

# NESTING ON WATER BANK LANDS IN MERCED COUNTY

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Abstract. The Water Bank Act (PL 91-559) authorizes the Department of Agriculture to enter into 10-year agreements with private landowners to preserve, restore and improve the wetlands of the nation that are of the most value to waterfowl nesting. A nesting study was conducted on 851 acres of Water Bank land in Merced County, California. The species nesting on the area as well as nest location, cover and fate of the nest are discussed.

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## INTRODUCTION

Wetland habitat has been lost nationwide. This means less wintering and nesting habitat for waterfowl. Although State and Federally owned wetlands provide critically needed habitat, it will not be enough to maintain present waterfowl populations. Private wetlands provide additional waterfowl habitat. The Water Bank Act (PL 91-559) provides incentive for private landowners to maintain waterfowl nesting habitat. This Act authorizes the Department of Agriculture to enter into 10-year agreements with private landowners to preserve, restore, and improve valuable wetlands. The first Water Bank agreements were signed in 1972. Each landowner in the Water Bank Program in California receives an annual payment of \$5 an acre for the wetlands and \$10-20 an acre for the adjacent land, depending on its capability and the value of crops that could have been produced.

The Water Bank Program was conceived for use in the prairie pothole states that are major producers of ducks. In 1976 there were 3,298 agreements nationwide covering 297,532 acres. The program has been extended to other

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states to see if waterfowl production can be improved. At present, 16,290 acres are included in Water Bank Program agreements in California. Most of this is in Merced County where 39 private duck clubs have 13,708 acres under agreements. The rest is in Modoc and Lassen Counties.

Historically, the Grasslands of Merced County have been an important wintering and nesting area for many species of waterfowl and nongame birds (Anderson 1956). In the past, runoff and overflow from the San Joaquin River provided enough water to maintain ponds and marshes throughout the year. However, with the construction of Friant Dam on the San Joaquin River and the development of intensive agriculture, water was diverted for non-wildlife uses. The result is a reduction in wetland habitat.

When a person or group obtains a Water Bank agreement, they become a cooperator, and a conservation plan is developed outlining practices which will provide good waterfowl nesting habitat. The cooperator can get help with these practices from the Soil Conservation Service through the Grasslands Resource Conservation District. Cost-sharing assistance may also be available through the Agricultural Conservation Program.

Wetland habitat in the Grasslands is characterized by shallow depressions and basins surrounded by low levees. These are usually dry by early June unless supplemental water is supplied. Lack of water results in increased brood mortality. The Water Bank Agreement requires duck clubs to maintain water on the area until July 15. This allows most ducklings a chance to mature. Work which would endanger nesting waterfowl must also be postponed until after July 15. Cattle grazing, mowing, burning or other methods may be used to manage vegetation after the nesting period if the local wildlife committee determines it will improve habitat. The local wildlife committee consists of representatives from the Fish and Wildlife Service, Department of Fish and Game, and the Soil Conservation Service.

This study was conducted to obtain data on species nesting on Water Bank lands, vegetation used by nesting species, relationship of nests to water and success of nesting. The data will be used to make future management recommendations.

Observations were made from May 3 to July 12, 1976. The year of the study was dry, with only half the normal 8.90 inches of rainfall. The Department of Fish and Game's aerial breeding pairs survey in the Grasslands showed a 40% decline from 1975.

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#### METHODS

Portions of 8 duck clubs, 4 from the north Grasslands and 4 from the south Grasslands, were chosen to provide a sample of different types of nesting habitat on Water Bank areas. Table 1 indicates size of study plots, and acreage included in Water Bank. Approximately 515 acres of adjacent land and 336 acres of wetland were surveyed for nests.

To locate duck nests a 100-foot rope was pulled over nesting habitat to flush hens from the nest (Hunt and Naylor 1955). Sticks were brushed over the vegetation on islands and other areas where the rope would have been awkward. When a bird was flushed, its nest was marked with surveyors tape several feet away. If a nest was found already depredated or without the hen, breast feathers were used to identify the species. American avocet, black-necked stilt, and other shorebird nests were also inventoried during the study. No effort was made to locate all shorebird nests because of the

Table 1. Size of study plots.

DUCK CLUB SURVEYED	WATER BANK CONTRACT YEAR	STUDY PLOT ACREAGE			TOTAL WATER BANK ACREAGE		
		ADJACENT LAND ACRES	WETLAND ACRES	TOTAL ACRES	ADJACENT LAND ACRES	WETLAND ACRES	TOTAL ACRES
Honey Lake	1972	38	--	38	289	91	380
101 Club	1972	91	27	118	108	27	135
Sunset	1972	63	107	170	78	104	182
Coast	1974	51	60	111	231	58	289
Lucky 6	1974	74	32	106	96	32	128
Coaches	1974	44	38	82	254	70	324
Hollister	1974	63	22	85	943	257	1,200
Esgibago	1975	91	41	132	119	41	160
<b>TOTAL</b>		<b>515</b>	<b>336</b>	<b>742</b>	<b>2,118</b>	<b>680</b>	<b>2,798</b>

Table 2. Location of nest sites.

Species	Location					Total Nests
	Dry Pond	Upland	Levee	Island	Blind	
Mallard	23	9	8	4	0	44
Cinnamon Teal	17	7	6	6	1	37
Gadwall	7	4	3	2	0	16
Pintail	2	1	0	0	0	3
<b>Total Duck Nests</b>	<b>49</b>	<b>21</b>	<b>17</b>	<b>12</b>	<b>1</b>	<b>100</b>
American avocet	1	1	6	13	18	39
Black-necked stilt	0	1	1	4	3	9
<b>Total Shore birds</b>	<b>1</b>	<b>2</b>	<b>7</b>	<b>17</b>	<b>21</b>	<b>48</b>
<b>TOTAL NESTS</b>	<b>50</b>	<b>23</b>	<b>24</b>	<b>29</b>	<b>22</b>	<b>148</b>

large number on some areas. Other nesting bird species were also noted, but detailed information was not obtained.

Data concerning the nesting species, location, vegetative cover, vegetation height, number of eggs and distance to water were recorded for each nest on 5 x 8-inch cards. Subsequent observations were also recorded on these cards.

## RESULTS AND DISCUSSION

A variety of ducks and nongame birds was found using Water Bank lands for nesting. Birds observed nesting were mallard (Anas platyrhynchos), cinnamon teal (A. cyanoptera), pintail (A. acuta), gadwall (A. strepera), American avocet (Recurvirostra americana), black-necked stilt (Himantopus mexicanus), killdeer (Charadrius vociferus), long-billed marsh wren (Telmatodytes palustris), red-winged blackbird (Agelaius phoeniceus), tri-colored blackbird (A. tricolor), western meadowlark (Sturnella neglecta), marsh hawk (Circus cyaneus), and lesser nighthawk (Chordeiles acutipennis). A pair of fulvous tree ducks (Dendrocygna bicolor); several pairs of ruddy ducks (Oxyura jamaicensis); two pair of green-winged teal (Anas crecca carolinensis); and several pheasants (Phasianus colchicus), some with broods, were observed but no nests were located.

A total of 100 duck nests was found during the study. Mallards made up 44 percent, cinnamon teal 37 percent, gadwall 16 percent, and pintail 3 percent. Only 48 shorebird nests were monitored for this study; 39 were American avocets, and 9 were black-necked stilts.

Waterfowl nesting density on separate study areas ranged from 1 nest per 2.4 acres to no nests found on a 132-acre area. Overall waterfowl nesting density was 1 nest per 8.5 acres for the 851 acres surveyed.

These results compare favorably with previous nesting studies conducted in the Grasslands. A 1948 study found a waterfowl nesting density of 1 nest per 18 acres on the Los Banos refuge, 1 nest per 33 acres on the Gustine Gun Club, and 1 nest per 95 acres in a strip along the Santa Fe Grade (USDI, 1951). Anderson (1956) found waterfowl nesting densities of 1 nest per 7.1 acres in 1953 and 1 nest per 8.9 acres in 1954. Anderson's study was conducted on areas he considered the best waterfowl nesting habitat in the Grasslands.

### Nest Sites and Cover

Nest sites were identified either as levee, upland, dry pond, island, or blind mound which is essentially the same as an island. Of the 100 duck nests located, 49 were in dry ponds, 21 were on upland sites, and 17 were on levees (Table 2). Islands accounted for another 12 and blinds only 1 of the nest sites.

The location of nongame bird nests differed from that of ducks. Of the 48 American avocet and black-necked stilt nests found, 38 were located on islands and blinds. Long-billed marsh wrens, red-winged blackbirds, and tricolored blackbirds utilized tules (Scirpus acutus) and cattail (Typha sp.) for their nest location.

Proximity to water was important to location of nests. The farther the nests are from water, the greater the risk of predation on ducklings (Anderson 1960). Sixty-three percent of the duck nests were located within 50 feet of water, 34 percent were 51 to 350 feet from water, and 3 percent were located between 351 and 500 feet from water. This differed significantly from American avocet and black-necked stilt nests of which 88 percent were located within 10 feet of water and the other 12 percent within 50 feet.

Nesting cover plays an important part in hiding nests from predators. Eighty percent of duck nests were located in vegetation 1 to 3 feet high.

Several species of plants were utilized by ducks for nesting cover. Nests were found in salt grass (Distichlis spicata), baltic rush (Juncus balticus), smartweed (Polygonum sp.), fat hen (Atriplex patula var. hastata), sour clover (Melilotus indica), alkali sacatan (Sporobolus airoides), creeping wild rye (Elymus triticoides), trefoil (Lotus corniculatus), alkali heath (Frankenia grandiflora), and cocklebur (Xanthium canadense).

Individual nests usually had a mixture of two or more of the above species. The two dominant plants were baltic rush and sour clover which were found associated with 48 percent and 20 percent of the nests, respectively (Table 3). Saltgrass is a low growing perennial usually less than 12 inches high. Of the 15 nests which occurred in predominantly saltgrass, 86 percent were cinnamon teal. Since teal are small ducks, they were able to conceal their nests better in saltgrass than could larger ducks.

American avocets and black-necked stilts depend upon cryptic coloration of the eggs rather than vegetation cover for concealment. Their nests are simple structures of a few twigs with the eggs placed on top. Of the 48 shorebird nests observed, 40 percent had no vegetation near the nest. The rest had some vegetation in the vicinity but it played no role in concealment.

#### Clutch Size

The average clutch size for each species was as follows: mallard 8.2 eggs (27 nests), cinnamon teal 8.4 eggs (27 nests), gadwall 9.2 eggs (12 nests), pintail 6 eggs (3 nests), American avocet 4 eggs (39 nests), and black-necked stilts 4 eggs (9 nests). These data are consistent with similar studies. Some nests were depredated before being located or were in early stages of laying and were not used in calculations of clutch size.

#### Fate of Nest

The fate of eggs in nests was recorded when possible. During this study, 20 percent of the nests successfully hatched. Duck nests have always suffered a high rate of depredation in the Grasslands (USDI 1951, Anderson 1956, Holland 1974). Predators such as coyotes (Canis latrans), striped skunks (Mephitis mephitis), opossums (Didelphis virginianus), racoons (Procyon lotor), and gopher snakes (Pituophis melanoleucus), occur throughout the Grasslands. An attempt was made to identify predators responsible for nest depredation, but identification was not readily apparent in many cases. Predators as a group were responsible for the destruction of 54 percent of all nests found. This figure may be misleading since 25 of these nests were destroyed prior to finding them, making some nests more readily apparent to the observers.

Cattle are not allowed on Water Bank areas during nesting season, but they were accidentally on two study plots for short periods. During the 10 days cattle occupied one study plot, they trampled 3 of the 33 nests found. Vegetation trampled by cattle also made 3 other nests more obvious, and may have contributed to their eventual depredation.

Fluctuating water levels were also responsible for duck and shorebird nest destruction. Two duck and 3 shorebird nests were drowned by a rise in pond level. Drops in water level provided easy access for predators to many nests previously isolated on islands and blinds.

Disturbance during the collection of data probably caused some hens to desert their nests. Predators might also have been attracted to disturbed nests causing an increase in predation.

American avocet and black-necked stilt nests were 83 percent successful. Even though their nests are less concealed than duck nests, their location on islands and blinds made them less accessible to predators. The adult birds also deter predators by actively defending their nest.

Participating landowners are paid annually to preserve their wetlands. They are required to keep water on these areas and to prevent any disturbance to nesting wildlife. Those wetlands which have been over grazed in the past are being given an opportunity to re-establish suitable cover for nesting birds. There is an on-going program to monitor vegetation and it is anticipated that future studies will be conducted to evaluate nesting on these Water Bank lands.

The Water Bank Program is only 4 years old. Many species are benefitting from the program. In addition to waterfowl, game and nongame birds, mammals, reptiles, and amphibians are provided with improved habitat to help maintain their populations. The rare giant garter snake (Thamnophis couchi gigas) was observed on Water Bank lands and may be benefitting.

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Table 3. Duck nesting cover.

Species	Dominant Vegetation Around Nest				
	Baltic Rush	Sour Clover	Salt Grass	Alkali Sacaton	Misc. Spp.*
Mallard	24	9	0	6	5
Cinnamon Teal	17	4	13	0	3
Gadwall	5	7	2	1	1
Pintail	2	0	0	1	0
TOTAL NESTS	48	20	15	8	9

\*This includes smartweed, fat hen saltbush, creeping rye, trefoil, alkali heath, and cocklebur.