

Executive Order 12866, dated September 30, 1993.

B. Regulatory Flexibility Act

DoD certifies that this final rule will not have a significant economic impact on a substantial number of small entities within the meaning of the Regulatory Flexibility Act, 5 U.S.C. 601, *et seq.*, because manufacturers of COTS items generally have not changed their manufacturing and purchasing practices based on DoD regulations. The burden generally falls on the Government to forego purchase of the item or to process a domestic nonavailability determination requested by the prime contractor. So far, only large contractors have had the resources to request a domestic nonavailability determination. If there is any impact of this rule, it should be beneficial, because small businesses providing COTS items, many of whom are subcontractors, will not have to—

- Rely on the prime contractor to request a domestic nonavailability determination from the Government; or
- Face the decision whether to cease doing business with the Government or set up systems to track and segregate all DoD parts that contain specialty metals.

C. Paperwork Reduction Act

The Paperwork Reduction Act does not apply, because this rule contains no information collection requirements that require the approval of the Office of Management and Budget under 44 U.S.C. 3501, *et seq.*

List of Subjects in 48 CFR Parts 202, 212, and 225

Government procurement.

Michele P. Peterson,

Editor, Defense Acquisition Regulations System.

■ Therefore, 48 CFR parts 202, 212, and 225 are amended as follows:

■ 1. The authority citation for 48 CFR parts 202, 212, and 225 continues to read as follows:

Authority: 41 U.S.C. 421 and 48 CFR Chapter 1.

PART 202—DEFINITIONS OF WORDS AND TERMS

■ 2. Section 202.101 is amended by adding the definition “Commercially available off-the-shelf item” to read as follows:

202.101 Definitions.

Commercially available off-the-shelf item—

- (1) Means any item of supply that is—
 - (i) A commercial item (as defined in FAR 2.101);

- (ii) Sold in substantial quantities in the commercial marketplace; and

- (iii) Offered to the Government, without modification, in the same form in which it is sold in the commercial marketplace; and

(2) Does not include bulk cargo, as defined in Section 3 of the Shipping Act of 1984 (46 U.S.C. App. 1702), such as agricultural products and petroleum products.

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PART 212—ACQUISITION OF COMMERCIAL ITEMS

■ 3. Section 212.570 is added to read as follows:

212.570 Applicability of certain laws to contracts and subcontracts for the acquisition of commercially available off-the-shelf items.

Paragraph (a)(1) of 10 U.S.C. 2533b, Requirement to buy strategic materials critical to national security from American sources, is not applicable to contracts and subcontracts for the acquisition of commercially available off-the-shelf items.

PART 225—FOREIGN ACQUISITION

■ 4. Section 225.7002–2 is amended by adding paragraph (q) to read as follows:

225.7002–2 Exceptions.

* * * * *

(q) Acquisitions of commercially available off-the-shelf items containing specialty metals. This exception does not apply when the specialty metal (e.g., raw stock) is acquired directly by the Government or by a prime contractor for delivery to the Government as the end item.

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Response to Court on Significant Portion of the Range, and Evaluation of Distinct Population Segments, for the Queen Charlotte Goshawk (*Accipiter gentilis laingi*)

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Response to court on significant portion of the range, and evaluation of distinct population segments.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce our

response to the May 24, 2004, order of the United States District Court for the District of Columbia in *Southwest Center for Biological Diversity, et al. v. Norton, et al.* (Civil Action No. 98–0934 (RMU)), directing the Service, on remand, to determine whether Vancouver Island constitutes a significant portion of the range of the Queen Charlotte goshawk (*Accipiter gentilis laingi*) and whether the goshawk should be listed as threatened or endangered on Vancouver Island, in connection with our 1997 finding on a petition to list the Queen Charlotte Goshawk as threatened or endangered under the Endangered Species Act of 1973, as amended (Act). After a thorough review of the best scientific and commercial data available, we conclude that Vancouver Island is a significant portion of the Queen Charlotte goshawk's range and that listing the subspecies on Vancouver Island is warranted.

In addition to addressing the court's remand, we have assessed whether listing is warranted for the Queen Charlotte goshawk beyond Vancouver Island. Our review has indicated that the subspecies' populations in British Columbia and Alaska each constitute distinct population segments (DPSs) of the Queen Charlotte goshawk. Based on differences in forest management, with substantially greater existing and anticipated habitat loss in British Columbia than in Alaska, we find that we have sufficient information about biological vulnerability and threats to the goshawk to determine that the entire British Columbia DPS warrants listing as threatened or endangered. We find that the best available information on biological vulnerability and threats to the goshawk does not support listing the Alaska DPS as threatened or endangered at this time. Pursuant to section 4(b)(3)(B)(ii) we will promptly publish in the **Federal Register** a proposed rule to list the British Columbia DPS of the Queen Charlotte goshawk. In that proposed rule we will indicate whether the British Columbia DPS and the Vancouver Island portion of the range should be listed as either endangered or threatened.

DATES: The finding in this document was made on November 8, 2007.

ADDRESSES: Submit data, information, comments, or questions regarding this finding to the Field Supervisor, U.S. Fish and Wildlife Service, Juneau Fish and Wildlife Field Office, 3000 Vintage Blvd., Suite 201, Juneau, AK 99801–7125.

FOR FURTHER INFORMATION CONTACT: Bruce Halstead, Field Supervisor, U.S.

Fish and Wildlife Service, Juneau Fish and Wildlife Field Office, 3000 Vintage Blvd., Suite 201, Juneau, AK 99801–7125; telephone 907–780–1161; facsimile 907–586–7154. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION: The supporting file for this finding is available for inspection, by appointment during normal business hours, at the street address listed in the **ADDRESSES** section. The April 25, 2007, status review for the Queen Charlotte goshawk, upon which much of this finding is based, and a list of all references cited in this finding are available online at <http://alaska.fws.gov/>.

Petition History and Previous Federal Actions

On May 9, 1994, the Service received a petition from eight conservation groups and two individuals to list the Queen Charlotte goshawk as endangered and to designate critical habitat. Logging of old-growth forest, where the bird nests and forages, was the primary threat identified. On August 26, 1994, we published our 90-day finding that the petition presented substantial information indicating that listing may be warranted, opened a public comment period, and initiated a status review to determine whether listing the subspecies was warranted (59 FR 44124).

Following our status review, we determined that listing the Queen Charlotte goshawk as threatened or endangered under the Act was not warranted and published our finding in the **Federal Register** on June 29, 1995 (60 FR 33784). We expressed concern for long-term viability of the bird under the existing management plan for the Tongass National Forest (covering about 80 percent of Southeast Alaska), but we acknowledged that a new management plan was being drafted, and the new plan was expected to provide improved protection for the subspecies. The June 1995 “not warranted” finding was challenged in the U.S. District Court for the District of Columbia, in a suit filed on November 17, 1995, by 8 of the original 10 petitioners, plus 2 additional conservation organizations and 1 additional individual. The district court granted summary judgment for the plaintiffs on September 25, 1996, holding that the Service should not have relied on “possible future actions” described in a draft revision to the 1979 Tongass Land Management Plan (TLMP) “to provide sanctuary for the goshawk.”

The decision was remanded to the Service with instructions to make a listing determination based on the existing 1979 TLMP (*Southwest Center for Biological Diversity v. Babbitt*, 939 F. Supp. 49 (D.D.C. 1996)). The district court established a deadline of May 31, 1997, for us to complete this analysis.

On May 23, 1997, the U.S. Forest Service (Forest Service) released a new land management plan. Therefore, we requested and received an extension from the district court of August 31, 1997, to review the petitioned action and the status of the subspecies in light of the new plan. On August 28, 1997, we published our new finding that listing the Queen Charlotte goshawk as threatened or endangered was not warranted (62 FR 46710). In 1998, this finding was challenged in the same district court, and on July 20, 1999, the finding was remanded to us, with instructions to provide a more accurate and reliable population estimate, and to consider a 1999 revision of the 1997 TLMP. We appealed the district court’s decision to the Court of Appeals for the District of Columbia. The court of appeals agreed with the Service and remanded the case back to the district court (*Southwest Center for Biological Diversity v. Babbitt*, 215 F. 3d 58 (DC. Cir. 2000)).

On July 29, 2002, a district court magistrate issued recommended findings that: (1) We had fulfilled our requirement to use the best scientific data available; (2) the “not warranted” determination was entitled to deference; (3) our determination that the Queen Charlotte goshawk would persist in Alaska and the Queen Charlotte Islands was not unreasonable; (4) Vancouver Island, which constituted one-third of the subspecies’ geographic range, was a “significant portion” of the subspecies’ range; and (5) our failure to make a specific finding as to the conservation status of the subspecies on Vancouver Island was a material omission. The magistrate recommended a remand to the Service to make a finding as to whether the Queen Charlotte goshawk should be listed based on its conservation status on Vancouver Island (*Southwest Center for Biological Diversity v. Norton*, No. 98–934, 2002 U.S. Dist. LEXIS 13661, (D.D.C. July 29, 2002)).

On May 24, 2004, a district court judge issued an order that adopted the magistrate’s recommendations, except for the magistrate’s finding that Vancouver Island constituted a significant portion of the range for the Queen Charlotte goshawk. Instead, the district court directed the Service upon remand to reconsider and explain any

determination as to whether or not Vancouver Island is a significant portion of the subspecies’ range, and assess whether the Queen Charlotte goshawk is endangered or threatened on Vancouver Island (*Southwest Center for Biological Diversity v. Norton*, No. 98–0934 (D.D.C. May 24, 2004)).

In the ten years since the Service’s 1997 determination on the petition to list the Queen Charlotte goshawk, the Service has obtained a substantial amount of new information and data relevant to the subspecies. Therefore, we updated our 1997 rangewide status review for the Queen Charlotte goshawk, to allow an evaluation of Vancouver Island’s significance in the context of current knowledge of the subspecies’ biology, habitat, and population status throughout its entire range. The updated status review (USFWS 2007) incorporates data and information on goshawks and forest management from a variety of sources including peer-reviewed scientific journals, agency reports, agency Web sites, public comments, and personal communications. Additional detail on many of the topics discussed below is available in the April 25, 2007, updated status review.

In October 2005, we hosted a workshop of goshawk experts who presented recent findings and suggested updates for portions of the 1997 status review. We also solicited input from the public through a December 15, 2005, notice in the **Federal Register** (70 FR 74284). We received and have evaluated information from 31 parties who commented during the 2005 notice’s 60-day comment period. Comments were submitted by wildlife agencies in Alaska and British Columbia, several falconers and falconry groups, two conservation groups (including one of the plaintiffs), a forest industry group, and several private citizens. Peer reviews of an updated draft of our status review by experts at Brigham Young University, the U.S. Forest Service, Alaska Department of Fish and Game, British Columbia Ministry of Environment, and the British Columbia Ministry of Forests and Range helped us improve the status review.

Below, we summarize the Service’s analysis of the best available data on the status of the Queen Charlotte goshawk. As directed by the court, we have evaluated whether Vancouver Island represents a significant portion of the Queen Charlotte goshawk’s entire range, and whether listing the subspecies as threatened or endangered is warranted for Vancouver Island.

We have also, of our own initiative, evaluated new information and data

relevant to the subspecies rangewide (described in the April 25, 2007, updated status review (USFWS 2007)) to determine whether listing is warranted. We conclude that there are two DPSs with different conservation status. As such, our finding includes a determination of the DPSs, and an evaluation of whether we have sufficient information on the biological vulnerability and threats to the subspecies to support listing the goshawk as threatened or endangered in all or a significant portion of the range of the DPSs.

Species Description

The Queen Charlotte goshawk is a comparatively small, dark subspecies of northern goshawk (*Accipiter gentilis*) that lives in the temperate rainforest archipelagos of Southeast Alaska and British Columbia. Adults have blue-gray to nearly black backs and tails, and gray bellies and chests that are finely marked with dark gray bars and streaks. A bold white stripe above the eye accents the vivid orange to bright scarlet eye. Females are larger than males; a sample of male goshawks trapped in Southeast Alaska averaged 29 ounces (827 grams), and females averaged 38 ounces (1074 grams) (Titus et al. 1994, p. 46), while males on Vancouver Island averaged 25 ounces (710 grams) and females 34 ounces (952 grams) (McClaren 2003, p. 39). Variation in color (Taverner 1940, pp. 158–159; Webster 1988, pp. 46–47; Flatten and McLaren 2003, p. 40) and size (Beebe 1974, p. 54; Titus et al. 1994, pp. 10–12; Flatten and McLaren 2003, p. 40; Flatten et al. 2002, p. 2) has been noted across the range of the subspecies, with birds averaging largest in the northern portion of their range (Titus et al. 1994, p. 12).

Taxonomy and Distribution

The Queen Charlotte goshawk was initially described and proposed as a subspecies by Taverner (1940, pp. 158–160) based on its darker coloration and geographic discreteness (Queen Charlotte and Vancouver Islands, British Columbia). The proposed subspecies was accepted by the American Ornithologists' Union in 1957 (AOU 1957, p. 103). Subsequent analyses added Southeast Alaska to the range of the subspecies (Beebe 1974, p. 54; Webster 1988, pp. 46–47) and established that the subspecies was smaller than goshawks elsewhere in North America, including those on the nearby British Columbia mainland (Johnson 1989, p. 638; Whaley and White 1994, pp. 179–181). Taxonomic treatments and reviews have generally accepted the Queen Charlotte goshawk

(*A. g. laingi*) as distinct from the subspecies found across most of North America (*A. g. atricapillus*) (reviewed in USFWS 2007, pp. 11–13).

Preliminary results of an investigation of genetic relationships among goshawks from within and around the reported range of the Queen Charlotte goshawk suggest that the birds on the Queen Charlotte Islands may be distinct from goshawks elsewhere (Talbot et al. 2005, p. 3), and that those on Vancouver Island are genetically closer to *atricapillus* than *laingi* (Talbot 2006, p. 1). To date, these potentially significant genetic data have not been reviewed by qualified taxonomists, and there have been no scientific publications or other reports proposing modification of currently accepted taxonomy for the species or subspecies. Accordingly, we continue to treat the birds on the Queen Charlotte Islands, Vancouver Island, and Southeast Alaska as within the range of the *laingi* subspecies.

We interpret the morphological and genetic variation found on Vancouver Island and in Southeast Alaska as “stable hybrid zones” (Haig et al. 2006, p. 7), where the *laingi* subspecies contacts the larger, lighter-colored *atricapillus* subspecies that inhabits most of North America. Flatten et al. (2002, p. 2) found that most adult goshawks in Southeast Alaska and on Vancouver Island showed at least partial expression of the darker *laingi* form. While this suggests an indefinite boundary, for purposes of this decision we include the mainland and islands of Southeast Alaska south of the international border between Mount Fairweather and Mount Foster, and Vancouver Island and the Queen Charlotte Islands in British Columbia, but not the British Columbia mainland (USFWS 2007, p. 14–21). This definition differs slightly from that used in our 1997 listing decision (62 FR 46710) as it incorporates nests in northern Southeast Alaska reported in 1999 and 2001.

For purposes of this finding, the term “Southeast Alaska” hereafter refers to the mainland and islands of Southeast Alaska south of the international border between Mount Fairweather and Mount Foster. “Vancouver Island” refers to Vancouver Island, British Columbia, and the smaller islands surrounding it. “Queen Charlotte Islands” refers to the Queen Charlotte Islands, British Columbia, also known by the Haida (First Nation) name of Haida Gwaii.

Some biologists believe that goshawks on the British Columbia coastal mainland, on Washington State's Olympic Peninsula, and in the Cascade Range of Washington and Oregon may

be Queen Charlotte goshawks, based on proximity of similar habitat (USFWS 2007, pp. 17–21). No taxonomists or goshawk researchers, however, have included these areas within published range descriptions for the subspecies since Jewett et al. (1953, p. 162) included “the Pacific slopes” of Washington and Oregon in the range of the subspecies. Subsequent authors have not accepted Jewett et al.'s (1953, p. 162) range extension, which was based on isolated museum specimens believed to represent rare incursion migrants (Whaley 1988, p. 47). We recognize that some goshawks on the coastal mainland of British Columbia and the Olympic Peninsula may exhibit *laingi* characteristics, because similar rainforest habitat exists there and is close enough for birds from Vancouver Island to reach. The only examinations of these birds that we are aware of, however, indicate that coastal mainland birds are larger than those on Vancouver Island (Johnson 1989, pp. 637–638; Whaley and White 1994, pp. 180–181; Flatten et al. 2002, p. 2). No analyses of plumage characteristics are available. Until data are available to demonstrate otherwise, we consider mainland British Columbia, Washington, and Oregon outside the range of the *laingi* subspecies.

Conservation Designations

In Canada, the *laingi* subspecies has been federally listed as “Threatened” under the Species at Risk Act (SARA) since 2002 (51 Eliz. II, Ch. 29), following listings by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as “Vulnerable” in 1995 and “Threatened” in 2000 (Cooper and Chytky 2000, p. 23; COSEWIC 2005, p. 1). British Columbia has included the subspecies on its “Red List,” indicating imperiled status, since 1998. In 2004, British Columbia designated the bird a Schedule 1 species at risk, indicating vulnerability to forest management and a need for protection beyond that provided by general forest management regulations (BCMSRM 2002, pp. 1–2; Barisoff 2004, p. 2; USFWS 2007, pp. 11–12).

The State of Alaska designated the bird a “species of concern” in 1998 due to threats to its nesting and foraging habitat, and the Forest Service designated it a “sensitive species” in 1994 (ADF&G 1998, pp. 1–2; USDA Forest Service 1997, p. 3/232). State, Provincial, and international heritage programs (which maintain data on species of concern) list the Queen Charlotte goshawk as “imperiled” State- and Province-wide, nationally, and globally (NatureServe 2005, p. 1).

Habitat

Queen Charlotte goshawks nest and forage in dense, wet, coastal rainforests. Goshawks in Southeast Alaska preferentially use medium and high volume forests for foraging and other daily activities and avoid non-forested and clear-cut areas. Young stands of regenerating forest (also called "second growth" or "second-growth forest") are avoided, probably because they are too dense for goshawks to effectively hunt.

Second-growth stands reach economic maturity as their growth rates begin to slow. Typically, trees of this age have not reached maximum size and the canopy of these stands is usually uniformly dense. There is usually little understory unless the stand has been thinned. In this finding, we refer to such stands as "mature" or "mature second growth". Goshawks use such stands in proportion to their availability (Titus et al. 1994, pp. 19–24; Iverson et al. 1996, pp. 27–40), and may nest in mature stands where old growth is limited.

"Old growth" or "old forest" refers to a structural stage of forest characterized by several age classes of trees, including dominant trees that have reached the maximum size typical for the site, accumulations of dead, dying, and decaying trees and logs, and younger trees growing in gaps between the dominant trees. Such stands are typically over 250 years old within the range of the Queen Charlotte goshawk, and have not been previously harvested.

The term "productive forest" typically describes forest land capable of producing stands of trees large enough to support commercial timber harvest. Productive forest may be of any age, from young second growth to old forest. Non-productive or "scrub" forest is land that supports over 10 percent cover by trees that are too small to be of commercial value. For purposes of this document, we use "productive forest", as defined by the U.S. Forest Service and the British Columbia Ministry of Forests and Range (USFWS 2007, pp. 32 and 139), as a reasonable approximation of goshawk habitat amount and distribution because goshawks have shown positive selection for such stands unless they have been converted to second growth. Low-productivity forests are used for foraging in proportion to their availability, indicating neither selection for, nor avoidance of, these habitats (Titus et al. 1994, pp. 19–24; Iverson et al. 1996, pp. 27–40). Non-productive forest that has not been harvested is, by definition, old growth forest, but in this finding we use the terms old growth and old forest to

describe only productive forest that has not been previously harvested.

Nests are typically located in large trees within mature or old growth forest stands that have greater volume and canopy cover than the surrounding forest (Iverson et al. 1996, pp. 47–56; Flatten et al. 2002, pp. 2–3; McClaren 2003, p. 12; McClaren and Pendergast 2003, pp. 4–6; Doyle 2005, pp. 12–14; USFWS 2007, pp. 26–30). As with goshawks elsewhere, nesting pairs appear to be territorial, with nests spaced somewhat uniformly across available habitat. Thorough searches on Vancouver and the Queen Charlotte Islands have documented goshawk nest stands spaced 4 to 9 miles (7 to 15 kilometers (km)) apart, as compared to 2 to 5 miles (3 to 7 km) apart for goshawks outside the range of the Queen Charlotte subspecies (McClaren 2003, pp. 13 and 21; Doyle 2005, p. 15; USFWS 2007, pp. 45–47).

Mature and old forest habitat provides productive habitat for prey species in a setting that goshawks can effectively hunt (see Food Habits). Such habitat appears to be critical in the vicinity of the nest (Ethier 1999, p. 31; Finn et al. 2002, pp. 270–271; McClaren 2003, pp. 11 and 16; Desimone and DeStefano 2005, pp. 317–318; Patla 2005, pp. 328–330), where it is used by fledglings learning to fly and hunt (Reynolds et al. 1992, pp. 15–16; Kennedy et al. 1994, p. 80; McClaren et al. 2005, pp. 260–261).

Doyle (2005, p. 14) found that all 10 known nest territories on the Queen Charlotte Islands had at least 41 percent mature and old growth forest, and successful nest territories had at least 60 percent mature-old growth forest, suggesting that about half of the territory must be mature or old forest to support nesting goshawks.

Food Habits

Goshawks hunt primarily by flying between perches and launching attacks from those perches. They take a variety of medium-sized prey, depending largely on local availability (Squires and Reynolds 1997, p. 1), which varies markedly among the islands in the Queen Charlotte goshawk's range. Red squirrels (*Tamiasciurus hudsonicus*) and sooty grouse (*Dendragapus fuliginosus*) (formerly blue grouse, *D. obscurus*) form the bulk of the diet in many locations (although neither occur on Prince of Wales and nearby islands in southern Southeast Alaska), with thrushes, jays, crows, ptarmigan, and woodpeckers frequently taken as well (Ethier 1999, pp. 21–22 and 32–47; Lewis 2001, pp. 81–107; Lewis et al. 2004, pp. 378–382; Doyle 2005, pp. 30–31). During winter, many avian prey

species migrate from the region, reducing the variety and abundance of prey available. Rabbits and hares are frequently taken by goshawks during winter elsewhere, but within the range of the Queen Charlotte goshawk, rabbits and hares are limited to portions of the mainland, Vancouver Island (BC), and Douglas Island (AK) (Ethier 1999, p. 22; MacDonald and Cook 1999, pp. 23–24; Nagorsen 2002, pp. 92–97; Doyle 2005, p. 31).

Prey availability is defined by both prey abundance and suitability of habitat for successful hunting. Timber harvest typically results in prey declines because few potential prey species adapted to open and edge habitats exist within the range of the Queen Charlotte goshawk (Iverson et al. 1996, pp. 59–61; Doyle and Mahon 2003, p. 39; USFWS 2007, pp. 42–45). Goshawks hunt from perches and have limited ability to take prey far from forest cover (i.e., in large openings created by logging). Potential prey animals that use dense second-growth stands (which typically follow logging) are likely to be unavailable, because these stands do not offer adequate flight space for goshawks (DeStefano and McCloskey 1997, p. 38; Beier and Drennan 1997, p. 570; Greenwald et al. 2005, pp. 125–126; USFWS 2007, pp. 62–67).

Home Range and Seasonal Movements

Breeding-season home ranges average about 11,000 acres (ac) (4,500 hectares (ha)) for females and 15,000 ac (6,000 ha) for males. During winter, Queen Charlotte goshawks typically shift their activity centers and range farther, but remain in the region. Females often move more than males during winter, when use areas average about 84,000 ac (34,000 ha) for females and 47,000 ac (19,000 ha) for males. Males apparently remain within or near their nesting home ranges during winter, while some females leave their nesting areas altogether to winter elsewhere in the region (Flatten et al. 2001, pp. 9–11; Lewis and Flatten 2004, pp. 2–3; McClaren 2004, p. 6). Following winter, some females and apparently all surviving males return to their previously used nesting areas, while some females move to new nesting areas and pair with new mates (Flatten et al. 2001, p. 9–11).

Reproduction

Nest occupancy (percentage of nest areas with adult goshawks present) and nesting activity (percentage of nest areas with eggs laid) appear to vary with habitat suitability (Ethier 1999, p. 31; Finn et al. 2002, pp. 270–271; McClaren 2003, pp. 11 and 16; Desimone and

DeStefano 2005, pp. 317–318; Patla 2005, pp. 328–330), prey availability (Doyle and Smith 1994, p. 126; McClaren et al. 2002, p. 350; Ethier 1999, p. 36; Salafsky et al. 2005, pp. 242–244), and weather (Patla 1997, pp. 34–35; Finn et al. 1998, p. 1; McClaren et al. 2002, p. 350; Fairhurst and Bechard 2005, pp. 231–232), with greater occupancy or activity in areas with less fragmented forest habitat and in years with higher prey abundance and with warmer, drier weather.

Individual nests are frequently not used in subsequent years as pairs often move to an alternate nest. Most alternate nests are clustered within a few hundred hectares (McClaren 2003, p. 13; Flatten et al. 2001, p. 9), although females have been documented leaving the nesting area altogether and nesting in subsequent years with a new mate in a different territory up to 95 miles (152 km) away. Males have been documented moving up to 2 miles (3.2 km) between subsequent nests, but apparently remain in their nesting area in subsequent years (Flatten et al. 2001, pp. 9–10).

When prey availability and weather are suitable and nesting is initiated, nest success (percent of active nests that fledge at least one young) is typically high (87 percent rangewide, 1991 to 2004), as is productivity (1.6 to 2.0 fledglings per active nest) (USFWS 2007, p. 54), although Ethier (1999, p. 31) found higher productivity in contiguous old and mature second growth forests than in fragmented forest.

Fledglings typically spend about 6 weeks within several hundred yards of their nests, in an area of 570 ac (230 ha) or less (average 146 ac (59 ha)) learning flight and hunting skills before dispersing (McClaren et al. 2005, p. 257). Retention of mature forest structure near the nest is believed to be important for supporting this developmental stage (Reynolds et al. 1992, pp. 15–16; Kennedy et al. 1994, p. 80; McClaren et al. 2005, pp. 260–261). Adults continue to feed the young and protect them from predators during this period. In Southeast Alaska, juveniles moved up to 100 miles (160 km) (some possibly farther as their radio-telemetry signals were lost) to areas where they either spent the winter or died (Iverson et al. 1996, p. 30).

Survival Rates

Annual survival rates for adult goshawks in Southeast Alaska were low for males (0.59) and for females that wintered in the same area where they nested (0.57), but high for females that left their breeding areas during the winter (0.96), with most mortality occurring in winter (Flatten et al. 2002,

p. 3; Titus et al. 2002, p. 1; McClaren 2003, p. 23).

Life-table calculations using vital rates observed and inferred from Southeast Alaska suggest that juvenile survival must approach 50 percent and a high proportion of adults must breed if goshawk populations are to remain stable in the region (USFWS 2007, pp. 58–59). Population viability analyses for goshawks on the Queen Charlotte Islands (approximately 12 percent of the subspecies' geographic range) estimate the probability of long-term population survival to be between 0 and 31 percent, due primarily to stochastic effects on the small population likely to remain after projected logging occurs (Doyle and Holt 2005, p. 7). Data on juvenile survival, age at first breeding, and percent of adults breeding, however, are lacking for Queen Charlotte goshawks. Therefore, these demographic models are necessarily speculative, and of limited reliability.

Population Estimates

Goshawk populations are difficult to census, but breeding pair populations have been estimated by adjusting habitat capability (number of potential territories) to reflect observed nest area occupancy rates. Marquis et al. (2005, pp. 22–26) calculated habitat capability for Vancouver Island by extrapolating mean nest spacing (4.3 mi (7 km) between adjacent nests) to determine that up to 126 territories could fit on the island. Potential territories were ranked by the percentage of suitable habitat (defined by stand age, tree species, biogeoclimatic subzone, and canopy closure). Only 103 territories had more than 25 percent suitable habitat, 44 had more than 50 percent suitable habitat, and 6 had more than 75 percent suitable habitat.

It is not known how much suitable habitat is required within a territory, and the amount probably varies depending on the prey community present in the area, but Doyle (2005, p. 14) found that all 10 known nest territories (25,000-ac (10,000-ha) circles centered on the nests) on the Queen Charlotte Islands had at least 41 percent mature and old growth forest, and successful nests had at least 60 percent mature-old growth forest. Iverson et al. (1996, p. 55) documented an average of 51 percent coverage by productive mature and old forest in 10,000-acre (4,000 ha) circles surrounding nests in Southeast Alaska, although coverage by productive forest ranged from 22 to 89 percent. These observations suggest that territories composed of 50 percent or more productive mature and old forest provide the best habitat, although some

pairs will use territories with lesser amounts of this preferred habitat. We therefore conclude that Vancouver Island may support about 44 to 100 viable territories. Given recent nest occupancy rates of 55 percent on Vancouver Island (McClaren 2006, p. 8), there may be only 24 to 45 breeding pairs on average. In years with abundant prey and good weather, nest activity is likely to be higher, but based on territory spacing, it seems unlikely that there could be more than about 100 pairs on Vancouver Island.

McClaren (2006, p. 8) applied the observed 55 percent nest occupancy rate to Cooper and Chytk's (2000, p. 19) less sophisticated estimate that Vancouver Island might have space for up to 300 territories, to calculate an average of 165 breeding pairs on Vancouver Island.

Marquis et al. (2005, pp. 27–28) plotted 53 potential nesting areas on the Queen Charlotte Islands, 47 of which contained more than 25 percent suitable habitat and 9 of which contained more than 50 percent suitable habitat. Recent nest occupancy rates of 43 percent on the Queen Charlotte Islands (McClaren 2006, p. 8) suggest there may be only 4 to 20 pairs on the Queen Charlotte Islands in average years.

Doyle and Holt (2005, p. 4) plotted 61 potential territories on the Queen Charlotte Islands, 24 to 43 of which were thought to be viable based on the percentage of mature and old forest cover. McClaren (2006, p. 8) adjusted that estimate with recent nest area occupancy rates from the Queen Charlotte Islands (43 percent) to estimate that there may be 10 to 18 breeding pairs. Doyle (2005, pp. 13–18) plotted 58 potential territories on the Queen Charlotte Islands, but only 10 to 25 had adequate habitat to support nesting. Doyle (2005, p. 18) used nest activity rates to estimate that 4 to 13 of those territories might support breeding. Cooper and Chytk (2000, p. 20) estimated that the Queen Charlotte Islands might support 50 pairs, based on their analysis of relative size and perceived habitat quality compared to Vancouver Island. Doyle (2007, p. 6) documented 6 active nests on the Queen Charlotte Islands in 2006.

An interagency modeling effort using observed home range sizes estimated that the Tongass National Forest (76 percent of the total area and 85 percent of the productive forest in Southeast Alaska) could hold 580 to 747 nesting territories, depending on how suitable habitat is defined (Schempf and Woods 2000, pp. 1–8; Schempf 2000, p. 1). Adjustment to reflect 45 percent territory occupancy observed in

Southeast Alaska, 1991 to 1999 (Flatten et al. 2001, p. 7) suggests 261 to 336 breeding pairs on the Tongass National Forest. Extrapolation of this number suggests 300 to 400 pairs across Southeast Alaska. An earlier habitat capability model based on home range sizes suggested that Southeast Alaska may hold between 100 and 200 breeding pairs (Crocker-Bedford 1994, p. 4).

We consider the habitat capability estimates by Marquis et al. (2005, pp. 22–28) to represent the best available data for Vancouver Island, those of Doyle and Holt (2005, p. 4) to be the best available for the Queen Charlotte Islands, and the interagency effort described by Schempf and Woods (2000, pp. 1–8) to be the best available for Southeast Alaska. These estimates are judged better than other available estimates because they were based on evaluation of territory-sized arrangement of habitat, rather than region-wide estimates of habitat (e.g., Crocker-Bedford 1994, Cooper and Chytky 200, p. 19). We favor Doyle and Holt's (2005, p. 4) estimate for the Queen Charlotte Islands over Marquis et al.'s (2005, p. 27–28) estimates for those islands because of Doyle's field experience with goshawks on those islands (which Marquis et al. lacked). Doyle and Holt's (2005, p. 4) effort represented a refinement of Doyle's (2005, p. 18) estimates, so we favor the former. None of the models have been verified, and we consider all to be of low precision. Based on these models, a review of the range of estimates available, and discussions with goshawk biologists, we estimate that Vancouver Island may have about 50 to 100 pairs, the Queen Charlotte Islands 8 to 15 pairs, and Southeast Alaska 300 to 400 pairs. We believe the rangewide population is approximately 350 to 500 pairs, plus an unknown number of non-breeding juveniles and adults.

Populations are believed to have declined, primarily due to timber harvest since the mid 1900s, although direct measures of goshawk populations and population trends are not available. Habitat models suggest that habitat capability has declined 30 percent in Southeast Alaska, 50 percent rangewide (Crocker-Bedford 1990, pp. 6–7), and by 57 to 81 percent on the Queen Charlotte Islands (Doyle 2005, pp. 15–16). Further declines are projected on the Queen Charlotte Islands through year 2050 (Doyle and Holt 2005, p. 4). Habitat capability projections are not available for Vancouver Island.

Response to the District Court's Question on Vancouver Island

In its May 24, 2004 order, the D.C. District Court directed the Service in connection with its 1997 12-month finding under 16 U.S.C. 1533(b)(3)(B), to reconsider and explain a determination as to whether or not Vancouver Island is a "significant portion" of the Queen Charlotte goshawk's entire range, and to assess whether the subspecies is endangered or threatened on Vancouver Island (*Southwest Center for Biological Diversity v. Norton*, No. 98–934, 2002 U.S. Dist. LEXIS 13661, (D.D.C. July 29, 2002).

The Act defines an endangered species as one "in danger of extinction throughout all or a significant portion of its range", and a threatened species as one "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The term "significant portion of its range" is not defined by the statute.

For purposes of this finding, a significant portion of a species' (or subspecies') range is an area that is important to the conservation of the species because it contributes meaningfully to the representation, resiliency, or redundancy of the species. Adequate representation insures conserving the breadth of the genetic makeup of the species needed to conserve its adaptive capabilities. Populations in peripheral areas, for example, may be important in this aspect. Resilience refers to the ability of a species to recover from periodic disturbances or environmental variability. In general, a species is usually most resilient in highest quality habitat. Redundancy of populations is needed to provide a margin of safety for the species to withstand catastrophic events. The contribution of the range portion must be at a level such that its loss would result in a decrease in the ability to conserve the species. It does not mean however, that if such portion of the range were lost, the species as a whole would be in danger of extinction immediately or in the foreseeable future; rather, that the ability to conserve the species would be compromised.

We estimate that Vancouver Island once held approximately 37 percent of the Queen Charlotte goshawk's habitat, yet due to disproportionate logging, now contains about 27 percent (USFWS 2007, pp. 99–101). Population estimates are uncertain, but there are probably only several hundred breeding pairs of Queen Charlotte goshawks throughout the entire range of the subspecies. Vancouver Island may support 50 to 100

breeding pairs, or about 15 to 20 percent of the rangewide population. Given the apparently low numbers of breeding pairs rangewide, loss of the Vancouver Island population would result in a meaningful decrease in redundancy and resilience of the rangewide goshawk population, and increase rangewide demographic vulnerability.

Preliminary genetic results suggest that goshawks on Vancouver Island may be genetically distinct from goshawks on the Queen Charlotte Islands and in Southeast Alaska (Talbot et al. 2005, pp. 2–3; Talbot 2006, p. 1). These potentially significant findings, if confirmed by peer review and/or corroborated by additional work, may provide additional indication of the significance of the Vancouver Island population because loss of genetic variability found there could reduce both representation and resilience of the subspecies, as defined above. This genetic diversity, for example, may help allow the subspecies to respond and adapt to future environmental changes, particularly as warmer-adapted forest communities move northward in response to climate change.

In summary, the Queen Charlotte goshawk population on Vancouver Island contributes to the redundancy of the subspecies rangewide, as this area historically provided a significant amount of goshawk habitat, and continues to do so by supporting a significant proportion of the rangewide population. We therefore conclude that Vancouver Island is a significant portion of the Queen Charlotte goshawk's entire range. Further, genetic variation present in the goshawk population on Vancouver Island may be important to the long-term conservation of the species, and potentially provides additional (although unconfirmed at this time) support for Vancouver Island as a significant portion of the subspecies' range.

The goshawk population on Vancouver Island lies within the British Columbia DPS, which we discuss in the next section (see *Distinct Population Segments*). As such, threats to the goshawk on Vancouver Island and elsewhere within the British Columbia DPS are evaluated in detail below (see *British Columbia Distinct Population Segment*). The court's question of whether listing is warranted for the Queen Charlotte goshawk on Vancouver Island, is addressed following our analysis of threats within the British Columbia DPS (see *Significant Portions of the British Columbia DPS's Range*).

We ultimately conclude that we have sufficient information to support listing the subspecies as threatened or

endangered in the British Columbia DPS, which includes the Vancouver Island SPR (See British Columbia DPS Finding). Because this determination covers all of the Vancouver Island SPR, a separate listing determination for the Vancouver Island SPR is not needed at this time. As we formally propose to list the British Columbia DPS of the Queen Charlotte goshawk, we will make a separate determination of listing status for the Vancouver Island SPR.

Distinct Population Segments

Section 2(16) of the Act defines “species” to include “any distinct population segment of vertebrate fish or wildlife which interbreeds when mature.” To interpret and implement the DPS provisions of the Act and Congressional guidance, the Service and the National Marine Fisheries Service published a Policy Regarding the Recognition of Distinct Vertebrate Population Segments in the **Federal Register** (DPS Policy) on February 7, 1996 (61 FR 4722). Under the DPS policy, three factors are considered in a decision concerning the establishment and classification of a possible DPS. These are applied similarly for additions to the list of endangered and threatened species. The first two factors—discreteness of the population segment in relation to the remainder of the taxon and the significance of the population segment to the taxon to which it belongs—bear on whether the population segment is a valid DPS. If a population meets both tests, it is a DPS and then the third factor is applied—the population segment’s conservation status in relation to the ESA’s standards for listing, delisting or reclassification (i.e., is the population segment endangered or threatened).

Discreteness Analysis

Under the DPS policy, a population segment of a vertebrate taxon may be considered discrete if it satisfies either of the following conditions: (1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation; or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of Section 4(a)(1)(D) of the Act.

Queen Charlotte goshawks in British Columbia (on the Queen Charlotte Islands and Vancouver Island) are

separated from those in Southeast Alaska by an international border. The subspecies is listed as Threatened under the SARA by the Canadian Federal Government, and as a Species at Risk by the British Columbia Provincial Government. Management of habitat and the mechanisms that regulate that management differ substantially, with greater levels of habitat loss from logging in British Columbia than in Southeast Alaska. In Southeast Alaska, approximately 13 percent (880,000 ac (356,000 ha)) of the 6.4 million ac (2.6 million ha) of productive forest has been harvested to date, with another 15 percent (929,000 ac (376,000 ha)) expected to be harvested over the next 50 to 100 years (USFWS 2007, pp. 96–98, and Appendix A, Table A–9). In British Columbia, 45 percent (3.7 million ac (1.5 million ha)) of the 8.4 million ac (3.4 million ha) of productive forest has been harvested to date, with another 14 percent (1.2 million ac (480,000 ha)) expected to be harvested over the next 40 years (USFWS 2007, pp. 96–98, and Appendix A, Table A–9). Designated parks, reserves, and other non-development designations protect about 55 percent (3.5 million ac (1.4 million ha)) of the productive forest in Southeast Alaska and about 9 percent (776,000 ac (314,000 ha)) in British Columbia (USFWS 2007, pp. 96–98, and Appendix A, Table A–9).

Based on the differences in conservation status, habitat management, and regulatory mechanisms (discreteness criteria 2), we conclude that the “British Columbia” population and the “Southeast Alaska” populations are each discrete.

Significance Analysis

If a population segment is considered discrete under one or more of the conditions described in our DPS policy, its biological and ecological significance is to be considered in light of Congressional guidance that the authority to list DPSs be used “sparingly” while encouraging the conservation of genetic diversity. In carrying out this examination, we consider available scientific evidence of the population segment’s importance to the taxon to which it belongs. This consideration may include, but is not limited to: (1) Its persistence in an ecological setting unusual or unique for the taxon; (2) evidence that its loss would result in a significant gap in the range of the taxon; (3) evidence that it is the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; or (4) evidence that the discrete population segment

differs markedly from other populations of the species in its genetic characteristics. A population segment needs to satisfy only one of these criteria to be considered significant. Furthermore, the list of criteria is not exhaustive; other criteria may be used, as appropriate. Below, we consider the biological and ecological significance of the Southeast Alaska DPS, followed by the British Columbia DPS.

Southeast Alaska: The ecological setting in Southeast Alaska encompasses the northernmost occurrences of the subspecies, where it confronts colder temperatures year-round and more snow at low elevation during winter, especially in the northern portion of the range. Loss of this segment would result in a significant gap in the subspecies distribution, as approximately two-thirds of the land area and about 60 percent of the remaining habitat for the subspecies is in Southeast Alaska (USFWS 2007, Appendix A, Tables A–9 and A–12). Southeast Alaska formerly held 52 percent of the rangewide habitat for Queen Charlotte goshawks, but now has 61 percent and is projected to have 66 percent by 2100 (USFWS 2007, pp. 99–101). This area supports most of the world’s population of Queen Charlotte goshawks, without which the subspecies would be restricted to the heavily impacted and vulnerable forests of coastal British Columbia. Therefore, we conclude that the Southeast Alaska population of the Queen Charlotte goshawk is significant to the taxon to which it belongs.

British Columbia: Loss of the Queen Charlotte goshawk from British Columbia would result in a significant gap in the subspecies’ distribution, as approximately one-third of the land area and half of the productive forest (much of which has been harvested) is in British Columbia (USFWS 2007, Appendix A, Tables A–9 and A–12). As a result, we conclude that the British Columbia population of the Queen Charlotte goshawk is significant to the taxon to which it belongs. Further, preliminary genetic results additionally suggest that goshawks on the Queen Charlotte Islands and Vancouver Island may be distinct from those in Southeast Alaska (Talbot et al. 2005, pp. 2–3; Talbot 2006, p.1), and appear to encompass much of the genetic diversity present in the taxa. These potentially significant findings, if confirmed by peer review and/or corroborated by additional work, may provide additional indication of the significance of the British Columbia population segment.

Summary: As a result of the analysis described above, we find that the Southeast Alaska and British Columbia populations of Queen Charlotte goshawks are each discrete, as well as significant in relation to the remainder of the taxon; thus, are two separate, valid DPSs.

Factors Affecting Distinct Population Segments

Section 4 of the Act (16 U.S.C. 1533) and implementing regulations (50 CFR 424) describe procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a), we may list a species on the basis of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

An endangered species is defined by the Act, with exception, as “any species which is in danger of extinction throughout all or a significant portion of its range.” A threatened species is defined as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” A species is defined by the Act to include “any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.”

Since we have identified Southeast Alaska and British Columbia as two separate, valid DPSs, we next evaluate each DPS with regard to its potential threatened or endangered status using the five listing factors enumerated in section 4(a) of the Act. Additional detail on our analyses of these factors is available in our updated status review dated April 25, 2007 (USFWS 2007, pp. 102–121).

Southeast Alaska Distinct Population Segment

On May 24, 2004, the U.S. District Court ruled that the Service’s 1997 decision to not list the Queen Charlotte goshawk as endangered or threatened based on its status in Southeast Alaska was neither arbitrary nor capricious, and the court showed deference to the agency on the technical and scientific conclusions in this case (*Southwest Center for Biological Diversity v. Norton*, No. 98–0934 (D.D.C. May 24, 2004)). Below, we provide an updated analysis

of factors affecting the subspecies in Southeast Alaska.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of the Species’ Habitat or Range

Mature and old forest provides nesting and foraging habitat for goshawks, and supports populations of preferred prey (see Habitat and Food Habits sections, above). Logging within and near nest stands has been implicated in nest site abandonment, although effects of such logging on productivity have varied (Crocker-Bedford 1990, pp. 263–266; Penteriani and Faivre 2001, p. 213; Doyle and Mahon 2003, p. 39; Mahon and Doyle 2005, pp. 338–340; Doyle 2006, pp. 138–139). Clearcut logging also reduces prey populations (USFWS 2007, pp. 62–64) and negatively impacts foraging habitat by removing perches and hunting cover, creating openings and dense second-growth stands that are avoided by goshawks in Southeast Alaska (Iverson et al. 1996, p. 36).

Timber harvest began in Southeast Alaska in the early 1900s and peaked in the 1970s. Since then, harvests have declined dramatically due primarily to declining market demand and other economic conditions (Brackley et al. 2006, pp. 11–15; USFWS 2007, p. 73). Approximately 13 percent (880,000 ac (356,000 ha)) of the 6.4 million ac (2.6 million ha) of productive forest within the range of the Queen Charlotte goshawk in Alaska has been harvested to date, with another 15 percent (929,000 ac (376,000 ha)) expected to be harvested over the next 50 to 100 years (USFWS 2007, pp. 96–98, and Appendix A, Table A–9). Designated parks, reserves, and other non-development designations protect about 55 percent (3.5 million ac (1.4 million ha)) of the productive forest. Some productive forest outside designated reserves will be retained on either inoperable ground (e.g., too steep, unstable, or wet; 9 percent of the productive forest) or in retention areas designed to protect other resources (e.g., beach and stream buffers; 7 percent of the productive forest) on lands otherwise available for timber production (USFWS 2007, pp. 96–98, and Appendix A, Table A–9).

Approximately 85 percent of the 6.4 million ac (2.6 million ha) of productive forest in Southeast Alaska is managed by the U.S. Forest Service (USFWS 2007, Appendix A, Table A–9) under the terms of the TLMP, which includes a conservation strategy intended to reduce impacts of forest management on vulnerable species. Included are old

growth reserves and other Forest Service non-development land use designations (such as Wilderness, Remote Recreation, Municipal Watershed, etc.), corridors of unharvested forest linking reserves, goshawk nest buffers, canopy retention in harvest units on part of one island, and pre-project goshawk surveys to locate nests prior to timber harvest.

Details of the conservation strategy were developed collaboratively by a planning team consisting of managers, research scientists, and resource specialists from the Forest Service, Service, and Environmental Protection Agency (Everest 2005, p. 21). The Alaska Department of Fish and Game was also closely involved. During development of the conservation strategy, the Forest Service published a conservation assessment for goshawks in Southeast Alaska (Iverson et al. 1996, pp. 1–101), and hosted goshawk risk assessment panels in 1995 and 1997 (Shaw 1999, p. 18). Biologists from the Forest Service, Service and the Alaska Department of Fish and Game were involved with the conservation assessment and the risk assessment panels.

Existing standards and guidelines within the TLMP are projected to maintain approximately 66 percent of the 2 million ac (807,000 ha) of productive old growth forest in areas open to commercial timber harvest on the Tongass National Forest (USFWS 2007, Appendix A, Table A–9). Under the current TLMP, operability standards that define the physical limitations of timber harvest due to factors such as slope and soil stability are projected to protect 35 percent of the remaining old growth in areas otherwise available for harvest. Areas with such limitations are termed “inoperable”. Retention of forest stands to protect non-timber resources (such as fish-bearing streams, marine shorelines, eagle nests, wolf dens, caves, and cultural sites) is expected to protect an additional 31 percent of the old growth in areas open to timber harvest (USFWS 2007, p. 72, Table 9).

Small Old Growth Reserves or land use designations that prohibit timber harvest protect at least 16 percent of the land and at least 8 percent of the productive forest in each Value Comparison Unit (VCU) open for timber harvest. VCUs vary from about 1,000 acres (400 ha) to nearly 9,000 acres (3,600 ha), and generally follow the boundaries of medium-order watersheds. Designation of Small Old Growth Reserves and other non-development designations in VCUs open to timber harvest is in addition to whatever inoperable and retention areas

exist within the timber production designation.

There are approximately 3.7 million acres (1.5 million ha) open to logging on the Tongass National Forest (USDA Forest Service 1997, ROD p. 7), but only 2.0 million acres (0.8 million ha) support productive forest (USFWS 2007, Table A-9, p. 129); that is, lands open to logging are 54 percent forested. Retention of 66 percent of the productive old forest within the area open to timber harvest will therefore result in a landscape with an average of about 36 percent cover by old forest. Old Growth Reserves protect an additional 8 percent or more of the productive forest within each watershed otherwise open for timber harvest, and maturing second growth will provide additional habitat. We therefore expect that approximately 45 percent of the harvested landscape will support productive old or mature forest, once all forest available for harvest is converted to second growth.

Across all ownerships in Southeast Alaska, approximately 41 percent of the vegetated landscape (i.e., ice, bare rock, water, and other non-vegetated areas that are not goshawk habitat excluded) is covered by productive mature and old forest (Albert 2007, p. 2).

Doyle (2005, p. 14) found that nest territories on the Queen Charlotte Islands had at least 41 percent mature and old forest, and successful nests had at least 60 percent mature and old forest in the 25,000 ac (10,000 ha) surrounding the nest. Productive old and mature forest covered an average of 51 percent of each 10,000 ac (4,000 ha) circle surrounding 34 nests in Southeast Alaska (Iverson et al. 1996, p. 55). These observations lead us to believe that retention of 66 percent of the existing productive old forest within the otherwise harvested matrix of the Tongass National Forest, in addition to Small Old Growth Reserves in every watershed open to logging, and larger reserves outside the harvested matrix, will provide adequate nesting and foraging habitat for goshawks on the Tongass National Forest.

Nest trees discovered on the Tongass National Forest during pre-project surveys are protected from harvest and disturbance with 100-ac (40-ha) buffers (USDA Forest Service 1997, pp. 4-89). Because goshawks are sometimes secretive at their nests and may not be detected during pre-project surveys (Boyce et al. 2005, pp. 296-302), we expect that some nest stands will be inadvertently harvested. We expect this to be a relatively rare event that would usually lead to reproductive failure for the affected pair that year. Occasional

nest failures occur naturally for various reasons, and a small number of such failures resulting from timber harvest is not likely to jeopardize the population if suitable alternate nest sites are available for subsequent nesting seasons. In most cases we expect that suitable alternative nest stands will be available in nearby reserves, retention areas, or on inoperable lands. Thus, while we believe that surveys for Queen Charlotte goshawk nests prior to timber harvest are important to the conservation of the subspecies, we do not consider occasional failure of such surveys to detect goshawks that are present to be a significant threat to the continued existence of the Queen Charlotte goshawk.

In 1954, prior to large-scale industrial timber harvest, the Tongass National Forest had 416 watersheds (as approximated by VCUs) with greater than 48 percent mature and old forest. By 1995, logging had reduced this number to 347, a 17 percent decline. Projections of logging on the Tongass National Forest done in 1997, based on full implementation of the 1997 TLMP, predicted that watersheds with greater than 48 percent mature and old forest would decline to 294 by 2055 (a 15% decrease from 1995 levels) and recover somewhat, to 338 by 2095 (3% decline from 1995) as second-growth matured (USFWS 2007, pp. 75-78). Since 1997, far less timber has been harvested than anticipated (30 to 50 million board feet annually, rather than the 267 million board feet annually used in the projections), so we expect impacts to goshawk territories to be much lower than predicted in 1997. Current projections of timber harvests are quite uncertain, with estimates of annual demand ranging from 48 to 370 million board feet (Brackley et al. 2006, p. 2). Unless new processing facilities are developed, timber harvests on National Forest lands are likely to remain well below 267 million board feet, as allowed under the TLMP (Brackley et al. 2006, pp. 24-27).

Most or all of the Queen Charlotte goshawk territories in which timber harvest will occur will likely remain viable territories because the conservation strategy within the TLMP ensures adequate amounts of mature and old forest will be available to support nesting and foraging. Reduced demand for wood from the Tongass National Forest, as compared to the 50 years prior to 1997 when now-defunct pulp mills were operating, is expected to result in lower impacts than previously believed. Therefore, we believe that the conservation strategy contained in the TLMP will

substantially reduce the impact of future harvest on the Queen Charlotte goshawks on the Tongass National Forest, as compared to timber harvest done without consideration for goshawk conservation.

Approximately one-third of the timber harvested to date in Southeast Alaska has been on private land owned by Alaska Native corporations. Corporate lands, which cover only 3 percent of the total area of Southeast Alaska but include 7 percent of the region's 6.4 million ac (2.6 million ha) of productive forest, are distributed throughout Southeast Alaska, with concentrations on and near Prince of Wales Island in southern Southeast Alaska. Approximately 285,000 ac (116,000 ha) of productive forest have been harvested on corporate lands to date, with another 104,000 ac (42,000 ha) likely to be harvested over the next few decades (USFWS 2007, pp. 81-82, and Appendix A, Table A-8 and A-9).

Intensive logging on corporate lands has probably eliminated goshawk nesting and foraging habitat, and may have affected territories roughly in proportion to the percentage of region-wide productive forest that has been harvested. That is, we estimate that logging by native corporations has probably reduced the number of potential nesting territories by approximately 4 percent across Southeast Alaska. Future harvest on corporate lands may affect another 2 percent of the breeding territories. We believe that this proportionate relationship is reasonable because native logging has been concentrated rather than dispersed across the landscape thereby minimizing the number of potential territories affected. However, this logging has probably reduced mature and old forest representation to far below 50 percent in most of the territories affected, thus rendering such territories poor habitat.

Loss of territories is potentially of concern to long-term population resilience. However, population-level impacts from the loss of 4 to 6 percent of potential goshawk territories to native logging in Southeast Alaska may affect population growth by a smaller increment than suggested by number of impacted territories because (1) in some cases, adults in impacted territories may establish new territories in otherwise vacant territories, and (2) impacted territories in the southern portion of Southeast Alaska (Prince of Wales and vicinity) where Native Corporation lands are concentrated, naturally lack key prey and have probably always had relatively low reproductive success compared to territories elsewhere in the

range of the Queen Charlotte goshawk. Surveys across the range of the goshawk have consistently documented a significant percentage of unoccupied territories (55 percent in Southeast Alaska, 21 to 46 percent elsewhere in North America) (USFWS 2007, p. 48), suggesting that vacant territories are probably available for at least some displaced pairs.

A variety of federal agencies, the State of Alaska, municipalities, and private owners other than the Forest Service and native corporations manage 8 percent of the productive forest in Southeast Alaska (USFWS 2007, pp. 81–82 and 128). Some of these lands are protected from harvest while other lands are available for various forms of development. We expect Queen Charlotte goshawks to continue to use many of these lands, because with minor exceptions, timber harvest and clearing for other purposes tends to be less intensive on these lands than on lands designated by the Forest Service for timber production, or on native corporation lands.

To evaluate trends in habitat conditions across Southeast Alaska, the Service has developed a habitat value model using discount factors to award full habitat value to protected, productive forest and lower habitat value for second growth, fragmented, and vulnerable stands (USFWS 2007, pp. 99–101 and Appendix A, Tables A–10 to A–15). This model suggests that approximately 92 percent of the historical goshawk habitat value remains in Southeast Alaska. Future logging is projected to leave approximately 80 percent of the historical habitat value and 88 percent of the current habitat value if logging proceeds at the maximum pace allowed by TLMP which, as discussed above, is unlikely (USFWS 2007, Appendix A Table A–13). Slower rates of harvest than modeled are likely to result in retention of greater than 80 percent of the historic habitat value.

Intensive logging has the potential to modify habitat to such a degree that Queen Charlotte goshawks could be excluded from large portions of their range, leading to extinction of the subspecies from Southeast Alaska. We believe this outcome is unlikely because the conservation strategy of the TLMP, which covers 85 percent of the productive forest in Southeast Alaska, combined with habitat remaining on other ownerships in Southeast Alaska, is expected to retain adequate habitat within the vast majority of goshawk territories, with only a small number of territories likely to be harvested to a degree that would exclude goshawks.

Therefore, we conclude that destruction, modification, or curtailment of habitat does not currently put the Queen Charlotte goshawk at risk of extinction in Southeast Alaska, nor is it likely to do so in the foreseeable future.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

We do not believe that the Queen Charlotte goshawk is subject to frequent shooting or other illegal take, although occasional shootings may occur. Most of its range is very sparsely inhabited by humans and contacts with humans are relatively rare. Take of Queen Charlotte goshawks for falconry is extremely limited, with one known instance in Alaska since 1990 (USFWS 2007, p. 107). Overutilization for commercial, recreational, scientific, or educational purposes is not believed to be a significant risk in Southeast Alaska and is therefore not expected to contribute to population declines or extinction risk.

Factor C. Disease or Predation

Squires and Reynolds (1997, p. 20), Squires and Kennedy (2006, pp. 39–40), and Reynolds et al. (2006, pp. 269–270) summarized information on diseases and parasites affecting northern goshawks, including tuberculosis, trichomoniasis, erysipelas, *Aspergillus*, lice, West Nile virus, heart failure caused by *Chlamydia tsittaci* and *Escherichia coli*, and various blood parasites as potential infectious agents in goshawk populations. Although there has been little or no investigation in this area, we have no indication that Queen Charlotte goshawks have experienced any significant problems with disease.

Squires and Reynolds (1997, p. 20) cite instances of predation on northern goshawks by great horned owl (*Bubo virginianus*), bald eagle (*Haliaeetus leucocephalus*), marten (*Martes americana*), and wolverine (*Gulo gulo*). All of these predators are present in Southeast Alaska. Wiens et al. (2006, p. 411) documented predation as a leading cause of mortality (along with starvation) among fledgling goshawks in Arizona. Data on predation are not available for the Queen Charlotte goshawk, but we expect that predators do take young and occasionally adult Queen Charlotte goshawks.

Disease and predation can contribute to population declines, especially in the presence of other stress factors such as prey shortages. Either threat can also suppress the recovery of small populations that have been depressed by other factors such as overharvest or habitat loss, even after the initial cause

of the population decline has been removed.

The goshawk population in Southeast Alaska is spread over many islands covering 20 million ac (8 million ha). Predator and prey communities vary among island groups across the southeast region of Alaska, so the effects of predation are likely to vary accordingly. There is no indication that Queen Charlotte goshawks have experienced any significant problems with disease or predation in Alaska, and neither appear to place the Queen Charlotte goshawk in danger of extinction, now or in the foreseeable future.

Factor D. Inadequacy of Existing Regulatory Mechanisms

Regulatory mechanisms in Alaska protect both goshawks and their habitat. Goshawks, their nests, eggs, and young are protected from take by the federal Migratory Bird Treaty Act, except as permitted by regulations governing scientific research, falconry, and similar activities (16 U.S.C. 703). The State of Alaska allows take of goshawks only by permitted falconers (5 AAC 92.037), and only one goshawk has been taken for permitted falconry since 1990 in Southeast Alaska.

Goshawk habitat is protected by a variety of regulatory mechanisms. Protected lands in Southeast Alaska include Congressionally designated National Monuments, Wilderness Areas, and roadless land designations within the Tongass National Forest (31 percent of the productive forest in Southeast Alaska); Forest Service land use designations such as Remote Recreation and Old Growth Habitat (23 percent of the region-wide productive forest); and National Parks (13 percent of the land base but less than 1 percent of the productive forest) (USFWS 2007, pp. 72 and 81, and Appendix A, Tables A–8 and A–9). About 69,000 ac (28,000 ha) are protected in State Parks, and 54,000 ac (22,000 ha) are protected in parks and various conservation agreements on municipal and private lands (together less than 1 percent of the total area and productive forest of Southeast Alaska) (Albert and Schoen 2006, p. 19). Designations that prohibit timber harvest collectively cover approximately 3.5 million ac (1.4 million ha) (55 percent) of the 6.4 million ac (2.6 million ha) of productive forest in Southeast Alaska (USFWS 2007, Appendix A, Table A–9).

The conservation strategy of the 1997 TLMP, which covers 76 percent of the land area and 85 percent of the productive forest in Southeast Alaska, incorporates several elements to reduce

impacts of timber harvest on goshawks, as discussed above under Factor A. Included are large, medium and small old growth reserves and other Forest Service non-development land use designations, nest buffers, canopy retention in harvest units on heavily-harvested portions of Prince of Wales Island, and pre-project goshawk surveys to locate nests prior to timber harvest. Each of these elements is discussed below.

Small old growth reserves on the Tongass National Forest protect a minimum of 16 percent of the total National Forest land and 8 percent of the productive old growth forest in each watershed that is designated for timber harvest, in addition to retention areas such as stream and beach buffers, and inoperable lands. This arrangement, which maintains significant amounts of unharvested forest within timber harvest areas is particularly appropriate for goshawks, which space their nests fairly uniformly across the landscape (about 4 to 9 miles (7 to 14 km) apart in British Columbia, unmeasured in Alaska) (McClaren 2003, pp.13 and 21; Doyle 2005, p. 15; USFWS 2007, pp. 45–47). Large reserves are approximately 40,000 ac (16,000 ha), with at least 20,000 ac (8,000 ha) of productive old growth forest, and medium reserves are approximately 10,000 ac (4,000 ha) with at least 5,000 ac (2,000 ha) of productive old growth forest. Large and medium reserves protect several adjacent watersheds, and are linked by corridors of old growth forest retained primarily along streams and marine shorelines (USDA Forest Service 1997, TLMP Appendix K). These corridors are expected to benefit several prey species, such as squirrels, grouse, and passerines. The Forest Service has worked in partnership with the Service and the Alaska Department of Fish and Game to improve the location and composition of many small old growth reserves following the guidelines specified in Appendix K of the TLMP. Among the Appendix K guidelines designed for goshawk conservation are those that specify that reserves should maximize interior forest conditions, minimize early seral stages and include the largest remaining blocks of contiguous old growth within the watershed and known or suspected goshawk nesting habitat.

Buffers of 100 ac (40 ha) of productive old growth forest are required around confirmed and probable nests (occupied or not), where (1) timber harvest is not allowed; (2) new road construction is allowed only if no other reasonable alternative exists; and (3) continuous disturbance is prohibited during the

nesting period. Surveys for nesting goshawks are required during project evaluations, and retention of 30 percent canopy closure is required in heavily-harvested areas on Prince of Wales Island in the southern Tongass National Forest, where key prey (red squirrels and sooty grouse) are naturally lacking.

As discussed above under Factor A, existing standards and guidelines within the TLMP are projected to maintain approximately 66 percent of the 1.4 million ac (582,000 ha) of productive old growth forest in areas open to commercial timber harvest on the Tongass National Forest (USFWS 2007, p. 72, Table 9). Parks and various non-development designations protect essentially all of the 3.5 million ac (1.4 million ha) of productive forest outside the areas open to timber harvest.

Concerns have been expressed over effectiveness of both the design of the conservation strategy contained in the TLMP (e.g., Powell et al. 1997, pp 2–10), and its implementation (Greenwald and Bosman 2005, pp. 9–17). Specific issues include: (1) Reserves are too small and are inadequately linked by corridors (primarily stream and beach buffers) that are too narrow to provide interior forest conditions and withstand windstorms; (2) most of the largest old growth blocks are vulnerable to fragmentation by roads and logging as the highest-volume stands continue to be disproportionately harvested, primarily by large-scale clearcutting, a method that neither mimics natural disturbance patterns in the rainforest nor maintains old-forest habitat; (3) harvest rotations averaging 105 years as planned (USDA Forest Service 1997, FEIS pp. 3–299) will not regenerate old growth characteristics in harvested stands (Powell et al 1997, p. 9); (4) the 100-ac (40-ha) nest buffers for goshawk are inadequate to protect foraging habitat within the home range of nesting birds (Greenwald and Bosman 2006), alternate nests (Flatten et al. 2001, pp. ii and 16–17), and post-fledging areas (USFWS 2007, p. 110); (5) old growth reserve designations have been inadequate; (6) timber harvest and other developments have been permitted in old growth reserves; and (7) pre-project goshawk surveys have been inconsistent and ineffective (Greenwald and Bosman 2006, pp. 9–17). Our responses to these (numbered) concerns are discussed in the following (correspondingly-numbered) paragraphs.

(1) We agree that goshawks would benefit from greater retention of large blocks of structurally diverse old growth, particularly in heavily harvested areas. However, in addition to old growth reserves, many other

designations on the Tongass National Forest, such as Wilderness, National Monument, Research Natural Area, Special Interest Area, Remote Recreation, and Municipal Watershed, contribute to habitat protection for goshawks. Old Growth Reserves are not intended to supply all the habitat necessary for goshawk conservation. Rather, they are intended to strategically supplement the other non-development designations in a way that together the combination of protected lands and the corridors linking them provide adequate habitat for the entire suite of old-growth-dependent wildlife on the Tongass National Forest. We believe that the system as implemented provides adequate habitat for Queen Charlotte goshawks on the Tongass National Forest because large reserves outside the harvested areas will provide suitable habitat for most of the breeding pairs in Southeast Alaska while significant blocks of old growth forest will remain in areas otherwise subject to timber harvest. We expect only a small percentage (probably less than 5 percent) of the watersheds that currently provide adequate nesting habitat to be rendered unsuitable by logging, especially given current and reasonably foreseeable demand for timber from the Tongass National Forest (see discussion under Factor A, above).

Connectivity among forest patches is unlikely to be problematic for goshawks directly because they can fly between forest patches, but it is probably critical to some of their prey such as red squirrels. DeSanto et al. (2006, pp. 6–10) reported that several avian prey species (e.g., red-breasted sapsucker (*Sphyrapicus ruber*), hairy woodpecker (*Picoides villosus*), hermit thrush (*Catharus guttatus*), and varied thrush (*Ixoreus naevius*)) nested successfully in 1,000-foot (305-meter) wide beach buffers, but were less successful in narrower beach buffers. Based on these results, we believe that 1,000 ft (305 m), as specified in the TLMP, is a reasonable minimum width for corridors. Goshawks probably forage in the beach and stream buffers that connect old growth reserves, but these remnants should not be considered prime nesting habitat, as they lack interior conditions apparently favored by goshawks.

(2) Fragmentation by roads, rock pits and timber harvest (including salvage and thinning) may have degraded some reserves. Minor fragmentation is unlikely to adversely affect goshawks, as they forage over large areas of heterogeneous habitat. Forest habitat in some parts of Southeast Alaska has been, or will be, fragmented to a much

greater degree (USFWS 2007, pp. 71–78). Queen Charlotte goshawks appear to be sensitive to timber harvest when it reduces mature and old growth forest to less than approximately 50 percent of a bird's home range (Doyle 2005, p. 14). Across all areas available for timber harvest, however, the Forest Service estimates that approximately 66 to 69 percent of the productive old growth forest will be retained in various buffers (e.g., riparian, beach, and estuary buffers) or inoperable areas (e.g., wet, steep, or unstable areas) (USDA Forest Service 1997, ROD p. 7; USFWS 2007, Appendix A, Table A–9). These buffers and other unharvested areas are interspersed throughout the otherwise harvested matrix lands, with retention required in every watershed. Few of the watersheds that currently offer suitable habitat are likely to be reduced below critical levels on National Forest lands, and most of those are likely to recover as second growth matures and harvest shifts away from old growth forest and onto second growth. We therefore believe that adequate habitat will remain in most goshawk territories on the Tongass National Forest.

Harvest regimes that create smaller openings, such as single-tree and group selections would favor goshawk conservation by avoiding creation of extensive blocks of dense second growth that goshawks cannot penetrate. Partial harvests such as shelterwood cuts or retention of patches of trees within harvest units, could provide perches and hunting cover for several years before second growth stands filled the understory. Overstory retained in such systems, if windfirm and left unharvested, might also provide nesting structures as the surrounding second growth approached maturity. Such retention is currently required on Tongass National Forest lands on Prince of Wales Island for goshawks, and in a few other heavily harvested areas to help reduce impacts on American marten. Clearcuts up to 100 acres (40 ha) remain the primary means of timber harvest across most of the Tongass National Forest (USDA Forest Service 1997, ROD p. 5), but retention of various buffers and reserves between harvest units should provide adequate foraging habitat in most areas, as approximately 72 percent of the productive forest in Southeast Alaska will not be logged (USFWS 2007, pp. 98 and 129), and 66 to 69 percent of the productive old growth in areas of commercial harvest will be retained (USDA Forest Service 1997, ROD p. 7). Although mature and old forest cover is likely to be reduced to below 50 percent in some watersheds,

the number of watersheds so affected is likely to be much lower than projected in 1997 because timber harvests since then have taken only about 15 percent of the volume expected at that time.

(3) Harvest rotations averaging 105 years in even-aged stands, as specified in the current TLMP, will provide a decade or two at the end of each rotation when goshawks will be able to use the regenerating forests. While these areas provide some habitat value for part of the rotation, unharvested areas are far more important because they cover a much greater area and they will remain interspersed among harvested stands, protecting over half of the productive forest in most of the goshawk territories on the Tongass National Forest.

(4) Nest buffers of 100 ac (40 ha) of productive old growth, as specified in the TLMP, are intended to protect individual nests from disturbance. Larger buffers would likely enhance goshawk conservation by providing better habitat for fledglings in the immediate vicinity of the nest, but lack of larger buffers is not expected to reduce fecundity or survival to an unsustainable level because old growth reserves, which typically protect much larger patches of old growth forest, and other retained forest patches are reserved in each watershed, and we expect goshawks to nest in these reserves as the forest around them is increasingly harvested. In some cases, suitable nesting habitat in nearby reserves may already be occupied by nesting pairs, but the territoriality of goshawks is likely to prevent this in most cases.

(5) and (6) As stated above, we agree that goshawks would benefit from greater retention of large blocks of structurally diverse old growth, particularly in heavily harvested areas, and that fragmentation by roads, rock pits and timber harvest (including salvage and thinning) may have degraded some reserves. However, many designations in addition to old growth reserves contribute to habitat protection for goshawks (discussed under (1), above), and we believe that the full complement of protected habitat is sufficient to maintain goshawk populations in Southeast Alaska because large and small blocks of unharvested productive forest will remain interspersed among the harvested units, retaining over 50 percent of the productive forest in most goshawk territories which, as discussed above under Factor A, should provide suitable nesting and foraging habitat.

(7) Current standards for pre-project goshawk surveys in project areas where

there is no previous history of goshawk activity rely largely on incidental observation of goshawks followed by a more focused survey effort where evidence of goshawks is reported. Forest Service records document pre-project surveys for goshawks at 6,356 sites, resulting in 260 goshawk detections (Rose 2006, p. 2). We believe that active surveys for nesting goshawks prior to timber harvest or other projects that could affect nesting habitat are a valuable tool for minimizing impacts to goshawks. Reliance on inadequate or inconsistent surveys can lead to erroneous conclusions about goshawk presence. Therefore, consistent implementation of adequate surveys is important.

In spite of the shortcomings discussed above, we find that the full suite of standards, guidelines, and land designations contained in the 1997 TLMP are likely to provide adequate habitat protection to sustain goshawks in Southeast Alaska into the foreseeable future, largely because adequate amounts of old and mature productive forest will be protected in reserves, retention areas, and inoperable stands, in large and small patches, throughout the harvested matrix. Protection of nest stands remains an important element of the conservation strategy for goshawks because nest stands typically support several alternate nests (some of which may remain undetected) and frequently support active nesting after one or more years of nest inactivity. Nest inactivity is often due to inclement spring weather or low prey populations (USFWS 1997, pp. 41 and 53), but where suitable habitat remains intact in the surrounding landscape, nest stands are likely to be re-used by nesting goshawks. Surveys to identify nests increase the likelihood that nest stands are discovered and protected.

The TLMP and its conservation strategy are currently being reviewed, with a range of alternatives under consideration. We have been instructed by the court, in this case, to base our decision on the management plan(s) in place at the time of our decision. We believe the current TLMP provides adequate protection to the goshawk and its habitat, and that it will continue to do so unless the protections relevant to goshawk conservation are substantively reduced or weakened.

Goshawk habitat receives less protection on State-managed and Native corporation lands, and we expect that goshawk nesting territories will be eliminated from some of those lands. For the reasons discussed above, we believe that adequate habitat will remain on National Forest and other

lands to sustain goshawks into the foreseeable future in Southeast Alaska, in spite of modest declines in habitat (and possibly goshawk populations) over the next 70 to 80 years. Therefore, we do not believe that inadequate regulatory mechanisms in Southeast Alaska currently contribute to extinction risk, nor do we believe that they will in the foreseeable future, unless protections are substantially weakened in an amended TLMP.

Factor E. Other Natural or Manmade Factors Affecting the Species' Continued Existence Competition

Several species of hawks, owls, and mammals have diets that overlap that of the goshawk. Red-tailed hawks (*Buteo jamaicensis*), barred owls (*Strix varia*), and great-horned owls occur in Southeast Alaska and prey on some of the same species as goshawks. These raptors typically make greater use of open habitats than goshawks and could be favored where timber harvest reduces forest cover and increases fragmentation (La Sorte et al. 2004, pp. 311–316; Mazur and James 2000, pp. 1–5; Preston and Beane 1993, pp 5–6; Houston et al. 1998, pp. 2–7). Mammalian predators such as wolverines (*Gulo gulo*), raccoons (*Procyon lotor*), lynx (*Lynx canadensis*), and marten (*Martes americana*) take some of the same prey as goshawks, notably grouse and squirrels, and could have competitive effects when prey are at low numbers. Marten are the most widespread and probably the most abundant of these predators in Southeast Alaska. Wolverines are found at low densities on the mainland and several of the near-shore islands, lynx are found in a few locations on the mainland, and (introduced) raccoons are found only on a few islands in southern Southeast Alaska (McDonald and Cook 2007, pp. 68, 85, and 98).

Competition among predators for limited prey may influence goshawk nesting effort during periods of low prey abundance where logging has fragmented the forest to favor species that use more open habitat when foraging. This effect would vary geographically, depending on local conditions, and may act, along with other factors, to reduce fecundity or survival in some areas. We are aware of no documentation of such competitive effects, though, so this potential threat must be considered hypothetical at this time. Accordingly, we are not aware, nor do we believe, that food competition places the Queen Charlotte goshawk in danger of extinction in Southeast Alaska, nor is it likely to in the foreseeable future.

Other species of birds use nest trees similar to those of the goshawk (e.g., red-tailed hawk, great horned owl, great blue heron (*Ardea herodias*)). Trees used for nesting must have adequate limb or top structures to support a large nest. Modern forestry practices usually retain significant numbers of such trees, enabling a wide range of species to have adequate nesting trees. Thus, we do not believe that availability of nest sites limits or reduces goshawk populations, nor is it likely to in the foreseeable future.

Contaminants: Goshawks have historically had low levels of organochlorine pesticides compared to other raptors (Snyder et al. 1973, pp. 300–304; Elliot and Martin 1994, pp. 189–198). Large-scale application of pesticides to control forest pests could have effects on goshawks, either directly or through their prey, but regulation of pesticides is intended to minimize such effects. We are not aware of any current threats to goshawk survival due to contaminants. We do not believe that contaminants place the Queen Charlotte goshawk in danger of extinction throughout all of its range, nor are they likely to in the foreseeable future.

Natural Disasters: Windstorms, landslides, avalanches, earthquakes, tsunamis, forest fires, and volcanic eruptions could affect localized areas of the subspecies range. These events would only affect small numbers of goshawks and thus are not believed to pose population-level threats, either now or in the foreseeable future.

Climate Change: Global climate change is expected to affect forest species composition and distribution over the next several decades as warmer-adapted tree species such as Douglas-fir and red-cedar expand northward and cool-adapted coastal hemlock (*Tsuga* spp.) forest invades alpine tundra (Hamann and Wang 2006, pp. 2781–2782, Bachelet et al., p. 2251). These changes should be positive for goshawks, as the area of productive forest is likely to increase, although *atricapillus* goshawks dispersing from surrounding areas could become more numerous within the existing range of *laingi* goshawks, exerting a greater competitive influence in the warmer forests. However, this effect could be offset by expansion of *laingi* range northward in Alaska toward Yakutat, where we presume the *laingi* phenotype would retain a competitive advantage because it is presumably better adapted to coastal rainforest.

Climate change is expected to increase the frequency and intensity of forest fires across much of Alaska, but the effects on fire frequency in

Southeast Alaska are not clear as they will depend largely on how precipitation is affected (Bachelet et al. 2005, pp. 2244–2245). Insect infestations or tree diseases might also increase (Bachelet et al. 2005, p. 2248), although we are not aware of any projections quantifying such changes. We lack sufficient information on the effects of climate change to conclude that climate change places the Queen Charlotte goshawk at risk in Southeast Alaska.

Genetic and Demographic Risks: The Queen Charlotte goshawk is believed to freely interbreed throughout Southeast Alaska, and it does not appear to be genetically isolated from adjacent goshawk populations, except that there has apparently been little or no recent genetic interchange between Southeast Alaska and the Queen Charlotte Islands to the south (Gust et al. 2003, p. 22; Talbot et al. 2005, pp. 2–3; Robus 2006, p. 2; USFWS 2007, pp. 117–118). Isolated populations are typically at greater risk of extinction or genetic problems such as inbreeding depression, hybridization, and loss of genetic diversity, particularly where populations are small (Lande 1988, pp. 1456–1457; Frankham et al. 2002, pp. 312–317).

The best population estimates of the Queen Charlotte goshawk in Southeast Alaska place the breeding population at a few hundred pairs, plus an unknown component of non-breeding birds. Studies of northern goshawk populations in Europe have estimated that one-third to one-half of the adults are non-breeders (Squires and Kennedy 2006, p. 38). With a similar proportion of non-breeders, the Alaska population of Queen Charlotte goshawks would still probably be less than 1,000 individuals. Small populations such as this are at greater risk than larger populations from stochastic events such as disease epidemics, prey population crashes, or environmental catastrophes.

The International Union for the Conservation of Nature uses estimates of population size (i.e., <50, 250, 1,000, 2,500 or 10,000 mature individuals), alone or with indications of population declines or geographic range fragmentation, constriction or contraction, as indicators of extinction vulnerability in their Red List evaluations (IUCN 2006, pp. 8–10). No such absolute criteria for minimum population size exist for listing under the Act. Population estimates and demographic modeling for Queen Charlotte goshawks are believed to be of low precision and unknown reliability, necessitating reliance on additional indications of vulnerability.

Queen Charlotte goshawk populations are relatively small and therefore at risk from genetic effects and stochastic events; yet demographic rates are not well enough known to allow reliable quantitative estimation of viability prospects. We currently have no indication that genetic factors such as inbreeding depression, hybridization, or loss of genetic diversity place the subspecies at risk in Alaska.

Prey Availability: Prey availability appears to limit Queen Charlotte goshawk populations in some parts of Southeast Alaska. Because of the fragmented nature of the island habitat it inhabits, prey species distributions vary. Researchers have identified food stress as a limitation for goshawks on Prince of Wales Island and surrounding islands in southern Southeast Alaska, which naturally lack both red squirrels and sooty grouse, important primary prey elsewhere (Lewis 2001, pp. 80, 100, and 111–112). Areas of extensive timber harvest also appear to lack sufficient prey, as few species of adequate size adapted to open habitats exist over much of the range of the Queen Charlotte goshawk. Prey availability is particularly limited in winter when many avian species migrate.

Annual fluctuations in prey abundance appear to affect goshawk breeding effort (Doyle and Smith 1994, p. 126; Ethier 1999, pp. 35–40; Doyle 2003, pp. 24–25; Salafsky 2004, pp. 16–19; Salafsky et al. 2005, pp. 242–243; Keane et al. 2006, pp. 93–96; Reynolds et al. 2006, pp. 267–268; Doyle 2007, p. 2). Fluctuations in conifer cone crops influence squirrel populations (Smith et al. 2003, p. 176; Keane et al. 2006 p. 93) and could contribute to goshawk population declines.

Queen Charlotte goshawks presumably evolved in coastal rainforests characterized by variable but limited prey communities, as compared to northern goshawk populations elsewhere. The typically smaller size of the subspecies may be an adaptation to the limited prey base. The naturally fragmented environment with different prey communities on different islands probably allows goshawks in some parts of the range to successfully reproduce while goshawks elsewhere in the range avoid nesting during some years.

Although natural and manmade factors could potentially affect Queen Charlotte goshawk populations in some parts of Southeast Alaska, such factors are either not well enough understood or limited, with effects that vary among the islands and mainland of the region. Therefore, we do not believe that competition, contaminants, natural

disasters, climate change, genetic or demographic risks, or prey availability place the Queen Charlotte goshawk in danger of extinction in Alaska, now or in the foreseeable future.

Foreseeable Future

The principal difference between an “endangered” and a “threatened” species under the Act is whether the species is currently in danger of extinction, or if it is likely to become so “within the foreseeable future.” The Act does not define the term “foreseeable future.”

Threats facing the Queen Charlotte goshawk are primarily related to loss of nesting and foraging habitat and declines in prey populations due to timber harvest. In evaluating habitat threats, we relied largely on analyses of lands available for, and protected from, timber harvest. Projections of timber harvest and forest growth rates indicate that most of remaining old growth forest available for harvest on the Tongass National Forest will be harvested within 70 years (USDA Forest Service 1997, p. 3–299 to 3–303). Such projections are not available for other ownerships.

Habitat destruction that causes or contributes to reduced survival or fecundity can have a delayed effect on species dependent on that habitat, with extinction resulting several generations after the habitat loss has occurred, as the affected species reach equilibrium with their habitat (Tilman et al. 1994, pp. 65–66). Current data and monitoring techniques are inadequate to allow prediction of the extinction threshold (in terms of habitat requirements) for Queen Charlotte goshawks, and existing estimates of survival, fecundity, and population resilience are too imprecise to allow us to detect declining trends, if they exist. We recognize, however, that goshawk populations may continue to decline for several years after logging of old growth forests has ceased and timber harvest is restricted to second-growth stands because it is likely to take several generations for the populations to equilibrate with their modified environments. Goshawks are sexually mature and may breed at age 2 or 3, where vacant territories with suitable habitat are available (Squires and Reynolds 1997). A generation is therefore defined as 2 to 3 years.

We expect goshawk habitat quantity and quality to decline as timber harvest converts the remaining available old growth (that is, old growth not protected by reserves, retention or its location in an inoperable area) to second growth, after which, habitat capability would begin to stabilize. However, goshawk populations will most likely continue to

decline for another 10 years (about 3 to 5 generations) following conversion of old growth to second growth forest, as the population reaches equilibrium with the reduced amount and distribution of habitat. Therefore, combining conversion rates above with 10 years for population equilibrium, we use 60 years to define foreseeable future for the Queen Charlotte goshawk in British Columbia, and 80 years in Southeast Alaska.

Southeast Alaska DPS Finding

Based on our analyses of threats to the Queen Charlotte goshawk within the Southeast Alaska DPS, and our evaluation of current management by the U.S. Forest Service and other land managers in Southeast Alaska, we find that the Southeast Alaska DPS of the Queen Charlotte goshawk is not in danger of extinction, nor is it likely to become in danger of extinction in the foreseeable future, given the current management regime. The TLMP provides relatively large reserves where timber harvest is not allowed, and adequate protection of habitat within areas open to timber harvest to ensure that most goshawk territories will remain suitable habitat. No information suggests that disease, predation, or overutilization for commercial, recreational, scientific, or educational purposes contributes to goshawk population declines in Southeast Alaska. Also, potential effects of other natural and manmade factors are limited across the landscape and not expected to have population-level impacts on the subspecies. Therefore, we find that the best available information on biological vulnerability and threats to the goshawk does not support listing the Southeast Alaska DPS of the Queen Charlotte goshawk as threatened or endangered.

Significant Portions of the Alaska DPS's Range

Threats to the Queen Charlotte goshawk in Southeast Alaska are greatest on Prince of Wales Island and the surrounding smaller islands at the southern end of the DPS. Timber harvest on both the Tongass National Forest and native corporation lands has been intensive in some parts of this area. Approximately 26 percent of the productive forest on Prince of Wales and the surrounding islands has been harvested, including some of the most productive forest lands in Southeast Alaska (Albert and Schoen 2006, pp. 15–18). Key prey (especially red squirrels and sooty grouse) are naturally lacking, resulting in comparatively low goshawk nesting densities and lower reproductive success than elsewhere in

the DPS (USFWS 2007, pp. 39–42 and pp. 74–78). We therefore focus on this portion of the Southeast Alaska DPS, to determine if it is a significant portion and whether the best available information on the biological vulnerability and threats to the goshawk support listing the subspecies as threatened or endangered on Prince of Wales Island.

The four biogeographic provinces that cover this area (North Prince of Wales, South Prince of Wales, Outside Islands, and Dall Island Complex) contain approximately 1.4 million ac (560,000 ha) of productive forest, or about 22 percent of the productive forest habitat across the entire DPS (Albert and Schoen 2006, p. 16). This area is likely to provide important redundancy for the DPS, as defined above, because it probably supports nearly one-fifth of the small population. Goshawks from this area tend to be smaller than those from the northern portion of the DPS (Titus et al. 1994, pp. 10–12), suggesting a possible adaptation to a prey-poor environment, perhaps providing important genetic representation. Based on these observations, we conclude that loss of the goshawk population on Prince of Wales and the surrounding smaller islands would significantly reduce redundancy and representation of the Queen Charlotte goshawk within Southeast Alaska, and would compromise conservation of the subspecies in the Southeast Alaska DPS. We conclude that Prince of Wales Island and the surrounding islands constitute a significant portion of the Alaska DPS's range.

Management protections of the TLMP conservation strategy, as discussed above under Factor D, apply throughout the Southeast Alaska DPS, with special provisions in VCUs on Prince of Wales Island, where over 33 percent of the productive forest had been harvested as of 1997. Within those VCUs, timber harvest on National Forest lands must be designed to retain an average of 30 percent canopy cover, with at least 8 large trees per ac (20 per ha) and 3 large dead or dying trees per ac (7 per ha) in harvest units over 0.8 ha (2 ac). Harvest units smaller than 0.8 ha (2 ac) may not collectively remove more than 25 percent of any stand in any 50-year period (USDA Forest Service 1997, pp. 4–91). These standards are intended to protect important features of forest stand structure. We believe that these measures of the TLMP will provide improved foraging opportunities for goshawks for the first 10 to 20 years following timber harvest, and provide improved nesting habitat as the second-growth stand approaches maturity.

Goshawks may use some of these partially-harvested stands while the second-growth is middle-aged and typically too dense for efficient foraging, but this possibility is less certain.

We conclude that threats within the Prince of Wales area appear to be adequately managed, and thus do not support listing this SPR at this time. We have not identified any other significant portions of the Alaska DPS that meet the definition of threatened or endangered.

British Columbia Distinct Population Segment

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

Timber harvest impacts goshawk nesting habitat, abundance of key prey species, and foraging habitat. These impacts are discussed above under Southeast Alaska Distinct Population Segment.

Industrial-scale logging began in the coastal rainforests of British Columbia in the early 1900s and peaked in the 1980s. Unlike in Alaska, however, harvests have remained relatively high since then (USFWS 2007, pp. 89–90). Timber harvest has converted approximately 3.7 million ac (1.5 million ha) (45 percent) of the 6.4 million ac (2.6 million ha) of productive forest on the coastal islands of British Columbia to second growth. This represents a loss in habitat value of 38 percent, compared to pre-logging conditions (USFWS 2007, Appendix A, Tables A–9 and A–13). Continued logging is projected to convert another 1.2 million ac (480,000 ha) (26 percent) of the remaining productive old growth forest to second growth over the next 50 years, representing a decline in current habitat value of 28 percent (USFWS 2007, Appendix A, Tables A–9 and A–15).

Retention of productive forest to protect various non-timber resources, such as riparian areas and important wildlife habitat, is expected to protect about 11 percent of the productive forest within the DPS. Inoperable areas cover 21 percent of the unharvested productive forest, although changes in technology and methods may allow future harvest of some of these stands. Designated parks and other such reserves protect about 9 percent of the productive forest within the DPS. Altogether we expect about 41 percent of the productive forest in the DPS to remain after all available old growth is converted to second growth forest over the next 50 years (USFWS 2007, pp. 82–90 and Appendix A, Tables A–1 and A–

9). Loss of 59 percent of the historically-available old growth is projected to result in a 55 percent decline in habitat value, as regeneration of harvested stands will provide some suitable habitat for a decade or two as the second growth stands approach economic maturity (USFWS 2007, pp. 99–101 and Appendix A, Table A–13).

High-quality nesting territories appear to contain at least 50 percent mature and old forest (Doyle 2005, p. 14; USFWS 2007, pp. 75–78), although goshawks may use areas with lower proportions of old forest where prey adapted to more open habitats is abundant (Iverson et al. 1996, p. 55; USFWS 2007, p. 36). On the Queen Charlotte Islands, where there are few prey available in non-forested areas, at least 50 percent mature and old forest cover appears to be crucial to goshawk nesting (Doyle 2005, p. 14). Vancouver Island supports hares and cottontail rabbits, so goshawks there are likely to successfully nest in areas with a somewhat lower percentage of mature and old forest. Given these observations, we consider landscapes with greater than 50 percent cover by mature and old forest to be high-quality habitat, those with less than 50 percent lower-quality habitat, and those with less than 30 percent poor-quality habitat (discussed above, under Southeast Alaska Distinct Population Segment, and in USFWS 2007, pp. 75–78).

Loss of 59 percent of the old forest cover across the British Columbia DPS is likely to result in very poor goshawk habitat. Although 1.6 to 1.7 million ac (650,000 to 680,000 ha) are protected by provincial and national parks within the British Columbia DPS, only 34 to 60 percent of those lands are forested (depending on how productive forest is defined) (USFWS 2007, pp. 82–84). On the Queen Charlotte Islands, as little as 26 percent of the protected lands may be forested (USFWS 2007, p. 84), offering poor habitat.

Within the areas open to timber harvest, only 35 percent of the productive old forest will remain in retention and inoperable areas (USFWS 2007, Appendix A, Table A–9). Since the area open to timber harvest was only 69 to 83 percent forested to begin with (USFWS 2007, pp. 82–84), we expect that only about 25 to 30 percent of the harvested landscapes will have productive old forest cover. Mature second growth will provide additional habitat (approximately 15 percent of the harvested areas), so approximately 35 to 40 percent of the landscape is likely to be mature and old forest. This habitat is likely to be distributed unevenly, with relatively few areas supporting higher

levels of productive mature and old forest (and reproducing goshawks), and relatively large areas with more dispersed patches of mature and old forest habitat. In general, we expect continued decline in the quality of the habitat within the range of the British Columbia DPS as the old growth forest available for harvest is converted to second growth. Ultimately, most of the landscape is likely to be low-quality or poor-quality habitat. Based on these analyses, we conclude that habitat loss is likely to contribute substantially to the long-term viability of Queen Charlotte goshawks.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

In British Columbia, the subspecies has been protected from harvest since becoming Red-listed in 1994 (Cooper and Stevens 2000, p. 14). Birds may be taken illegally on occasion, but we have no indication that such activity is common, or that it poses any threat to the subspecies. Overutilization for commercial, recreational, scientific, or educational purposes is not believed to be a significant risk, and is not expected to contribute to population declines or extinction risk of the Queen Charlotte goshawk in British Columbia.

Factor C. Disease or Predation

Disease and predation associated with Queen Charlotte goshawks are not well documented, but small populations such as those on Vancouver Island and the Queen Charlotte Islands can be vulnerable to diseases, particularly when simultaneously stressed by other factors such as prey shortages. Predation can also suppress small populations, leaving them vulnerable to other population stress factors. Goshawk predators within the British Columbia DPS include great horned owl, bald eagle, American marten, wolverine, and black bear. Raccoons, which could take eggs or nestlings, have also been introduced on the Queen Charlotte Islands. No information suggests that disease and predation currently put Queen Charlotte goshawks in danger of extinction in the British Columbia DPS, but either disease or predation may contribute to extinction risk in the foreseeable future if their effects are exacerbated by other population stressors such as prey shortages, habitat limitations, or unfavorable weather (which affects nesting effort).

Factor D. Inadequacy of Existing Regulatory Mechanisms

Direct Take: Throughout Canada, the SARA protects the Queen Charlotte

goshawk from direct harm, harassment, and take on Federal lands. The birds, their eggs, and occupied nests are protected on all jurisdictions in British Columbia under the provincial Wildlife Act (RSBC 1996, section 34). Possession and trade in the subspecies is forbidden throughout Canada, as is destruction of nests. Based on the available information, regulation of direct take appears to be adequate throughout the range of the goshawk.

Habitat Protection: Two mechanisms exist to protect habitat under the SARA in Canada: (1) Identification of critical habitat which may not be destroyed, and (2) conservation agreements which may be negotiated with any entity or individual. The SARA requires development of a recovery strategy, which identifies the scientific framework for recovery, as well as development of a recovery action plan, which outlines specific measures to implement the recovery strategy. Although a recovery team is currently developing a Queen Charlotte goshawk recovery strategy and action plan, which would identify areas that need protection, neither critical habitat nor conservation agreements exist at this time.

Land use planning is the primary method identified by the British Columbia Provincial Government for establishing protected areas and limits on development to conserve biodiversity across the Province. On Vancouver Island, where a land use plan was approved in 2000, 13 percent of the landscape is in protected status, but much of it is at high elevation and on low-productivity sites. Eight percent of the landscape is in "Special Management" zones where timber harvest is allowed but non-timber values such as wildlife and recreation are given additional consideration. An approved land use plan is not yet available for the Queen Charlotte Islands, but 23 percent of the land base has been protected in parks and other reserves. Depending on how productive forest is defined, as little as 26 percent of the protected land on the Queen Charlotte Islands may support productive forest, however, offering poor goshawk habitat. Altogether, protected areas cover approximately 9 percent of the productive forest within the range of the British Columbia DPS, most of which is probably low-quality habitat (USFWS 2007, Appendix A, Table A-9).

Logging on Crown (Provincial) lands open to timber harvest, which cover 84 percent of the productive forest on Vancouver and the Queen Charlotte Islands (USFWS 2007, Appendix A,

Table A-6), is regulated by the Forest and Range Practices Act. This act and its companion regulations set objectives for many resources, and require timber harvest plans describing how each objective will be met. Integrated with the Forest and Range Practices Regulations is the Identified Wildlife Management Strategy (IWM Strategy), which was developed by the British Columbia Government to provide additional protection for species requiring specific measures beyond the "coarse filter" system of protected areas and the various regulations governing timber harvest generally. The IWM Strategy provides for establishment of Wildlife Habitat Areas around known goshawk nests, and allows prescription of management measures within those areas (BCMWLAP 2004, pp. 1-4). Timber harvest is not allowed in a core area of approximately 500 ac (200 ha) around designated nests to protect the active nest, alternate nests, and post-fledging habitat. A management plan must be developed for timber harvesting and road construction in the surrounding management zone of about 5,000 ac (2,000 ha) to protect foraging habitat. Non-binding recommendations have been developed to help guide these management plans (McClaren 2004, pp. 10-11). To date, 28 Wildlife Habitat Areas covering 36,470 ac (14,765 ha) have been designated for *laingi* goshawks in British Columbia (USFWS 2007, p. 113).

Provincial policy limits the amount of land that may be protected under the IWM Strategy to one percent of the short-term timber supply in each Forest District, for all Identified Wildlife species combined. This limitation may be waived with adequate justification, and does not have legal force of law, but is considered a goal of government (BCMWLAP 2004, p. 4; FPB 2004, pp. 7-8). Because the 1 percent cap is on impacts to the "short-term" timber supply, rather than the long-term supply, calculations must be based on mature forest stands. In the South Island Forest District (which covers southern Vancouver Island), less than one-third of the productive forest is at or near economic maturity, so Wildlife Habitat Areas and other such retentions for Identified Wildlife are limited to approximately one-third of 1 percent of the productive forest in the Timber Harvesting Land Base. Similar situations exist wherever past harvest is extensive, yet these are the areas with the greatest need for conservation (FPB 2004, pp. 7-8).

The 1 percent cap is likely to interfere with meaningful conservation for goshawks in areas with high numbers of

other at-risk species and continuing threats to those species (Wood and Flahr 2004, pp. 394–395). Southern Vancouver Island, for example, is a biodiversity “hot spot,” with a large number of rare and endemic species (Scudder 2003). Some of these species have habitat needs that differ from those of the goshawk, yet their legitimate conservation needs must be accommodated along with the goshawk within the 1 percent limit. In the South Island Forest District, Wildlife Habitat Areas are approaching, and may have already exceeded, the 1 percent cap (Wood et al. 2003, p. 53).

In 2004, the British Columbia Ministry of Sustainable Resource Management established “Provincial Non-Spatial Old Growth Objectives” that must be addressed in Forest Stewardship Plans (Abbott 2004, pp. 1–6). The order established “Landscape Units” and old growth forest retention objectives for each of those units. Individual Landscape Units are assigned to low, intermediate, or high biodiversity emphasis, with lower percentages of old growth retention identified for lower-emphasis units. The exact amount of old growth that must be retained depends on the forest type (biogeoclimatic zone) and the “natural disturbance regime” identified for each biogeoclimatic zone variant. Within the Coastal Western Hemlock (*Tsuga heterophylla*) Zone, old growth retention objectives range from 9 to 13 percent; in the Mountain Hemlock (*T. mertensiana*) Zone, objectives range from 19 to 28 percent; and in the Coastal Douglas-fir (*Pseudotsuga menziesii*) Zone, 9 to 13 percent. The objectives are termed “non-spatial” because they describe amounts but not specific areas to be retained, unlike other orders that establish protection of specified areas. In order to meet the non-spatial old growth objectives, tenure-holders and Timber Supply Area managers can rely on existing protected areas such as Wildlife Habitat Areas, riparian reserves, inoperable lands, and other designations that result in retention of old growth stands.

The Wildlife Amendment Act, which was passed in 2004 but has not yet taken effect, is expected to enhance the ability of Provincial Governments to list and protect species and populations. At this time, however, we are unaware of specific conservation efforts or other proposals relative to Queen Charlotte goshawks under the Wildlife Amendment Act.

There is no program, mechanism, or requirement to provide for recovery at the provincial level (Wood and Flahr 2004). At the Federal level, SARA does

require recovery planning, and a team is currently evaluating conservation needs of the subspecies under the authority of the Federal law. The “Canadian Northern Goshawk *A. g. laingi* Recovery Team” includes experts from provincial and Federal (U.S. and Canadian) government agencies, private consultants, non-government organizations, industry and First Nations (McClaren 2006). The work of this group is confidential until a recovery strategy is completed and released publicly, so little is known about conservation efforts that may be included in the strategy. The focus of the SARA, however, is on Federal lands (Smallwood 2003). For the Queen Charlotte goshawk, this means one park (with a small percentage of productive forest) in the southern portion of the Queen Charlotte Islands, and another small park on the southwest coast of Vancouver Island.

Although regulatory mechanisms exist in British Columbia to conserve biodiversity and protect natural resources, at present, we are unaware of conservation actions or plans that specifically target the Queen Charlotte goshawk at the provincial level. The Province’s Protected Area Strategy protects only 9 percent of the productive forest across all ownerships on Vancouver Island, which is probably inadequate to support a viable population of goshawks. The Province’s Identified Wildlife Management Strategy, which allows for designation and protection of Wildlife Habitat Areas around goshawk nests, is limited by a policy-level cap of 1 percent of the short-term timber supply. Further, resource protection provided at the Federal level only relates to a small percentage of productive forest on Vancouver Island and the Queen Charlotte Islands. Overall, we conclude that existing regulatory mechanisms may be inadequate to eliminate the risk of extinction for the British Columbia DPS of the Queen Charlotte goshawk.

Factor E. Other Natural or Manmade Factors Affecting the Species’ Continued Existence

We are not aware of current population-level threats to Queen Charlotte goshawks due to competition for either prey or nest sites. Competition among herbivores has been implicated in grouse declines on the Queen Charlotte Islands, though, where introduced deer have reportedly overbrowsed blueberries and other important grouse foods, resulting in grouse population declines (Golumbia et al. 2003, pp. 10–11; Doyle 2004, pp. 15–16). This has probably reduced goshawk

nesting effort (number of pairs attempting to nest) on the Queen Charlotte Islands during periods of low squirrel density, when goshawks might otherwise have nested if grouse had been more abundant.

We know of no contaminants that pose current or potential future threats to goshawks within the British Columbia DPS.

Natural disasters such as windstorms, landslides, avalanches, earthquakes, tsunamis, and volcanic eruptions could affect localized areas within the British Columbia DPS, but are not believed to pose population-level threats, either now or in the foreseeable future. Large, landscape-altering forest fires, insect infestations, or tree diseases could pose population-level threats to Queen Charlotte goshawks in the British Columbia DPS if they affect major portions of either Vancouver Island or the Queen Charlotte Islands, both of which support contiguous blocks of forest habitat on one or two large islands, rather than many islands as in the Southeast Alaska DPS. Global climate change could increase the frequency and severity of large fires, forest pests, or forest diseases (Bachelet et al. 2005, pp. 2244–2248), but we do not know how likely such events might be. Increases in forest cover, as cool-adapted species invade alpine areas, is likely to increase the amount of habitat available to goshawks in the British Columbia DPS. We conclude that although the possibility exists that landscape-level changes due to climate change could negatively affect the British Columbia DPS of the Queen Charlotte goshawk, these threats do not currently place the DPS in danger of extinction. Because of inadequate information, we do not know if these threats pose a threat in the future, so we conclude that within the foreseeable future, the British Columbia DPS is not likely to become in danger of extinction due to climate-change-induced landscape modifications.

The small goshawk population on the Queen Charlotte Islands appears to be genetically distinct from goshawks elsewhere and may be genetically isolated. Populations on Vancouver Island and in Southeast Alaska apparently interbreed with *atricapillus* goshawks from the mainland, which seems likely given the proximity of Vancouver Island to the mainland (Gust et al. 2003, p. 22; Talbot et al. 2005, pp. 2–3; Talbot 2006, p. 1). Isolated populations such as the one on the Queen Charlotte Island are typically at greater risk of extinction or genetic problems such as inbreeding depression, hybridization, and loss of

genetic diversity, particularly where populations are small (Lande 1988, pp. 1456–1457; Frankham et al. 2002, pp. 312–317). The breeding population across the British Columbia DPS appears to be about 58 to 115 breeding pairs. In addition to genetic problems, small populations such as this are at greater risk than larger populations from stochastic events such as disease epidemics, prey population crashes, or environmental catastrophes. We conclude, therefore, that the British Columbia DPS of the Queen Charlotte goshawk is not currently in danger of extinction due to natural and manmade factors such as competition, contaminants, natural disasters, climate change, or genetic problems, but due to its small population size, may be vulnerable to prey fluctuations, hybridization (on Vancouver Island), or inbreeding depression (on the Queen Charlotte Islands) in the foreseeable future.

British Columbia DPS Finding

Based on our analyses of threats to the Queen Charlotte goshawk within the British Columbia DPS, we find that the British Columbia DPS of the Queen Charlotte goshawk is in danger of extinction or likely to become in danger of extinction in the foreseeable future due to modification and destruction of habitat; inadequacy of existing regulatory mechanisms; and vulnerability to disease, predation, prey fluctuations, or genetic risks as a result of small population sizes on Vancouver Island and the Queen Charlotte Islands.

Therefore, we find that the biological vulnerability and threats to the Queen Charlotte goshawk support issuing a proposed rule to list the entire British Columbia DPS as threatened or endangered. As we develop the proposal to list the British Columbia DPS of the Queen Charlotte goshawk, we will determine whether the status is endangered or threatened.

Significant Portions of the British Columbia DPS's Range

Vancouver Island is part of the British Columbia DPS, and is subject to the same threats that affect goshawks throughout the DPS. Listing is, therefore, warranted for goshawks on Vancouver Island. As we propose to list the British Columbia DPS of the Queen Charlotte goshawk, we will consider whether threats differ substantially enough between Vancouver Island and the remainder of the DPS to require a separate listing for the Vancouver Island SPR (that is, endangered if the DPS is otherwise listed as threatened). We will also determine whether there are other significant portions of the DPS where separate listings are warranted.

Conclusion

After a thorough review of the best scientific and commercial data available, we conclude that Vancouver Island is a significant portion of the Queen Charlotte goshawk's range. Further, our review has indicated that the subspecies' populations in British Columbia and Alaska each constitute distinct population segments (DPSs) of

the Queen Charlotte goshawk. We have sufficient information about biological vulnerability and threats to the goshawk to determine that the entire British Columbia DPS, which includes the Vancouver Island SPR, warrants listing as threatened or endangered. Pursuant to section 4(b)(3)(B)(ii) we will promptly publish in the **Federal Register** a proposed rule to list the British Columbia DPS of the Queen Charlotte goshawk. In that proposed rule we will indicate whether the British Columbia DPS and the Vancouver Island portion of the range should be listed as either endangered or threatened.

References Cited

A complete list of all references cited herein is available upon request from the Field Supervisor at the Juneau Fish and Wildlife Field Office (see **ADDRESSES**).

Author

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Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

Dated: November 1, 2007.

Kenneth Stansell,

Acting Director, Fish and Wildlife Service.
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