

THE TULE WHITE-FRONTED GOOSE (ANSER ALBIFRONS GAMBELLI) IN THE  
SACRAMENTO VALLEY, CALIFORNIA

Sanford R. Wilbur, Sacramento National Wildlife Refuge, Willows, California

In the most recent edition of the U.S. Bureau of Sport Fisheries and Wildlife "Red Book" on rare and endangered wildlife, the tule white-fronted goose is listed as "endangered". By this I mean that its prospects for survival and reproduction appear to be in immediate jeopardy, and extinction will probably follow if it does not receive some sort of assistance. Although it shares this "especially critical" category with such well-known wildlife as the whooping crane, California condor, black-footed ferret and key deer, the tule goose has achieved no such renown. In fact there is so little known about this bird - and so much misunderstanding about what is known - that its very existence seems jointly dependent on how quickly we can learn how to preserve it, and on how quickly we can convince the world that there really is a tule goose to preserve!

During the past two winters I have been working with white-fronted geese in California's Sacramento Valley, mainly on and near the Sacramento National Wildlife Refuge. I have made what I consider are some interesting observations on tule geese and, in the next few minutes, I'd like to tell you about some of my findings. I will mix my work in with the observations of others, with the intention of building a case for the existence of the tule goose as well as to present an overall picture of what we presently know about this bird.

I want to stress at the start that the tule goose is a subspecies, or race, of the white-fronted goose, not a special kind of bird only distantly related to other kinds. Its gross appearance is similar to other races of the white-fronted goose - and it is probably reproductively compatible with these other races - but it has developed some characteristics that are definitely all its own. These characteristics are probably the result of geographical isolation from other white-fronts during the breeding season.

The tule white-fronted goose was first named and described by Hartlaub in 1852, but from the start there was considerable confusion over just

what bird he had named. For many years the subspecific name gambelli was used to designate North American white-fronts in general, while Anser albifrons albifrons was understood to be the European white-front (Bent 1925). It was 65 years later that Swarth and Bryant (1917) showed that Hartlaub's name gambelli actually belonged only to a large dark form of North American white-front that was rather rare and local in occurrence. Most authorities (American Ornithologists Union 1957; Delacour 1954) now recognize two North American white-fronted geese, the common light-colored Pacific white-front (A.a.frontalis) and the rare dark tule goose (A.a.gambelli).

#### DISTINGUISHING CHARACTERISTICS

The tule goose is separated from other white-fronts mainly on the basis of body proportions and coloration. Its head and neck are dark brown, often tinged with black, and there is often a sharp division of color above the eye. Most of the tule goose specimens I examined showed a very definite blackish-brown "cap". The Pacific white-front is much lighter colored on head and neck and seldom exhibits the dark cap effect.

Also very prominent on the tule geese I examined was the heavy orange-colored mineral staining around the bill, much the same as the orange coloration many of you have probably noted on the heads of some snow geese. Without exception, the Pacific white-fronts I examined showed no such staining.

As striking as coloration is the bill size of the tule goose. Bill comparisons with Pacific white-fronts of the same sex and age group show a difference as conspicuous as that between a "honker" and a lesser Canada goose, or between greater and lesser snow geese. In my examinations I never found even an old adult male light-colored white-front with a culmen length over 55 millimeters. In contrast, I examined large dark-colored females with 60 millimeter bills, and both adult and immature dark males with bills commonly longer than 60 millimeters. There was also a definite difference in wing feather length between the two subspecies. I was gratified to see a good selection of immature males and females with very dark plumage and large bills and wings. This has made me certain that tule geese are not just "grown-up" Pacific white-fronts.

Comparing body weight is rather a tricky business and, as we know, conclusions based on just this measurement are not accepted too readily in scientific circles. This is because so many things influence weight. Back in 1938 Margaret Nice showed that daily fluctuations of from 3.5 to 10.8 per cent can occur in birds' weights. Because of the problems of interpreting my findings, I took weights only as supplementary, general interest information. Nevertheless, I did come up with some noticeable differences between the subspecies. The sample is pretty small but, for general interest, I'll give you one example:

Four adult male tule geese weighed: 5 lb. 4 oz.; 6 lb. 2 oz.; 6 lb. 9 oz.; and 6 lb. 12 oz.. Average weight: 6 lb. 3 oz.

Six adult male Pacific white-fronts weighed: 3 lb. 4 oz.; 3 lb. 13 oz.; 4 lb.; 4 lb. 10 oz.; 4 lb. 13 oz.; and 4 lb. 15 oz.. Average weight: 4 lb. 4 oz.

As you can see, there was no overlap in weight between subspecies and there was even a fairly respectable gap between the smallest tule and the largest Pacific. Several years ago David B. Marshall (U. S. Bureau of Sport Fisheries and Wildlife, Portland, Oregon) examined 44 tule goose specimens in the collections of the California Academy of Sciences and the Museum of Vertebrate Zoology and found almost no weight overlap between tules and Pacific white-fronts of the same sex and age groups. The average weight of the tule geese in each group was about 1.5 pounds greater than the Pacifics.

Even though weight isn't a very concrete measure in itself, when you add it to coloration, bill size and wing feather length I think you can see the picture developing of two noticeably different birds: the large, dark, heavy proportioned tule goose; and the smaller, slighter, and lighter colored Pacific white-front.

You will find a few other distinguishing characteristics listed in the older literature, including the color of the membrane surrounding the eye and the number of tail feathers. When Swarth and Bryant (1917) published their preliminary observations it appeared that tule geese had yellowish eye-rings, while these were grayish or brownish on Pacific white-fronts. Also, the male tule goose was believed to have 18 tail feathers while the female tule goose and all Pacifics were supposed to have only 16.

In an article in "The Condor" in 1928, Alfred Bailey presented information which showed that both tail feather number and eye-ring color were too variable to be used to separate the two subspecies. I also found considerable variation in both characters. I checked birds of both subspecies and of all sex and age classes, and found individuals in each group with fifteen, sixteen and seventeen tailfeathers. The only goose I found with 18 feathers (supposedly the mark of a male tule goose) was an adult female tule goose. While most tule geese did possess the yellow eye-ring, I found several without it and I also examined quite a few small light-colored white-fronts that had the alleged tule coloration.

## HABITS

As is the case with most subspecies, distinguishing characteristics are more easily seen when the bird is in the hand than when it is loose in the wild. Even though I can spot a tule goose on a hunter's strap halfway across the checking station parking lot, I have yet to identify birds alive

and in the marsh that I was dead sure were of the larger subspecies. However, U.S. Game Management Agent Tom Harper (1965) has studied the white-fronts in the vicinity of Fairfield, California, and has been able to pick out both subspecies "in the wild". His identifications are substantiated by several tule goose specimens he obtained, two of which are now in the U. S. National Museum.

Tom noted that his tule geese were normally in small flocks (5 to 25 in a group) and were always isolated from the larger flocks of Pacific white-fronts. The large size, dark heads and large bills made the tules distinguishable from quite a distance. Tom also observed that they were less wary than the smaller subspecies and were harder to frighten. His comments are very similar to those made earlier by Moffitt (1926), Longhurst (1955), and others.

The early writers (Swarth and Bryant 1917; Moffitt 1926) described the tule goose as a bird of wooded sloughs and small ponds dense with emergent vegetation. This apparent habitat preference gave rise to the common names "tule goose" and "timber goose". There was very little of this type habitat in the Suisun Marsh area studied by Harper (1965), but he did observe that the "tules" usually stayed in an area of heavier vegetative growth than did the smaller white-fronts. On the Sacramento Refuge the few live birds I saw that I thought might be tule geese were in cattail - bulrush marsh areas at a time when most of the refuge white-fronts were in the rice fields.

#### DISTRIBUTION

Where are tule geese found? Well, up until very recently almost all the records we had were from wintering areas in central California. Swarth and Bryant (1917) Moffitt (1926) and other early writers felt that the major wintering areas were along Butte Creek in Butte and Sutter counties, and in the Napa and Suisun marshes of Salano County. However, Moffitt pointed out that this is where most of the looking had been done, and other populations could have been easily overlooked. Bent (1925) says that there were persistent rumors of tule geese in the Los Banos area of Merced County, but he was unable to substantiate their occurrence there.

In recent years reports have continued to come from the two well-known areas, although not too many records are available for the Butte - Sutter region during the last 20 years. In addition we have now discovered what appears to be a fairly substantial population on and in the vicinity of the Sacramento National Wildlife Refuge in Glenn and Colusa counties. This is only 15 air miles from the center of the Butte Sink where Moffitt made his tule goose observations, but it is certainly a different type of terrain. Instead of living among inaccessible wooded ponds such as are found along Butte Creek, the Sacramento Refuge tule geese make their home among rice and millet fields.

Tule geese probably migrate through and winter in other parts of California also. Don White, manager at the Merced National Wildlife Refuge, tells me he has seen several birds in recent years that were probably tule geese, and Ed O'Neill, biologist at the Tule Lake National Wildlife Refuge, examined two birds last November that were almost definitely tule geese. Outside of California there have been occasional reports from Saskatchewan, Louisiana, Texas, Mexico, Arizona, and a few other points.

We can't know very much about the wintering areas and migration routes used by the tule goose, but we know even less about its breeding grounds. Some waterfowl literature (including Kortright's "Duck, geese and swans of North America" - 1942) describes Angus Gavin's "discovery" of a tule goose nesting colony in the Perry River region in 1941, but these birds turned out to be the smaller subspecies after all. We thought we had our discovery again in 1964 when Bob Elgas (1965) made his observations on the Old Crow Flats in northeastern Alaska, but recent findings may rule out this one, too. The most concise statement to be made right now is that nobody knows for sure where the tule goose breeds.

#### STATUS

How many tule geese are there? Again, nobody knows, but apparently they make up only a small fraction of the approximately 200,000 white-fronted geese that live within the Pacific and Central Flyways. In the winter of 1964-65, Tom Harper estimated that there were about 250 tule geese among the 2,000 whitefronts on Grizzly Island in the Suisun marshes. This winter on the Sacramento Refuge I identified about 40 tule geese in a sample of 200 white-fronts killed by hunters. Reports from other parts of the country have been of single specimens or, at the most, small flocks. The overall picture is of a rather small number of birds with a very localized distribution.

I said at the start of this talk that we now classify the tule goose not only as rare, but also as "endangered". Being restricted to very localized areas on both its breeding and wintering grounds, it is probably more susceptible to change than would be a more widespread wildlife population. And the changes seem to be coming!

We don't know for sure where the tule goose breeds but there is a pretty good chance that it will be found nesting somewhere in the interior region of Alaska or Canada, away from the tundra areas used by the Pacific white-fronts. It is in this interior region that the great changes are coming: accelerating oil exploration and development on the Old Crow Flats and in other areas, for instance, to say nothing of the proposed Rampart Dam on the upper Yukon. Either one of these projects could destroy valuable habitat needed by this bird.

On the California wintering grounds there are also changes apparent. The Butte Sink, one of the locations where the tule goose was first described, is in danger of being at least partially destroyed through flood

control and land reclamation projects. On the Federal wildlife refuges there has been a noticeable change in land use, with many cattail - bulrush marshes now converted to rice fields and millet ponds. If the tule goose is really as "choosy" of its habitat as we now think it is, it may not be adapting to the "new look" of the Sacramento Valley.

The general nature of the tule goose may also be getting it deeper into trouble. Most investigators have pointed out its lack of wariness and its habit of flying very low over the marshes. Considering the tremendous hunting pressure in northern California, it seems particularly unwise for a rare bird to also be an easily killed bird!

## THE FUTURE

It's hard to say what the future will hold for the tule goose because we don't really know what has happened to it in the past. It has always apparently been rare and localized, but just how rare or how local we don't know. However, whether or not a decline in numbers has occurred, the potential for a decline now seems pretty great. Unless we want to count tule geese the way we now number condors, whooping cranes and Everglade kites, we need to accelerate the pace of tule goose research and fill in a good number of gaps in our present knowledge. We need a much better idea of total numbers and, just as important, we need a more complete knowledge of tule goose distribution at all times of the year.

Seeing a tule goose is not as easy as seeing a scarlet tanager in a snowfield. They are not conspicuous in the wild, so we are not going to be able to rely on casual observations to tell us where they do and do not live. We are going to need something that will draw our attention to the geese, and probably the best "attention getter" would be a large sample of banded birds. If we had this large sample banded, we could then concentrate our field studies in the areas where band recoveries were reported. Unfortunately, we don't have the sample to band yet - and probably won't have until we track down the still elusive breeding grounds. It looks like much of our work down this way will have to wait until we can get some of the answers up north.

Actually, we do have some pretty good clues to the breeding grounds right now, with the tule goose itself providing some of the more promising ones. For instance, we are pretty sure that the tule geese must be isolated from other white-fronted geese during the breeding season. If they weren't separated, interbreeding would negate the chances of having two kinds of birds that look so different. Most of the white-fronts nest on the coastal tundra, and there are only a few breaks between the different breeding areas. Although a small population of tules might be living in one of these "breaks", the chances are much better that they come from an entirely different area with a different habitat type altogether.

Some of our so-called zoological "rules" may also be helpful in our search. For instance, both Bergmann's Rule on body size and Gloger's Rule

about coloration would lead us to believe that a large, dark bird like the tule goose would come from a region of lower temperature and higher humidities than do other white-fronts. However, if we throw in Allen's Rule, we might expect big-billed tule geese to come from just the opposite type of country. Which rule carries more weight here?

What about the prominent mineral stains present on tule geese, but absent on Pacific white-fronts? Might not this help us in our search? And, one more possibility, we might try what Dr. Harold Hanson is trying with Canada geese: analyzing the trace elements on the primary feathers. If we found any striking difference in the trace elements carried by tule geese and Pacific white-fronts, this might get us one step closer. As work advances, other possibilities will no doubt reveal themselves.

Just as a big honker is more exciting to most outdoors-people than the cackling goose or even a lesser Canada, so the tule goose has a special fascination about it. Its rarity and mysterious background make it a worthy target for more intensive study in the future.

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