



Fig 4 Ditch-grass generally grows in shallows that geese, swans and dabblers can reach by up-ending.

Jordan Creeks. Geese are apparently unwilling to forage in such small, confined areas, but do frequently pass by overhead. Mallards, in contrast, are adept at dropping into small ponds and narrow sloughs, and can rise from them almost vertically when frightened. Even in winter, Mallards are twice as numerous in the Juneau Christmas Bird Count circle as Glaucous-winged Gulls, the second most common bird of concern (fig 3). Their frequent use of fresh and salt water habitats both north and south of the runway results in regular flights through airplane landing space.

Vancouver Canada Goose is a local non-migratory subspecies, one of the heaviest in North America. They are present on the Mendenhall Refuge during all but the midsummer breeding/molting months. Canada Goose feeding and resting areas cluster around the runway (Hotspots report, page 37), and their flight patterns regularly take them through airplane landing space.

Of special concern is the daily route taken by Canada Geese during hunting season. A large percentage of resident geese and mallards take refuge from hunters on Auke Lake by day. At dusk, about 1/2 hour after the last legal shooting light, geese leave the lake for the Mendenhall Wetlands. Laurie Ferguson Craig (pers. comm.) lives on Glacier Highway between the lake and the refuge, and is frequently able to record the timing and numbers of



Fig 6 Mallards sometimes nest in the floatplane basin area.



Fig 5 Trumpeter Swan at junction of Floatplane Pond and west arm, a delight to birders but a threat to airplane safety.

passing geese. Their route from the lake often takes them directly through the airplane approach path to the runway.

These birds graze Lyngbye sedges and other salt marsh plants throughout the night. According to Jim King (pers. comm.), the timing of their morning departure is less consistent than that of their evening arrival. They sometimes wait until the first shots are fired before departing.

Two other ducks that use the Floatplane Pond throughout the colder months (until freezing) are Greater Scaup and Bufflehead. Both are divers, adapted to the deeper waters of the landing pond (as opposed to the dabblers that tip up for ditch-grass in the shallower east and west arms). These species are of concern to floatplane pilots. They are highly habituated to noise and traffic, and often simply dive or scuttle a short distance out of the way of oncoming planes.

In spring 2002, many observers noted that north-bound Greater White-fronted and Snow Geese seemed tamer around people and traffic than in previous years. We recorded this behavior not only at JNU, but also at Angoon and Gustavus. Both species overwinter in marshes in California. Severe droughts there in recent years forced the US Fish and Wildlife Service to shut down many of the foraging ponds on National Wildlife Refuges. We speculate that as a result, some geese are becoming habituated to more humanized feeding locations such as watered lawns and highway margins. They may then be carrying their habituation north with them in migration.

The consequences are disturbing to airport staff. Greater White-fronted and Snow Geese both grazed on seeded grass margins of roads, taxiways and runways in spring, 2003. It's hard to predict if such habituation will increase or decline. Fall hunting season "re-educates" many of these geese to avoid people.

In fall, airport hazing staff rely on assistance from hunters permitted to use the Floatplane Pond security area. Several blinds are available to these hunters at the junction of the east and west arms with the Floatplane Pond. It may be possible by directed hazing to train Juneau-resident



Fig 7 The three commonest gull species at JNU. Bonaparte's are absent in winter.

mallards to avoid these areas, but during fall migration a new set of “naive” dabblers passes through each day. Hunters are permitted to set out decoys at the margin of the Floatplane Pond to lure in migratory birds in order to teach them not to use an area they will likely never see again. We consider this practise illogical, and recommend that it be discontinued.

Firing by hunters that have other motivations in addition to airplane safety may also frighten birds in unpredictable directions. Wilmoth (2001) discusses potential for unintended consequences of hunting in the security area. He observed hunter-dispersed ducks to circle for up to 5 minutes before settling. On one occasion, birds fired upon by hunters flew north across the runway and landed in Impact Pond near the bend in Jordan Creek. Similarly, the passage of waterfowl between the Floatplane Pond and Miller-Honsinger Pond takes birds across the runway on a regular basis. Hunter disturbances increase the frequency of these flights. Even professional hazing can backfire. Laurie Ferguson Craig (Juneau Empire, 4/29/01) watched airport staff haze swans that were feeding on the western margins of Floatplane Pond, causing them to circle several times over the runway before landing to feed again.

Of 191 ducks dropped at JNU by hunters in 1999, 15% escaped Wilmoth (2001). These birds attract eagles and scavengers such as corvids to Floatplane Pond.

Duck hunters using the refuge outside of airport property actually drive birds onto sloughs and ponds near the runway. Constant firing throughout the fall hunting

season keeps waterfowl searching for unhunted locations. JNU employee Brad Gruening (pers. comm.) says that one of his most consistent hazing challenges is in the sloughs paralleling the east end of the runway on the south side. These sloughs are within airport property, and accessible only to JNU-permitted hunters, who tend to prefer the established blinds in Floatplane Pond Woodland. Without repeated hazing, hundreds of geese and ducks pile up alongside the runway.

It is difficult with currently available data to evaluate the relative risk to aircraft of different groups of birds of concern at JNU. Several pilots including waterfowl biologists Jack Hodges and Jim King have mentioned to us that they are impressed with the agility of gulls in flight compared to that of ducks, geese and swans. Waterfowl in general may thus pose greater hazards to aircraft than do gulls and terns.

Gulls

“Around the world, gulls (*Larus spp.*) account for the majority of strikes on civilian as well as military aircraft.” (Sodhi, 2002). While this statement may appear to contradict our speculation above, consider that JNU is centered over the estuaries of two streams and a major glacial river, within one of the prime waterfowl gathering areas of Southeast Alaska. Such an unfortunate location may tip the odds of airstrike from gulls toward waterfowl.

Be that as it may, gulls pose an undeniable risk to aircraft. Juneau gull species, in order of abundance, are: Glaucous-winged (2.2 lb), Mew (15 oz), Bonaparte's (7 oz), Herring (2.5 lb), and Thayer's (2.2 lb). Herring and Thayers are much less common than the first three species. Bonaparte gulls are seasonally common, but leave in the winter months, and are also much lighter, almost as agile in flight as terns.

Both Glaucous-winged and Mew Gulls are common at JNU. Of the two, Glaucous-wings are more likely to attend to human garbage in parking lots, at dumpsters, etc. Glaucous-wings also nest on the bare rocks near Mendenhall Glacier, thus passing regularly through JNU approach routes on foraging excursions to and from the

Fig 8 Gulls gather by the thousands off of DIPAC hatchery to feed on ground-up salmon, and at the mouths of Mendenhall River, Fish, Salmon and Lemon Creeks during spawning time. These birds “commute” between foraging and resting places at fairly high elevations, frequently placing them in JNU flight space.





Fig 9 Brad Gruening hazes eagles off of runway anemometer perch with 12 gauge cracker shells near mouth of Jordan Creek. The eagles returned to this perch within 10 minutes.

ocean. This is the only gull we recorded on our Duck and Jordan triangle sites north of the runway during point count periods in 2002.

Mew Gulls do frequent the airport, however. Wilmoth (2001) observed twice as many Mews as Glaucous-wings over a year-long study at JNU (fig 3). On December 12, 2002, hazing staff killed 7 Glaucous-winged and 1 Mew out of a mixed flock of several hundred foraging in seeded grass on the runway margin. (Brad Gruening, pers comm) Airport staff speculate that earthworms or possibly grit for gizzards are the attractants. Gulls are very intelligent, and if hazers merely fire at foraging groups, they soon return. Killing a number out of the flock prevents return, at least temporarily.

Crops of the sacrificed birds were not saved for examination. Crops offer important information that should be routinely gathered whenever birds are killed or found dead near the runway.

Eagle

Like herons, Bald Eagles (9.5 lb) are top predators, therefore numerically uncommon compared to other birds of concern. Also like herons, however, eagles have been



Fig11 Successful eagle nest near T2, summer 2001.



Fig 10 Eagle perched on runway approach lights. This is a convenient scanning post immediately next to Mendenhall River.

involved in serious strikes at JNU (FAA, 2002). Eagles are less maneuverable than gulls and corvids in flight, especially when carrying food.

A famously habituated pair of eagles have nested in Floatplane Pond Woodland for the past few years, entertaining dike trail walkers. They often perch directly over the trail in low cottonwoods. This pair, named Nellie and Juan, are territorial, chasing other eagles from the western end of the woodland. A second pair uses perches at the eastern end, including anemometer posts over the Jordan Creek culvert when salmon are running. These airport-resident birds may actually serve as hazers themselves, of more dangerous nonresident eagles. Sodhi (2002) discusses the greater airplane-savvy of airport resident birds compared to transients, and especially immatures.

At times, large congregations of eagles gather off the west end of the runway, attracted to food like eulachon. One of us (Armstrong) observed eagles being dispersed by airport staff. The birds separated into two flocks and circled over the east and west ends of the runway.

The fact that both eagles and herons have been involved more than once in strikes at JNU makes it clear that more than numerical abundance is



Fig 12 Ravens and crows are much more maneuverable in flight than eagles, as can be seen during mobbing.