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Goshawk Ecology and Habitat Relationships on the Tongass National Forest

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**GOSHAWK ECOLOGY AND HABITAT RELATIONSHIPS
ON THE TONGASS NATIONAL FOREST
1998 ANNUAL REPORT**

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SUMMARY

During 1998 Alaska Department of Fish and Game (ADF&G) staff continued northern goshawk (*Accipiter gentilis*) surveys across Southeast Alaska in close cooperation with the US Forest Service (FS). The objectives of this multiyear study are to monitor for goshawks and their nest sites while gathering habitat, movement, productivity, and survival data as part of an interagency monitoring program. During the 1998 field season, interagency staff monitored the activity status of known nest areas, searched for new nest sites at locations where goshawk activity had been observed or reported, captured and radiotagged goshawks at active nests, and monitored radiotagged goshawks. A total of 17 active goshawk nests were located in 1998, including 13 located in previously known nest areas and 4 located in new nest areas. One additional nesting area was not included in the total number of active nests because it was located late in the season and although fledglings were present, a nest was not found. The addition of 5 new nest areas in 1998 increased the cumulative total of Southeast Alaska goshawk nest areas documented since 1991 to 55. In 1998, nest searches were conducted at 46 of the 50 nest areas identified before this year, and an active nest was located at 13 (28%) of these areas. These results do not indicate density or population size because our nest searches were nonsystematic and covered only a small portion of the forested lands of the Tongass National Forest. Minimum reoccupancy of a nest area at least once in a consecutive year was documented at 20 (42%) of the 48 nest areas that were identified before 1998 and checked for consecutive year use. In 1998, 17 documented nesting attempts produced 38 young for a mean productivity of 2.2 young/nest (range 0–4). During the 8-year period 1991–98, 88 nesting attempts at 49 nest areas produced 182 young for a mean productivity of 2.1 young/nest (annual mean range 1.5–2.3). These productivity figures are similar to those reported for goshawks in other regions. A total of 37 goshawks, including 21 adults and 16 juveniles, were captured at 12 nest areas in 1998. Twenty-two goshawks, including 18 adults and 4 juveniles, were radiotagged. Time lapse video surveillance of active nests was begun in 1998 as part of a cooperative Boise State University graduate study of the diet of nesting goshawks in Southeast Alaska. A total of 2640 compressed hours of video tape were recorded at 5 nests this year, documenting 759 prey deliveries. Feather and blood samples were collected from captured goshawks and will be used for ongoing stable isotope analyses and future genetic analyses.

Key words: *Accipiter gentilis*, *Accipitridae*, forest management, northern goshawk, raptor, Tongass National Forest

CONTENTS

SUMMARY	i
INTRODUCTION.....	1
METHODS	2
RESULTS AND DISCUSSION	3
NESTING ACTIVITY.....	3
PRODUCTIVITY	4
ADULT FEMALE BREEDING DISPERSAL	5
GOSHAWK CAPTURES.....	5
DIET STUDIES.....	5
<i>Stable Isotope Analysis</i>	5
<i>Video Surveillance of Active Nests</i>	5
<i>Goshawk Prey Remains</i>	7
TISSUE SAMPLE COLLECTIONS.....	7
RECOMMENDATIONS	8
ACKNOWLEDGMENTS	8
LITERATURE CITED	9
FIGURE	11
TABLES.....	12
APPENDIX Summary of activities at documented goshawk nest areas, SE Alaska 1985-1998.....	23

INTRODUCTION

In 1991 the Alaska Department of Fish and Game (ADF&G) and the USDA Forest Service (USFS) initiated a study of northern goshawk (*Accipiter gentilis*) ecology and habitat relationships on the Tongass National Forest in Southeast Alaska. In 1998 ADF&G and USFS personnel completed the eighth field season of cooperative nest searches and data collection. This report summarizes the results of 1998 field-season activities, including ADF&G and USFS goshawk nest area monitoring on the Tongass National Forest and progress associated with ongoing ecological studies.

The northern goshawk, its population status, and association with forest management continue to be of concern in the western U.S., including Southeast Alaska (e.g., Kennedy 1997). Recent suggestions for information needs focus on demographic, population estimation, habitat relationships, and a meta-analysis to pool data across studies (Kennedy 1997, Crocker-Bedford 1998, DeStefano 1998, Kennedy 1998). This project has shifted focus over the past few years.

PROJECT OBJECTIVES

- monitor goshawk nesting areas for activity in both managed and unmanaged landscapes,

- evaluate inter-year movements of individual goshawks, and
- determine survival of adult goshawks.

These objectives are in keeping with the Tongass Land and Resource Management Plan (Tongass Plan; US Forest Service 1997) that provides direction to coordinate and cooperate with other agencies to develop a better understanding of the northern goshawk. The Tongass Plan also has specific requirements to "manage goshawk foraging habitat (productive old-growth forest) to retain important features of forest stand structure..." using newly designed silvicultural systems in areas where goshawk distribution or occurrence is considered at risk. The current study design will not evaluate the efficacy of these alternative silvicultural systems.

METHODS

ADF&G and USFS staff used standard field methods (Pendleton et al. 1987) for forest raptor studies to collect information about goshawk nesting, survival, and habitat ecology. Raptor survey techniques included searches of known goshawk nest stands and other forested areas where goshawks were or had been observed in previous years (Fuller and Mosher 1987), the use of taped recordings of goshawk calls in attempts to increase detection rates (Kennedy and Stahlecker 1993, Watson et al. 1999), and valley watches for goshawks flying above the canopy (Pentriani 1997). The focus during the 1998 field season was to determine the activity status of known nest areas and search for new nest areas where goshawks or evidence of nesting were observed or reported. Monitoring and nest search activities include inspecting all known nests for signs of recent activity, searching documented or suspected nest stands for nests or signs of occupation by goshawks, broadcasting goshawk "alarm" and "wail" calls in a nonsystematic fashion in attempts to elicit responses, and conducting valley watches for goshawk flight activity in known or suspected nest areas. Some active nests were located by tracking radiotagged adult goshawks to nesting areas different from those of the previous year. This is unlike many other goshawk studies that do not use radiotelemetry and have little likelihood of locating nesting goshawks that may have moved out of an intensively searched study area or moved a long distance to alternate nests.

We captured and radiotagged adult goshawks near their nest site using a non-releasable great horned owl (*Bubo virginianus*) as a lure and dho-gozza nets (Bloom 1987). Adult goshawks were fitted with tail-mount or backpack style radiotransmitters (Kenward 1987), depending on the likelihood of future recapture, remoteness of the site, stage of molt, and sex of bird. Juvenile goshawks were captured and banded, and, depending on the discretion of the biologist in the field, some were fitted with a tail-mount radiotransmitter. Captured goshawks were weighed, standard morphometric measurements were taken, stage of molt was noted, feather samples were collected, and blood was drawn from most individuals. Feather samples were collected for future stable isotope analysis of the diet and trophic relationship of goshawks from Southeast Alaska (Gannes et al. 1997), and the calamus of the pulled feather and blood sample will be archived for future genetic study.

We defined the nest site as the nest tree and a 0.04-ha area surrounding that tree (Titus and Mosher 1981). We define the "nest stand" in an ecological context as the nest site and the associated contiguous forested area where stand structure is relatively homogeneous. The size of

a nest stand may vary from 2 ha to >20 ha, and it may contain ≥ 1 goshawk nest. We defined the "nest area" as the forested stand of up to a few hundred hectares that may contain ≥ 1 goshawk nest. Some goshawks may move >1 km between annual nesting attempts, yet these alternate nests are within their normal movement patterns and breeding home range. It was unlikely that many of these alternate nests would have been located without the aid of radiotelemetry. Because of movements between alternate nests and nest stands, it is difficult to draw conclusions about reoccupancy of entire "nest areas," except in the case of some radiotagged goshawks. Thus, we report reoccupancy as minimum values.

RESULTS AND DISCUSSION

NESTING ACTIVITY

A total of 17 active goshawk nests were identified as a result of interagency search efforts in Southeast Alaska in 1998. Of these 17 nests, 13 occurred within previously documented nest areas and 4 occurred within new nest areas located in 1998. One probable new nest area at Madan Bay on the mainland near Wrangell was documented as being active in 1998. Two fledgling goshawks and an adult were observed in this nest area but no nest was found. With the discovery of 5 new nest areas in 1998, the cumulative number of nest areas documented to date in Southeast Alaska increased to 55. Between 1991 and 1998 the highest number of documented active nests occurred in 1994 when 21 active nest areas were located (Fig. 1, Table 1, and Appendix I). (Note: In previous reports the Rio Roberts Creek and Cutthroat Creek-Prince of Wales Island nest areas were considered separate nest areas. These areas were combined in this report to represent a single nest area with 4 widely spaced alternate nest sites, all existing within the territory of the same adult male. As a result, a reduction of 1 nest area in the cumulative total is reported here for 1995-98; these figures differ from those reported previously).

We continue to have difficulty locating active goshawk nests in some portions of Southeast Alaska, especially on islands such as Prince of Wales, Revillagigedo, and the Cleveland Peninsula. While there has been an emphasis on locating goshawk nests in portions of southern Southeast Alaska, our qualitative assessment suggests that few active nests have been found there relative to effort expended. In contrast, we have been consistently able to locate a number of active goshawk nests in the Chatham Area with comparatively less effort than in the southern portions of Southeast Alaska. We believe the number and size of goshawk breeding territories vary across Southeast Alaska, probably in relation to prey distribution and abundance. That goshawks and raptors vary in density across the landscape is well documented in the literature (e.g., Newton 1986). Because our search efforts are not confined to a localized study area or conducted systematically, we are unable to draw quantitative conclusions regarding varying goshawk nesting densities and population size across Southeast Alaska.

In 1998 nest searches ranging from 1 visit lasting several hours to 10 or more visits over the course of the breeding season were conducted at 46 of 50 nest areas identified since 1991; active nests were located at 13 (28%) of these areas. This represents a minimum reoccupancy rate because search effort was variable among areas and some active alternate nests could have gone undetected. In each historical nest area, all known nests were inspected for activity. If all nests were inactive, variable effort was applied to the surrounding area. During the period 1991-98,

consecutive year nest area reoccupancy was documented on at least one occasion at 20 (42%) of the 48 nest areas that were identified prior to 1998 and checked for consecutive year use. In contrast with previous years, however, consecutive year nest area reoccupancy rates in 1998 were relatively high in Southeast Alaska. Eleven of 16 (69%) nest areas known to be active in 1997 also contained an active nest in 1998, though 8 of these 11 nests were located by tracking radiotagged adult females. Goshawk activity (e.g., responses, sightings) was detected at 4 known nest areas where active nests were not found in 1998 (Table 1 and Appendix I). Documented nest area reoccupancy rates for Southeast Alaska are difficult to compare with those reported for other goshawk studies. While our study has the advantage of long-term tracking of some goshawks with radiotelemetry, we lack systematic searches due to difficult logistics and terrain and staffing and funding limitations. Squires and Reynolds (1997) indicate that yearly occupancy rates can be highly variable. They also indicated that determining yearly occupancy of goshawk nest areas is difficult because alternate nests are sometimes widely spaced.

We received information about 1 additional nest area in 1998, and we chose not to include this as a confirmed nest. A probable goshawk nest area was reported from the Bartlett Lake Trail near Gustavus on the Chilkat Peninsula. Fledglings were reported, but searches for an active nest were not conducted.

Of 18 active nest areas located in 1998, 8 (Blueberry, Camp Carl, Fish Creek, Green Cove Margaret Lake, Nugget Creek, Ready Bullion Creek, Roberts/Cutthroat Creek) were found by tracking radiotagged adult females to active nests within previously documented nest areas, 3 (Auke Bay, Elena Bay, Tunehean Creek) were found by tracking radiotagged adult females to new nest areas, 3 (Deer Island, Mud Bay, Timber Knob,) were found by searching previously documented nest areas, 2 (Eagle River, Point Bridget) resulted from observations from members of the public who were engaged in recreation, and 2 (Brown Cove, Madan Bay) were found as a result of goshawk observations during timber presale activities. Of the 55 goshawk nest areas located in Southeast Alaska since 1985, 26 (47%) were located as a result of activities associated with timber sale preparation or harvest, 17 (31%) were located as a result of searches or events unrelated to timber harvest, and 12 (22%) were located by following radiotagged adult females to nesting areas, which differed from those of the previous year (Appendix I).

PRODUCTIVITY

In 1998, 17 documented nesting attempts in Southeast Alaska produced 38 young for a mean productivity of 2.2 young/nest (range 0–4). Two Chatham Area sites each produced 4 fledglings in 1998. One nest failure was documented in 1998 (Roberts–Cutthroat Creek, Prince of Wales Island). This nest failure occurred during the early nestling period. Of 87 total nesting attempts documented since 1991, 5 attempts are known to have failed. Of these 5 nesting failures, 2 occurred during the incubation period, 1 occurred during the nestling period, and 2 occurred during the fledgling dependency period. For the eight year period 1991–1998, 87 documented nesting attempts produced a total of 182 young for a mean productivity of 2.1 young/nest (range of annual means 1.5–2.3; Table 2). These figures are similar to nest productivity figures reported for goshawks in other regions.

ADULT FEMALE BREEDING DISPERSAL

As in previous years, in 1998 some radiotagged adult females moved to new breeding territories. Between 1992 and 1998, 9 adult females moved a total of 11 times to new breeding territories and nested with different mates than in previous years. Mean distance between nests for these 9 radiotagged females was 38.4 km, with a median distance of 24.5 km and a range of 3.2 km to 152 km. In 1997, one radiotagged adult female (96RCAF) moved 152 km between her 1996 nest site at Cutthroat Creek, Prince of Wales Island and a new nest site at Security Bay, Kuiu Island where she paired with a new mate. This represents the largest between-nests movement documented to date. In 1998 this female moved again from Security Bay, Kuiu Island to Tunehean Bay, Kupreanof Island, a distance of 48 km. We have yet to document a radiotagged adult male moving to a new breeding territory ($n = 26$; Table 3).

GOSHAWK CAPTURES

Biologists captured 37 goshawks, including 21 adults and 16 juveniles, at 12 nest sites in Southeast Alaska in 1998. Additionally, the Juneau Raptor Center rehabilitated 2 injured immature goshawks that were banded by ADF&G prior to release. We attached radiotransmitters to 9 goshawks, including 5 adults and 4 juveniles, captured for the first time and attached or replaced transmitters on 13 adults captured on 1 or more previous occasions (Table 4).

Since 1992 we have captured and/or banded 135 goshawks in Southeast Alaska, including 57 adults, 68 juveniles, and 10 immatures (Table 5). Of these, 96 were fitted with radiotransmitters (53 adults, 39 juveniles, 4 immatures), including 90 goshawks (51 adults, 39 juveniles) captured at 34 nest sites and 6 goshawks (2 adults, 4 immatures) captured away from nest sites. The history and status of all adult female and adult male goshawks radiotagged in Southeast Alaska during the period 1992–98 is presented in Tables 6 and 7, respectively.

DIET STUDIES

Stable Isotope Analysis

In 1996 a preliminary analysis of goshawk food webs was conducted by comparing natural abundance of stable isotope ratios (carbon and nitrogen) of goshawk feather samples with tissue samples from known and potential goshawk prey species from across Southeast Alaska (Ben-David 1996). This preliminary examination of 14 goshawk feather samples collected across Southeast Alaska indicated high variability in the composition of goshawk diets during the breeding season. Some individuals apparently consume songbirds and squirrels, while others feed mainly on birds or mammals that feed in intertidal or marine environments. In 1998 additional feather and prey samples collected prior to this year were submitted for analysis. These included 39 goshawk feather samples and 32 tissue samples representing 23 potential prey species from Southeast Alaska. We collected feather samples from an additional 24 goshawks captured in 1998; these will also be used to further assess goshawk diets by extending the 1996 preliminary stable isotope analysis.

Video Surveillance of Active Nests

Peer review of the interagency goshawk project identified a need to develop a better understanding of goshawk diet and prey brought to nests in Southeast Alaska. We currently lack

an assessment of prey brought to nest locations with differing prey availability. In 1997 ADF&G, USFS, and FWS entered into cooperative agreements with Boise State University (BSU) to study the nesting season food habits of the goshawk in Southeast Alaska. The US Forest Service, through the Forestry Sciences Laboratory, also entered into an agreement with BSU for this study.

BSU graduate student Steve Lewis initiated fieldwork associated with the goshawk diet study in the spring of 1998. Initial efforts concentrated on obtaining and field-testing video surveillance systems and locating a sample of active nests suitable for camera deployment. Searches for active nests initially concentrated near Juneau at previously identified nesting areas and other areas where evidence indicates nesting goshawks were likely. A decision was made early on to concentrate initial video-monitoring efforts near Juneau where a comparatively large sample of relatively accessible nest sites had been identified. Furthermore, the presence of an established road system around Juneau reduced logistical considerations and facilitated frequent site visits necessary to operate and maintain video systems at nests. Later, as the field season progressed, nest searches were extended to nest areas elsewhere in Southeast Alaska.

We acquired and field-tested 5 video surveillance systems in early spring before the start of the 1998 field season. The camera systems were later deployed at 4 active goshawk nests near Juneau and 1 active nest on Prince of Wales Island (POW). Camera systems were installed at active nests as soon as possible following hatching with an effort to minimize the chance of nest abandonment. Following deployment, the camera systems were maintained until either the young no longer used the nest (post-fledging), the nest failed, or the surveillance system itself failed. VCRs were programmed to record daily, from sunrise to sunset, and set to maximize the number of frames recorded per second while at the same time minimizing the number of visits required to change videotapes and batteries. Two different video-recorder settings were tested in 1998. At the 4 nests near Juneau, VCRs were programmed to expose videotape at the rate of one frame/0.8 second. At this setting, 1 visit was required every 48 hours to change batteries and videotapes. At the POW nest, the VCR was programmed to expose videotape at the rate of 1 frame every/1.2 second. At this setting 1 in-person visit was required every 72 hours.

Three of the 5 camera systems ran successfully until the early fledgling period, 1 system failed prematurely (1 day post-fledging) due to weather conditions, and 1 nest failed during the mid-nestling period at which time the camera was allowed to cease operating. As a result of these efforts, 63 videotapes comprising 2640 hours of video footage were collected from 5 goshawk nest areas (\bar{x} = 528h/nest; range = 204–811h). During this time, 759 prey deliveries were documented (\bar{x} = 152 deliveries/nest; range = 42–225 deliveries). Mean prey delivery rate for monitored nests was 0.288 deliveries/h (range = 0.2055–0.3107 deliveries/h) (Table 8).

Preliminary analysis of videotapes indicated that several factors can affect the quality of video footage and our ability to identify items delivered to nests. These factors include ambient light conditions at nest sites, size and condition of items brought to nests, where on the nest relative to camera placement items are delivered and consumed, and camera focus. In conjunction with surveillance systems, each of these nest sites were routinely searched for prey remains and pellets which will allow comparison between the video system analysis and more traditional prey and pellet collection analysis.

Goshawk Prey Remains

Between 1991 and 1997, personnel associated with the goshawk project routinely collected prey remains during visits to active nests. During this period prey remains representing 57 nest-years were collected at 33 nest areas in Southeast Alaska. In 1998 prey remains were collected at 13 nest sites located across Southeast Alaska, including 7 sites in the Juneau area. Near Juneau, where frequent visits to active nest sites were more feasible, prey remains were collected weekly. At more remote sites, only 1 or 2 collections were conducted during the course of the field season. A total of 390 samples representing 71 nest-years have been collected from 42 goshawk nest sites across Southeast Alaska. Each sample has been cataloged based on the nest location and the year it was collected.

Efforts to collect and preserve a representative sample of potential prey species indigenous to Southeast Alaska may require an extended visit to a facility where such a collection already exists. Some collecting (salvage) of potential goshawk prey species from Southeast Alaska was initiated in 1998. Current research efforts center on analyzing videotapes and dissecting prey remains and pellets at BSU. Videotape analysis and remains identification will continue until the start of the 1999 field season. Field activities associated with the goshawk food habits study are scheduled to continue through the end of the 1999 field season.

TISSUE SAMPLE COLLECTIONS

In order to archive tissue samples for future analysis of genetic variation in goshawks and to better determine the status of the *A. g. laingi* subspecies, we collected blood samples from an additional 19 goshawks, including 9 adults and 10 juveniles. Since 1992, blood samples from >75 goshawks have been collected for use in future genetic analyses. In addition to blood samples, in 1998 we collected tissue samples from 24 goshawks by plucking a small contour feather from each bird and preserving the tip of the feather shaft along with attached residual tissues in an alcohol solution. These samples are available for future genetics work.

Gavin and May (1996) assayed genetic variation in northern goshawks by examining blood samples collected from 7 geographic regions in North America, including Arizona, California, Michigan, New Mexico, and Southeast Alaska. One objective of their study was to determine whether there is genetic evidence to support the current view that there are 3 subspecies of goshawk in North America, including *A.g.laingi*. Several molecular techniques were used to assay genetic variation, including allozymes, random amplified polymorphic DNA (RAPDs), restriction fragment length polymorphism (RFLPs) of monomorphic RAPD-generated bands, and microsatellites. Blood samples from 59 Southeast Alaska goshawks, including 34 adults and 25 juveniles, were provided to this study in 1994–95; however, no more than ~20 adult samples from this group were used in the various molecular techniques. The results of this study were inconclusive. The authors concluded that *A.gentilis* does not exhibit or does not have as much genetic variation as most other birds studied and that this fact probably complicated their ability to detect genetic variation among the samples examined. No difference was found between the Southeast Alaska goshawk samples. Populations studied are genetically distinct populations; however, because of the low level of genetic variation found in this examination of N.A. goshawk DNA, Gavin and May caution that their conclusions must be viewed as tentative. Further work is needed to examine any genetic variation among N.A. goshawk subspecies and

populations in more detail. This might include advanced molecular techniques such as gene sequencing and examination of nuclear DNA.

RECOMMENDATIONS

This was the eighth full field season of goshawk study in Southeast Alaska. Study objectives were altered slightly in 1996 to focus on surveying and monitoring of nests and adult goshawks in terms of survival and interyear movements. The primary objective of this phase of study is to examine patterns of nest site fidelity and movements by adult goshawks to new nesting areas. Some female goshawks continue to exhibit large movements to new nesting areas between years, so radiotelemetry is a key component of this work.

Monitoring of nests and adult goshawks should continue for 2–3 more years. This would allow us to establish adequate sample sizes to understand the importance of goshawk nesting areas to birds, compare habitat use and home range sizes in managed vs. unmanaged landscapes, document the portion of the adult population moving between nesting areas, and provide survival rate estimates. Understanding long-term patterns of reuse of goshawk nesting areas is important for those implementing the 1997 Tongass Land and Resource Management Plan. That plan has specific management guidelines for protecting goshawk nesting areas. Evaluation of these guidelines will provide useful information for future adaptive management decisions to maintain viable and well-distributed goshawk populations on the Tongass National Forest. For next year we recommend a more thorough data analysis than was included in the goshawk conservation assessment (Iverson et al. 1996). This includes an analysis of existing data on home ranges and landscape characteristics. Various resource-selection statistical procedures should be used to explore the relationships between goshawk home range size and habitat composition. Results from these analyses are of interest to other agencies because they may help clarify how forest management relates to goshawk use of home range and habitat. These analyses require large sample sizes and are confounded by 1) unequal sampling of radiotagged goshawks, 2) differing goshawk prey availability across Southeast Alaska, 3) nonrandom goshawk home range data with respect to managed and unmanaged landscapes, and 4) inaccurate cover maps.

Ideas for additional field study include gathering site-specific habitat data at radiotelemetry locations, perhaps as related to foraging (e.g., Beier and Drennan 1997). Winter habitat use and winter prey availability have also been discussed as possible limiting factors on goshawks in Southeast Alaska. Increasing the effort to study goshawks outside of the nesting season would require additional funding beyond the current monitoring program. Because of anticipated difficulty in acquiring more intensive goshawk radiotelemetry or diet data in the non-nesting season, any winter fieldwork should be undertaken as a pilot study.

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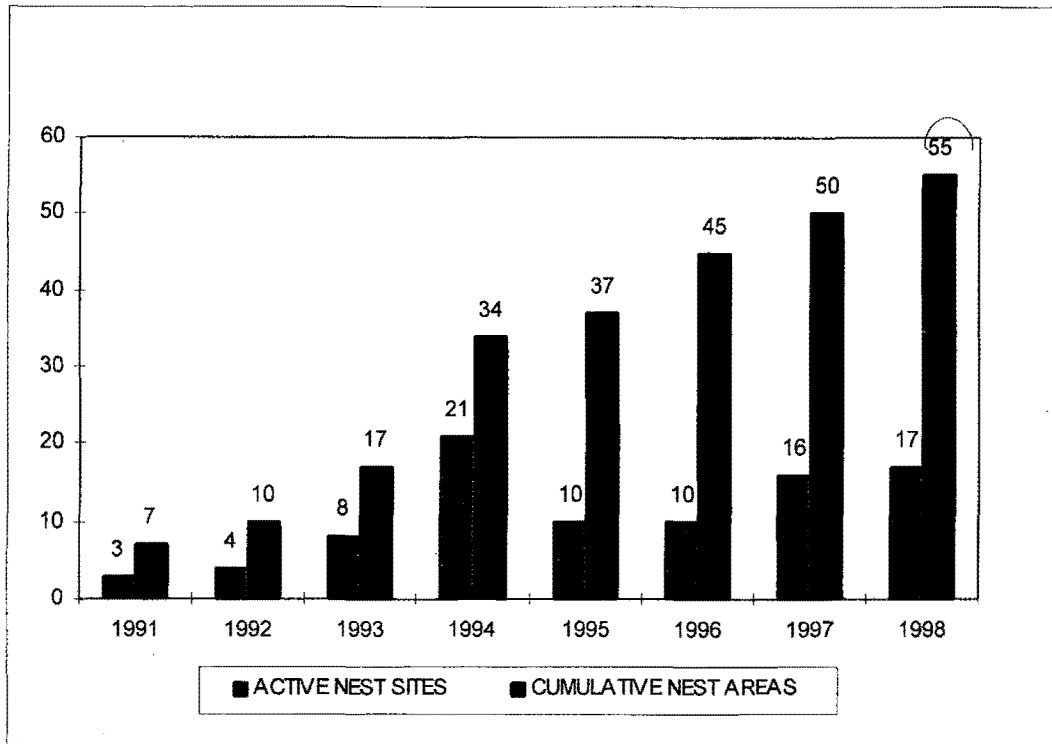


Figure 1. Goshawk nest sites and cumulative nesting areas documented in Southeast Alaska, 1991-1998.

Table 1. Activity status of known goshawk nest area in Southeast Alaska 1985-98.

N = nest area documented this year

A = active nest first located

B = active alternate nest located

C = previously known active nest reused; () = year first active

G = goshawk(s)/activity observed during breeding season, active nest not located.

O = no goshawk/activity observed, active nest not located

R = adult(s) radiotagged and/or present

X = area not checked

Nest Area	80s	90	91	92	93	94	95	96	97	98
Ketchikan Area, Tongass N.F.										
Butterball Lake, Heceta Island					G	NAR	O	O	O	O
Carroll River, Revilla Island								G	NA	G
Convenient Cove, Hassler Is.				G	G	NA	G	G	O	O
Derrumba Ridge, Heceta Is.									NO	O
Logjam Creek, P.O.W. Island					NAR	O	O	O	O	O
Margaret Lake, Revilla Is.						NA	G	BR	BR	BR
Port Refugio, Suemez Is. (89)	NA	O	O	G	G	B	G	G	O	O
Roberts/Cutthroat Crk. P.O.W. Is							NAR	BR	BR	BR
Sarheen Creek, P.O.W. Island			G	G	G	O	O	O	O	O
Sarkar Lake, P.O.W. Island				NAR	O	O	G	O	O	O
Timber Knob, Heceta Island								NA	B	C(96)R
Traitors Creek, Revilla Is.						NAR	BR	O	O	O
Twelvemile Arm, P.O.W. Island								NO	O	O
Stikine Area, Tongass N.F.										
Big John Creek, Kupreanof Is.				NA	BR	O	O	O	O	O
Brown Cove, Petersburg Mainland										NA
Camp Carl, Etolin Island									NAR	BR
Cat Creek, Cape Fanshaw						NAR	O	O	X	O
Duncan Creek, Kupreanof Is.						NA	O	O	G	O
East Bay of Pillars, Kuiu Island						NAR	BR	X	BR	O
Elena Bay, Kuiu Island										NA
Irish Lakes, Kupreanof Island								NA	G	O
Kadake Bay, Kuiu Island								NAR	O	O
Kake, Kupreanof Island (89)	NA	O	X area cut 89		X	X	X	X	X	X
Kuakan, Deer Island									NA	B
Madan Bay, Wrangell Mainland										NG
Mitchell Creek, Kupreanof Is.						NAR	B	O	G	O
Mossman Inlet, Etolin Is. (86)	NA	X	X	O	O	X	X	X	X	X
Mountain Point, Kupreanof Is.						NAR	O	X	O	O
Negro Creek, Port Houghton						NA	G	O	O	O
Rowan Creek, Kuiu Island					NAR	O	G	O	G	O
Sanborn Canal, Port Houghton						NA	O	O	X	G
Security Bay, Kuiu Island									NAR	O
Starfish, Etolin Island			NA	O	O	O	O	X	O	O
Totem Camp, Kupreanof Island						NA	O	X	O	O
Tunchean Creek, Kupreanof Island										NA
Upper Totem, Kupreanof Island					NO	O	O	X	G	O
West Bay of Pillars, Kuiu Island						NAR	BR	X	G	O

Table 1. Continued

Nest Area	80s	90	91	92	93	94	95	96	97	98
Chatham Area, Tongass N.F.										
Auke Bay, Juneau Mainland										NAR
Blueberry Hill, Douglas Island					NAR	BR	C(93)R	GR	C(94)R	BR
Dewey Lk., Skagway (85)	NA	X	X	X	X	X	X	X	X	X
Distin Lake Trail, Admiralty Is.						NA	X	X	B	O
Duffield Peninsula, Baranof Is.						NA	C(94)	C(94)	O	X
Eagle Creek, Douglas Island					NAR	O	O	O	O	O
Eagle River, Juneau Mainland									NG	AR
Fish Creek, Douglas Island						NAR	BR	AR	BR	C(96)R
Florence Bay, Chichagof Island								NAR	O	O
Green Cove, Admiralty Island								NAR	BR	BR
Lace River, Berners Bay						NAR	O	O	O	O
Mud Bay River, Chichagof Is.					NA	A	G	X	O	C(93)
Nugget Crk., Mendenhall Glacier					NAR	BR	O	O	C(93)R	C(94)R
Paylof River, Chichagof Island							NAR	O	O	G
Point Bridget, Juneau Mainland				NA	BR	O	G	G	G	BR
Ready Bullion Crk., Douglas Is.			NA	BR	O	O	O	O	C(91)R	BR
Turner Lake, Juneau Mainland								NG	A	G
Whitestone, Chichagof Island							NAR	C(95)R	O	O

N = nest area documented this year

A = active nest first located

B = active alternate nest located

C = previously known active nest reused; () = year first active

G = goshawk(s)/activity observed during breeding season, active nest not located.

O = no goshawk/activity observed, active nest not located

R = adult(s) radiotagged and/or present

X = area not checked

Table 2. Productivity of goshawk nests in Southeast Alaska, 1991-98.^{a, b}

Nest	# Young Observed by Year							
	91	92	93	94	95	96	97	98
Keetchikan Area	20 nesting attempts produced 38 young = 1.9 young/nest							
Butterball Lake, Heceta Island				3				
Carroll Inlet, Revillagigedo							2	
Convenient Cove, Hassler Island				2				
Logjam Creek, P.O.W. Island			1					
Margaret Lake, Revillagigedo Island				2		1	2	3
Port Refugio, Suemez Island				0				
Roberts/Cutthroat Creek, P.O.W. Island					2	1	2	0
Sarheen Creek, P.O.W. Island	2							
Sarkar Lake, P.O.W. Island		2						
Timber Knob, Heceta Island						2	3	3
Traitors Creek, Revillagigedo Island				3	2			
Stikine Area^c	27 nesting attempts produced 52 young = 1.9 young/nest							
Big John Creek, Kupreanof Island		2	1					
Brown Cove, Mainland								1
Camp Carl, Etolin Island							2	1
Cat Creek, Cape Fanshaw				2				
Duncan Creek, Kupreanof Island				3				
East Bay of Pillars, Kuiu Island				3	3		1	
Elena Bay, Kuiu Island								2
Irish Lake, Kupreanof Island						2		
Kadake Bay, Kuiu Island						0		
Kuakan, Deer Island							1	3
Mitchell Creek, Kupreanof Island				3	1			
Mountain Point, Kupreanof Island				2				
Negro Creek, Port Houghton				3				
Rowan Creek, Kuiu Island			2					
Sanborn Canal, Port Houghton				2				
Security Bay, Kuiu Island							2	
Starfish, Etolin Island	2							
Totem Camp, Kupreanof Island				2				
Tunehean Creek, Kupreanof Island								1
West Bay of Pillars, Kuiu Island				2	1			
Chatham Area	42 nesting attempts produced 94 young = 2.2 young/nest							
Auke Bay, Juneau Mainland								3
Blueberry Hill, Douglas Island			2	2	2		2	2
Distin Lake Trail, Admiralty Island				2			0	
Duffield Peninsula, Baranof Island				3	2	3		
Eagle Creek, Douglas Island			2					
Eagle River, Juneau Mainland							2	4
Fish Creek, Douglas Island				3	1	2	2	3
Florence Bay, Chichagof Island						2		
Green Cove, Admiralty Island						2	3	3
Lace River, Berners Bay				1				
Mud Bay River, Chichagof Island			3	2				4
Nugget Creek, Mendenhall Glacier			3	3			3	1
Pavlof River, Chichagof Island					3			
Point Bridget, Echo Cove		2	2					2
Ready Bullion, Douglas Island	2	1					2	2
Turner Lake, Juneau Mainland							3	
Whitestone, Chichagof Island					3	0		
TOTAL # of young observed	6	7	16	48	20	15	32	38
TOTAL # of active nests	3	4	8	21	10	10	16	17
MEAN # young/nest	2.0	1.8	2.0	2.3	2.0	1.5	2.0	2.2

^a Productivity = number of fledglings when observed, otherwise = number of nestlings

^b Excludes 4 nests reported active prior to initiation of ADF&G study in 1991 (Dewey Lake, Kake, Mossman Inlet, Suemez 89) and 2 areas where no active nest has been located (Twelvemile Arm, Upper Totem).

^c Excludes 1 nesting area located at Madan Bay on the Wrangell mainland that fledged 2 young. The nest was not located.

Table 3. Distance between consecutive year nests of radiotagged adult female goshawks that moved to new breeding territories, Southeast Alaska 1992–98.

Adult Female	Nest Area Movement	Year Moved	Distance (km)
92SLAF	Sarkar Lake, P.O.W. Island to Butterball Lake, Heceta Is.	92–94 ^a	27.1
93BJAF	Big John Lake, Kupreanof Is. to West Bay of Pillars, Kuiu Is.	93–94	43.4
93RNAF	Rowan Creek, Kuiu Is. to East Bay of Pillars, Kuiu Is.	93–94	11.2
93ECAF	Eagle Creek, Douglas Is. to Fish Creek, Douglas Is.	93–94	3.2
93PBAF	Point Bridget, mainland to Lace River, mainland	93–94	24.5
93BBAF	Blueberry Hill, Douglas Is. to Green Cove, Admiralty Is.	95–96	18.5
95WPAF	West Bay of Pillars, Kuiu Is. to Kadake Bay, Kuiu Is.	95–96	28.8
96RCAF	Roberts/Cutthroat Creek, P.O.W. Is. to Security Cove, Kuiu Is.	95–96	152.0
97NCAF	Nugget Crk., Juneau mainland to Auke Bay, Juneau mainland	97–98	12.2
96RCAF	Security Cove, Kuiu Is. to Tunehean Bay, Kupreanof, Is.	97–98	48.0
93RNAF	East Bay of Pillars, Kuiu Is. to Elena Bay, Kuiu Is.	97–98	14.4
	mean distance moved		34.8
	median distance moved		24.5

^a Did not nest in 1993

Table 4. Goshawks captured in Southeast Alaska in 1998.

Nest Area	Age	Sex	Date	Band #/Leg	Tagged?	Previously Captured?
Ketchikan Area, Tongass N.F.						
Margaret Lake, Revilla Is.	A	F	6/18/98	1387-84709/R	Y	Margaret Lake 96,97
Margaret Lake, Revilla Is.	A	M	6/18/98	1807-41988/L	Y	Margaret Lake 96,97
Timber Knob, Heceta Island	A	F	6/25/98	1807-57828/R	Y	no
Timber Knob, Heceta Island	A	M	6/25/98	1807-57829/L	Y	no
Timber Knob, Heceta Island	J	M	7/17/98	1807-41995/L	N	no
Timber Knob, Heceta Island	J	F	7/17/98	1807-41996/R	N	no
Timber Knob, Heceta Island	J	M	7/17/98	1807-41997/L	N	no
Margaret Lake, Revilla Island	J	F	8/3/98	1807-41998/L	Y	no
Stikine Area, Tongass N.F.						
Tunehean Creek, Kupreanof Is.	A	M	6/28/98	1807-57830/L	N	no
Elena Bay, Kuiu Island	A	F	6/30/98	1387-64183/L	Y	Rowan Bay 93, East Bay of Pillars 95,97
Elena Bay, Kuiu Island	A	M	6/30/98	1807-57831/L	N	no
Camp Carl, Etolin Island	A	F	7/8/98	1807-41994/R	Y	Camp Carl 97
Camp Carl, Etolin Island	A	M	7/8/98	1807-57823/L	Y	Camp Carl 97
Chatham Area, Tongass N.F.						
Ready Bullion Crk., Douglas Is.	A	F	6/16/98	1387-84724/L	Y	Ready Bullion 97
Ready Bullion Crk., Douglas Is.	A	M	6/16/98	1807-41983/R	Y	Ready Bullion 97
Nugget Creek, Juneau Mainland	A	F	6/17/98	1387-84730/R	Y	no
Fish Creek, Douglas Island	A	M	6/18/98	1807-41976/R	Y	Sunny Point 94, Fish Creek 96,97
Auke Bay, Juneau Mainland	A	F	6/19/98	1387-84725/L	Y	Nugget Creek 97
Auke Bay, Juneau Mainland	A	M	6/19/98	1807-57836/R	Y	no
Blueberry Hill, Douglas Island	A	F	6/24/98	1387-64177/L	Y	Blueberry 93,94,95, Green Cove 96,97
Blueberry Hill, Douglas Island	A	F	6/29/98	1387-84726/L	Y	Blueberry 97
Blueberry Hill, Douglas Island	A	M	6/29/98	1807-41956/R	Y	Blueberry 93,94, 95
Fish Creek, Douglas Island	J	F	7/13/98	1387-84731/R	N	no
Fish Creek, Douglas Island	A	F	7/14/98	1387-64182/L	Y	Eagle Crk. 93, Fish Crk. 94,95,96,97
Ready Bullion Crk., Douglas Is.	J	M	7/16/98	1807-57837/L	N	no
Mud Bay River, Chichagof Is.	J	M	7/19/98	1807-57838/L	N	no
Eagle River, Juneau Mainland	A	M	7/27/98	1807-57841/L	N	no
Eagle River, Juneau Mainland	J	M	7/27/98	1807-57840/L	N	no
Eagle River, Juneau Mainland	J	M	7/27/98	1807-57839/L	N	no
Eagle River, Juneau Mainland	J	F	7/27/98	1387-84732/R	N	no
Nugget Creek, Juneau Mainland	J	M	7/29/98	1807-57842/L	N	no
Point Bridget, Juneau Mainland	A	M	7/31/98	1807-57843/R	Y	no
Point Bridget, Juneau Mainland	J	M	7/31/98	1807-57844/L	N	no
Point Bridget, Juneau Mainland	J	M	7/31/98	1807-57845/L	N	no
Auke Bay, Juneau Mainland	J	F	8/6/98	1387-84746/R	Y	no
Auke Bay, Juneau Mainland	J	F	8/6/98	1387-84745/R	N	no
Blueberry Hill, Douglas Island	J	M	8/14/98	1807-57846/L	N	no
Downtown Juneau *	I	F	9/19/98	1807-57847/L	N	no
Salmon Creek, Juneau*	I	F	11/28/98	1807-57848/L	N	no

* Goshawk found injured; then rehabilitated and released.

Table 5. Goshawks banded in Southeast Alaska, 1992-98.

#	Date	Location	Age	Sex	Band #	Tag?	Recapture?	Status
1	2/10/92	Sunny Point, Juneau	A	F	1387-02003	Y	93,94	dead
2	3/10/92	Sunny Point, Juneau	I	F	1387-02004	N		?
3	6/10/92	Sarkar Lake, P.O.W. Island	A	F	1387-64171	Y	94	dead
4	6/10/92	Sarkar Lake, P.O.W. Island	A	M	1807-41951	Y		dead
5	6/29/92	Sarkar Lake, P.O.W. Island	J	M	1807-41952	Y		?
6	7/2/92	Ready Bullion Crk., Douglas Is.	J	F	1387-64172	Y		dead
7	7/2/92	Ready Bullion Crk., Douglas Is.	A	F	1387-64173	Y		dead
8	7/2/92	Ready Bullion Cr., Douglas Is.	A	M	1807-41953	Y		?
9	7/28/92	Sarkar Lake, P.O.W. Island	J	M	1807-41954	Y		?
10	8/12/92	Big John Crk., Kupreanof Is.	J	F	1387-64174	N		?
11	8/12/92	Big John Crk., Kupreanof Is.	J	F	1387-64175	N		?
12	8/14/92	Falls Crk., Mitkof Island	I	M	1807-41955	N		?
13	9/8/92	Hungry Point, Mitkof Island*	I	F	1807-41961	Y		dead
14	6/29/93	Blueberry Hill, Douglas Island	A	F	1387-64177	Y	94,95,96,97,98	alive
15	6/29/93	Blueberry Hill, Douglas Island	A	M	1807-41956	Y	94,95,98	alive
16	7/1/93	Nugget Crk. Juneau	A	M	1807-41957	Y	94	?
17	7/6/93	Point Bridget, Juneau	A	F	1387-64178	Y	94	?
18	7/6/93	Point Bridget, Juneau	A	M	1387-64179	Y		?
19	7/13/93	Big John Crk., Kupreanof Is.	A	F	1387-64181	Y	94	?
20	7/13/93	Big John Crk., Kupreanof Is.	J	M	1807-41958	Y		dead
21	7/13/93	Big John Crk., Kupreanof Is.	A	M	1807-41962	Y		?
22	7/23/93	Eagle Crk., Douglas Island	A	F	1387-64182	Y	94,95,96,97,98	alive
23	7/23/93	Eagle Crk., Douglas Island	A	M	1807-41963	Y		?
24	7/28/93	Rowan Crk., Kuiu Island	A	F	1387-64183	Y	95,97,98,	alive
25	7/28/93	Rowan Crk., Kuiu Island	A	M	1807-41964	Y		dead
26	8/4/93	Logjam Crk., P.O.W. Island	A	M	1807-41965	Y		dead
27	8/4/93	Logjam Crk., P.O.W. Island	J	M	1807-41966	Y		?
28	8/9/93	Nugget Crk. Juneau	J	F	1387-64196	Y		?
29	8/9/93	Nugget Crk. Juneau	J	F	1387-64197	Y		?
30	8/13/93	Blueberry Hill, Douglas Island	J	F	1387-64198	Y		?
31	8/13/93	Eagle Crk., Douglas Island	J	M	1807-41967	Y		?
32	8/13/93	Eagle Crk., Douglas Island	J	M	1807-41968	Y		?
33	8/16/93	Rowan Crk., Kuiu Island	J	F	1387-64184	Y		dead
34	8/16/93	Point Bridget, Juneau	J	M	1807-41959	Y		?
35	8/16/93	Point Bridget, Juneau	J	M	1807-41960	Y		dead
36	8/17/93	Rowan Crk., Kuiu Island	J	F	1387-64185	Y		?
37	8/19/93	Big John Crk., Kupreanof Is.	J	F	1387-64180	Y		dead
38	12/28/93	Petersburg, Mitkof Island	A	M	1807-41969	Y		?
39	6/17/94	Butterball Lake, Heceta Island	A	M	1807-41970	Y		?
40	6/24/94	Fish Crk., Douglas Island	A	M	1807-41971	Y	95	dead
41	6/27/94	Lace River, Juneau Mainland	A	M	1807-41972	Y		?
42	7/1/94	East Bay of Pillars, Kuiu Is.	A	M	1807-41973	Y	95	dead
43	7/8/94	Mitchell Crk., Kupreanof Island	A	F	1387-64192	Y		?
44	7/8/94	Mitchell Crk., Kupreanof Island	J	F	1387-64194	N		?
45	7/10/94	Mountain Point, Kupreanof Is.	A	F	1387-64193	Y		dead
46	7/10/94	Mountain Point, Kupreanof Is.	A	M	1807-41974	Y		?
47	7/13/94	Cat Crk., Cape Fanshaw	A	F	1387-64195	Y		?

Table 5. Continued

#	Date	Location	Age	Sex	Band #	Tag?	Recapture?	Status
48	7/21/94	Traitors Crk., Revillagigedo Is.	A	F	1387-64200	Y	95	dead
49	7/27/94	Convenient Cove, Hassler Is.	J	F	1387-64201	Y		?
50	8/1/94	Butterball Lake, Heceta Island	J	F	1387-64202	Y		?
51	8/2/94	Fish Crk., Douglas Island	J	F	1387-64186	Y		?
52	8/2/94	Fish Crk., Douglas Island	J	F	1387-64187	Y		?
53	8/10/94	Mountain Point, Kupreanof Is.	J	F	1387-64199	Y		dead
54	8/11/94	Duncan Crk., Kupreanof Island	J	F	1387-64203	Y		dead
55	8/17/94	West Bay of Pillars, Kuiu Island	J	F	1387-64189	Y		?
56	11/9/94	Sunny Point, Juneau	I	F	1387-64190	Y		dead
57	12/31/94	Sunny Point, Juneau	I	M	1807-41976	Y	96,97,98	alive
58	2/3/95	Vallenar Point, Gravina Island	I	F	1807-41989	N		?
59	6/27/95	Traitors Crk., Revillagigedo Is.	A	M	1807-41975	Y		?
60	6/29/95	Roberts/Cutthroat Crk., P.O.W.	A	F	1387-64205	Y		dead
61	6/29/95	Roberts/Cutthroat Crk., P.O.W.	A	M	1807-41984	Y	96,97	alive
62	7/7/95	West Bay of Pillars, Kuiu Is.	A	F	1387-64206	Y		?
63	7/7/95	West Bay of Pillars, Kuiu Is.	A	M	1807-41985	Y		dead
64	7/9/95	Mitchell Crk., Kupreanof Island	A	M	1807-41986	Y		dead
65	7/27/95	Pavlof River, Chichagof Is.	J	F	1387-64191	Y		?
66	7/28/95	Pavlof River, Chichagof Is.	A	F	1387-84716	Y		?
67	8/1/95	Fish Creek, Douglas Island	J	F	1387-84717	Y		?
68	8/4/95	Whitestone, Chichagof Island	J	F	1387-84718	Y		?
69	8/8/95	Roberts/Cutthroat Crk., P.O.W.	J	F	1387-84701	Y		?
70	8/8/95	Roberts/Cutthroat Crk., P.O.W.	J	M	1807-41987	Y		?
71	8/11/95	Traitors Crk., Revillagigedo Is.	J	F	1807-57801	Y		?
72	8/16/95	Whitestone, Chichagof Island	A	F	1387-84719	Y		?
73	6/25/96	Margaret Lake, Revilla. Island	A	F	1387-84709	Y		alive
74	6/25/96	Margaret Lake, Revilla. Island	A	M	1807-41988	Y		?
75	7/1/96	Roberts/Cutthroat Crk., P.O.W.	A	F	1387-84710	Y	97	alive
76	7/11/96	Green Cove, Admiralty Island	A	M	1807-41977	Y		dead
77	7/15/96	Florence Bay, Chichagof Is.	A	M	1807-41978	Y		?
78	7/16/96	Florence Bay, Chichagof Is.	A	F	1387-84721	Y		?
79	7/24/96	Duffield Peninsula, Baranof Is.	J	F	1387-84720	N		?
80	7/24/96	Duffield Peninsula, Baranof Is.	J	M	1807-41979	N		?
81	7/25/96	Duffield Peninsula, Baranof Is.	J	F	1387-84722	Y		?
82	7/25/96	Florence Bay, Chichagof Is.	J	F	1387-84723	N		?
83	8/5/96	Margaret Lake, Revilla. Island	J	M	1807-41990	Y		?
84	8/7/96	Fish Creek, Douglas Island	J	M	1807-41980	Y		?
85	8/8/96	Roberts/Cutthroat Crk., P.O.W.	J	M	1807-41991	Y		?
86	12/7/96	Auk Bay, Juneau*	I	M	1807-41981	Y		?
87	5/29/97	Back Loop. Rd., Juneau *	I	M	1807-41982	N		?
88	6/25/97	Ready Bullion Crk., Douglas Is.	A	F	1387-84724	Y	98	alive
89	6/25/97	Ready Bullion Crk., Douglas Is.	A	M	1807-41983	Y	98	alive
90	6/27/97	Nugget Crk., Juneau	A	F	1387-84725	Y	98	?
91	7/2/97	Blueberry Hill, Douglas Island	A	F	1387-84726	Y	98	alive
92	7/3/97	Roberts/Cutthroat Crk., P.O.W..	A	F	1807-41992	Y		?
93	7/9/97	East Bay of Pillars, Kuiu Island	J	M	1807-41993	N		?
94	7/11/97	Green Cove, Admiralty Island	J	F	1387-84727	N		?

Table 5. Continued

#	Date	Location	Age	Sex	Band #	Tag?	Recapture?	Status
95	7/11/97	Green Cove, Admiralty Island	J	M	1807-57816	N		?
96	7/11/97	Green Cove, Admiralty Island	A	M	1807-57817	Y		alive
97	7/17/97	Camp Carl, Etolin Island	A	F	1807-41994	Y		alive
98	7/17/97	Camp Carl, Etolin Island	A	M	1807-57823	N		alive
99	7/22/97	Timber Knob, Heceta Island	J	F	1807-57824	N		?
100	7/23/97	Timber Knob, Heceta Island	J	F	1387-84712	N		?
101	7/24/97	Timber Knob, Heceta Island	J	M	1807-57825	N		?
102	7/26/97	Nugget Crk. Juneau	J	M	1807-57818	N		?
103	7/26/97	Nugget Crk. Juneau	J	M	1807-57819	N		?
104	7/31/97	Ready Bullion Crk., Douglas Is.	J	M	1807-57820	N		?
105	7/31/97	Ready Bullion Crk., Douglas Is.	J	M	1807-57821	N		?
106	8/7/97	Blueberry Hill, Douglas Island	J	F	1387-84729	Y		?
107	8/8/97	Fish Creek, Douglas Island	J	M	1807-57822	Y		alive
108	8/12/97	Margaret Lake, Revilla. Island	J	M	1807-57827	Y		?
109	8/14/97	Blueberry Hill, Douglas Island	J	M	1807-57835	N		?
110	6/17/98	Nugget Creek, Juneau Mainland	A	F	1387-84730	Y		alive
111	6/19/98	Auke Bay, Juneau Mainland	A	M	1807-57836	Y		alive
112	6/25/98	Timber Knob, Heceta Is.	A	F	1807-57828	Y		alive
113	6/25/98	Timber Knob, Heceta Is.	A	M	1807-57829	Y		alive
114	6/28/98	Tunehean Creek, Kuiu Is.	A	M	1807-57830	N		?
115	6/30/98	Elena Bay, Kuiu Is.	A	M	1807-57831	N		?
116	7/13/98	Fish Creek, Douglas Island	J	F	1387-84731	N		?
117	7/16/98	Ready Bullion Crk., Douglas Is.	J	M	1807-57837	N		?
118	7/17/98	Timber Knob, Heceta Is.	J	F	1807-41996	Y		?
119	7/17/98	Timber Knob, Heceta Is.	J	M	1807-41995	Y		?
120	7/17/98	Timber Knob, Heceta Is.	J	M	1807-41997	N		?
121	7/19/98	Mud Bay River, Chichagof Is.	J	M	1807-57838	N		?
122	7/27/98	Eagle River, Juneau Mainland	A	M	1807-57841	N		?
123	7/27/98	Eagle River, Juneau Mainland	J	M	1807-57840	N		?
124	7/27/98	Eagle River, Juneau Mainland	J	M	1807-57839	N		?
125	7/27/98	Eagle River, Juneau Mainland	J	F	1387-84732	N		?
126	7/29/98	Nugget Creek, Juneau Mainland	J	M	1807-57842	N		?
127	7/31/98	Point Bridget, Juneau Mainland	A	M	1807-57843	Y		alive
128	7/31/98	Point Bridget, Juneau Mainland	J	M	1807-57844	N		?
129	7/31/98	Point Bridget, Juneau Mainland	J	M	1807-57845	N		?
130	8/3/98	Margaret Lake, Revilla. Is.	J	F	1807-41998	Y		
131	8/6/98	Auke Bay, Juneau Mainland	J	F	1387-84746	Y		?
132	8/6/98	Auke Bay, Juneau Mainland	J	F	1387-84745	N		dead
133	8/14/98	Blueberry Hill, Douglas Island	J	M	1807-57846	N		?
134	9/19/98	SOB, Downtown Juneau*	I	F	1807-57847	N		?
135	11/28/98	Salmon Creek, Juneau*	I	F	1807-57848	N		?

* Goshawk found injured, then rehabilitated and released.

Table 6. Status of adult female goshawks captured and radiotagged in Southeast Alaska, 1992-98.

Adult Female	Capture Location	Band #	First Capt.	Recapt. (year)	1998 Status	92	93	94	95	96	97	98	Comments
93NCAF	Sunny Point, Juneau	1387-02003	2/10/92	93, 94	D		T,N	N	D				banded 2/92; first tagged 6/93; died 2/95
92SLAF	Sarkar Lake, P.O.W. Is.	1387-64171	6/10/92	94	D	T,N	X	N	D				moved 27.1 km in 94, new mate. died 3/95
92RBAF	Ready Bull. Crk., Doug. Is.	1387-64173	7/2/92		D	T,N,S							backpack stationary 9/92, presumed dead
93BBAF	Blueberry Hill, Doug Is.	1387-64177	6/29/93	94,95,96, 97, 98	A	T,N	N	N	N	N	N	N	moved 18.5 km in 96, new mates 96 & 97, 98 mate?
93PBAF	Point Bridget, Juneau	1387-64178	7/6/93	94	U		T,N	N,L	U	U	U	U	moved 24.5 km in 94, new mate. lost 10/94
93BJAF	Big John Crk., Kupr. Is.	1387-64181	7/13/93	94	U		T,N	N,L	U	U	U	U	moved 43.0 km in 94, new mate. lost 10/94
93ECAF	Eagle Crk., Doug. Is.	1387-64182	7/23/93	94,95,96, 97,98	A		T,N	N	N	N	N	N	moved 3.2 km in 94, new mates 94, & 96
93RNAF	Rowan Crk., Kuiu Is.	1387-64183	7/28/93	95,97,98	A		T,N	N	N	X	N	N	moved 11.2 km in 94; 14.4 km in 98; new in 94 & 98
94MCAF	Mitchell Crk., Kupr. Is.	1387-64192	7/8/94		U			T,N,L	U	U	U	U	lost 10/94, dropped tailmount
94MPAF	Mountain Pt. Kupr. Is.	1387-64193	7/10/94		D			T,N	D				died 4/95
94CCAF	Cat Crk., Cape Fanshaw	1387-64195	7/13/94		U			T,N,L	U	U	U	U	lost 8/94
94TRAF	Traitors River, Revilla Is.	1387-64200	7/21/94	95	D			T,N	N	D			died 3/96
95RRAF	Rob./Cutthroat, P.O.W.	1387-64205	6/29/95		D				T,N	D			died 3/96
95WPAF	West Bay of Pillars, Kuiu	1387-64206	7/7/95	96	U				T,N	N,L	U	U	moved 28.8 km in 96, new mate. lost 2/97
95PRAF	Pavlof River, Chichagof Is.	1387-84716	7/28/95		U				T,N	X	X,L	U	tag expired, last relocation 8/20/97
95WSAF	Whitestone, Chichagof Is.	1387-84719	8/16/95		U				T,N,L	N,L	U	U	tag failed 11/95, visual of female w/ failed tag 6/96
96MLAF	Margaret Lake, Revilla Is.	1387-84709	6/25/96	97,98	A					T,N	N	N	moved 3.2 km in 97, same mate
96CTAF	Roberts/Cutthroat Creek, P.O.W. Island	1387-84710	7/1/96	97	A					T,N	N	N	moved 152 km in 97; 48 km in 98; new mates in 97 & 98
96FBAF	Florence Bay, Chichagof	1387-84721	7/16/96		U					T,N	S		backpack stationary in 4/97, presumed dead
97RBAF	Ready Bull. Crk., Doug. Is.	1387-84724	6/25/97	98	A						T,N	N	
97NCAF	Nugget Creek, Juneau	1387-84725	6/27/97	98	A						T,N	N	moved 12.2 km in 98, new mate in 98
97BBAF	Blueberry Hill, Douglas Is.	1387-84726	7/2/97	98	A						T,N	N	
97CTAF	Rob./Cutthroat, P.O.W.	1807-41992	7/3/97		U						T,N	N	tag expired 7/98
97CEAF	Camp Carl, Etolin Island	1807-41994	7/18/97	98	A						T,N	A	
98NCAF	Nugget Creek, Juneau	1387-84730	6/17/98		A							T,N	
98TKAF	Timber Knob, Heceta Is.	1807-57828	6/25/98		A							T,N	

A = alive

D = dead

U = status unknown

T = first year radiotagged

N = nested this year

X = did not nest

S = stationary signal

L = signal lost

Table 7. Status of adult male goshawks captured and radiotagged in Southeast Alaska, 1992-98.

Adult male	Capture Location	Band #	First Capt.	Recapt. (year)	12/98 Status	92	93	94	95	96	97	98	comments
92SLAM	Sarkar Lake, P.O.W. Is.	1807-41951	6/10/92		D	T,N	D						died 3/93
92RBAM	Ready Bull. Crk., Doug. Is.	1807-41953	7/2/92		U	T,N,L	U	U	U	U	U	U	lost 9/92
93BBAM	Blueberry Hill, Doug. Is.	1807-41956	6/29/93	94,	A		T,N	N	N	X,L	N	N	radio failed 11/96, visual of male with failed tag in 5/97
93NCAM	Nugget Crk. Juneau	1807-41957	7/1/93	94	U		T,N	N	L	U	U	U	radio failed, lost 10/95
93PBAM	Point Bridget, Juneau	1387-64179	7/6/93		U		T,N	L	U	U	U	U	radio failed, lost 3/94
93BJAM	Big John Crk., Kup. Is.	1807-41962	7/13/93		U		T,N	L	U	U	U	U	lost 3/94
93ECAM	Eagle Crk., Doug. Is.	1807-41963	7/23/93		U		T,N	X, L	U	U	U	U	radio failed, lost 12/94
93RNAM	Rowan Crk., Kuiu Is.	1807-41964	7/28/93		D		T,N	X	D				died 3/95
93LJAM	Logjam Crk., P.O.W. Is.	1807-41965	8/4/93		D		T,N,D						died 11/93
93MIAM	Petersburg, Mitkof Is.	1807-41969	12/28/93		U		T	L	U	U	U	U	tagged 12/93, dropped tag 7/94
93HCAM	Butterball Lake, Heceta Is.	1807-41970	6/17/94		D			T,N	D				presumed dead 8/95
94FCAM	Fish Crk., Douglas Is.	1807-41971	6/24/94	95	D			T,N	N,D				died 10/95
94LRAM	Lace River, Juneau Main.	1807-41972	6/27/94		D			T,N	L	U	U	U	tag failed 10/95, breeding status in 95 uncertain
94EPAM	East Bay of Pillars, Kuiu Is.	1807-41973	7/1/94	95	D			T,N	N	D			died 4/96
94MPAM	Mountain Pt., Kup. Is.	1807-41974	7/10/94		U			T,N,L	U	U	U	U	lost 10/94
94SPJM	Sunny Point, Juneau	1807-41976	12/31/94	96,97,98	A			T	L	TN	N	N	tagged as imm. winter 94, recaptured & tagged in 96
95TRAM	Traitors River, Revilla. Is.	1807-41975	6/27/95		U				T,N	L	U	U	lost 1/96
95RRAM	Roberts/Cutthroat Creek, P.O.W. Island	1807-41984	6/29/95	96,97	U				T,N	N	N	N	moved 2.7 km in 96, 1.6 km in 97; 1.2 km in 98 new mates in 96, 97, 98
95WPAM	West Bay of Pillars, Kuiu Is.	1807-41985	7/7/95		D				T,N	D			died 4/96
95MCAM	Mitchell Crk., Kup. Is.	1807-41986	7/9/95		D				T,N	D			died 4/96
96MLAM	Margaret Lake, Revilla Is.	1807-41988	6/25/96	97	U					T,N	N	N	moved 2 miles in 97, same mate all years
96GCAM	Green Cove, Admiralty Is.	1807-41977	7/11/96		D					T,N	D		died between 11/13/96 and 5/2/97
96FBAM	Florence Bay, Chichagof Is.	1807-41978	7/15/96		U					T,N,L	U	U	radio failed 8/96
97RBAM	Ready Bullion Crk., Doug.	1807-41983	6/25/97	98	A						T,N	N	
97GCAM	Green Cove, Admiralty Is.	1807-57817	7/11/97		U						T,N	L,U	dropped tailmount tag late 8-9/97
97CEAM	Camp Carl, Etolin Island	1807-41994	7/17/97		U						N	T,N	banded in 97, no radiotag; tagged in 98
98ABAM	Auke Bay, Juneau Main.	1807-57836	6/19/98		A							T,N	
98TKAM	Timber Knob, Heceta Is.	1807-57829	6/25/98		A							T,N	
98TCAM	Tuncheon Creek, Kup. Is.	1807-57830	6/28/98		U							N	not tagged
98EBAM	Elena Bay, Kuiu Is.	1807-57831	6/30/98		U							T,N	not tagged
98ERAM	Eagle River, Juneau Main.	1807-57841	7/27/98		A							T,N	
98PBAM	Point Bridget, Juneau Main.	1807-57843	7/31/98		A							T,N	

A = alive
D = dead
U = status unknown
T = first year radiotagged

N = nested this year
X = did not nest
S = stationary signal
L = signal lost

Table 8. Hours recorded and prey deliveries documented by video cameras at five goshawk nests in Southeast Alaska during the 1998 breeding season.

Nest	Hours Recorded	Deliveries	Delivery Rate
Auke Bay, Juneau	811.13	225	0.2774
Blueberry Hill, Douglas Is.	405.54	126	0.3107
Cutthroat Creek, P.O.W. Is.	204.36	42	0.2055
Fish Creek, Douglas Is.	698.54	216	0.3092
Ready Bullion, Douglas Is.	520.17	150	0.2884
Total	2639.74	759	0.2875 (\bar{x})

Appendix I. Summary of activities at documented goshawk nest areas, Southeast Alaska 1985-98.

Ketchikan Area, Tongass National Forest

Nest Area/Goshawk	Activities/Observations*
Butterball Lake, Heceta Island <u>band #/ tag frequency/ year/ age-sex</u> 1387-64171 150.587 92-94 AF 151.726 94-95 AF 1387-64202 151.173 94 JF 1807-41970 150.036 94 AM	Area documented in 94. Active nest located this year only on 5/16/94 by tracking adult female (1387-64171; 150.587 Biotrack 24 mo. BP) banded and tagged in 92 at Sarkar Lake, P.O.W. nest. This adult female (1387-64171; 151.726 Biotrack 24 mo. BP) retagged and the adult male (1807-41970; 150.036 Biotrack 12 mo. BP) were banded and tagged on 6/17/94. Three fledglings also observed on this date. Juvenile female (1387-64202; 151.173 Biotrack 12 mo. TM) banded and tagged on 8/1/94. Last signal for adult male (1807-41970) 8/31/94 on Heceta Island. Remains of adult female recovered on 3/13/95 at Warmchuck Inlet on Heceta Island. No activity observed at nest area in 95, 96, 97, or 98.
Carroll River, Revillagigedo Island no goshawks banded/tagged	Area documented in 96 with active nest located in 97 only. Adult male goshawk observed and vocalizations heard at site 5/1/96 during ground check of mortality location for Traitors Creek, Revillagigedo Island adult female (1387-64200; 151.956). Nest not located in subsequent searches in 96, but active nest with two fledglings located 7/28/97. Goshawks observed at site in 98 but active nest not located.
Convenient Cove, Hassler Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-64201 151.243 94 JF	Area documented in 94. Active nest located this year only on 7/26/94 as result of intensive goshawk nest search activities. Two fledglings observed. Juvenile female (1387-64201; 151.243 Biotrack 12 mo. TM) banded and tagged on 7/27/94. Adult goshawk(s) observed at site in 4/95 and 5/96 but active nest not located. No activity observed in 97 or 98.
Derrumba Ridge, Heceta Island no goshawks banded/tagged	Area documented in 97. No active nest located. Two inactive nests found on 10/30/96 as a result of timber presale activities. Nests confirmed on 8/27/97 when two nest trees climbed and eggshell fragments and prey remains collected. Area checked in 98 but no activity observed.
Logjam Creek, Prince of Wales Island <u>band#/ tag frequency/ year/ age-sex</u> 1807-41965 150.055 93 AM 1807-41966 150.125 93 JM	Area documented in 93. Active nest located this year only on 8/2/93 as result of timber presale inventory by FS biologist. Adult male (1807-41965; 150.055 ATS 12 mo. BP) and fledgling male (1807-41966; 150.125 ATS 12 mo. TM) banded and tagged 8/4/93. Adult male found dead NE of Sweetwater Lake, P.O.W. Island on 11/3/93; bird in starved condition. Necropsied at Washington State Univ. but acute cause of death not determined. Univ. of Alaska Museum specimen #UAM 6502. Nest area checked 94-98 but no activity observed.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
<p>Margaret Lake, Revillagigedo Island</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-84709 151.706 96 AF 150.586 97 AF 150.603 98 AF 1807-41988 151.936 96 AM 151.260 97 AM 1807-41990 151.485 96 JM 1807-41998 150.424 98 JF 1807-57827 150.918 97 JM</p>	<p>Area documented in 94 with active nests located in 94, 96, 97, and 98. Active and alternate nests first found on 7/28/94 as result of incidental observation with follow-up searches; two fledglings present. Goshawks observed at area in 95, but active nest not located. Active nest located 4/24/96 in alternate nest first located in 94. Adult female (1387-84709; 151.706 Biotrack 24 mo. BP) and male (1807-41988; 151.936 Biotrack 9 mo. TM) banded and tagged 6/25/96. Single juvenile male (1807-41990; 151.485 Biotrack 9 mo. TM) banded and tagged 8/5/96. Nest located 5/23/97 3.2 km. from 96 nest by tracking adult female. Same adult female (1387-84709; 150.586 Biotrack 24 mo. BP) and same male (1807-41988; 151.260 Biotrack 9 mo. TM) retagged on 6/30/97. Two fledglings observed. Juvenile male (1807-57827; 150.918 Biotrack 9 mo. TM) tagged 8/12/97. Nest located on 5/5/98 ~200 m from 97 nest by tracking adult female. Same adult female (1387-84709; 150.603 Biotrack 24 mo. BP) retagged on 6/18/98; adult male (1807-41988) captured but not retagged due to old tail feathers. Three nestlings also observed on this date. Fledgling female (1807-41998; 150.424 Biotrack 12 mo. TM) banded and tagged on 8/3/98.</p>
<p>Port Refugio, Suemez Island</p> <p>no goshawks banded/tagged</p>	<p>Area documented in 89 with active nests located in 89 and 94. Active nest first active nest found 6/89 as result of timber presale activities; adults and fledglings observed. This is first southeast Alaska goshawk nest documented by biologists. Area checked 90-98. No activity observed in 90 and 91. Goshawk(s) observed in 92 and 93, but active nest not located. Active nest located 4/6/94, but failed during egg laying/incubation. Intact, addled egg found on ground 50 m from nest tree on 6/15/94. Goshawk(s) observed at area in 95 and 96, but active nest not located. Area checked in 97 and 98 but no activity observed.</p>

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
<p>Rio Roberts Creek/ Cutthroat Creek, Prince of Wales Island</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-64205 150.508 95 AF 1387-84701 150.447 95 JF 1387-84710 150.495 96 AF 1807-41984 151.046 95 AM 151.807 96 AM 151.515 97 AM 1807-41987 151.475 95 JM 1807-41991 151.462 96 JM 1807-41992 150.046 97 AF 1807-57826 150.525 97 JM</p>	<p>Area documented in 95 with active nests located in 95, 96, 97, and 98. This nest area encompasses four nests in Rio Roberts and Cutthroat Creeks area which were used by the same adult male and three different females 95-98. The area was previously identified as two separate nest areas. Active nest located at Rio Roberts Creek on 6/14/95 as result of USFS spring breeding bird survey. Adult female (#1387-64205, 150.508 Biotrack 24 mo. BP) and adult male (1807-41984; 151.046 Biotrack 9 mo. TM) were banded and tagged on 6/29/95. Three nestlings were present on this date. The remains of one nestling were found beneath nest tree on 7/21/95. A fledgling female (1387-84701; 150.447 Biotrack 12 mo. TM) and fledgling male (1807-41987; 151.475 Biotrack 9 mo. TM) were banded and tagged on 8/8/95. Mortality location of 95 adult female confirmed 3/27/96 near Sweetwater Lake, P.O.W. The original Rio Roberts Creek nest site was checked in 96, 97, and 98 but no activity was observed. Adult male (1807-41984; 151.046) moved 2.7 km. N to new nest site at Cutthroat Creek in 96 and nested with new mate; nest located on 6/23/96 by repeatedly following adult male's signal. Adult female (1387-84710; 150.495 Biotrack 12 mo. BP) banded and tagged on 7/1/96 at the Cutthroat Creek nest; adult male (1807-41984; 151.807 Biotrack 9 mo. TM) also retagged here on this date. Single male fledgling (1807-41991; 151.462 Biotrack 9 mo. TM) banded and tagged on 8/8/96. The 96 adult female (1387-84710) from this site moved 152 km to Security Bay, Kuiu Island in 97 and nested with a new mate. The adult male's (1807-41984; 151.807) tailmounted transmitter was molted on ~7/7/96 less than one week after attachment. An active nest was located on 7/1/97 1.6 km north of the 96 Cutthroat Creek nest after adult female wail calls were heard. The new adult female (1807-41992; 150.046 Biotrack 12 mo. BP) was banded and tagged on 7/3/97 and the adult male (1807-41984; 151.515 Biotrack 9 mo. TM) was retagged. The 97 Cutthroat Creek nest contained two nestlings; fledgling male (1807-57826; 150.525 Biotrack 9 mo. TM) was banded and tagged on 8/6/97. In 98 the 97 adult female (1387-84710) and adult male (1807-41984) nested 1.1 km N of 97 nest. Three nestlings were observed on 6/5/98 when video camera was mounted at nest; one nestling almost dead on this date from attacks of siblings. Second nestling fell from nest and was fed to third by adult female several days later. Nest failed on night of 6/19/98 when last nestling disappeared from nest (video). Adult female (1387-84710; 151.046) and adult male (1807-41984; 151.515) not recaptured. Adult male dropped tailmount transmitter along Thorne River, P.O.W. Island in 1/98. Last signal/visual for adult female (151.046) at nest on 6/22/98.</p>
<p>Sarheen Creek, Prince of Wales Island</p> <p>no goshawks banded/tagged</p>	<p>Area documented in 91. Active nest not located. Two fledglings and adults observed 8/91 during incidental observations. Inactive nests located later in 8/91 during timber presale activities < 1.6 km from location of observations. Active nest not located. Area check 92-98. Goshawks observed in vicinity in 92 and 93, but no nesting activity observed. Area checked 94-98 but no activity observed.</p>
<p>Sarkar Lake, Price of Wales Island</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-64171 150.587 92-94 AF 1807-41951 150.425 92-93 AM 1807-41952 150.468 92 JM 1807-41954 150.486 92 JM</p>	<p>Area documented in 92. Active nest located this year only on 5/16/92 as result of general nest search efforts. Adult female (1387-64171; 150.587 Biotrack 24 mo. BP) and male (1807-41951; 150.425 Biotrack 12 mo. BP) banded and tagged 6/10/92. Two nestlings observed on 6/29/92. One male (1807-41952) banded on this date and tagged (150.468; Biotrack 12 mo. TM) on 7/28/92. Other nestling (1807-41954; 150.486 Biotrack 12 mo. TM) banded and tagged on 7/28/92. Mortality location of adult male (1807-41951) confirmed at Shipley Bay, Kosciusko Island on 3/10/93. Adult female (1387-64171) wintered on Zarembo Is. in 92/93. She did not nest in 93 but was relocated and observed at Butterball Lake on Heceta Island. In 94 she nested with a new mate at this site after wintering again on Zarembo Island in 93/94. No activity observed at Sarkar Lake nest area in 93 or 94. Adult male (unidentified) responded to playback calls in adjacent stand in 95. Area checked in 96, 97, and 98 but no activity observed.</p>

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
Timber Knob, Heceta Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-84712 no tag 97 JF 1807-41995 151.175 98 JM 1807-41996 151.326 98 JF 1807-41997 no tag 98 JM 1807-57824 no tag 97 JF 1807-57825 no tag 97 JM 1807-57828 150.548 98 AF 1807-57829 150.862 98 AM	Area documented in 96 with active nests located in 96, 97, and 98. First active nest found on 7/13/96 as result of incidental observations; two fledglings observed. New nest located ~400m from 96 nest on 7/15/97. Three fledglings banded 7/22/97, including two females (1387-84712 and 1807-57824) and one male (1807-57825). 96 nest was found active again on 5/29/98, three nestlings observed. Adult female (1807-57828; 150.548 Biotrack 24 mo. BP) and male (1807-57829; 150.862 Biotrack 12 mo. BP) banded and tagged on 6/25/98. Three fledglings banded on 7/17/98, one male (1807-41995; 151.175 Biotrack 9 mo. TM) and one female (1807-41996; 150.326 Biotrack 12 mo. TM) were also tagged. The other fledgling male (1807-41997) was banded only. Tagged juvenile male (1807-41995) was found dead on the Thorne River, P.O.W. Island on 10/22/98 ~59 km ESE of the Timber Knob nest.
Traitors Creek, Revillagigedo Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-64200 151.966 94-95 AF 151.956 95-96 AF 1807-41975 150.077 95-96 AM 1807-57801 151.076 95 JF	Area documented in 94 with active nests located in 94 and 95. First active nest found on 7/18/94 as result of timber presale activities. Adult female (1387-64200; 151.966 Biotrack 24 mo. BP) banded and tagged 7/21/94. Three fledglings observed. New nest located ~100 m. from 94 nest on 4/24/95 by tracking adult female. This female (1387-64200; 151.956 Biotrack 24 mo. BP) retagged and adult male (1807-41975; 150.077 Biotrack 12 mo. BP) banded and tagged on 6/27/95. Two fledglings observed on 8/11/95; juvenile female (1807-57801; 151.076 Biotrack 9 mo. TM) banded and tagged on this date. Last signal for adult male (1807-41975) on 1/23/96 at Orchard Creek, Revillagigedo Is. Mortality location for adult female (1387-64200; 151.956) confirmed on 5/1/96 near Carroll River, Revillagigedo Is. Area checked in 96, 97, and 98 but no activity observed.
Twelevemile Arm, Prince of Wales Island no goshawks banded/tagged	Area documented in 96. No active nest located. An inactive nest was found 7/96 during timber presale activities. Nest confirmed on 8/20/96 when tree was climbed and goshawk feathers and prey remains were collected. No activity observed in 97 or 98.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Appendix I. Continued.

Stikine Area, Tongass National Forest

Nest Area/Goshawk	Activities/Observations*
Big John Creek, Kupreanof Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-64174 no tag 92 JF 1387-64175 no tag 92 JF 1387-64180 150.281 93 JF 150.083 93 JF 1387-64181 150.507 93-94 AF 1807-41958 151.951 93 JM 1807-41962 151.685 93-94 AM	Area documented in 92 with active nests located in 92 and 93. First active nest found 8/6/92 as result of timber presale activities. Two fledgling females (1387-64174 and 1387-64175) banded 8/12/92. Active nest located 6/15/93, ~150m from 92 nest. Adult female (1387-64181; 150.507 Biotrack 24 mo. BP) and adult male (1807-41962; 151.685 Biotrack 9 mo. TM) banded and tagged 7/13/93. Nestling female (1387-64180; 150.281 AVM 12 mo. LM) nestling male (1807-41958; 151.951 AVM 12 mo. LM) banded and tagged on this date. Fledgling female (1387-64180; 150.083 ATS 12 mo. TM) retagged 8/19/93. Fledgling male (1807-41958) found dead 125m from nest on this date. Last signal for adult male (1807-41962) on 3/23/94 on Kupreanof Island. In 94, adult female (1387-64174) nested with new mate at West Bay of Pillars, Kuiu Island site, a distance of 43 km from the Big John Creek nest. Big John Creek nest area checked in 93, 94, 95, 97, and 98 but no activity observed. Area not checked in 96.
Brown Cove, Petersburg Mainland no goshawks banded/tagged	Area documented in 98. Active nest located on 7/21/98. An adult goshawk was observed during timber presale activities on two occasions during the previous week. In subsequent searches on this date a single fledgling responded to playback calls and was observed near the nest.
Camp Carl, Etolin Island <u>band#/ tag frequency/ year/ age-sex</u> 1807-41994 151.497 97-98 AF 151.458 98 AF 1807-57823 no tag 97 AM 150.677 98 AM	Area documented in 97 with active nests located in 97 and 98. First active nest was found on 7/1/97 by biologists staying at the USFS Camp Carl. An adult female goshawk was observed from the camp as it aggressively chased and vocalized at a bald eagle. A nest containing two nearly fully feathered nestlings was subsequently located near this location. On 7/17/97 the adult female (1807-41994; 151.497 Biotrack 24 mo.BP) was banded and tagged and the adult male (1807-57823) was banded only. An active nest was located on 5/8/98 ~1/4 mi NNW of the 98 nest by tracking the adult female. This female (1807-41994, 151.458 Biotrack 24 mo. BP) was retagged and her mate (1807-57823; 150.677 Biotrack 9 mo. TM) tagged for the first time on 7/8/98. One mostly feathered nestling was observed on this date. The last signal for the adult male (150.677) was on 11/1/98 at Menefee Inlet, Etolin Island.
Cat Creek, Cape Fanshaw <u>band#/ tag frequency/ year/ age-sex</u> 1387-64195 151.739 94 AF	Area documented in 94. Active nest located this year only on 6/21/94 during timber presale activities by contract biologist familiar with goshawks; three nestlings observed. Adult female (1387-64195; 151.739 Holohil 12 mo. TM) banded and tagged 7/13/94; last signal on 8/19/94. Area checked in 95, 96, and 98 but no activity observed. Freshly constructed nest located on 6/6/96 but no other nesting activity observed.
Duncan Creek, Kupreanof Island <u>band#/tag frequency/ year/ age-sex</u> 1387-64203 151.037 94 JF	Area documented in 94. Active nest located this year only on 8/10/94 during timber presale activities; three fledglings observed. Juvenile female (1387-64203; 151.037 Biotrack 12 mo. TM) banded and tagged 8/11/94. Bird located as mortality on 11/9/94 near the nest area. Area checked but no activity observed in 95. Hairy woodpecker feather remains found at base of nest tree 7/18/96, nest inactive. Adult observed at area after it responded to playback call in 7/97, but active nest not located. Area checked but no activity observed in 98.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
East Bay of Pillars, Kuiu Island <u>band# / tag frequency / year / age-sex</u> 1387-64183 151.868 93-95 AF 150.604 95-97 AF 151.782 97-98 AF 151.680 98 AF 1807-41973 151.426 94-95 AM 150.677 95 AM	Area documented in 94 with active nests located in 94, 95, and 97. First active nest found on 6/16/94 by tracking 93 Rowan Creek, Kuiu Island adult female (1387-64183; 151.868 Holohil 24 mo. BP) to the new nest area. East Bay of Pillars nest is 11 km from the Rowan Creek nest. Adult male (1807-41973; 151.426 Biotrack 9 mo. TM) banded and tagged on 7/1/94; female (1387-64183) not recaptured; three fledglings observed on this date. New nest located 5/19/95 ~100 m from 94 nest by tracking adult female. Same female (1387-64183; 150.604 Biotrack 24 mo. BP) and same adult male (1807-41973; 150.677 Biotrack 12 mo. BP) retagged on 7/6/95. Three nestlings observed and all fledged on this date. Area not checked in 96. During spring and summer of 96 adult female (1387-64183) resided in vicinity of Duncan Canal, Kupreanof Island but did not nest. Last signal for adult male (1807-41973; 150.677) on 11/22/95. New active nest located 6/4/97 0.8 km. from 95 nest by tracking adult female (1387-64183; 150.604). Single prefledging male (1807-41993) found on ground ~50 m from nest tree on 7/8/97; bird banded and returned to nest on this date. Adult female (1387-64183; 151.782 Biotrack 24 mo. BP) retagged on 7/9/97. Adult male not observed; identity unknown. Adult female (1387-64183) tracked 14.4 km to new nest area at Elena Bay (Tebenkof), Kuiu Island in 98 where she nested with new mate.
Elena Bay (Tebenkof Bay), Kuiu Island <u>band# / tag frequency / year / age-sex</u> 1387-64183 151.782 97-98 AF 151.680 98 AF 1807-41993 no tag 98 JM 1807-57831 no tag 98 AM	Area documented in 98. Active nest located this year only on 5/4/98 by tracking the East Bay of Pillars, Kuiu Island adult female (1387-64183; 151.680 Biotrack 24 mo. BP); bird originally tagged and banded at Rowan Bay, Kuiu Island in 93) to this new nest area. This female (1387-64183; 151.680 Biotrack 24 mo. BP) was retagged and adult male (1807-57831) banded but not tagged on 6/30/98. One late nestling was observed in the nest and it fledged on this date; a second fledgling was heard in vicinity of the nest.
Irish Lake, Kupreanof Island no goshawks banded/tagged	Area documented in 96. Active nest located this year only as as result of timber presale activities. Two fledglings observed on 7/25/96 and nest was located on 7/28/96. An adult goshawk was observed feeding on a squirrel at the site in 6/97. Active nest was not located this year. Area was checked in 98 but no activity was observed.
Kadake Bay, Kuiu Island <u>band# / tag frequency / year / age-sex</u> 1387-64206 150.568 95-96 AF	Area documented in 96. Nest located this year only on 7/15/96 by tracking 95 West Bay of Pillars, Kuiu Island adult female (1387-64206; 150.568 Biotrack 24 mo. BP) to this new nest area. The Kadake Bay nest is 28 km. from the West Bay of Pillars nest. Remains of single prefledging nestling (~5 weeks old) were found on ground ~50m from nest tree on the date the nest was located. The adult male not observed and his identity is unknown. Last signal for the adult female (1387-64206; 150.588) was on 2/4/97 on Kuiu Island. Nest area was checked in 98 but no activity was observed.
Kake, Kupreanof Island no goshawks banded/tagged	Area documented in 89. Active nest found on 6/23/89 when the nest tree was felled by a logger cutting in Unit Q of Kake Tribal land north of Kake. The location of this nest area is T 55S, R 72E, S 26 NW1/4 of NE1/4. Two nestling goshawks were recovered from the fallen nest tree and sent to the Alaska Raptor Rehabilitation Center where they were raised and later released in 11/89. This nest area was checked in 90, but no activity was observed. The area was not checked 91-98.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
Kuakan, Deer Island no goshawks banded/tagged	Area documented in 97 with active nests located in 97 and 98. An adult was called in with playback recordings on 6/26/97 during timber presale inventories. On 6/27/97 a young fledgling responded to calls and the nest was located. On 7/15/97 an unsuccessful effort was made to trap this fledgling and the adults. The adults were not observed. The 97 nest was checked on 5/7/98 but no activity was observed. A new active nest was located on 6/27/98 during goshawk/timber presale, wildlife inventories when fledglings responded to playback recordings; three fledglings were observed. The 98 nest is located 1.2 km SE of the 97 nest. Efforts to trap the fledgling and adults on 7/11-12/98 were unsuccessful. The adults were not observed and their identities remain unknown.
Madan Bay, Wrangell Mainland no goshawks banded/tagged	Area documented in 98. On 7/22/98 archeologists conducting timber presale work in the area observed two fledglings. During a subsequent visit by biologists on 7/29/98, two fledglings and one adult were observed but the active nest could not be located (<i>nest was located later on 4/13/99</i>).
Mitchell Creek, Kupreanof Island <u>band# / tag frequency / year / age-sex</u> 1387-64192 151.956 94 AF 1387-64194 no tag 94 JF 1807-41986 150.716 95-96 AM	Area documented in 94 with active nests located in 94 and 95. First active nest located on 6/5/94 as result of timber presale activities. Adult female (1387-64192; 151.956 Biotrack 12 mo. TM) banded and tagged on 7/8/94; three fledglings observed. Adult male not observed and identity unknown. Young fledgling female (1387-64194) banded but not tagged on 7/11/94. Last location for adult female on 10/12/94 (dropped tailmount transmitter). New active nest located 6/95 ~250 m from 94 nest via nest search efforts. Adult male (1807-41986; 150.716 Biotrack 12 mo. BP) banded and tagged on 7/8/95; banded adult female (presumed to be 1387-64192) present but not recaptured. Two nestlings observed on this date. Remains of 95 adult male (1807-41986; 150.716) recovered on north Zarembo Island on 4/18/96. Nest area checked in 96, 97, and 98 but no activity observed.
Mossman Inlet, Etolin Island no goshawks banded/tagged	Area first reported by USFS cruiser in 86 as result of timber presale activities. Active nest and aggressive adults observed (by cruiser) this year only. Nest area checked in 92 and 93 but the nest was inactive. Area not checked in 94, 95, 96, 97, or 98.
Mountain Point, Kupreanof Island <u>band# / tag frequency / year / age-sex</u> 1387-64193 151.025 94-95 AF 1387-64199 151.404 94 AF 1807-41974 151.595 94 AM	Area documented in 94. Active nest located this year only on 6/21/94 as result of timber presale activities. Adult female (1387-64193; 151.025 Biotrack 12 mo. TM) and adult male (1807-41974; 151.595 Biotrack 9 mo. TM) banded and tagged on 7/10/94; two fledglings observed on this date. Fledgling female (1387-64199; 151.404 Biotrack 12 mo. TM) banded and tagged on 8/10/94. Adult female (1387-64193; 151.025) found dead in nest area on 5/9/95. Univ. of Alaska Museum specimen # UAM 6712. Adult male's (1807-41974; 151.595) tailmounted transmitter signal stationary, then failed in 12/94; status of bird unknown. No activity observed at area in 95. Area not checked in 96. Area checked but no activity observed in 97 or 98.
Nergo Creek, Cape Fanshaw no goshawks banded/tagged	Area documented in 94. Active nest located this year only on 7/3/94 as result of timber presale activities. One fledgling observed on this date. Area occupied by adults in 95 but active nest not located. Area checked in 96 and 98 but no activity observed. Area not checked in 97.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
Rowan Creek, Kuiu Island <u>band# / tag frequency / year / age-sex</u> 1387-64183 151.868 93-94 AF 1387-64184 150.033 93 JF 1387-64185 150.155 93 JF 1807-41964 151.889 93-95 AM	Area documented in 93. Active nest located this year only on 6/21/93 as result of timber presale activities; two fledglings observed. Adult female (1387-64183; 151.868 Holohil 24 mo. BP) and adult male (1807-41964; 151.889 Holohil 24 mo. BP) banded and tagged on 7/28/93. Two juvenile females (1387-64184; 150.033 ATS 12 mo. TM and 1387-64185; 150.155 ATS 12 mo. TM) banded and tagged on 8/16-17/93. In 94 the adult female (1387-64183) moved to East Bay of Pillars, Kuiu Island area and nested with a new mate. The 93 Rowan Creek adult male (1807-41964) remained on territory in 94 and 95 but no nesting activity was detected. This bird's remains were recovered at Rowan Bay on 5/18/95. A silent unmarked adult male was observed at the 93 nest site on 7/18/95 after broadcast of conspecific calls. No activity observed at area in 96. In 6/97 an adult female and male of unknown identities were observed vocalizing aggressively in response to playback recordings ~400 m south of 93 nest site; an active nest was not located this year. Area checked in 98 but no activity observed.
Sanborn Canal, Cape Fanshaw no goshawks banded/tagged	Area documented in 94. Active nest located this year only on 7/18/94 as result of timber presale activities; two fledglings observed. No activity observed in 95. Area checked on 6/7/96 but no activity observed. Area not checked in 97. Area checked in 98 but no was activity observed.
Security Bay, Kuiu Island <u>band# / tag frequency / year / age-sex</u> 1387-84710 150.495 97 AF 151.512 97-98 AF	Area documented in 97. Active nest located this year only on 6/6/97 by tracking the 96 Roberts/Cutthroat Creek, P.O.W. Island adult female (1387-84710; 150.495) to this new nest area. The distance between the Roberts/Cutthroat Creek nest and the Security Bay nest is 152 km. This adult female (1387-84710; 151.512 Biotrack 24 mo. BP) was retagged on 7/11/97. Her mate was not observed and his identity is unknown. Two large, downy nestlings were observed on this date. This area was checked on 6/29-30/98 but no activity was observed.
Starfish, Etolin Island no goshawks banded/tagged	Area documented in 91. Active nest located this year only as result of timber presale activities; two fledglings observed. Area checked 92-95 but no activity observed. Nest area not checked in 96. Area checked in 97 and 98 but no activity observed.
Totem Camp, Kupreanof Island no goshawks banded/tagged	Area documented in 94. Active nest located this year only on 8/1/94 as result of timber presale inventories; two fledglings observed. Area checked in 95 but no activity observed. Area not checked in 96. Area checked in 97 and 98 but no activity observed.
Tunehean Creek, Kupreanof Island <u>band# / tag frequency / year / age-sex</u> 1387-84710 151.512 97-98 AF 1807-57830 no tag 98 AM	Area documented in 98. Active nest located this year only on 6/28/98 by tracking the Security Bay, Kuiu Island adult female (1387-84710; 151.512 Biotrack 24 mo. BP) to this new nest area. This bird was originally banded and tagged 7/1/96 at Roberts/Cutthroat Creek nest area on Prince of Wales Island. The Tunehean Creek nest is 48 km from the Security Bay, Kuiu Island nest. The Tunehean Creek adult male (1807-57830) was banded but not tagged on 6/28/98; one ~18 day old nestling was observed on this date. The adult female (1387-84710) was not recaptured in 98.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
Upper Totem Creek, Kupreanof Island no goshawks banded/tagged	Area documented in 93. No active nest located. Two inactive nests located during timber presale activities on 7/12-13/93; goshawk prey remains collected. Area checked in 94 and 95 but no activity observed. Area not checked in 96. Area checked in 97 and 98 but no activity observed.
West Bay of Pillars, Kuiu Island <u>band# / tag frequency / year / age-sex</u> 1387-64181 150.507 93-94 AF 151.642 94 AF 1387-64189 no tag 94 JF 1387-64206 150.568 95-96 AF 1807-41985 150.917 95-96 AM	Area documented in 94 with active nests located in 94 and 95. First active nest found on 6/17/94 by tracking the 93 Big John Creek, Kupreanof Island adult female (1387-64181; 150.507) to this new nest area. The West Bay of Pillars, Kuiu Island nest is 43 km from the Big John Creek, Kupreanof Island nest. This adult female (1387-64181; 151.642 Biotrack 24 mo. BP) was retagged on 6/30/94; the unmarked adult male was observed briefly but not captured; two ~28 day-old nestlings observed on this date. Fledgling female (1387-64189; 151.273 Biotrack 12 mo. TM) banded and tagged on 8/17/94. Last signal for the adult female (1387-64181; 151.642) on 10/7/94. New active nest located in snag on 7/7/95 ~150m from 94 nest after new adult female responded to playback conspecific calls. One ~28 day-old nestling observed on this date. This adult female (1387-64206; 150.568 Biotrack 24 mo. BP) was banded and tagged on 7/7/95. Adult male (1807-41985; 150.917 Biotrack 12 mo. BP) banded and tagged on 7/8/95. Nest area not checked in 96. Adult female (1387-64181) nested ~3 miles N of Kadake Bay, Kuiu Island with different mate in 96. Remains of 95 West Bay of Pillars adult male (1807-41985) recovered from marten burrow at Rowan Bay, Kuiu Island on 7/10/96. Nest area checked in 97 and snag nest tree of 95 had fallen; 94 nest inactive. Area checked in 98 but no activity observed.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Appendix I. Continued

Chatham Area, Tongass National Forest

Nest Area/Goshawk	Activities/Observations*
<p>Auke Bay, Juneau, Mainland</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-84725 151.275 97-98 AF 98 AF 1387-84745 no tag 98 JF 1387-84746 150.251 98 JF 1807-57836 151.357 98 AM</p>	<p>Area documented in 98. Active nest located on 3/30/98 by tracking the 97 Nugget Creek, Juneau Mainland adult female (1387-84725; 151.725 Biotrack 24 mo. BP) 12.2 km to this new nest area where she paired with a new male. Copulation and nest building observed on this date. This adult female (1387-84725; 151.481 Biotrack 24 mo. BP) was retagged and the adult male (1807-57836; 151.357 Biotrack 9 mo. TM) banded and tagged on 6/19/98. Nest fledged 3 young in 98, including 2 females and 1 male. One fledgling female (1387-84746; 150.251 Biotrack 12 mo. TM) was banded and tagged and the other fledgling female (1387-84745) banded only on 8/6/98. The juvenile male damaged a wing during the fledgling dependency period and was sent to the Sitka Raptor Rehabilitation Center for surgery; it was later placed with a falconer for rehabilitation. Juvenile female (1387-84745; no tag) was located with a broken wing in a residential area within the Mendenhall Valley on 9/6/98 and died during surgery. A signal from the other juvenile female (1387-84746; 150.251) was last detected on 8/12/98. The 98 nest site is located within the Auke Bay road bypass project area. Despite attempts at mitigation, road clearing and construction were initiated on 5/18/98 during the incubation period. Construction activities significantly altered the nest stand.</p>
<p>Blueberry Hill, Douglas Island</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-64177 150.567 93-94 AF 151.845 94-95 AF 151.001 95-96 AF 1387-64198 150.155 93 JF 1387-84726 151.824 98 AF 1807-41956 151.424 93-94 AM 150.396 94-95 AM 151.129 95-96 AM 150.530 98 AM</p>	<p>Area documented in 93 with active nests located in 93, 94, 95, 97, and 98. First active nest first found in 93 by a USFS technician conducting bird survey point counts. Subsequent nests located 94-98 by tracking tagged adults. Adult female (1387-64177; 150.567 Biotrack 24 mo. BP) and adult male (1807-41956; 151.424 Biotrack 12 mo. BP) first banded and tagged on 6/29/93. Site fledged 2 young in 93; one female (1387-64198; 150.155 ATS 12 mo. TM) fledgling was banded and tagged on 8/13/93. The 94 nest was located on 4/18/94 ~200 m. from the 93 nest by tracking the adult female. This female (1387-64177; 151.845 Biotrack 24 mo. BP) and the same adult male (1807-41956; 150.396 Biotrack 12 mo. BP) were retagged on 6/23/94. The site fledged two young in 94 but neither were banded or tagged. The 95 nest was located on 4/18/95 by tracking the adult female (93 nest reoccupied). This adult female (1387-64177; 151.001 Biotrack 24 mo. BP) and the same adult male (1807-41956; 151.129 Biotrack 12 mo. BP) were retagged on 6/29/95. The site fledged two young in 95 but neither were banded or tagged. No sign of activity was observed at this nest area in 96 after the adult female moved 18.5 km to the Green Cove, Admiralty Island nest area and mated with a new male. The adult male's transmitter failed in 11/96. A new unmarked adult female was located incubating eggs on the 94 nest on 5/13/97. An adult male wearing a failed radio was also observed on 5/13/98 and is presumed to be the original 93 male (1807-41956) from this site. The new adult female (1387-84726; 151.841 Biotrack 24 mo. BP) was banded and tagged on 7/2/97, but the adult male eluded capture. Two fledglings were observed in 97. A juvenile female (1387-84729; 150.075 ATS 12 mo. TM) was banded and tagged on 8/7/97 and a juvenile male (1807-57835) was banded but not tagged on 8/14/97. Nest area active again in 98 with the same adult female and male occupying a newly constructed alternate nest located on 5/22/98 ~ 198 m. from the 97 nest. The adult female (1387-84726; 151.824 Biotrack 24 mo. BP) and adult male (1807-41956; 150.530 Biotrack 9 mo. TM) were retagged on 6/29/98. The adult male had not been recaptured since 95. The site fledged two young in 98; one fledgling male (1807-57846) was banded but not tagged on 8/14/98.</p>

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
Dewey Lake Trail, Skagway, Mainland no goshawks banded/tagged	Area documented in 85. Active nest not located but fledglings and aggressive adults observed this year as result of incidental observations. Area not checked 91-98.
Distin Lake, Admiralty Island no goshawks banded/tagged	Area documented in 94; active nests located in 94 and 97. First active nest found on 7/13/94 when 2 fledglings and an aggressive adult were observed as result of an incidental observation. Area was not checked in 95 or 96. Active nest with incubating adult female located on 6/5/97; this was the latest incubation date documented in 97 for southeast Alaska. Nest was found to have failed during incubation when revisited on 7/16/97. One broken egg and one added egg were collected from the nest platform. Nest area checked in 98 but no signs of activity were detected.
Duffield Peninsula, Baranof Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-84722 151.998 96 JF 1387-84720 no tag 96 JF 1807-41979 no tag 96 JF	Area documented in 94 with active nests located in 94, 95, and 96. First active nest found on 7/3/94 when aggressive adult and three fledglings were observed during timber presale activities. Same nest reoccupied for three consecutive years 94-96. Two fledglings were observed in 95 and 3 fledglings observed in 96. A fledgling female (1387-84720) and a fledgling male (1807-41979) were banded on 7/24/96. A second fledgling female (1387-84722; 151.998 Biotrack 9 mo. TM) was banded and tagged on 7/25/96. Area checked in 97 but no activity observed. Area not checked in 98.
Eagle Creek, Douglas Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-64182 150.604 93-94 AF 1807-41963 151.926 93-94 AM 1807-41967 151.768 93 JM 1807-41968 151.809 93 JM	Area documented in 93. Active nest located this year only on 7/14/93 as result of USFS songbird survey two nestlings observed. The adult female (1387-64182; 150.604 Biotrack 24 mo. BP) and adult male (1807-41963; 151.926 Holohil 24 mo. BP) were banded and tagged on 7/23/93. Two male fledglings (1807-41967; 151.768 Holohil 12 mo. TM and 1807-41968; 151.809 Holohil 12 mo. TM) were banded and tagged on 8/13/93. In 94 the adult female moved 3.2 km to a new nest area at Fish Creek, Douglas Is. area and mated with a new male. The 93 adult male's transmitter (151.926) expired in 12/94 and his status remains unknown. Nest area checked 94, 95, 96, 97, and 98 but no activity observed.
Eagle River (Taku Inlet), Juneau Mainland <u>band#/ tag frequency/ year/ age-sex</u> 1387-84732 no tag 98 JF 1807-57839 no tag 98 JM 1807-57840 no tag 98 JM 1807-47841 150.563 98 AM	Area documented in 97. Site active in 97 and 98 but active nest located in 98 only. This nest area first identified on 8/5/97 as result of observation by an ADF&G biologist who reported multiple goshawk sightings during a two day period in early August; at least two fledglings were observed here in mid-August. An active nest first found on 7/22/98 following sightings reported by a recreational hiker. The adult male (1807-57841; 150.563 Biotrack 12 mo. BP) was banded and tagged on 7/27/98 but the adult female was not observed. Site fledged four young this year and three were banded on 7/27/98, including one female (1387-84732) and two males (1807-57839 and 1807-57840).

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
Fish Creek, Douglas Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-64182 150.604 93-94 AF 151.895 94-95 AF 151.821 95-96 AF 151.616 96-97 AF 150.449 97-98 AF 151.271 98 AF 1387-64186 151.265 94 JF 1387-64187 151.256 94 JF 1387-84717 150.485 95 JF 1387-84731 no tag 98 JF 1807-41971 150.316 94-95 AM 151.206 95-96 AM 1807-41976 151.206 96-97 AM 151.634 97-98 AM 150.653 98 AM 1807-41980 151.269 96 JM 1807-57822 151.504 97 JM	Area documented in 94 with active nests located in 94, 95, 96, 97 and 98. Active nest first found on 5/12/94 by tracking the Eagle Creek, Douglas Island adult female (1387-64182; 150.604) to this new nest area, a distance of 3.2. km This original female has nested and been recaptured and retagged at this nest area each year from 94 through 98. This bird (1387-64182; 151.895 Biotrack 24 mo. BP) was retagged and her mate (1807-41971; 150.316 Biotrack 12 mo. BP) banded and tagged on 6/24/94. The site produced three fledglings this year and these two females (1387-64186; 151.265 Biotrack 12 TM and 1387-64187; 151.256 Biotrack 12 mo. TM) were banded and tagged on 8/2/94. On 7/3/95, the adult female (1387-64182; 151.821 Biotrack 24 mo. BP) and adult male (1807-41971; 151.206 Biotrack 12 mo. BP) were retagged. The 95 nest fledged one young and this juvenile female (1387-84717; 150.485 Biotrack 12 mo. TM) was banded and tagged on 8/1/95. The 94/95 male (1807-41971) died in 10/95 and his remains were collected on 10/12/95 on the hillside above downtown Juneau. The dead male was replaced in 96 by a two year old male (1807-41976) that was originally captured and banded on 12/31/94 at a domestic waterfowl facility at Sunny Point, Juneau. On 7/2/96, the adult female (1387-64182; 151.616 Biotrack 24 mo. BP) and this adult male (1807-41976; 151.206 Biotrack 12 mo. BP) were retagged and tagged, respectively. The 96 nest produced two fledgling and one male (1807-41980; 151.269 Biotrack 9 mo. TM) was banded and tagged on 8/7/96. On 7/3/97, the adult female (1387-64182; 150.449 Biotrack 12 mo. TM) and adult male (1807-41976; 151.634 Biotrack 9 mo. TM) were retagged. The nest fledged two young in 97 and one male (1807-57822; 151.504 Biotrack 9 mo. TM) was banded and tagged on 8/8/97. The area was active again in 98 and the adult male (1807-41976; 150.653 Biotrack 9 mo. TM) was retagged on 6/18/98. The adult female (1387-64182; 151.271 Biotrack 9 mo. TM) was retagged on 7/14/98. Three young fledged and 98 and one was found dead at the site on 7/12/98. A juvenile female (1387-84731) was banded but not tagged on 7/13/98. A total of eleven young were observed to have fledged at this nest area between 94 and 98.
Florence Bay, Chichagof Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-84721 151.977 96-97 AF 1807-41978 151.570 96 AM	Area documented in 96. Active nest located this year only on 6/28/96 by an USFSL crew conducting vegetation plots work. The adult female (1387-84721; 151.977 Biotrack 12 mo. BP) and adult male (1807-41978; 151.570 Biotrack 12 mo. BP) were banded and tagged on 7/16/96 and 7/15/96, respectively. Two young fledged in 96 and one juvenile female (1387-84723) was banded but not tagged on 7/25/96. The adult male's transmitter is believed to have failed during the fall of 96. The adult female's transmitter became stationary in 4/97 and expired before it could be investigated. The area was checked in 97 and 98 but no activity was observed.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
Green Cove, Admiralty Island <u>band#/ tag frequency/ year/ age-sex</u> 1387-64177 151.001 95-96 AF 150.548 96-97 AF 151.250 97-98 AF 151.606 98 AF 1387-84722 no tag 97 JF 1807-41977 150.560 96-97 AM 1807-57816 no tag 97 JM 1807-57817 151.020 97 AM	Area documented in 96 with active nests located in 96, 97 and 98. Active nest first found on 5/11/96 by tracking the 93-95 Blueberry Hill, Douglas Is. adult female (1387-64177; 151.001 Biotrack 24 mo. BP) a distance of 18.5 km to this new area, where she mated with different males in 96 and 97. On 7/11/96, this female (1387-64177; 150.548 Biotrack 24 mo. BP) and the adult male (1807-41977; 150.560 Biotrack 12 mo. BP) were retagged and banded and tagged, respectively. The site fledged two young in 96 but neither was banded or tagged. The 96 male (1807-41977) died during the winter of 96/97, remains recovered on 6/6/97 at King Salmon Bay, Admiralty Is.. An active alternate nest site was located near Oliver's Inlet on 6/6/97, 2.4 km from the 96 nest by tracking the adult female. On 7/11/97, this female (1387-64177; 151.250 Biotrack 9 mo. TM) and the new adult male (1807-57817; 151.029 Biotrack 9 mo. TM) were retagged and banded and tagged, respectively. The site fledged three young this year, two of which, a male (1807-57816) and a female (1387-84727), were banded but not tagged on 7/11/97. The adult male dropped his tailmounted radiotag in late August or September of 97. On 4/10/98, an active alternate nest was located near Green Cove ~2.5km from the 97 nest by tracking the adult female. This same female (1387-64177; 151.606 Biotrack 9 mo. TM) was retagged on 6/24/98. The adult male (1807-57817; 151.029) dropped his tailmounted radiotag in late August or September of 97. The adult male present at the 98 nest eluded capture and remains unidentified. Three nestlings were observed in 98 and are believed to have all fledged. None of these juveniles were banded or tagged.
Lace River, Mainland <u>band#/ tag frequency/ year/ age-sex</u> 1387-64178 150.546 93-94 AF 151.746 94 AF 1807-41972 150.556 94-95 AM	Area documented in 94. Active nest located this year only by tracking the 93 Point Bridget, Juneau Mainland adult female (1387-64178; 150.546 Biotrack 24 mo. BP) a distance of 24.5 km, to this new nest area where she mated with a new male. This female (1387-64178; 151.746 Biotrack 24 mo. BP) was retagged and the adult male (1807-41972; 150.556 Biotrack 12 mo. BP) banded and tagged on 6/27/94. One ~32 day old nestling was observed on this date. The adult female could not be relocated after 10/94. The adult male appears not to have nested in 95 and his transmitter failed and could not be relocated after 10/95. Area was checked in 95, 96, 97 and 98 but no activity was observed.
Mud Bay River, Chichagof Island <u>band#/ tag frequency/ year/ age-sex</u> 1807-57838 no tag 98 JM	Area documented in 93 with active nests located in 93, 94, and 98. Active nest first found on 8/11/93; three fledglings observed on this date. No active nest was found in 94 but two fledglings were observed. Area was checked in 95 and 97 but no activity was detected. Area was not checked in 96. The 94 nest was found active with unidentified adults on 7/9/98. This nest fledged four young, one of which, an emaciated juvenile male (1807-57838) was banded on 7/19/98. Attempts to capture the adults were unsuccessful in 98.

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
<p>Nugget Creek, Juneau Mainland</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-02003 150.386 92-93 AF 151.624 93-94 AF 151.795 94-95 AF 1387-64196 151.106 93 JF 1387-64197 150.047 93 JF 1387-84725 151.725 97-98 AF 1387-84730 151.001 98 AF 1807-41957 151.562 93-94 AM 150.885 94-95 AM 1807-57818 no tag 97 JM 1807-57819 no tag 97 JM 1807-57842 no tag 98 JM</p>	<p>Area documented in 93 with active nests located in 93, 94, 97 and 98. Active nest first found on 4/11/93 by tracking an adult female (1387-02003; 150.386) first captured and radiotagged after raiding domestic waterfowl at Sunny Point, Juneau on 3/18/92. This female (1387-02003; 151.624 AVM 12 mo. TM) and adult male (1807-41957; 151.562 AVM 12 mo. BP) were retagged and banded and tagged, respectively, on 7/1/93; three nestlings were observed on this date. Two fledgling females (1387-64196; 150.106 ATS 12 mo. TM and 1387-64197; 150.047 ATS 12 mo. TM) were banded and tagged on 8/9/93. Site was occupied by same adults in 94. Active alternate nest located on 4/24/94 ~300 m from the 93 nest. The adult female (1387-02003; 151.795 Biotrack 24 mo. BP) and adult male (1807-41957; 150.885 Biotrack 12 mo. BP) were retagged on 6/24/94. Two nestlings were observed: on this date; both fledged successfully but neither was banded/tagged. The adult female died during 2/95 and her remains were recovered on 6/21/95 ~2.6km from 94 nest. The adult male remained on territory but is believed not to have nested in 95. His transmitter (150.885) expired 10/95. No activity was observed in this nest area in 96. On 5/30/97 an unmarked adult female was observed incubating on the 93 nest. This new adult female (1387-84725; 151.725 Biotrack 24 mo. BP) was banded and tagged on 6/27/97. Her mate eluded capture and remained unidentified. Three nestlings fledged successfully this year and two juvenile males (1807-57818 and 1807-57819) were banded but not tagged on 7/26/97. In 98 the 97 adult female (1387-84725) moved to a new nest site at Auke Bay, Juneau where she mated with a new male. A site check on 4/8/98 revealed that a new female had replaced the 97 female at the Nugget Creek nest area and that she and her mate were preparing to reoccupy the 94 nest. One nestling was observed on 5/29/98. The 98 adult female (1387-84730; 151.001 Biotrack 24 mo. BP) was banded and tagged on 6/17/98. The adult male eluded capture again in 98 and remains unidentified. The lone nestling male fledged successfully (1807-57842) and was banded but not tagged on 7/29/98.</p>
<p>Pavlof River, Chichagof Island</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-64191 151.362 95 JF 1387-84716 151.681 95-97 AF</p>	<p>Area documented in 95 when fledglings responded to broadcast calls. Active nest located this year only on 7/25/95. The adult female (1387-84716; 151.681 Biotrack 24 mo. BP) was banded and tagged on 7/28/95 but the adult male eluded capture. Three fledglings were observed in 95, one of which, a juvenile female (1387-64191; 151.362 Biotrack 9 mo. TM) was banded and tagged on 7/27/95. The adult female remained in the general vicinity during both 96 and 97 but did not nest either year. Site was checked in 98 and although no sign of activity was detected in the near vicinity of the 95 nest, a pair of goshawks was observed (possibly responding to broadcast calls) along an adjacent ridge ~ 2 km from the 95 nest.</p>

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
<p>Point Bridget, Juneau Mainland</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-64178 150.546 93-94 AF 1387-41979 151.789 93-94 AM 1807-41959 151.709 93 JM 1807-41960 151.789 93 JM 1807-57844 no tag 98 JM 1807-57845 no tag 98 JM</p>	<p>Area documented in 92 with active nests located in 92, 93 and 98. Nest area first located on ~8/16/92 when two fledglings were observed along the trail during recreational activity. Active nest located on 8/19/92. An active alternate nest was located ~450 m from the 92 nest on 7/2/93 when an adult female responded to broadcast calls. The adult female (1387-64178; 150.546 Biotrack 24 mo. BP) and the adult male (1387-64179; 151.504 Biotrack 12 mo. BP) were banded and tagged on 7/6/93. Two male nestlings were observed in 93 and both (1807-41959; 151.709 Holohil 12 mo. TM and 1807-41960; 151.789 Holohil 12 mo. TM) were banded in the nest on 8/16/93. These birds both fledged successfully and were captured and tagged on 8/16/93. The adult female (1387-64178; 150.546) moved 24.5 km to the Lace River, Mainland area in 94 and mated with a new male. The 93 adult male's radio (151.504) failed in 3/94 and his status remains unknown. The nest area was checked in 94, 95, 96, and 97 but no nesting activity was confirmed despite numerous goshawk observations and responses to playback recordings during 95, 96 and 97. Nest area was active in 98 with the birds occupying an alternate nest stand ~ 2.8 km from the previously known nest cluster. Nest located on 7/30/98 after following up on a recreational hikers reports of fledgling vocalizations. The new adult male (1807-57843; 150.716 Biotrack 12 mo. BP) at this nest was banded and tagged on 7/31/98. The adult female was never observed and remains unidentified. The 98 nest fledged two young and both of these males (1807-57844 and 1807-57845) banded but not tagged 7/31/98.</p>
<p>Ready Bullion, Douglas Island</p> <p><u>band#/ tag frequency/ year/ age-sex</u></p> <p>1387-64172 150.446 92 JF 1387-64173 150.526 92 AF 1387-84724 151.893 97-98 AF 151.617 98-99 AF 1807-41953 150.406 92 AM 1807-41983 150.687 97-98 AM 151.029 98-99 AM 1807-57820 no tag 97 JM 1807-57821 no tag 97 JM 1807-57837 no tag 98 JM</p>	<p>Area documented in 91 with active nests located in 91, 92, 97, and 98. Active nest and two fledglings first observed on 6/22/91 but no captures were attempted this year. In 92 an active alternate nest was located ~250 m from the 91 nest. The adult female (1387-64173; 150.526 Biotrack 24 mo. BP) and adult male (1807-41953; 150.406 Biotrack 12 mo. BP) were banded and tagged on 7/2/92. One female nestling (1387-64172; 150.446) ~25 days old was observed and banded on this date. This bird was captured and tagged on 8/6/92. The adult female's radio signal (150.526) became stationary during 9/92 and failed before it could be investigated. The adult male's signal (150.406) was lost during 9/92 and his status remains unknown. Although no nesting activity was observed during 93, 94, 95, or 96, an alternate nest possibly active in 93 or 94 was located on 5/8/96. The site was active again in 97 and an unmarked adult male was observed reconstructing the 91 nest and copulating with an unmarked adult female on 4/11/97. The adult female was later observed incubating on 5/13/97. The adult female (1387-84724; 151.893 Biotrack 24 mo. BP) and adult male (1807-41983; 150.687 Biotrack 12 mo. BP) were banded and tagged on 6/25/97. Two nestlings were observed on this date and both of these males (1807-57820 and 1807-57821) were captured and banded as fledglings on 7/31/97. The same adults occupied the site in 98 and constructed new alternate nest ~200 m from the 97 nest. The adult female (1387-84724; 151.617 Biotrack 24 mo. BP) and adult male (1807-41983; 151.029 Biotrack 9 mo. TM) were retagged on 6/16/98. The site fledged two young, a male and a female, this year. The juvenile male (1807-57837) was banded but not tagged on 7/16/98.</p>

* BP = backpack style transmitter, TM = tail-mounted transmitter; LM = leg-mounted transmitter

Nest Area/Goshawk	Activities/Observations*
Turner Lake, Juneau Mainland no goshawks banded/tagged	Area documented in 96. Active nest located in 97 only. This nest area was first found following adult and fledgling goshawk observations reported by a F&G biologist recreationally camping at the lake during the first week of 8/96. No nest search was conducted that year. An active nest contained three branching nestlings, and one alternate nest were located on 6/17/97. The chronology of this nest was very early as all nestlings fledged by 6/29/97. No goshawks were captured here in 97. The site was checked in 98 and evidence suggests the site may have failed this year. An adult male responded to broadcast calls within the nest stand on 6/3/98 and a previously identified alternate nest appeared to have been reconstructed. No other nesting activity was observed and the adult female was not observed. A third alternate nest, believed to be the 96 active nest, was also located on 6/3/98. No goshawks have been captured or banded at this site.
Whitestone, Chichagof Island <u>band# / tag frequency / year / age-sex</u> 1387-84718 150.036 95 JF 1387-84719 151.501 95 AF	Area documented in 95. Active nest located in 96 only. This area was first found following an incidental observation of an adult female by a goshawk project biologist on 7/27/95. Three fledglings were observed on this same date. One juvenile female (1387-84718; 150.036 Biotrack 12 mo. TM) was banded and tagged on 8/4/95. The adult female (1387-84719; 151.501 Biotrack 24 mo. BP) was banded and tagged on 8/16/95 but her transmitter failed in 10/95. The first active nest was found on 6/3/96 when an adult female wearing a failed radiotag (presumed to be the 95 female) was observed incubating or brooding. This nest is believed to have failed during the fledgling dependency period. FWS biologists reported observing one fledgling on 7/5/95 but a follow visit on 7/8/96 revealed no signs of activity. Site was checked in 97 but no signs of nesting activity were observed, however, a fresh pluck was found in the nest stand. The site checked again in 98 but no sign of activity was observed. An active logging operation nearby this year may have deterred the birds from using the known nest stand.

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Goshawk nest sites and cumulative nesting areas documented in Southeast Alaska, 1991–1998

