

# The greater sandhill cranes of Shasta Valley



**Greater sandhill cranes.**

*Photo © John C Muegge*

*By R. Robert Smith*

The month of February can be a strange month in the Shasta Valley. True, we are still in the throws of winter, yet for a brief time the weather often warms and reminds us that spring is around the corner. Noisy territorial squabbles between Canada goose pairs are common as the birds begin the egg laying process. Duck pairs occupy every ditch and puddle. Shorebird flocks appear along wetland mud flats as they edge northward to their arctic breeding grounds. All too often, winter returns and slows the progression towards spring. For me, it is not the brief warm spell that makes this month special. In the Shasta Valley, February is the month that the greater sandhill cranes return. I look forward to their incessant, guttural bugling which announces their arrival to their nesting territories on cattle ranches and the Shasta Valley Wildlife Area. For me, it is an important milestone in the passing of the seasons.



*Photo © John C Muegge*

**The stately greater sandhill crane stands five feet tall and weighs around 10 pounds.**

The stately greater sandhill crane stands five feet tall and weighs around 10 pounds. These long-legged birds occupy shallow wetlands and open wet meadows and fields. Greater sandhill cranes are very long-lived, with birds surviving 20 to 30 years in the wild not at all uncommon. One crane lived 80 years in captivity! Not surprisingly, a greater sandhill crane pair nesting for the first time is at least three years old and often as old as seven or eight years. Unless a mate dies, greater sandhill cranes form lifelong pair bonds. One of our most ancient bird species, the sandhill crane is in many respects a living fossil with records of this species dating back over 2 million years.

The greater sandhill crane has been listed as threatened by the Fish and Game Commission. Though the population within California appears to be slowly increasing, concern over the decline of breeding and wintering habitat and the lack of young that survive to adulthood prompted the listing. The greater sandhill crane is the

largest of six subspecies of sandhill cranes that occur throughout North America. There are five recognized populations of greater sandhill cranes. The population that occurs in California is known as the Central Valley Population. These birds winter in California's Central Valley, and nest in northeastern California, eastern Oregon, portions of Nevada and Washington, and British Columbia. Oregon and British Columbia support the majority of the nesting population and only a few pairs are found in Nevada and Washington. It is thought that 200-300 pairs nest in northeastern California. Recent estimates place the entire Central Valley Population of greater sandhill cranes between 4,000 and 5,000 birds.

The Shasta Valley is one area where nesting greater sandhill cranes are found. This arid valley averages about 2500 to 3000 feet in elevation with 10 to 18 inches of annual precipitation. The valley is bordered to the east by the Cascades; the Klamath Mountains are found to the west; and south is spectacular Mt. Shasta. The site of an ancient volcanic debris flow, the valley is full of hills ranging in height from 100 to over 1000 feet above the valley floor. The Shasta River is the main watercourse running south to north before emptying into the Klamath River.

The Department of Fish and Game (DFG) has intensively surveyed



Photo © R. R. Smith

**A greater sandhill crane adult displays aggressively when protecting a colt.**

northeastern California for breeding sandhill cranes three times over the past 25 years. A survey conducted in 1981 raised only the possibility that one to two pairs of cranes nested in the Shasta Valley...noting that if this were true, it would extend westward their known breeding range. The last coordinated statewide survey (conducted in 1988) located seven pairs of cranes within the Shasta Valley.

In 1991, the Wildlife Conservation Board acquired the property that would become the Shasta Valley Wildlife Area. I arrived in 1992 and along with Fish and Wildlife Assistant II Anthony Ries was

charged with the development and management of this new wildlife area. At the time of acquisition, three pairs of cranes occupied territories on the wildlife area. During the summer of 1993, only one pair could be found on the Shasta Valley Wildlife Area. From a distance and with great interest, we observed these birds throughout nest incubation. Finally the blessed day arrived when two young cranes (wildlife biologists call them colts) hatched. Much to my surprise and dismay, the pair immediately moved their colts off DFG property to the neighbor's cattle ranch. This single event, more than any other, launched my personal interest in learning more about greater sandhill cranes.

During the spring and summer of 1994, we attempted to observe where cranes were in the Shasta Valley. That year of informal observation yielded some surprising information. First, it appeared that the breeding population of cranes in Shasta Valley was much larger than previously thought. We had no problem locating 15 pairs and were told of others by cattle ranchers anxious to show their land stewardship was important for critters other than cows. Also of interest was the number of young cranes which were fledged. Age ratio counts on the wintering grounds in the Central Valley suggested that fewer than five percent of the wintering greater sandhill cranes were young of the year.



Photo © R. R. Smith

**A nonbreeder flock forages on private land in Shasta Valley.**



**A greater sandhill crane adult with two recently fledged young.**



*Photo © Mike McVey*

**A greater sandhill crane nest platform with egg fragments.**

We observed over 20 percent young in pre-migration staging at Shasta Valley Wildlife Area. This observation period also showed that greater sandhill crane pairs were most often found in large open irrigated pastures, especially those which were poorly drained and had small artificial wetlands adjacent to them. In order to make Shasta Valley Wildlife Area attractive to cranes, it was obvious that we would have to work to duplicate some of these conditions.

A management strategy was developed which involved the manipulation of both vegetation and water. Vegetation management was accomplished with carefully timed livestock grazing and fire. We created wet meadow habitat by running water through grazed or burned pastures beginning in late winter and continuing

through midsummer. Diked seasonal wetlands were managed for vegetation preferred by nesting cranes and water levels were stabilized throughout the spring nesting period. With this management in place, during the spring of 1998, six pairs of greater sandhill cranes defended territories within the boundaries of Shasta Valley Wildlife Area.

Not only did our observations of cranes on private lands assist with the development of management strategies on Shasta Valley, it also led to our designing a long-term study of greater sandhill cranes. In 1995, we formalized a research project on greater sandhill cranes which is ongoing. Initially, our project focused on habitat use and reproductive success on private land, mostly cattle ranches. This project

could not have gotten off the ground without the cooperation of local landowners in the Shasta Valley. Since 1996, scientific aide Mike McVey has spent the majority of his time from March through July collecting data on nesting cranes. In 1998, we expanded the project to include developing a way to predict greater sandhill crane nesting and brood rearing habitat through the use of LANDSAT satellite imagery. Humboldt State graduate and GIS expert Chris Stermer joined our group and has put his expertise to work mapping greater sandhill crane habitat. Many other DFG employees and volunteers have assisted in various aspects of this project.

By the end of the summer of 1998, 21 pairs of cranes had been located in Shasta Valley including 15 pairs on private land. Our access to private land allowed us the opportunity to closely look at 10 pairs during the time they were on their territories.

As with any study, it requires the collection of lots of data before hard conclusions can be drawn. Commonly, this information is tested with statistics in order to determine whether or not it is valid. We are still a year or two away from being able to draw some of those conclusions. If we follow the greater sandhill cranes of Shasta Valley from the time they arrive in late winter until they depart in the fall, you will see some of what we have learned about this wonderful bird.

Our crane pairs typically begin arriving in the Shasta Valley before the end of February. Sometimes we see crane pairs as early as late January, while other



Photo © R. R. Smith

### **The young lack the red crown on the forehead.**

pairs wait until March to show. Our Shasta Valley cranes appear to migrate a full six to eight weeks earlier than nesting cranes returning to higher elevation valleys such as Big Valley and the Klamath Basin. The pairs seem to arrive and immediately defend their chosen territories. Greater sandhill crane pairs have been observed using the same territory year after year. Much like geese, cranes migrate in family groups. A pair of cranes that successfully fledged a young the previous summer will return with that bird on the migration north. For the first few weeks, the pair tolerates their offspring. As nest building time approaches, young cranes are driven away from their parent's territories. These birds group together in a nonbreeder flock. Our neighbor Roy Smith, who's ranch provides prime habitat for Shasta Valley cranes, calls this flock "the teenagers." In Shasta Valley, a typical non-breeder flock will number between 12 and 18 birds. I view this as a sign of a productive breeding population of birds. These "teenagers" will eventually form pairs and become breeders.

It is difficult to characterize what a typical territory is in the Shasta Valley. Pair territories seem as variable as the birds themselves. The size seems to range from 20 to 60 acres, with some territories being much larger. A few common characteristics are always present. First, Shasta Valley cranes require a shallow wetland to build their nest. They also seem to prefer tall marsh vegetation such as tules or cattails, though that isn't always the case. In other greater sandhill crane nesting



Photo © R. R. Smith

### **The crane colts stand about six inches at birth and have what can best be described as orange, downy plumage.**

areas, it is more common for cranes to use very short marsh vegetation for nest construction. These wetlands can be as small as a half-acre. Breeding crane territories also have open damp or wet meadows with short vegetation where they prefer to forage, usually adjacent to their nest site. These meadows can range in size from 20 to over 100 acres. In Shasta Valley, the geography and the dispersal of crane habitat keeps crane pairs separate and scattered. Territorial squabbles between pairs are uncommon. In one case, we have two pairs that appear to have overlapping territories. Though they keep their space, these two pairs appear unusually tolerant of one another, yet aggressively drive off any other crane intruders.

Nest building can start as early as March or as late as early June. In Shasta

Valley, nest construction is usually complete by early May. Sandhill crane nests are typically constructed of whatever vegetation is available in shallow water (usually less than 12 inches deep). Vegetation is plucked and stacked to form a mound. These are often very large, two to three feet high and up to six feet in diameter. So much is required for the construction of these nests, the birds will often remove every bit of vegetation for many feet around the nest. From the air, these circular areas known as "pluck zones," assist us with locating crane nests. Not all crane pairs construct nest mounds. We had one pair create a bowl the size of a duck nest on an island in a Shasta Valley Wildlife Area wetland. Most Shasta Valley crane nests are well concealed in wetland vegetation. Again, this is not

always the case and some crane nests can be the highest point for hundreds of acres and be very conspicuous. Two eggs are usually laid and both birds participate in the incubation process. Hatching occurs in about 31 days.

Sometimes crane pairs will defend territories during the spring, and not even attempt to build a nest. Other pairs will construct several nest platforms, then not lay eggs. Are these young pairs “learning the ropes”? Maybe or maybe not. During one very dry spring, we found a number of pairs, and even some of the more “experienced” birds, did not even attempt to nest. This was in spite of the fact that ample wetland habitat was available within their territories. Perhaps a behavioral “switch” is turned on telling the birds that their wetland habitat may not persist through the summer months.

The nest is considered “successful” if at least one egg hatches. The crane colts stand about six inches at birth and have what can best be described as orange, downy plumage. If two colts hatch, competition occurs immediately between the colts for care by the adults. More often than not, the stronger colt will drive the weaker one off. Occasionally, crane pairs will successfully fledge both colts. This is done by having the pair “split duties” with each adult caring for a colt during daily foraging. Crane colt diets initially consist of high protein invertebrates such as aquatic and terrestrial insects. As they grow older, they take on their parent’s omnivorous foraging habits, adding vegetative matter to their diets. At night, the family group returns to the original nest platform to roost. Other platforms are often constructed for roosting purposes throughout their “home” wetland. The colts grow quickly and fledge (can fly) in about 70 days. Once colts fledge, we have observed crane pairs and young moving off their territories, perhaps flying to “greener (foraging) pastures.” One place that crane pairs and colts sometimes gather is at Steamboat Reservoir at Shasta Valley Wildlife Area. There, the birds can forage and roost along the shoreline, or fly a short distance to feed in the wildlife area’s wheat fields located nearby.

It is never this simple of course. Perils and hazards are out there and take their toll on both crane adults and young. Predation has been identified as an area of concern with cranes. In the Shasta Valley, the coyote seems to be responsible for more crane deaths than any other



Photos © R. R. Smith

**Above, Shasta Valley cranes appear to migrate a full six to eight weeks earlier than nesting cranes returning to higher elevation valleys such as Big Valley and the Klamath Basin.**

**Right, an adult crane with two newly hatched colts.**



critter. We rarely find eggs predated on nests. When this does occur, coyotes, ravens and raccoons usually are the culprits.

In 1998, an adult crane was killed by what is suspected to be a coyote on Shasta Valley Wildlife Area. I have seen coyotes actively hunt crane colts and have witnessed both successful and unsuccessful coyote “attacks.” Much like humans, we find some crane pairs to be better “parents” than others. Age and experience likely play a role in this. Some pairs are very effective at driving marauding coyotes away. Playing a game of “decoy and deception,” experienced cranes seem to deal with the coyote problem quite effectively. Habitat is important also, because cranes need to spot the intruders from a great distance. Not surprisingly, we have observed some “super parents” fledge young every year while others have failed to even nest.

I believe that greater sandhill cranes are unique among California’s threatened and endangered species. A

species that has evolved for over 2 million years has “survival” programed into it. For the millennia, cranes have seen changes on this planet. Animal species have come and gone, droughts, volcanos, floods, glaciers, yet the sandhill cranes have persisted. They are a species which has adapted to a very dynamic and changing habitat. Wetlands and wet meadows are often impacted by flood, drought, fire, grazing and trampling. I have come to admire the sandhill crane’s complex social behavior, individuality and ability to adapt and survive.

Whether you are in the Sacramento Valley, or Alturas in northeastern California, opportunities exist to view these living fossils throughout the year. I am sure once you have spent a morning viewing these fascinating birds, you will be a convert.

*R. Robert Smith manages DFG’s Shasta Valley Wildlife Area.*