

# ARIZONA BALD EAGLE WINTER COUNT: 2001

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James T. Driscoll and J.G. Koloszar

## INTRODUCTION

The national bald eagle (*Haliaeetus leucocephalus*) winter count was initiated and organized by the National Wildlife Federation (NWF) from 1979-1991. Arizona contributed statewide information in the 1970s to the early 1980s (Todd 1977, 1981, 1984a, 1984b; Hall 1985). However in 1986, a NWF protocol change asked the states to survey only areas of high bald eagle concentrations (routes with more than 15 bald eagles observed in two or more years). Due to Arizona's lack of "concentrations," we contributed minimal information in 1986 and 1987 (Hastings 1988), and surveyed only specific management areas such as Roosevelt Lake (U.S. Fish and Wildlife Service 1990) and Nankoweap Creek (Brown et. al 1989; Brown and Stevens 1992) from 1989 to 1991. The national winter count is now coordinated by the U.S. Geological Survey Biological Resources Division, Snake River Field Station (USGS-BRD-SRFS)

Arizona's statewide annual winter counts resumed in 1992 (Beatty 1993; Beatty and Driscoll 1994, 1996, 1998; Beatty et al. 1995a, 1995b, Driscoll et al. 2000), using a combination of ground visits (foot, automobile, boat, snowmobile) and helicopters. By 1995 the Arizona Game and Fish Department, in coordination with the NWF, established 115 standardized routes for Arizona's bald eagle winter count.

Because the bald eagle is gregarious in winter, national surveys are a valuable tool to determine the species' success throughout its range (Stalmaster 1987). In addition, determining the wintering bald eagle's habitat use in Arizona, increases our knowledge of management needs for wintering areas. Identifying winter distribution in Arizona was a goal in the 1982 Southwest Bald Eagle Recovery Plan (U.S. Fish and Wildlife Service 1982). Although the U.S. Fish and Wildlife Service (USFWS) has reclassified the bald eagle to threatened status (USFWS 1995), and has proposed to delist the species (USFWS 1999), the national winter count is still important. Through the consistent efforts of each state, the winter count will provide valuable information on nationwide population fluctuations post-delisting.

## METHODS

In 2001, we continued to use the established 115 standardized survey routes in Arizona. Our objective was to complete all of the standardized routes. Any additional routes completed are included for management purposes only, and are not included in the results.

We scheduled Arizona bald eagle winter count for January 8 to 14, 2001. This allowed for the weekday use of agency helicopters and weekends for volunteers. Due to the diverse habitat in Arizona, and our desire to maximize (but not duplicate) statewide coverage in a narrow period

with minimal effort; we needed a variety of methods to perform an adequate survey. The best way to survey the rugged terrain and deep canyons of the Salt, Verde, and Gila river watersheds, is by helicopter. U.S. Bureau of Reclamation (USBR) and Salt River Project (SRP) contributed four days of helicopter time, while volunteers surveyed the other areas more accessible by boat, vehicle, and foot.

The low-level helicopter flights contained two to three biologists and a pilot flying directly above the watershed. While the level of flight and speed were dependent upon terrain, height and density of power lines, and wind speed; a height of 100 to 200 feet above ground level and 55 to 65 knots was optimum for observing bald eagles.

We solicited volunteers from agencies and private groups through the mail, supplied survey forms (from the USGS-BRD-SRFS), and instructed them on the protocol. Most volunteers surveyed from their vehicle, although they also used boats, foot travel, snowmobiles, and planes.

We classified the bald eagle sightings into adult, subadult, and unknown age classes. We advised the volunteers to be aware of the various near-adult plumages as they may be easily mistaken for full-adult bald eagles. We also recorded the occurrence of golden eagles during the survey, but did not report them in this document.

We broke the data into two sections: 1. The volunteer survey by county (Tables 1-9), and 2. The helicopter survey (Tables 10). The separation between volunteer and helicopter surveys represents the difference in methods for future comparisons.

## RESULTS

The 2001 Arizona bald eagle winter count totaled 216 (Tables 1-10, 12). We documented 141 adults (66 percent), 70 subadults (32 percent), and 5 unknown age bald eagles (2 percent). The highest number of bald eagles occurred on the Verde River (n=30). An additional nine bald eagles were counted on non-established routes (Table 11).

Of the 115 standardized routes, Arizona completed 108 (94 percent). Surveyors spent a total of 8,726 minutes (145.4 hours) searching. For one route, minutes were not recorded, and survey times were estimated from those reported in previous years. The greatest survey effort was in Coconino County, where volunteers searched for 3,097 minutes (51.6 hours) (Table 3).

The most efficient method of counting was by helicopter (Table 12). We counted 71 bald eagles in 1012 minutes (16.9 hours). This represented 0.701 bald eagles observed per minute. The most efficient volunteer ground effort (in counties with more than one survey route) occurred in Coconino County where they observed 0.220 bald eagles per minute.

#### DISCUSSION

The total number counted in the 2001 Arizona bald eagle winter count was 216. This is the lowest number of bald eagles counted since the survey routes were standardized in 1995. However, our low numbers were not attributed to a lack of effort. From 1995 to 2000 our average survey time is 8,251 minutes (137.5 hours) where we completed an average 101.5 routes. This year we surveyed for 475 minutes (7.9 hours) and six routes above those averages (8,726 minutes and 108 routes).

The percentage of adults and subadults bald eagles counted in Arizona match the NWF national winter surveys for 1986-1988 (Hastings 1988). Statewide winter counts from 1981 to 1985 and 1992 to 2000 averaged 65 percent adults (n=2342), 33 percent subadults (n=1199), and 2 percent unknown (n=79) (Table 13). In 2001, the percentage of adults counted (66 percent) was just above, while the percentage of subadults (32 percent) was just below national levels.

We can attribute the low count this year to three consecutive severe winter storms entering the state during and after Arizona's survey period. Areas that normally record a high number of bald eagles (lakes near Flagstaff, San Carlos Reservoir, White and lower Black rivers, etc.) had minimal counts.

#### RECOMMENDATIONS

Continue to conduct the annual winter count with the 115 standardized routes.

Continue updating the Nongame Branch bald eagle winter count database with core information from the standardized survey forms.

Develop statewide maps documenting the location and abundance of wintering eagles for distribution to managing agencies.

Begin to document the location of wintering bald eagle mortalities in Arizona and follow up with appropriate management.

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Route Number	Route Name	Minimum Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
11	Coconino Lake	25	0	0	0	0
12	Lupe Lake	25	1	2	0	0
13	Nelson Reservoir	25	0	0	0	0
14	Nurmes Reservoir	25	3	0	0	0
15	Taney Pond	10	0	0	0	0
16	San Francisco River (Alpine RD to New Mexico)	125	0	0	0	0
17	Campbell Blue Creek	90	0	0	0	0
	Total	705	12	2	0	0

Route Number	Route Name	Minimum Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
18	Parker Canyon Lake	120	2	0	0	0
19	Wilcox Ponds	210	0	0	0	0
20	Superior Springs Valley - Whitewater Draw	45	0	0	0	0
	Total	375	2	0	0	0

APPENDIX A: 2001 WINTER COUNT

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
1	Becker Lake	10	2	0	0	0
2	Little Colorado River (LCR)	10	0	0	0	0
3	S. Fork LCR - Campground	15	0	0	0	0
4	Casa Malpais - LCR	10	0	0	0	0
5	Greer Lakes (River, Bunch, and Tunnel Reservoirs)	115	0	0	0	0
6	Sponseller Lake	20	0	0	0	0
7	Mexican Hay Lake	60	0	0	0	0
8	White Mountain Hereford Ranch (Trinity, Glen Livet, McKay reservoirs)	60	6	0	0	0
9	The Ranch Lake	20	0	0	0	0
10	Ortega Lake	34	0	0	0	0
11	Concho Lake	25	0	0	0	0
12	Luna Lake	55	1	2	0	0
13	Nelson Reservoir	25	0	0	0	0
14	Nutrioso Reservoir	25	3	0	0	0
15	Tenney Pond	10	0	0	0	0
16	San Francisco River (Alpine RD to New Mexico)	125	0	0	0	0
17	Campbell Blue Creek	90	0	0	0	0
Total		709	12	2	0	0

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
18	Parker Canyon Lake	120	2	0	0	0
19	Willcox Playa	210	0	0	0	0
20	Sulphur Springs Valley - Whitewater Draw	45	0	0	0	0
Total		375	2	0	0	0

Table 3. Results of the 2001 Arizona bald eagle winter count, Coconino County.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
21	Long Lake Complex	120	2	2	0	1
22	Stoneman Lake	260	4	4	0	0
23	FH3	75	1	0	0	0
24	I-17, Sedona to Flagstaff	220	7	4	0	0
25	Bellefont	285	0	0	0	0
26	Townsend/Winona A/B	180	1	5	0	0
27	HWY 89 North/Sunset Crater - Wupatki	350	4	0	0	0
28	FH3 Lakes (Mary, Mormon, Marshall, Prime)	420	5	0	0	0
29	Continental Country Club Lakes	195	5	3	0	0
30	Chevelon Canyon Lake	Not Surveyed				
31	Holden Lake	10	0	0	0	0
32	Spring Valley Wash	120	0	0	0	0
33	Red Lake Valley	15	0	0	0	0
34	Kaibab Lake	150	3	1	0	0
35	Pittman Valley	20	1	1	0	0
36	Davenport Lake	20	1	0	0	0
37	Scholz Lake	45	0	4	0	0
38	Cataract Lake	25	0	0	0	0
39	Willow Springs Lake	65	0	0	0	0
40	West Chevelon Canyon	90	1	0	0	0
41	Willow Creek	72	0	0	0	0
42	White Horse Lake - Pomeroy Tanks	45	0	0	0	0
43	JD Dam Lake	30	0	0	0	0
44	Barney Flat Wetland	5	0	0	0	0
45	Steel/Stone Road	55	0	0	0	0
46	Pine Flat	40	0	0	0	0
47	Boggy Tank	90	0	0	0	0
48	Blue Stem Wash-Babbitt property	Not Surveyed				

**Table 3. (continued)**

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
49	Glen Canyon Nat'l Rec Area (Lee's Ferry)	95	3	5	0	0
50	Colorado River, Lee's Ferry to Little Colorado River	Not Surveyed				
Total		3097	38	29	0	1

**Table 4. Results of the 2001 Arizona bald eagle winter count, Graham, Greenlee, and Maricopa Counties.**

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
51	Point of Pines Lake Area	180	0	0	0	0
52	Greys Peak	30	0	0	0	0
53	Painted Rock Reservoir	10	0	0	0	0
Total		220	0	0	0	0

**Table 5. Results of the 2001 Arizona bald eagle winter count, Mohave County.**

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
54	Lake Mohave	915	0	2	0	3
55	Havasu National Wildlife Refuge, Topock Marsh	240	1	1	0	0
56	Lake Mead, Temple Bar	420	2	2	0	0
57	Alamo Lake	12	1	1	0	0
Total		1587	4	6	0	3

Table 6. Results of the 2001 Arizona bald eagle winter count, Navajo County.							
Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle	
58	Lake of the Woods	25	0	0	0	0	
59	Rainbow Lake	25	2	3	0	0	
60	Little Mormon Lake	18	0	0	0	0	
61	Whipple Lake	35	0	0	0	0	
62	Long Lake	49	0	0	0	0	
63	Lone Pine Lake	60	0	0	0	0	
64	Schoens Reservoir	60	0	0	0	0	
65	White Mountain Lake	60	1	0	0	0	
66	Dry Lake	50	0	0	0	0	
67	Jacques Marsh	40	0	0	0	0	
68	Scott's Reservoir	35	0	0	0	1	
69	Showlow Lake	30	0	0	0	0	
70	Pintail Lake	20	0	0	0	0	
71	Telephone Lake	30	1	0	0	0	
72	Fool Hollow Lake	120	1	2	0	0	
73	Fred's Lake	10	0	0	0	0	
74	Edeler's Lake	5	0	0	0	0	
75	Cottonwood Wash/Clay Springs	20	0	0	0	0	
76	White Lake	10	0	0	0	0	
Total		702	5	5	0	1	

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
77	Arivaca Lake	120	0	0	0	0
78	Picacho Reservoir	57	0	0	0	0
79	Bog Hole	30	0	0	0	0
80	Patagonia Lake	Not Surveyed				
81	San Raphael Valley	60	0	0	0	0
82	Pena Blanca Lake	90	0	0	0	0
Total		357	0	0	0	0

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
83	Wet Beaver Creek	Not Surveyed				
84	Oak Creek	345	1	1	0	0
85	Willow Lake	49 <sup>1</sup>	0	0	0	0
86	Lynx Lake	60	3	1	0	0
87	Watson Lake	63	0	0	0	0
88	Goldwater Lake	90	0	0	0	0
Total		607	4	2	0	0

<sup>1</sup>Minutes not recorded. Times averaged from those reported 1994 - 2000.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
89	Imperial National Wildlife Refuge Cibola/Martinez Lake - Colorado River	60	2	0	0	0
Total		60	2	0	0	0

Table 10. Results of the 2001 Arizona bald eagle winter count, helicopter surveys.

Route Number	Route Name	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
90	Verde River	171	25	5	0	0
91	Lower East Verde River	9	1	0	0	0
92	Lower West Clear Creek	6	1	0	0	0
93	Lower Salt River	44	6	1	0	0
94	Upper Salt River	42	7	1	0	0
95	Lower Tonto Creek	29	3	1	0	0
96	Lower Cherry Creek	8	0	0	0	0
97	Lower Canyon Creek	7	0	0	0	0
98	Lower Cibecue Creek	15	2	0	0	0
99	Lower Carrizo Creek	5	0	0	0	0
100	White River	13	2	0	0	0
101	North Fork White River	15	6	6	0	0
102	Lower Black River	Not Surveyed				
103	Big and Little Bonito Creeks	Not Surveyed				
104	San Carlos River (Talkalai Lake)	34	3	0	0	0
105	San Carlos Reservoir	22	2	6	0	0
106	Upper and Lower Gila River	58	1	0	0	0
107	Eagle Creek	54	11	5	0	0
108	Bonita Creek	18	0	1	0	0
109	Lower San Francisco River	32	2	0	0	0
110	Blue River	12	1	0	0	0
111	Sunrise Lake	2	0	0	0	0
112	Big Lake	1	0	0	0	0
113	Lee Valley Reservoir	1	0	0	0	0
114	Crescent Lake	1	0	0	0	0
115	Lake Pleasant	22	1	0	0	0
Totals		621	74	26	0	0

Table 11. Results of the 2001 Arizona bald eagle winter count, non-standardized routes.

Route Name	County	Minutes Surveyed	Adults	Subadults	Unknown Bald Eagle	Unknown Eagle
Cataract Creek	Coconino	245	2	0	0	0
FS 354 & FS 105 - Bar Cross Tank	Coconino	40	0	0	0	0
HWY 64 & FS 320 - FS 684 & FS301	Coconino	480	1	0	0	0
HWY 64 West	Coconino	150	0	0	0	0
HWY 87 South	Coconino	85	0	0	0	1
HWY 87 North	Coconino	115	0	0	0	0
McLellan	Coconino	40	0	0	0	0
Blue River, Blue River Crossing - XXX Ranch	Greenlee	60	1	0	0	0
Eagle Creek, FS 217 - Honeymoon Campground	Greenlee	200	2	0	0	0
Woodland Lake/Big Springs	Navajo	60	2	0	0	0
Camp Verde	Yavapai	15	0	0	0	0



Table 12. Summary of 2001 Arizona bald eagle winter count.

County	Routes	Minutes	Adult	Subadult	Unknown	Total	Total/minute
Verde River drainage	3	186	27	5	0	32	0.1720
Salt River drainage	9	178	26	9	0	35	0.1966
Gila River drainage	7	621	20	12	0	32	0.0515
Various helicopter	5	27	1	0	0	1	0.0370
Apache	17	709	12	2	0	14	0.0197
Cochise	3	375	2	0	0	2	0.0053
Coconino	27	3097	38	29	1	68	0.0220
Graham	1	180	0	0	0	0	0
Greenlee	1	30	0	0	0	0	0
Maricopa	1	10	0	0	0	0	0
Mohave	4	1587	4	6	3	13	0.0082
Navajo	19	702	5	5	1	11	0.0157
Pima	1	120	0	0	0	0	0
Pinal	1	57	0	0	0	0	0
Santa Cruz	3	180	0	0	0	0	0
Yavapai	5	607	4	2	0	6	0.0098
Yuma and LaPaz	1	60	2	0	0	2	0.0333
Totals	108	8726	141	70	5	216	0.0248

Table 13. Summary of statewide Arizona bald eagle winter counts, 1981-1985, 1992-2001.

Year	Survey Time	Birds/minute	Adults	Subadults	Unknown	Total
1981	- <sup>1</sup>	-	103 (63%)	60 (36%)	2 (1%)	165
1982	-	-	135 (64%)	72 (34%)	3 (2%)	210
1983	-	-	104 (66%)	53 (33%)	1 (1%)	158
1984	-	-	159 (71%)	63 (28%)	3 (1%)	225
1985	-	-	78 (66%)	40 (34%)	0	118
1992	9801	0.0230	145 (65%)	70 (31%)	10 (4%)	225
1993	9938	0.0187	133 (71%)	46 (25%)	7 (4%)	186
1994	7949	0.0457	263 (72%)	96 (26%)	4 (1%)	363
1995 <sup>2</sup>	9563	0.0259	164 (66%)	76 (31%)	8 (3%)	248
1996	7255	0.0498	232 (64%)	127 (35%)	2 (1%)	361
1997	7718	0.0444	193 (56%)	134 (39%)	16(5%)	343
1998	7190 <sup>3</sup>	0.0416	183 (63%)	103 (36%)	4(1%)	290
1999	8378 <sup>3</sup>	0.0500	248 (62%)	144 (36%)	11 (3%)	403
2000	9402 <sup>3</sup>	0.0346	202 (62%)	115 (35%)	8 (2%)	325
2001	8726 <sup>3</sup>	0.0248	141 (66%)	70 (32%)	5 (2%)	216
Totals	85920 <sup>3</sup>	0.0446	2483 (65%)	1269 (33%)	84 (2%)	3836

<sup>1</sup> The effort for the 1981-1984 counts was described in miles flown.

<sup>2</sup> Beginning of use of 115 standardized routes from the 1992-1994 surveys.

<sup>3</sup> Some survey times not recorded. Times averaged from reported times of previous counts.