

Marine Bird Surveys

2005-2008

**Raw Sightings
Information**



RAINCOAST
CONSERVATION FOUNDATION



MARINE BIRD SURVEYS

2005-2008

Raw Sightings Information

2013

Surveys completed by: Raincoast Conservation Foundation
Document prepared by: Gillian Harvey and Caroline Fox
Cover images provided by: Caroline Fox and Mike Munroe
Maps by: Daisuke Kawai and Gillian Harvey

©2013 Raincoast Conservation Foundation
PO Box 2429
Sidney, BC V8L 3Y3

For further information, contact caroline@raincoast.org



ACKNOWLEDGEMENTS

R. Williams, L. Thomas, B. Best, M. Price, H. Krajewsky, B. Falconer, P. Paquet, M. MacDuffee, H. Recker, J. Weir, D. Kawai and other Raincoast team members, volunteers and supporters are thanked for contributing to this research. This project was supported in part by Marisla Foundation, Gordon and Betty Moore Foundation, Bullitt Foundation, Vancouver Foundation, McLean Foundation, The Russell Family Foundation, Endswell, Mountain Equipment Co-op, Patagonia, The Jane Marcher Foundation, Willow Grove Foundation, BaseCamp Adventure Outfitters, Raincoast Conservation Foundation donors and others.



Table of Contents

Introduction	1
Methods	1
Seabirds	3
Albatrosses	
Black-footed Albatross.....	3
Laysan Albatross	4
Short-tailed Albatross	5
Alcids	
Common Murre	6
Pigeon Guillemot	7
Marbled Murrelet	8
Ancient Murrelet.....	9
Cassin’s Auklet	10
Rhinoceros Auklet.....	11
Tufted Puffin	12
Horned Puffin.....	13
Cormorants	
Brandt’s Cormorant	14
Double-crested Cormorant	15
Pelagic Cormorant	16
Fulmars and Shearwaters	
Northern Fulmar	17
Pink-footed Shearwater.....	18
Buller’s Shearwater	19
‘Dark’ Shearwaters: Flesh-footed Shearwater, Short-tailed Shearwater & Sooty Shearwater	20
Jaegers, Kittiwakes and Gulls	
Pomarine Jaeger	21
Parasitic Jaeger	22
Long-tailed Jaeger	23
Black-legged Kittiwake	24

Bonaparte's Gull	25
Mew Gull.....	26
California Gull.....	27
Herring Gull & Thayer's Gull	28
Glaucous-winged Gull	29
Sabine's Gull.....	30
Western Gull	31
Storm-petrels	
Leach's Storm-petrel.....	32
Fork-tailed Storm-petrel	33
Shorebirds	34
Oystercatchers	
Black Oystercatcher	34
Sandpipers and Phalaropes	
Whimbrel	35
Dunlin.....	36
Black Turnstone	37
Red-necked Phalarope.....	38
Waterfowl	39
Ducks	
Mallard.....	39
Northern Shoveler	40
Greater Scaup	41
Bufflehead.....	42
Surf Scoter.....	43
White-winged Scoter	44
Black Scoter.....	45
Harlequin Duck.....	46
Long-tailed Duck	47
Hooded Merganser	48
Red-breasted Merganser.....	49
Geese	
Snow Goose	50

Brant	51
Canadian Goose	52
Grebes	
Horned Grebe	53
Red-necked Grebe	54
Western Grebe.....	55
Loons	
Red-throated Loon.....	56
Pacific Loon	57
Common Loon.....	58
Yellow-billed Loon.....	59
<u>Marine Raptors</u>	
Osprey.....	60
Bald Eagle.....	61
<u>Marine-Associated Birds</u>	<u>62</u>
Great-blue Heron	62
Sandhill Crane	63
Belted Kingfisher	64
Northwestern Crow	65
Common Raven.....	66
<u>Author's note</u>	<u>67</u>

INTRODUCTION

In 2005, Raincoast initiated systematic, surveys of British Columbia's coastal waters to determine the at-sea abundance and distribution of marine birds. Performed alongside surveys for marine mammals that were started in 2004, this research is part of our effort to (1) generate a quantitative baseline of marine birds at-sea, (2) better understand bird-habitat relationships at-sea, (3) support stronger science-based decision making and (4) understand some of the risks to marine wildlife posed by coastal industrial activities (e.g. tanker traffic, oil spills etc).

Between 2005 and 2008, in an area that measures over 70,000 km², over 10,000 km of marine track-line were surveyed and almost 18,000 sightings of nearly 100,000 birds were collected.

The survey area included the waters of the Queen Charlotte Basin, including Dixon Entrance, Hecate Strait, Queen Charlotte Sound, Queen Charlotte Strait and mainland inlets such as Spiller and Rivers Inlets. In this document, raw sightings data for marine bird species sighted are provided. Note that these data are collected using Distance Sampling (DS); raw sightings data do not represent measures of density or abundance and should be used quantitatively with caution. However, these data are valuable for information relating to distribution, area of occurrence and seasonal or annual patterns.

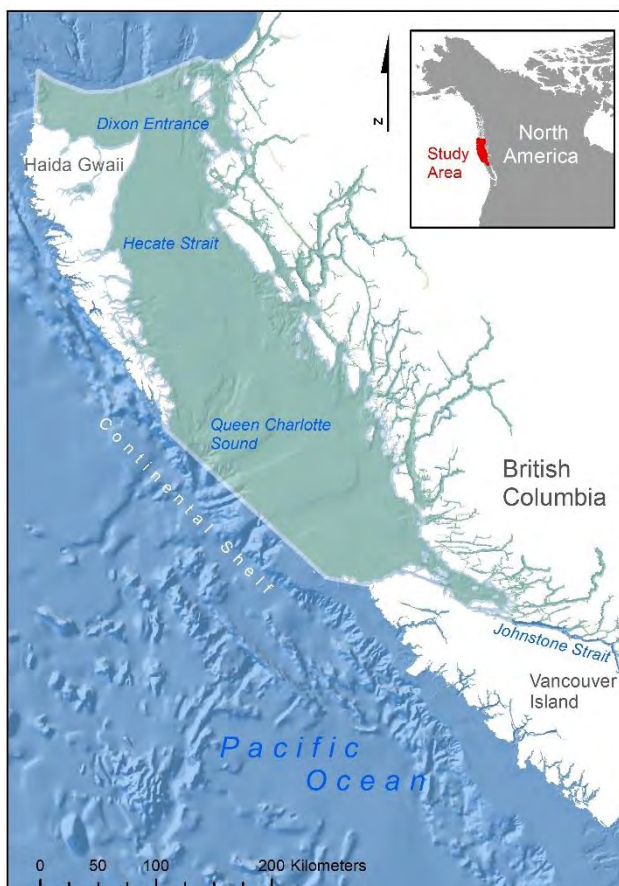


Figure 1: Queen Charlotte Basin and associated inlets.

METHODS

Line transect surveys using DS are an effective approach for estimating the density and/or size of wildlife populations (Buckland et al. 2001). Marine bird surveys using DS were conducted five times during 2005 – 2008, in conjunction with cruises originally designed and conducted for marine mammals (for details, see Williams and Thomas 2007, and Thomas et al. 2007).

Two research vessels were used for surveys: in 2005, the survey was conducted aboard

the Gwaii Haanas, a 20-metre long powerboat and subsequent surveys were conducted aboard the Achiever, a 22-metre long powered sailboat. Average running speed was ~15 km/h. Vessel location was tracked by GPS, with location recorded every 10 seconds. One to two trained observers conducted bird surveys with an average eye height of 2.5 – 3.5 m above sea level using naked eyes and binoculars

(8×42) to scan 180° of the vessel's course. Marine bird sighting data collected consisted of time of detection, estimated distance between observer and bird/bird group, estimated object angle from the track line, species, group size, and object position (in flight or on water). Species were identified with >95% observer confidence; otherwise, higher taxa or group specifications were applied.

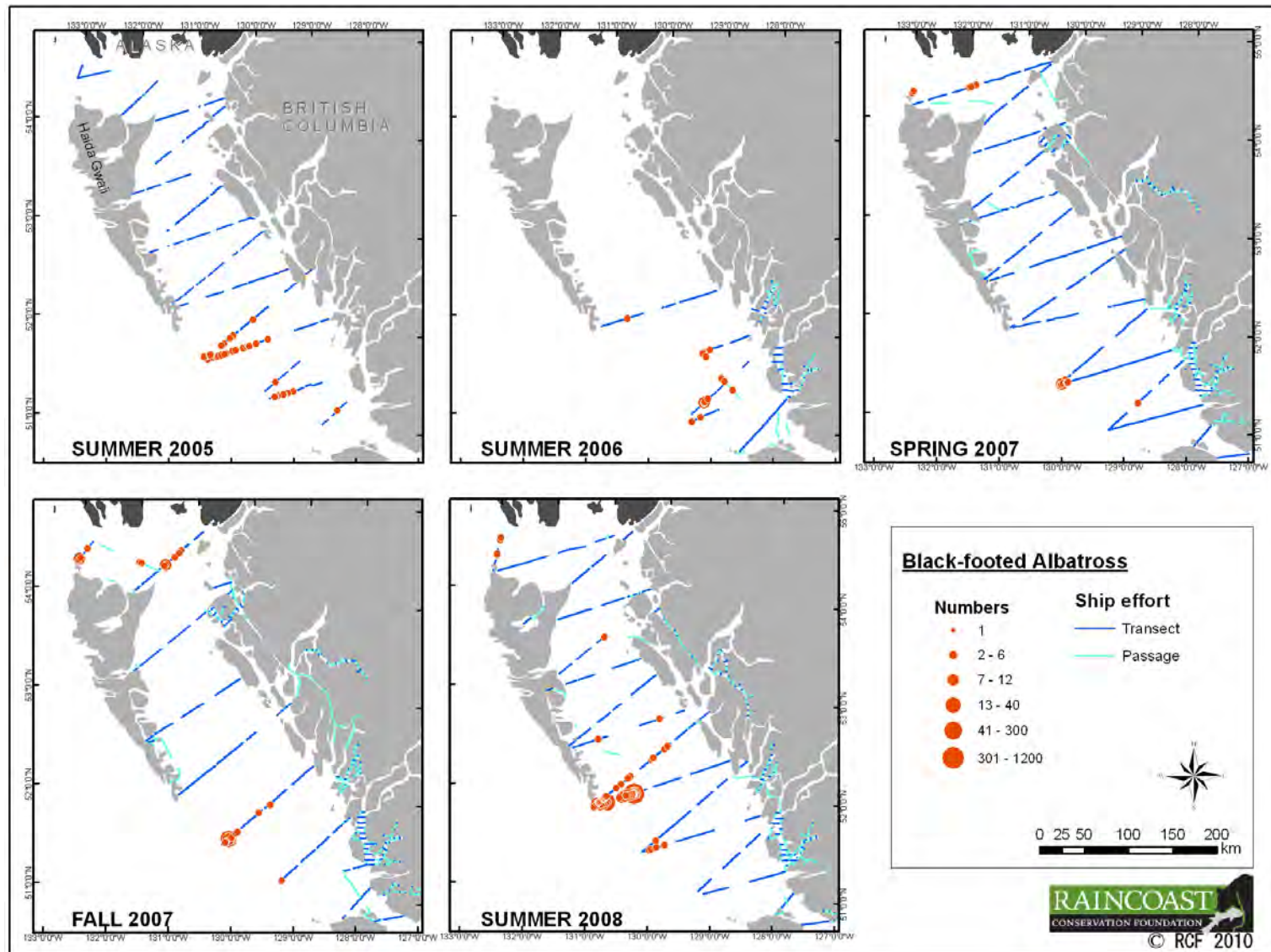
References:

Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L. & Thomas, L. 2001. Introduction to Distance Sampling. Oxford University Press, Oxford, UK.

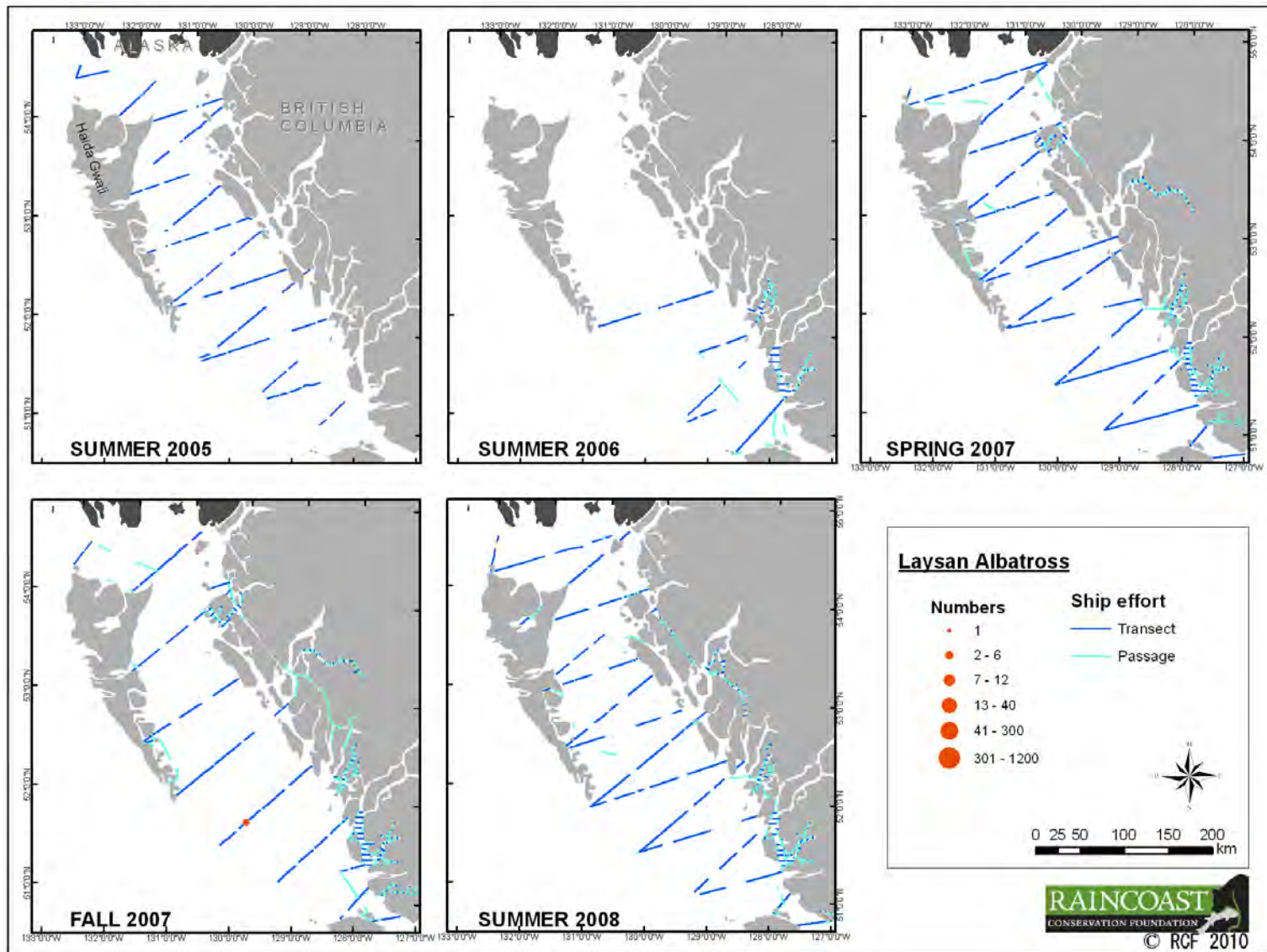
Thomas, L., Williams, R. & Sandilands, D. 2007. Designing line transect surveys for complex survey regions. *Journal of Cetacean Research and Management* 9: 1-13.

Williams, R. & Thomas, L. 2007. Distribution and abundance of marine mammals in the coastal waters of British Columbia, Canada. *Journal of Cetacean Research Management* 9: 15-28.

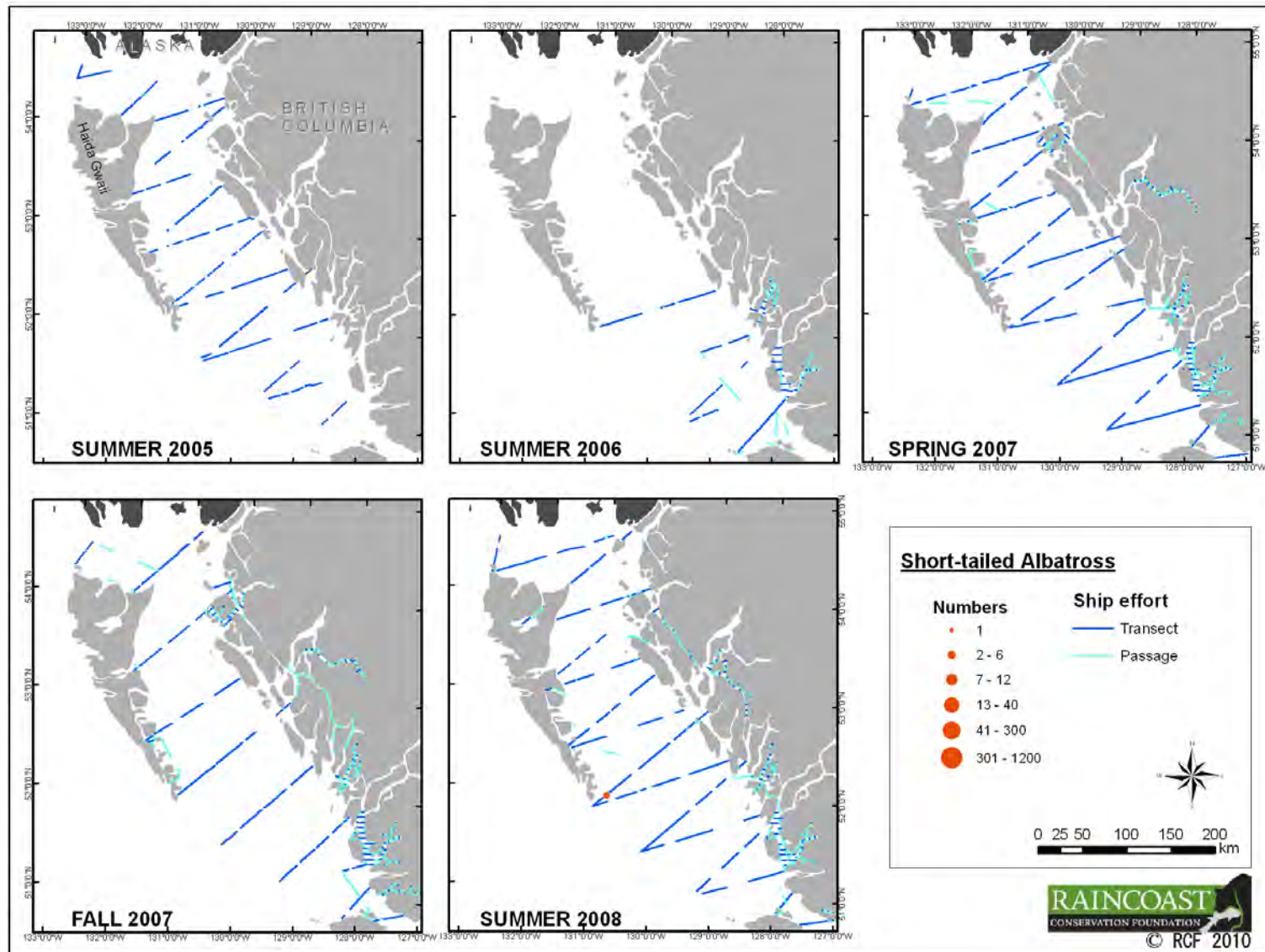
BLACK-FOOTED ALBATROSS

Figure 2: Black-footed Albatross (*Phoebastria nigripes*) sightings from surveys 2005-2008.

LAYSAN ALBATROSS

Figure 3: Laysan Albatross (*Phoebastria immutabilis*) sightings from surveys 2005-2008.

SHORT-TAILED ALBATROSS

Figure 4: Short-tailed Albatross (*Phoebastria albatrus*) sightings from surveys 2005-2008.

COMMON MURRE

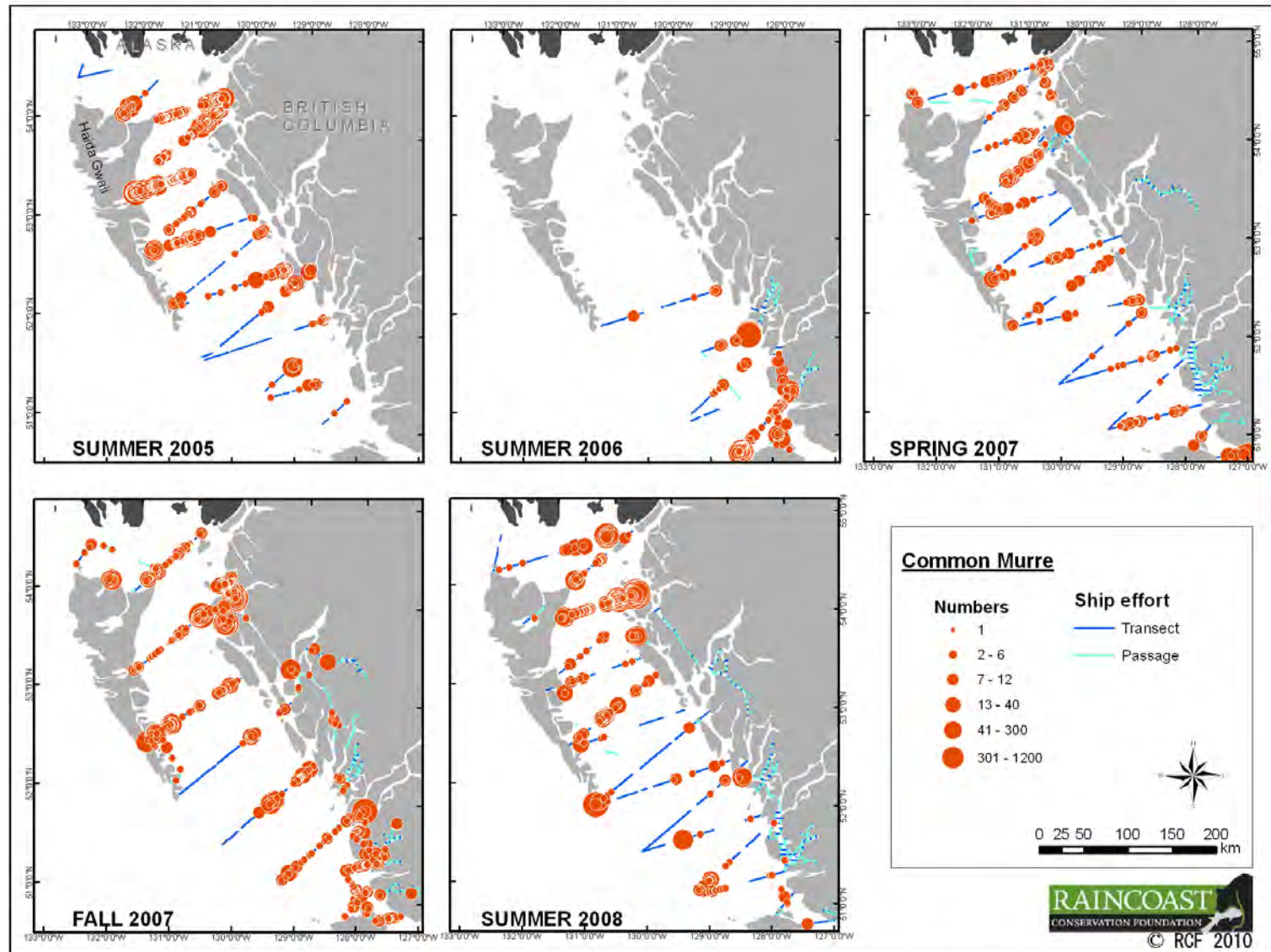
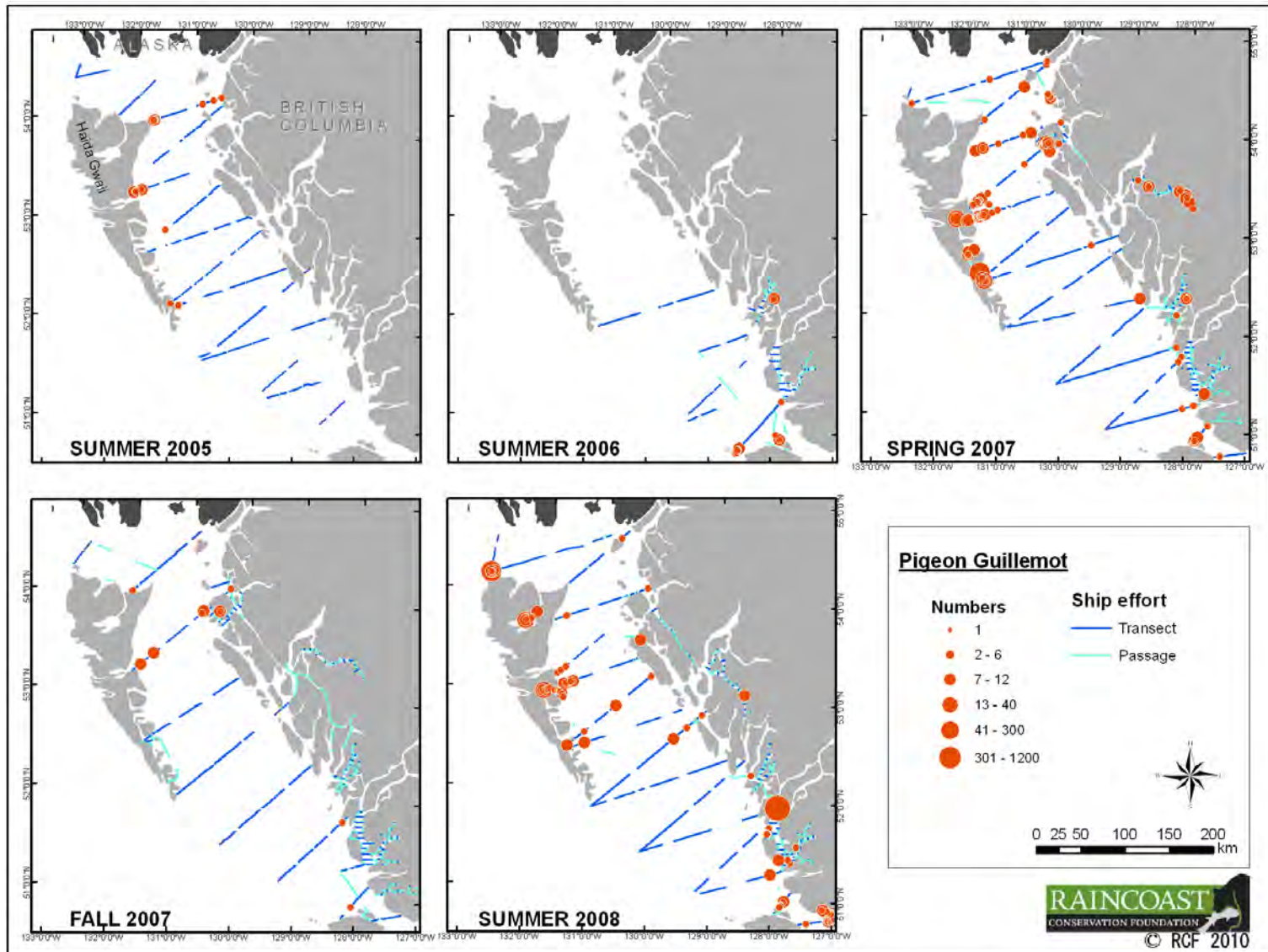
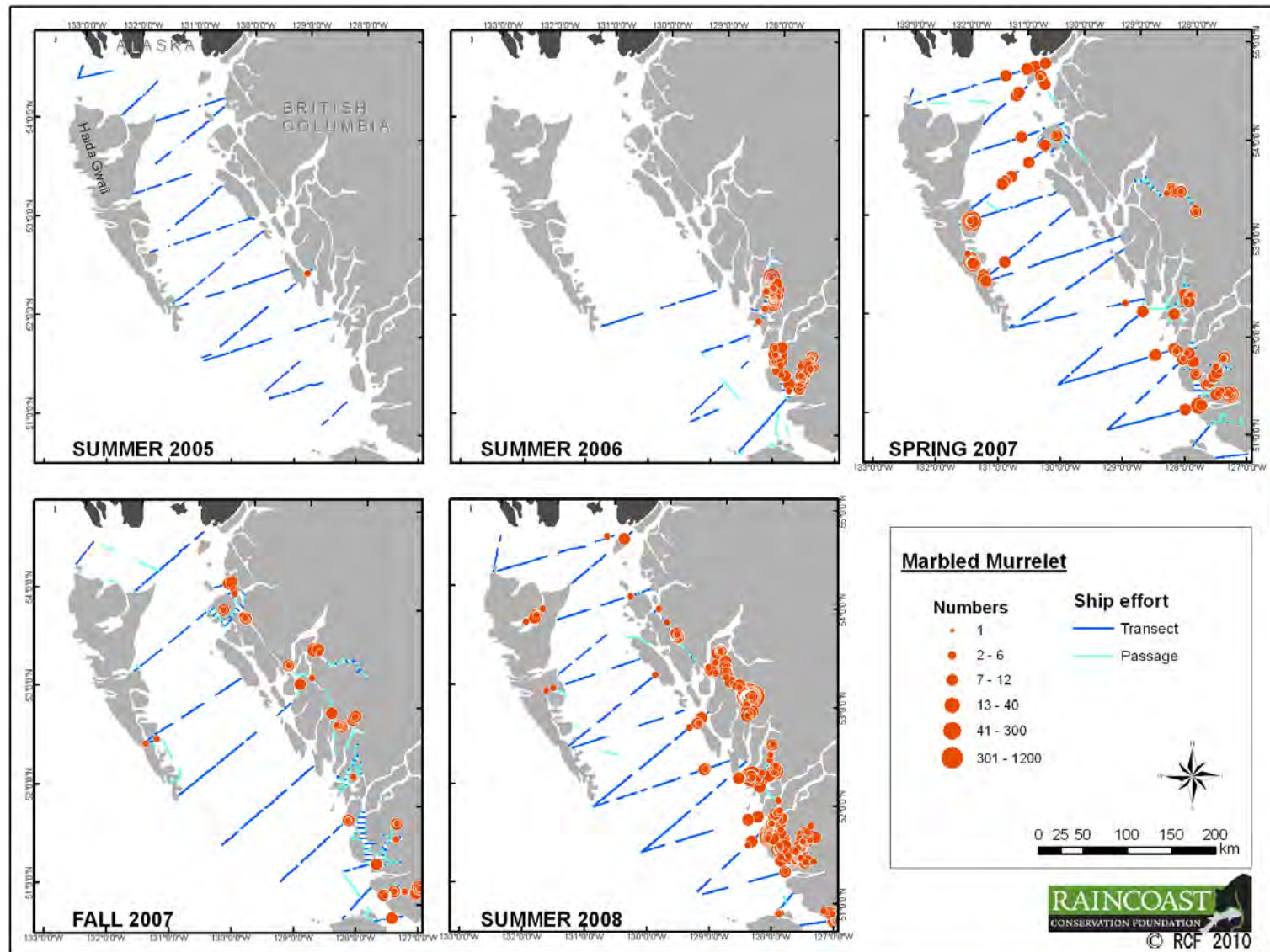


Figure 5: Common Murre (*Uria aalge*) sightings from surveys 2005-2008.

PIGEON GUILLEMOT

Figure 6: Pigeon Guillemot (*Cepphus columba*) sightings from surveys 2005-2008.

MARBLED MURRELET

Figure 7: Marbled Murrelet (*Brachyramphus marmoratus*) sightings from surveys 2005-2008.

ANCIENT MURRELET

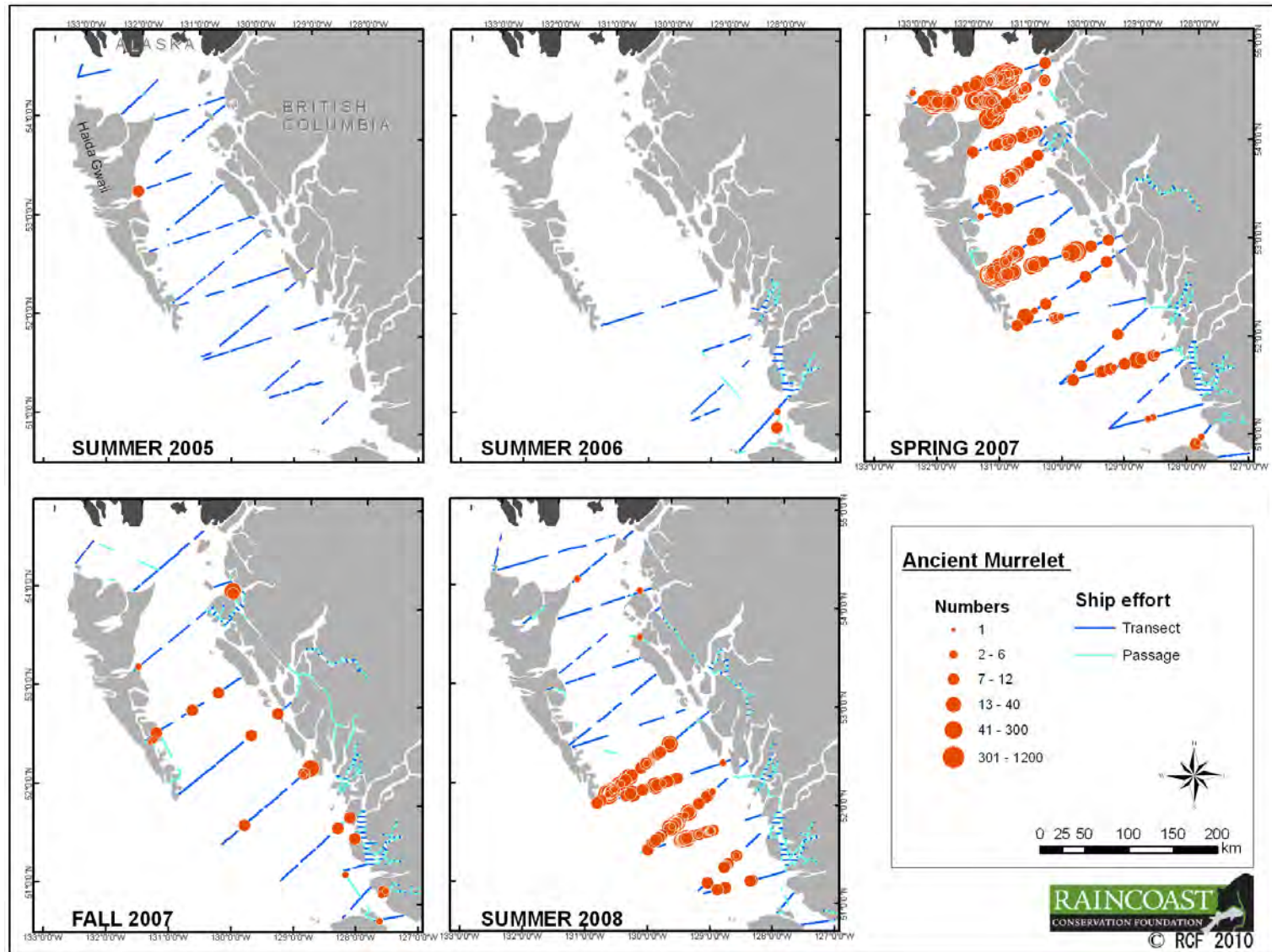


Figure 8: Ancient Murrelet (*Synthliboramphus antiquus*) sightings from surveys 2005-2008.

CASSIN'S AUKLET

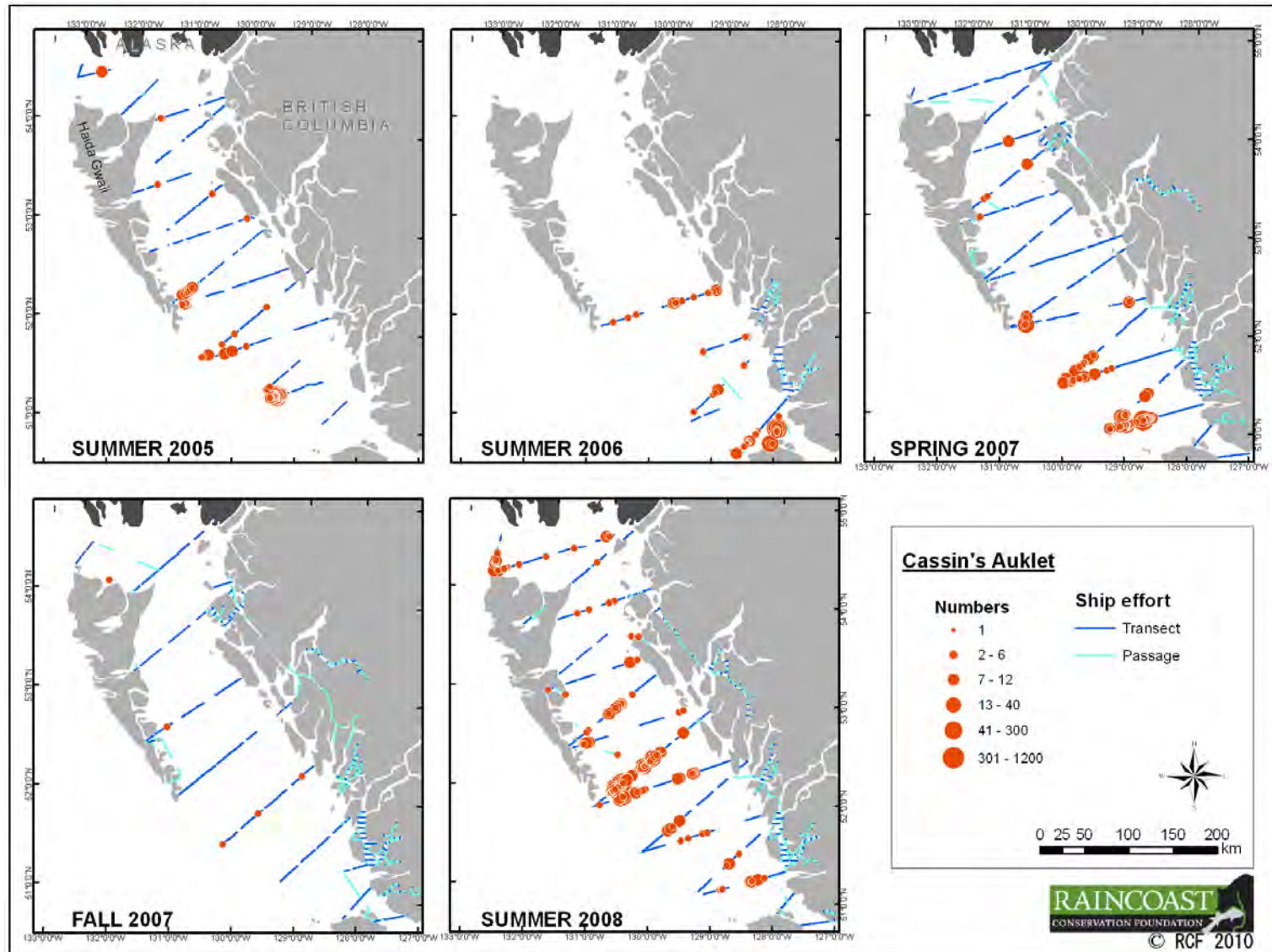
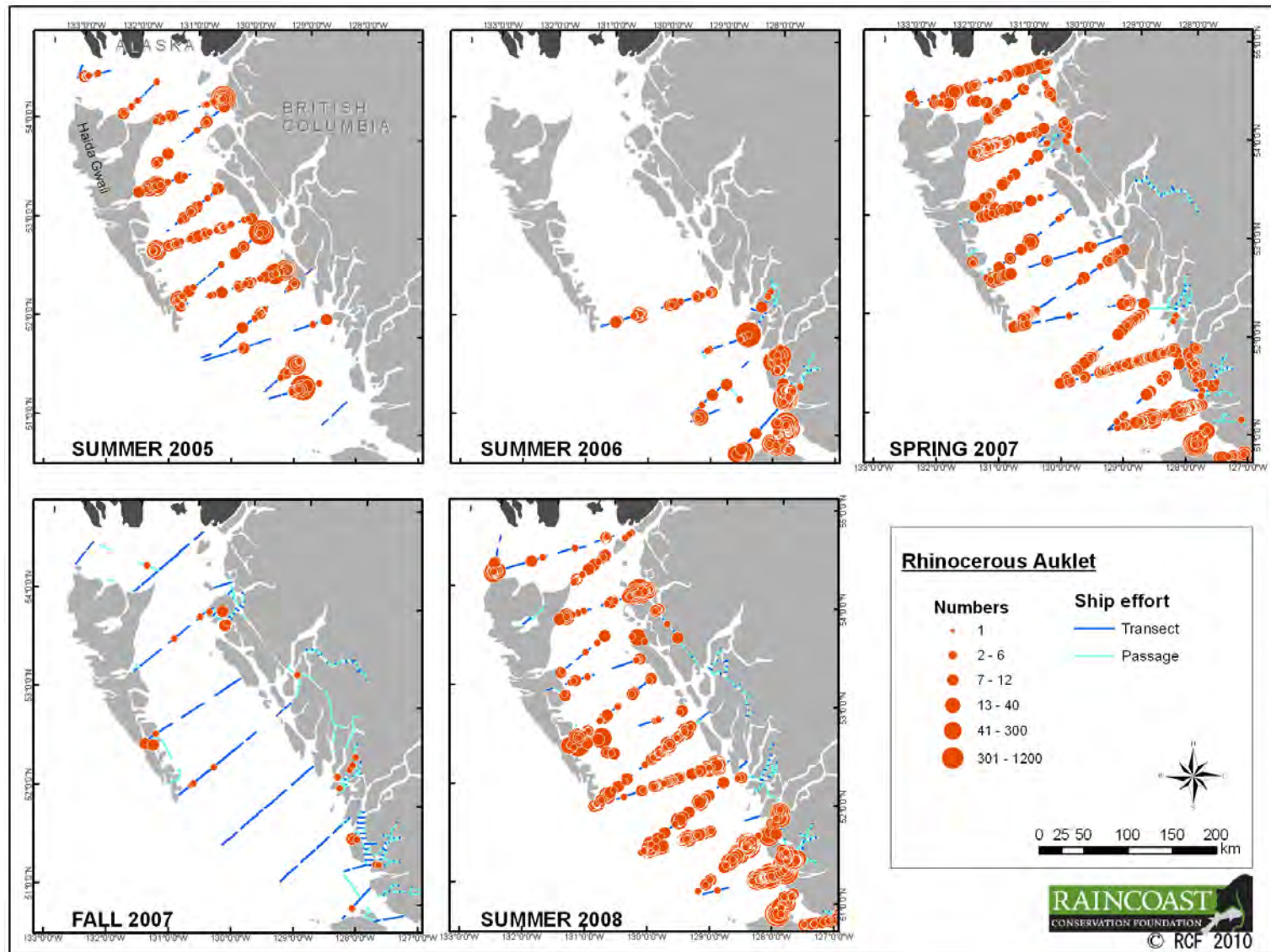
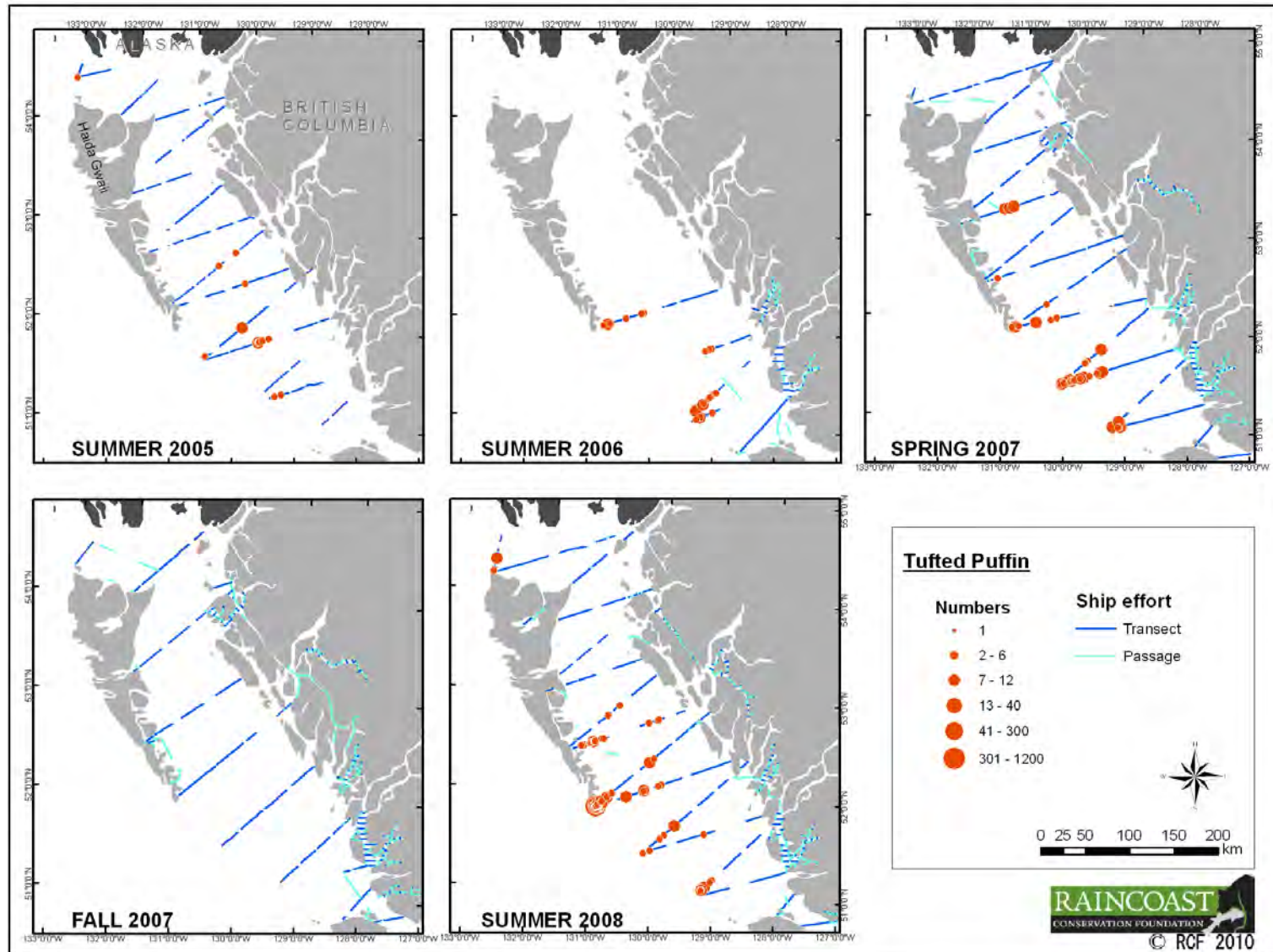


Figure 9: Cassin's Auklet (*Ptychoramphus aleuticus*) sightings from surveys 2005-2008.

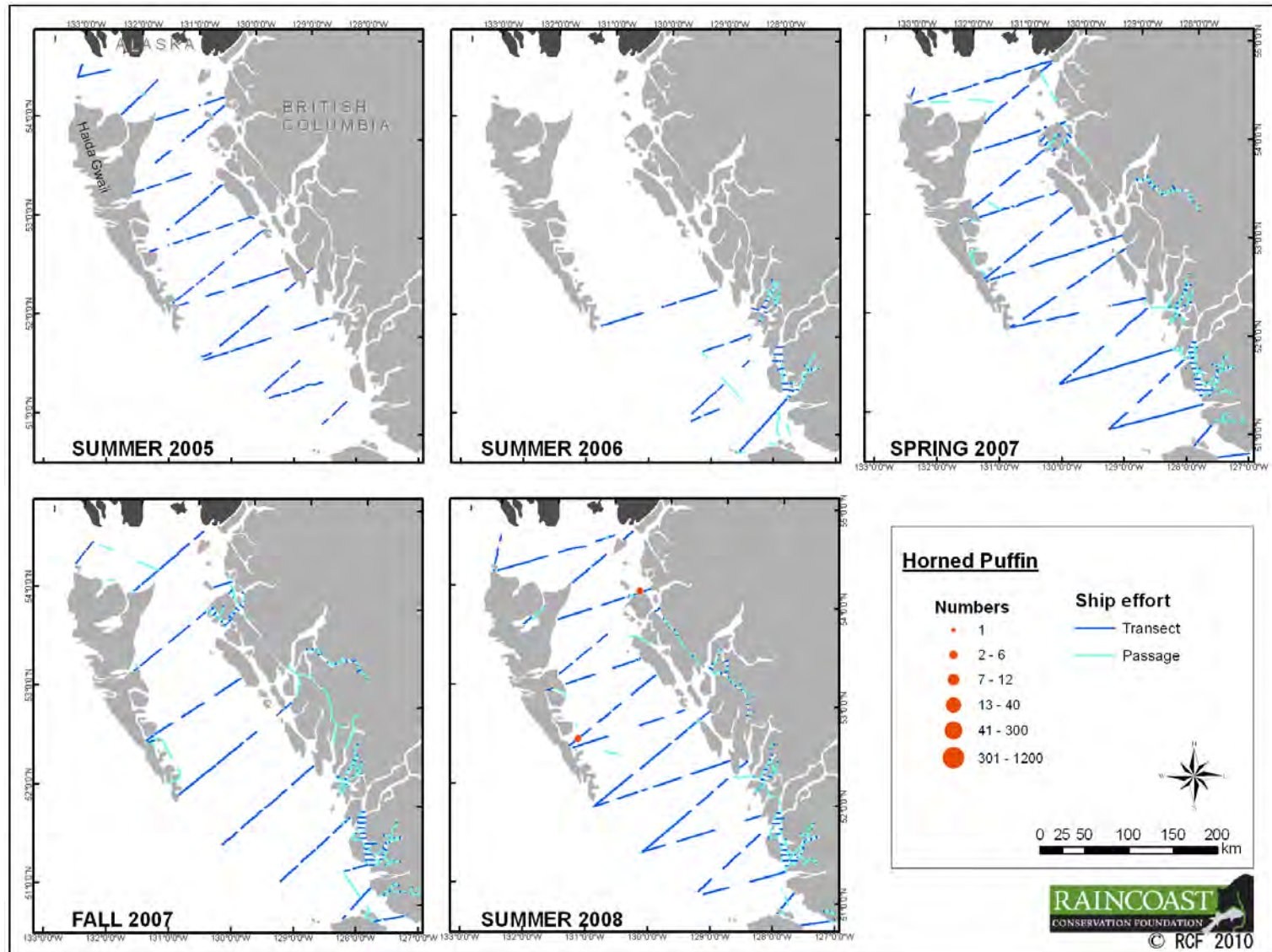
RHINOCEROUS AUKLET

Figure 10: Rhinoceros Auklet (*Cerorhinca monocerata*) sightings from surveys 2005-2008.

TUFTED PUFFIN

Figure 11: Tufted Puffin (*Fratercula cirrhata*) sightings from surveys 2005-2008.

HORNED PUFFIN

Figure 12: Horned Puffin (*Fratercula corniculata*) sightings from surveys 2005-2008.

BRANDT'S CORMORANT

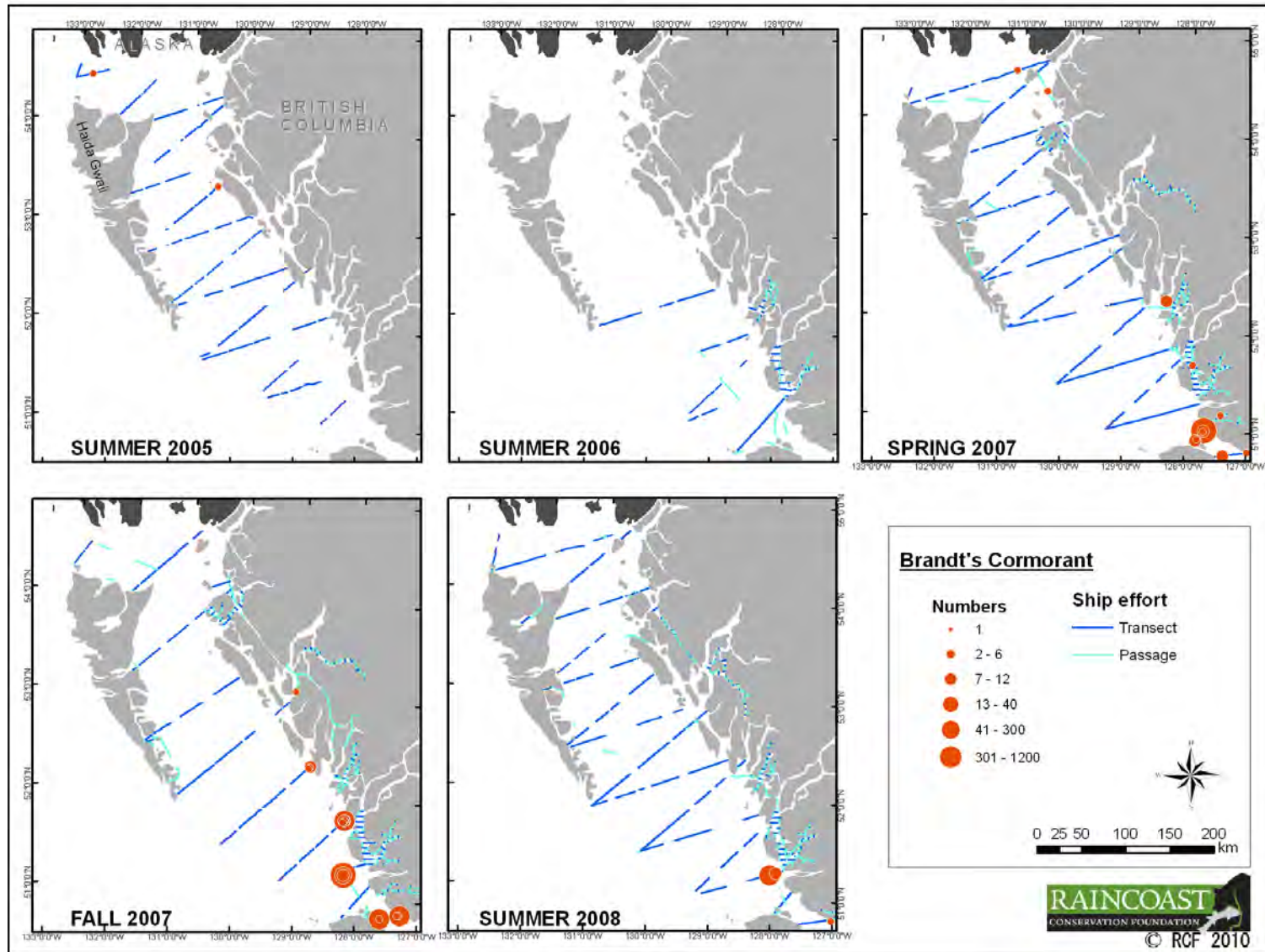
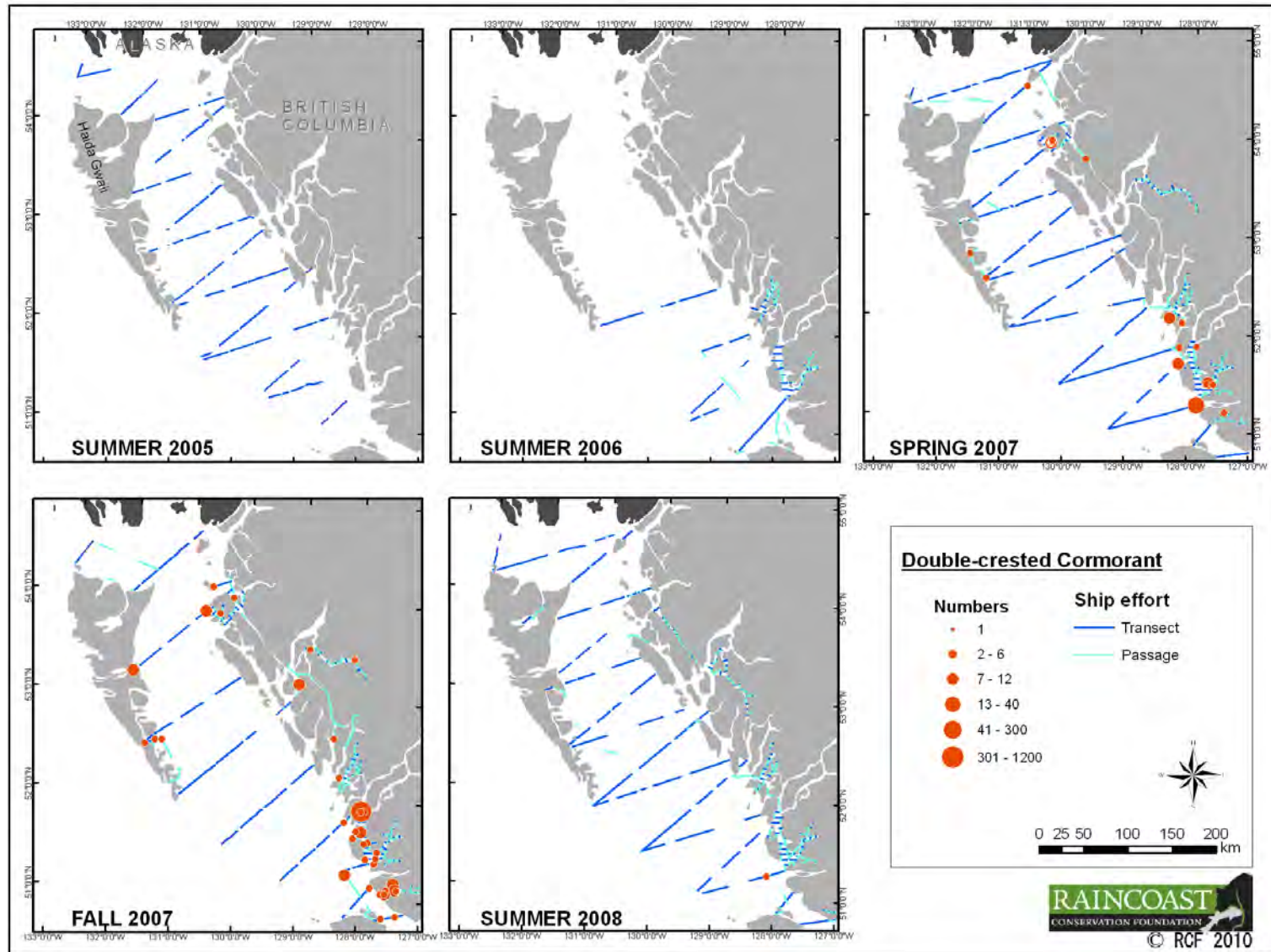


Figure 13: Brandt's Cormorant (*Phalacrocorax penicillatus*) sightings from surveys 2005-2008.

DOUBLE-CRESTED CORMORANT

Figure 14: Double-crested Cormorant (*Phalacrocorax auritus*) sightings from surveys 2005-2008.

PELAGIC CORMORANT

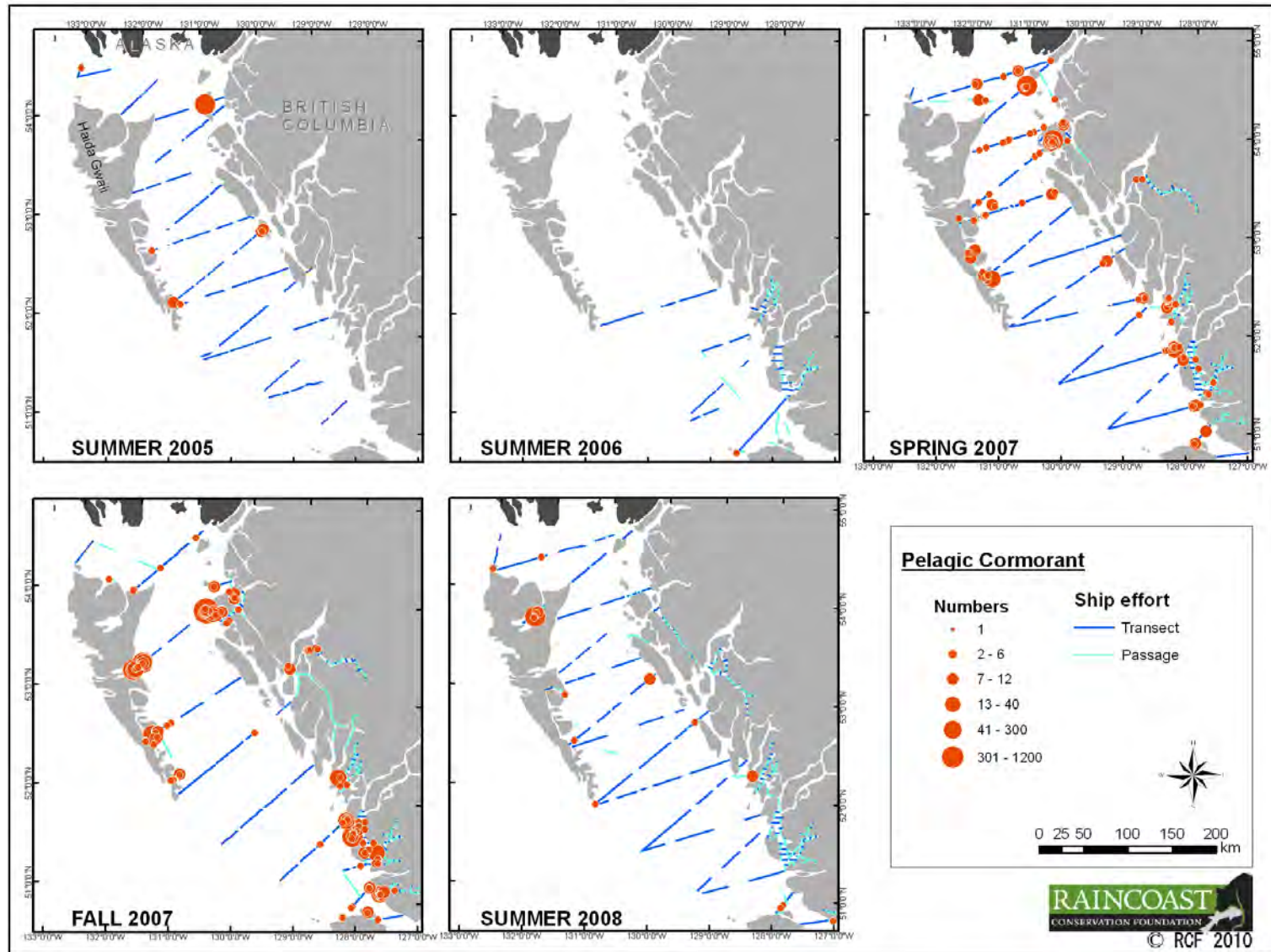
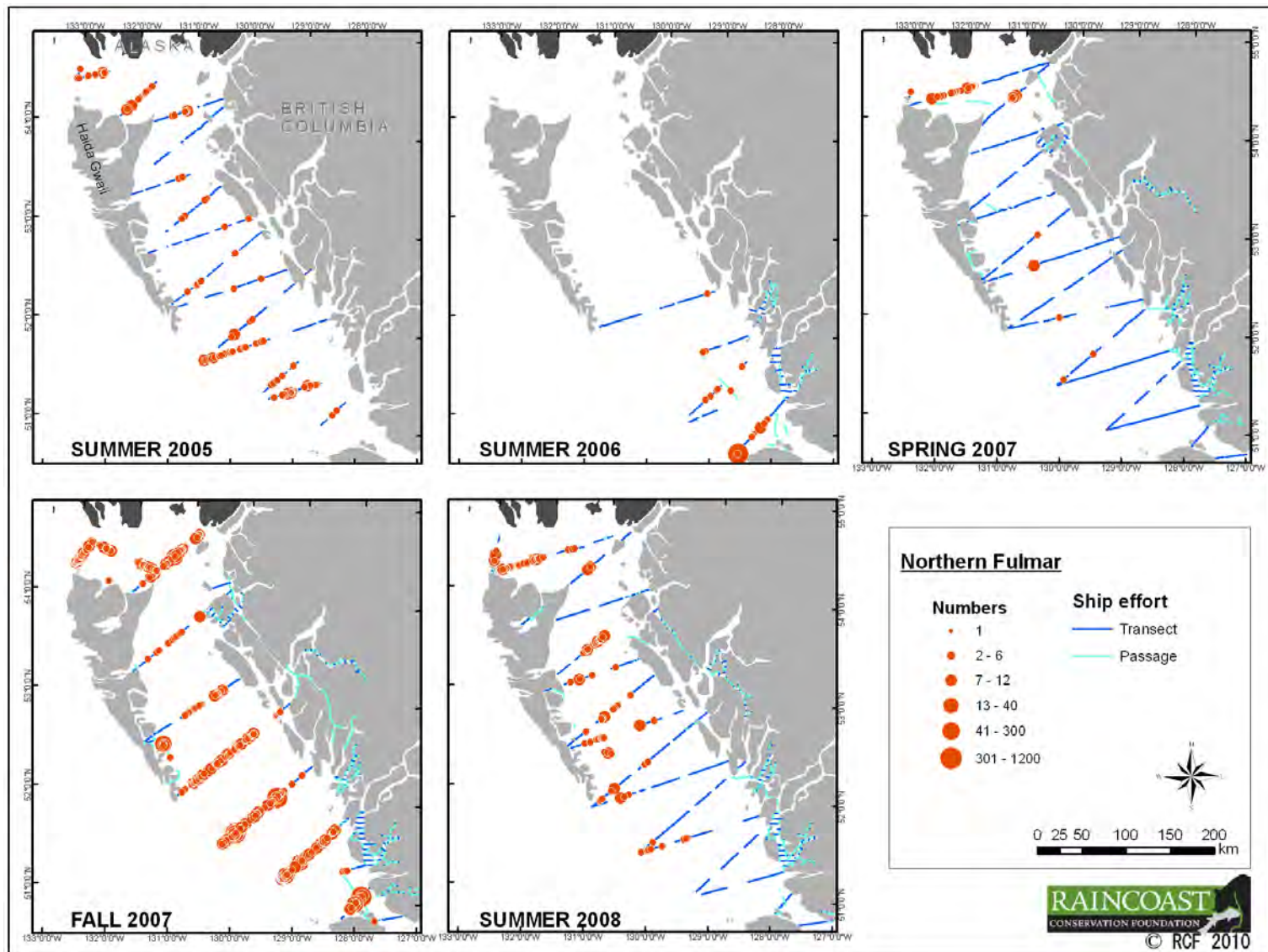
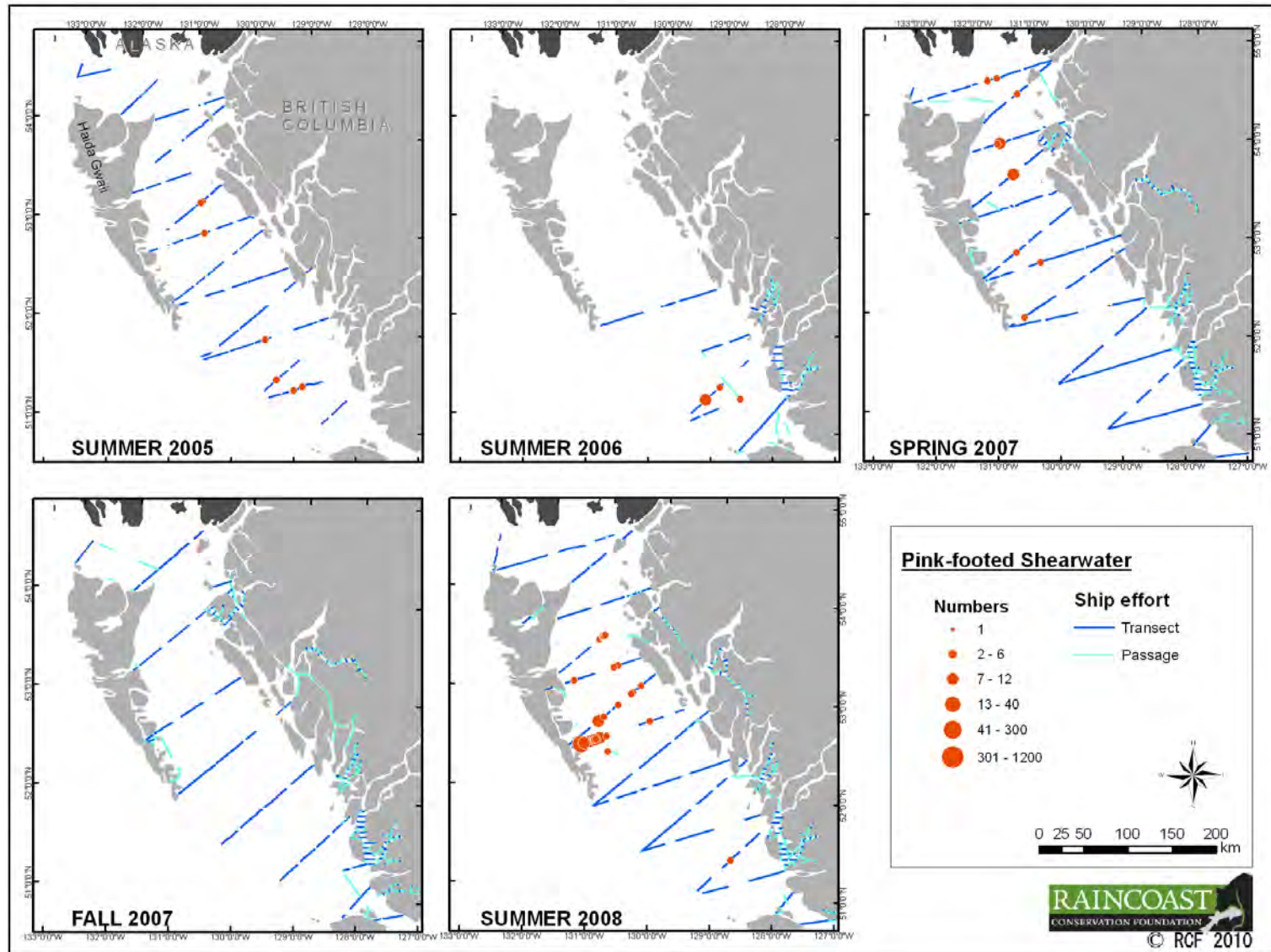


Figure 15: Pelagic Cormorant (*Phalacrocorax pelagicus*) sightings from surveys 2005-2008.

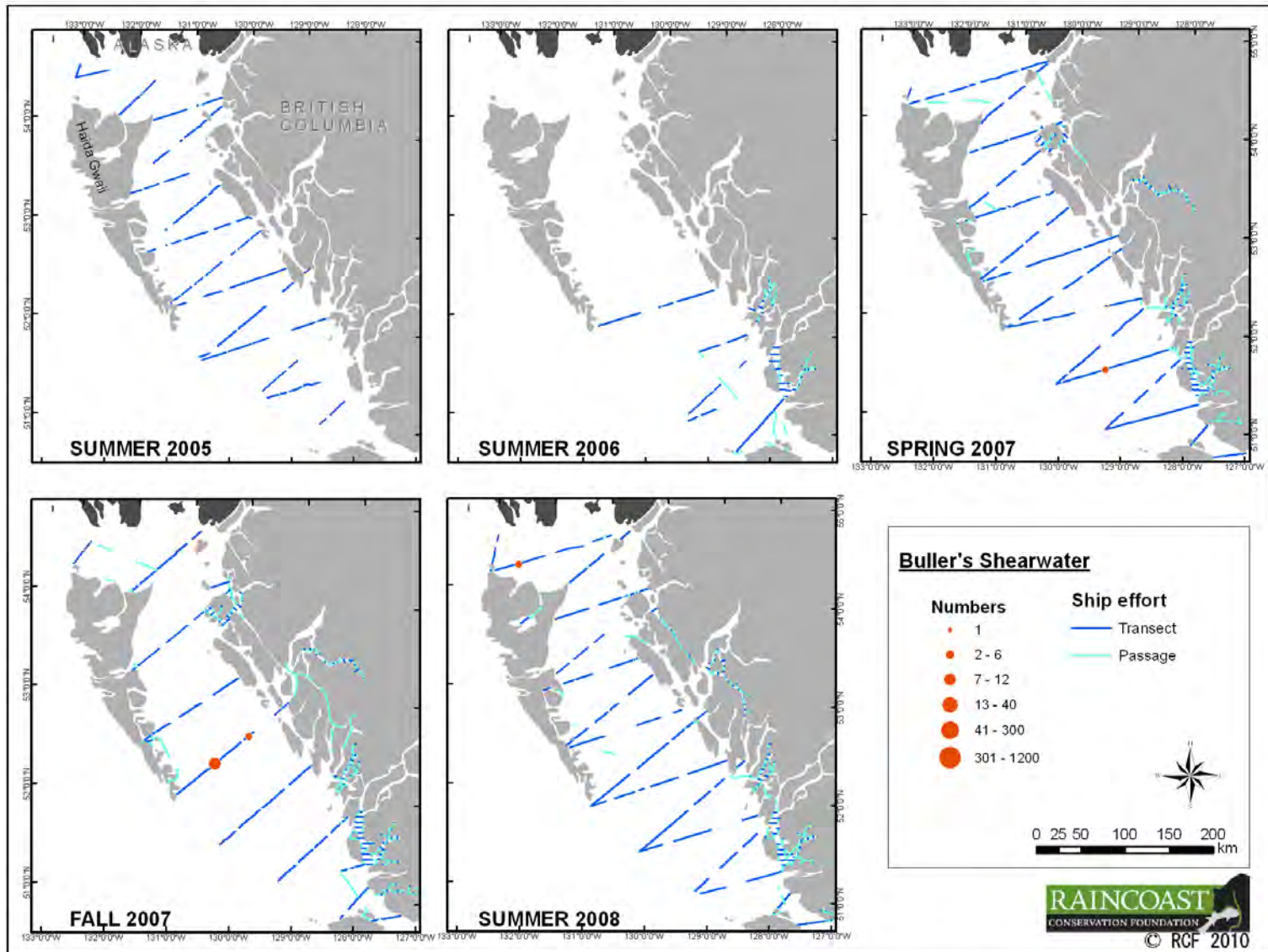
NORTHERN FULMAR

Figure 16: Northern Fulmar (*Fulmaris glacialis*) sightings from surveys 2005-2008.

PINK-FOOTED SHEARWATER

Figure 17: Pink-footed Shearwater (*Puffinus creatopus*) sighting from surveys 2005-2008.

BULLER'S SHEARWATER

Figure 18: Buller's Shearwater (*Puffinus bulleri*) sightings from surveys 2005-2008.

'DARK' SHEARWATERS: FLESH-FOOTED SHEARWATER, SHORT-TAILED SHEARWATER & SOOTY SHEARWATER

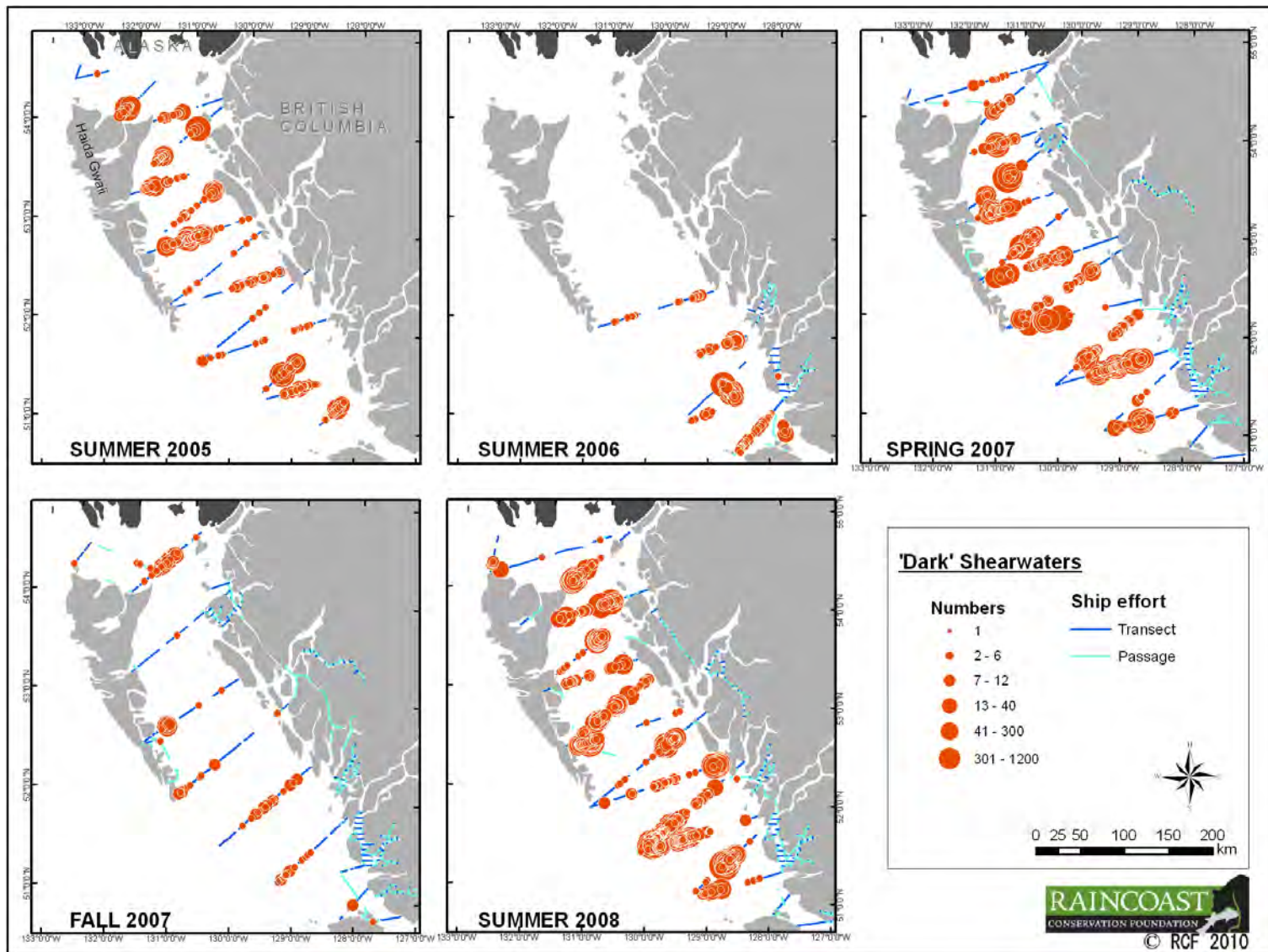
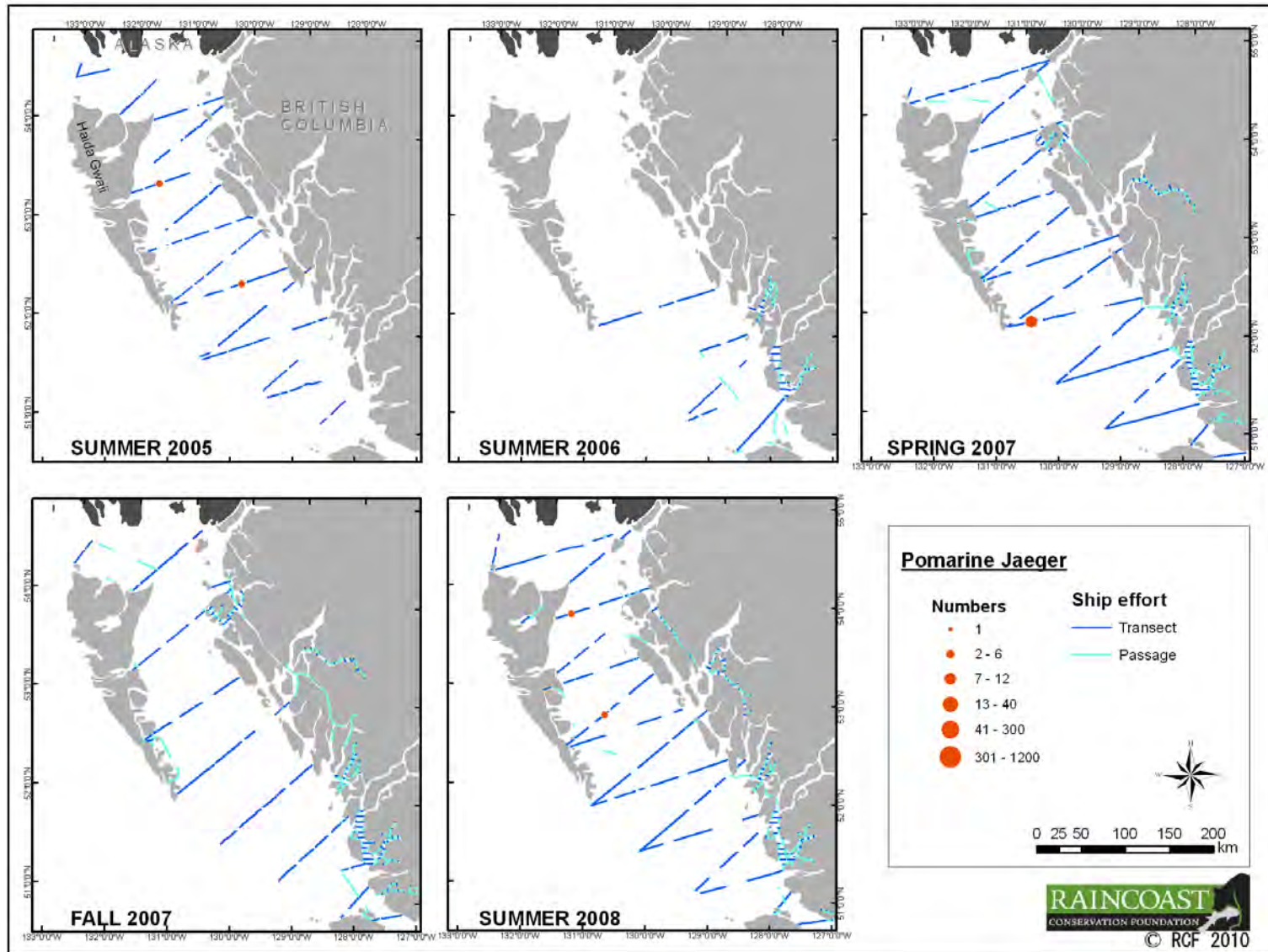
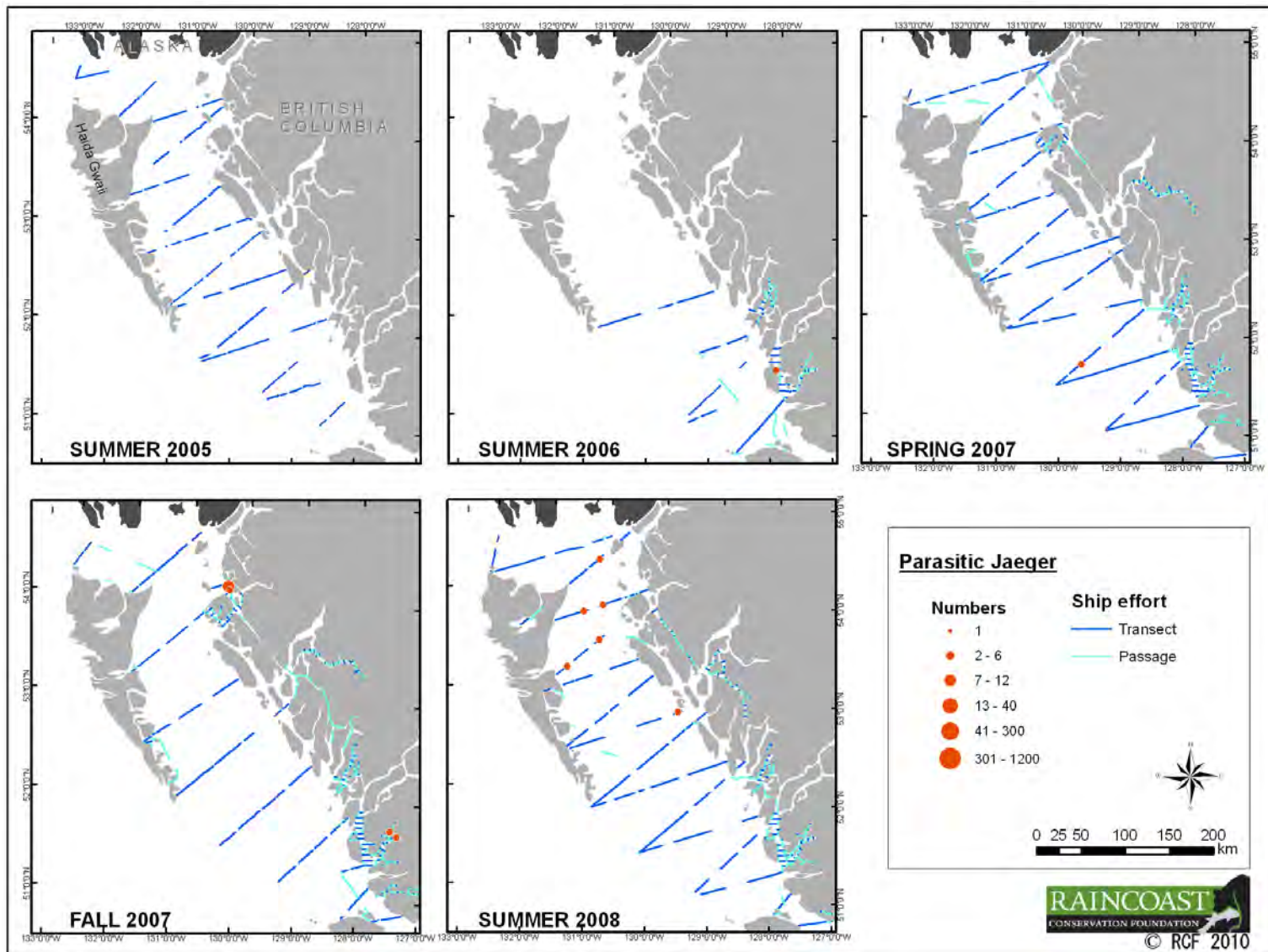


Figure 19: 'Dark' shearwater sightings from surveys 2005-2008. 'Dark' shearwaters include: Flesh-footed Shearwaters (*Puffinus carneipes*), Short-tailed Shearwater (*Puffinus tenuirostris*) and Sooty Shearwater (*Puffinus*

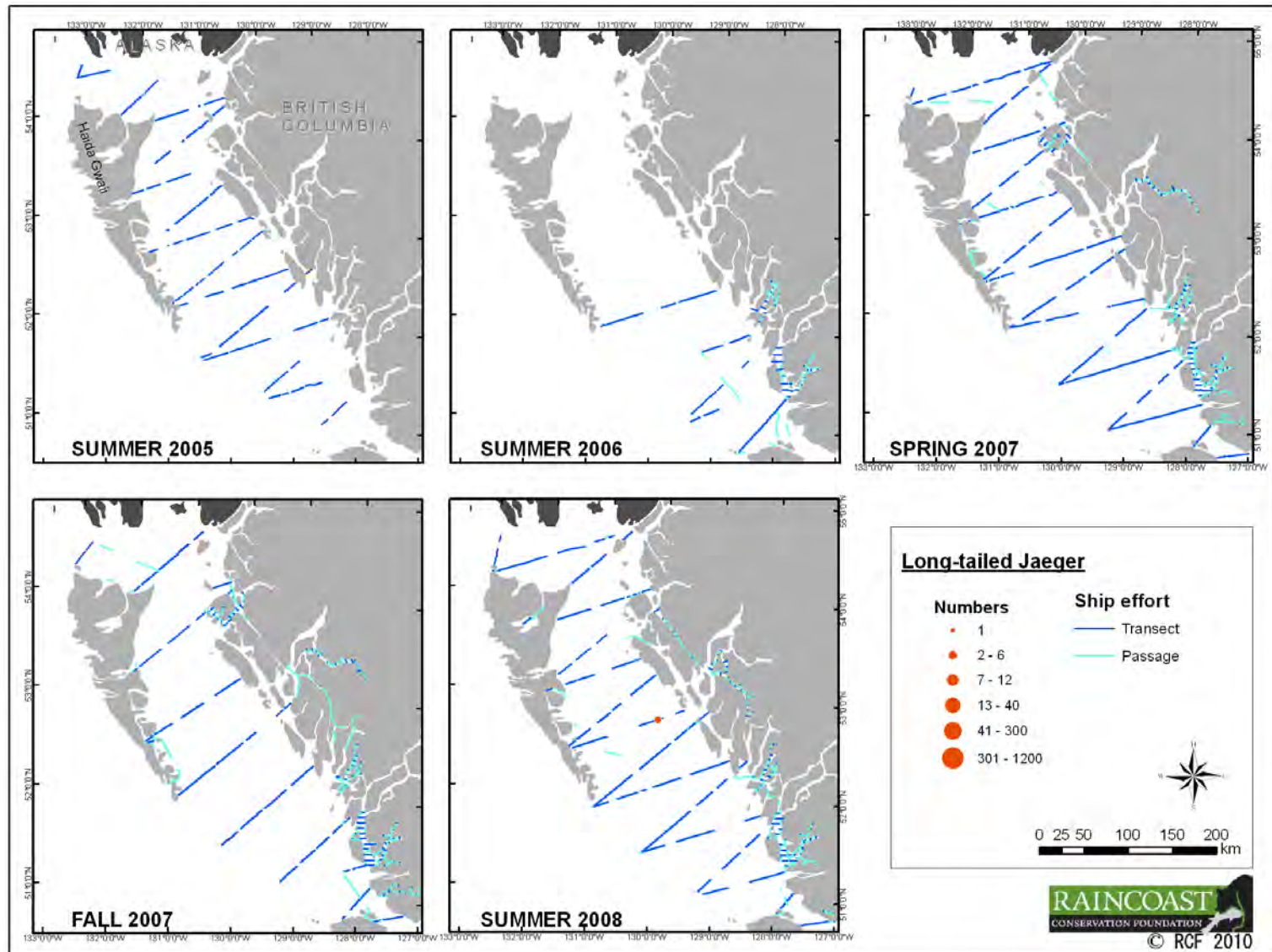
POMARINE JAEGER

Figure 20: Pomarine Jaeger (*Stercorarius pomarinus*) sightings from surveys 2005-2008.

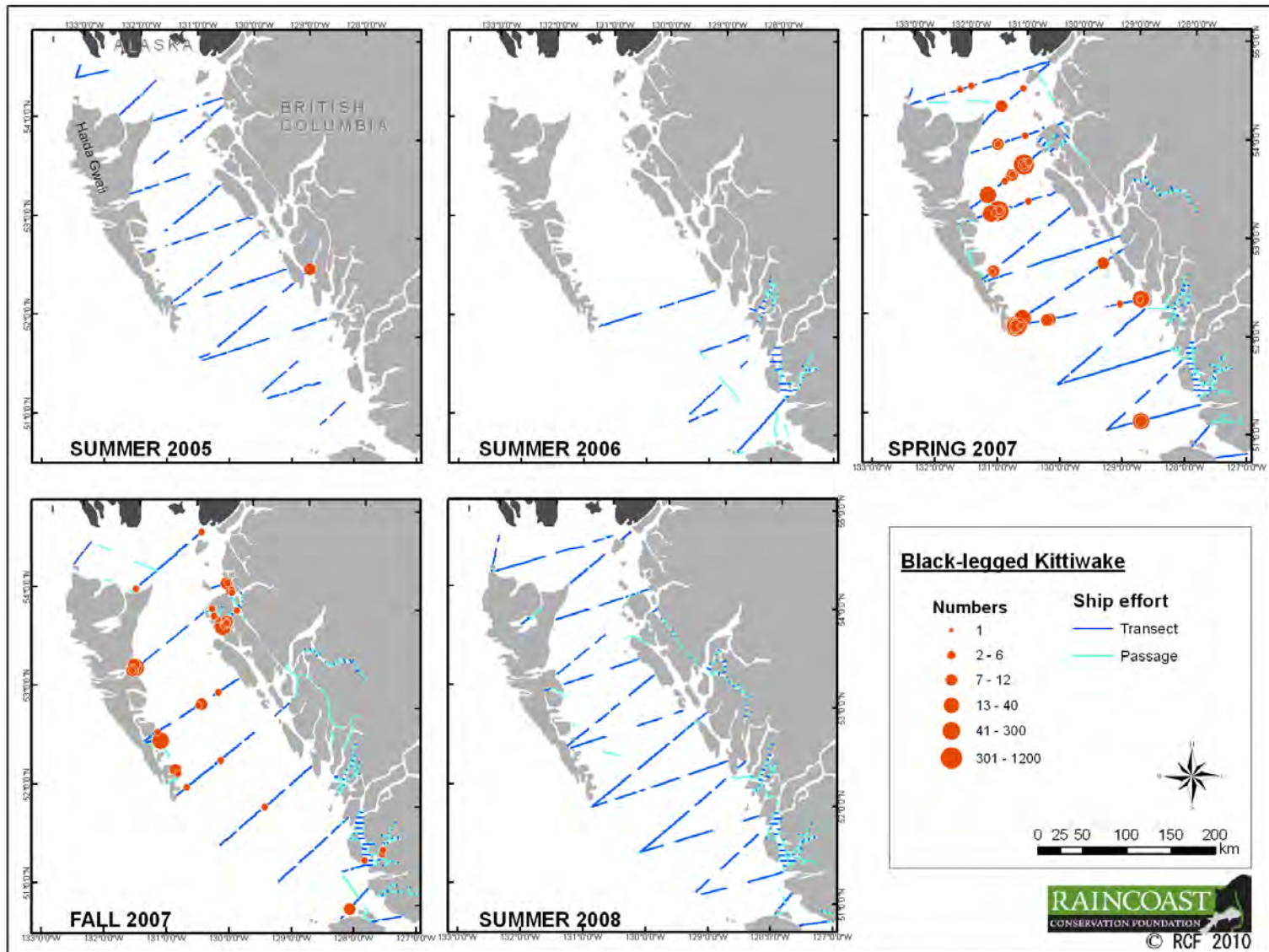
PARASITIC JAEGER

Figure 21: Parasitic Jaeger (*Stercorarius parasiticus*) sightings from surveys 2005-2008.

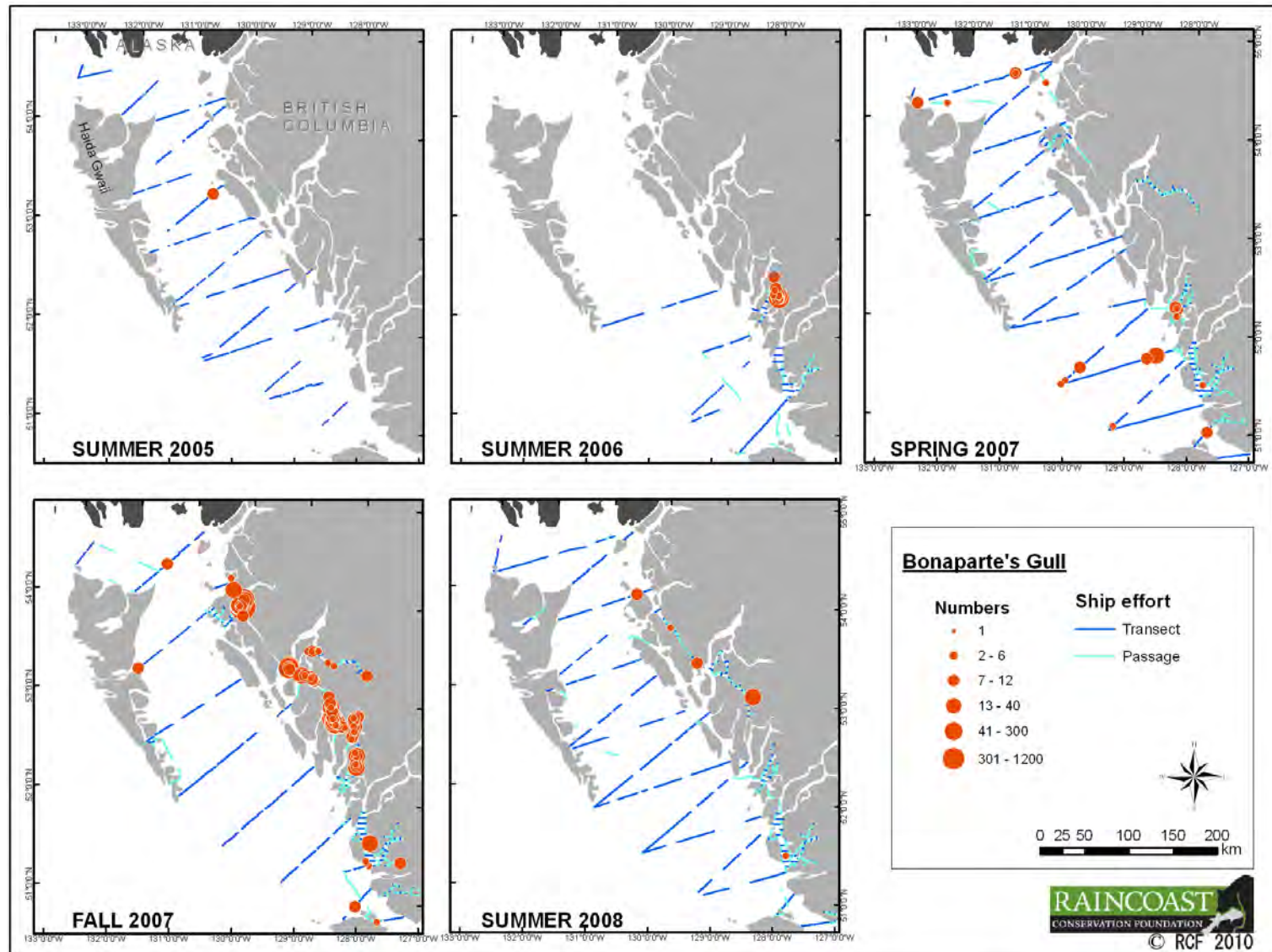
LONG-TAILED JAEGER

Figure 22: Long-tailed Jaeger (*Stercorarius longicaudus*) sightings from surveys 2005-2008.

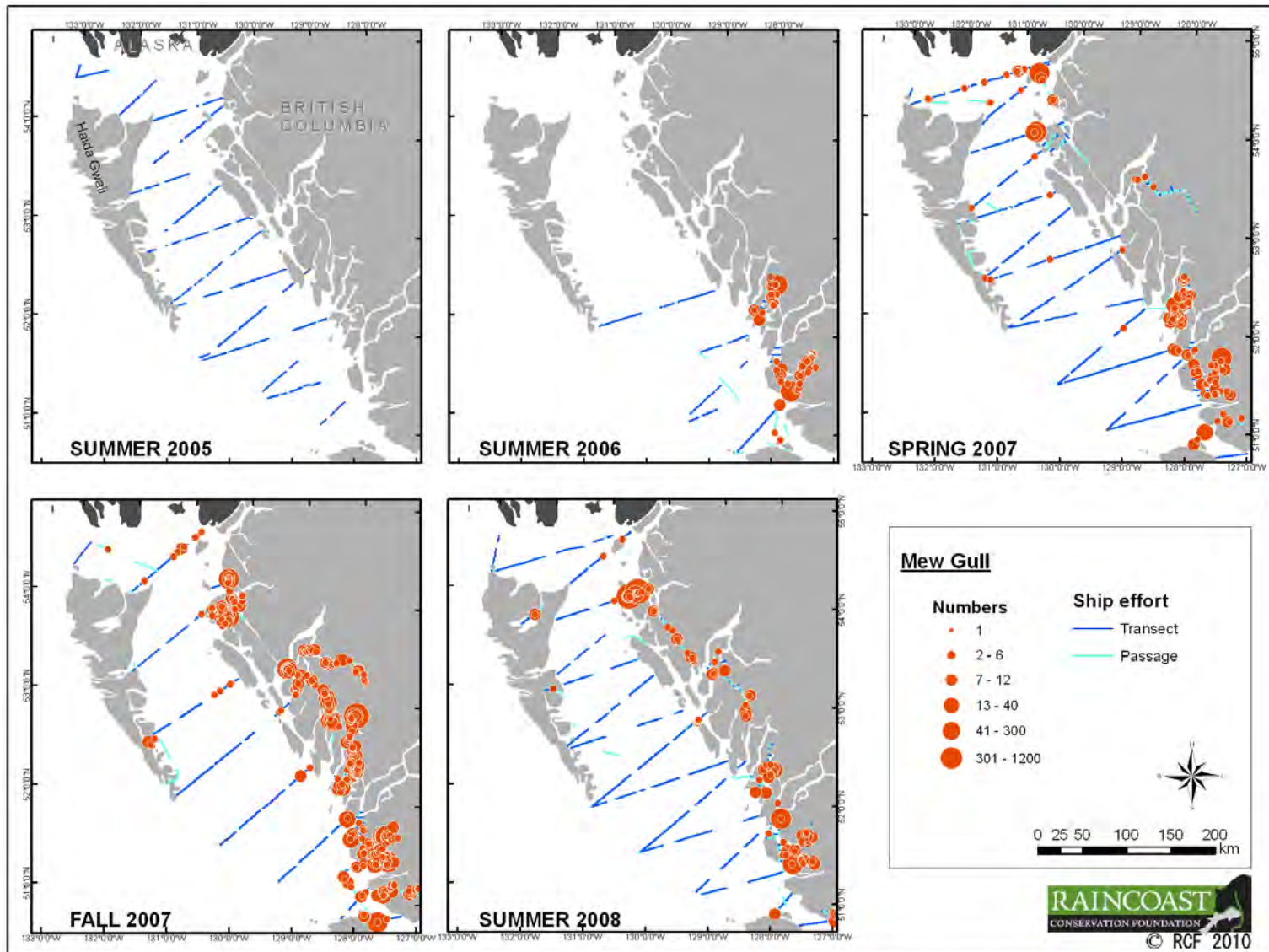
BLACK-LEGGED KITTIWAKE

Figure 23: Black-legged Kittiwake (*Rissa tridactyla*) sightings from surveys 2005-2008.

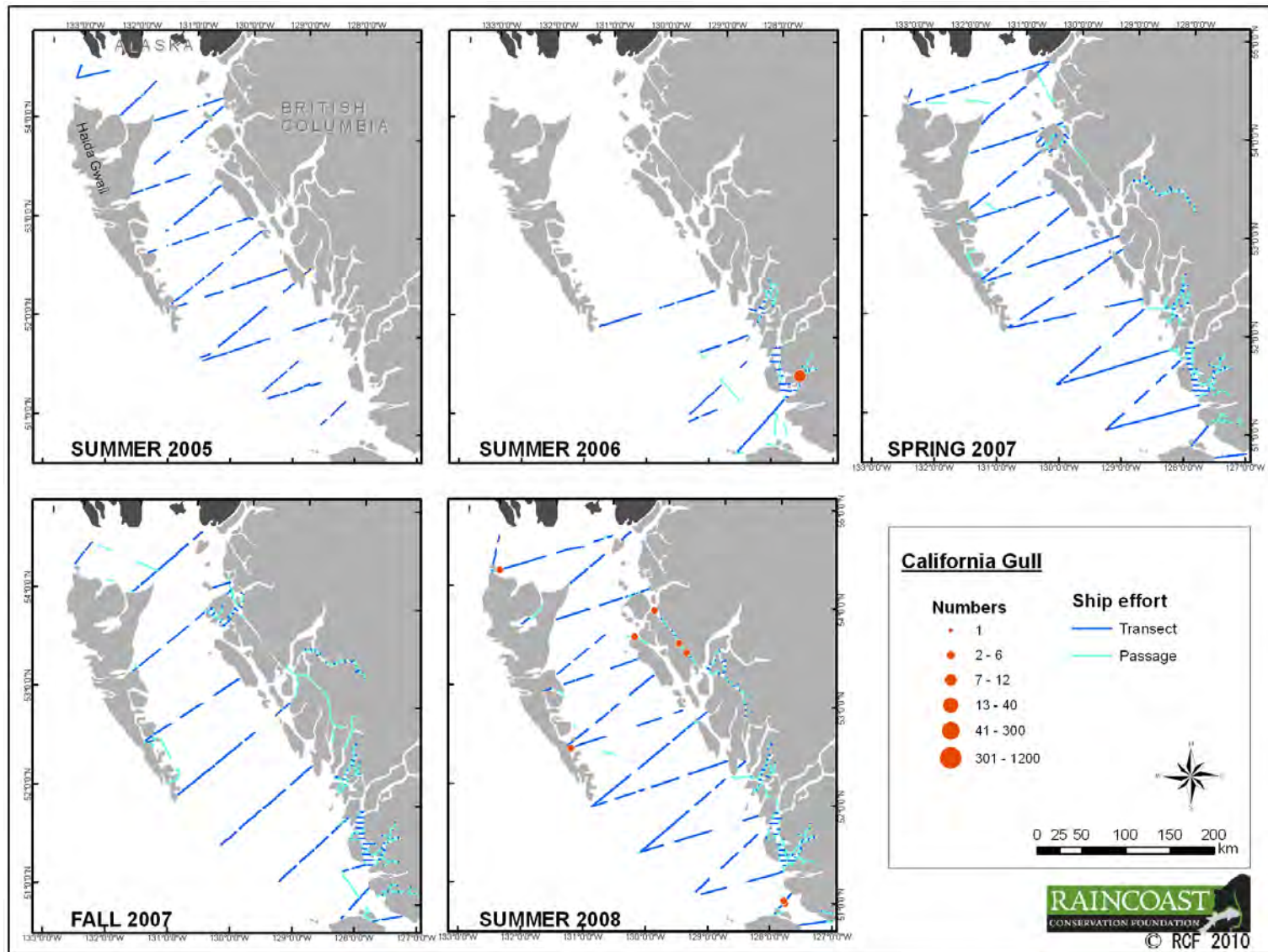
BONAPARTE'S GULL

Figure 24: Bonaparte's Gull (*Chroicocephalus philadelphia*) sightings from surveys 2005-2008.

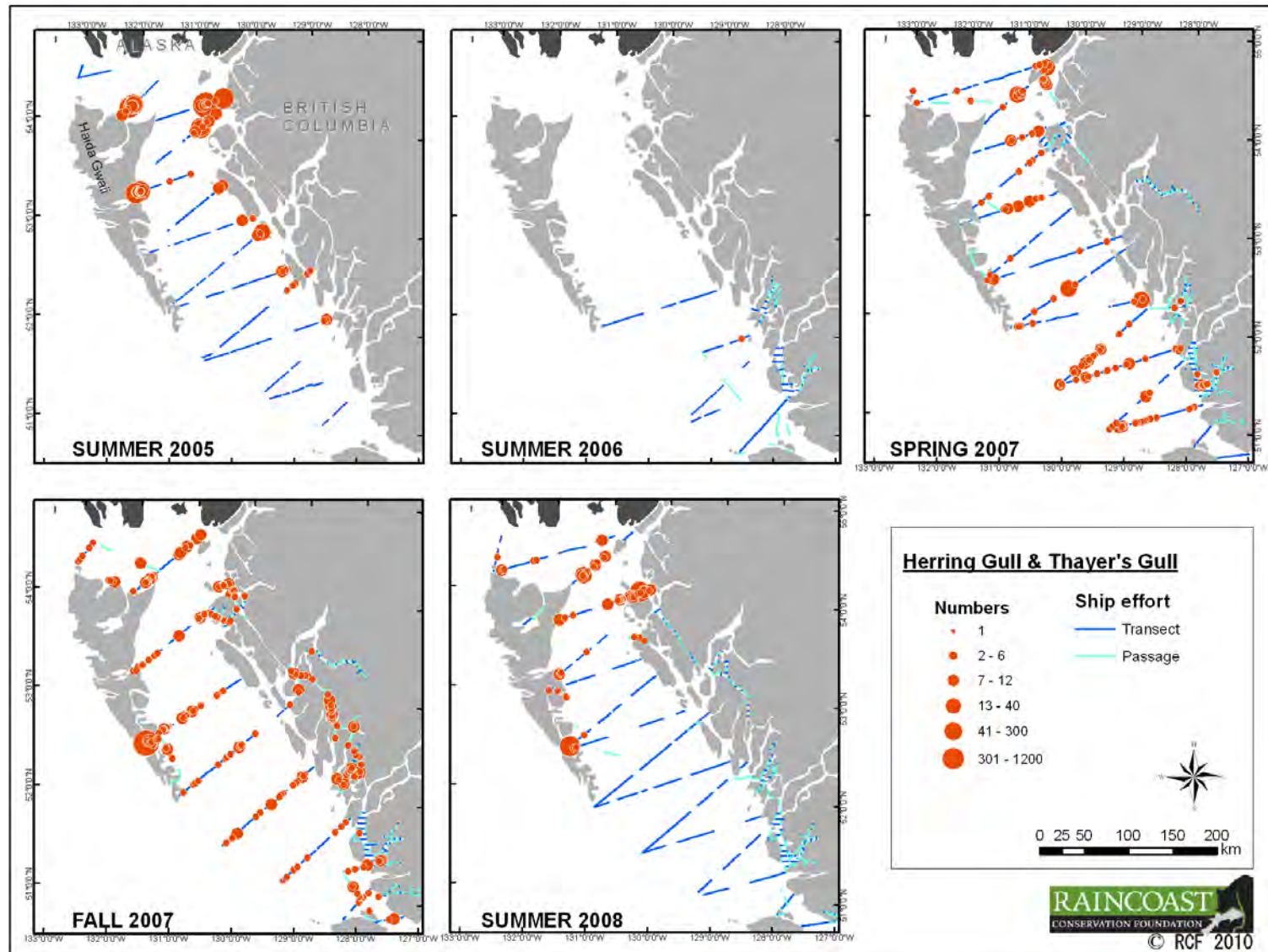
MEW GULL

Figure 25: Mew Gull (*Larus canus*) sightings from surveys 2005-2008.

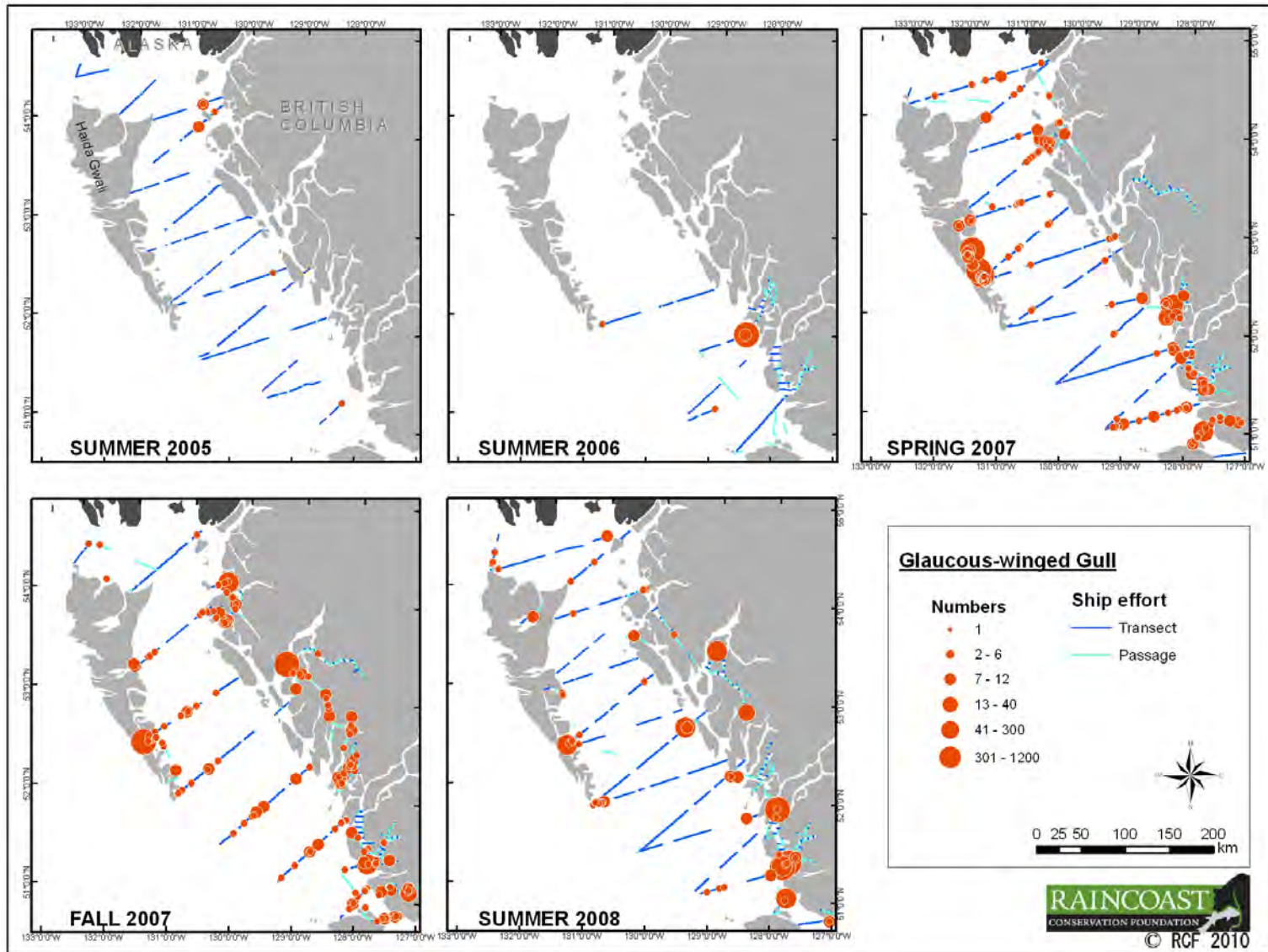
CALIFORNIA GULL

Figure 26: California Gull (*Larus californicus*) sightings from surveys 2005-2008.

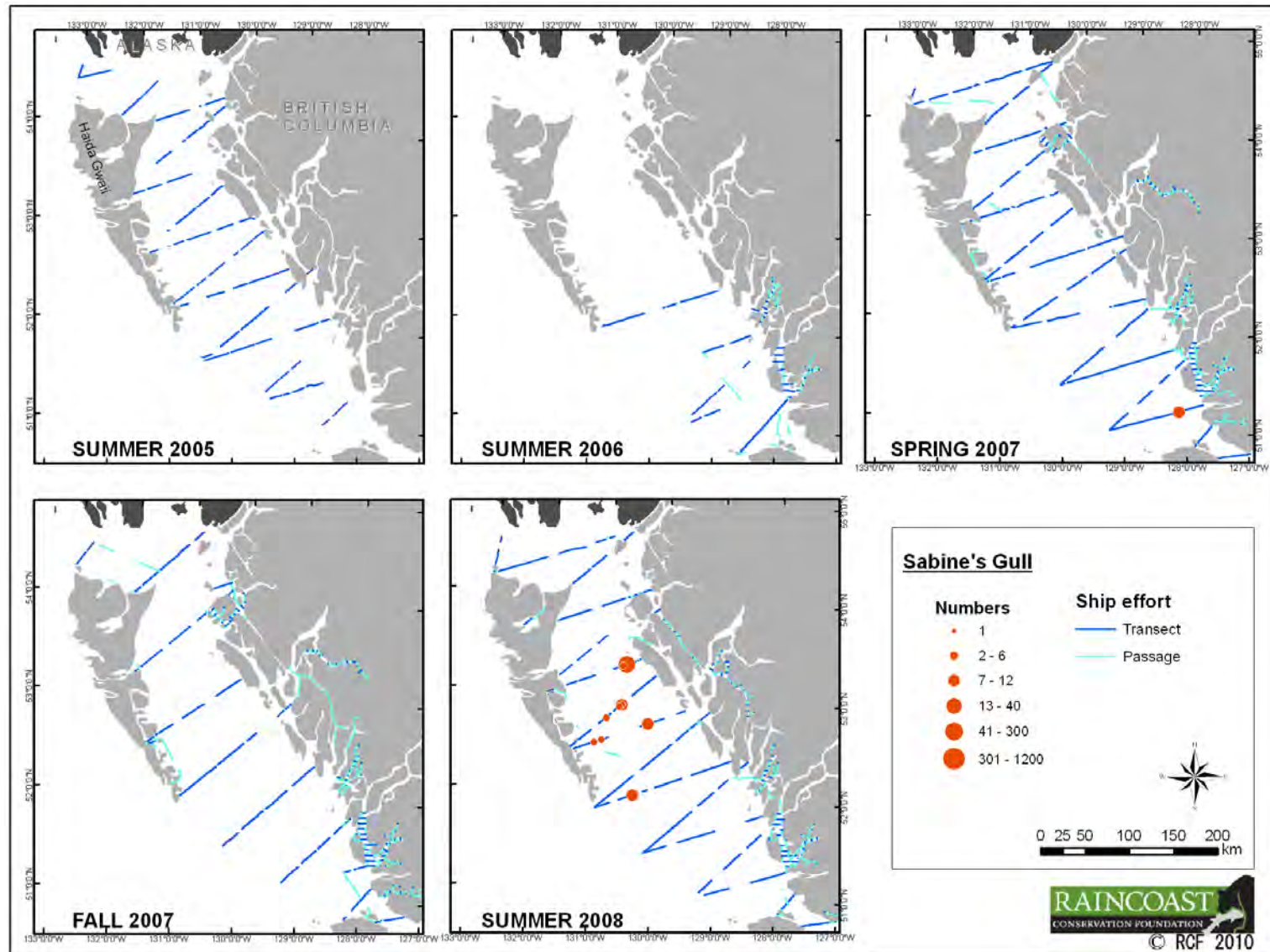
HERRING GULL & THAYER'S GULL

Figure 27: Herring Gull (*Larus argentatus*) and Thayer's Gull (*Larus thayeri*) sightings from surveys 2005-2008.

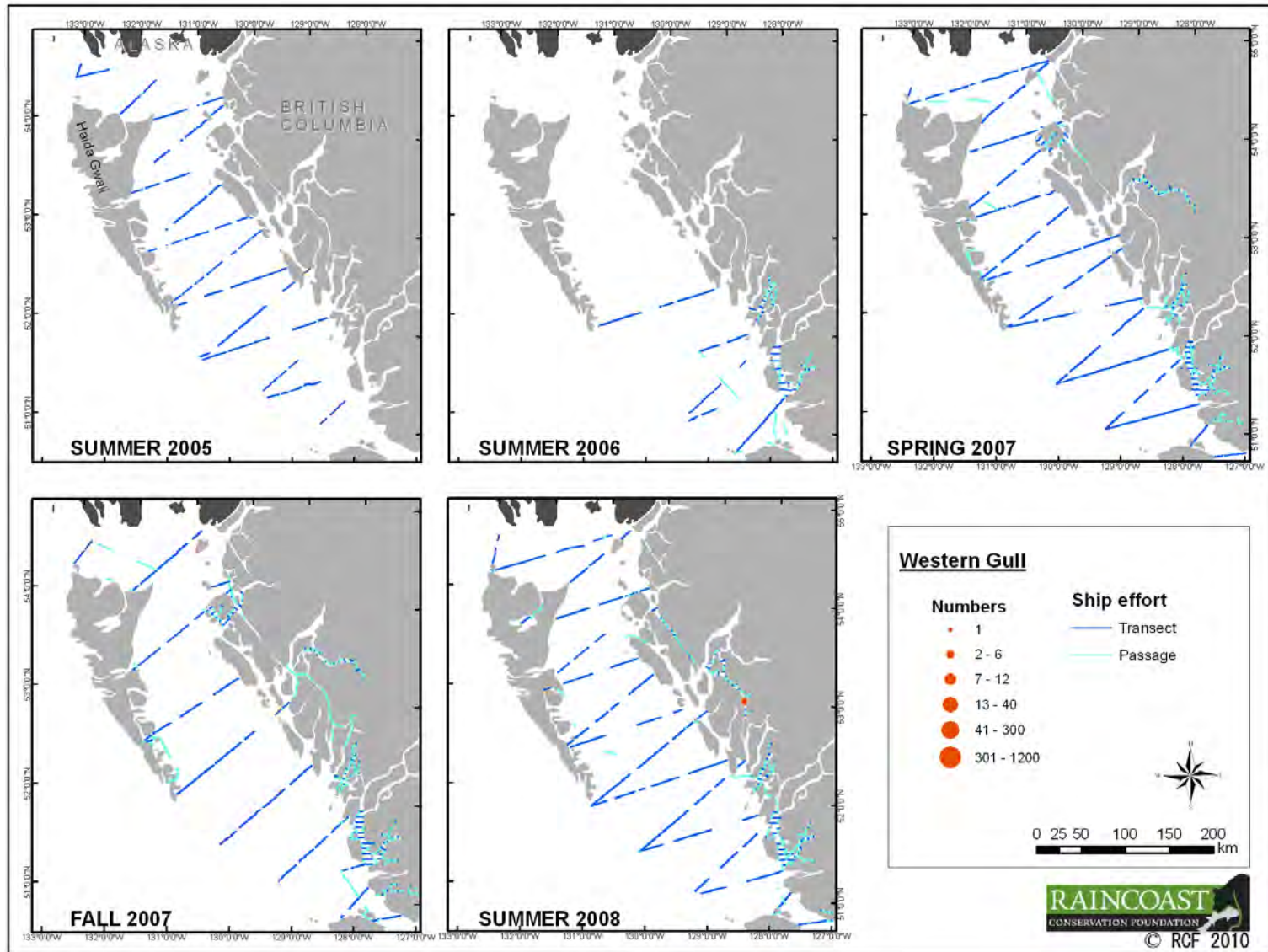
GLAUCOUS-WINGED GULL

Figure 28: Glaucous-winged Gull (*Larus glaucescens*) sightings from surveys 2005-2008.

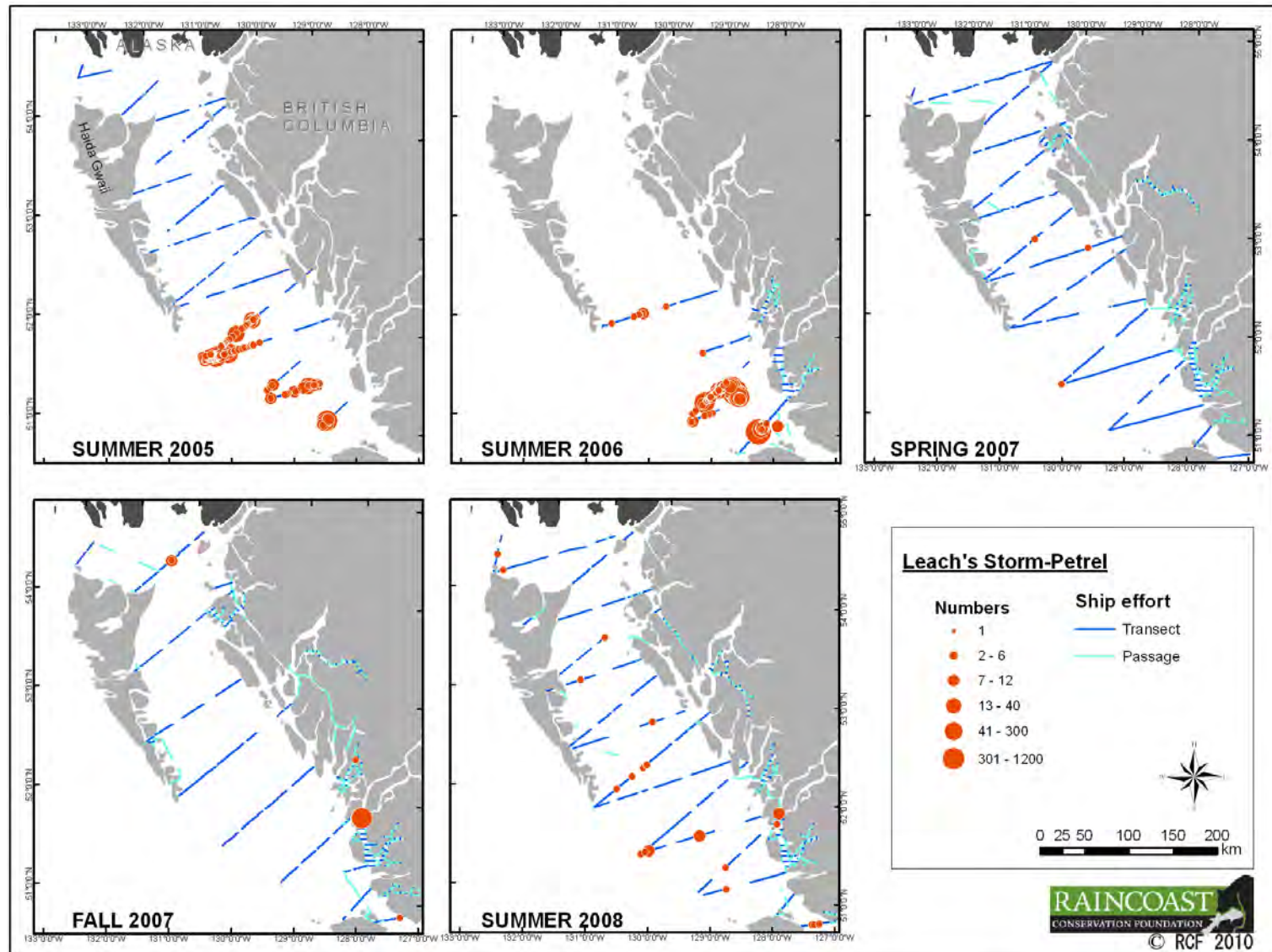
SABINE'S GULL

Figure 29: Sabine's Gull (*Xema sabini*) sightings from surveys 2005-2008.

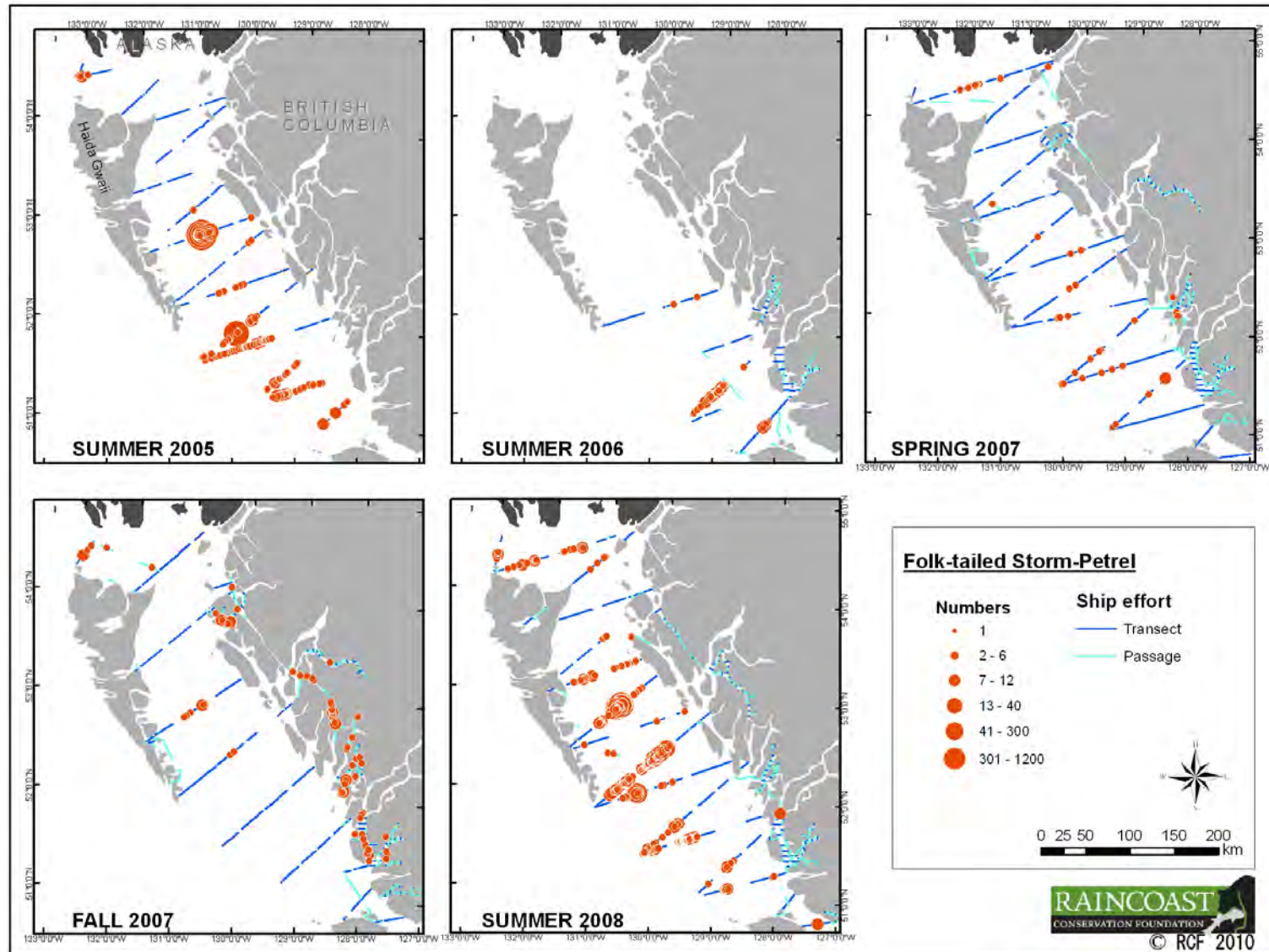
WESTERN GULL

Figure 30: Western Gull (*Larus occidentalis*) sightings from surveys 2005-2008.

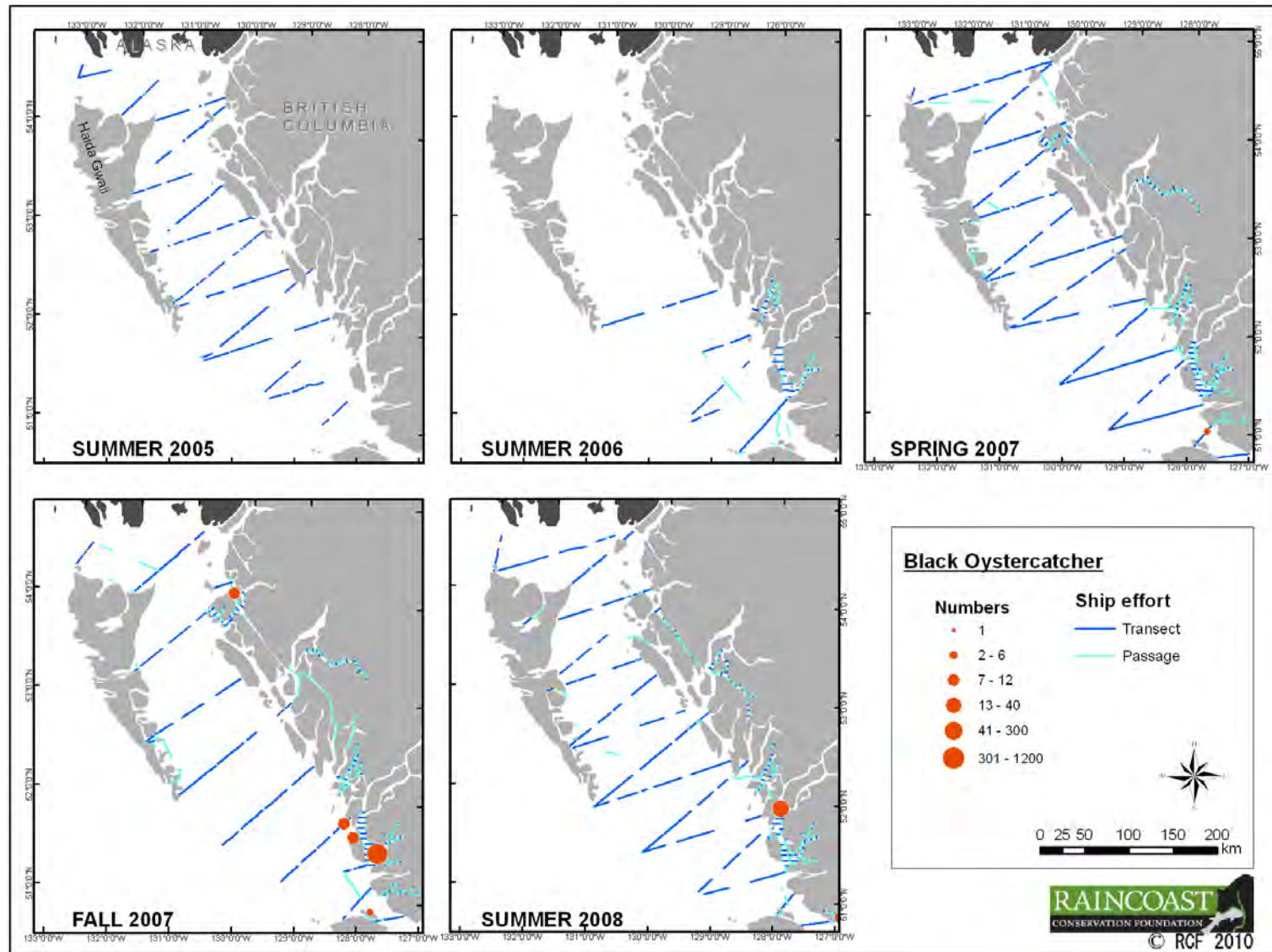
LEACH'S STORM-PETREL

Figure 31: Leach's Storm-Petrel (*Oceanodroma leucorhoa*) sightings from surveys 2005-2008

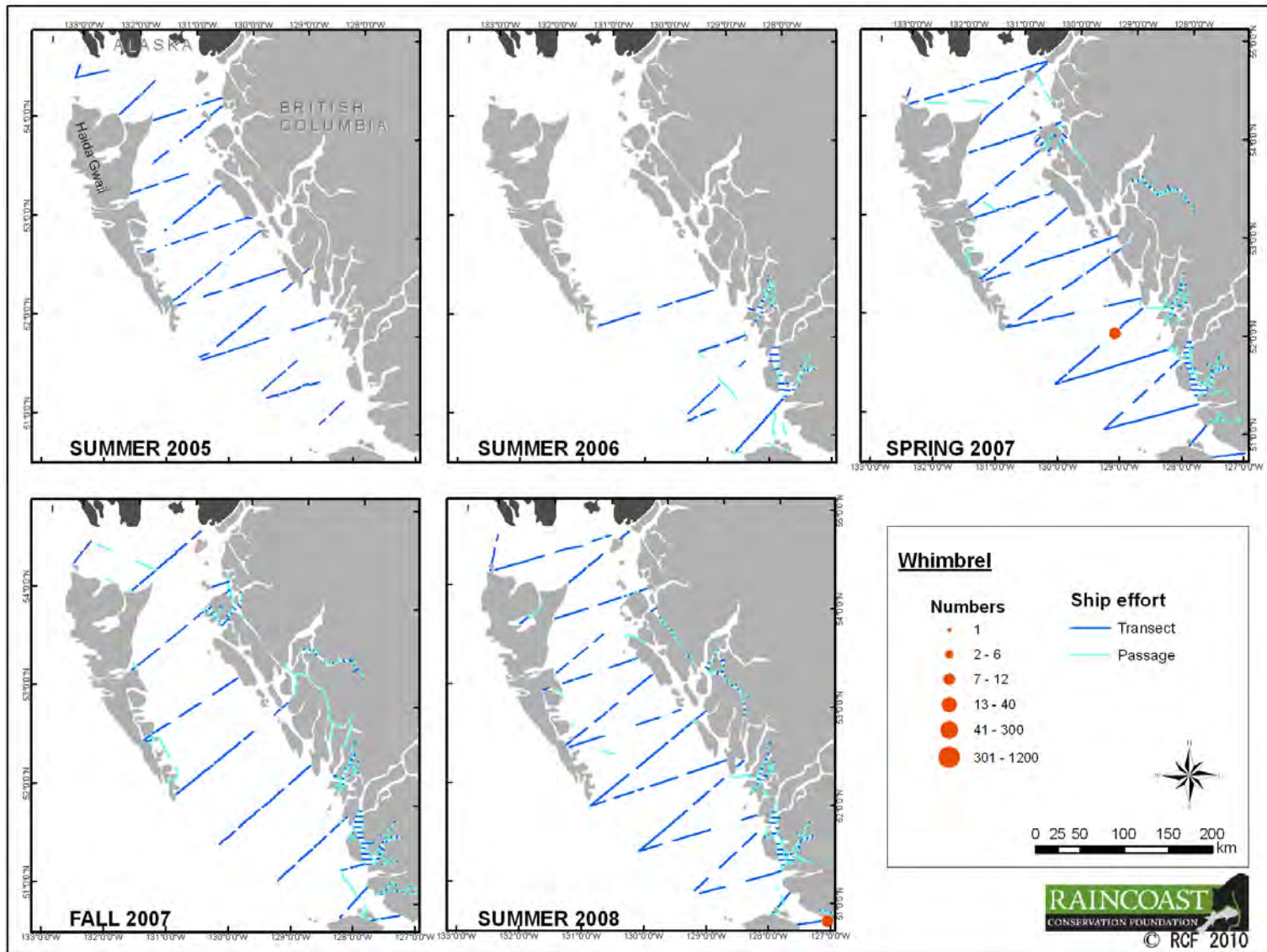
FORK-TAILED STORM-PETREL

Figure 32: Fork-tailed Storm-Petrel (*Oceanodroma furcata*) sightings from surveys 2005-2008.

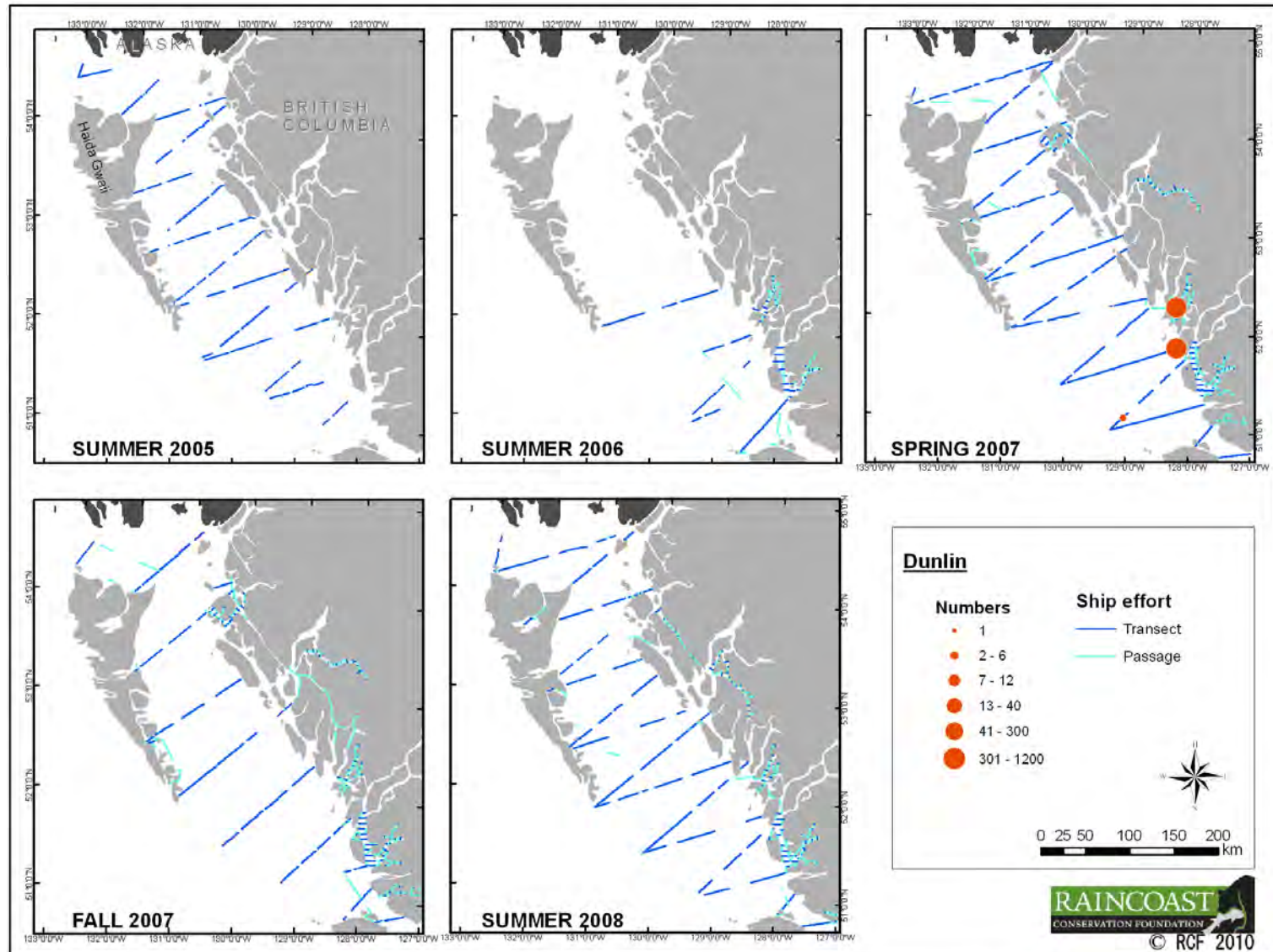
BLACK OYSTERCATCHER

Figure 33: Black Oystercatcher (*Haematopus bachmani*) sightings from surveys 2005-2008.

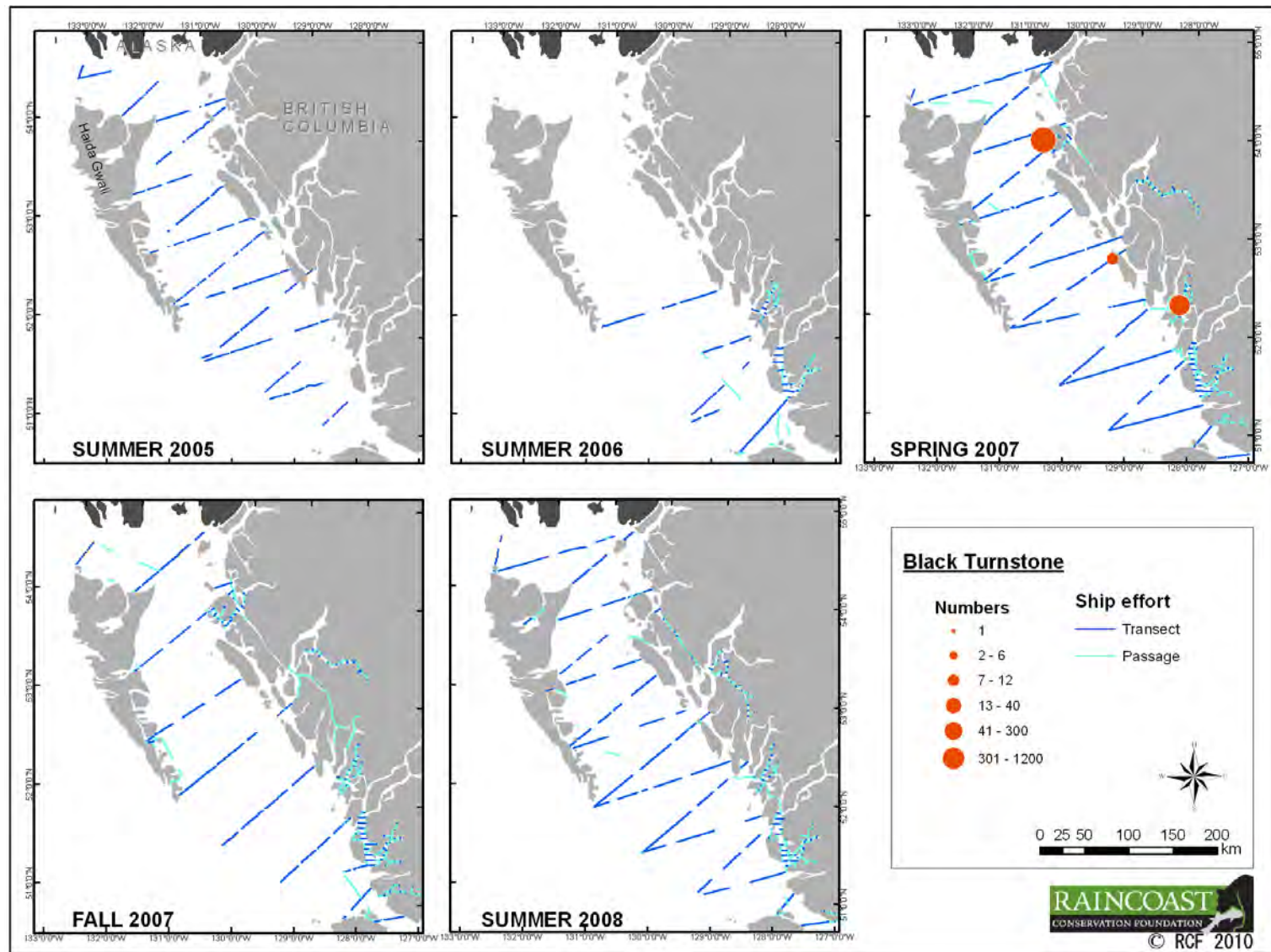
WHIMBREL

Figure 34: Whimbrel (*Numenius phaeopus*) sightings from surveys 2005-2008.

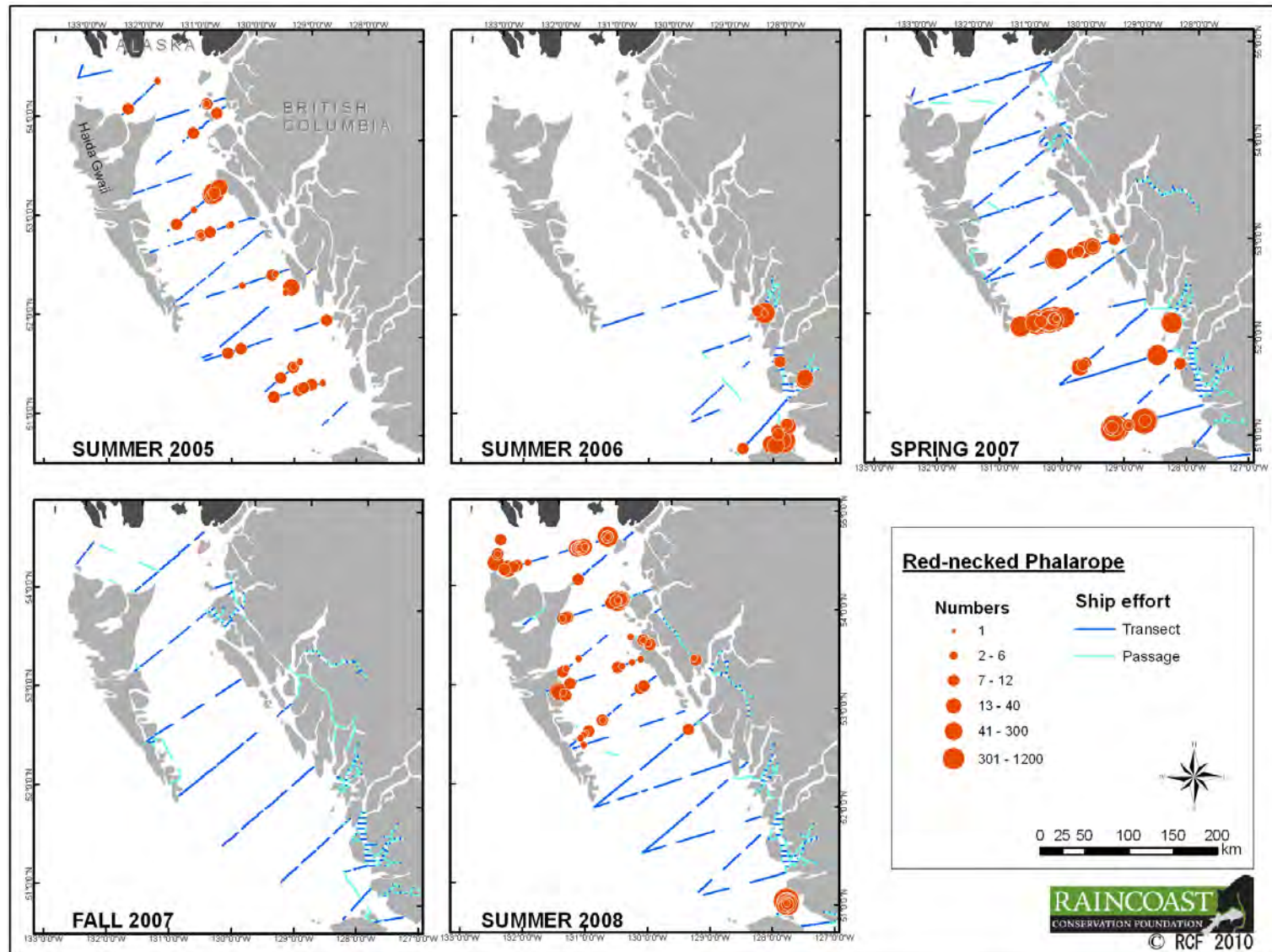
DUNLIN

Figure 35: Dunlin (*Calidris alpina*) sightings from surveys 2005-2008.

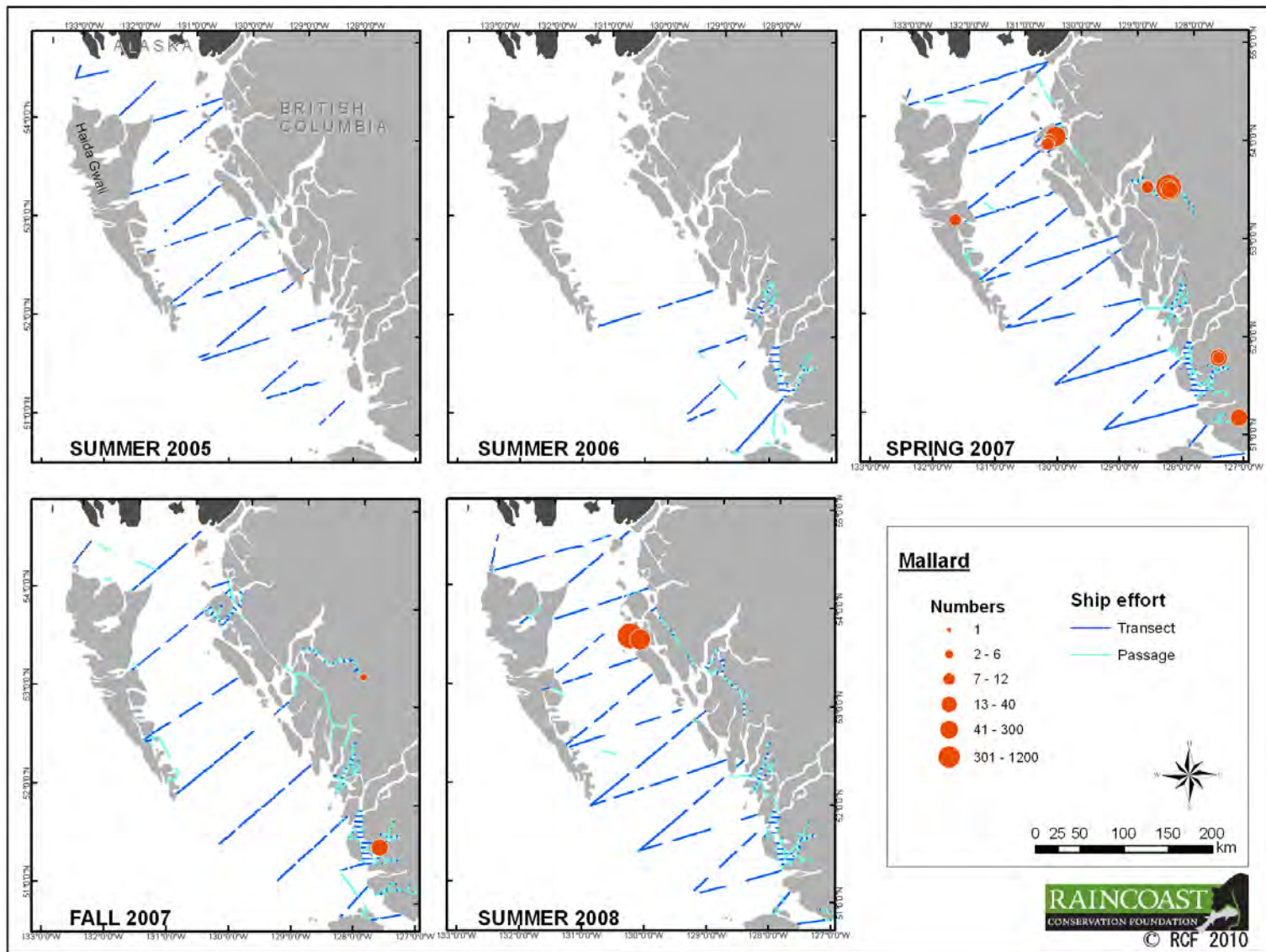
BLACK TURNSTONE

Figure 36: Black Turnstone (*Arenaria melanocephala*) sightings from surveys 2005-2008.

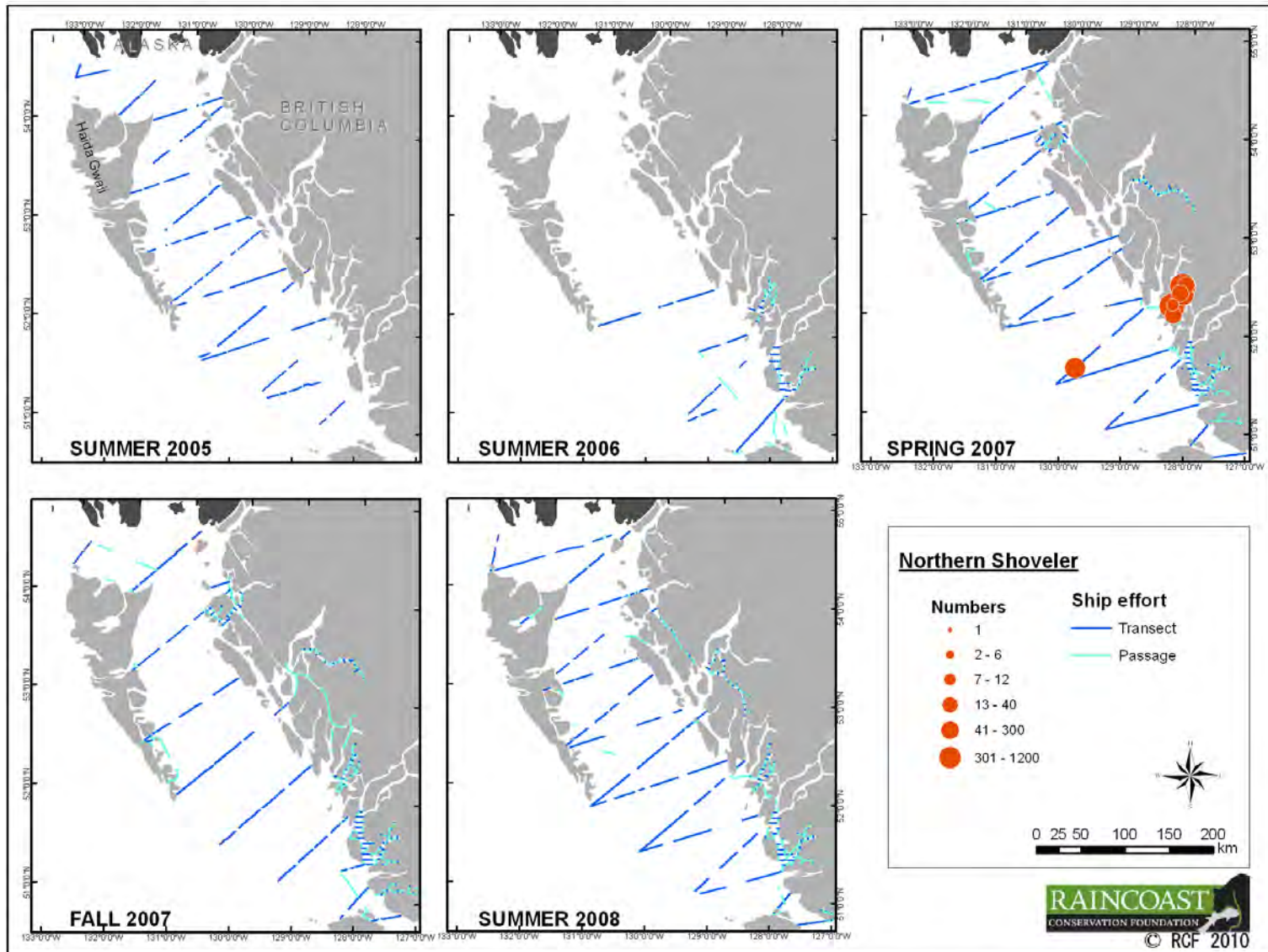
RED-NECKED PHALAROPE

Figure 37: Red-necked Phalarope (*Phalaropus lobatus*) sightings from surveys 2005-2008.

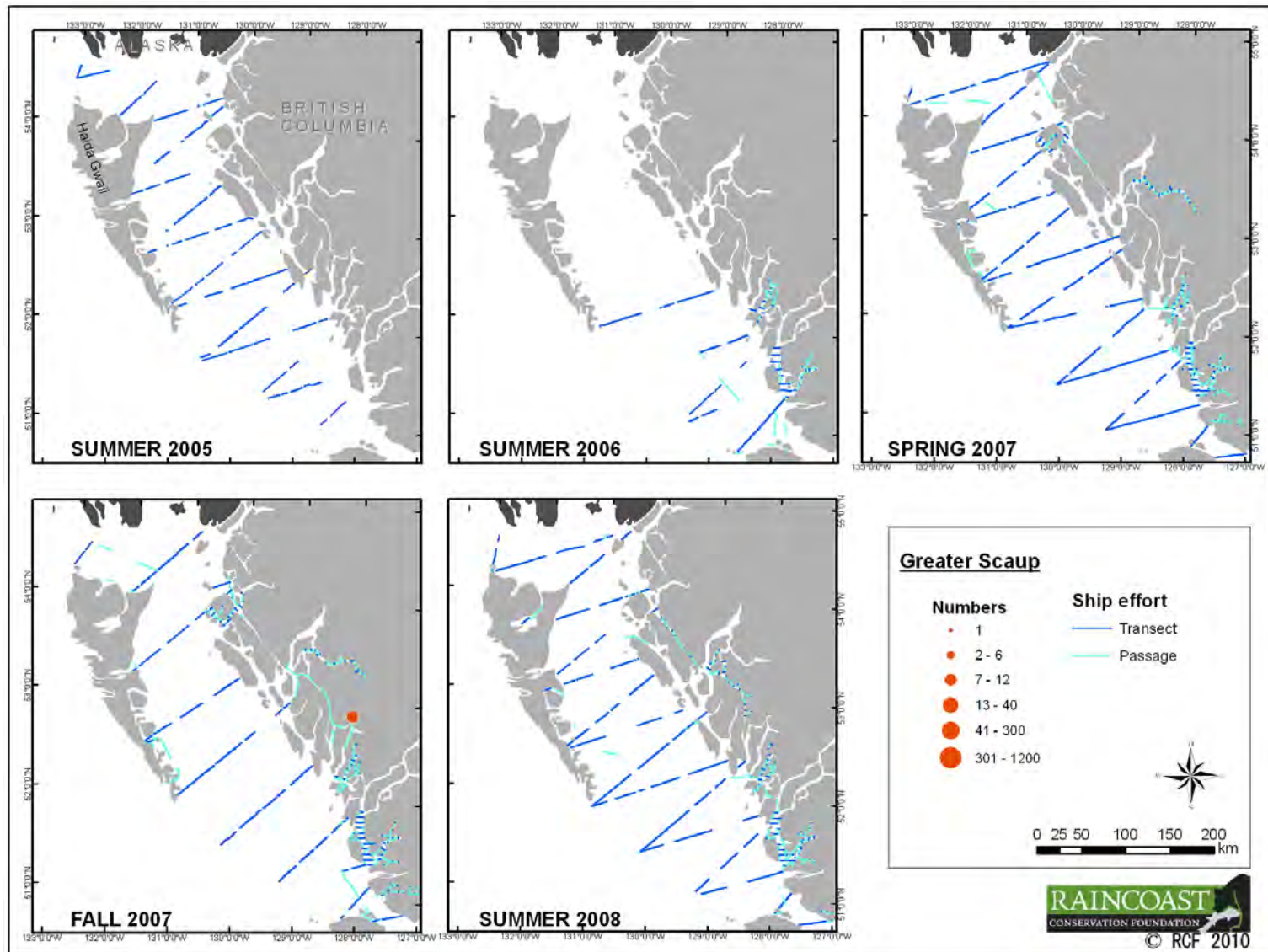
MALLARD

Figure 38: Mallard (*Anas platyrhynchos*) sightings from surveys 2005-2008.

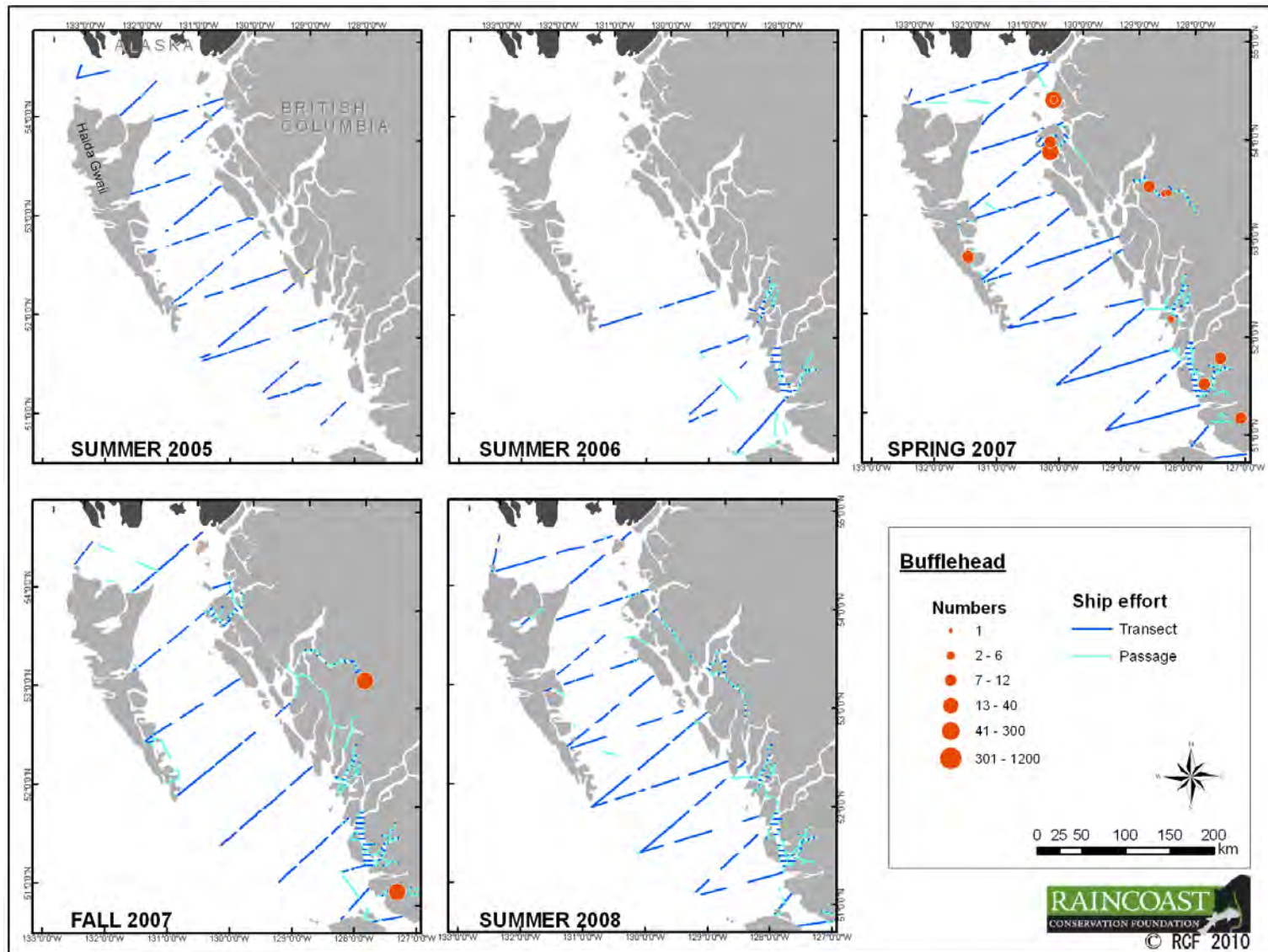
NORTHERN SHOVELER

Figure 39: Northern Shoveler (*Anas clypeata*) sightings from surveys 2005-2008.

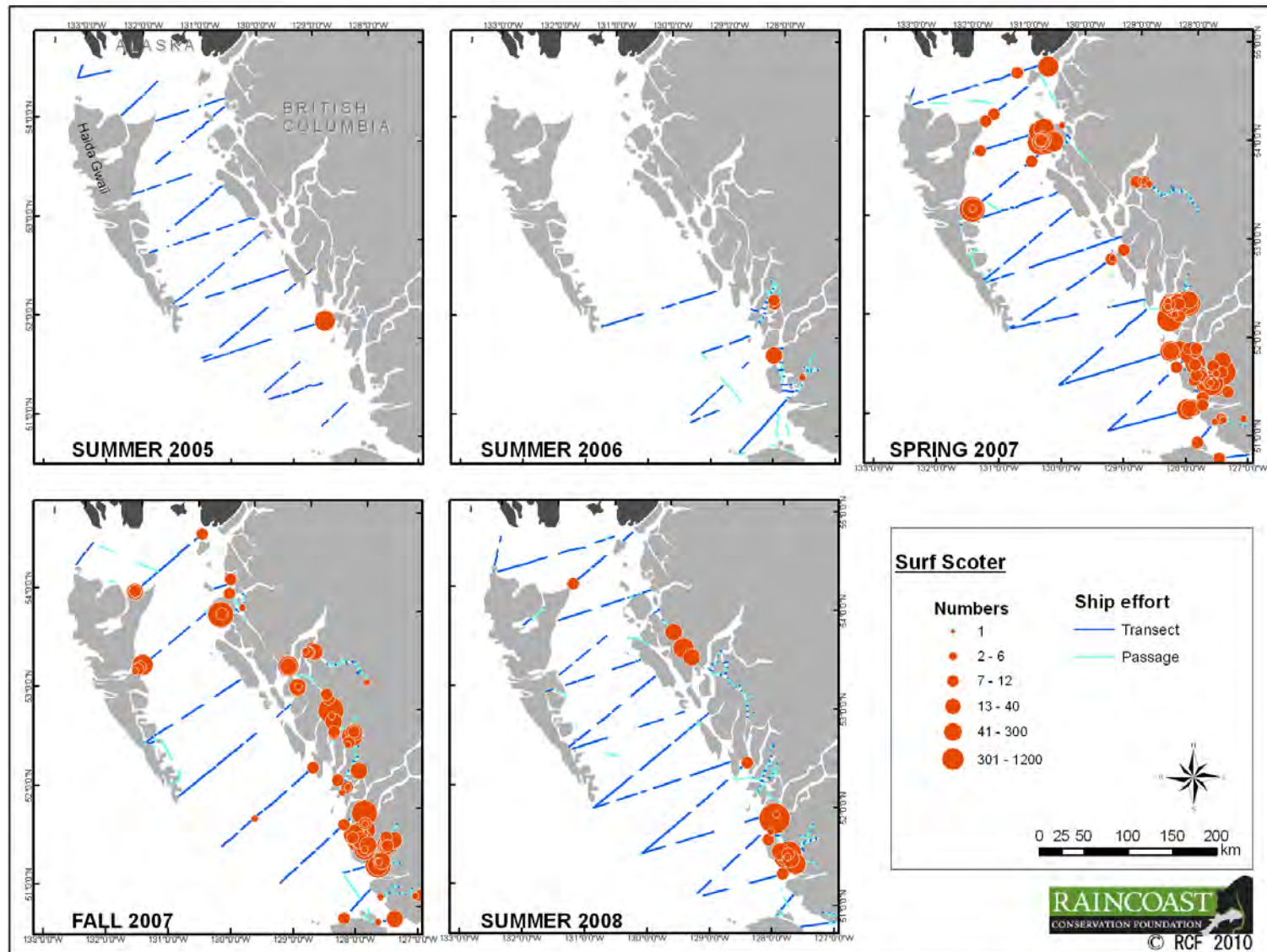
GREATER SCAUP

Figure 40: Greater Scaup (*Aythya marila*) sightings from surveys 2005-2008.

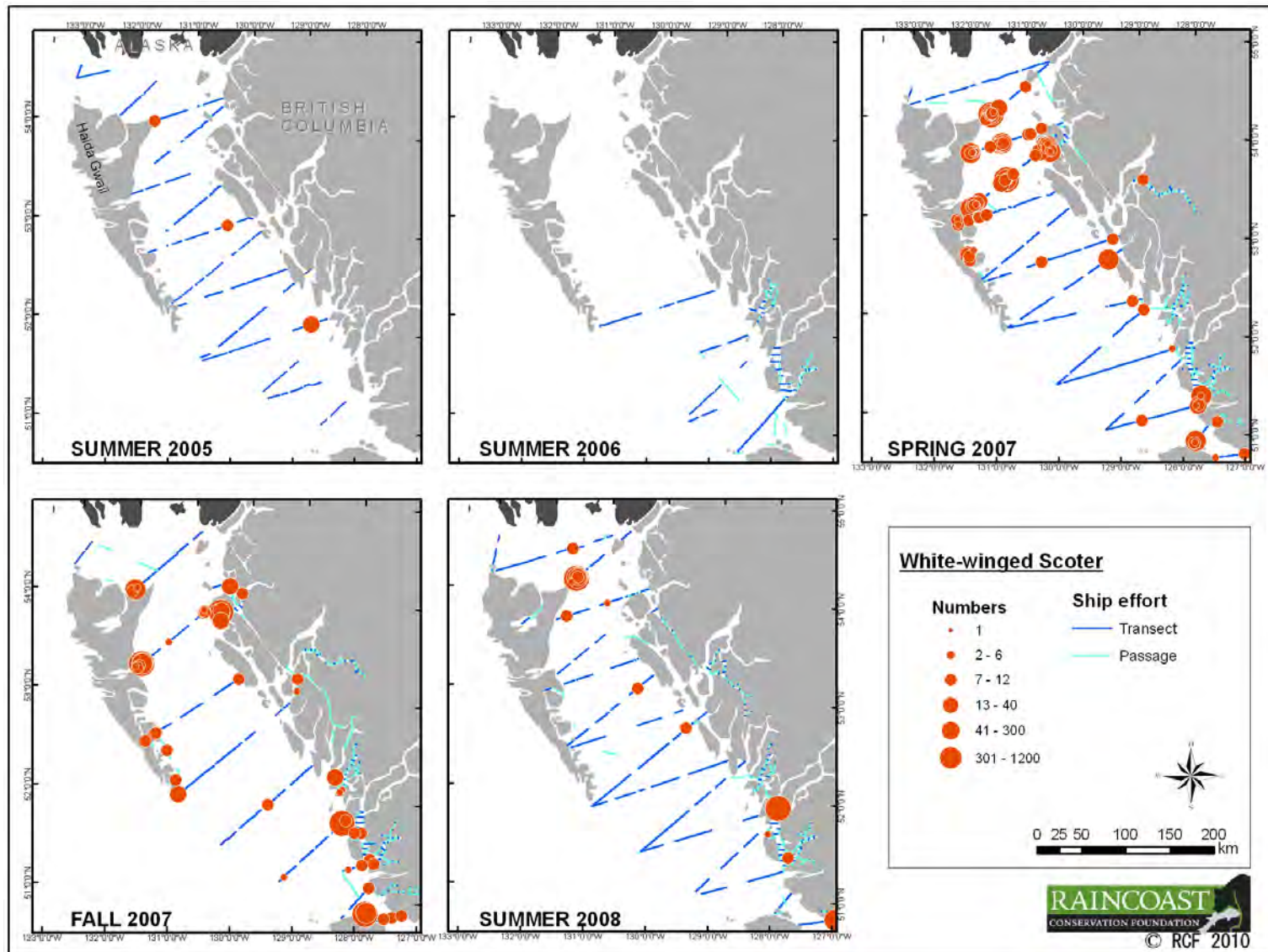
BUFFLEHEAD

Figure 41: Bufflehead (*Bucephala albeola*) sightings from surveys 2005-2008.

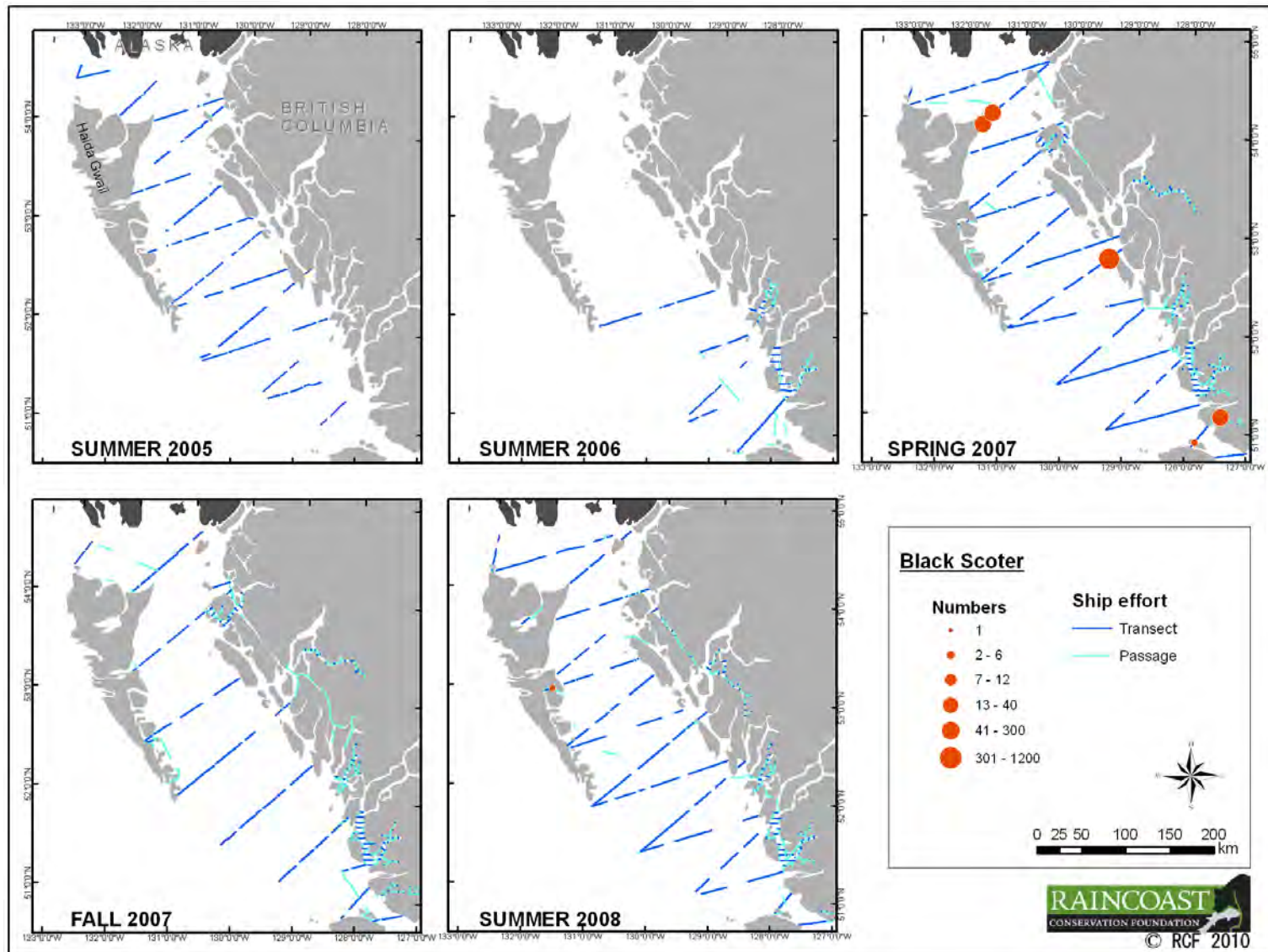
SURF SCOTER

Figure 42: Surf Scoter (*Melanitta perspicillata*) sightings from surveys 2005-2008.

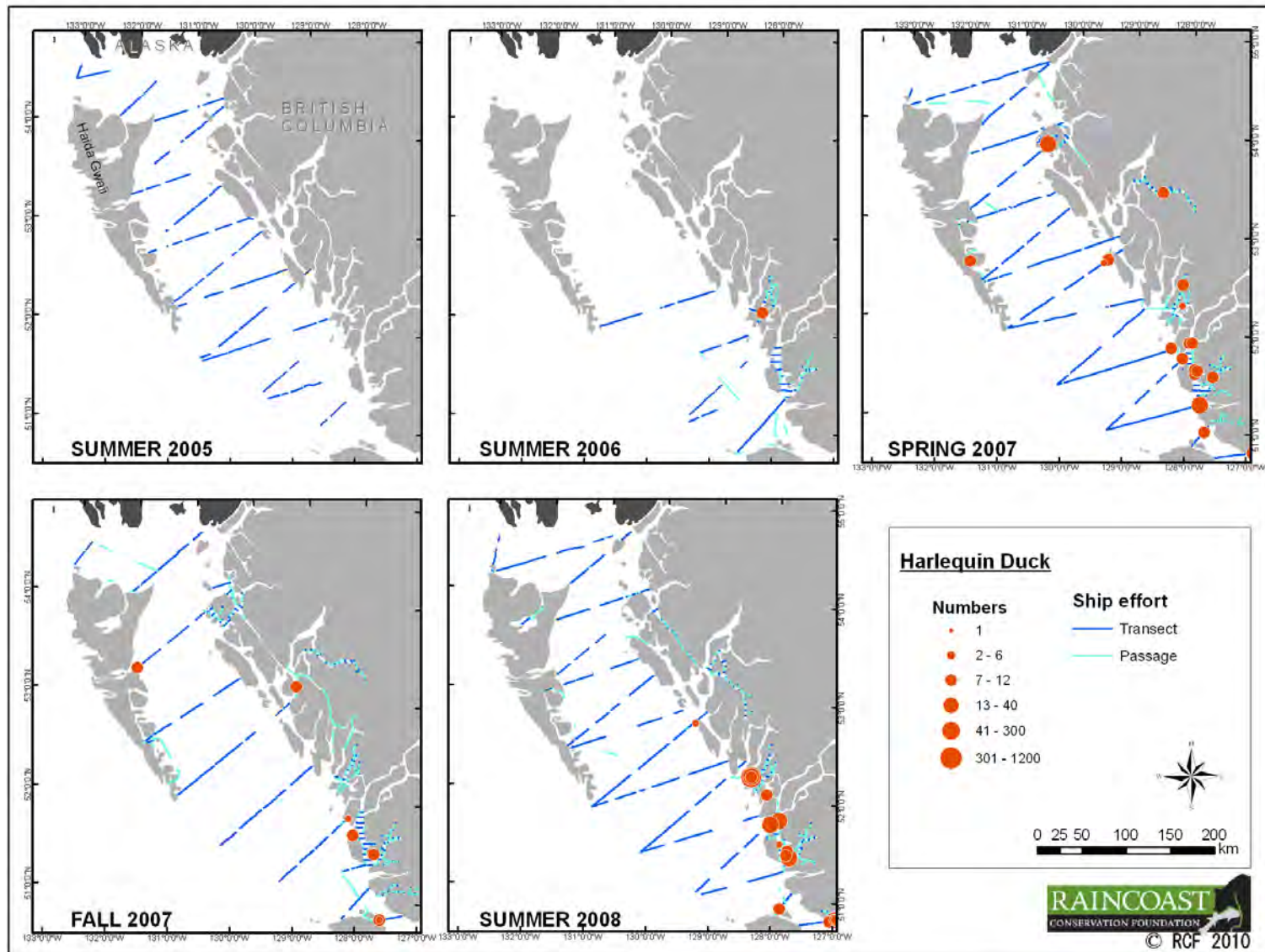
WHITE-WINGED SCOTER

Figure 43: White-winged Scoter (*Melanitta deglandi*) sightings from surveys 2005-2008.

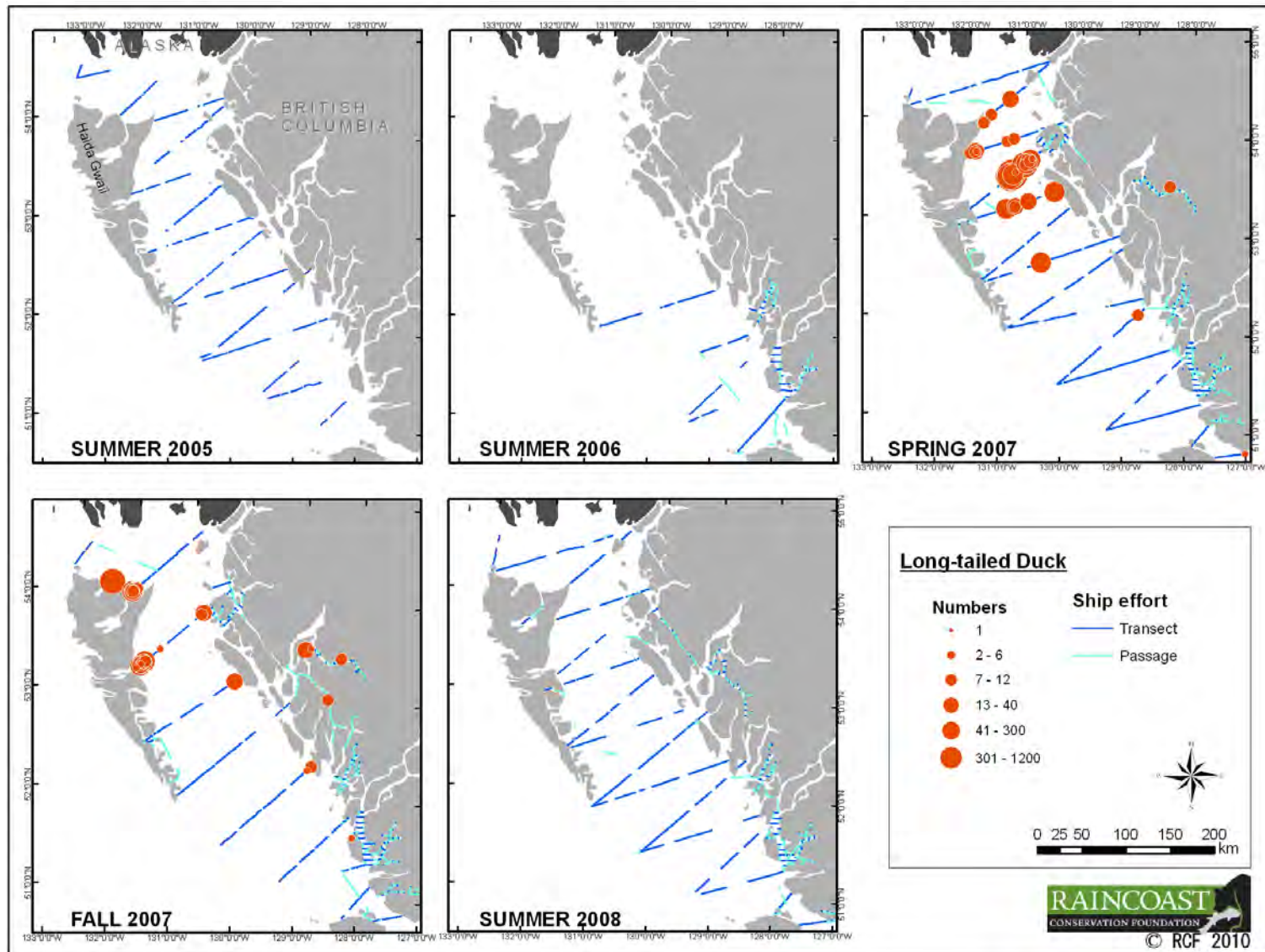
BLACK SCOTER

Figure 44: Black Scoter (*Melanitta americana*) sightings from surveys 2005-2008.

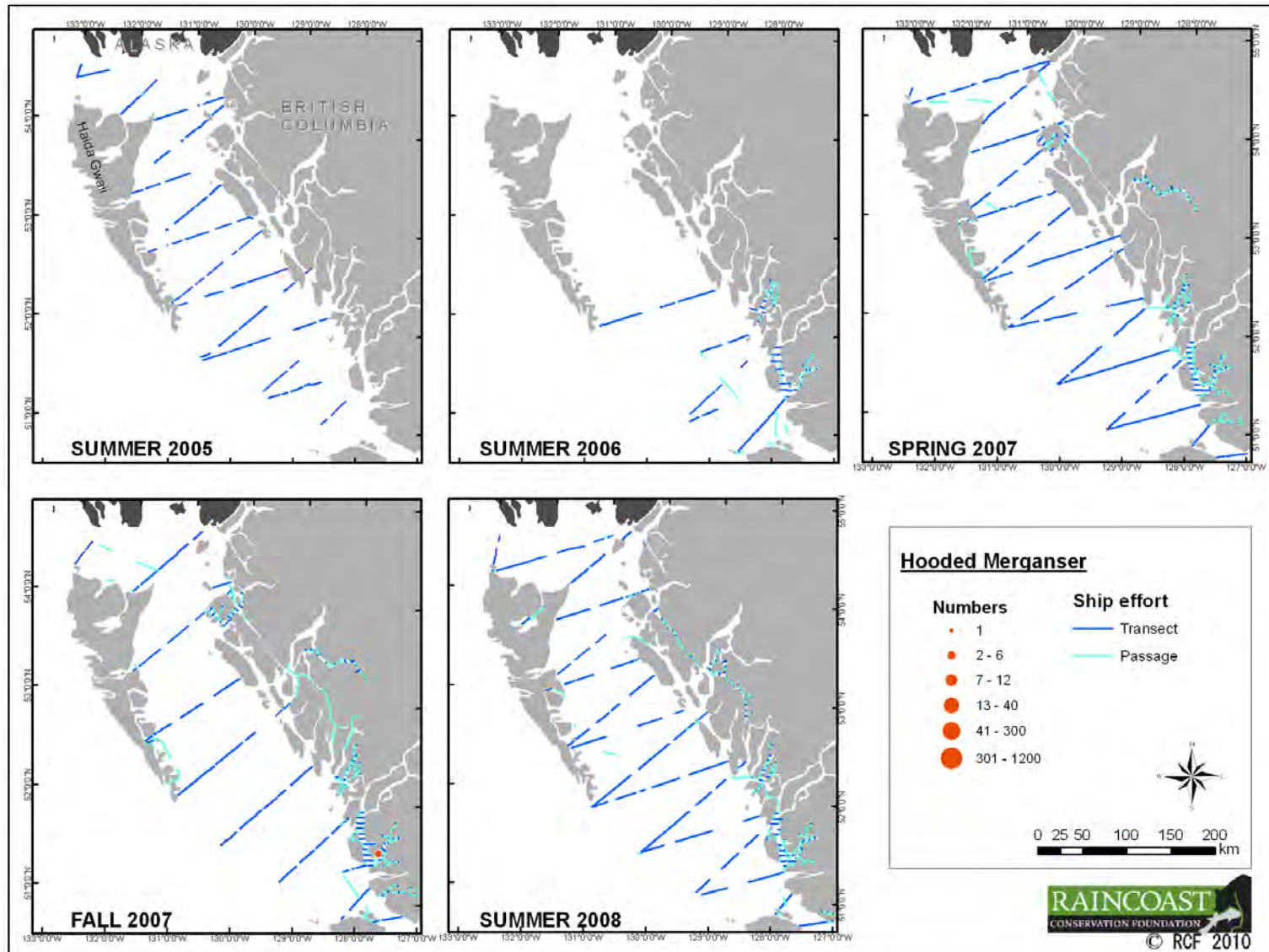
HARLEQUIN DUCK

Figure 45: Harlequin Duck (*Histrionicus histrionicus*) sightings from surveys 2005-2008.

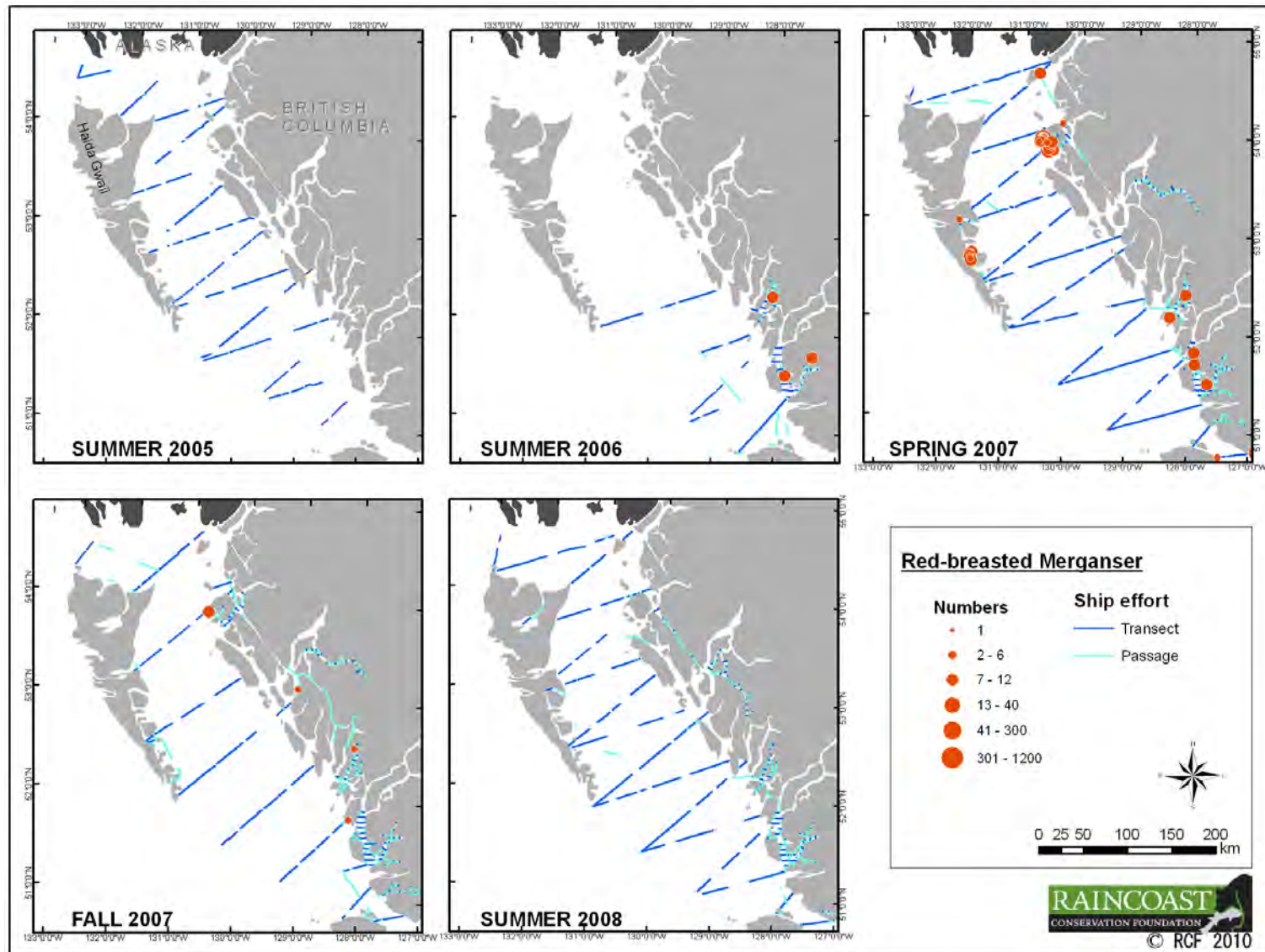
LONG-TAILED DUCK

Figure 46: Long-tailed Duck (*Clangula hyemalis*) sightings from surveys 2005-2008.

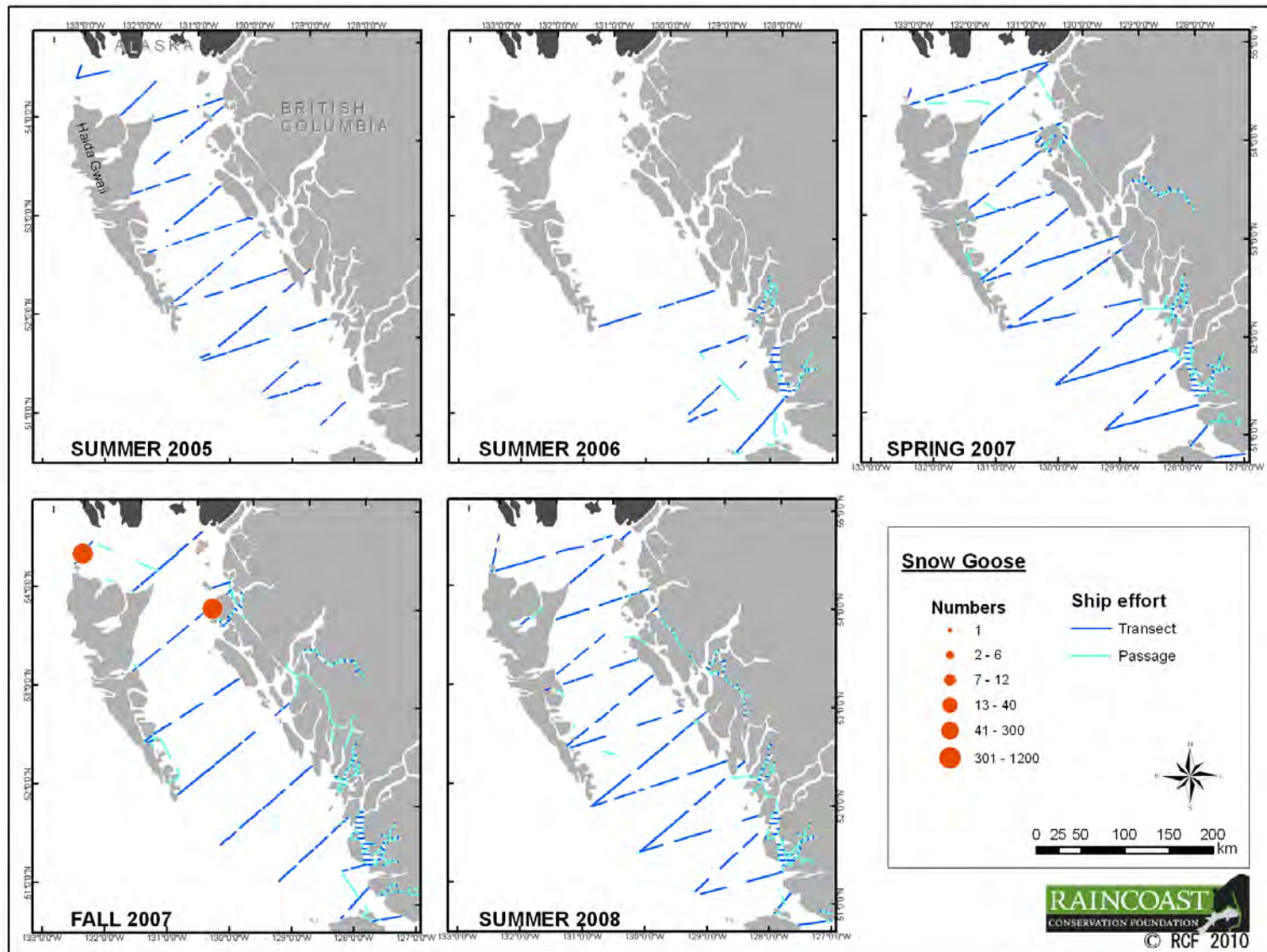
HOODED MERGANSER

Figure 47: Hooded Merganser (*Lophodytes cucullatus*) sightings from surveys 2005-2008.

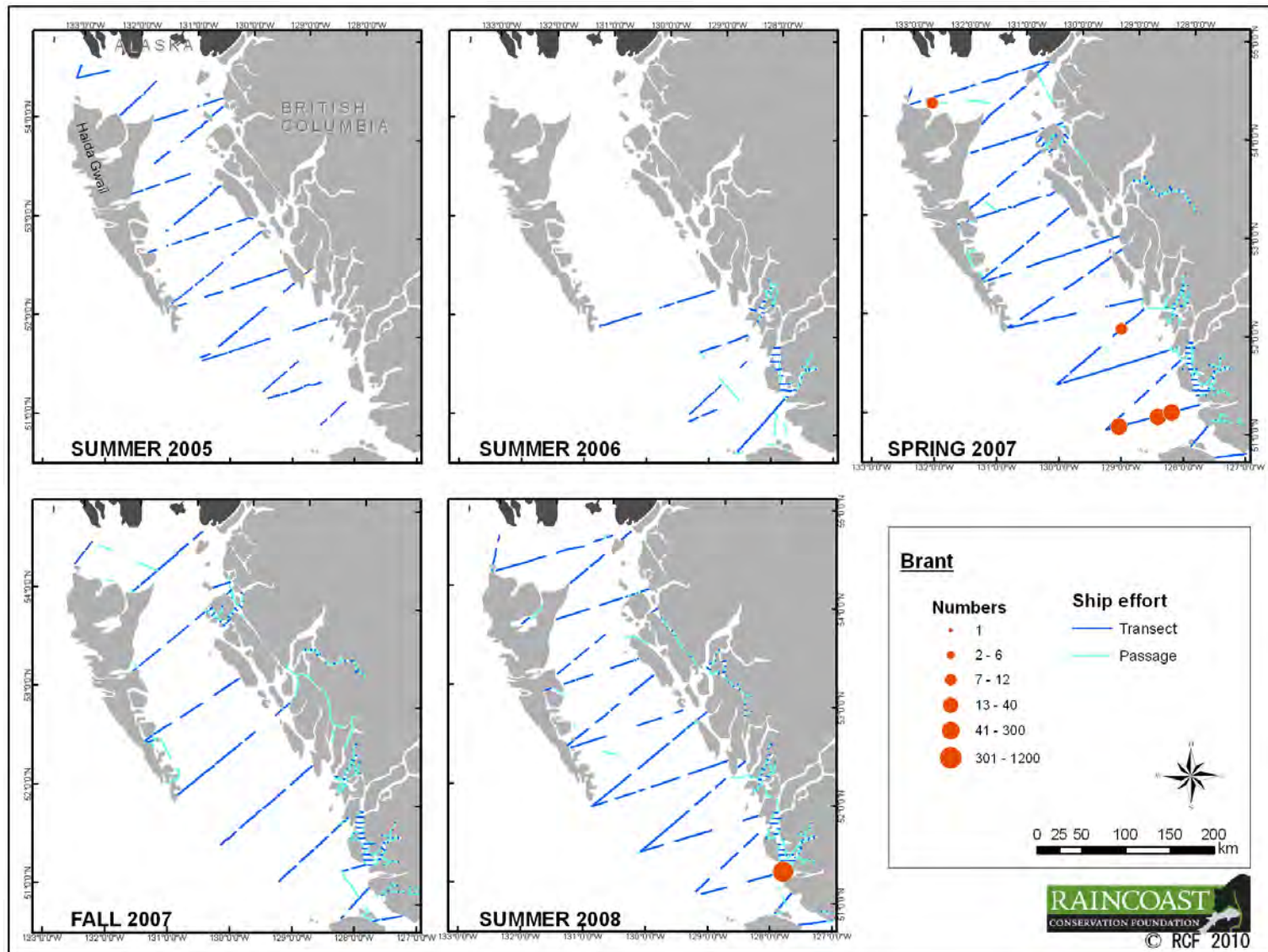
RED-BREASTED MERGANSER

Figure 48: Red-breasted Merganser (*Mergus serrator*) sightings from surveys 2005-2008.

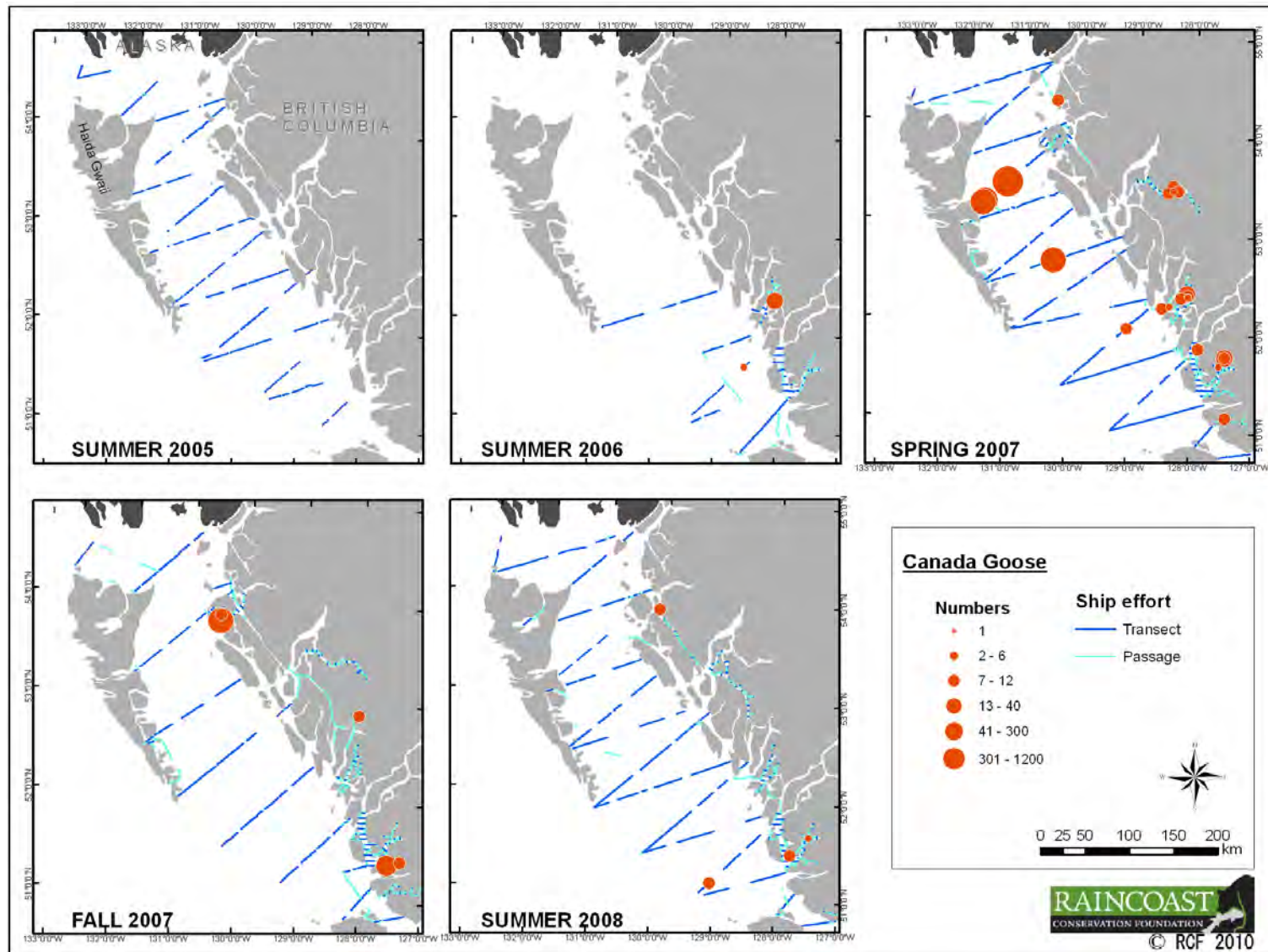
SNOW GOOSE

Figure 49: Snow Goose (*Chen caerulescens*) sightings from surveys 2005-2008.

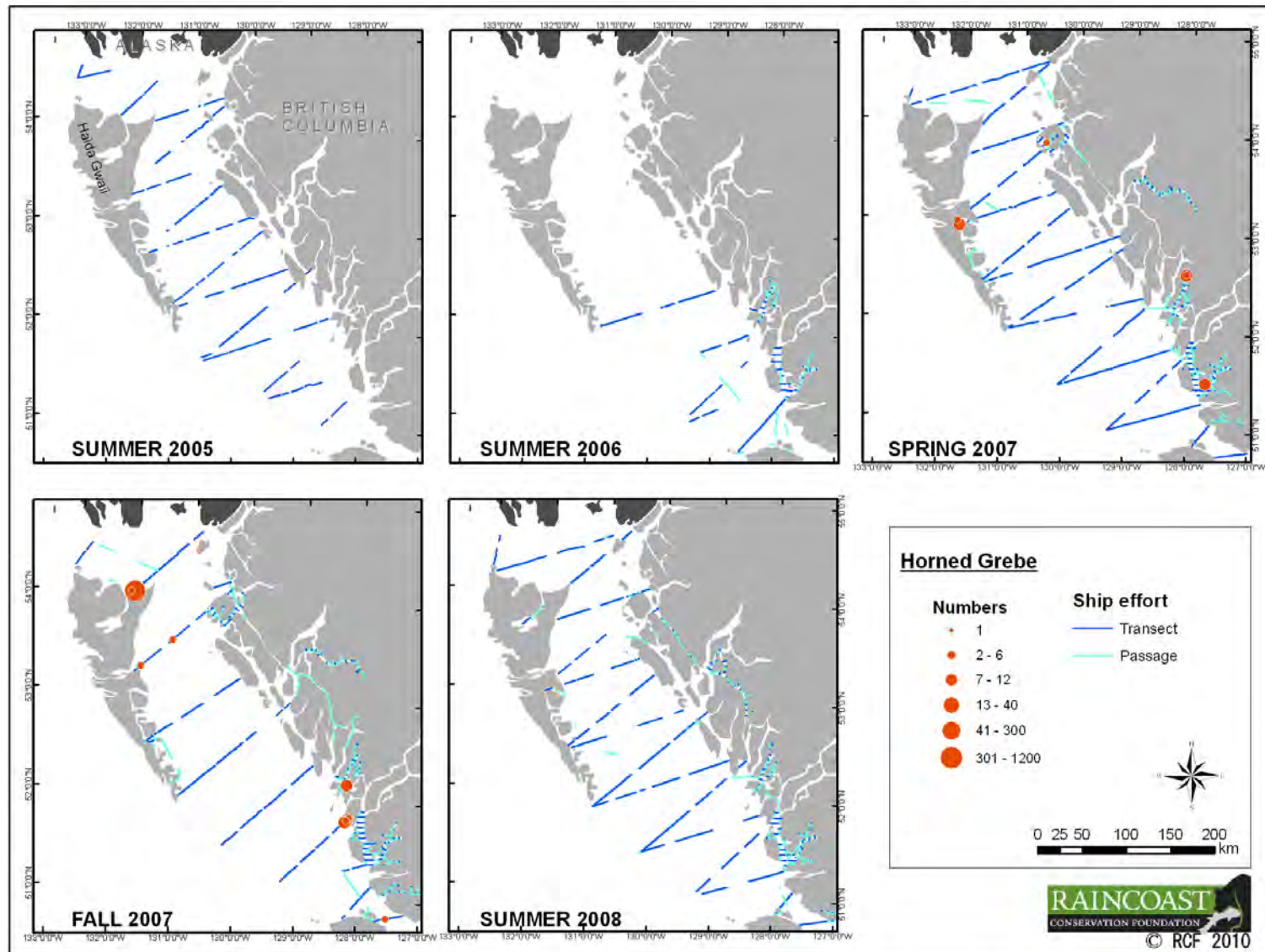
BRANT

Figure 50: Brant (*Branta bernicla*) sightings from surveys 2005-2008.

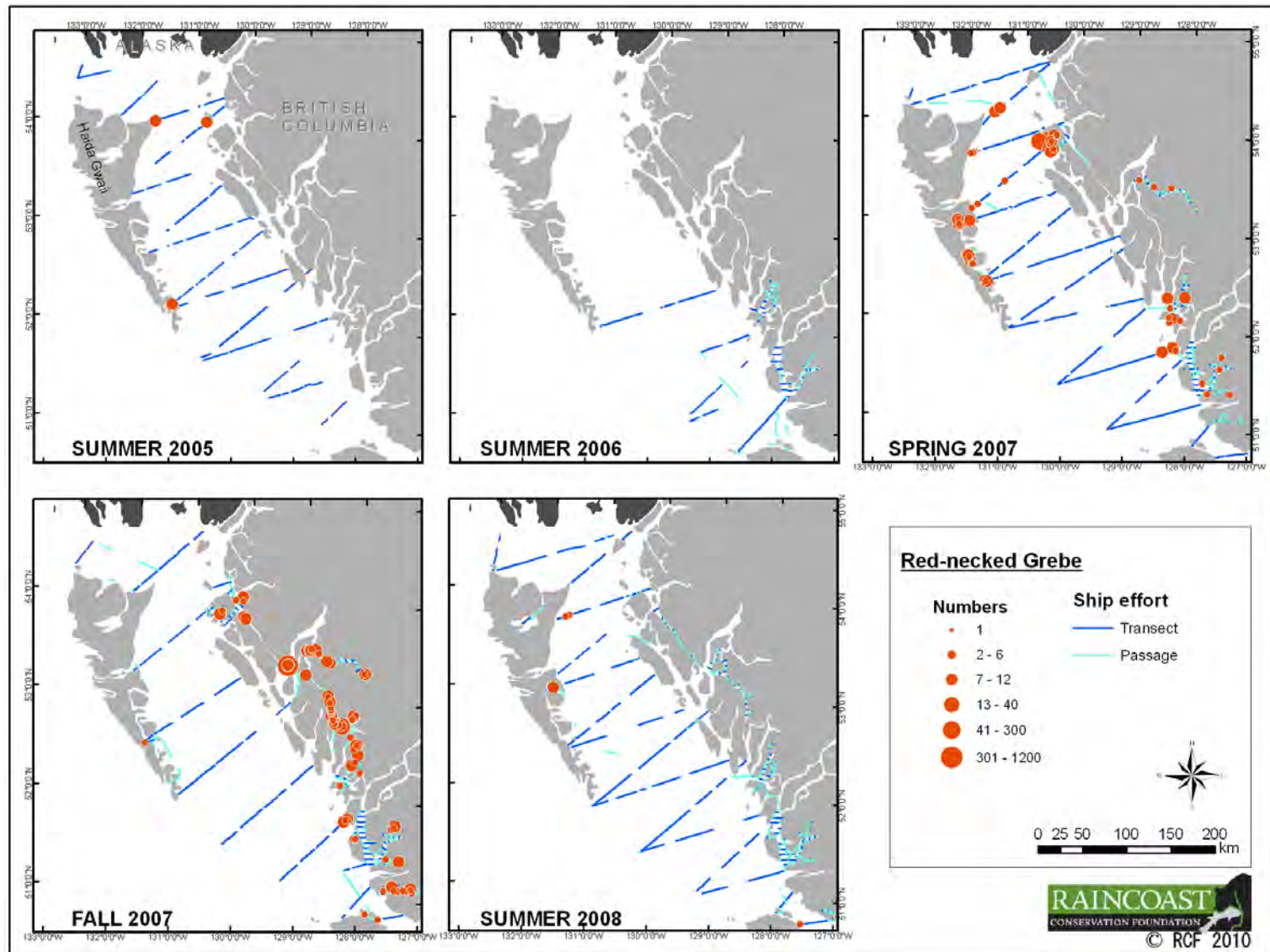
CANADA GOOSE

Figure 51: Canada Goose (*Branta canadensis*) surveys from 2005-2008.

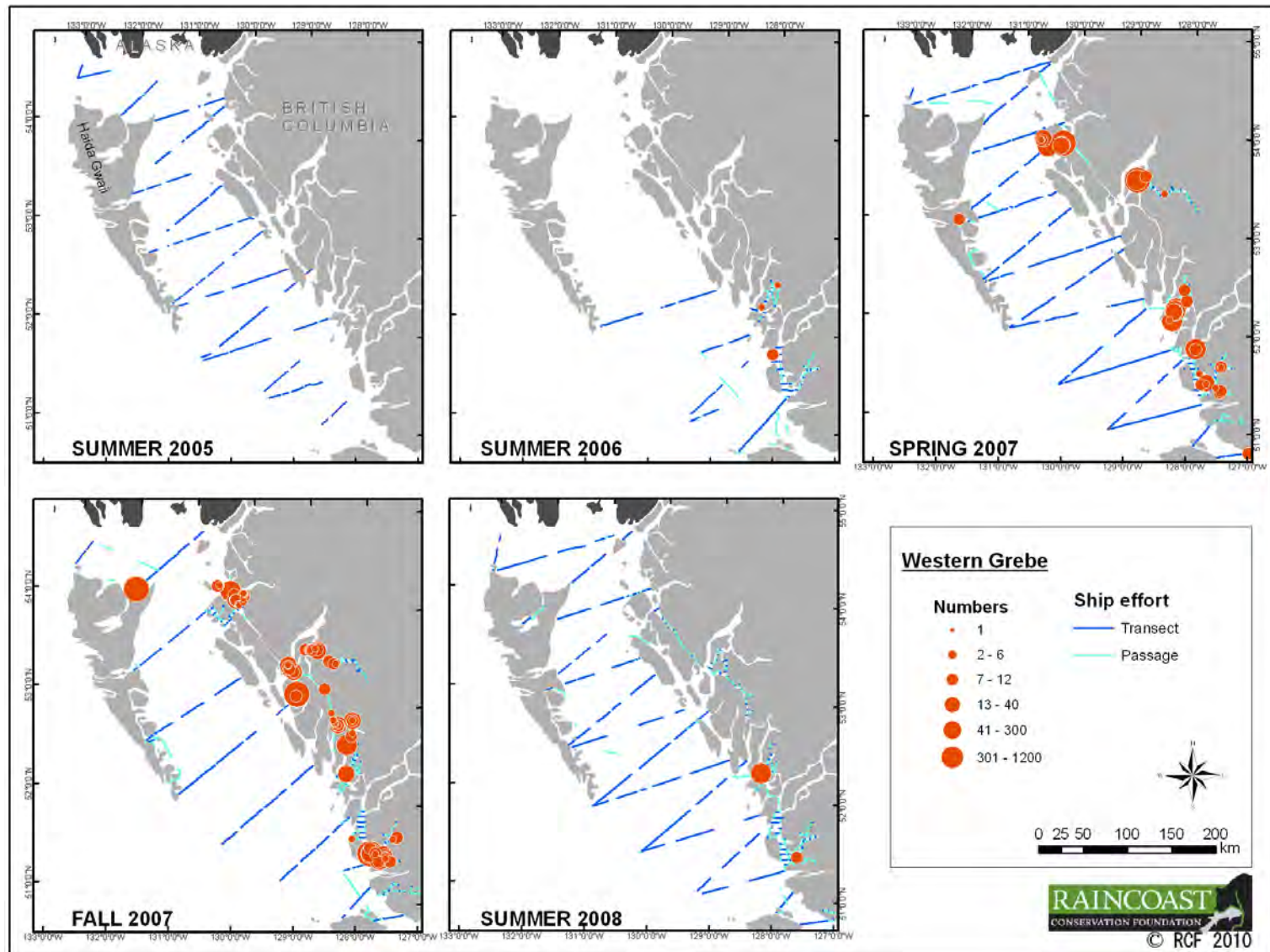
HORNED GREBE

Figure 52: Horned Grebe (*Podiceps auritus*) sightings from surveys 2005-2008.

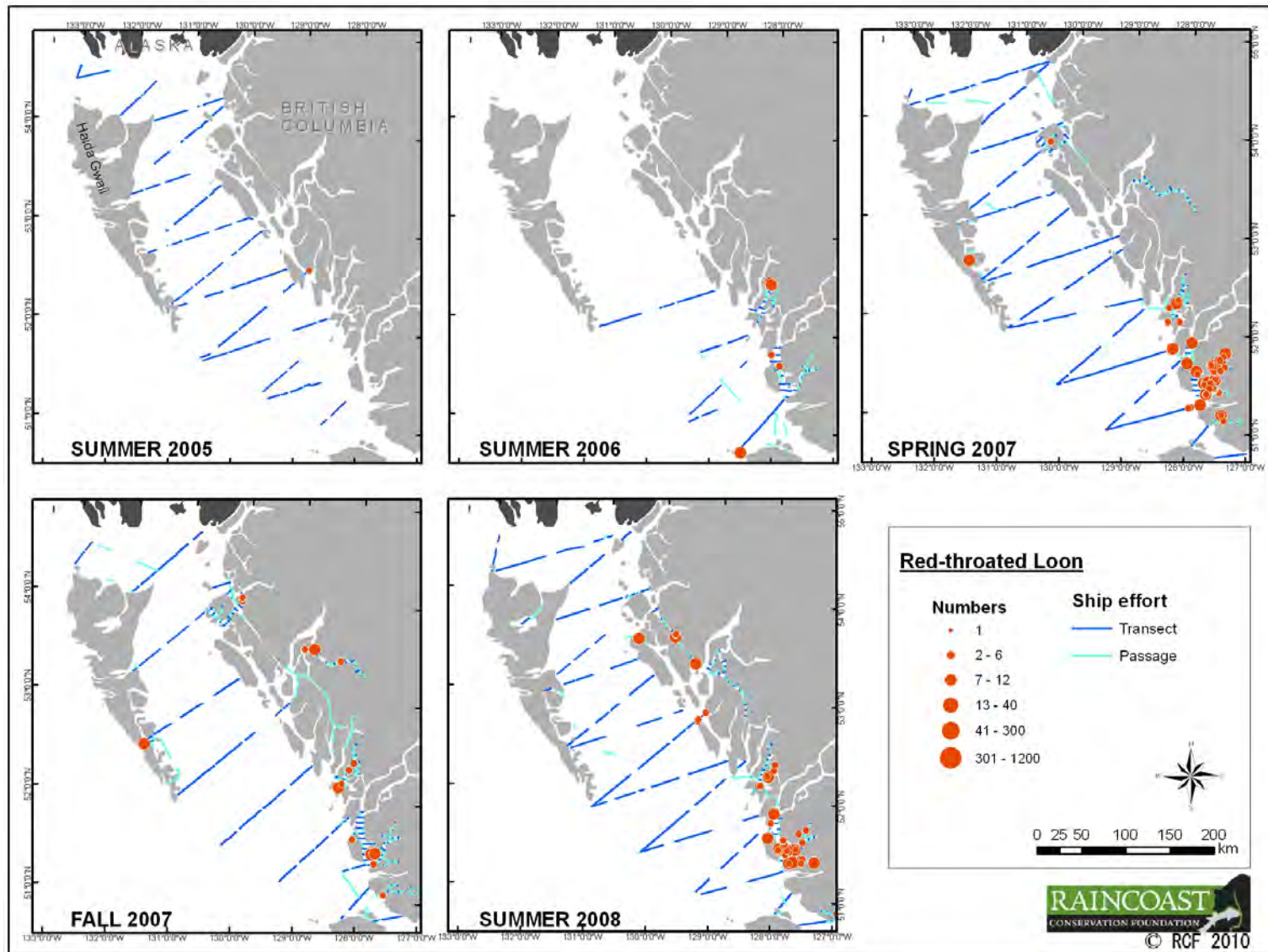
RED-NECKED GREBE

Figure 53: Red-necked Grebe (*Podiceps grisegena*) sightings from surveys 2005-2008.

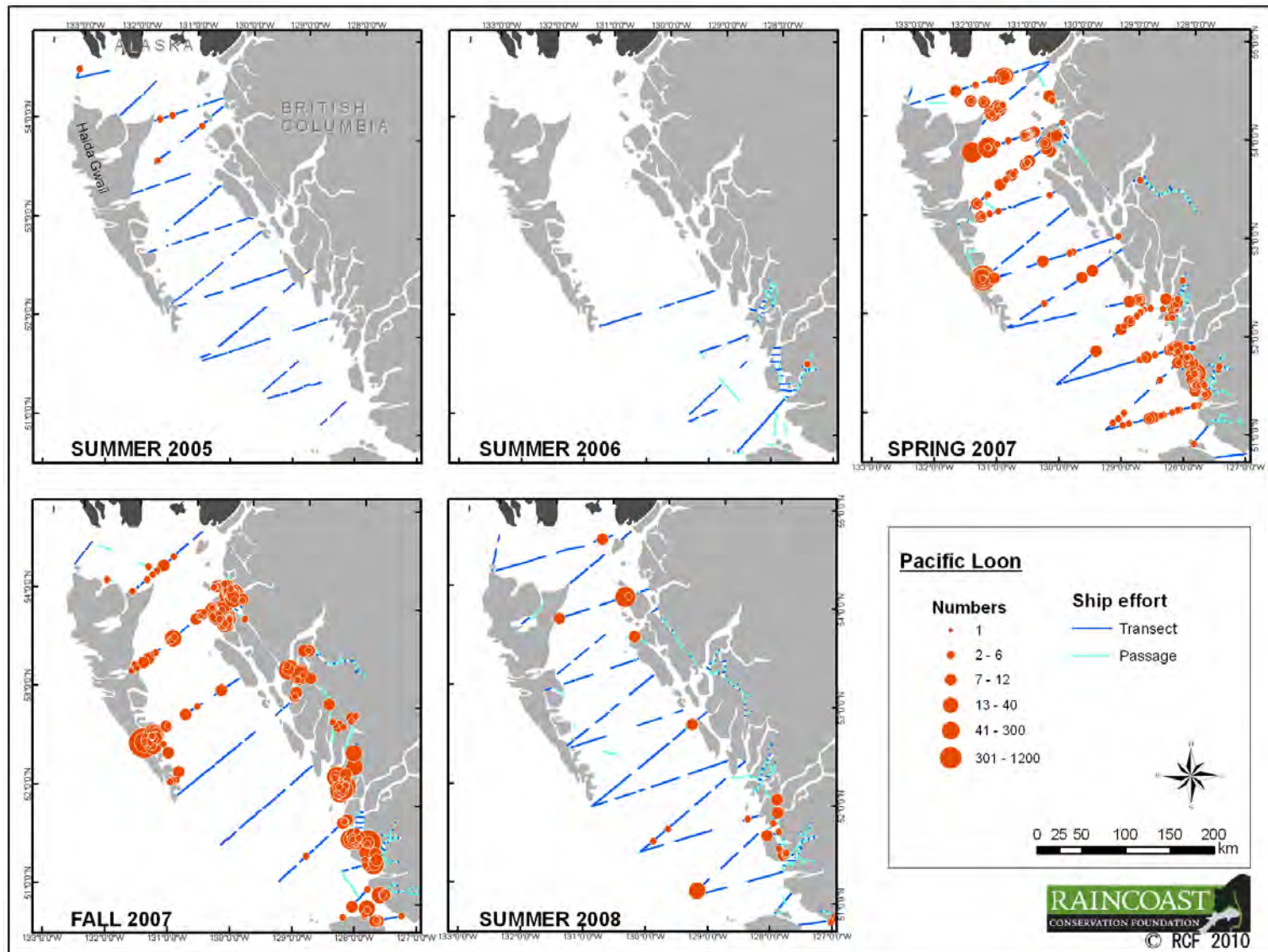
WESTERN GREBE

Figure 54: Western Grebe (*Aechmophorus occidentalis*) sightings from surveys 2005-2008.

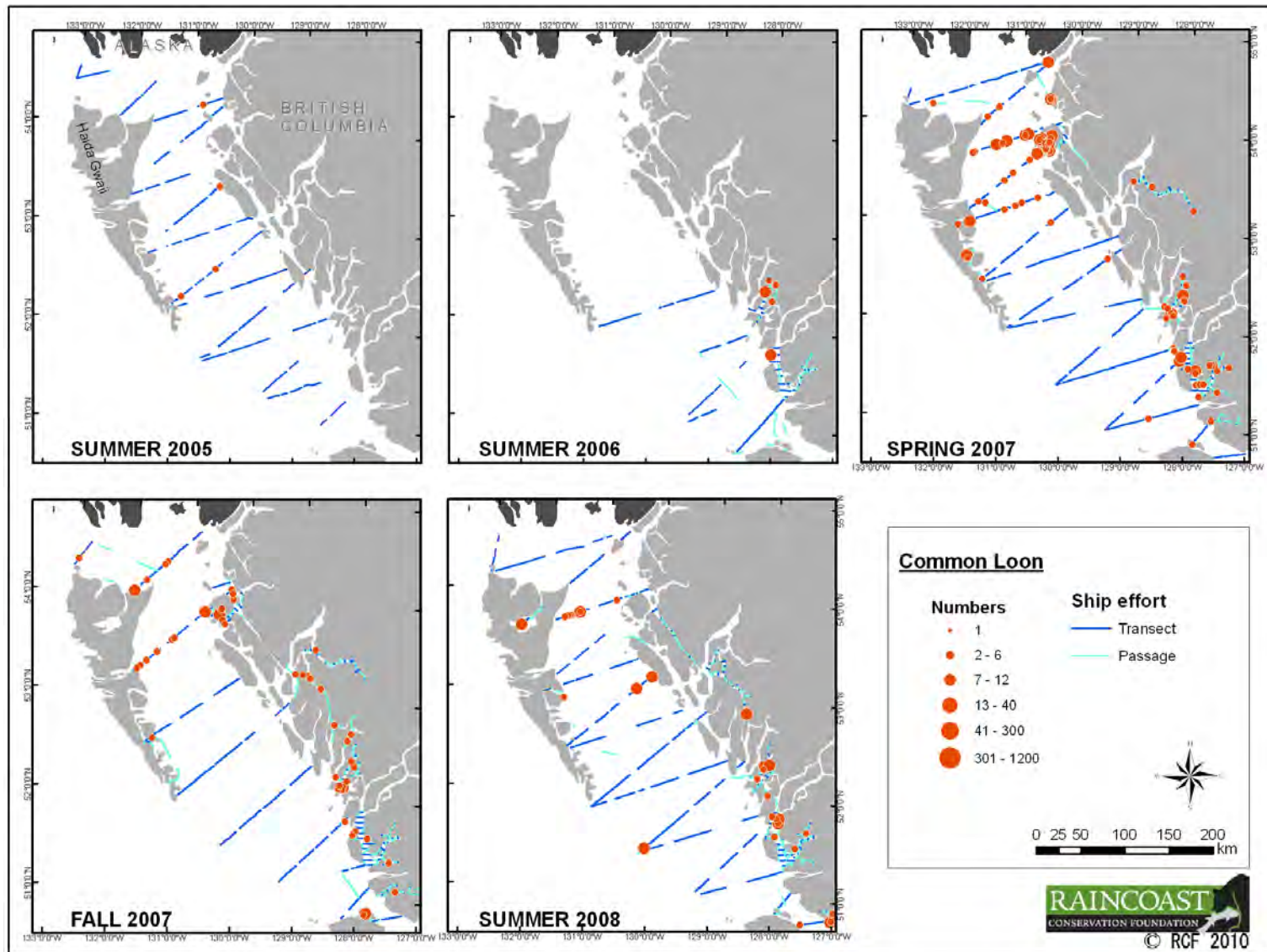
RED-THROATED LOON

Figure 55: Red-throated Loon (*Gavia stellate*) sightings from surveys 2005-2008.

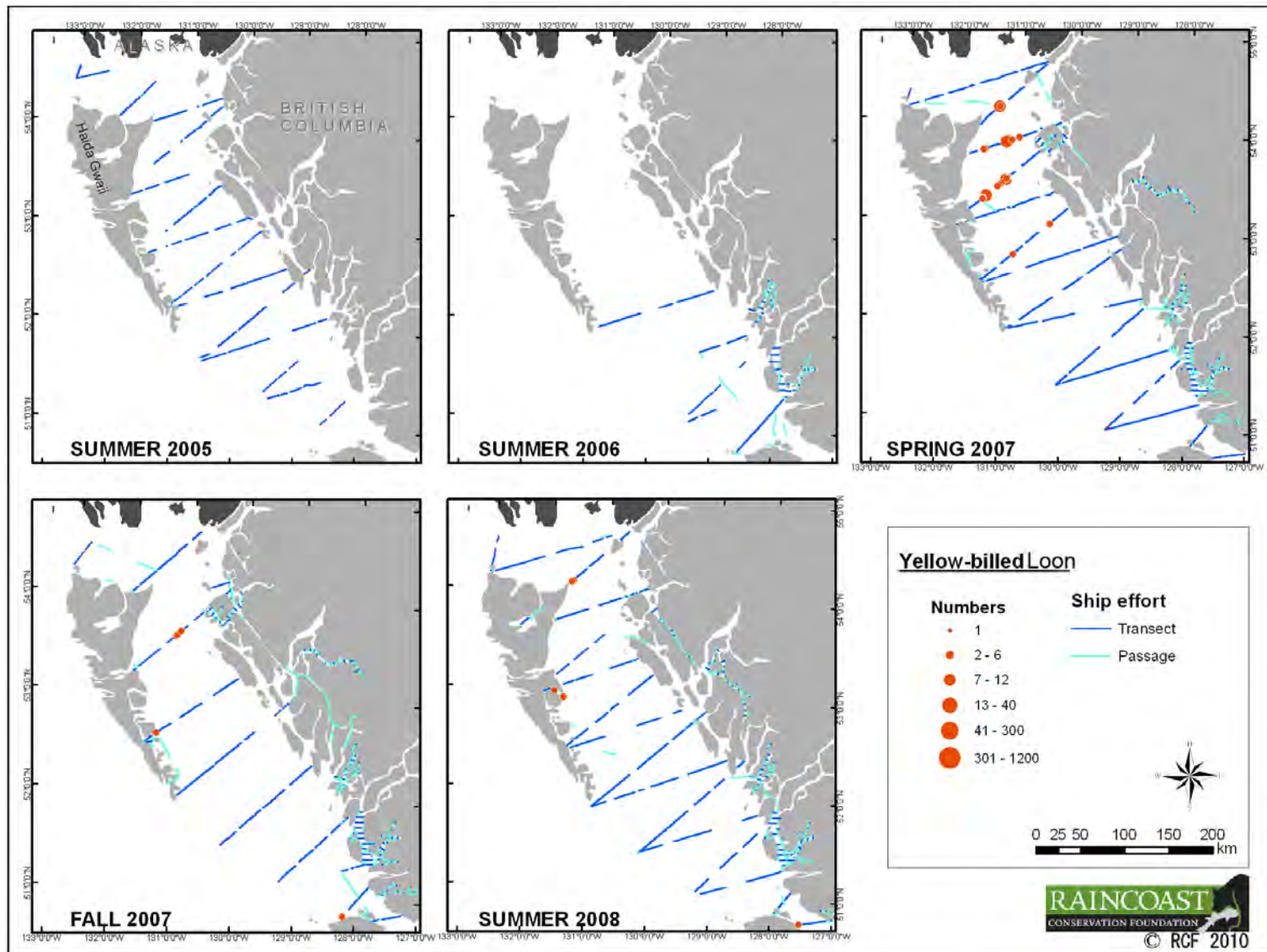
PACIFIC LOON

Figure 56: Pacific Loon (*Gavia pacifica*) sightings from surveys 2005-2008.

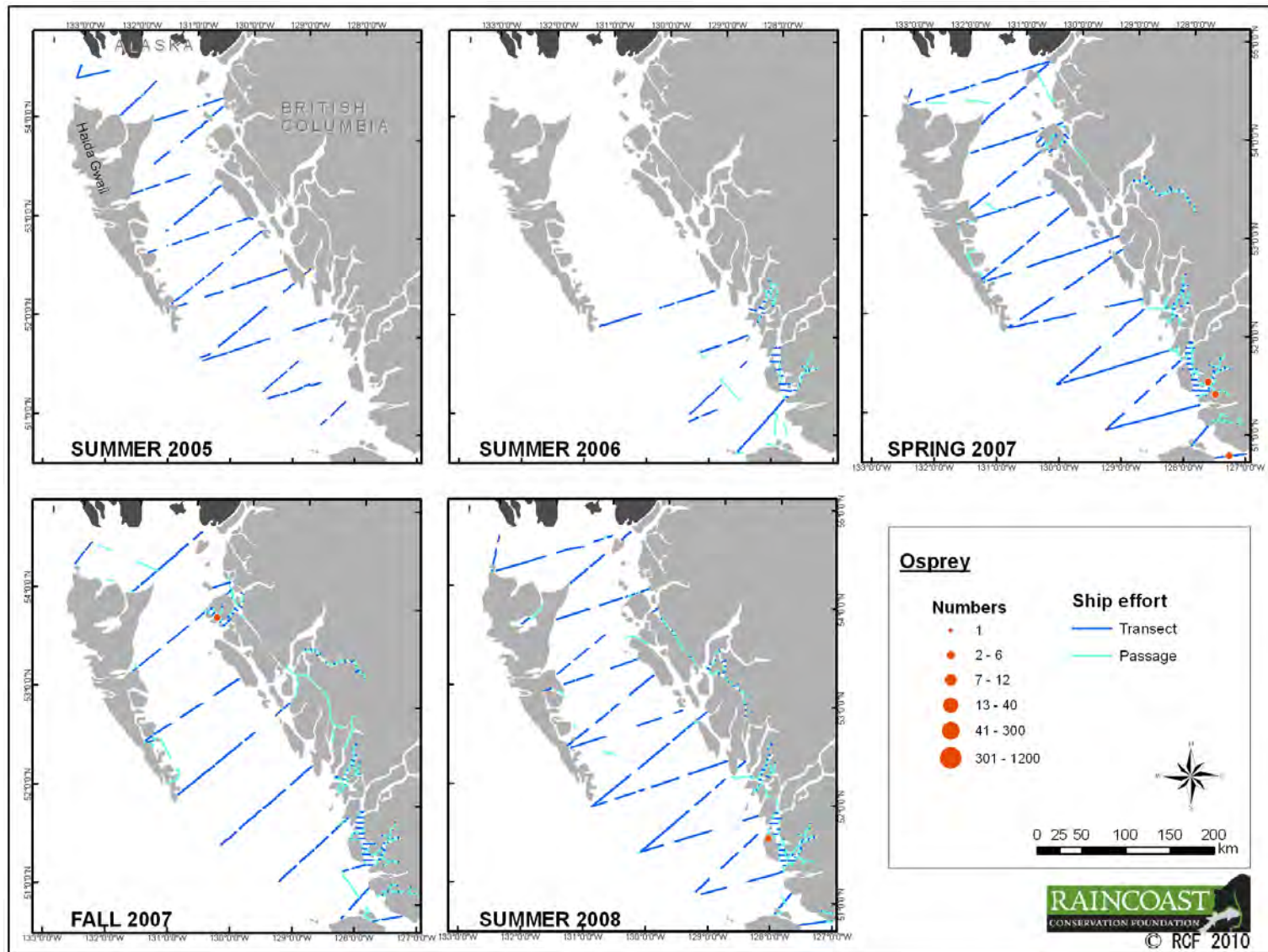
COMMON LOON

Figure 57: Common Loon (*Gavia immer*) sightings from surveys 2005-2008.

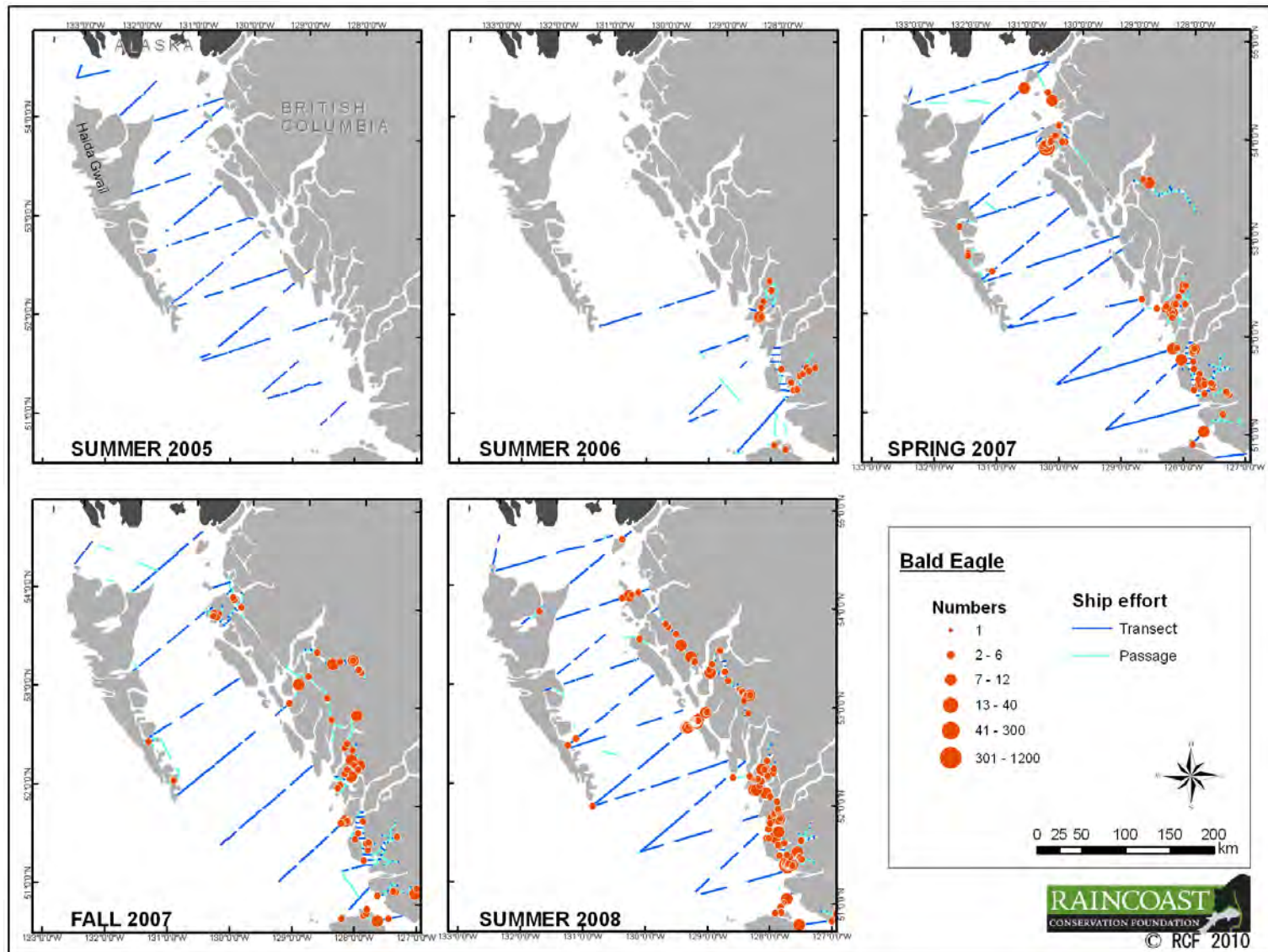
YELLOW-BILLED LOON

Figure 58: Yellow-billed Loon (*Gavia adamsii*) sightings from surveys 2005-2008.

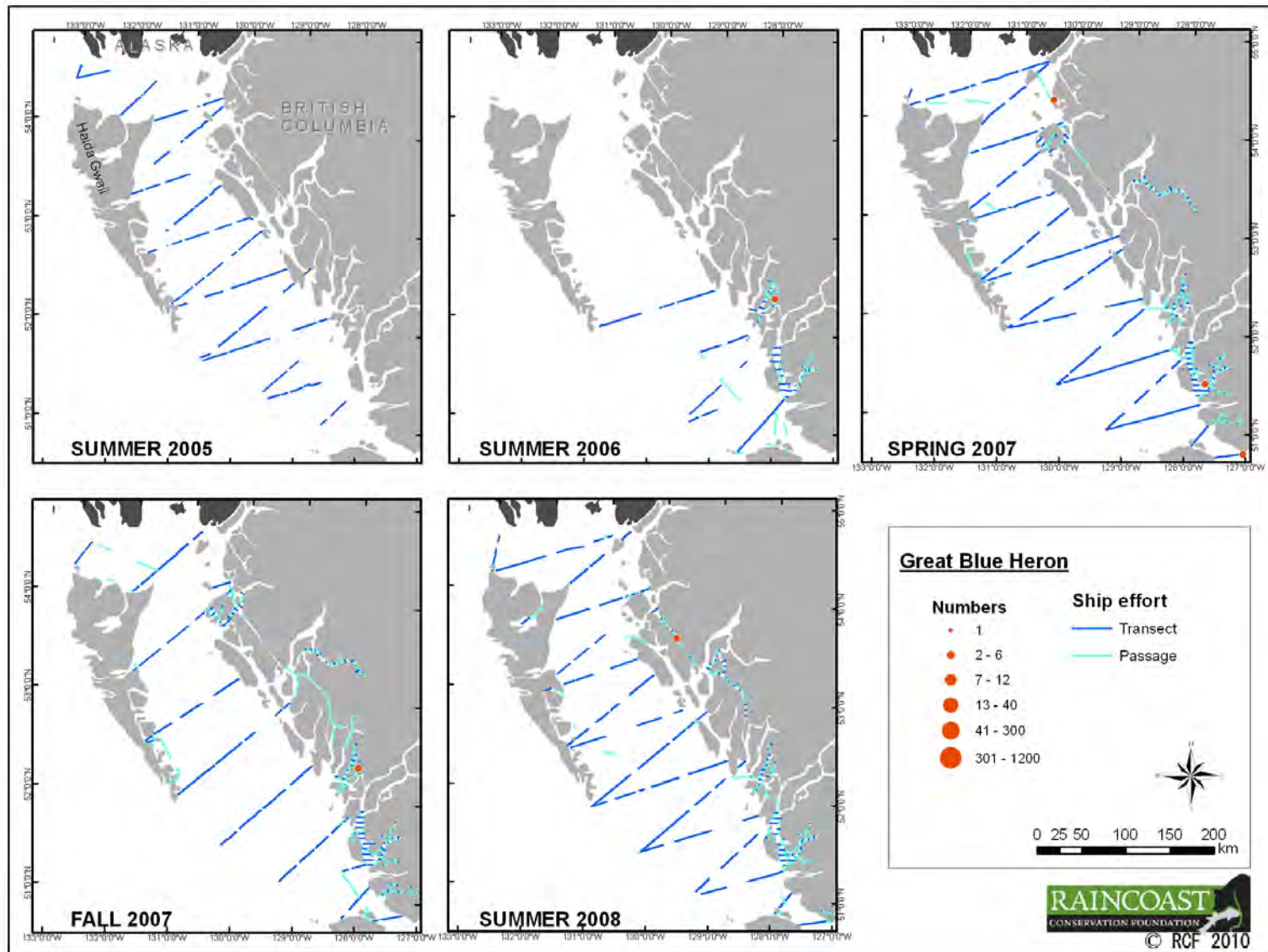
OSPREY

Figure 59: Osprey (*Pandion haliaetus*) sightings from surveys 2005-2008.

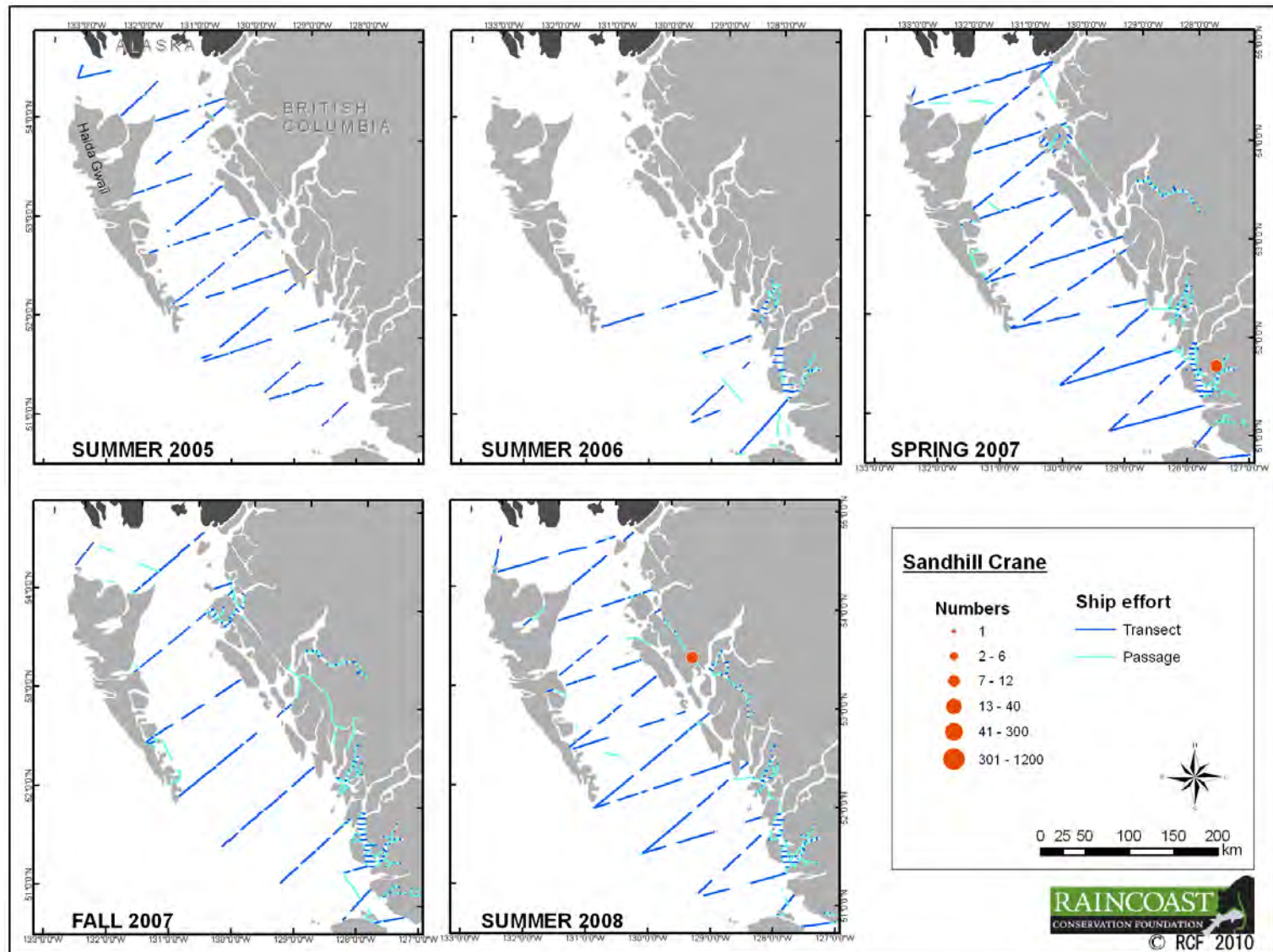
BALD EAGLE

Figure 60: Bald Eagle (*Haliaeetus leucocephalus*) sightings from surveys 2005-2008.

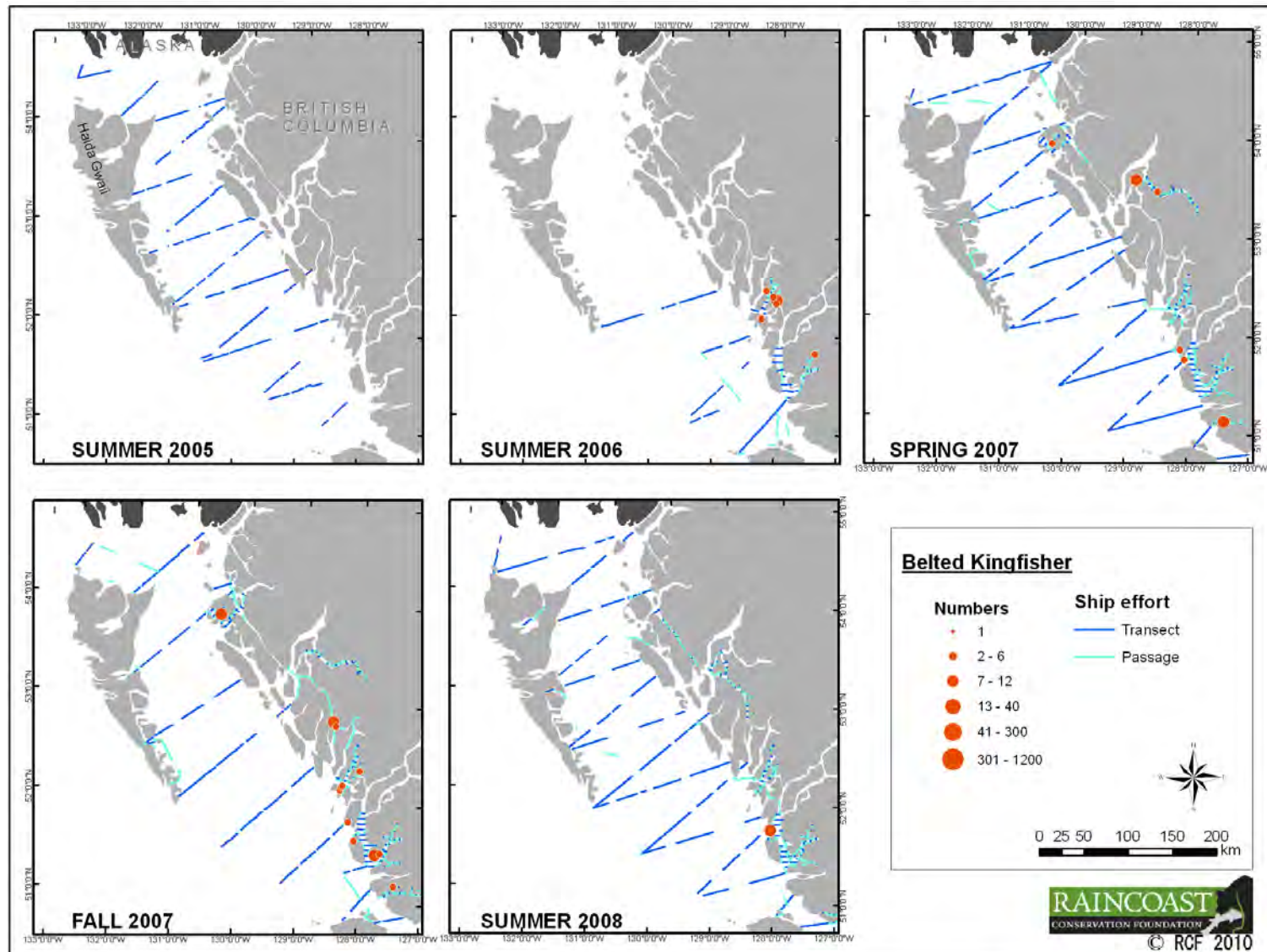
GREAT BLUE HERON

Figure 61: Great Blue Heron (*Ardea herodias*) sighting from surveys 2005-2008.

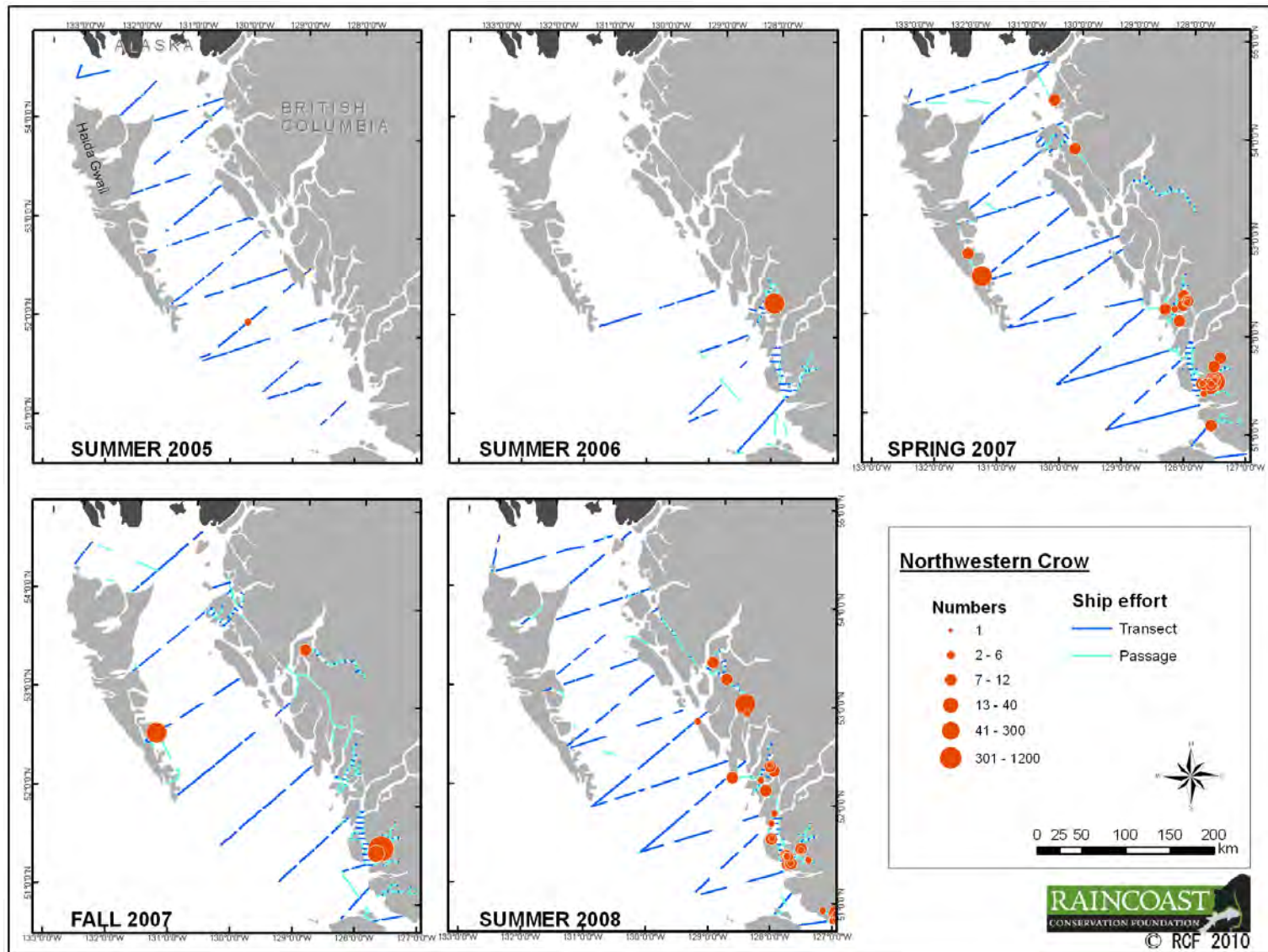
SANDHILL CRANE

Figure 62: Sandhill Crane (*Grus canadensis*) sightings from surveys 2005-2008.

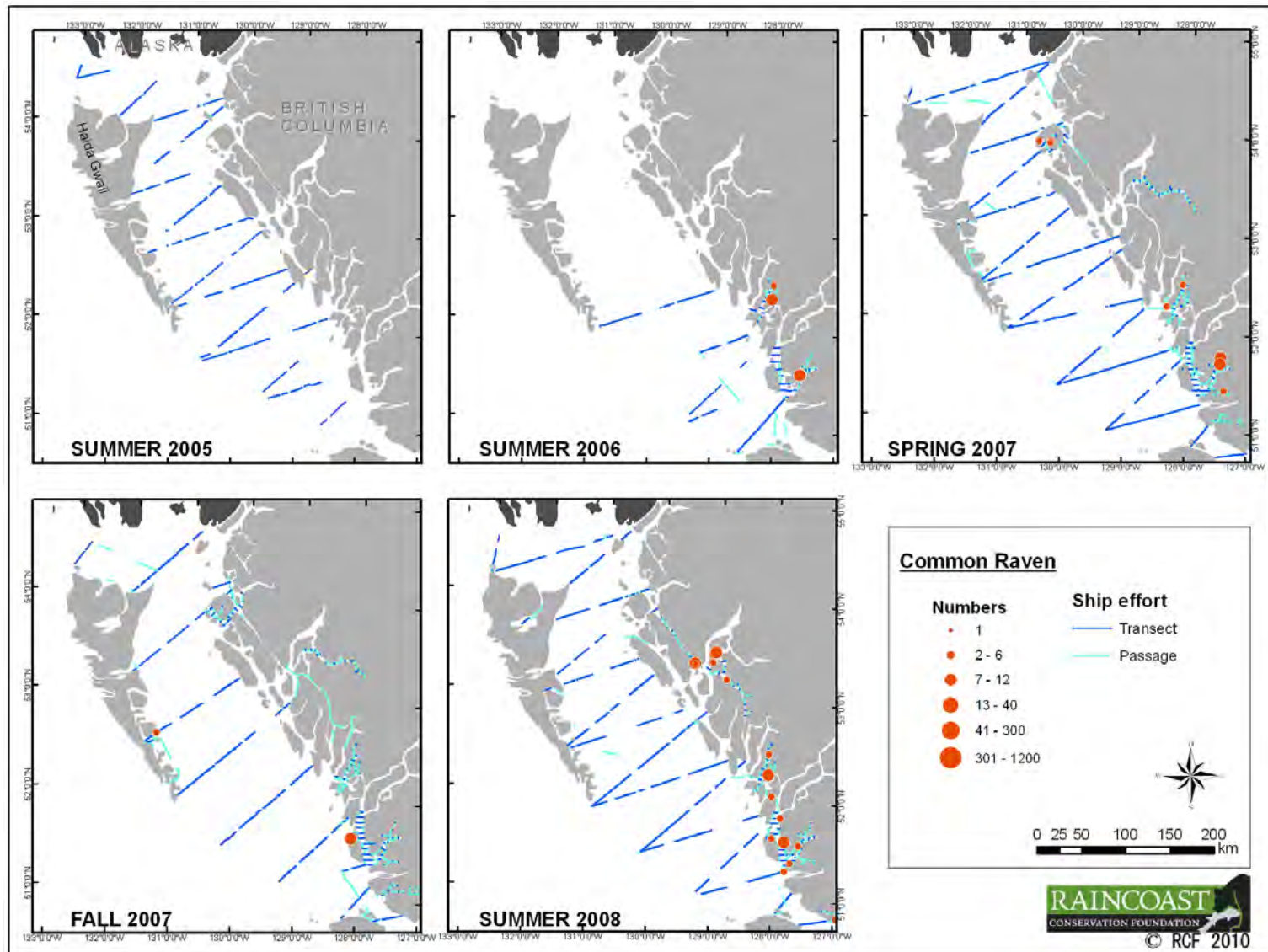
BELTED KINGFISHER

Figure 63: Belted Kingfisher (*Megasceryle alcyon*) sightings from surveys 2005-2008.

NORTHWESTERN CROW

Figure 64: Northwestern Crow (*Corvus caurinus*) sightings from surveys 2005-2008.

COMMON RAVEN

Figure 65: Common Raven (*Corvus corax*) sightings from surveys 2005-2008.

Note: American Wigeon (*Anas americana*) and Goldeneye (*Bucephala albeola*, *Bucephala clangula*, *Bucephala islandica*) observations were included in 2005-2008 studies, however distribution maps are not incorporated into this report.