

# Migratory Behavior of Franklin's Gulls (*Larus pipixcan*) in Peru

Joanna Burger<sup>1</sup>, Michael Gochfeld<sup>2</sup>, Robert Ridgely<sup>3</sup>

<sup>1</sup>Division of Life Sciences, Rutgers University, Piscataway, USA

<sup>2</sup>Environmental and Occupational Medicine, UMDNJ-Robert Wood Johnson Medical School, Piscataway, USA

<sup>3</sup>N. Sandwich, New Hampshire, UK

E-mail: [burger@biology.rutgers.edu](mailto:burger@biology.rutgers.edu), [gochfeld@eohsi.rutgers.edu](mailto:gochfeld@eohsi.rutgers.edu), [rrridgely@earthlink.net](mailto:rrridgely@earthlink.net)

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## Abstract

Information on the migratory pathways for birds is essential to the future siting of wind power facilities, particularly in off-shore waters. Yet, relatively little is known about the coastal or offshore migratory behavior of most birds, including Franklin's gulls (*Larus pipixcan*), a long-distant migrant. We report observations along the coast of Peru made in November 2008 to determine where birds concentrated. Wind facilities can not avoid regions of high avian activity without knowing where that activity occurs. Migrant flocks of 250 to 50,000 were observed on coastal farmfields, dumps and estuaries, on beaches and mudflats, and up to 45 km offshore. Bathing and foraging flocks ranged in size from 20 to 500 birds, and most flocks were monospecific, with occasional grey-headed (*Larus cirrocephalus*) and band-tailed (*L. belcheri*) on the periphery. While previous notes report Franklin's gulls foraging coastally, we found flocks feeding up to 45 km offshore by diving for prey or feeding on the water. The relative percentage of birds of the year varied in migrant flocks from zero to 14%, with lower numbers of young foraging aerially on insects (only 1%). The percentage of young feeding over the ocean decreased with increasing distance from shore; no young of the year were recorded at 36-44 km offshore. While there were large flocks of Franklin's gulls resting on the water inshore, the number of gulls foraging offshore did not decline up to 45 km offshore. The presence of foraging flocks of Franklin's gulls out to 45 km offshore, and occupying space from 0 to 20 m above the water, suggests that they would be vulnerable to offshore anthropogenic activities, such as offshore drilling and wind facilities.

**Keywords:** Migration, *Larus pipixcan*, Franklin's Gulls, Gulls, Migrants, Young of the Year, Habitat Use, Flock Associations, Wind Farms, Offshore Drilling

## 1. Introduction

The siting of wind facilities has become an important topic as governments and industry consider the possibility of large-scale offshore facilities. Yet little is known of the ecology and behavior of species, such as marine mammals, fish, and birds, in offshore regions where wind facilities might be sited. Before siting many such facilities, it is essential to understand whether the locations would impact ecological resources in these sites.

The migratory behavior of birds is an important, but often little studied aspect of their life cycle, mainly because long-distance migrants are difficult to study. They often migrate at night, at high altitudes, or at unpredictable places and times. Further, scientists often focus on the breeding season, or on native species, or on the rare

migrants, making information on abundant migrants particularly lacking. Yet, for many species, migration is one of the most risky life stages, because of predation, weather conditions, obstacles (such as buildings or towers [1,2]), or lack of foraging habitats [3-8].

Information on the locations, habitats, and timing of migration is needed to understand both the vulnerability of a species to natural forces, as well as to potential anthropogenic activities, such as wind facilities. While scientists have long recognized the threats to migrants of anthropogenic terrestrial threats, such as buildings and towers [1,9,10], little attention has been devoted to coastal and offshore migrants. With the recent focus on renewable energy, many countries are turning to offshore wind farms, and the question of risk to avian populations that migrate offshore is coming to the fore, with the re-

alization that there is a lack of information on the specific locations of common and abundant migrants along coasts, and out to the edge of the continental shelf.

In this paper we report on observations of migrant Franklin's (*Larus pipixcan*) Gulls in coastal Peru. We were particularly interested in flock locations (distribution along the coast), habitats, and in the percentage of young of the year present in flocks (an indication of reproductive success). Little quantitative information is available on migrant Franklin's Gulls in South America [11]. They were believed to migrate mainly offshore over the ocean, and in Peru to migrate low over the deserts [12], but timing, flock size, habitat use, and flock associations were poorly known [11].

## 2. Methods

All observations were made in Peru from 1 to 23 November 2008. We visited freshwater marshes, coastal marshes, and beaches from south of Lima to northern Peru, recording the numbers of adult and young of the year Franklin's Gulls, along with other species of gulls that were present. Counts of adults and young of the year were made at each location. Photographs were also taken of flocks both on the ground and in the air, and these were enlarged digitally to confirm counts and the ratio of

adults to young of the year.

On 5 November 2008 we travelled 44 km offshore from Lima.

## 3. Results

Migrant flocks of 250 to 50,000 Franklin's Gulls were observed on coastal farmfields, dumps and estuaries, on beaches and mudflats, and up to 45 km offshore (Table 1). Most flocks were either migrating or coming in to roost or preen, but some flocks were feeding aerially on insects, and these contained very few young (1%). At several locations (Villa, Ventanilla) we observed flocks descending from high altitudes (out of range of binoculars) to the beach or marsh locations to drink, bath, and preen vigorously.

Bathing and foraging flocks ranged in size from 20 to 500 birds, but resting flocks ranged up to 50,000. A high percentage of gulls in resting flocks were engaged in vigorous preening (up to 60%). While previous notes report Franklin's gulls foraging coastally, we found flocks feeding up to 45 km offshore by diving for prey or feeding on the water (Table 2). Although there were large flocks of Franklin's Gulls resting on the water inshore, the number of gulls foraging offshore did not decline up to 45 km offshore.

**Table 1. Observations of Franklin's Gulls (*Larus pipixcan*) from Peru (November 2008). Young of the year accounted for ??% of the gulls (where counts could be made visually and from photographs).**

Date	Location	Habitat	Number of Franklin's Gulls (% young of the year)	Presence of other species
1 November	Bayovar, N. Peru	Beach	50,000+ (not recorded)	
2 November	Villa, near Lima	Freshwater pool	800 (10)	Band-tailed gulls
		Beach dunes	5000 (12)	Grey-headed gulls at edge of flock
		Nearby saltwater	5000 (12)	None
		In air, hawking insects	200 (1)	None
5 November	Lima harbor out to 44 km	Coastal/ocean	14,260 (2)	Mainly monospecific
6 November	80 km north of Lima	Aerial migrants, 5 km from coast	300 (8)	None
	Ventanilla	Freshwater marsh near coast	273 (10)	None
	Ventanilla	Aerial migrants above town	2,100 (not recorded)	None
8 November	Pimentel	Pimentel beach, sewage outfall, and mudflat	310 (11)	Dense monospecific with flocks of 20 grey-headed and 30 kelp gulls on edge, and 3 elegant terns within Franklin's Gull flock
	Santa Rosa	Santa Rosa Beach	1325 (11)	Dense monospecific flocks with grey-headed and band-tailed at edges; a short distance away was a dense flock of 2,500 grey-headed gulls
		Garbage dump	254 (18)	None
		Wet marshes and farmfields	1513 (15)	None
9 November	Abra de Porcuya (east side)	Flying over Andes	1 (adult)	None
23 November	Villa, Lima	Beach, marshes and ocean	10,000 (14+)	Kelp, Band-tailed and Grey-headed in nearby flocks, with some at edges of Franklin's Gull flocks

Note: Percent of young based on visual and photographic counts except 1 and 23 November, and for the aerial flock at Ventanilla (where the light prevented aging of the gulls).

**Table 2. Number of Franklin's Gulls in a coastal transect out to 44 km (Lima, Peru, November 5, 2008). Such information is directly relevant to offshore activities, such as shipping, oil drilling and wind farm construction.**

Distance from shore (km)	Number of Franklin's Gulls in air (additional gulls rafting on water)	Percent of young of the year in flying or feeding flocks
0-4	2316 (4,200)	8
4.1-8	803 (1000)	4
8.1-12	918 (110)	5
12.1-16	74 (210)	0
16.1-20	330	1
20.1-24	300 (156)	0
24.1-28	279	3
28.1-32	804 (408)	0
32.1-36	1028 (76)	2
36.1-40	577 (180)	0
40.1-44	491	0

The relative percentage of birds of the year varied in migrant flocks from zero to 14%, with lower numbers of young foraging aerially on insects (only 1%, **Table 1**). The percentage of young feeding over the ocean decreased with increasing distance from shore; no young of the year were recorded at 36-44 km offshore. The gulls we observed were mainly occupying the vertical space from the water to 20 m above the water (although migrants were much higher), but were concentrated below 10 m.

Most flocks were monospecific, with occasional Grey-headed (*Larus cirrocephalus*) and Band-tailed (*L. belcheri*) Gulls on the periphery (**Table 1**). At some beaches, there were discrete and dense flocks of these two species, along with discrete flocks of kelp gulls (*Larus dominicanus*) a few meters or hundreds of meters from the Franklin's Gulls. Franklin's Gulls resting or roosting on beaches often stood in very dense flocks, nearly touching one another.

Even in dense migrant flocks, Franklin's Gulls are vulnerable to predators. On 23 November, two Franklin's Gulls were killed by two different Peregrine Falcons (*Falco peregrinus*) visible at the same time. In one case an immature Peregrine flew up to a Franklin's Gull flock swirling over land and flipped upside down to snatch a gull's breast, riding with it to the ground. Five minutes later, a second immature Peregrine rose higher than a different gull flock, and dove into it in the classic manner. Although the gull flock scattered, the Peregrine pursued one bird until it slammed into the gull, exploding the gull and forcing it to the ground.

Two additional observations bear mention: 1) In late October 2007, several flocks of 600-1000 birds flew high overhead (at the limit of binocular vision) at the La Ventosa area of the Isthmus of Tehuantepec in Mexico; other flocks (100-1000) flew low and close to shore moving south and east (A. Farnsworth, pers. comm.). In 2003, Franklin's gulls had only just begun to reach the northern beaches of Chile (Valparaiso to Astero Lampa Santiago de Pacifica): from 9-10 November fewer than 20 gulls

were observed at each of several different beaches, but by 10-12 November the number had built up to 100 at several locations (F. Lesser, pers. comm.).

#### 4. Discussion

With the world-wide development of renewable energy resources, such as wind power, it is essential to determine before facilities are built whether there are conflicts with wildlife that would provide an ecological threat that would impact operations. Many of the initial sitings of wind facilities were within migratory or overwintering ranges of birds, and resulted in high avian mortality, and some curtailing of operations [13,14]. This paper provides data that can be used in considering the offshore patterns of migratory gulls, particularly Franklin's Gulls.

The Franklin's Gulls observed in this report were likely migrants just arriving in Peru, as judged by the large dense flocks engaged in vigorous preening, and their descent in large and continuous flocks from high altitudes. That is, when we scanned the sky with binoculars in areas where birds were descending, we could just make out birds at the limit of binocular vision still descending. The presence of relatively large flocks of 5,000 to 50,000 birds suggests that they were arriving, and had not spread out along the coast.

Like other authors [12,15,16] we found them mainly along the coast, but one was in the Andes. Birds found in the high Andes may well be either lost, or merely on a different migration route.

While many different foraging and migratory habitats have been reported for Franklin's Gulls in North America, few have been recorded for South America [11]. Habitats recorded in South America include fishmeal plants, rivers, coasts, and behind trawlers [17,18]. We found them resting, bathing and foraging on beaches, saltwater and freshwater marshes, sewage outfalls, farm-fields, and garbage dumps. While these habitats are not unexpected, given their use of them in North America, it

requires documentation.

For most flocks, about 10-12% of the gulls were young of the year, although far fewer young were in flocks offshore and almost none engaged in aerial hawking for insects. This is not surprising, since both aerial foraging and foraging offshore on fish are more difficult foraging tasks than feeding on invertebrates along the shore or on garbage [19-22]. That 10-12% of the flocks are young of the year indicates successful reproduction and migration over thousands of km; there are no previous data on percentages of young in migrant flocks in the southern US, Central America or South America.

The presence of flocks of foraging and resting gulls out to 45 km indicates that this species would be vulnerable to any human activity on the continental shelf. While it has previously been reported that Franklin's Gulls may migrate over the ocean, there were no quantitative data on numbers or distances from shore. Further, reporting that gulls migrate over the ocean does not indicate the location of these birds (either longitudinally or horizontally). In this study we report birds resting and feeding on the water, and flying above the water at elevations that would put them at risk from anthropogenic activities on the water. That is, there were gulls in every 4 km block from 0 to 44 km offshore, and there were gulls flying from the water level to 20 m above the water. As governments and companies strive to diversify energy, there is a need to have both qualitative and quantitative information on the spatial envelope birds occupy at different times of the year. The data in this paper indicate that migrating (and potentially overwintering) Franklin's Gulls in Peru occupy an envelope of space from 0 to 45 km offshore (and likely further out) and from 0 to 20 m from the water's surface. Migrants descending from the sky came through space from the limit of binocular vision directly to the water or land.

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