significances of the natural and cultural heritage</li> </ul>

<sup>15</sup> Connectivity Program is a pilot project aiming to develop outreach programs via video conferencing with outside agencies such as schools and Discovery Centres.

Parks Canada at ukee Days



The target is to establish baseline data collection methods for each measure by 2009 and to start collecting data by 2010.

**iii. KEY ISSUES AND PLANNING CONSIDERATIONS**

Key issue relating to outreach education that should be considered in the creation of the management plan is the development of indicators, measures, targets, and monitoring for future use with national office staff.

**2.4.3 Stakeholders Relations**

**i. STAKEHOLDER RELATIONS CONTEXT**

Pacific Rim staff recognizes the importance of building relationships with local, regional and international stakeholders. Some relationships are focused on short-term activity or events while in other cases they are long-term relationships that may be formal or informal. The objective is

Design Workshop with schools





to seek opportunities for stakeholders to engage in the protection and presentation of the cultural and natural heritage of Pacific Rim.

On a formal basis staff participate on a variety of boards and committees. Some committees are international in scope like the Baja to Bering Initiative linking Mexico, United States and Canada around marine ecological integrity issues. Others are more regional and include:

- The West Coast Vancouver Island Aquatic Management Board
- The Clayoquot Regional Board
- The West Coast Forum and the Alberni Clayoquot Regional District Committee;
- The Clayoquot Sound UNESCO Biosphere Trust which focuses on building a healthy, sustainable community;
- The Whale Festival, Shorebird Festival, Aboriginal Day, and Aboriginal School Days committees which focus on protecting the area's ecological integrity and cultural heritage;
- Tourism Tofino, Tourism Ucluelet, the Ucluelet Chamber of Commerce, the Tofino-Long Beach Chamber of Commerce, Alberni Valley Chamber of Commerce, Qualicum Chamber of Commerce, Parksville Chamber of Commerce and Tourism Vancouver Island which focus on marketing and tourism;

On a less formal basis, park staff work with members of the community to further our reach in a variety of ways:

- The Wild Coast Project has taken park staff into the local communities to work with the non-profit Pacific Rim Bear Smart Committee to further their conservation message reach through this multiplier;
- The *Shoreline Currents Newsletter* is distributed on a semi-annual basis to all commercial operators holding a business licence with the park;
- The Nuuchahnulth Working Group has been drawn together to redesign the Nuuchahnulth component of the Wickaninnish Interpretive Centre exhibits;

Aboriginal Day



- Park staff work with BGI Fee Collection Concessionaires to promote their understanding of public safety and resource conservation issues in the unit which in turn enables them to deliver these messages to park visitors;
- Park staff developed an agreement with the primary carrier of visitors into the BGI, Lady Rose Marine Services. Park staff meets with Lady Rose Marine Services passengers at their facilities, permitting staff to deliver a variety of park messages before these passengers enter the park;
- Kayak guides check-in with park staff by phone on entrance to the BGI to ensure an exchange of information;
- Attending kayak guide meetings;
- Attending pool captain<sup>16</sup> meetings and meeting with individual commercial fishers when fisheries open in or adjacent to the BGI;

WIC Project - Nuuchahnulth Working Group



<sup>16</sup> A pool captain is an individual tasked with representing a group of fishers

- Communicating on a daily basis with the whale watching industry in the BGI;
- Ongoing communication with RCMP, DFO, Coast Guard, Department of Environment, the Ucluelet Fire Department and Conservation Officers whose jurisdictions bring them into the park.

**ii. STATUS AND TREND OF THE STAKEHOLDER RELATIONS INDICATORS AND MEASURES**

There are no indicators and measures developed for stakeholder relations at this time. The following indicators and measures are proposed:

INDICATOR	MEASURE
AWARENESS	<ul style="list-style-type: none"> <li>• Stakeholders support the protecting and increasing awareness about the natural and cultural heritage of the park.</li> <li>• Stakeholders are satisfied that they have adequate opportunity to contribute and influence park activities.</li> <li>• Stakeholders are satisfied that they have the opportunity to be actively involved in the protection, management and presentation of the park.</li> <li>• Stakeholders took action to protect, manage and present the park.</li> </ul>

The target is to establish baseline data for each measure by 2009 as input into the next *State of the Park Report*.

**iii. KEY ISSUES AND PLANNING CONSIDERATIONS**

The key issue relating to outreach education that should be considered in the creation of the management plan is the development of indicators, measures, targets, and monitoring.

## 3. EVALUATION OF MANAGEMENT ACTIONS

### 3.1 Evaluation of Management Actions

A full park management plan does not currently exist, although in 2003 an Interim Management Guidelines draft document was produced as an update to the 1994 Park Management Guidelines document. The 2003 Interim Management Guidelines was used as a basis for evaluating management actions where feasible, though it lacks specific objectives and targets. Management actions taken since 2003 are consistent with the interim management direction but responsive to the dynamic circumstances surrounding the management of the park.

Co-operative management boards are being established with the Huu-ay-aht and the Tseshaht and Ditidaht First Nations. Pacific Rim is also continuing to build relationships and work collaboratively on key projects with five other First Nations not included under the current Maa-nulth Treaty, including a working group with the Tla-o-qui-aht, and a cultural resource management working group with the Tseshaht. A key success is that many First Nations and Parks Canada staff have been working collaboratively to develop and implement projects and partnership arrangements. The successes range from extensive archaeological work, supporting the development of a Tribal Park, the Esowista residential expansion, studies of Nuu-chah-nulth traditional ecological knowledge (TK), cultural awareness celebrations, a Central Region Nuu-chah-nulth Language Group partnership, collaboration with nine First Nations on the Wickaninnish Interpretive Centre Re-design Project, completion of the Nuu-chah-nulth Trail, Timber Agreements to ensure the continued ecological integrity of First Nation reserves within the park boundary, MOUs and partnerships to identify shared commitment to park management planning, and supporting the designation of the Kiix'in National Historic Site (outside the scope of park management).



There are a few key successes in improving ecological integrity in the park. The restoration of Lost Shoe Creek to improve stream condition and connectivity is making significant progress toward the ultimate long-term goal to restore old-growth riparian forest ecosystems. The eradication of invasive plants from a number of sites in the LBU is significantly assisting the ultimate goal of eradication of the three key invasive species: English Ivy, Scotch Broom and European Dunegrass. The planned development of a comprehensive, ecosystem-based monitoring program will enable better tracking and reporting on the future state of ecological integrity in the park.

A key success for the cultural resource management program has been the establishment of good working relationships with First Nations, who are also full partners in site revisits in their traditional territories. Pacific Rim – along with its First Nations partners – has completed site revisits to high priority and highly threatened sites (~18 % of all sites in past 5 yrs). Other successes include establishing a process for stabilizing and restoring the R. Wells shipwreck drawings and the interpretation and maintenance of cultural objects displayed at the Wickaninnish Interpretive Centre.

Overall visitation, participation, return rates and levels of satisfaction with service and experience are high. Year round personal use fees have increased revenues to support capital infrastructure and 'Greening' initiatives in the park (e.g., picnic tables, privies, recycle bins). Successes in visitor services and interpretation include (Table 3.1):

- A redesign of interpretive exhibits in the Wickaninnish Interpretive Centre is currently underway with the active involvement of the Nuu-chah-nulth cultural working group; (insert an image here of the Nuu-chah-nulth Working Group Discussion)
- Moving the Pacific Rim Visitor Centre to a high-profile location has significantly

increased Parks Canada's opportunities to communicate with visitors and enhanced its working relationship with Ucluelet Chamber of Commerce;

- Nuu-chah-nulth interpretation by First Nations has been initiated on the WCT;
- A new ecological integrity outreach education position has been established.

### 3.2 Key Issues and Planning Considerations

Strategic direction in a park management plan would help to set priorities as well as set realistic measures, targets and actions to evaluate outcomes.

Table 3.1. Evaluation of Key Management Actions

#### Aboriginal Voices

PARK MANAGEMENT GOALS/OBJECTIVES	ACTIONS	RESULTS	IMPACT ON MEASURE/INDICATOR
<ul style="list-style-type: none"> <li>• Develop a sustainable regional tourism strategy, addressing communications, reception and accommodation, access, circulation, infrastructure and carrying capacity.</li> </ul>	<ul style="list-style-type: none"> <li>• Enhance the involvement with our First Nation partners in Aboriginal tourism initiatives through co-operative projects, and support with the creation of the eco-tourism Aboriginal initiative.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in economic opportunities for the First Nation communities.</li> <li>• Engage community and regional governments, First Nations, tourism and recreational stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>• More people from the surrounding area visiting the park because of the tourism initiatives with the local First Nations.</li> </ul>
<ul style="list-style-type: none"> <li>• The park is a model of co-operative management with First Nations.</li> </ul>	<ul style="list-style-type: none"> <li>• Engage First Nations partners in a more formal, co-operative management board as well as working towards informal working groups.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in economic opportunities for the First Nation communities.</li> </ul>	<ul style="list-style-type: none"> <li>• More people from the surrounding area visiting the park because of the tourism initiatives with the local First Nations.</li> </ul>
<ul style="list-style-type: none"> <li>• Maintain the integrity of cultural resources and landscapes.</li> </ul>	<ul style="list-style-type: none"> <li>• Deliver cultural information to visitors through the Nuu-chah-nulth Trail, use of Nuu-chah-nulth place names, cultural walks with interpreters, displays in Wickaninnish Centre and Aboriginal Days events.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased partnership and information sharing with the LBU First Nations.</li> </ul>	<ul style="list-style-type: none"> <li>• More information sharing with the visitors allowing for a more cultural experience for everyone.</li> </ul>

### Ecological Integrity

PARK MANAGEMENT GOALS/OBJECTIVES	ACTIONS	RESULTS	IMPACT ON MEASURE/INDICATOR
<ul style="list-style-type: none"> <li>Promote the park's ecological integrity by applying a regional approach to habitat connectivity to maintain stable populations of native species.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out habitat suitability and connectivity analyses for key species; improve habitat connectivity if impaired.</li> </ul>	<ul style="list-style-type: none"> <li>Habitat suitability mapping conducted for marbled murrelet, black bear, wolf, river otter and cougar; habitat connectivity analyzed for small forest flora and fauna.</li> </ul>	<ul style="list-style-type: none"> <li>N/A.</li> </ul>
<ul style="list-style-type: none"> <li>Restore ecosystem function to damaged ecosystems by protecting, restoring and maintaining processes, floral and faunal communities and the interactions between processes and community.</li> </ul>	<ul style="list-style-type: none"> <li>Restore salmon streams; restore original forest composition at sites planted with Douglas-fir; restore sand-dune processes and populations of species at risk.</li> </ul>	<ul style="list-style-type: none"> <li>Restoration work conducted on Lost Shoe Creek but ecological assessment incomplete.</li> </ul>	<ul style="list-style-type: none"> <li>Impact on Forest streams undefined as yet.</li> </ul>
<ul style="list-style-type: none"> <li>Empower local communities to change ecosystems and motivate environmental stewardship.</li> </ul>	<ul style="list-style-type: none"> <li>Encourage the practice of good environmental stewardship.</li> </ul>	<ul style="list-style-type: none"> <li>Regional Landfill water treatment by Alberni-Clayoquot Regional District (ACRD); cooperation by Timberwest in Marbled murrelet research; bear research with ACRD; Central West Coast Forestry Society involved in stream restoration.</li> </ul>	<ul style="list-style-type: none"> <li>Impact on Streams is undefined as yet.</li> </ul>
<ul style="list-style-type: none"> <li>The global biosphere is enhanced by park participation in regional, national and international environmental initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>Participation in multi-agency initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>The park participates in environmental initiatives at various levels including work with the UNESCO Clayoquot Biosphere Reserve and the North American Monitoring and Protection Area Network .</li> </ul>	<ul style="list-style-type: none"> <li>N/A.</li> </ul>

### Cultural Resources

PARK MANAGEMENT GOALS/OBJECTIVES	ACTIONS	RESULTS	IMPACT ON MEASURE/INDICATOR
<ul style="list-style-type: none"> <li>Maintain the integrity of cultural resources and landscapes.</li> </ul>	<ul style="list-style-type: none"> <li>Promote the maintenance of cultural resources and landscapes.</li> </ul>	<ul style="list-style-type: none"> <li>Cultural resource management and protection is integrated into the environmental assessment process;</li> <li>Discourage access to sensitive cultural sites; Maintain inventories and periodic monitoring programs; Additional work to be completed on First Nations' traditional-use sites.</li> </ul>	<ul style="list-style-type: none"> <li>No measures were defined.</li> </ul>

## Connection to Place

PARK MANAGEMENT GOALS/OBJECTIVES	ACTIONS	RESULTS	IMPACT ON MEASURE/INDICATOR
<ul style="list-style-type: none"> <li>Allow no net increase in total parking in the LBU.</li> </ul>	<ul style="list-style-type: none"> <li>Combers Beach parking lot closed and new parking lot established.</li> </ul>	<ul style="list-style-type: none"> <li>No increase in total parking in the LBU.</li> </ul>	
<ul style="list-style-type: none"> <li>Facilitate Park Use Fee delivery.</li> </ul>	<ul style="list-style-type: none"> <li>Review of Park Use Fee delivery.</li> </ul>	<ul style="list-style-type: none"> <li>Third-party sales through Chambers of Commerce and local businesses initiated; LBU Information Centre* relocated to a more visible location with a longer service offer.</li> </ul> <p>*Renamed Pacific Rim Visitor Centre (PRVC)</p>	
<ul style="list-style-type: none"> <li>Redevelop the Wickaninnish Interpretive Centre.</li> </ul>	<ul style="list-style-type: none"> <li>Obtain funding, hire a project manager and establish a steering committee.</li> </ul>	<ul style="list-style-type: none"> <li>Development is underway. Installation to be complete 2010.</li> </ul>	
<ul style="list-style-type: none"> <li>Collaborate with the District of Ucluelet to develop a joint information facility at the Tofino/Ucluelet Junction.</li> </ul>	<ul style="list-style-type: none"> <li>Establish a working group to coordinate this project.</li> </ul>	<ul style="list-style-type: none"> <li>Jointly-operated visitor centre (PRVC) opened in July 2005. Visitation to the PRVC has increased 10-fold since the move in 2005.</li> </ul>	
<ul style="list-style-type: none"> <li>Maintain existing trail systems to acceptable standards. Expansion of existing trail systems will take place only if there is a demonstrated need relative to broadening the spectrum of heritage communications messages.</li> </ul>		<ul style="list-style-type: none"> <li>LBU: 7 of 9 trails currently open to the public. Both closed trails require significant repairs.</li> <li>WCT: major capital repair resulting from significant storm damage in 2006/07. Nitinat Triangle portage routes are cleared and in the best condition in years.</li> </ul>	
<ul style="list-style-type: none"> <li>Develop a business licensing system for commercial tourism operators for all three units of Pacific Rim.</li> </ul>	<ul style="list-style-type: none"> <li>Establish a position to develop and implement a business licensing system.</li> </ul>	<ul style="list-style-type: none"> <li>Staff hired, business licensing system in place; standards still pending for backcountry hiking, sport fishing and school groups.</li> </ul>	
<ul style="list-style-type: none"> <li>Establish a First Nations interpretive program on the WCT.</li> </ul>	<ul style="list-style-type: none"> <li>Work with the Quu'as West Coast Trail Society to establish an interpretive program offer along the trail, focusing on First Nations heritage.</li> </ul>	<ul style="list-style-type: none"> <li>Quu'as interpretive program offered in 2006-07</li> <li>One part-time Parks Canada employee offered First Nations interpretation in 2006 and 2007.</li> <li>First Nations disbanded Quu'as in winter 2007-08; new First Nations contracts are currently being established.</li> </ul>	

*Connection to Place cont.d*

PARK MANAGEMENT GOALS/OBJECTIVES	ACTIONS	RESULTS	IMPACT ON MEASURE/INDICATOR
<ul style="list-style-type: none"> <li>Update the BGI Area Plan.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct consultation with user groups and local stakeholders.</li> <li>Update the BGI Area Plan</li> </ul>	<ul style="list-style-type: none"> <li>No progress.</li> </ul>	
<ul style="list-style-type: none"> <li>Develop an area plan for the Nitinat Triangle area similar to that completed for the Cape Beale headland.</li> </ul>	<ul style="list-style-type: none"> <li>Establish boards with the Ditidaht and Huu-ay-aht First Nations.</li> </ul>	<ul style="list-style-type: none"> <li>Boards to be established with the Huu-ay-aht First Nation and with the Ditidaht/ Pacheedaht First Nations in 2008.</li> </ul>	
<ul style="list-style-type: none"> <li>Work with community and regional governments, First Nations, tourism and recreational stakeholders to develop a sustainable regional tourism strategy.</li> </ul>	<ul style="list-style-type: none"> <li>Establish working groups to develop a sustainable regional tourism strategy.</li> </ul>	<ul style="list-style-type: none"> <li>This work is on hold pending the restructuring of the Chambers and Tourism Associations. Work is scheduled to resume in the fall of 2008.</li> </ul>	





## 4. ISSUES AND CHALLENGES

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First Nations relationships and involvement, including co-operative management, treaty implementation and Aboriginal Title cases are a key priority for the park. These relationships will affect overall park management from traditional harvesting and monitoring, marine management, visitor experience, and park interpretation and information to overall park management. A key challenge will be to continue to build on relationships with all nine First Nations partners to establish both formal boards and informal working groups that enable fair and equitable participation and collaboration for Pacific Rim's management. Ideally this would be achieved sometime in the future under one co-operative management board.

The management of the marine ecosystem, as noted by the decline in biodiversity in the subtidal ecosystem and increased proliferation of invasive species in the intertidal ecosystem, represents a significant priority for the park and local communities. Building relationships and a common marine management regime with First Nations, federal and provincial governments, the Bamfield Marine Science Centre, industry and other partners to monitor and manage marine ecosystems in and around the park is critical to success. Oil spill response planning and response capacity is a key challenge that will need to be addressed as it could significantly impact the ecological integrity of the marine and shoreline ecosystems. Pacific Rim has a large marine component that is currently regulated under the Canada National Parks Act but does not have an active management regime in place for the marine ecosystem. Many First Nations and other partners are concerned about the decline in the health of the marine environment and are interested in addressing marine management and in identifying marine protected areas along the west coast of Vancouver Island.



The fact that there are 42 species at risk identified in or migrating through the park creates a significant challenge to assess priorities for action, to develop a site-based ecosystem approach to action planning and to engage First Nations and other partners in planning and implementing recovery actions. First Nations are interested in identifying opportunities for joint action on recovery of species at risk.

Ecological disturbances within the park that occurred prior to park establishment and ongoing disturbances in adjacent watersheds may be affecting the ecological integrity of Pacific Rim's forests, streams and wetland ecosystems, including:

- The spread of invasive plants in the shoreline dunes and terrestrial ecosystem;
- Water contamination from adjacent human sources continues to be an issue for Esowista Indian Reserve and sewage contamination on Long Beach.
- Forest harvest and development pressures (e.g., landfill, residential, commercial and industrial).

It is an ongoing challenge to monitor these disturbances, build awareness and partnerships with First Nations, other levels of government, local communities and industry to mitigate the effects of current and past management practices.

The ongoing assessment of the state of cultural resources and the protection of these resources continues to be a challenge. Further work is required to develop a cultural resource values statement that would include an assessment of landscape features and buildings and structures. The potential future transfer of the Pacheena and Carmanah Lighthouse stations to Parks Canada would require significant resources to manage these historic buildings and structures over the long term.

Many cultural sites are located in close proximity to the coastline. While active management steps are being taken to mitigate negative impacts from human disturbance (e.g., Superintendents' Orders and site monitoring to protect sacred burial caves), threats from natural disturbance are more difficult to gauge and to mitigate. The inventory and monitoring programs for cultural objects requires ongoing attention and updating.

To date, little focus has been placed on the survey and examination of cultural landscapes (WCT, First Nations' traditional territories). Inventories and assessments for First Nations' traditional use sites (including culturally modified trees) and early Holocene period archaeological sites (elevated and drowned landscapes) are needed. Furthermore, mapping and evaluative studies are necessary at ~20 Euro-Canadian sites in the LBU that have not



yet been authenticated. Also, the conditions of shipwrecks documented along the WCT by Parks Canada Marine Archaeology Unit (Ottawa) in 1988 have not been monitored nor have their conditions been assessed since that time.

Pacific Rim receives over 800,000 visitors annually to the LBU and has the highest levels of backcountry use of any Canadian national park in its BGI and WCT units. Visitor experience, level of service and all park operations are challenged by the fact that the three units in the park are spread across large yet geographically distinct sections of land and ocean with extreme weather and ocean effects. (Insert image here of PR BGI solo paddler)

A key service and legal responsibility to visitors is to minimize hazards and risks to promote visitor safety. Challenges exist in our ability to plan, communicate, train and respond to public safety issues. The high urban interface in the LBU with the Pacific Ocean continues to challenge public safety response especially with growing interest in surfing and winter storm watching in the low seasons when our capacity to respond is lowest. (insert image here PR BGI chart Reading )

The service offer for the WCT is not financially sustainable given declining visitation rates and high infrastructure costs. The Cape Beale Headland and Nitinat Triangle portions of the WCT unit currently have minimal management

and visitation, but are viewed as an economic opportunity for the communities of Bamfield and the Huu-ay-aht and Ditidaht First Nations.

With the introduction of Park Use Fees in 1994 and more recent year round collection of park use fees came an expectation that services would be maintained or improved. Services and assets have not improved. Public support for Personal Use Fees and the perceived value for payment are low.

Visitor facilities and assets (e.g., campgrounds, trail infrastructure including bridges and board walks, picnic tables, washroom facilities, visitor centres) are in poor condition and continue to deteriorate.

Winter season visitation (190,000 users or 25% of the park's annual visitation) has increased with the communities of Ucluelet and Tofino actively marketing winter as the season for storm watching or extended surfing seasons. Park resource allocations cover a service offer from mid-March through mid-October. This creates major challenges for maintaining adequate levels of public safety response capacity, information and interpretation services during the winter season period.

The Pacific Rim Visitor Centre visitation increased 10-fold when the facility was moved. The centre now receives over 100,000 visitors per season; associated visitor services including garbage, sewage, janitorial and information are struggling to meet the increased demand. Permanent staffing levels have not addressed the increased length of season or peak-season demand, resulting in redirecting staff from other programs, such as interpretation.

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## APPENDIX 1: EXECUTIVE SUMMARY (STATE OF THE PACIFIC RIM NATIONAL PARK RESERVE)

The following indicators provide the current state of the park and assist in identifying key issues and challenges that need to be addressed in the future to improve their condition


STATUS				TREND			
							
GOOD	FAIR	POOR	UNDETERMINED	IMPROVING	STABLE	DECLINING	UNDETERMINED

INDICATOR	STATUS	TREND	HIGHLIGHTS
<b>ABORIGINAL VOICES</b>			
<b>Governance</b>			In preparing for treaty signings, Pacific Rim has worked to create a post-treaty environment through recognizing First Nations interests and making a concerted effort to include their values in all aspects of park operations and management. Pacific Rim has committed to engage First Nation partners, to learn from one another and to forge lasting collaborative relationships based on mutual respect and trust.
<b>State of the land</b>			The State of the land from the First Nations perspective remains to be assessed. Pacific Rim is collaborating with Parks Canada's Social Science department to conduct a survey with all nine First Nation partners to achieve this goal.

### ECOLOGICAL INTEGRITY

<b>subtidal</b>		↓	The ecosystem has been stressed due to harvesting pressure on fin-fish with the cascading effects on seabirds. The poor ecological state has been exacerbated by climatic effects and it continues to decline. This trend reflects the global trend in the marine ecological integrity.
<b>intertidal</b>		↔	The ecosystem has shown a mixed state of ecological integrity with some measures being in the green, others in the yellow and red. An emerging issue is establishment and proliferation of exotic species.
<b>shoreline</b>		↔	The ecosystem fared well as it continues to support healthy populations of shorebirds. An emerging issue in this ecosystem is establishment of invasive dunegrass which will be addressed as part of sand-dune restoration.
<b>streams</b>		↔	Some streams flowing through the park are affected by chemical pollutants from external sources. Attempts to rectify the issue have been made via co-operative efforts with local land managers, although the problem still persists.
<b>forest</b>		↔	Forest extent and condition remain good. Amounts of suitable habitat of several species of wildlife (Marbled Murrelet, Black Bear, Wolf, Cougar, River Otter) remain stable. Invasive plants are an emerging issue in the system.
<b>lakes &amp; wetlands</b>		?	Monitoring of water quality and amphibian populations has started. A formal assessment of the status and trend of this ecosystem will be made in the next SoPR.

### CULTURAL RESOURCE MANAGEMENT

<b>resource condition</b>		?	Cultural site types vary from pre-European-contact Nuu-chah-nulth habitation and spiritual-use locations to non-aboriginal post-contact sites. Up-to-date site inventory records for each location are securely stored both at the park and at the Western & Northern Service Centre (Victoria).
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INDICATOR	STATUS	TREND	HIGHLIGHTS
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**CONNECTION TO PLACE - VISITOR EXPERIENCE**

<b>personal connection</b>	Repeat use for each unit is: LBU 54% of Canadian visitors; WCT 13%; BGI 28%		
<b>marketing and promotion</b>	Visitation is stable in the BGI and LBU and is decreasing on the WCT		
<b>interpretation and learning</b>	An estimate of 35% of visitors take part in learning activities (this is below the target of 50%). Due to PRVC facility staffing demands, interpretation capacity is being reduced		
<b>visitor activities and services</b>	98% of visitors surveyed were satisfied with their overall visit, but express less satisfaction with secondary roads in the park, traffic in the park, information prior to visit, campsites, park washrooms and value for park use fee.		
<b>public safety</b>	A demographic shift to older, urban-based visitors is increasing demands on Search and Rescue, as is the increase in low-season surf and storm watching when response capacity is low.		

**CONNECTION TO PLACE - OUTREACH EDUCATION**

<b>understanding</b>	Baseline data to be established by 2009-10		
<b>appreciation</b>	Baseline data to be established by 2009-10.		
<b>awareness</b>	Baseline data to be established by 2009-10		

**CONNECTION TO PLACE - STAKEHOLDER RELATIONS**

<b>awareness</b>	Baseline data to be established by 2009-10.		
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