Shorebirds and Avian Influenza Sampling in Alaska and Asia

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Collaborators

- Alaska
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  - Audrey Taylor, Nathan Coutsoubos, River Gates, UAF Graduate Students
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  - Stephen Brown, Manomet Center for Conservation Sciences
  - Joe Liebezeit and Steve Zack, Wildlife Conservation Society
  - Debbie Nigro, BLM
  - Abby Powell, UAF
  - Bill Streever, BP Exploration (Alaska) Inc.
- Asia
  - Mark Barter, Wetlands International – Oceania, Australia
  - Chung-yu Chiang, Taiwan Wader Study Group, Taiwan
  - Dr. Zhijun Ma, Fudan University, China
  - Dr. Cao Lei, University of Science and Technology, China
  - Pavel Tomkovich, Moscow State Uni., Russia
  - Nial Moores, Birds Korea, S. Korea
  - Yoshi Shigeta, Yamashina Institute for Ornithology, Japan

Objectives

- Describe intensive capture efforts of breeding and postbreeding shorebirds in Alaska (by USFWS)

- Describe focused avian influenza sampling and migration ecology study of *arcticola* Dunlin

Priority Species

1. Steller's eider
2. Northern pintail
3. Lesser snow goose
4. Emperor goose
5. Black brant
6. Spectacled eider
7. Aleutian goose
8. Long-tailed duck
9. Tundra swan
10. Common eider
11. King eider
12. Lesser sandhill crane
13. Dunlin
14. Sharp-tailed sandpiper
15. Bar-tailed godwit
16. Ruddy turnstone
17. Pectoral sandpiper
18. Red knot
19. Long-billed dowitcher
20. Rock sandpiper
21. Pacific golden plover
22. Buff-breasted sandpiper
23. Arctic warbler
24. Eastern yellow wagtail
25. Gray-cheeked thrush
26. Glaucous gull

Breeding Season Sampling: find nests and then capture adults

Nests initiated early May - June; chicks fledged by mid-July

B. Trask

Rope drags are one way used to find cryptic nests.

B. Trask

Alternatively, people can use bird behavior to locate nest sites.

R. Lanctot


R. Lanctot


Once found, adult birds can be captured at nest sites using a bow net.
T. Mano
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Adults and chicks can also be captured after hatch.

M Denega

Postbreeding Season Sampling: Spring and Fall Staging

shorebirds aggregate along coastal estuaries and lagoons

A Taylor

Birds can be caught by luring them close to mist nets using shorebird decoys.

R. Gill

Another option is simple traps that catch birds by allowing them to walk into a trap but making it difficult for them to walk out.

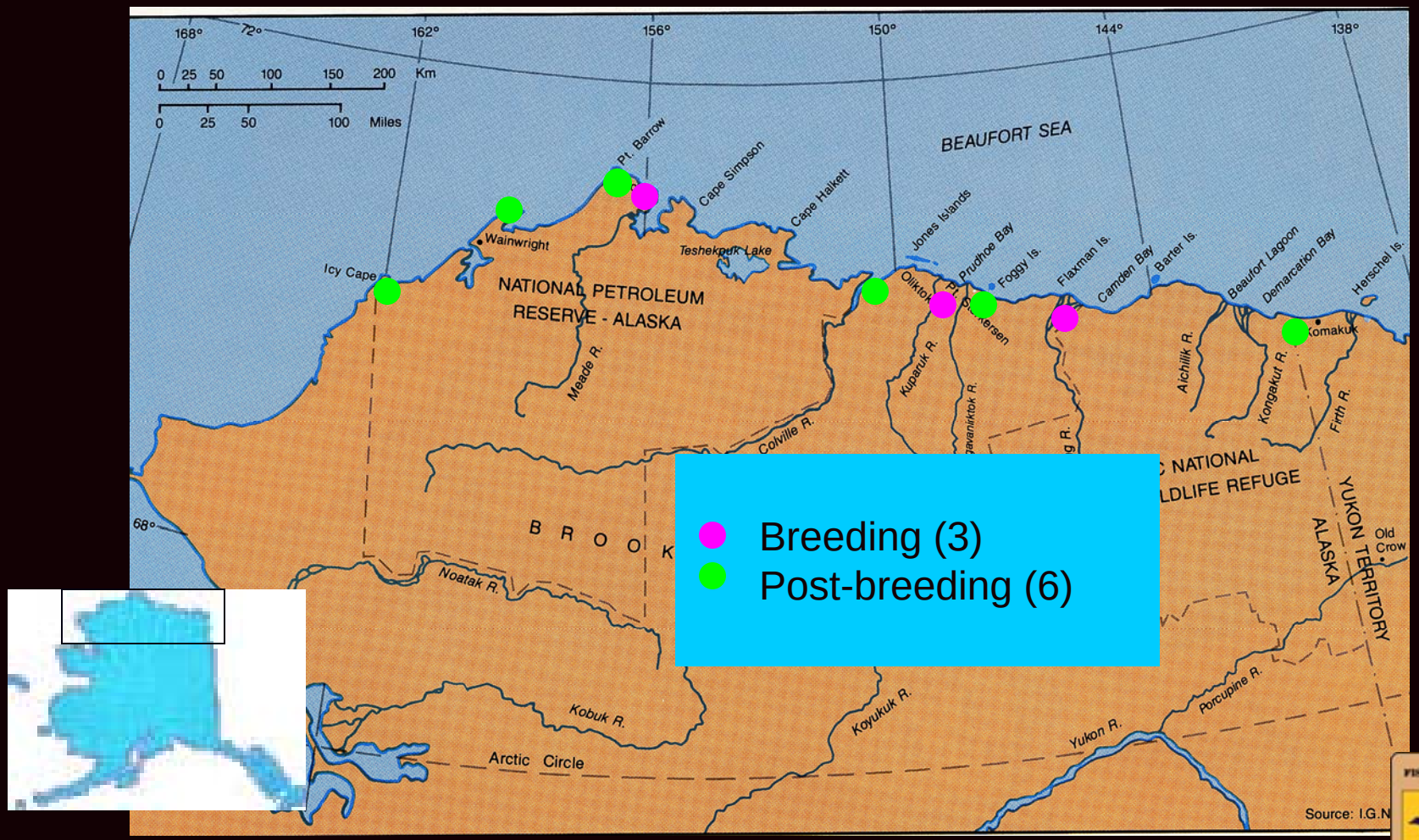
R. Gill

Sampling Effort in Alaska

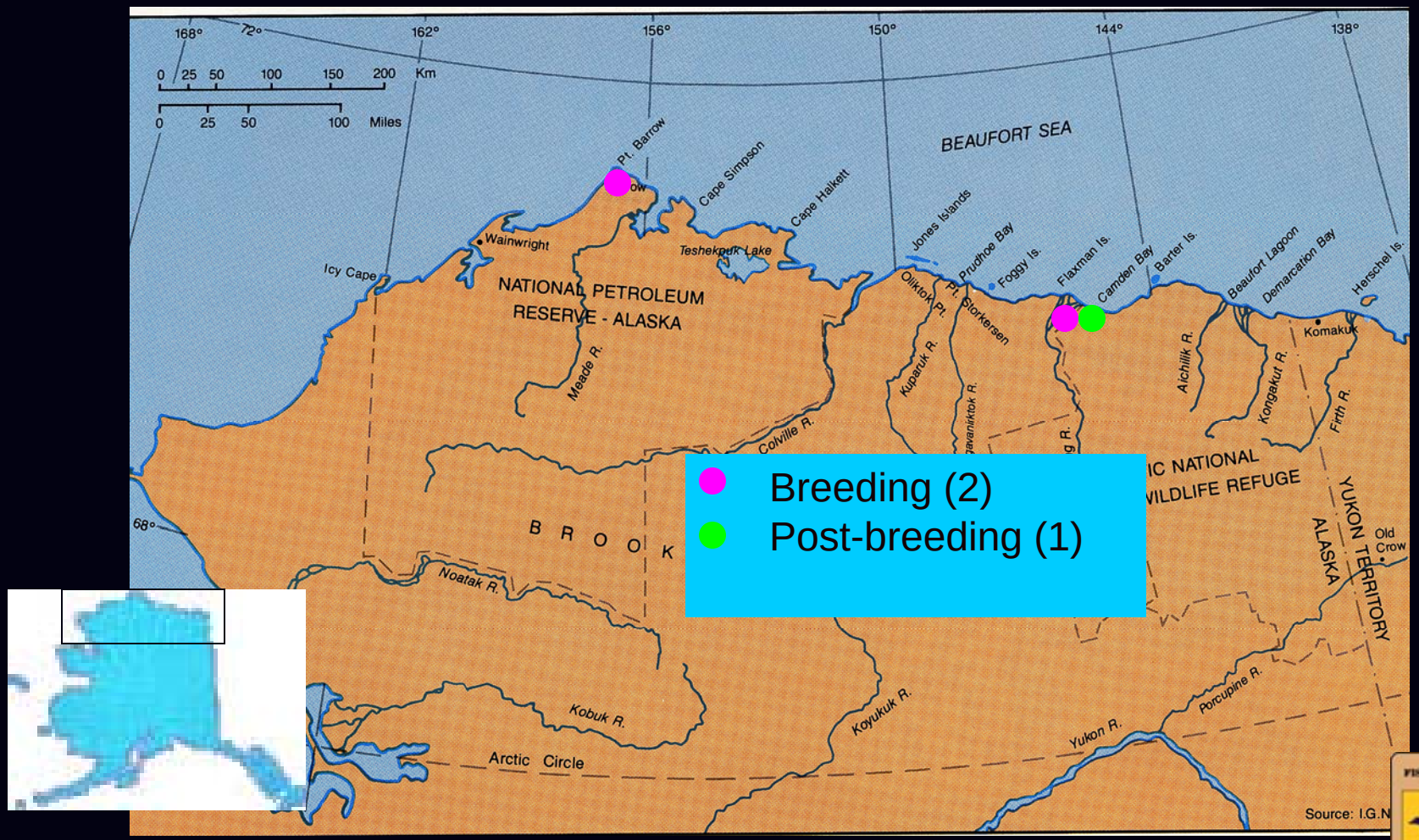
- Breeding Season
  - Intensive Field Efforts at Particular Sites
  - Minimal Effort at many sites

- Postbreeding Season
  - Intensive Field Efforts at Particular Sites

2006 Intensive Shorebird Sampling Sites on the North Slope



2007 Intensive Shorebird Sampling Sites on the North Slope



Intensive Breeding Samples

Species	Barrow		Prudhoe	Canning River		all sites/years
	2006	2007	2006	2006	2007	Total
bbsa	13	1	53	14	2	83
dunl	91	129	16	28	12	276
lbdo	29	35	6	5	0	75
pesa	249	37	43	45	18	392
rutu	0	0	6	7	4	17
total	382	202	124	99	36	843

Intensive Postbreeding Samples

Species	Kasegaluk	Peard Bay	Barrow	Colville	Prudhoe Bay	Okpilak	Canning	
	2006	2006	2006	2006	2006	2006	2007	Total
bbsa	0	0	0	0	0	18	3	21
dunl	9	0	38	19	6	20	54	146
lbdo	4	0	0	0	0	5	1	10
pesa	0	0	0	1	0	27	30	58
rutu	0	0	0	2	0	9	1	12
total	13	0	38	22	6	79	89	2

Avian Influenza Results

- No HPAI detected
- 1 Dunlin sampled during postbreeding at Barrow tested positive for LPAI

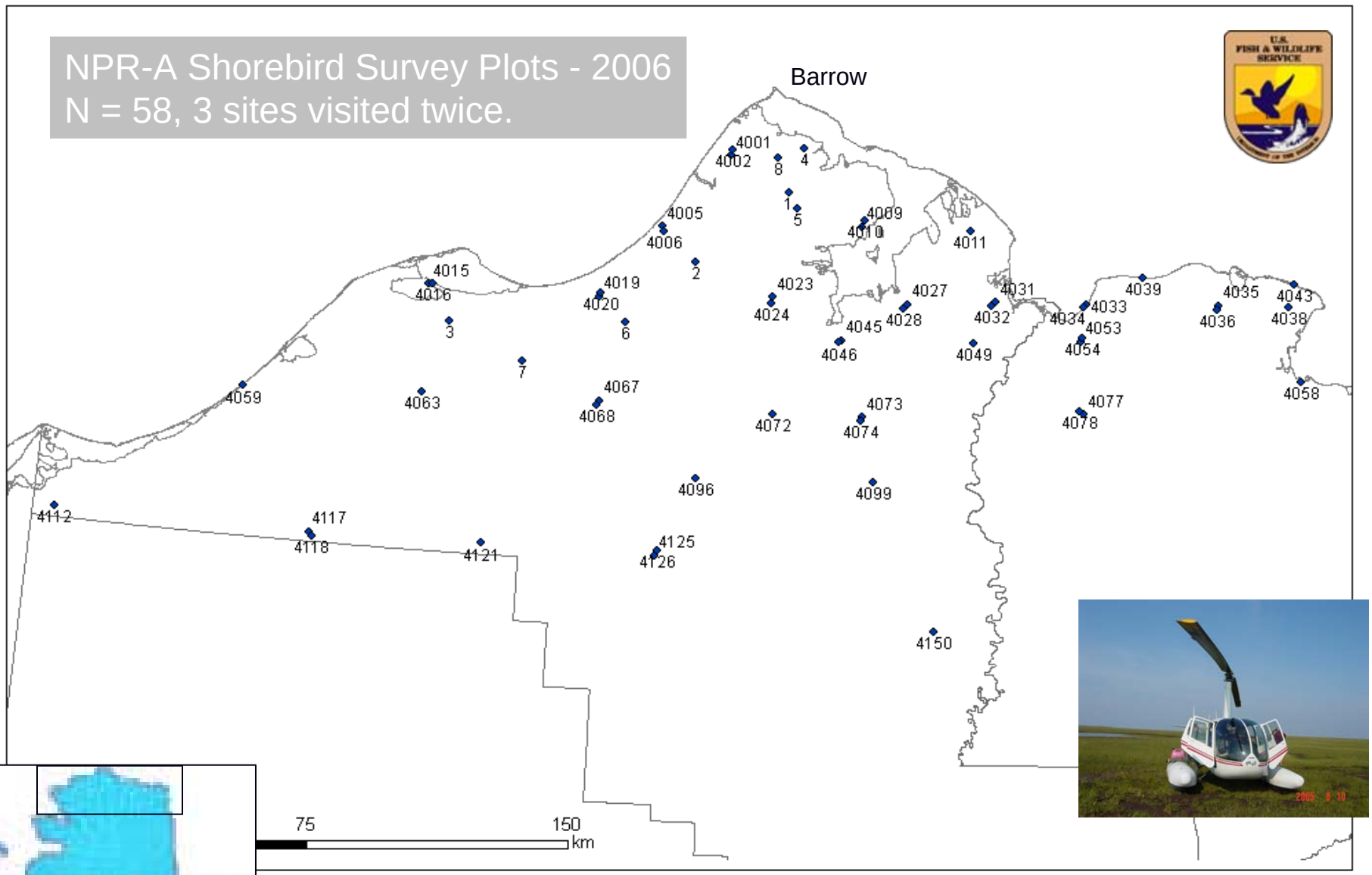
B. Trask

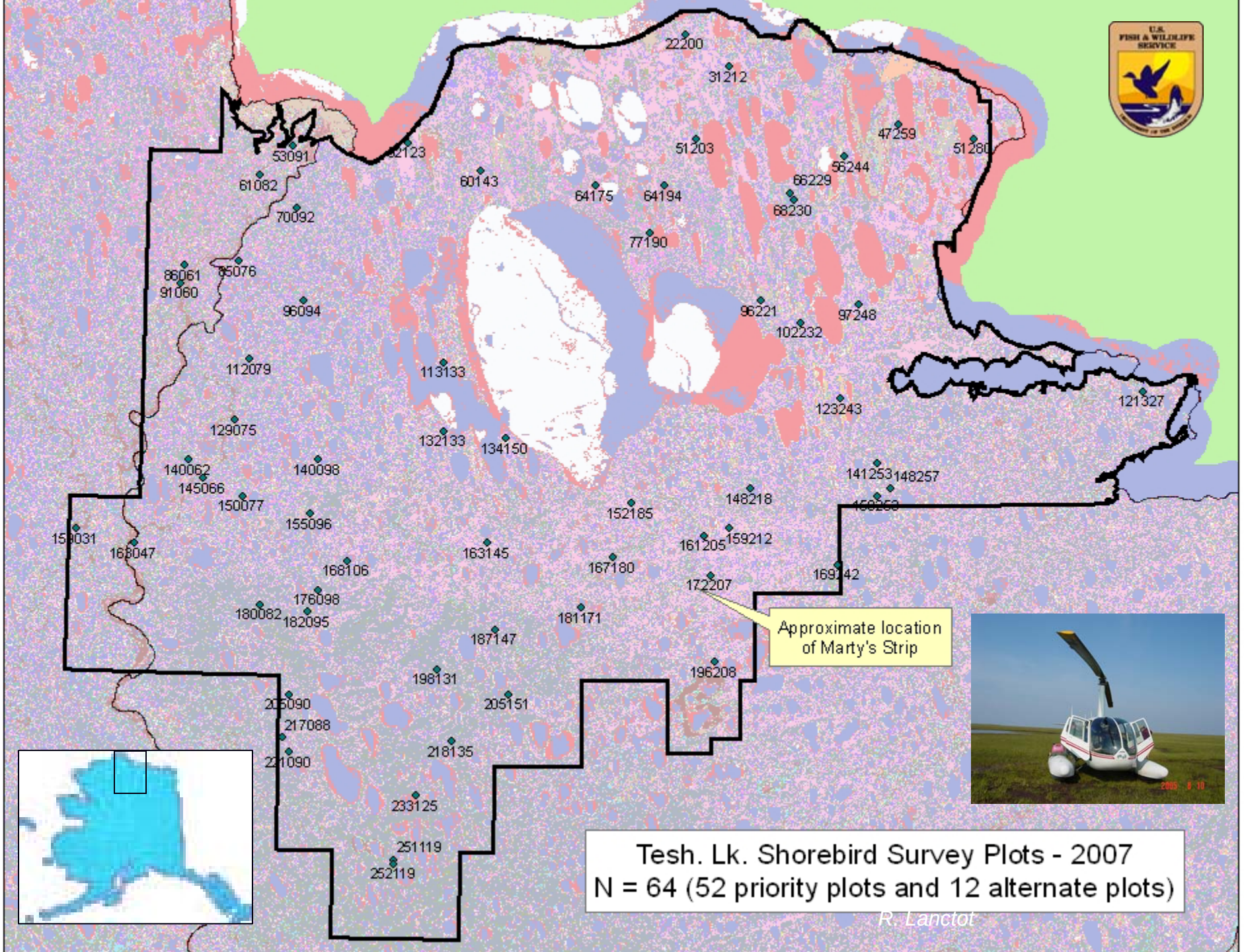
Breeding - NPRA

- Goal: sample many areas for short time
- Purpose: maximize detection of HPAI

S. Brown

# NPR-A Shorebird Survey Plots - 2006
N = 58, 3 sites visited twice.




22200
31212
47259
51280
51203
56244
53091
52123
60143
66229
64175
64194
68230
61082
70092
77190
86061
91060
85076
96094
96221
97248
102232
112079
113133
123243
121327
129075
132133
134150
140062
145066
140098
141253
148257
148218
150077
152185
155096
159031
163047
161205
159212
163145
167180
168106
169142
172207
176098
180082
182095
181171
187147
196208
198131
205090
205151
217088
218135
221090
233125
251119
252119
Approximate location of Marty's Strip
Tesh. Lk. Shorebird Survey Plots - 2007
N = 64 (52 priority plots and 12 alternate plots)
R. Lanctot

NPR-A Breeding Samples

Species	2006	2007
amgp	2	2
bbpl	3	1
bbsa	3	4
dunl	41	43
lbdo	1	12
pesa	55	47
reph	53	5
rnph	1	4
rutu	4	4
sesa	29	21
stsa	3	2
wesa	3	0
total	**197**	**145**
sites	58	40
sampling period	8 - 24 June	10 - 24 June

Avian Influenza Results

- No HPAI or LPAI detected in 2006 or 2007

B. Trask

AK Side Benefits

- Blood and feather samples collected from many birds for future genetic and stable isotope studies
- Birds equipped with radio transmitters to document movement from breeding to staging areas, among staging areas on North Slope, and length of stay at staging areas
- Conducted replicate surveys at remote sites (2001 to 2006) and first intensive surveys at the Teshekpuk Lake Special Area (2007)
- Many birds color marked have been resighted during migration and on wintering grounds.

Dunlin Case Study

centralis

sakhalina

arcticola

pacifica

actites

kistchinski

hudso

There are five subspecies of Dunlin that breed in the Beringia area. Arcticola *and* pacifica *are the two subspecies in Alaska.*

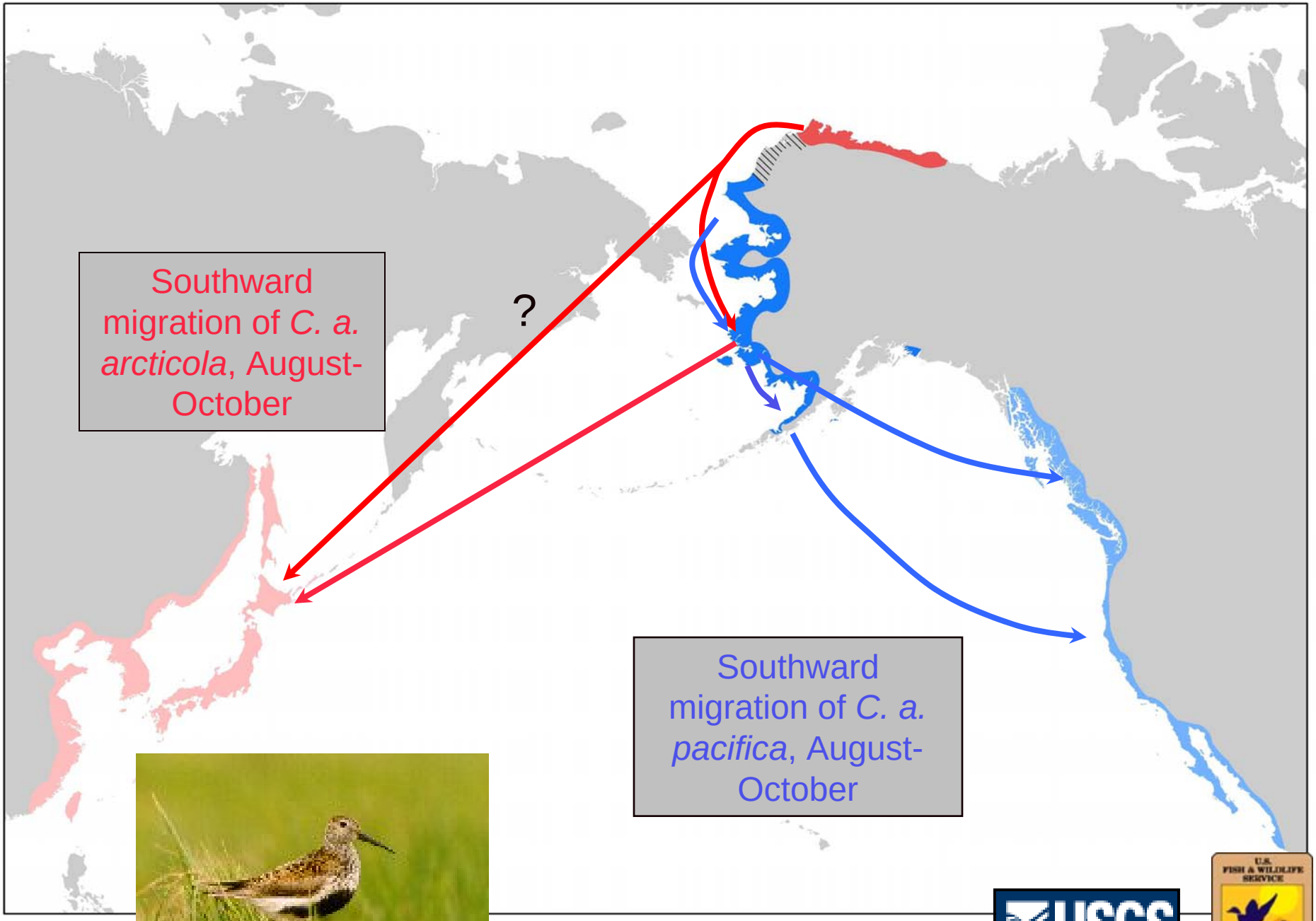
T. Mano

The arcticola *race of dunlin is one that is most likely to carry the H5N1 avian influenza virus.*

Northward migration of *C. a. arcticola*, May-June

Northward migration of *C. a. pacifica*, May-June

T. Mano


Southward migration of *C. a. arcticola*, August-October
?
Southward migration of *C. a. pacifica*, August-October

T. Mano

HPAI H5N1 sampling in shorebirds in Asia – 2007

- **Sampling birds in areas where H5N1 outbreaks have occurred can answer the most basic question -- are shorebirds, particularly Dunlin, susceptible to acquiring the virus?**

- **Began multi-faceted study to determine where the *arcticola* race of Dunlin, as well as other Dunlin migrate and winter**


Yellow Sea
West Sea
Japan
Daegu
Busan
(Pusan)
Nagoya
Osaka
Xi'an
Cheju do
Fukue-jima
Nanjing
Wuxi
Shanghai
China, Shanghai
Wuhan
Hangzhou
Chongqing
Eastern China Sea
Poyang Lake
Okinawa-jima
Fuzhou
Taipei
Miyako-jima
Ishigaki-shima
Taichung
Taiwan
Tainan
Kaohsiung City
Guangzhou
(Canton)
Macau
Kowloon
(Hanoi)
Philippine Sea
UNEP
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China Results (3 sites)

Species	% pos. (# pos)	*N*
Bar-tailed Godwit	33.3 (1)	3
Spot Billed Duck	0	1
Dunlin	5.8 (8)	139
Greenshank	0	1
Grey Plover	0	1
Kentish Plover	0	3
Plover, Kentish	12.8 (5)	39
Spotted Redshank	0	1
Stint, Red-necked	0	4
Stint, Temminck's	0	4
Teal, Common	0	1
Grand Total	7.1 (14)	196

Results are based on matrix rRT-PCR test. 1 DUNL and 1 KEPL tested positive for H5 but could not test N.

Taiwan Samples (Dec 2007)

species	*N*
cosa	1
cosn	1
dunlin	162
grsh	2
gspl	3
kepl	31
lrpl	2
lspl	2
pagp	1
resh	6
rnst	31
rutu	1
wosa	1
Grand Total	**244**

Avian Influenza sampling in shorebirds in U.S. and China

- All shorebirds
  - Alaska 2006 (0.16%) - 5 of 3180 samples
  - Alaska 2007 (0%) - ?? samples
  - China 2007 (7.1%) – 14 of 196
- Dunlin
  - Alaska 2006 (0.22%) – 2 of 897
  - Alaska 2007 (0%) - ?? samples
  - China 2007 (5.75%) – 8 of 139

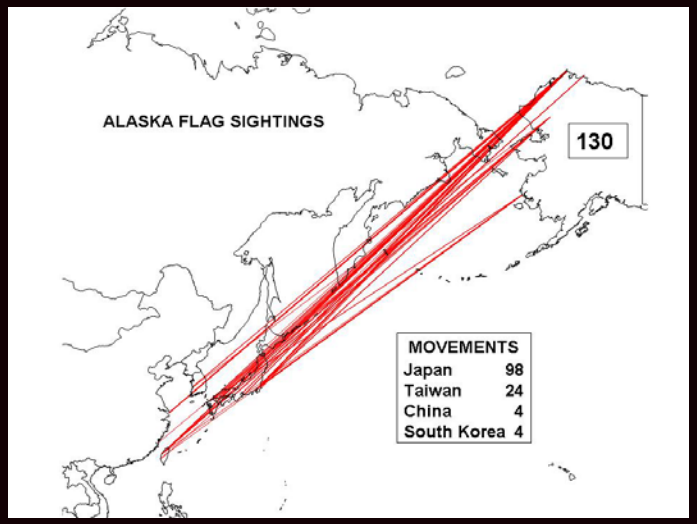
- Sampling shorebirds in China clearly presents a better opportunity to detect LPAI and maybe HPAI.

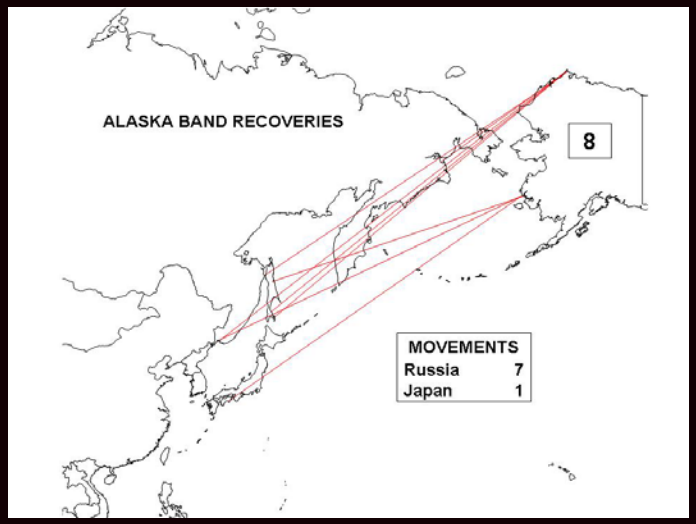
Poyang Lake

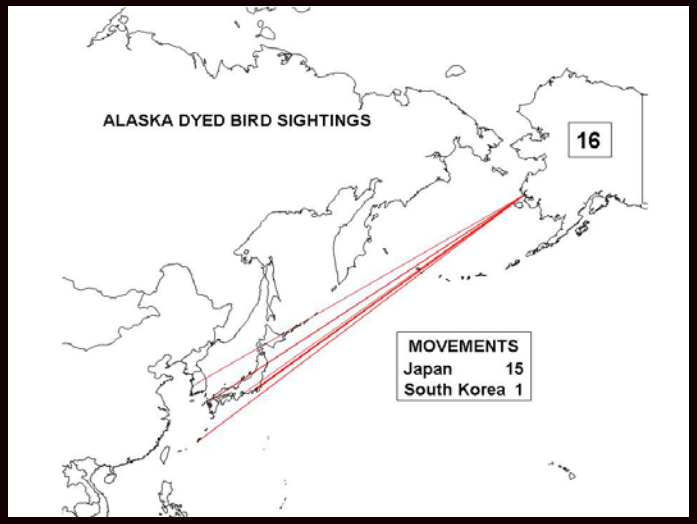
Dunlin movements and delineation of wintering areas

- **Resightings of marked individuals:** direct evidence of movement between known breeding and wintering sites
  - Preliminary analysis conducted by Mark Barter

Alaska Marked Bird Resightings



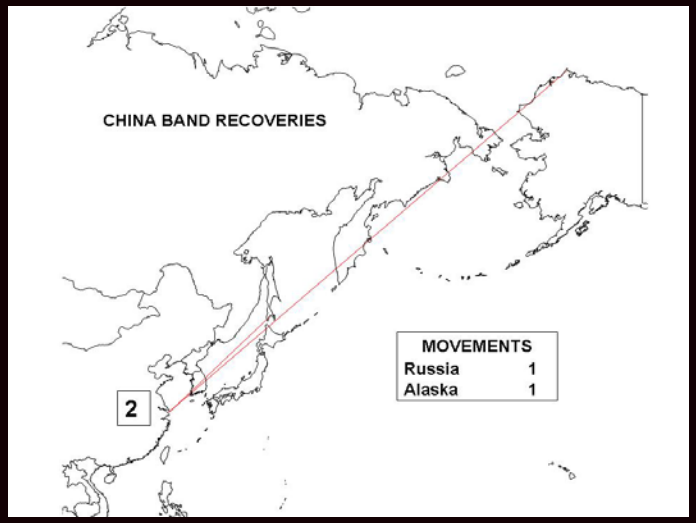


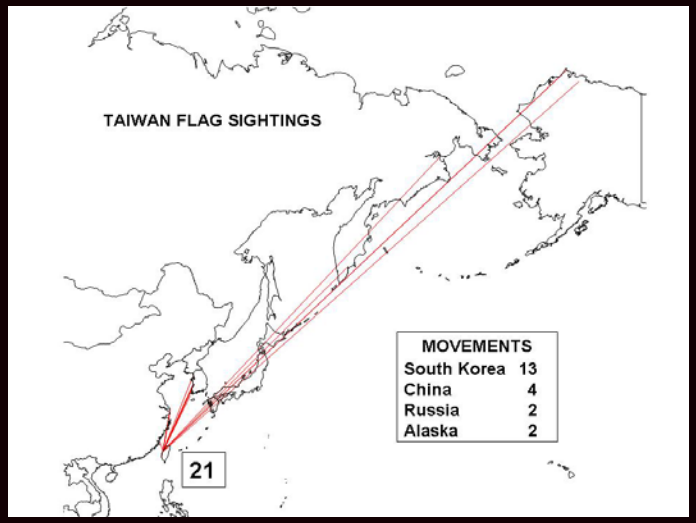


Alaska birds have been resighted Primarily in Japan and Taiwan.

Few observers in other countries.

Marked Bird Resightings in Alaska



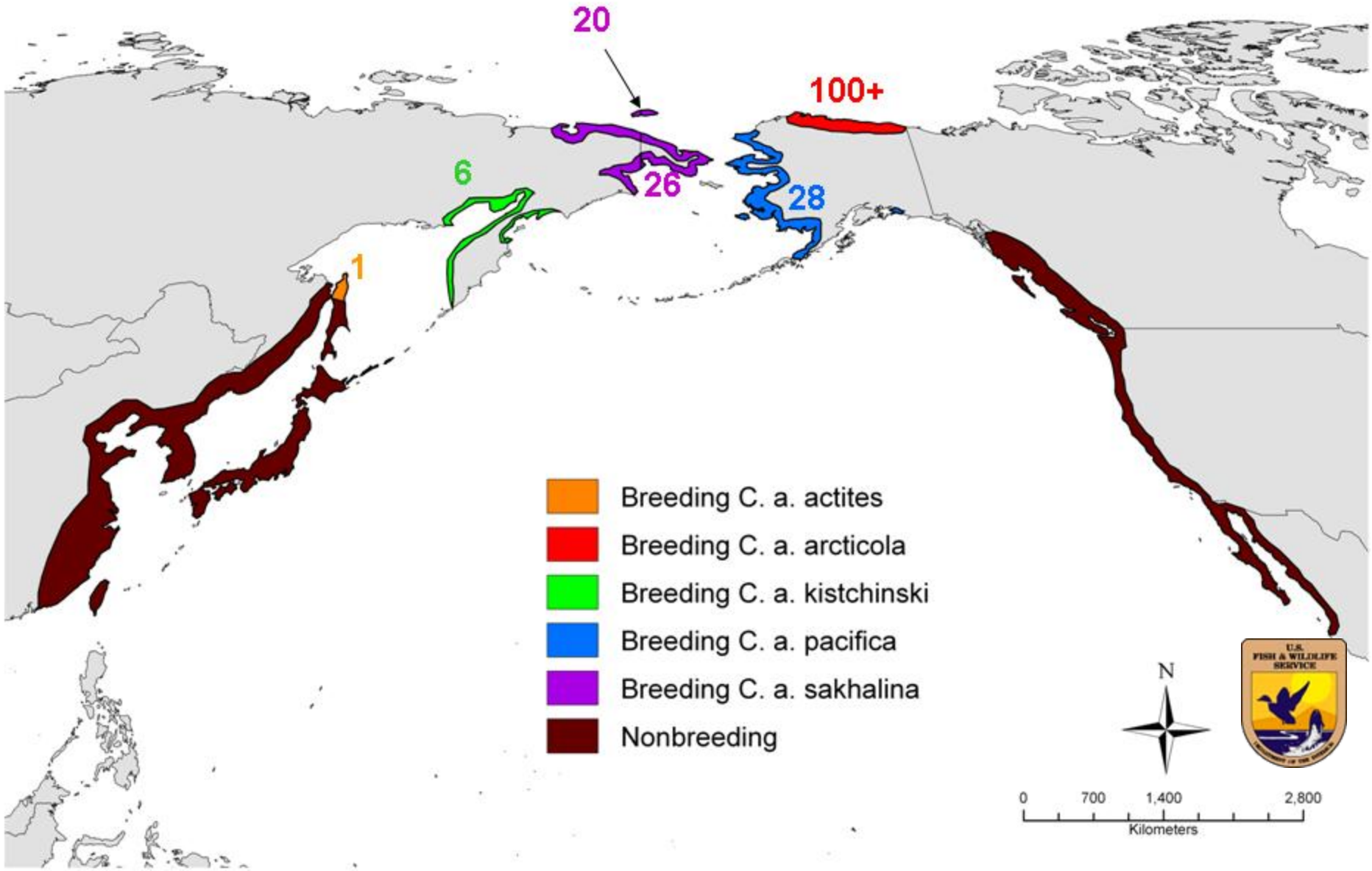


Recoveries of Alaskan-banded birds
In Skhalin (all in Aug-Nov) suggest
Arcticola dunlin migrate southwards
Via the Sea of Okhotsk.

Dunlin movements and delineation of wintering areas

- **Genetics:** On-going study to determine if we can differentiate breeding individuals of *arcticola, pacifica, actities, sakhalina, and* kistchinski Dunlin
  - If successful, will use mixed stock analysis to determine what subspecies winter in various regions of Asia

Dunlin Genetic Sample Distribution



Dunlin movements and delineation of wintering areas

- **Stable isotopes: Proposal to use stable isotope analysis to do similar thing as genetics, assuming we can identify different isotope signatures that are present in feathers molted on the breeding and wintering grounds**
  - **1st to 6th primary feathers grown on breeding grounds**
  - **Black belly feathers grown on wintering grounds**
  - **Samples currently available or being collected for this project**