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***Results of the 1982 Bald Eagle  
Nest Survey in the Glennallen  
Resource Area***

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## OPEN FILE REPORTS

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### Study Area

The study area (Figure 1) includes both the Denali block (4.5 million acres) and the Tielkel block (507,000 acres) of BLM administered land. Included within the Denali block are the Gulkana Wildlife Habitat Area (WHA) (1.1 million acres) (Appendix 1) and the Delta WHA (72,000 acres) (Appendix 2). These two areas were inventoried for bald eagle nests in the summer of 1981. Descriptions of the study areas can be found on the write-up of the 1981 BLM survey.

The 1982 survey was expanded to include suitable bald eagle habitat in the remainder of the Denali block (Appendix 3). This consisted of: the Upper Susitna River (both the east and west forks) above the Oshetna River; Valdez Creek; the Maclaren River; Clearwater Creek; the Nenana River (above Wells Creek); Brushkana Creek; Butte Creek; Wickersham Creek; the Oshetna River; Sanona Creek, and the upper reaches of the Tyone Creek. The surveyed area is fairly mountainous; elevations of the valley floors range from 2,500 feet to 5,000 feet above sea level (a.s.l.). At lower elevations, continuous stands of lowland spruce-hardwood forests are common. Towards the headwaters of the streams, suitable bald eagle habitat is found in upland spruce-hardwood stands that become less continuous and more isolated as elevation increases.

The survey was also expanded to include the Tielkel block (Appendix 4), where it was limited to channels cut by streams running through the Chugach Mountains, which dominate the area. These streams were the Tonsina River, the Little Tonsina River, the Tielkel River, Bernard Creek, and Dust Creek. Upland spruce-hardwood forests occur along most of the sections of the rivers which were surveyed. White spruce (Picea glauca), black cottonwood (Populus trichocarpa), and balsam poplar (Populus balsamifera) were the common species. Elevations range from 1,400 feet to 2,700 feet.

### Methods

The methods used for the 1982 survey were the same as those for the 1981 survey. A description of procedures and equipment used can be found in the 1981 BLM Bald Eagle Nest Survey report. In 1982, 14.9 hours of flight time (seven flights) were devoted to the nest survey. The surveys in the Gulkana River and the Delta River WHA's (4.4 hours (two flights) and 1.6 hours (one flight), respectively) were limited to checking the status (active, inactive, not found) of nests located in the 1981 survey. New nests were not searched for, but if encountered, they were recorded. Six and one-half hours (three flights) were devoted to surveying the remainder of the Denali block. Two and three-tenths hours (one flight) were needed to survey the Tielkel block. All but one flight were conducted in an 18-day period from 7 June to 25 June. Sanona Creek, Tyone Creek, and the Oshetna River

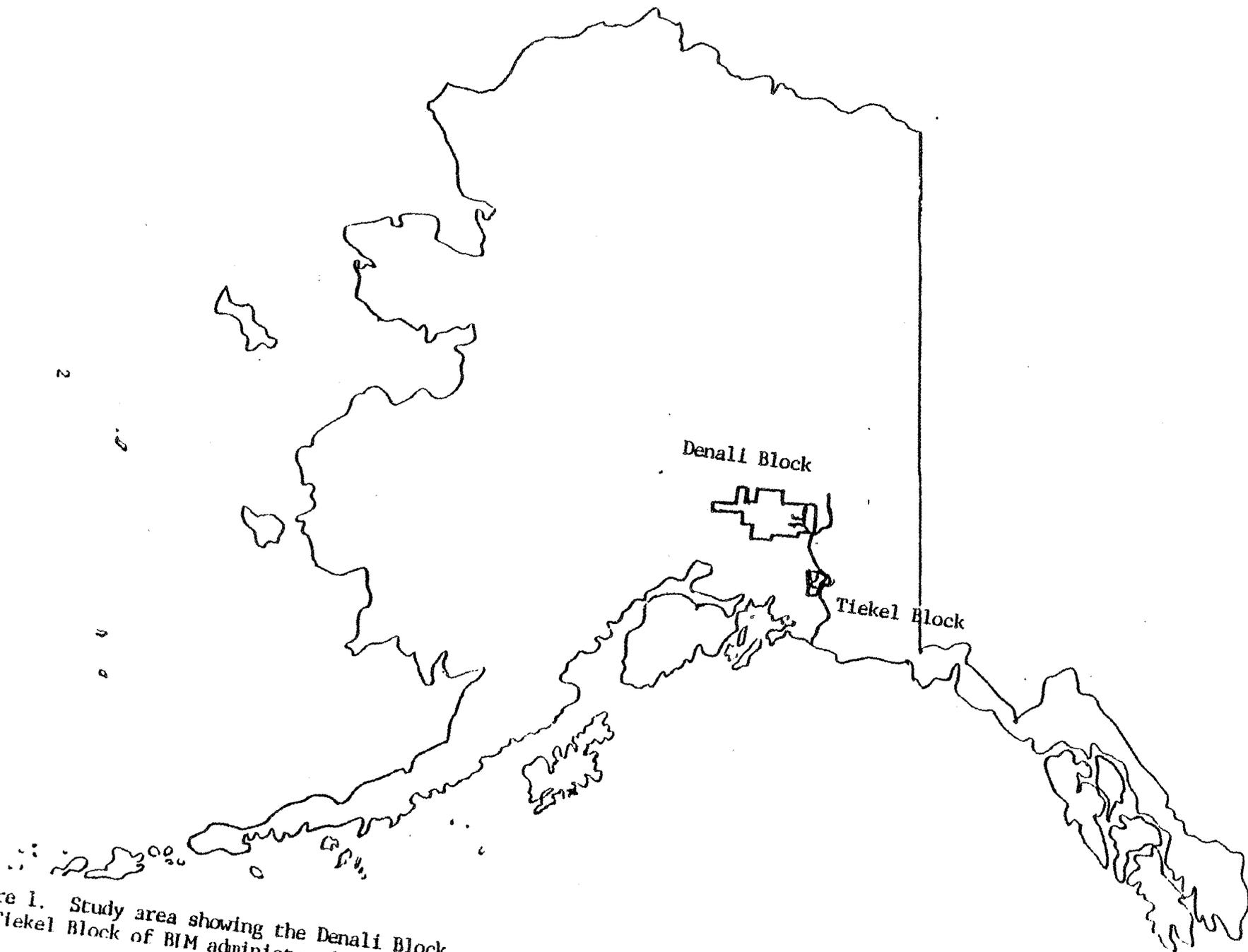


Figure 1. Study area showing the Denali Block and Tielkel Block of BIM administered land.

were surveyed on 13 August for presence of nests only.

In addition, three nest trees were measured along the lower Gulkana River from Sourdough to the Richardson Highway bridge (Henderson, Byrne, Ziegler, 23 June). The diameter at breast height (dbh) and height of the nest trees and distance to water were measured; habitat description, nest visibility and accessibility, and observations of active nests were recorded. The upper Gulkana River from Paxson Lake to Sourdough was floated (Henderson, Byrne, Recreation Crew, 1-8 July). Observations of active nests were recorded.

No ground survey of nests in the expanded areas was conducted because of their inaccessibility.

### Results

#### Gulkana WHA and Delta WHA:

During the 1981 BLM Bald Eagle Survey, 49 nests were found in the Gulkana and Delta Wildlife Habitat Areas. When these areas were resurveyed in 1982, 38 of the 49 nests were relocated. The single ground nest was essentially gone by autumn 1981 and seven trees nests probably blew down sometime during the past year. Three of the nests not relocated may still exist. Two nest locations in the lakes region may have been mismapped, and one nest in a poplar tree may have been present but not visible because of the screening effect of the poplar leaves.

In addition, five new nests were found, raising the total nests to 43 (Gulkana WHA-39, Delta WHA-4). All calculations include only the nests seen in 1982.

#### Nest Activity

Nests were determined to be active if an adult eagle was present on the nest, or if eggs or young were seen in the nest during the aerial survey. Since eagles may initiate nesting later than the survey date (Bent 1937 in Snow 1973), defend inactive nests (Rolands and Hodges 1976), or simply perch on an inactive nest, activity status recorded for some nests may be wrong. For example, no eagle was seen on Paxson Lake nest #5 on 2 June, 1982, the official survey date. One week later, on an incidental flight, an adult eagle was seen on the nest, but to be consistent, the nest was still considered inactive. In addition, one nest (Paxson Lake #4) known to be active in mid-May but abandoned by the survey date was also considered inactive.

Table 1 Change in use of thirty-eight nests present in both 1981 and 1982.  
(Percent activity is shown in parentheses)

	Gulkana WHA				Delta WHA	
	Paxon Lake	Gulkana Mainstem	West and Middle Fork Gulkana	Lakes Area	Total WHA	Delta River
<u>A</u> # nests present in 1981 and 1982	5	10	9	10	34	4
<u>B</u> # nests active in 1981 (% = B/A)	3 (60%)	6 (60%)	5 (56%)	5 (50%)	19 (56%)	1 (25%)
<u>C</u> # nests active in 1982 (% = C/A)	1 (20%)	7 (70%)	5 (56%)	5 (50%)	18 (53%)	1 (25%)
<u>D</u> # nests active in 1981 and 1982 (% = D/A)	1 (20%)	6 (60%)	4 (44%)	4 (44%)	15 (44%)	1 (25%)
<u>E</u> # nests active in '81 inactive in '82 (E = B - D)	2	0	1	1	4	0
<u>F</u> # nests inactive in '81 active in '82 (F = C - D)	0	1	1	1	3	0
<u>G</u> % reuse of active nests (G = D/B)	33%	100%	80%	80%	79%	100%

PL#5, considered inactive, may have been active. If so, this figure would be 67%.

In both 1981 and 1982, 49% of the nests in the Gulkana and Delta WHAs were active. This percentage indicates an overall level of activity; it does not mean that the same nests were active in 1981 and 1982, as eleven nests were not relocated, five new nests were found, and the active status of seven nests changed from 1981 to 1982.

Thirty-eight nests were present both years; four in the Delta WHA and 34 in the Gulkana WHA. The single active nest in the Delta WHA in 1981 was again active in 1982, indicating 100% reuse of active nests in this area.

Of the 34 nests in the Gulkana WHA, 19 were active in 1981. Fifteen of these 19 active nests were again active in 1982, indicating a high reuse (79%) of nests. Only four active nests became inactive, and three inactive nests became active. These changes in activity status were spread across the Gulkana WHA (Table 1), and were not concentrated in any single area.

The high percentage of nest reuse, and the same overall level of activity in the two WHAs suggest that the nesting situation is stable for the one-year period. No widespread use of alternative nest sites is apparent. However, nesting activity does not indicate nest success.

Byrne et al (1982) compared activity status of nests in motorized and non-motorized sections of the mainstem Gulkana River. Activity of nests (83%) remains the same in 1982 as it was in 1981 for the non-motorized section. In the section used by both rafters and fishermen in motorboats, one nest inactive in 1981 was active in 1982 and another inactive nest was found. Therefore, nest activity in this section increased from 20% to 33%, still much lower than in the undisturbed area. High nest density (.50/mile) suggests that the area is good eagle habitat. There are several possible explanations for the large number of inactive nests. Several eagle pairs may have nested there in the past, but have been displaced from the area by increasing human disturbance. A second possibility is that a single eagle pair nested in the area, but built new nests in different sites as a response to human activity. Variable food supply and weather conditions are two factors which may also help explain the situation.

#### Nest Distribution and Density

No new nests were found on the Delta River. One nest or nest tree had blown down, and the ground nest no longer exists. The loss of two nests reduces nest density in this area from .12/mile to .08/mile. Active nest density remains at .02 active nests/mile, a low for the two WHAs. Nest densities for the Gulkana and Delta WHAs are found in Table 2.

Table 2 Nest density along streams in Bald Eagle nesting survey area 1982.

<u>Area</u>	<u>Miles Habitat Surveyed</u>	<u>Nests/mile</u>	<u>Active nest/miles</u>
Gulkana-mainstem			
Paxson Lake to Sourdough	45	.24	.16
-----			
Gulkana - West Fork	95	.08	.04
-----			
Gulkana - Middle Fork	30	.13	.03
-----			
Delta	49	.08	.02
-----			
Susitna	65	.09	.05
-----			
Nenana	28	.09	.05
-----			
Clearwater	19	.11	.11
-----			
Tonsina	7	.14	.14
-----			
Lower Gulkana			
Sourdough to Gulkana bridge	34	.09	.03
-----			
Oshetna*	9	.11	--
-----			
Sanona*	18	.11	--
-----			
Tyone*	15	.13	--
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Total	414(390**)	.15	.07

	<u>Mile<sup>2</sup>Habitat</u>	<u>Nests/mile<sup>2</sup></u>	<u>Active nests/mile<sup>2</sup></u>
Lake Area	351	.03	.02

\*Active/inactive status of nests was not determined

\*\* Mileage of streams surveyed on which status of nests was determined.

In the Gulkana WHA, density varies with area surveyed. One nest in the Mainstem below the confluence with the West Fork, blew down, and one deteriorated nest in the same area was found. Nest density remains at .24 nests/mile, and active nest density increased from .13/mile to .16/mile.

Three nests on the West Fork blew down, reducing nest density from .11/mile to .08/mile. Active nest density decreased from .05/mile to .04/mile because one of the down nests was active in 1981. On the Middle Fork, the one active and three inactive nests were the same as in 1981.

In the Lakes area, two nests were determined down and three were not relocated. One nest was found on Fish Lake, but overall nest density decreased from .04 nests/sq. mile to .03/sq. mile, and active nest density remained at .02/sq/mile.

The survey was expanded to include the Susitna River drainage. A 16.9 mile section of the Susitna River is the western boundary of the Gulkana WHA, and two nests were found in this section. Calculations on density are included with the other Susitna River nests in the next section of this report.

Information recorded for nest trees included tree species, height, and distance to water and elevation. Since the area surveyed is essentially the same as in 1981, the only changes in this information result from finding five nests and not relocating eleven nests. It is likely the average nest location for the Gulkana and Delta WHAs is similar to the one described for 1981 (Byrne et al 1982). New information has been incorporated into calculations for the entire study area, including the expanded survey, and can be found under the section entitled "Total Study Area."

#### Expanded Study Area

Eighteen bald eagle nests are located outside of the Gulkana and Delta WHAs. Six of these nests are on non-BLM-administered land just outside the WHA boundary. They are included in this summary to increase the sample size. Management recommendations will not include these nests. Two of the six nests were active (33% active) in 1982. This is the same as the 1981 figure for these nests, however, the same nests were not necessarily active in both years. The nest on Horseshoe Lake was active in 1981 but not in 1982. The nest on Susitna Lake was inactive in 1981 and active in 1982. Gulkana-14, on the lower Gulkana River, was active in both years.

For these six nests, the average height of the nest tree was 53.3 feet. The average distance from the nest tree to water was 124 feet. Elevation averaged 1967 feet asl. All nests were in white spruce trees.

Only one nest (Tonsina-1) was located in the Tiekel Block. This nest was active in 1982. It is likely that another nest (or nests) exists in the area, but was not located during our survey. Other nests have been documented to exist in the area in the past. In May 1981, a downed cottonwood tree with a bald eagle nest in its crown was observed on the bank of the Tiekel River near milepost 52 of the Richardson Highway. This nest, the Tonsina nest, and an additional nest along the Little Tonsina River were all previously documented and mapped (Joint State/Federal Fish and Wildlife Advisory Team, 1976). An adult eagle was sighted on the Little Tonsina River near the location plotted as a nest site in 1976. No nest was observed. It is assumed that this nest is down. Large cottonwood trees exist along much of the upper Tiekel River. It is likely that a nest (or nests) exists along this river, but was not visible because of the leaves shielding it from view.

Eleven nests were observed in the Denali block, outside of the WHAs. The active/inactive status of five of these nests (Oshetna 1, Sanona r-1 and 2, Tyone r-1 and 2) could not be determined because of the late timing of the survey (13 August 1982). Mature golden eagles were sitting in two of these nests. It is not known if golden eagles nested at these sites or were merely perched there. Both nests were located in the top of spruce trees (species undetermined) and appeared similar in shape and material to bald eagle nests. Mature bald eagles were observed near another two nests. No immature eagles of either species were observed near any of these nests.

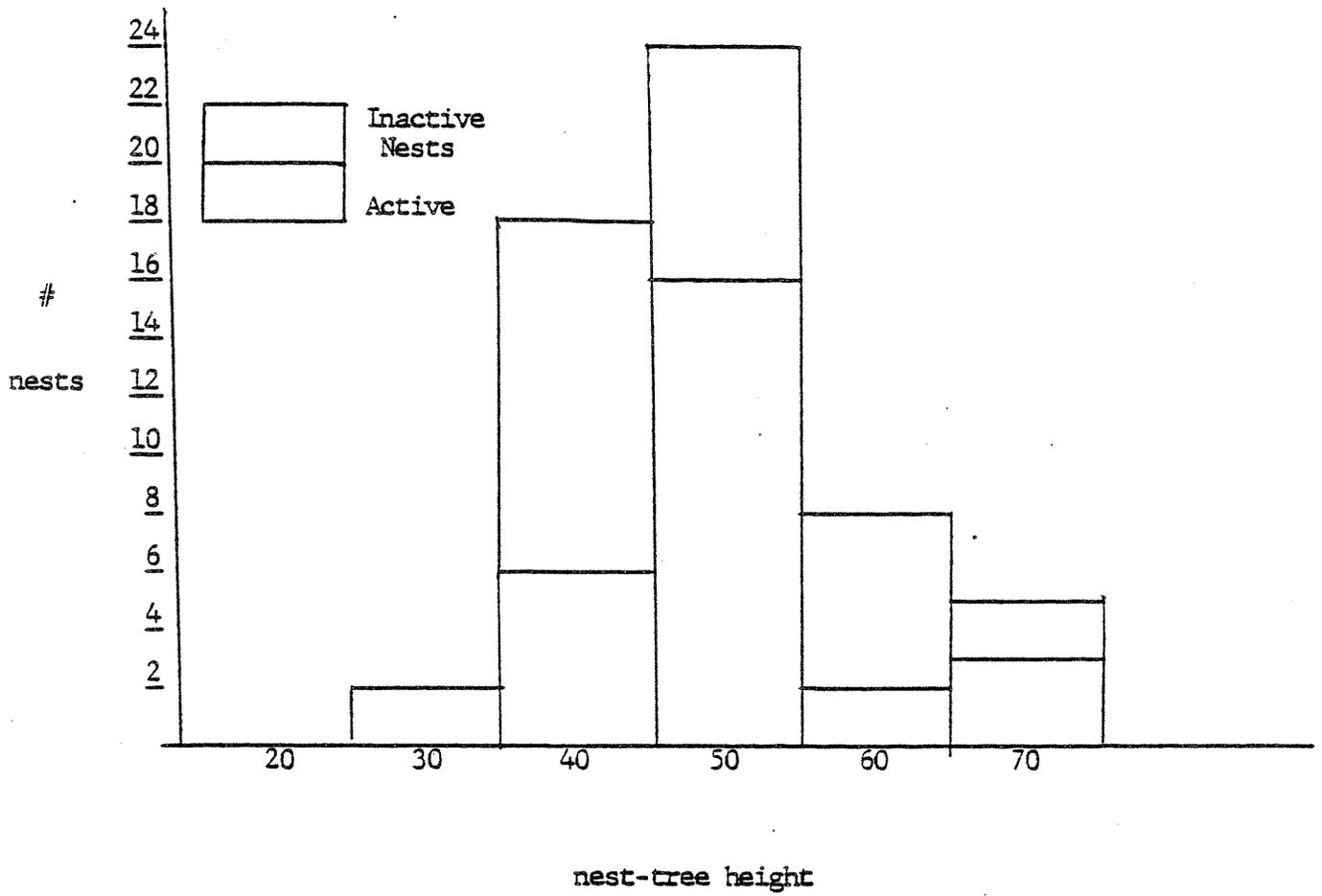
The active/inactive status of the remaining six nests was determined. Four of these nests were located along the Susitna River, two of which were active (50% active). Two other nests were found along the Susitna River within the Gulkana WHA and one of these was active. For the entire stretch of the Susitna River which was surveyed, 50% (3 of 6) of the nests were active.

There was also an active nest on Clearwater Creek and an inactive nest on the Nenana River.

For the entire expanded study area, the status of 13 of 18 nests was determined. Of these 13 nests, six were active (46% active). This compares with 49% active nests for the combined Gulkana and Delta WHAs in 1982.

The average height of all nest trees was 44.1 feet. The average distance from nest tree to water was 75.8 feet. The average elevation

Figure 1 Number of active and inactive nests in trees of different height classes.



at which nests were found was 2,375 feet asl. Five of the nests were built in white spruce trees, two in black spruce, four in spruce trees of undetermined species, and one in a cottonwood.

Densities of nests along streams within the expanded study area are presented in Table 2. Densities are in general agreement with those found for streams within the Gulkana and Delta WHAs, except along the mainstem of the Gulkana River which has the highest density within the study area. The high density of active nests along Clearwater Creek and the Tonsina River can be attributed to the one active nest found along the short section surveyed along each stream. Only the Susitna River had more than one documented active nest. All three active nests along the Susitna occurred within a 29.5 mile stretch of the river. The shortest distance between active nests was eight miles (Susitna 6 to Susitna 4).

#### Total Study Area

Data for the entire study area was combined to calculate average nest tree heights, distance of nests to water, and nest tree species. Results were separated for active and inactive nests; therefore, calculations do not include the five nests surveyed 13 August 1982, because activity status was unknown.

The majority of nests (84%) were in white spruce trees, with another 5% of nests in spruce trees of undetermined species (white or black). Only 11% of the nests were in cottonwood trees. There was little or no difference in nest activity status between tree species.

Nest tree heights ranged from 30 to 65 feet, with average tree height being 46.6 feet. Most active nests (59%) occurred in trees between 41 and 50 feet; inactive nests occurred more often in slightly shorter trees (31 to 40 feet-38%, 41 to 50 feet-28%). This information is shown in Figure 1. When in spruce trees, a nest was usually in the broken or dead top of the tree. Therefore, nest tree height approximates nest height above ground.

Only 12% of nest trees were leaning at an angle greater than 10 degrees. Nest trees were often the largest and/or stoutest trees in the stand. Few trees were dead below nest level.

Most nest trees (66%) were within 100 feet of water, though 25% of the nest trees were greater than 200 feet from water. Only 4% of the nest trees were further than 300 feet from water. No apparent relationship exists between activity of the nests and proximity to water.

Elevations of eagle habitat surveyed ranged from 1,400 feet a.s.l. (Tonsina River) to 2,800 feet a.s.l. (Delta River, Maclaren River, Sanona Creek, Clearwater Creek, Tyone Creek). Eagle nests were found between elevations of 1,500 feet and 2,800 feet. Areas surveyed which appeared to be reasonable eagle habitat such as Brushkana Creek, Butte Creek, Dust Creek, Bernard Creek, and Monahan Creek, are at the upper extremes of these elevations ranging between 2,600-3,000 a.s.l. Elevations higher than 2,800 feet in this study area may suggest marginal eagle habitat.

Average elevations for active and inactive nests, by area, are shown in Table 3. The highest elevation of an active eagle nest was 2,700 feet; this nest was also the only active nest in the Delta WHA. This area has the highest average elevation for eagle nests, and the expanded study area has the lowest average elevation of eagle nests.

Table 3 Average elevations above sea level of eagle nest trees

	Active		Inactive		Total	
	feet	#	feet	#	feet	#
Gulkana WHA	2271	20	2339	19	2304	31
Delta WHA	2700	1	2717	3	2712	4
Expanded area	2154	6	2121	7	2136	13
Total Study area	2261	27	2326	29	2295	56*

\*doesn't include 5 nests of unknown activity status

#### Recommendations

The bald eagle population in the WHAs appears to be stable with respect to the situation in 1981. Forty-nine percent of the nests were active in both years. This is comparable to the 46% active nests in the study area outside the WHAs.

The area along the Gulkana River from the West Fork down to Sourdough showed substantially less nesting activity (20% active nests in 1981, 33% in 1982) than the upper Gulkana (83% active in both years). The lower stretch of the river is highly productive, as evidenced by the large number of fishermen attracted to the king

salmon run each year. Even with the heavy use by fishermen, the establishment of fish camps and the associated disturbance of motorized boats, there were two active nests in 1981. This situation should be further monitored with future surveys to determine if nesting activity is indeed increasing or if the increase in activity is just a minor fluctuation in the long-term average.

Color-banding mature eagles at nest sites would aid in monitoring bird displacement and nest fidelity. A banding program would help determine if only older birds, conditioned to high levels of disturbance, are nesting along this stretch of the river. If that is the case, nesting activity will decrease as older birds die out and younger birds are displaced from the area.

Several points became apparent while conducting this survey. It is recommended that these points be addressed in the future to make the information gathered in the survey more uniform, complete, and reliable.

1. The survey was conducted too late (mid-June) to pick up some nests built in poplar or cottonwood trees. This was probably the case for a nest in a poplar tree on Fish Lake (Fish Lake-2). This nest was active in 1981, but was not relocated in 1982. It is likely that bald eagles nest along the Tiekel River in cottonwoods. That a nest was not found along that river could be due to shielding by deciduous leaves at the time of the survey. Flights before leaf-out (mid-May) would help locate these nests.

2. The method of determining the active/inactive status of a nest was based on a single flight. The presence of a mature eagle on the nest was taken to indicate an active nest. Reproductive activity (e.g. incubation), eggs, or young were not necessarily observed. Another flight later in the season (late June or early July) would provide more accurate information about whether a nest was used to produce young. Number of young and success of the nest could be determined by a late survey.

3. The WHAs were initially surveyed in 1981. In 1982, only known nest locations were resurveyed to determine nest status; the areas were not surveyed for new or previously overlooked nests. It is apparent from the 1982 survey that winters can take a heavy toll on nests. Eleven of the nests in the WHAs were not relocated in the 1982 survey. It is important to look for new nests, as they indicate the attractiveness and productivity of an area to bald eagles. At least once every five years the entire study area should be resurveyed for new nests.

Byrne, L. C., D. W. Daum, M. W. Small, and J. S. Henderson 1982.  
Results of the 1981 BLM Bald Eagle (Haliaeetus leucocephalus  
alaskanus) Nest Survey Conducted in the Gulkana River and Delta  
River Wildlife Habitat Areas.