

THE CONDOR

VOLUME XXXIX

MARCH-APRIL, 1937

NUMBER 2

THE GOLDEN EAGLE IN SAN DIEGO COUNTY, CALIFORNIA

WITH FIVE ILLUSTRATIONS

By JAMES B. DIXON

The Golden Eagle (*Aquila chrysaetos*) is a common resident bird in San Diego County, California. This article sets forth my observations on this bird during the period 1900-1936, including some data as to sizes and numbers of eggs laid during the lifetimes of two pairs.

On the map (fig. 14) each area shown is the feeding range of a pair of eagles. The only feeding area in which the nesting site has not been located is the one between areas 7 and 13. I have

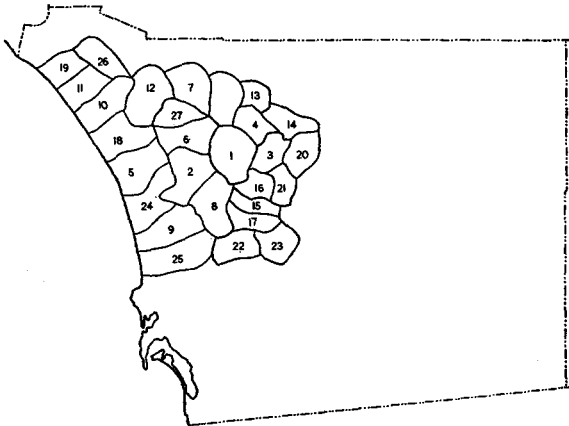


Fig. 14. Map of San Diego County, California, showing known feeding areas of 27 pairs of Golden Eagles. Sizes of the numbered areas, in square miles, are as follows: 51, 47, 25, 24, 48, 36, 39, 46, 48, 39, 32, 52, 19, 27, 19, 21, 23, 46, 24, 32, 21, 30, 34, 46, 59, 33, 24; average, 36.

good reason to believe that the entire coastal area in San Diego County is just as thickly populated with eagles as the part shown in figure 14 which shows the feeding areas of 27 known pairs. The numbers as shown indicate the sequence in which the nesting sites were located. The lines were drawn from data gathered over 36 years' experience with the birds in the field and are accurate for the time the nesting site of each was located. These areas vary slightly with changing pairs, much as land areas owned by early settlers change; but in the main

they remain substantially the same. The areas have been computed; the minimum is 19 square miles, the maximum, 59 square miles, and the average for the 27 is almost exactly 36 square miles, the equivalent of a township.

Area 15 is situated on the south slope of Palomar Mountain and varies from 600 feet to almost 6000 feet in elevation. The actual hunting area exposed is much more than 19 square miles as measured on the level. Contrasted with this is the 59 square miles shown in area 25 which consists of level areas much of which is in grain and other annual crops. Where areas are planted to trees or cropped, or otherwise changed from their natural status, the feeding areas show an increase in acreage. This is shown by areas 1 and 12, both largely level valley and surrounding foothills highly developed to orchards and permanent improvements. By this change in natural conditions the birds have been forced to take in more territory.

Boundaries of the area claimed by each pair of birds are definite and this area is handed down from generation to generation; the death of one bird of a pair does not affect the status of a given area. If both birds are destroyed at the same time the area is open territory but does not seem to remain so for any length of time. This would indicate an ample supply of birds of breeding age in the region. If one of a pair is killed the survivor will secure a new mate soon. One female was caught in a steel trap in December and was killed in being removed from the trap. By the following February 20, a new mate had been secured and a set of eggs deposited.



Fig. 15. San Luis Rey River Canyon, San Diego County, California. Golden Eagles from area 3 nest in cliff at lower left; birds from area 4 nest in cliff at right of center. Photographed in March, 1929.

Referring to the size of eggs and the number of eggs laid over a twenty-year period by two pairs of eagles, we find a fixed and definite decrease in the size of the eggs as the birds increase in age. This decrease is surprisingly consistent in ratio as shown by the difference in size of the first and last egg laid in each set. The third egg in three sets has been ignored as to measurements. One pair laid three sets of three eggs in twenty years and the other but one. There is an increase of shell thickness with the decrease in the size of the egg, and the actual volume of shell changes but little from the first to the last egg. These records were taken from birds residing in areas 1 and 2. The eggs of the birds of area 1 were typical in every respect, whereas the eggs of area 2 were abnormal in size and also they were always infertile. Area 1 had four distinct nesting locations in widely separated parts of the range, and eleven nests. Five of these nests were in cliffs and six were in trees. Area 2 had four distinct nesting areas in widely separated parts, and twelve nests. Four of these were in cliffs and eight in trees. All nests in trees were in oaks, except two in eucalyptus.

Eggs are deposited, in this area, as early as the first week in February and as late as the first week in March. If for any reason the first laying is destroyed, the birds

will invariably deposit a second set, sometimes in the same nest but usually in another nest. The period between layings is 28 days. About one set in ten will consist of three eggs per set, and about the same percentage of sets of one egg are laid. I have known



Fig. 16. Golden Eagle's nest in oak tree in area 2; R. M. Barnes at nest. Photographed in March, 1912.

where third and even fourth sets were laid in one season. This will occur apparently only where food conditions are favorable and where the birds are in the prime of life.

A nesting location is generally on the margin of the hunting area where air currents are favorable to slow flying and landing at slow speeds. Air currents are important in the life of an eagle as shown by their taking every advantage of existing

ones. This is perhaps best illustrated by the fact that every pair will have a favorite location for elevating and this is nearly always over a cone-shaped peak where the currents are ascending. Again when they are going home with a kill they do not always fly directly home but will often travel due east until they reach elevating currents which will take them up to the desired height to cross intervening ranges of hills. They know all these spots and I have often seen one kill a squirrel and take



Fig. 17. Nest of Golden Eagle in oak tree in area 2. Photographed in March, 1912.

the ascending air current route home although it was much farther than a direct route.

Nests are composed of light, dead brush for a platform, dead stalks of the Spanish dagger, dried-up bushes of wild alfalfa, oak or sycamore sticks of considerable size, and almost any dry material that is within reach and strikes the fancy. Nest building is usually done between 10 a.m. and 1:30 p.m., or after the morning hunt is over. The linings of the nests may be carried for long distances but usually are taken from near the nests. The one thing that seems necessary is the dry last year's leaves of the Spanish dagger, with the needle-like hard points. Eucalyptus and oak leaves are used. Through several weeks of sitting, the incubating bird shreds these hard dagger

leaves into a soft blanket-like mat for the lining next to the eggs, and by the time the eggs are hatched the hollow is well formed and often the lining can be lifted out in one piece much like a blanket.

Eagles do not nest year after year in the same nest as generally reported. Even if they have several nests in a given nesting location they circulate around in the vicinity and leave a nesting location and move to another if an abutting pair en-



Fig. 18. Young Golden Eagles in a cliff nest in area 1, July 4, 1921. The standing bird left the nest soon after this picture was taken.

croaches. They are jealous of their feeding range and often nest close together as measured by air distance and often where they can watch each other. This is often practiced by pairs 3, 4 and 14, and also by pairs 2, 8 and 9. Their nests are sometimes within two square miles and each pair radiates out over its respective hunting area but nests where it can keep an eye on the others. The worst insult one pair can give another is to steal sticks from its nest. The nest from which the stick is taken may be an old one which has not been used for years; but that does not seem to make any difference. The battle is on, and if it takes place with considerable wind blowing, it is a sight worth seeing. Twice I have seen three pairs involved in such a battle and often have seen two pairs involved.

Nest building begins with the first heavy fall rains and continues through the winter. New nests are often built, but these are not used the year they are built. I have often noticed a nest being built that I was sure was a new nest; but invariably the birds would leave this nest for an older used nest when egg-laying time arrived.

The female being larger and stronger than the male, seems to have full say as to the nest location and for no apparent reason will change from one nest to another. Several times I have watched a female look over various nesting sites, one after the other, and finally seem to decide on one of the five or six places she inspected. The male at this time is aggressive and shows off his powers of flight, the commonest of which is to get up about 2000 feet and dive in loops, one right after another in a line toward some other eagle in the far distance. Sometimes at the top of the swoop he will make almost a right angled turn, but usually the dives are directed at a bird in the distance and seem to be a challenge or a warning to the latter to stay on his own hunting ground.

As a rule, the eagles are tolerant of other predatory birds and simply ignore them. Almost every area shown on figure 14 contains one or more pairs of nesting Western Red-tailed Hawks and Pacific Horned Owls. In one instance a pair of eagles moved onto a cliff where a pair of Duck Hawks had made its home for years and persistently fought with and outfought the Duck Hawks, forcing them to leave. The eagles are still nesting there. Previous to this occurrence I had thought the Duck Hawk was supreme in maintaining its home.

If times are hard and food becomes scarce, and it becomes a case of the survival of the fittest, the eagle will kill breeding pairs of Western Red-tailed Hawks and Pacific Horned Owls. I do not know that all pairs will do this but I have actually seen pairs of eagles hunt down and kill both the hawk and the owl. Both of the birds worked together and there could be no doubt as to their intentions. Young Western Red-tailed Hawks of the previous years' hatch but which had not reached fully mature plumage were more often killed than full-plumaged breeding birds.

One peculiar habit, and this has been noted in several instances, is that breeding birds roost some distance from their newly lined and rebuilt nest. On cloudy days birds will often go to roost for the night as early as 3 p.m., but they are out with the crack of dawn.

Of the two birds, each does its share of incubating, and the regular shift of incubation starts within 48 hours after the last egg is laid and continues during the incubation period. If the male brings in a kill for the female, she usually leaves the nest to receive it. This is much more apt to occur in the period of laying. Several days usually elapse between the layings of the eggs, and the female stays on or around the nest and seems to know just when to expect the return of the male. I have watched them when the female would begin clucking and calling for some time before the male put in his appearance. The pitches of their calls are enough different in tone to be distinguishable, and sometimes the answering call of the male is heard before the bird can be seen. The male drops out of the sky directly overhead or comes in around the mountain-side, with something for the female. After incubation is under way, this procedure does not occur. The male drops into the nest on a high or low dive and the female leaves almost immediately. Unless you knew, you would think the same bird left the nest that went into it.

The question of how an eagle slept came up once and in order to determine this matter we went up to a nest one night where we knew an eagle was incubating. Cautiously working out onto a point on the cliff where a good view of the nest could be had, we flashed a strong spotlight on the sitting bird. Our first impression was

that the bird was dead. Her head lay forward on the nest edge directly in front of her, her wings were half open and spread out in a drooping position at her sides. We were much disappointed, as we were sure she was dead; but we decided to find out, so threw a small pebble over toward the nest and began talking, whereupon the bird woke up and left the nest in a great hurry. We thought this experience might cause the birds to desert the nest but they did not do so. Since then I have found them in this same position during the day and apparently sound asleep on the nest and have had to drop pebbles down on their backs to wake them up. Birds vary a great deal as to wildness. The ones around civilization become very tame in some instances and usually wind up by being shot by some passing hunter.

Food supply seems to be the center around which everything in the life of the eagle revolves. We have given careful attention to the food in nests under almost every condition from ones just ready for eggs to ones with full-grown young. The best time to get a check on the food supply is when the young are just hatched and too young to eat much. At this time a large amount of food often accumulates. Squirrels, both ground and tree, are the first and foremost item of food. Next in importance are the three kinds of rabbits found in this region. Ranking third are the various water birds such as the coot and the larger ducks. The eagles are not particular, as we have found skunks, gray foxes, house cats, young pigs, young deer, and young goats in or at the bases of nests. Eagles have been accused by the cattlemen here of killing newly born calves, but I have never seen any definite evidence of such action.

The birds are reputed to remain mated for life. I doubt this for the following reasons. In several instances I have seen an unmated female, unsuccessful in securing a mate, go ahead at the breeding time and build her nest and lay her eggs (infertile), then proceed with securing of a mate as soon as possible. During this period she was not above trying to steal an adjoining mate and would always secure a mate from some place. This has been particularly true if the area in which the female lived was a productive one as to food supply. The eggs of the various females show great individuality and, you might say, a family resemblance. This is so true in this area that recently, when a collector challenged this statement and said he had six sets of eggs he had recently collected in San Diego County, I was able to tell him from the eggs without a single error where he had taken each set. Basing my opinion on this difference or individuality in the eggs of a given female I feel sure that they change around some and that both birds of a pair shift or trade areas, or the female alone moves into a new area.

Another thing I have witnessed on several occasions is the banishing of an aged bird of a pair which is no longer able to carry on and has been supplanted by a new and younger mate. In such cases the banished bird will hang around the margin of the food area and is much harassed by one of the ruling pair though tolerated by the other bird of the pair. I have also seen this transpire with young birds of the previous year which insisted on returning to the area from which they had been driven the previous fall. Invariably it has been the larger bird of the old pair that has done the chastising and the smaller or male bird that tagged along but took no part in the fight and appeared in some cases to condole with the chastised bird to the extent of flying over and sitting alongside it; but after a short time the adult would return to the bird which was doing the punishing and go off with it.

Some peculiar hunting habits of the eagles seem worthy of recording. An old female in area 2 had been shot by duck hunters and the end of one wing injured. By tipping the opposite wing she was still able to fly but not so well as formerly and

she had to make up in wisdom what she lacked in flying ability. I have seen her do the following things which would indicate an ability almost to think.

Her nest was high in an oak on a rough mountain-side overlooking a freshwater lake. This lake had a barbed wire fence around its highwater margin. On the wires of this fence trailed creeping vines such as wild morning glory, making in effect a screen of the vines and fence combined. On this lake many coots were living and they often fed up from the lake shore under this fence. The old eagle would leave her nest on the mountain-side high above the lake and sail south at a high elevation as though leaving the area, for a distance of about a mile, then would drop down to the lake level and, paralleling the fence but between it and the lakeside, she would fly slowly along about three feet off the ground until she had put herself between the coots and the lake, whereupon she would rise over the fence and pick up a coot before it knew what had happened. She did this time after time and the coots never seemed to learn that this was a dangerous place in which to feed.

This bird also did the following: She made a pass at a ground squirrel but was too slow to pick the squirrel up although she tried hard. Clucking and talking to herself she waddled up to the top of the dirt mound and apparently went to sleep perched well back out of sight. I could see her turning her head as though listening but she remained very still. Soon the squirrel came out of its burrow and began to forage again. The eagle remained perfectly quiet but movements of her head indicated that she knew the squirrel was there. When the squirrel got far enough away from its burrow, the eagle quietly took wing and, dropping off the hillside above, easily picked it up and returned to her nest with it.

Another bird was seen to use a truck full of woodcutters to stalk a bunch of coots near the lake. Flying alongside of the truck and only a few feet above the ground the bird paced the truck until it was in a position to strike, whereupon the bird wheeled rapidly over the truck and struck down a coot within a distance of fifty feet.

Another pair was hunting and one missed a squirrel which ran into a heavy bush. Squealing in anger the bird took hold of the bush with its feet and beating its wings against the bush seemed to try to scare out the prey. Meanwhile the other bird was waiting, ready to strike if the prey flushed. They were unsuccessful in this ruse as apparently the squirrel was an experienced one and did not flush. One of this pair would follow a man and plow team and when the horses would flush a squirrel she would pounce upon it while the squirrel's attention was directed to them. This bird would then sit within a few feet of the plowman and proceed to eat the squirrel. When the man stopped his team and playfully snapped his whip at the eagle, she would only retreat a few feet and proceed to eat. I went down and talked to this man and he told me that he had lived for 54 years on this ranch and that there had always been a pair of eagles there.

Summary.—The average area in the San Diegan district of California to support a pair of Golden Eagles appears to comprise close to 36 square miles, or the size of a township. The age of one bird is rather definitely established as 30 years, as shown by the record of the female in area 1. Eggs of young eagles are larger and more heavily marked than eggs from older females, and the eggs gradually decrease in size and increase in thickness of shell. The birds are beneficial on the whole, being heavy feeders on mammals objectionable to the agriculturist. Eagles in this region are better able to survive than most predatory birds in that they are shy and retiring by nature and live principally in unsettled sections.

Escondido, California, December 17, 1936.