U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Korthalsella degeneri*

COMMON NAME: Hulumoa

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: April 2007

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X__ Continuing candidate
___ Non-petitioned
_X__ Petitioned - Date petition received: May 11, 2004
_ 90-day positive - FR date:
X 12-month warranted but precluded - FR date: May 11, 2005
N Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? Yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, since publication of the last CNOR, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs) because most of our national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations, and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken, see the discussion of "Progress on Revising the Lists" in the current CNOR, which can be viewed on our Internet website (http://www.fws.gov/endangered).

___ Listing priority change
Former LP: ___

New LP: ___

Date when the species first became a Candidate (as currently defined): October 25, 1999

___ Candidate removal: Former LP: ___

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Santalaceae (Sandalwood family) (Wagner *et al*. 2005)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, island of Oahu

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, island of Oahu

LAND OWNERSHIP: The only known population is on State land managed as a military training area under the jurisdiction of the U.S. Army.

LEAD REGION CONTACT: Scott McCarthy, (503) 231-6131, scott_mccarthy@fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish and Wildlife Office, Christa Russell, (808) 792-9400, christa_russell@fws.gov

BIOLOGICAL INFORMATION

Species Description

Korthalsella degeneri is a parasitic (on *Sapindus* and *Nestegis*) subshrub; stems 4 to 8 inches (in) (10 to 20 centimeters) long, many branched, cylindrical for 2 to 3 internodes and similar in width, otherwise flattened throughout, 0.3-0.9 in (7 to 22 millimeters (mm)) long, and 0.08-0.2 in (2 to 5 mm) wide. Flower groups are confined to the axils (Wagner *et al*. 1999a).

Taxonomy

Korthalsella degeneri was described by B.H. Danser (1937). This species was tentatively recognized as a distinct taxon in Wagner *et al*. (1999a). In their 2003 supplement, Wagner and Herbst noted that Molvray (1997) synonymized *K. degeneri* with *K. taenioides*, a broadly

delimited and widespread (Marquesas and Hawaiian Islands, Tahiti, Samoa, Fiji, and Norfolk Island) species and suggested that "this sweeping change should be further evaluated before adopting".

Habitat/Life History

Korthalsella degeneri is parasitic on two species of native trees, *Sapindus oahuensis* and *Nestigis sandwicensis*, in diverse mesic forest between the elevations of 1,100 and 1,200 feet (ft) (335 and 366 meters (m)) on Oahu (Wagner *et al*. 1999a; Hawaii Biodiversity and Mapping Program (HBMP) 2006a).

Historical Range

Little is known of the historic locations of *Korthalsella degeneri*. There was one population that occurred in Makua Valley, in the Waianae mountains of Oahu, in 1938 (HBMP 2006a).

Current Range/Distribution

Currently, this species is found only in Makua Valley (HBMP 2006a).

Population Estimates/Status

Recent surveys indicate that the species is known only from one population of approximately 900 to 1,000 individuals in Makua Valley (HBMP 2006a; B. Garnett, Division of Forestry and Wildife, pers. comm. 2000; J. Lau, Hawaii Natural Heritage Program, pers. comm. 2000). Prior to human arrival on Oahu, native mesic forests, including the *Sapindus* and *Nestigis* trees that *Korthalsella degeneri* is parasitic on, were widespread and abundant, and it is assumed that *K. degeneri* was relatively abundant within this habitat type (Wagner *et al*. 1999a).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Korthalsella degeneri is threatened by feral goats (*Capra hircus*) and feral pigs (*Sus scrofa*) that degrade and destroy habitat (HBMP 2006a). Evidence of the activities of feral goats and pigs has been reported at the only known population of *K. degeneri* in Makua Valley (HBMP 2006a). Predation by feral goats is unlikely to be a direct threat to *Korthalsella degeneri*; however, it is dependent on two woody native Hawaiian plants, *Sapindus oahuensis* and *Nestigis sandwicensis*, which are at risk of predation by feral goats. Goats were successfully introduced to the Hawaiian Islands in 1792. Currently, populations exist in mesic forest areas on Oahu, especially in the more remote and inaccessible areas of Makua Valley (U.S. Army Garrison 2005). Goats eat nearly all plants available, but their preference is for woody species (Spatz and Mueller-Dombois 1973). A study of goat predation on the native *Acacia koa* (koa) forest on the island of Hawaii has shown that grazing pressure by goats can cause the eventual extinction of the koa because it is unable to reproduce (Spatz and Mueller-Dombois 1973). Goats also browse on introduced grasses and native plants, and are able to reach more remote and inaccessible areas than other ungulates. They thrive on a variety of food plants, and are instrumental in the decline of native vegetation in many areas (Cuddihy and Stone 1990). Feral goats trample roots and seedlings, cause erosion, and promote the invasion of alien plants. They are able to forage in extremely

rugged terrain and have a high reproductive capacity (Clarke and Cuddihy 1980; van Riper and van Riper 1982; Scott *et al*. 1986; Tomich 1986; Culliney 1988; Cuddihy and Stone 1990).

Feral pigs are unlikely to predate *Korthalsella degeneri* directly, as it grows on the higher branches of the *Sapindus* and *Nestigis* trees, which they would be unable to reach. However, seedlings and young plants of *Sapindus* and *Nestigis*, which *K. degeneri* is dependent on, may likely be threatened by disturbance and predation by feral pigs. Pigs of Asian ancestry were introduced to Hawaii by the Polynesians, and the Eurasian type was introduced to Hawaii by Cook in 1778, with many other introductions thereafter (Tomich 1986). Some pigs raised as food escaped into the forests of Hawaii, Kauai, Oahu, Molokai, Maui, and Niihau, formed herds, and are now managed as a game animal by the State to optimize hunting opportunities (Tomich 1986; State of Hawaii 2001). A study was conducted in the 1980s on feral pig populations in the Kipahulu Valley on Maui (Diong 1982). This valley consists of a diverse composition of native ecosystems, from near sea level to alpine, and forest types ranging from mesic to wet, *Acacia koa* (koa) to *Metrosideros polymorpha* (ohia). Rooting by feral pigs was observed to be related to the search for earthworms, with rooting depths averaging 8 in (20 cm), greatly disrupting the leaf litter and topsoil layers, contributing to erosion and changes in ground topography. The feeding habits of pigs created seed beds, enabling the establishment and spread of weedy species such as *Psidium cattleianum* (strawberry guava). The study concluded that all aspects of the food habits of pigs are damaging to the structure and function of the Hawaiian forest ecosystem (Diong 1982). The effects on mesic and wet forest habitat by foraging of feral pigs have also been reported in fencing studies. In a fencing study conducted in the montane bogs of Haleakala, it was found that when feral pigs were fenced out of an area the cover of native plant species increased from 6 percent to 95 percent within six years of protection (Loope *et al*. 1991).

Hawaiian ecosystems, having evolved without hoofed mammals, are susceptible to large-scale disturbance by feral pigs, goats, and other introduced ungulates (Loope *et al*. 1991). Because of demonstrated habitat modifications by feral goats and pigs such as destruction of native plants, disruption of topsoil leading to erosion, and establishment and spread of nonnative plants; the Service believes they are a threat to *Korthalsella degeneri*.

B. Overutilization for commercial, recreational, scientific, or educational purposes.
None known.

C. Disease or predation.
None known.

D. The inadequacy of existing regulatory mechanisms.
Korthalsella degeneri currently receives no protection under Hawaii's endangered species law (HRS, Sect. 195-D) or the Federal Endangered Species Act (16 U.S.C. §1531-1544).

Goats and pigs are managed in Hawaii as game animals, but many populate inaccessible areas where hunting is difficult, if not impossible, and therefore has little effect on their numbers (Hawaii Heritage Program 1990). Goat and pig hunting is allowed year round, or during certain months, depending on the area (Hawaii Department of Land and Natural Resources n.d.-a, n.d.-b,

n.d.-c, n.d.-d.); however, public hunting is not adequate to eliminate this threat to *K. degeneri*.

E. Other natural or manmade factors affecting its continued existence.
Alien plant species are a threat to *Korthalsella degeneri* as they degrade habitat and outcompete native plants. The nonnative plant species that are reported to be the greatest threats to *K. degeneri*, and the plants that it is dependent on are: *Syzygium cumini* (Java plum), *Melia azedarach* (Chinaberry), *Leucana leucocephalla* (koa haole), *Schinus terebinthifolius* (Christmas berry), *Toona ciliata* (Australian red cedar), and *Ageratina riparia* (Hamakua pamakani) (HBMP 2006a).

Syzygium cumini is a tree native to India, Ceylon, and Malesia, and is widely cultivated and naturalized. In Hawaii it is naturalized in mesic valleys and disturbed forests. *Syzygium cumini* forms a dense cover, excluding all other species, and prevents the reestablishment of native lowland forest. The large black fruit is dispersed by frugivorous birds and feral pigs (Pacific Island Ecosystems at Risk 2006a).

Melia azedarach is a deciduous tree that rapidly grows to about 65 ft (20 m) (Wagner *et al*. 1999a). A native of southwestern Asia, *M. azedarach* was introduced to Hawaii as early as 1839 (Wagner *et al*. 1999a). It is invading forests, fence lines and disturbed areas. Its fast growth and rapidly spreading thickets make it a significant pest plant because it shades out and displaces native vegetation (University of Florida 2006). Feral pigs and fruit-eating birds further distribute the seeds (Stone 1985). The Hawaii Weed Risk Assessment Protocol, based on information on the biology of the species obtained from scientific literature and other documented sources used to predict likely invasiveness of a plant species, places *M. azedarach* in the high risk category with a score of 14 (plants with scores greater than 6 are recommended to be rejected from importation (Australia) or a species likely to be of high risk (Pacific)) (Pacific Island Ecosystems at Risk 2006b).

Leucana leucocephala a naturalized shrub native to the Neotropics, and cultivated for various purposes, threatens native ecosystems in Hawaii. It often forms the dominant element of the vegetation in low elevation, dry, disturbed areas. *Leucana leucocephala* is an aggressive competitor that fixes nitrogen (Geesink *et al*. 1999).

Schinus terebinthifolius, a shrub native to Brazil, was introduced to Hawaii in 1911 and is now naturalized in mesic areas (Wagner *et al*. 1999a). It forms dense thickets and grows even on steep slopes, and the red berries are attractive to birds (Smith 1989). Seedlings grow very slowly and can survive in dense shade, exhibiting vigorous growth if the canopy is cleared leading to the creation of open habitat and further influencing and increasing its rate of spread (Brazilian Pepper Task Force 1997). *Schinus terebinthifolius* is also a relative of poison ivy and may cause allergic skin reactions on sensitive persons. There are no released biocontrol agents to date (Brazilian Pepper Task Force 1997). This species is on the Hawaii noxious weed list (HAR Title 4, Subtitle 6, Chapter 68).).

Toona ciliata is a fast-growing tree, 66 to 98 ft (20 to 30 m) tall. It is native to India, southeastern Asia, and Australia, and is cultivated as a timber tree (Koala Native Plants 2006). It

was first collected on Oahu in 1929, and was extensively planted. Australian red cedar is a well-branched shade tree with an open spreading crown. It has wind-dispersed seeds and is naturalized in mesic to wet disturbed habitats on Maui, Hawaii, Kauai, Oahu and Lanai (Wagner *et al*. 1999a).

Ageratina riparia is a subshrub that spreads from a creeping rootstock, and is native to Mexico and the West Indies. In Hawaii it is naturalized in dry, disturbed habitats in mesic to wet forest on all the main islands (Wagner *et al*. 1999a). This species forms dense mats, preventing regeneration of native plants (Anderson *et al*. 1992). The most successful biological control agent use for suppression of Hamakua pamakani infestations is the fungus *Entyloma ageratinae*. Three insects were released as biological controls, but only one, the Pamakani gall fly (*Procecidochares alani*), has established and contributes to suppression of Hamakua pamakani (Morin *et al*. 1997).

The original native flora of Hawaii consisted of about 1,400 species, nearly 90 percent of which were endemic. Of the current total native and naturalized Hawaiian flora of 1,817 taxa, 47 percent were introduced from other parts of the world, and nearly 100 species have become pests (Smith 1985; Wagner *et al*. 1999a). Several studies (Cuddihy and Stone 1990; Wood and Perlman 1997; Robichaux *et al*. 1998) indicate nonnative plant species may outcompete native plants similar to *Korthalsella degeneri*. Competition may be for space, light, water, or nutrients, or there may be a chemical produced that inhibits growth of other plants (Smith 1985; Cuddihy and Stone 1990). In addition, nonnative pest plants found in habitat similar to that of this species have been shown to make the habitat less suitable for native species (Smathers and Gardner 1978; Smith 1985; Loope and Medeiros 1992; Medeiros *et al*. 1992; Ellshoff *et al*. 1995; Meyer and Florence 1996; Medeiros *et al*. 1997, Loope *et al*. 2004). In particular, alien pest plant species degrade habitat by modifying availability of light, altering soil-water regimes, modifying nutrient cycling, or altering fire characteristics of native plant communities (Smith 1985; Cuddihy and Stone 1990; Vitousek *et al*. 1997). Because of demonstrated habitat modification and resource competition by nonnative plant species in habitat similar to the diverse mesic forest habitat of *K. degeneri*, the Service believes nonnative plant species are a threat to *K. degeneri*.

Korthalsella degeneri is also likely threatened by fire. The U.S. Army uses Makua Valley as a military training area and firing range and, as a result, fires periodically occur, especially during the dry summer months (U.S. Army 2003). Because Hawaiian plants were subjected to fire during their evolution only in areas of volcanic activity, or from occasional lightning strikes, they are not adapted to fire regimes and do not quickly recover after a fire. Alien plants are often better adapted to recurring fire than native plant species, and some fire-adapted grasses have become widespread in Hawaii. The presence of nonnative fire-adapted species in Hawaiian ecosystems greatly increases the intensity, extent, and frequency of fire, especially during the drier months or times of drought. Fire-adapted alien plant taxa can quickly reestablish in a burned area, resulting in a reduction of the amount of native vegetation after each fire. Native shrubland and dry forest can thus be converted to land dominated by alien grasses. Fire can destroy dormant seeds as well as plants, even in steep or inaccessible areas (Cuddihy and Stone 1990; D'Antonio and Vitousek 1992; Friefelder *et al*. 1998). With only one remaining population of *K. degeneri* located in Makua Valley, the threat from fire is very high. The Army

implements a fire management plan to minimize fire damage to Makua Valley resulting from military training activities, but the plan does not address the threat of fire from other sources, nor is it expected to be completely effective in eliminating the threat of fire from military training actions (U.S. Army 2003).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

Under the terms of the 1999 U.S. Fish and Wildlife Service's Biological Opinion for routine military training at Makua Military Reservation, the Army began fencing areas of the Makua training area for protection and outplanting of listed endangered and threatened species (Service 1999; U.S. Army Garrison 2005). A portion of the population of *Korthalsella degeneri* is within a fenced area; however, without continued monitoring of those fences, feral goats and pigs from surrounding areas can easily access unmaintained fenced areas.

A fire management plan for Makua Valley has been developed and adopted by the U.S. Army to minimize the effects of fires started as a result of military training activities in the valley (U.S. Army 2003).

SUMMARY OF THREATS

Based on our evaluation of habitat degradation and loss by feral pigs, goats, and nonnative plants, we conclude there is sufficient information to develop a proposed rule for this species (once the taxonomic questions have been resolved*) due to the present and threatened destruction, alteration, or curtailment of its habitat and range, and the displacement of individuals of *Korthalsella degeneri*, due to competition with nonnative plants for space, nutrients, water, air, and light. Predation by feral pigs and goats is a likely threat to *K. degeneri* and the plant species it is dependent on. Fire is a likely threat, as the only known population of *K. degeneri* occurs in a military training area where live fire ammunition is used. We find that this species is warranted for listing throughout all of its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

*The taxonomic validity of this species must be resolved before developing a proposed listing rule.

RECOMMENDED CONSERVATION MEASURES

- Conduct research on taxonomic validity of this species
- Survey for populations of *Korthalsella degeneri* in areas of potentially suitable habitat
- Control alien plants
- Begin propagation efforts for maintenance of genetic stock
- Reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species

LISTING PRIORITY

THREAT

Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	**2***
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:
Korthalsella degeneri is highly threatened by feral goats and pigs that directly prey upon the plants that it is dependent on, and also degrade and destroy habitat; and by nonnative plants that outcompete and displace native plants. It is also threatened by fire. Threats to the diverse mesic forest habitat of *Korthalsella degeneri*, and to individuals of this species, occur throughout its range and are expected to continue or increase without control or eradication.

Imminence:
Threats to *Korthalsella degeneri* from feral goats, pigs, and nonnative plants are considered imminent because they are ongoing.

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. The species does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the time frame of the routine listing process. In addition, the U.S. Army has constructed fencing to prevent access of the valley by feral goats and pigs, which will provide protection to a portion of the population of *Korthalsella degeneri*. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of *K. degeneri* as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

DESCRIPTION OF MONITORING

Much of the information on this form is based on the results of a meeting of 20 botanical experts held by the Center for Plant Conservation in December of 1995, and was updated by personal communication with Bill Garnett, Division of Forestry and Wildlife, in 2000; and Joel Lau, Hawaii Natural Heritage Program, in 2000. We incorporated additional information on this species from our files and the most recent supplement to the *Manual of Flowering Plants of Hawaii* (Wagner and Herbst 2003). In 2004, the Pacific Islands Office contacted the following species experts: Robert Hobdy, retired from the Hawaii Division of Forestry and Wildlife; Joel Lau, Hawaii Natural Heritage Program; Arthur Medeiros, U.S.G.S. Biological Resources Discipline; Hank Oppenheimer, resource manager for the Maui Land and Pineapple Company; and Steve Perlman and Ken Wood, National Tropical Botanical Garden; however, no new status or range information was provided. In 2005 we contacted species experts, but received no new information on this taxon. In 2006, the Pacific Islands Office contacted the species experts listed below, but received no new information.

List all experts contacted:

Name	Date	Affiliation
Abbott, Lyman	08/11/06	Kahoolawe Island Reserve Commission
Agorastos, Nick	08/11/06	Hawaii Division of Forestry and Wildlife
Aruch, Sam	08/11/06	The Nature Conservancy
Bakutis, Ane	08/11/06	Plant Extinction Prevention Program
Bartlett, Randy	08/15/06	Maui Land and Pineapple Company
Belfield, Thomas	08/15/06	National Park Service
Bender, David	08/11/06	National Tropical Botanical Garden
Burney, David	08/11/06	National Tropical Botanical Garden
Caraway, Vickie	09/13/06	Hawaii Division of Forestry and Wildlife
Cassel, Katie	08/11/06	Kokee Resource Conservation Program
Chimera, Chuck	08/11/06	National Park Service
Clark, Michelle	08/11/06	Natural Resources Conservation Service
Cordell, Susan	08/11/06	U.S. Forestry Service
Denslow, Julie	08/11/06	U.S. Forestry Service
Drake, Don	08/11/06	University of Hawaii
Duvall, Fern	08/11/06	Hawaii Division of Forestry and Wildlife
Gagne, Betsy	08/11/06	Hawaii Division of Forestry and Wildlife
Garnett, Bill	08/11/06	National Park Service, Kalaupapa
Giffin, Jon	08/11/06	The Nature Conservancy
Gon, Sam	08/11/06	The Nature Conservancy
Hadway, Lisa	08/11/06	Hawaii Division of Forestry and Wildlife
Higashino, Paul	08/11/06	Kahoolawe Island Reserve Commission
Hobdy, Robert	08/11/06	Retired, HI Division of Forestry & Wildlife
Hoffman, Nancy	09/12/06	U.S. Fish and Wildlife Service, Refuges
Hughes, Guy	08/11/06	National Park Service
Imada, Clyde	08/11/06	Bishop Museum
Jacobi, Jim	08/11/06	U.S. Geological Survey
Jeffrey, Jack	08/11/06	U.S. Fish and Wildlife Service, Refuges

Kaufman, J. Boone	08/11/06	U.S. Forestry Service
Kawakami, Galen	08/08/06	Hawaii Division of Forestry and Wildlife
Kawelo, Kapua	08/11/06	U.S. Army, Environmental Division
Kiyabu, Brian	08/11/06	Amy Greenwell Botanical Garden
Koob, Gregory	08/11/06	Natural Resources Conservation Service
Lau, Joel	08/11/06	Hawaii Biodiversity and Mapping Program
Liesemeyer, Brent	08/11/06	Hawaii Division of Forestry and Wildlife
Loh, Rhonda	08/11/06	National Park Service
Loope, Lloyd	08/11/06	U.S. Geological Survey
Medeiros, Arthur	08/11/06	U.S. Geological Survey
Menard, Trae	08/11/06	The Nature Conservancy
Misaki, Ed	08/11/06	The Nature Conservancy
Morden, Cliff	08/11/06	University of Hawaii
Moses, Wailana	08/11/06	The Nature Conservancy
Naboa, Eldridge	08/11/06	The Nature Conservancy
Nakai, Glynnis	08/11/06	U.S. Fish and Wildlife Service
Oppenheimer, Hank	08/11/06	Plant Extinction Prevention Program
Palmer, Dan	08/11/06	amateur pteridologist
Pelizza, Sylvia	08/11/06	U.S. Fish and Wildlife Service, Refuges
Perlman, Steve	08/11/06	National Tropical Botanical Garden
Perry, Lyman	08/11/06	Hawaii Division of Forestry and Wildlife
Pratt, Linda	08/11/06	U.S. Geological Survey
Rehkemper, Cindy	06/06/06	U.S. Fish and Wildlife Service, Refuges
Rivers, Julie	09/12/06	U.S. Navy, Environmental Division
Ryder, Micah	08/11/06	Koolau Mountains Watershed Partnership
Sailer, Dan	08/11/06	The Nature Conservancy
Scowcroft, Paul	08/11/06	U.S. Forestry Service
Seidman, Stephanie	07/25/06	Maui Nui Botanical Gardens
Starr, Forest	08/11/06	U.S. Geological Survey
Sugii, Nellie	08/30/06	Lyon Arboretum
Tangalin, Natalia	05/24/06	National Tropical Botanical Garden
Warshauer, Rick	08/11/06	U.S. Geological Survey
Wass, Richard	08/11/06	U.S. Fish and Wildlife Service, Refuges
Welton, Patti	12/13/06	National Park Service
Whitehead, Namaka	08/11/06	Kamehameha Schools
Wood, Ken	08/11/06	National Tropical Botanical Garden
Yoshiokia, Joan	08/11/06	National Park Service

The Hawaii Biodiversity and Mapping Program identified this species as critically imperiled (HBMP 2006b). Based on the International Union for Conservation of Nature and Natural Resources Red Plant Data Book rarity categories, this species is recognized as Rare (could be considered at risk of extinction) by Wagner *et al*. (1999b). *Korthalsella degeneri* is not included in the list of species in Hawaii's 2005 Comprehensive Wildlife Conservation Strategy (Mitchell *et al*. 2005).

COORDINATION WITH STATES

In September 2006 we provided the Hawaii Division of Forestry and Wildlife with copies of our most recent candidate assessments for their review and comment. Vickie Caraway, the State botanist, reviewed the information for this species and provided no additional information or corrections (V. Caraway, State Botanist, pers. comm. 2006).

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____ 6/1/07
Regional Director, Fish and Wildlife Service Date

Concur: _____ November 27, 2007
Acting Director, U.S. Fish and Wildlife Service Date

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: Date: April 6, 2007
Conducted by: Cheryl Phillipson, Pacific Islands FWO
Biologist, Prelisting and Listing Program

Comments:
PIFWO Review

Reviewed by: Christa Russell Date: April 7, 2007
Prelisting and Listing Program Coordinator

Gina Shultz Date: April 11, 2007
Assistant Field Supervisor,
Endangered Species

Patrick Leonard Date: April 11, 2007

Field Supervisor