

# **GOSHAWK ECOLOGY AND HABITAT RELATIONSHIPS ON THE TONGASS NATIONAL FOREST**

## **1994 FIELD SEASON PROGRESS REPORT**

Prepared for:

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## Overview

This report summarizes the interagency northern goshawk project fieldwork conducted between April 1 and September 15, 1994. Specifically addressed were efforts concerning Jobs 1 and 2 of the Study Plan (ADF&G 1993c), as required by contract 43-0109-4-0209 for this reporting period. Job 1 was to locate additional goshawk nest sites and inventory known and suspected goshawk nesting areas on an annual basis. Job 2 was to capture and radio-tag goshawks.

In 1994, numerous individuals on the Ketchikan, Stikine, and Chatham Areas of the Tongass National Forest took part in goshawk surveys and nest searches, either as active participants or informed reporters of casual goshawk observations. These efforts by USFS biologists, foresters, cruisers, contractors, and others --in addition to those by ADF&G biologists-- were instrumental in the increased success at locating nest sites. Nest searches and goshawk observations are being done by a larger group of more informed or experienced observers each year.

After three field seasons of study the total number of goshawk nest sites known in Southeast Alaska continues to remain relatively small despite increased search efforts and goshawk awareness by people who work in the forest. This observation supports the previously held opinion of project and other biologists that goshawk nest densities in Southeast Alaska may be generally lower than those reported for other areas of this species' range (e.g., McGowan 1975, Shuster 1976, Reynolds and Wight 1978, Crocker-Bedford and Chaney 1988, Kennedy 1989).

In 1993, a total of 16 historic and current sites with one or more nest were documented on the Ketchikan, Stikine, and Chatham Areas, including 8 active nests located that year (ADF&G 1993d, 1994). These figures increased in 1994, when a total of 33 historic and current sites with one or more nest were documented, including 21 active nests located. The summary status table has been revised from previous, similar lists (e.g., ADF&G 1993b, 1993d, 1994) and includes only those sites where an actual goshawk nest has been located [Table 1 (the Kake, Kupreanof Island nest cut in 1989 and reported in ADF&G 1993b is not included in this list)].

Of the 21 active nests located in 1994, 17 were at new sites located this year and 4 were at previously known nest areas. The increased rate of nest location observed in 1994, resulted primarily from the larger group of informed persons that searched for goshawk nests and reported sightings.

Few active nest sites were located within nesting areas (i.e., nest stands) known to have had an active nest in a previous year. Active nest sites were located at only 4 of 14 previously known nesting areas checked in 1994 (Table 1), and only 2 of 7 previously known nesting areas checked in 1993. These values support observations of low nest site and nest area reoccupancy by Southeast Alaska goshawks, but more within and among year data are needed to evaluate reoccupancy rates. The difficulty in locating nests and confidently determining nest site activity status even if a pair of goshawks move a

short distance (e.g.,  $\leq 300\text{m}$ ) between years has been discussed (ADF&G 1994) and hinders interpretation reoccupancy rates. The current search effort does not allow for evaluation of reoccupancy beyond the nest site and nesting area, nor can inferences be made about rates of reoccupancy or goshawk population status.

Six of the 21 active nests located in 1994 were located by tracking adult females radio-tagged at nest sites in 1993 or 1992, and 15 were located without the aid of telemetry (Table 1). Of these latter 15 nests (no telemetry), 3 were located by searching a previously known nest area, and 12 were found at new locations. Also of the 15 nests located without telemetry, 6 were found with unsolicited fledgling vocalizations as the primary nest location clue, 4 were found with unsolicited adult goshawks alarm calls and/or observations as the primary clue, 2 were found by spotting a nest, and 3 were found by fledgling responses to broadcast conspecific calls. Conspecific calls were played during initial nest search efforts at 8 of the 21 sites where an active nest was located in 1994, but only 3 of these 8 nests were located as a direct result of a detected response to calls.

In 1994, a total of 25 goshawks were captured at 13 nest sites, including 10 adult females, 7 adult males, and 8 fledgling females. No fledgling males were captured. With the exception of one fledgling female, all captured goshawks were radio-tagged. Eight goshawks, including 5 adult females and 3 adult males that were captured and radio-tagged at nest sites in 1993 or 1992, were recaptured in 1994 and fitted with new transmitters. Blood samples for DNA analysis were collected from 13 goshawks, including 8 adults and 5 juveniles (Table 2).

Tracking effort for each of 24 adult and juvenile goshawks radio-tagged during the 1994 field season was summarized by totalling the number of relocations between date of capture and September 12, 1994. Maximum recorded distance from the nest during this period was also estimated (Table 3). For 17 adult goshawks radio-tagged in 1994, the number of relocations ranged from 8 to 33, and maximum recorded distance from the nest ranged from 6 to 66 km. For 7 juvenile goshawks, the number of relocations ranged from 4 to 10, and maximum recorded distance from the nest ranged from 2 to 115 km.

Mean nest productivity was calculated as the total number of fledglings or nestlings observed divided by the total number of nests. The number of fledglings observed was used when possible instead of number of nestlings to account for pre-fledging mortality. Of the 21 active nests located in 1994, fledglings were observed at 18 nests, nestlings only at 2 nests, and one nest failed in the early egg-laying or incubation period and produced no young (Table 4). A total of 47 young (fledglings or nestlings) were observed at 21 nests in 1994, with a mean of 2.2 young/nest. Mean productivity of the 20 successful nests was 2.3 young/nest. These figure are comparable to the 2.1 young/nest reported for eight Southeast Alaska goshawk nests in 1993 (ADF&G 1993d), and also to nest productivity figures reported for goshawks from other regions: Interior Alaska, 2.0 young/nest (McGowan 1975); Oregon, 1.7 young/nest (Reynolds and Wight 1978);

California, 1.7 young/nest (Bloom et al 1986).

In 1994, 8 of the 21 active nests located in Southeast Alaska produced 3 young (Table 4). This value is comparable to the 2 of 8 active nests that produced 3 young in 1993 (ADF&G 1993*d*).

The following section gives a brief narrative of activities at each of the 21 active nests located in 1994.

## **Summary of 1994 Active Nests, Goshawk Capture, Radio-tagging, and Tracking Efforts**

### **Ketchikan Area**

#### **Port Refugio, Suemez Island**

This nest was found on April 6, 1994 during a general nest search conducted by USFS biologists at a previously known nest site. The nest was located approximately 0.8 km (0.5 mi) from a nest known to be active in 1989 (ADF&G 1993a, 1993b). The 1994 nest was found unaided by goshawk responses to broadcast conspecific calls. Though calls had been played within 100 m of the nest, the adult female did not vocalize aggressively until the nest was spotted and the nest tree approached. Both the adult female and adult male were observed near the nest the following day on April 7 (Table 1).

The site was visited again on June 14 when the nest was found to have failed. A whole, intact goshawk egg was collected from the ground 50 m upslope of the nest. The egg was later determined to be infertile. A few prey remains and a molted goshawk primary feather were also collected from the vicinity of the nest tree, but no other sign of activity was observed. No response to conspecific calls was detected. This nest appeared to have failed early in the egg laying/incubation period as no down feathers were observed on the nest and no whitewash or castings were observed on the ground beneath the nest.

The three other known nests at this area (GN 1,2,3) were also checked on June 14 and all were inactive. On June 15, an adult male soared up from the vicinity of these nests, performed a courtship flight for 5 minutes over the site, and then returned to the same stand. Subsequent nest searches were unsuccessful.

The 1994 nest is located in an approximately 200 m (0.14 mi) wide corridor between units 9 and 10 of the Suemez Island Santa Cruz Timber Sale. Road construction to these and other units southeast of Port Refugio was begun in mid-May 1994. By mid-August, 1994 construction had progressed to units 9 and 10, and this new road currently lies within 192 m (630 ft) of the 1994 nest.

#### **Butterball Lake, Heceta Island**

This nest was located by tracking the adult female radio-tagged in 1992 at the Sarkar Lake nest site on Prince of Wales Island (Table 1) (ADF&G 1993a, 1993b, 1993d, 1994). The 1994 Heceta Island nest was located 27 km (17 mi) southwest of the Sarkar Lake nest. This adult female wintered on Zarembo Island and northern Prince of Wales Island in both 1992/93 and 1993/94. In 1993, she was also relocated on Heceta Island. The first relocation here was on April 6, 1993. On June 9, 1993 she was observed with an adult

male on Heceta Island near the location of the 1994 nest, however, her subsequent movements in 1993 indicated she was not nesting at that time.

In 1994, the adult female was first relocated again on Heceta Island on April 8. On May 16, she was tracked to a nest where she was observed incubating or brooding. On June 17, she was recaptured and fitted with a new transmitter. Her mate --an unmarked male-- was also captured and radio-tagged (her radio-tagged 1992 mate died in March 1993 on Kosciusko Island). Three nestlings were observed on June 17, 1994. On August 1, a juvenile female fledgling was captured and radio-tagged (Table 2). Three fledglings were present on this date.

On August 26, 1994 the adult female was located again on Zarembo Island, where she continues to remain at time of writing. Through September 12, 1994 the total number of relocations and maximum recorded distance from the nest for each goshawk radio-tagged at this nest were: adult female, 28 relocations (101 total relocations since radio-tagged in 1992), 66 km (41 mi); adult male 28 relocations, 9.8 km (6.1 mi); juvenile female, 7 relocations, 115 km (72 mi) (Table 3). On August 29, the radio-tagged juvenile female was relocated on Dry Island at the mouth of the Stikine River. All relocations to date for the adult male have been on Heceta Island.

#### Traitors Creek, Revillagigedo Island

This nest was located by Ketchikan Ranger District (R.D.) biologists on July 18, 1994 in unit 739-9062 of the North Revilla Timber Sale after a layout crew reported goshawk observations (Table 1). The nest was found by following fledgling food-begging vocalizations. On July 21, the adult female was captured and radio-tagged (Table 2). Three well-developed fledglings were present on this date. The adult male made food deliveries to the fledglings away from the nest on July 21-23 and neither he or the fledglings were captured.

Through September 12, 1994 a total of 8 relocations have been recorded for the adult female radio-tagged at this site. Maximum recorded distance from the nest was 5.6 km (3.5 mi) (Table 3). All relocations for this bird to date have been within the Traitors Creek and Carol Creek drainages.

#### Convenient Cove, Hassler Island

Goshawk observations were documented on Hassler Island during the spring and summer of 1992-94. In 1994, Ketchikan R.D. biologists conducted extensive foot searches aided by playback of conspecific calls. A nest was located on July 26 after unsolicited fledgling food-begging vocalizations were heard and followed to the nest area (Table 1). The nest was located 0.5 km (0.3 mi) northwest of unit 735-5024 in the North Revilla Timber Sale.

On July 27, a fledgling female was captured and radio-tagged (Table 2). A total of two fledglings were observed on July 27-28. Neither the adult female or male were observed during trapping efforts on these dates. A total of 4 relocations were recorded for this goshawk through September 12, 1994 for the juvenile female radio-tagged at this site. Maximum recorded distance from the nest was 32 km (20 mi) (Table 3).

#### Margaret Lake, Revillagigedo Island

Ketchikan R.D. biologists located this nest on July 28, 1994 after a goshawk sighting was reported by a fisheries technician. The nest, located in unit 738-8069 of the North Revilla Timber Sale, was found by following fledgling food-begging vocalizations (Table 1). The site was visited on August 4-5 when two well-developed fledglings were observed > 0.5 km (0.3 mi) from the nest. Efforts to capture and radio-tag these birds were unsuccessful and neither the adult female or male were observed.

#### **Stikine Area**

#### Mitchell Creek, Lindenberg Peninsula, Kupreanof Island

This nest was found on June 5, 1994 by EA Engineering personnel doing timber sale contract work for the USFS after a Petersburg R.D. fisheries technician reported hearing unsolicited goshawk alarm calls (Table 1). The nest was located in proposed unit 59 of the South Lindenberg Peninsula Timber Sale. On July 8, the adult female was captured and radio-tagged and 3 young fledglings were present. On July 11, both a juvenile female and the adult female were captured incidentally during efforts to trap the adult male. The juvenile female was banded but not radio-tagged due to incomplete development of its tail feathers. The adult male was not observed on either July 8 or 11 (Table 2). On August 10, the site was visited again but only a single fledgling male was observed near the nest stand. Efforts to capture and radio-tag this bird were unsuccessful.

Through September 12, 1994 a total of 32 relocations were recorded for the adult female radio-tagged at this site. Maximum recorded distance from the nest was 11 km (7 mi) (Table 3).

#### Mountain Point, Lindenberg Peninsula, Kupreanof Island

EA Engineering personnel doing timber sale contract work for the USFS found this nest

on June 21, 1994. The nest was located after an adult goshawk was observed on a nest and gave alarm calls (Table 1). The nest was located on State land 200 m south of proposed unit 99 of the South Lindenberg Peninsula Timber Sale. The adult female and male were captured and radio-tagged on July 10. Two fledglings were observed on this date. A female fledgling was captured and radio-tagged on August 10 (Table 2).

Through September 12, 1994 the total number of relocations and maximum distance from the nest recorded for each goshawk radio-tagged at this site were: adult female, 32 relocations, 11 km (7 mi); adult male, 33 relocations, 9.6 km (6 mi); juvenile female, 10 relocations, 32 km (20 mi) (Table 3).

#### Duncan Creek, Kupreanof Island

EA Engineering personnel doing USFS timber sale contract work reported hearing and seeing 3 fledglings 400 m south of proposed units 8 and 9 of the South Lindenberg Peninsula Timber Sale on July 26, 1994. A Petersburg R.D. biologist located an active nest here August 10. A total of 3 fledglings were observed (Table 1). A fledgling female was captured and radio-tagged on August 11, but neither adult was observed (Table 2). Through September 12, 1994 a total 8 relocations were recorded for the radio-tagged juvenile female. The maximum distance from the nest recorded was 1.6 km (1 mi) (Table 3).

#### Totem Camp, Totem Bay, Kupreanof Island

This nest was located on August 1, 1994 after Petersburg R.D. biologists heard goshawk fledgling vocalizations from the USFS Totem Camp (Table 1). The nest was located in proposed unit 432-15 of the Douglas Timber Sale, <400 m from the camp. Two fledglings were observed.

#### East Site, Bay of Pillars, Kuiu Island

This nest was located on June 16, 1994 by tracking the adult female that was radio-tagged at the Rowan Creek, Kuiu Island in 1993 (Table 1). The 1994 nest was on land designated LUD II and was located 11 km (6.8 mi) from the female's 1993 nest. The adult male at this site was a new mate in 1994. He was captured and radio-tagged on July 1 (Table 2). Three fledglings were present on this date. No fledglings were radio-tagged at this site.

Between July 1 and September 12, 1994, 17 relocations were recorded for each of the adult male and adult female (1993 transmitter) at this site. Maximum distance from the nest recorded during this period was 9.6 km (6 mi) for the adult female and 14.4 km (9

mi) for the adult male. A total of 71 relocations have been recorded for the adult female since first radio-tagged in 1993.

The radio-tagged 1993 mate of the adult female at this site (Rowan Creek, Kuiu Island adult male) continues to remain within the approximate area of his 1993 home range. It could not be determined if this bird nested in 1994.

#### West Site, Bay of Pillars, Kuiu Island

This nest site was located on June 17, 1994 by tracking the adult female radio-tagged at the 1993 Big John Creek, Kupreanof Island nest (Table 1). The area is on land designated LUD II. This year's nest was located 43 km (26.9 mi) from the female's 1993 nest. On June 30, 1994 the adult female was captured and fitted with a new transmitter; her mate was not captured (Table 2). Two nestlings were observed on this date and both were observed as fledglings on August 17 when one, a female, was captured and radio-tagged. The 1993 mate of the adult female at this site (Big John Creek, Kupreanof Island adult male) remained within the approximate area of his 1993 home range through late winter 93/94 when his transmitter apparently failed. The status of this bird is not known.

Through September 12, 1994 a total of 17 relocations were recorded for the adult female at this site (1994 transmitter). Maximum distance from the nest recorded was 17.6 km (11 mi). A total of 72 relocations have been recorded for the adult female since first radio-tagged in 1993. Eight relocations were recorded for the juvenile female through September 12, 1994 (Table 3). The greatest distance from the nest recorded for this bird to date was 77 km (48 mi), near Petersburg.

#### Cat Creek, Cape Fanshaw

Parametrix personnel doing timber sale contract work for the USFS located this nest on July 3, 1994. The nest was located in proposed unit 321005 of the Port Houghton Timber Sale. Conspecific calls were played near this nest on June 26, but no response was detected. On July 3, the nest was located by following fledgling vocalizations (Table 1). The adult female was captured and radio-tagged on July 13. The adult male and two fledglings were also observed on this date, but were not captured (Table 2).

Through September 12, 1994 a total of 11 relocations were recorded for the adult female at this site. Maximum distance from the nest recorded was 16 km (10 mi) (Table 3).

#### Negro Creek, Port Houghton

This nest was located on June 21, 1994 by Parametrix personnel doing unit timber sale

contract work for the USFS in unit 27112 of the Port Houghton Timber Sale. Conspecific calls had been played earlier in the unit, but no goshawk responses were detected. Three nestlings were observed when the nest was located (Table 1).

#### Sanborn Canal, Port Houghton

A Parametrix forester doing timber sale contract work for the USFS reported seeing a goshawk in proposed unit 333091 of the Port Houghton Timber Sale on July 17, 1994. Parametrix wildlife personnel returned to the site on July 18 and found an active nest after adult goshawks gave alarm calls. One fledgling was observed and another was heard (Table 1).

#### **Chatham Area**

#### Blueberry Hill, Douglas Island

The adult female radio-tagged in 1993 at this nesting area was tracked to her 1994 nest on April 18 (Table 1). The 1994 nest was 200 m from the 1993 nest. On June 23, the adult female and her mate, who was also radio-tagged at the 1993 nest, were captured and fitted with new transmitters (Table 2). Two nestlings were observed on this date. These birds were later observed at the site as fledglings, but were not radio-tagged.

Through September 12, 1994, the total number of relocations and maximum distance from the nest recorded for each goshawk radio-tagged at this site were: adult female, 22 relocations, 7 km (4.4 mi); adult male, 19 relocations, 9 km (5.6 mi). Since first radio-tagged in 1993, a total of 40 and 37 relocations have been recorded for the adult female and male, respectively, at this site (Table 3).

#### Nugget Creek, Mendenhall Glacier

This nest was located on April 24, 1994 by searching the forest stand where an active nest was located in 1993 (Table 1). The adult female and male were radio-tagged at the 1993 nest, however, the female's transmitter failed in autumn, 1993 and could not be used to assist in the location of this year's nest. The 1994 nest was located approximately 300 m from the 1993 nest. The adult female and male were captured on June 24, 1994 and fitted with new transmitters (Table 2). Two nestlings were observed on this date and both were known to have successfully fledged. Neither fledgling was radio-tagged.

Between June 24 and September 12, 1994, the total number of relocations and maximum distance from the nest recorded for each goshawk radio-tagged at this site were: adult female, 22 relocations (1994 transmitter), 6 km (3.8 mi); adult male, 19 relocations (1994

transmitter), 8 km (5 mi). Since first radio-tagged in 1993, a total of 45 and 37 relocations have been recorded for the adult female and male, respectively, at this site (Table 3).

#### Fish Creek, Douglas Island

The adult female radio-tagged at the 1993 Eagle Creek, Douglas Island nest was tracked to this nest on May 4, 1994 (Table 1). This goshawk and her mate were captured and radio-tagged on June 24, 1994 (female fitted with new transmitter) (Table 2). Three nestlings were present on this date. Three fledglings were observed on August 2. Two of these birds, both females, were captured and radio-tagged on this date.

The 1993 radio-tagged mate of the adult female at this site (Eagle Creek, Douglas Island adult male) remained within the approximate area of his 1993 home range through the summer of 1994. He was suspected to be nesting near the 1993 Eagle Creek nest, but a nest could not be located despite extensive searching.

Through September 12, 1994 the total number of relocations and maximum distance from the nest recorded for each goshawk radio-tagged at this site were: adult female, 23 relocations (1994 transmitter), 14 km (8.8 mi); adult male, 25 relocations, 6 km (3.8 mi); juvenile female #1, 9 relocations, 85 km (53 mi); juvenile female #2, 10 relocations, 53 km (33 mi). Since first radio-tagged in 1993, a total of 38 relocations have been recorded for the adult female at this site (Table 3).

#### Lace River, Berners Bay

The adult female radio-tagged at the 1993 Point Bridget, Echo Cove nest was tracked to this nest on May 5, 1994 where she was observed incubating (Table 1). The female's 1994 nest was located 36 km (22 mi) from her 1993 nest. The site was revisited on June 5, when the adult female was observed brooding at least one small young. The adult female and her new mate at this site were captured and radio-tagged on June 27, 1994 (female was fitted with new radio) (Table 2). One well-developed nestling was observed on this date.

The radio-tagged 1993 mate of the adult female at this site (Point Bridget, Echo Cove adult male) remained within the approximate area of his 1993 home range until spring, 1994 when his transmitter apparently failed. The status of this bird is not known.

Through September 12, 1994 the total number of relocations and maximum distance from the nest recorded for each goshawk radio-tagged at this site were: adult female, 16 relocations, 14 km (8.8 mi); adult male, 16 relocations, 11 km (6.9 mi). Since first radio-tagged in 1993, a total of 29 relocations have been recorded for the adult female at this

site (Table 3).

Mud Bay River, Chichagof Island

This site was initially located in 1993 when an active nest was found. Hoonah R.D. biologists visited the site on 4 occasions in 1994. Adult goshawks responded to conspecific calls on June 22 and July 20. Two fledglings were observed in late July and early August and at least one plucking perch was found. All observed activity occurred within 400 m of the 1993 nest. Though the 1994 nest could not be located, observations indicate that nesting at this location was certain (Table 1).

Distin Lake Trail, Admiralty Island

Hoonah R.D. biologists located this nest on July 13, 1994 after fledglings responded to conspecific calls. An adult female was observed when she flew in and perched near the observers. A total of 2 fledglings were observed (Table 1).

Rodman Creek, Baranof Island

This nest was found by Sitka R.D. biologists on July 3, 1994 after an adult goshawk responded to conspecific calls broadcast during stream survey work. Three fledglings were observed the following day on July 4 (Table 1).

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**Table 1. 1994 Status of known northern goshawk nest sites in Southeast Alaska<sup>1</sup>.**

**A. Ketchikan Area**

Nest Site	Status
Port Refugio, Suemez Island <sup>2</sup>	Active nest located on 04/06/94. Nest had failed when checked again on 06/14/94. Intact, infertile egg found on ground. Adult male in courtship flight on 06/15/94. Three other nests (GN 1,2,3) known from 1989-92 were inactive.
Sarheen, Prince of Wales Island	No activity observed in 1994.
Sarkar Lake, Prince of Wales Island	1992 nest inactive. An adult male responded to playback calls 1.2 km to SE on 04/21/94. 1992 adult female nested at Butterball Lake site on Heceta Island in 1994.
Logjam Creek, Prince of Wales Island	1993 nest inactive. No activity observed in 1994.
Butterball Lake, Heceta <sup>2</sup> Island	Nest located on 05/16/94 by tracking adult female radio-tagged at 1992 Sarkar Lake site. Adult male and female tagged on 06/10/94. Juvenile female tagged on 08/01/94. 3 fledglings observed.
Traitors Creek, Revillagigedo Island <sup>2</sup>	Active nest found on 07/18/94. Unsolicited fledgling vocs. Adult female tagged on 07/21/94. 3 fledglings present.
Convenient Cove, Hassler Island <sup>2</sup>	Active nest found on 07/26/94. Unsolicited fledgling vocs. 2 fledglings present. Juvenile female tagged on 07/27/94.
Margaret Lake, Revillagigedo Island <sup>2</sup>	Active nest found on 07/28/94. Unsolicited fledgling vocs. 2 fledglings present.

1 Includes all sites where one or more goshawk nest is known.

2 Active nest was located in 1994.

Table 1. (cont.)

B. Stikine Area

Nest Site	Status
Big John Creek, Kupreanof Island	1992 and 1993 nests inactive. Adult male tagged in 1993 appears to be maintaining home range. Adult female tagged in 1993 nested with new mate at West Site, Bay of Pillars, Kuiu Island in 1994.
Rowan Creek, Kuiu Island	1993 nest inactive. Adult male tagged in 1993 appears to be maintaining territory. Adult female tagged in 1993 nested with new mate at East Site, Bay of Pillars, Kuiu Island in 1994.
Mossman Inlet, Etolin Island	Not checked in 1994.
Starfish, Etolin Island	Site checked in April and July, 1994. 1991 nest inactive; 2nd inactive nest located. No activity observed.
Upper Totem Creek, Kupreanof Island	2 inactive nests located in 1993; both inactive in 1994.
Mitchell Creek, Kupreanof Island <sup>2</sup>	Active nest located on 06/05/94. Unsolicited adult alarm call, nest spotted. Adult female tagged on 07/08/94. 3 fledglings observed. Fledgling female captured and banded on 07/11/94.
Mountain Point, Kupreanof Island <sup>2</sup>	Active nest located on 06/21/94. Goshawk observations, unsolicited alarm calls. Adult female and male tagged on 07/10/94. 2 fledglings observed. Fledgling female tagged on 08/10/94.
Duncan Creek, Kupreanof Island <sup>2</sup>	Active nest located on 08/10/94. Unsolicited fledgling vocs. 3 fledglings observed. Fledgling female tagged on 08/11/94.
Totem Camp, Kupreanof Island <sup>2</sup>	Active nest located 08/01/94. Unsolicited fledgling vocs. 2 fledglings observed.
East Site, Bay of Pillars, Kuiu Island <sup>2</sup>	Nest found on 06/16/94 by tracking adult female tagged at 1993 Rowan Creek, Kuiu Island site. Adult male tagged on 07/01/94. 3 fledglings observed.

Nest Site	Status
West Site, Bay of Pillars, Kuiu Island <sup>2</sup>	Nest found on 06/17/94 by tracking adult female tagged at 1993 Big John Creek, Kupreanof Island site. Adult female retagged on 06/30/94. 2 fledglings observed. Fledgling female tagged on 08/17/94.
Cat Creek, Cape Fanshaw <sup>2</sup>	Active nest located on 07/03/94. Unsolicited fledgling vocs. Calls played with no response on 06/24/94. Adult female tagged on 07/13/94. 2 fledglings observed.
Negro Creek, Port Houghton <sup>2</sup>	Active nest located on 06/21/94. Calls played but no response. 3 nestlings observed.
Sanborn Canal, Port Houghton <sup>2</sup>	Active nest located on 07/17/94 after goshawk was observed. 2 fledglings present.

2 Active nest located in 1994.

Table 1. (cont.)

C. Chatham Area

Nest Site	Status
Dewey Lake Trail, Skagway	Active nest in 1985. Recent status of site unknown. Not checked in 1994.
Ready Bullion Creek, Douglas	1991 and 1992 nests inactive in 1993 and 1994.
Blueberry Hill, Douglas Island <sup>2</sup>	Active nest located on 04/18/94 by tracking adult female tagged at 1993 nest. 1994 nest 200 m from 1993 nest. Adult female and male tagged at 1993 nest captured and retagged on 06/23/94. 2 nestlings present.
Nugget Creek, Mendenhall Glacier <sup>2</sup>	Active nest located on 04/24/94 300 m from 1993 nest. Calls played but no response. Nest spotted. Adult female and male tagged at 1993 nest, captured and retagged on 06/24/94. 2 nestlings observed.
Point Bridget, Echo Cove	1992 and 1993 nests inactive. No activity observed after extensive search of area. Status of adult male tagged in 1993 uncertain. Adult female tagged in 1993 nested at Lace River, Berners Bay site in 1994.
Eagle Creek, Douglas Island	1993 nest inactive. Adult male tagged in 1993 appears to be maintaining home range. Nesting status in 1994 not determined. Adult female tagged in 1993 nested at Fish Creek, Douglas Island site in 1994.
Fish Creek, Douglas Island <sup>2</sup>	Active nest located on 05/04/94 by tracking adult female tagged at 1993 Eagle Creek, Douglas Island site. Adult female and male tagged on 06/24/94. 2 fledgling females tagged on 08/02/94. 3 fledglings observed.
Mud Bay River, Chichagof Island	Site checked in 1994; 1993 nest inactive. Adults responded to calls on 06/20 and 07/20/94. 2 fledglings observed in late July and early August. 1994 nest not located.

Nest Site	Status
Lace River, Berners Bay <sup>2</sup>	Active nest located on 05/04/94 by tracking adult female tagged at 1993 Point Bridget site. Adult female and male tagged on 06/27/94. 1 nestling observed.
Distin Lake Trail, Admiralty Island <sup>2</sup>	Active nest located on 07/14/94. Fledglings responded to conspecific calls. 2 fledglings observed.
Rodman Creek, Baranof Island <sup>2</sup>	Active nest located on 07/03/94. Adult responded to conspecific calls. 3 fledglings observed on 07/04.

2      Active nest located in 1994.

**Table 2. Northern goshawks captured and radio-tagged in Southeast Alaska, June 17 - August 17, 1994.**

**A. Ketchikan Area**

Nest Site	Age/Sex	Date Captured	USFWS Band#/Leg
Butterball Lake, Heceta Island	adult female <sup>1</sup>	06/17/94	1387-64172 right
Butterball Lake, Heceta Island	adult male <sup>2</sup>	06/17/94	1807-41970 left
Butterball Lake, Heceta Island	juvenile female	08/01/94	1387-64202 right
Traitors Creek, Revillagigedo Island	adult female <sup>2</sup>	07/21/94	1387-64200 right
Convenient Cove, Hassler Island	juvenile female <sup>2</sup>	07/27/94	1387-64201 left

- 1 Captured and radio-tagged at 1992 Sarkar Lake, Prince of Wales Island nest. Fitted with new transmitter in 1994.
- 2 Blood sample taken.

Table 2. (cont.)

B. Stikine Area

Nest Site	Age/Sex	Date Captured	USFWS Band#/Leg
West Site, Bay of Pillars, Kuiu Island	adult female <sup>3</sup>	06/30/94	1387-64181 left
West Site, Bay of Pillars, Kuiu Island	juvenile female <sup>2</sup>	08/17/94	1387-64189 right
East Site, Bay of Pillars, Kuiu Island	adult male <sup>2</sup>	07/01/94	1807-41973 right
Mitchell Creek, Kupreanof Island	adult female <sup>2</sup>	07/08/94	1387-64192 right
Mitchell Creek, Kupreanof Island	juvenile female <sup>4</sup>	07/08/94	1387-64194 right
Mountain Point, Kupreanof Island	adult female <sup>2</sup>	07/10/94	1387-64193 right
Mountain Point, Kupreanof Island	adult male <sup>2</sup>	07/10/94	1807-41974 left
Mountain Point, Kupreanof Island	juvenile female	08/10/94	1387-64199 right
Cat Creek, Port Houghton	adult female <sup>2</sup>	07/13/94	1387-64195 right
Duncan Creek, Kupreanof Island	juvenile female	08/11/94	1387-64203 right

2 Blood sample taken.

3 Captured and radio-tagged at 1993 Big John Creek, Kupreanof Island nest. Fitted with new transmitter in 1994.

4 Not radio-tagged due to incomplete growth of rectrices.

Table 2. (cont.)

## C. Chatham Area

Nest Site	Age/Sex	Date Captured	USFWS Band#/Leg
Blueberry Hill, Douglas Island	adult female <sup>5</sup>	06/23/94	1387-64177 left
Blueberry Hill, Douglas Island	adult male <sup>5</sup>	06/23/94	1807-41956 right
Fish Creek, Douglas Island	adult female <sup>6</sup>	06/24/94	1387-64182 left
Fish Creek, Douglas Island	adult male <sup>2</sup>	06/24/94	1807-41971 right
Fish Creek, Douglas Island	juvenile female <sup>2</sup>	08/02/94	1387-64186 right
Fish Creek, Douglas Island	juvenile female <sup>2</sup>	08/02/94	1387-64187 right
Nugget Creek, Mendenhall Glacier	adult female <sup>7</sup>	06/24/94	1387-02003 left
Nugget Creek, Mendenhall Glacier	adult male <sup>7</sup>	06/24/94	1807-41957 right
Lace River, Berners Bay	adult female <sup>8</sup>	06/27/94	1387-64178 right
Lace River, Berners Bay	adult male <sup>2</sup>	06/27/94	1807-41972 left

2 Blood sample taken.

5 Captured and radio-tagged at 1993 Blueberry Hill, Douglas Island nest. Fitted with new transmitter in 1994.

6 Captured and radio-tagged at 1993 Eagle Creek, Douglas Island nest. Fitted with new transmitter in 1994.

7 Captured and radio-tagged at 1993 Nugget Creek, Mendenhall Glacier nest. Fitted with new transmitter in 1994.

8 Captured and radio-tagged at 1993 Point Bridget, Echo Cove nest. Fitted with new transmitter in 1994.

**Table 3. Number of radio-tagged northern goshawk relocations and maximum recorded distance from nest through September 12, 1994, Southeast Alaska.**

**A. Ketchikan Area**

Nest Site	Age/Sex	Date Tagged	# Reloc.	Max. Dist. (km)
Butterball Lake, Heceta Island	adult female	06/17/94	28 <sup>1</sup>	66
Butterball Lake, Heceta Island	adult male	06/17/94	28	10
Butterball Lake, Heceta Island	juvenile female	08/01/94	7	115
Traitors Creek, Revillagigedo Is.	adult female	07/21/94	8	6
Convenient Cove, Hassler Island	juvenile female	07/27/94	4	32

- 1 Initially radio-tagged on 06/10/92 at Sarkar Lake, Prince of Wales Island. A total of 101 relocations have been recorded since this date.

Table 3. (cont.)

B. Stikine Area

Nest Site	Age/Sex	Date Tagged	# Reloc.	Max. Dist. (km)
West Site, Bay of Pillars, Kuiu Is.	adult female	06/30/94	17 <sup>3</sup>	18
West Site, Bay of Pillars, Kuiu Is.	juvenile female	08/17/94	9	77
East Site, Bay of Pillars, Kuiu Is.	adult female	(07/01/94)	17 <sup>4</sup>	10
East Site, Bay of Pillars, Kuiu Is.	adult male	07/01/94	17	14
Mitchell Creek, Kupreanof Island	adult female	07/08/94	32	11
Mountain Point, Kupreanof Island	adult female	07/10/94	32	11
Mountain Point, Kupreanof Island	adult male	07/10/94	33	10
Mountain Point, Kupreanof Island	juvenile female	08/10/94	10	21
Cat Creek, Port Houghton	adult female	07/13/94	11	16
Duncan Creek, Kupreanof Island	juvenile female	08/11/94	8	2

3 Initially radio-tagged on 07/13/93 at Big John Creek, Kupreanof Island. A total of 72 relocations have been recorded since this date.

4 Not captured in 1994. Relocations since date of mate's capture. Initially radio-tagged on 07/28/93 at Rowan Creek, Kuiu Island. A total of 71 relocations have been recorded since this date. A total of 70 relocations have been recorded to date for this female's 1993 mate, the Rowan Bay, Kuiu Island adult male, also radio-tagged on 07/13/93.

Table 3. (cont.)

## C. Chatham Area

Nest Site	Age/Sex	Date Tagged	# Reloc.	Max. Dist. (km)
Blueberry Hill, Douglas Island	adult female	06/23/94	22 <sup>5</sup>	7
Blueberry Hill, Douglas Island	adult male	06/23/94	19 <sup>5</sup>	9
Fish Creek, Douglas Island	adult female	06/24/94	23 <sup>6</sup>	14
Fish Creek, Douglas Island	adult male	06/24/94	25	6
Fish Creek, Douglas Island	juvenile female #1	08/02/94	9	85
Fish Creek, Douglas Island	juvenile female #2	08/02/94	10	53
Nugget Creek, Mendenhall Glacier	adult female	06/24/94	22 <sup>7</sup>	6
Nugget Creek, Mendenhall Glacier	adult male	06/24/94	19 <sup>7</sup>	8
Lace River, Berners Bay	adult female	06/27/94	16 <sup>8</sup>	14
Lace River, Berners Bay	adult male	06/27/94	16	11

5 Initially radio-tagged on 06/29/93 at same site. A total of 40 and 37 relocations have been recorded for the adult female and male, respectively, since this date.

6 Initially radio-tagged on 07/23/93 at Eagle Creek, Douglas Island site. A total of 38 relocations have been recorded since this date.

7 Initially radio-tagged on 07/01/93 at same site. A total of 45 relocations have been recorded since this date.

8 Initially radio-tagged 07/06/93 at Point Bridget, Echo Cove site. A total of 29 relocations have been recorded since this date.

**Table 4. Northern goshawk productivity observed at Southeast Alaska nests in 1994.**

Area	Nest	# of Young <sup>1,2</sup>
Ketchikan	Port Refugio, Suemez Island	0 <sup>3</sup>
	Butterball Lake, Heceta Island	3
	Traitors Creek, Revillagigedo Island	3
	Convenient Cove, Hassler Island	2
	Margaret Lake, Revillagigedo Island	2
Stikine	Totem Camp, Kupreanof Island	2
	Mitchell Creek, Kupreanof Island	3
	Mountain Point, Kupreanof Island	2
	Duncan Creek, Kupreanof Island	3
	East Site, Bay of Pillars, Kuiu Island	3
	West Site, Bay of Pillars, Kuiu Island	2
	Cat Creek, Cape Fanshaw	2
	Negro Creek, Port Houghton	3
	Sanborn Canal, Port Houghton	2
Chatham	Blueberry Hill, Douglas Island	2
	Nugget Creek, Mendenhall Glacier	2
	Fish Creek, Douglas Island	3
	Lace River, Berners Bay	1
	Mud Bay River, Chichagof Island <sup>4</sup>	2
	Distin Lake Trail, Admiralty Island	2
	Rodman Creek, Baranof Island	3
<b>Total number of young observed at 21 nests</b>		<b>47</b>
<b>Mean number of young/nest<sup>5</sup></b>		<b>2.2</b>

1 # of young equals number of fledglings observed, except at the Negro Creek and Lace River nests where only nestlings were observed.

2 Bold numbers indicate nests where both nestlings and fledglings were observed and all nestlings were known to have fledged.

3 Nest failed during early egg laying/incubation phase.

4 Site located in 1993. Active in 1994 but new nest not located.

5 Mean productivity of successful nests (20) is 2.3 young/nest.