

MARINE BIRDS

Marine birds are important components of North Pacific ecosystems. At least 137 sea bird species inhabit the North Pacific, with total abundance estimated to exceed 200 million birds. They are widely distributed across the North Pacific, and include many species which breed in the South Pacific but migrate to the North Pacific to feed in summer. Sizes of individual birds range from 20 to over 8,000 g. The number of species varies by region. The fewest number of species (24) occurs in the Eastern Sub-Arctic, whereas the largest number is in the Kuroshio/Oyashio Current region (61 species). In general, the western Pacific has a higher species richness than the eastern North Pacific but the difference is only about 10%. Birds of larger body mass (>1000 g) predominate in the Bering Sea and California Current regions (murre, puffins and shearwaters). Most of these species forage in the upper water column for small fish or macrozooplankton. Small marine bird species (<125 g) predominate in the Eastern and Western Sub-Arctic gyres, and in the central North Pacific Transition Zone (storm petrels). These smaller birds forage at the water's surface, consuming mainly neuston and microneuston. Numbers of species in each region are:

	Number of marine bird species
Eastern Bering Sea shelf	37
Gulf of Alaska	24-30
Coastal Gulf of Alaska	38
California Current North	52
California Current South	49
Western sub-arctic gyre	31
Sea of Okhotsk	42
Central Transition Zone	35-40
Kuroshio/Oyashio	54-61
East China Sea	25-36

Comparison of populations of dominant marine bird between the western and eastern North Pacific are:

Western N. Pacific	Albatrosses	Fulmars & Shearwaters	Storm-Petrels	Gulls & allies	Phalaropes	Alcids	Total	Surface Area
Western Subarctic	1,105,000	4,135,000	7,100,000	1,064,000	87,000	145,000	13,636,000	2,168,315
Western Transition Zone	386,000	23,503,000	31,600,000	174,000	120,000	2,000	55,785,000	6,337,700
Total	1,491,000	27,638,000	38,700,000	1,238,000	207,000	147,000	69,421,000	8,506,015
Density (number/km ²)	0.18	3.25	4.55	0.15	0.02	0.02	8.16	

Eastern N. Pacific	Albatrosses	Fulmars & Shearwaters	Storm-Petrels	Gulls & allies	Phalaropes	Alcids	Total	Surface Area
Eastern Subarctic	44,000	2,301,000	4,100,000	1,088,000	12,000	284,000	7,545,000	3,621,580
Gulf of Alaska	9,000	9,360,000	1,240,000	1,415,000	410,000	3,691,000	12,435,000	428,520
California Current North	3,000	275,000	230,000	268,000	97,000	612,000	872,000	166,456
Eastern Transition Zone	665,000	435,000	2,700,000	839,000	1,152,000	59,000	5,791,000	7,808,530
California Current South	3,000	245,000	175,000	244,300	240,000	489,000	907,000	128,620
Total	724,000	12,615,000	8,445,000	3,854,000	1,911,000	5,135,000	27,550,000	12,153,706
Density (number/km ²)	0.06	1.04	0.69	0.32	0.16	0.42	2.27	

Estimates of species abundances in summer (June – August) by region are provided in the table below:

- BSC** - Bering Sea Continental Shelf
- BSP** - Bering Sea Pelagic/Russia/Aleutian Islands
- ASK** - Gulf of Alaska
- CAN** - California Current North
- ESA** - Eastern Subarctic
- WSA** - Western Subarctic
- KM/KL** - Kamchatka and Kurile Islands

Species	BSC	BSP	ASK	CAN	ESA	WSA	KM/KL
Short-tailed Albatross	+	+	+	+	+	+	+
Black-footed Albatross	10	800	9000	2,500	23,000	5000	+
Laysan Albatross	800	130000	400	200	21,000	1.1e+006	200000
Northern Fulmar	810000	1.6e+006	360000	6,500	470,000	600000	70000
Sooty Shearwater	100000	20000	2.9e+006	125,000	1,600,000	3.1e+006	+
Short-tailed Shearwater	1.49e+007	2.9e+006	6.1e+006	14,000	220,000	430000	+
Leach's Storm-Petrel	3000	120000	40000	96,000	2,200,000	3.5e+006	350000
Fork-tailed Storm-Petrel	2e+006	4.5e+006	1.2e+006	134,000	1,900,000	3.6e+006	200000
Red-faced Cormorant	14000	560000	7000				25000
Pelagic Cormorant	21000	180000	6000	10,000			55000
Double-crested Cormorant	1000	2000	1000	5,000			
Pomarine Jaeger	+	+	+	300	40,000	190000	+
Parasitic Jaeger	+	+	+	500	80,000	76000	+
Long-tailed Jaeger	+	+	+	600	440,000	38000	+
Jaegers	37000	270000	140000				
Red Phalarope	604700	318300	49200	+	5,000	87000	+
Red-necked Phalarope	75000	55700	361000	+	7,000	+	+
Glaucous Gull	4000	2000		50			+
Glaucous-winged Gull	31000	33000	210000	78,000	+	+	+
Herring Gull	100	2000	1000	2,400	?	?	+
Mew Gull	200	+	15000	100			+
Black-legged Kittiwake	1.9e+006	420000	870000	+	440,000	610000	90000
Red-legged Kittiwake	500000	1.2e+006			?	+	+
Arctic Tern	87000	1300	87000				+
Aleutian Tern	93000	400	92000	+			+
Dovekie	50						
Common Murre	3.2e+006	190000	720000	87,000			300000
Thick-billed Murre	4.9e+006	890000	73000	+	15,000	47000	43000
Pigeon Guillemot	9000	31000	28000	2,200			5000
Marbled Murrelet	+	+	+	36,000			
Kittlitz's Murrelet	+	+	+				
Long-billed Murrelet	+	+	+	+			?
Ancient Murrelet	3000	29000	190000	124,000	?	+	3000
Parakeet Auklet	290000	90000	59000	+	?	+	1000
Crested Auklet	2e+006	4.3e+006	6000			380000	1e+006

Species	BSC	BSP	ASK	CAN	ESA	WSA	KM/KL
Least Auklet	2.5e+006	2.3e+006	3000			47000	1000
Horned Puffin	143600	145000	172000	100	13,800	85000	4000
Tufted Puffin	458600	1.9e+006	1.9e+006	31,000	255,000	892000	175000
Mottled Petrel		+		+	+	+	?
Slaty-backed Gull		20000					90000
Black-headed Gull		+					+
Sabine's Gull		1000		27,000			+
Common Tern		1000					+
Spectacled Guillemot		+					5000
Cassin's Auklet		105000	370000	200,000			
Whiskered Auklet		6000	200				+
Rhinoceros Auklet		30	170000	132,000			10000
Brandt's Cormorant			25	100			
Murphy's Petrel				60	?		
Buller's Shearwater				7,500	11,000	5000	?
Flesh-footed Shearwater				100	+	+	+
Pink-footed Shearwater				27,000	+	+	
Manx Shearwater				+			
Black-vented Shearwater				+			
Magnificent Frigatebird				+			
Brown Pelican				+			
South Polar Skua				600	160,000	150000	+
Phalaropes				97,000			
Thayer's Gull				100			
California Gull				155,000			
Western Gull				1,500			
Bonaparte's Gull				200			
Caspian Tern				+			?
Arctic/Common Tern				1,700			
Xantus' Murrelet				30			
Cook's Petrel					?	+	+
Cormorant					2,000	1000	
Bonin Petrel							+
Streaked Shearwater							+
Band-rumped Storm-Petrel							?
Swinhoe's Storm-Petrel							?
Temminck's Cormorant							7000
Black-tailed Gull							1000
Little Gull							+
Japanese Murrelet							?

YELLOW SEA / EAST CHINA SEA

The intertidal areas and coastal wetlands of the Yellow Sea support more than 2,000,000 shore birds during their northward migration; about 40% of the all migratory shorebirds in the East Asian-Australasian Flyway.ⁱ A total of 36 shorebird species have so far been found to occur in internationally important numbers at one or more sites in the Yellow Sea, representing 60% of the migratory shorebird species occurring in the Flyway. Two of the species are classified as globally threatened, the Spotted Greenshank *Tringa guttifer* and Spoon-billed Sandpiper *Eurynorhynchus pygmeus*, whilst two are near-threatened, the Eastern Curlew *Numenius madagascariensis* and Asian Dowitcher *Limnodromus semipalmatus*. While the South Korean coastline has been well surveyed, only about one-third of the Chinese coasts has been surveyed and little is known from the North Korea.

A total of 160 species and about 634,773 individuals of water birds were reported to overwinter on the Korean coast in 2001-2002. Dominant species were geese, mallards (*Anas platyrhynchos*), and ducks (*A. poeciloryncha*, *A. formosa*). Migratory birds that use Korean coasts as stopover sites consisted of 305,887 individuals in 25 species during the spring and of 269,317 individuals in 33 species during the autumn in 2002.ⁱⁱ Dominant species were lapwings (*Vanellus vanellus*), plovers (*Charadrius dubius*), and sandpipers (*Tringa hypoleucos*). More species of migratory birds stop over at Heuksando Islands (remotely located in the southern Yellow Sea) during spring and autumn. The number of species was 112 while the number of individuals was 3,448 in 2002.

Time series of the number of overwintering birds during 1993-2002 showed no particular trends, although they were different depending on locations (Figure 1). In the Keum River estuary (located at ~36°N latitude), for example, the total number is largely determined by a couple of dominant species, such as *Anas formosa*. There was no particular trend in the time series of the number of spring-autumn migratory birds (Figure 1, lower panel).

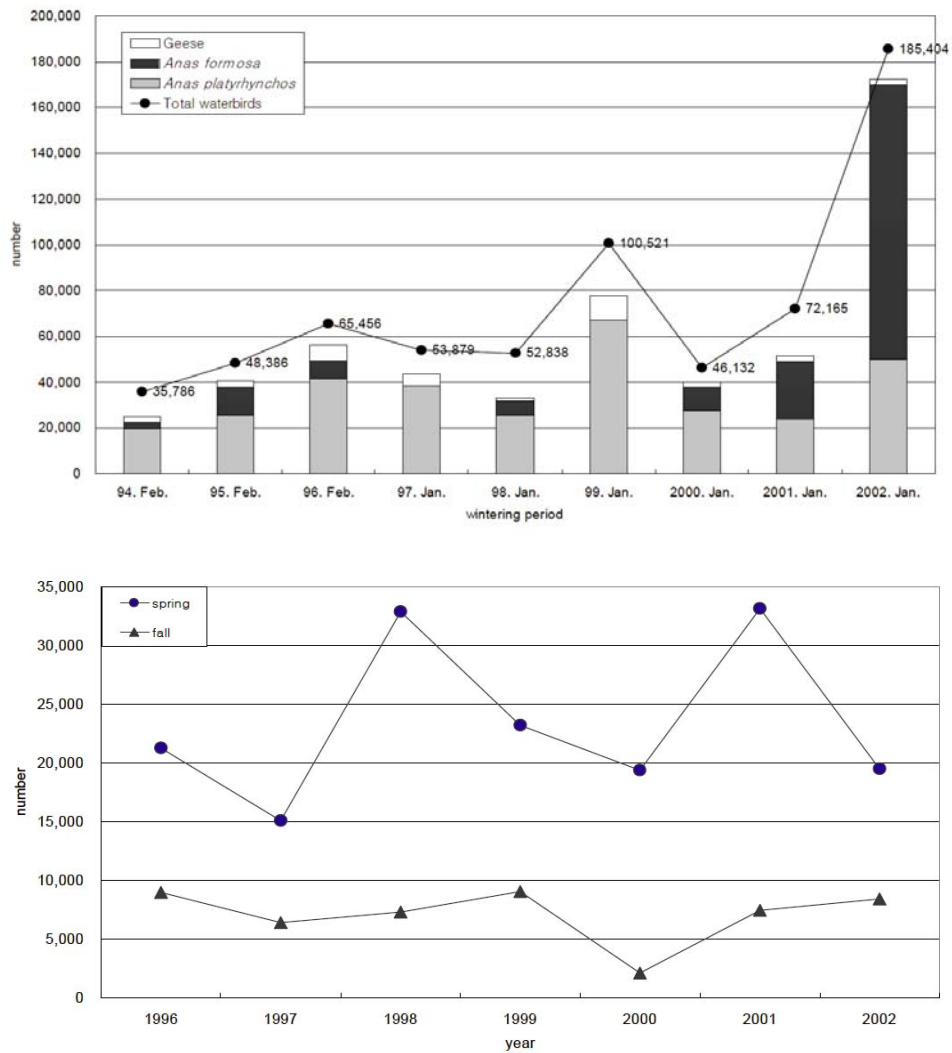


FIGURE 1 UPPER PANEL: THE NUMBER OF OVERWINTERING BIRDS IN THE KEUM RIVER ESTUARY (KOREAN YELLOW SEA COAST). LOWER PANEL: THE NUMBER OF BIRDS THAT STOPPED OVER AT THE ASAN RECLAMATION AREA DURING THEIR MIGRATION IN SPRING AND FALL.ⁱⁱ

ⁱ Barter, M.A. 2002. Shorebirds of the Yellow Sea: Importance, threats, and conservation status. Wetlands International Global Series 9, International Wader Studies 12, Canberra, Australia.

ⁱⁱ Kim, J., Park, J., Yi, J., Yoo, B. and Rhee, D. 2002. The migration route and monitoring of the migratory birds in Korea. Report of NIER 24: 153-164.