

## Summary of Bald Eagle Nesting Results for Mayne Island, British Columbia - 2009

### Introduction

The Bald Eagle is among the most charismatic and widely known species of wildlife in North America. Bald Eagles occur in large numbers along the coast of British Columbia and are symbolic of the natural world. While Bald Eagles living in more populated areas, such as the Strait of Georgia, appear to have habituated to the proximity of human settlement, their wellbeing is dependent on the availability of feeding, roosting, and nesting habitat.

In an effort to understand the habitat needs of Bald Eagles, between 1987 and 1995 Biologists with the Canadian Wildlife Service, the BC Ministry of Environment and several forest companies worked together to catalogue over 3,000 Bald Eagle nest sites around Vancouver Island, the southern Gulf Islands, and in the lower Fraser Valley. In the late 1990's, supported by BC Hydro and administered by BC Nature, the Wildlife Tree Stewardship Program (WiTS) was created as the repository of Bald Eagle nest information and the coordinating body for a large number of volunteer nest tree monitor, Citizen Scientists.

The information presented here is a summary of what we know to date about the locations and nesting success of Bald Eagle on Mayne Island, British Columbia.

### Methods

Throughout North America for the past 40 years Bald Eagles and other large raptor species have been annually inventoried following a scientific method laid out by Sergej Postupalsky in 1974. This method involves a minimum of two nest observations per year, usually made from either fixed wing or rotary aircraft.

A first observation, to record nest activity, is timed for early in the nesting season when the presence of birds near a nest should represent the commitment to a nesting attempt. At this time, the presence of birds on or near a nest would receive an “Active” score. At the same time, if the birds were in the immediate area, though clearly not focused on the nest site in question, a score of “Occupied Territory” would be given with the assumption that the pair was defending an area and likely nesting in an alternate nest. For Bald Eagles nesting around the Strait of Georgia the activity period would fall between 15 March and 30 April. The second observation scores the success of the nesting attempt and is timed to be within the last two to three weeks before any chicks would leave the nest. Around the Strait of Georgia the productivity period would fall between 15 June and 31 July.

The importance of the timing in the two visit method centres on eliminating bias when scoring success or failure. For example, if we come across an empty nest late in the nesting season, unless we made a previous visit, we have no way to determine if the nest was not used that year or if a nesting attempt had failed early and the adult birds had left. If we visit a site in mid season and see chicks, we really have no idea if the chicks survived to the point when they would naturally leave the nest.

The WiTS program makes every attempt to follow the two visit methodology though is a citizen science approach where all observations are made from a distance on either the ground or on the water. To make up for the limitations of more difficult angles of sight, the observation times are longer and may be repeated.

## Results and Discussion

### Known Nest Trees:

At the completion of the 2009 nesting season we had confirmed locations of 30 Bald Eagle nests sites on Mayne Island, including three small islands in the immediate vicinity (Tables 1 and 2 and Map 1). In the past ten years our list of known nests has increased from 10 to 30. While this could represent a trend of increasing population we are more inclined to suggest this is due to increased search effort and record keeping.

As Bald Eagles are primarily fish eaters, their nests and perch trees are typically within sight of water. Bald Eagles are a monogamous species, and will defend a nesting territory for many years. Along the British Columbia Coast, Bald Eagles defend a nesting territory of approximately one kilometre of coastline. For reasons not completely known, most pairs of Bald Eagles have more than one nest in their territories and they will often switch nests from year to year. By considering the nest usage pattern and the distances between nests we have divided the 30 known nesting sites into 20 nesting territories (Table 2 and Map 2).

The 1km circles in Map 2 are centred on either the nest location or an average centre point of nests thought to make up a territory. In the natural world, Bald Eagle nesting territories are never precise circles and will vary in size depending on habitat conditions. In areas of fast currents and where fish are often concentrated, such as Active Pass, nesting territories are expected to be smaller and closer

together. When attempting to assess the quality of available habitat, we might look at Map 2 and question why there are areas of coast with no apparent nesting territories. These might be sites where we have yet to look for nests or they may be areas where no suitable nest trees remain. On Mayne Island, Crane Point, along the south-west shore, is a prominent location with a good view of the surrounding area and it is surprising not to see the presence of an eagle nest.

#### Eagle Nesting Productivity:

Across North America, measuring the production of young at Bald Eagle nests is based on a common method that records the number of chicks raised to fledging in each occupied territory (see Postupalsky 1974). Over the past ten years, record keeping on Mayne Island has been sporadic and often the timing of observations has not followed the methodology. The results presented in Table 1 are too sparse for statistical comparison with other areas. This being said, on Mayne Island we have no reasons to expect any lower number of nesting attempts or success than on other area of the BC coast. Elliott *et al.* 1998 presents the Variable Reproductive Success of Bald Eagles on the British Columbia Coast. For comparative purposes, results from the south-east Vancouver Island area (1991-1995) have been added to the bottom of Table 1. While results from Mayne Island appear lower than expected, presumably due to sampling effort, the results do match what Sprunt *et al.* 1973 presents as the 0.7 young/occupied territory required to sustain a stable eagle population.

With the WiTS program, we often encounter local residents who have collected nest observations for many years and with these added to the Atlas we are able to update and improve our summary information.

#### Constraints to Bald Eagle Nesting Success:

The primary constraints to Bald Eagle nesting success are food supply, health, and the availability of nesting and perch trees.

In more remote areas, such as the west coast of Vancouver Island, Johnstone Strait, and the Queen Charlotte Islands food supply is thought to be the most limiting factor to nesting success. In these sites there are many nesting attempts initiated in the early spring which fail during the time of rapid chick growth (Elliott *et al.* 1998) In the Clayoquot Sound area the most successful nests were in proximity to supplemental food sources near settlement, logging camps and fishing resorts (Moul 1998).

While in most areas of North America, precipitous declines in the numbers of Bald Eagle in the 1950s and 1960s have been linked to health and chemical contamination, this appears to be less of an issue in the Strait of Georgia. Elliott and Norstrom 1996, report stable or declining chemical contaminant levels below the threshold likely to cause serious reproductive problems.

From the perspective of those of us in the WiTS program, preventing the loss of nesting and perching trees is a key component in assuring the long term viability of the eagle population. Along the east coast

of Vancouver Island, throughout the Gulf Islands and in the Lower Fraser Valley, development pressure for residential properties has led to loss of many nest and perch trees. Bald Eagles build large nests, often two meters across and weighing more than 500kg. In the past, the most common eagle nest trees were veteran Douglas fir, often with tops that were damaged by winds or lightning strikes. The preferred location of these trees is near the shore with commanding views of the ocean, the source of their food supply. As coastal forests are cleared for residential construction, lone veteran nest trees have increased risk for wind-throw, are considered as hazards and get cut down. With the loss of many of the preferred nest trees, eagles are nesting in smaller less suitable trees. The net result is more nest failure due to collapsing tree limbs and a need to nest further inland making it more difficult to both attend young eagles at the nest and to watch for food along the ocean shore.

#### Legislation Protecting Bald Eagle Nests:

Section 34 of the Provincial Wildlife Act provides year-round protection for Bald Eagle nests. This legislation does not protect the surrounding habitat. Nest trees and eagle nesting success often suffer due to disturbances, vegetation removal, and water table changes in the vicinity of nest trees. Excellent recommendations on protecting Bald Eagle nest trees may be found in a provincial Develop With Care publication available through the WITS website at <http://www.wildlifetree.org/docs/DWC-eagles.pdf>. To increase the protection of eagle nest trees, many Local Governments have included Bald Eagle nest protection in their Official Community Plans (OCPs) and developed bylaws that protect the habitat surrounding nest trees. These local bylaws are often in the form of Development Permit Areas (DPAs).

#### Additional information available through the WITS program:

Specific information for all nest sites we know of may be found on the WITS Atlas at [www.shim.bc.ca/atlasses/wits2/witsloginscreen.htm](http://www.shim.bc.ca/atlasses/wits2/witsloginscreen.htm). As the WITS program has a responsibility to protect personal privacy and sites of special conservation concern, some information will only be released following signed information sharing agreements. Beyond public viewing we have two levels of Atlas access: 1) The naturalist level allows one to view all information on public viewing, but also allows for the addition of new nest observations; 2) A government or consultant level, (requiring a signed understanding of confidentiality limits), offers detailed information on nest locations, an inventory description of the surrounding habitat, land tenure, and photographs of the nest sites. While we strive to keep our records up to date and accurate, all information in the WITS Atlas is dependent on what is provided to us by government, industry and the public.

On request, we are able to provide summary information on specific sites or areas, as is presented in this report. Within the constraints of personal privacy we are also able to provide mapping shape-files and/or lists of nest coordinates.

## Literature Cited

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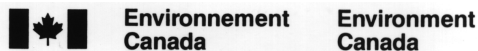
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This report was prepared by Ian Moul, RPBio and Coordinator for the WiTS program.

Electronic copies of this report may be found on the WiTS website [www.wildlifetree.org](http://www.wildlifetree.org) Look under Programs and Resources/ Reports



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**Table 1: Summary Result of Bald Eagle Nests: Mayne Island - British Columbia**

Year	# of Known Nest Sites	# of Known Territories	Territories Visited	Occupied Territories	% Occupied Territories	Sample of Occupied Territories	Number of Successful Territories	% nest success	Number of Young Produced	Young per Occupied Territory
2000	10	9	1	1	100	0				
2001	14	11	4	3	75	1	1	100	1	1.00
2002	14	11	0							
2003	16	12	10	7	70	0				
2004	16	12	1	1	100	1	1	100	2	2.00
2005	17	13	3	3	100	1	1	100	2	2.00
2006	23	16	13	10	77	3	1	33	2	0.67
2007	25	16	12	9	75	0				
2008	27	16	6	3	50	0				
2009	30	20	17	13	76	7	3	43	3	0.43
Summary Totals			67	50	75	13	7	54	10	0.77
South-east Vancouver Island 1991-1995 (Elliott et al. 1998)			41	32	89	41	20	64	32	0.95

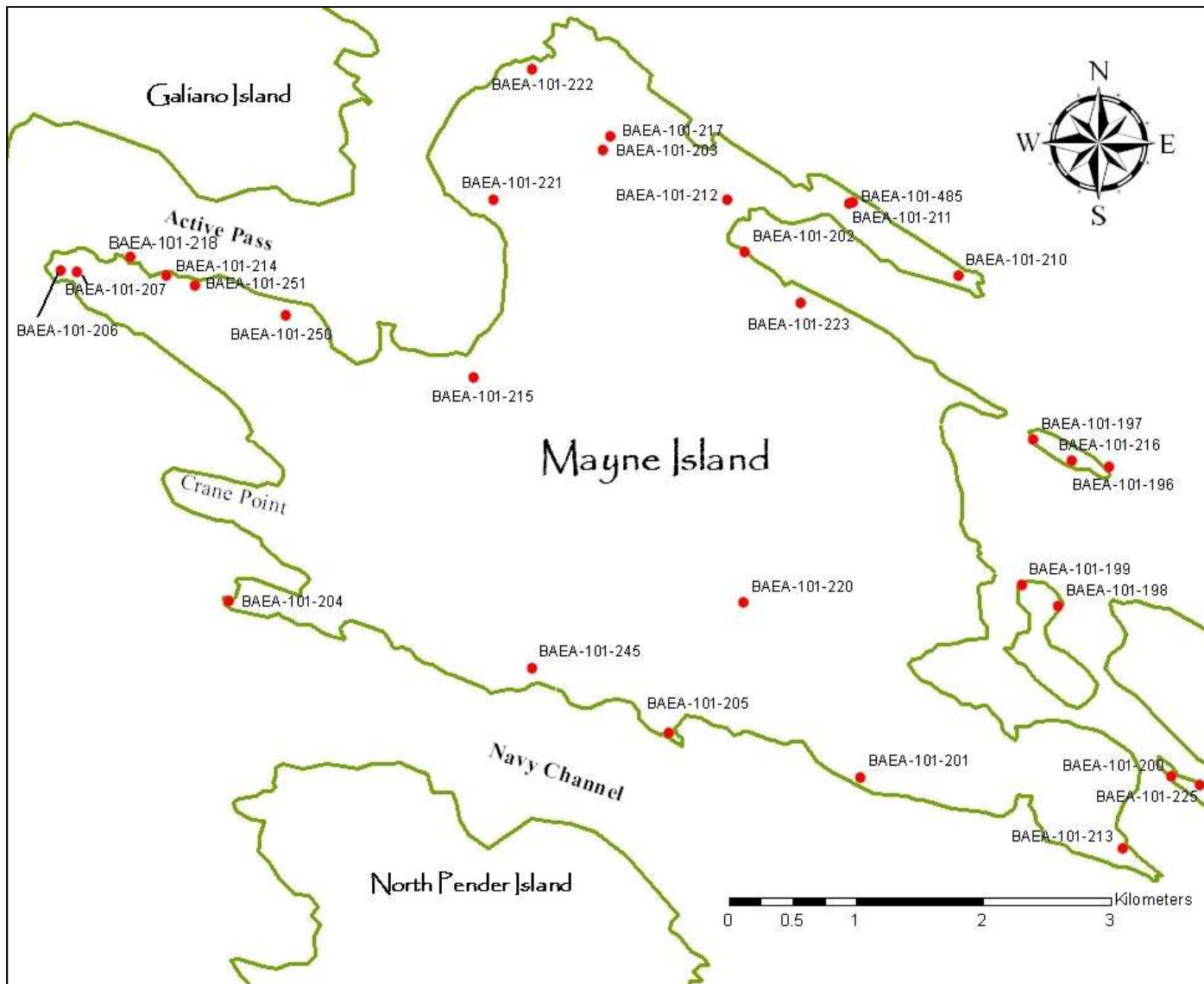
**Table 2: Wildlife Tree Stewardship (WiTS) Records for Bald Eagle Nesting Territories on Mayne Island**

This information corresponds to records in the WiTS Atlas from 1 Jan 2000 to 5 November 2009

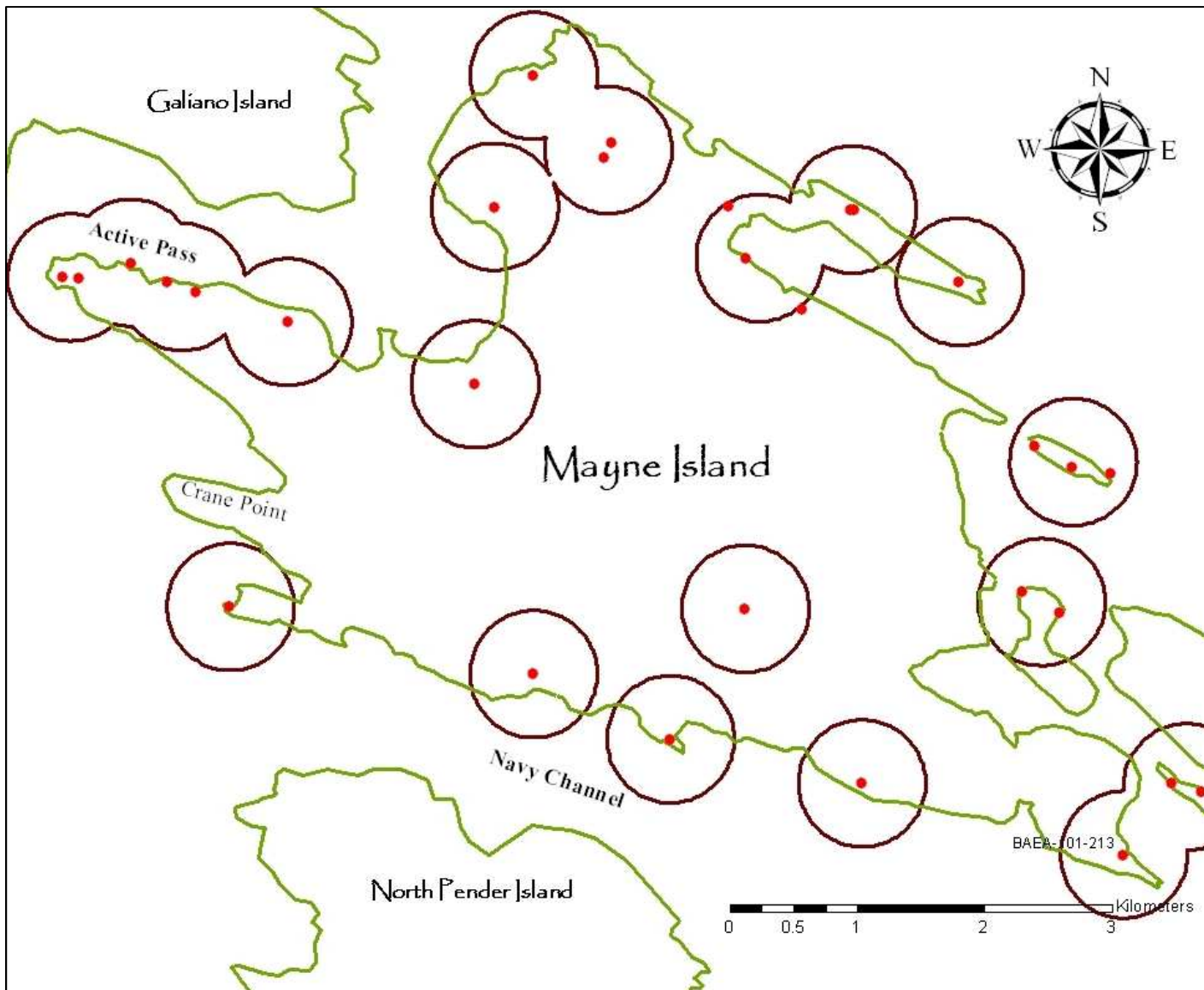
Territory #	Nest ID #	Site Name	Year										
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
MI-T01	BAEA-101-204	Dinner Point								0C	0C		A
MI-T02	BAEA-101-245	Navy Channel Road										1C	1C
MI-T03	BAEA-101-205	Piggott Point							2C	1C	0C	N/A	OT
MI-T04	BAEA-101-201	Henderson Hill								0C	1C	A	0C
MI-T05	BAEA-101-213	Saint John's Point		OT									N/A
MI-T06	BAEA-101-200	Lizard Island - A				N/A					N/A		OT
	BAEA-101-225	Lizard Island - B									1C		A
MI-T07	BAEA-101-198	Curlew Island - A	Last record 1987 - N/A										
	BAEA-101-199	Curlew Island - B		N/A		A				A	N/A		0C
MI-T08	BAEA-101-196	Georgeson Island SE		A									
	BAEA-101-197	Georgeson Island NW		A		A				1C	N/A		OT
	BAEA-101-216	Georgeson Island - centre		A									
MI-T09	BAEA-101-202	Campbell Bay (Bell Bay Rd)				A	2C	2C	2C	2C	OT	N/A	
	BAEA-101-212	Hall Hill	Only Record 1987 - A										
	BAEA-101-223	Campbell Bay - B									1C		1C
MI-T10	BAEA-101-211	W Edith Point - A				A				1C	OT		OT
	BAEA-101-485	W Edith Point - B								OT	A		N/A
MI-T11	BAEA-101-210	Edith Point				A				N/A	OT		N/A
MI-T12	BAEA-101-203	Chu-an Trail (upper tree 2)									N/A	N/A	OT
	BAEA-101-217	Chu-an Trail (lower tree 1)				A		0C	N/A	0C			OT
MI-T13	BAEA-101-222	Maude Bay											0C
MI-T14	BAEA-101-221	Miners Bay - North										A	1C
MI-T15	BAEA-101-215	Miners Bay - South (Maple Dr)				N/A							
MI-T16	BAEA-101-250	Naylor Bay - West	No records for this site										
MI-T17	BAEA-101-214	Active Pass - A				A				1C			N/A
	BAEA-101-251	Active Pass - B											N/A
MI-T18	BAEA-101-218	Helen Point - East		1C		A				1C	A		N/A
MI-T19	BAEA-101-206	Helen Point (tip)								OT	OT	N/A	1C
	BAEA-101-207	Helen Point (East of Tip)								1C			
MI-T20	BAEA-101-220	Gallagher Bay Road	2C										

Code descriptions: N/A - Not Active, A - Active nest site, OT - Occupied nesting territory, 0C - no chicks, failed nesting attempt, 1C - one chick, 2C - two chicks

Notes: 1) Highlighted cells represent data that does not satisfy the two site visit method. These records may be improved with new information.



Map 1: Known Bald Eagle nest trees on Mayne Island British Columbia



Map 2: Bald Eagle Nesting Territories on Mayne Island British Columbia