

Beach Jacquemontia
(Jacquemontia reclinata)

**5-Year Review:
Summary and Evaluation**

**U.S. Fish and Wildlife Service
Southeast Region
South Florida Ecological Services Office
Vero Beach, Florida**

5-YEAR REVIEW
Beach jacquemontia / *Jacquemontia reclinata*

I. GENERAL INFORMATION

A. Methodology used to complete the review: This review is based on monitoring reports, surveys, and other scientific and management information, augmented by conversations and comments from biologists familiar with the species. The review was conducted by the lead recovery biologist for beach jacquemontia in the South Florida Ecological Services Office. Literature and documents on file at the South Florida Ecological Services Office were used for this review. All recommendations resulting from this review are a result of thoroughly assessing all available information on the beach jacquemontia. Comments and suggestions regarding the review were received from South Florida Ecological Services Office supervisors and peer reviews from outside the Service. No part of the review was contracted to an outside party.

B. Reviewers

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Lead Field Office: South Florida Ecological Services Office, Marilyn Knight, (772) 562-3909, extension 297

C. Background

1. **FR Notice citation announcing initiation of this review:** June 21, 2005. Endangered and threatened wildlife and plants; 5-year review of 10 southeastern species. 70 FR 35689.
2. **Species status:** Decreasing, 2005 and 2006 Recovery Data Call. The 4 existing beach jacquemontia populations have shown a decline in total occupied area and individuals in wild have gone from 720 to 666.
3. **Recovery achieved:** 3 (51-75% recovery objectives achieved), 2005 and 2006 Recovery Data Call.
4. **Listing history**
Original Listing
FR notice: 58 FR 62046
Date listed: November 24, 1993
Entity listed: Species
Classification: Endangered
5. **Review History:**
Recovery Status Summary 1994
Final Recovery Plan 1999
Recovery Data Call 2005, 2004, 2003, 2002, 2001, 2000

A separate internal review of the species' status was completed by the South Florida Ecological Services Office, which is the recovery lead office for beach jacquemontia, on April 23, 2004, concluding that the recovery criteria necessary for delisting/downlisting had not been achieved to warrant a change of status.

6. Species' Recovery Priority Number at start of review (48 FR 43098): 2

7. Recovery Plan or Outline

Name of plan: South Florida Multi-Species Recovery Plan (MSRP)

Date issued: May 18, 1999

Dates of previous revisions: November 1, 1996

II. REVIEW ANALYSIS

A. Application of the 1996 Distinct Population Segment (DPS) policy

1. Is the species under review listed as a DPS? No.

The Act defines species to include any distinct population segment of any species of vertebrate wildlife. This definition limits listings as distinct population segments (DPS) only to vertebrate species of fish and wildlife. Because the DPS policy is not applicable to this plant species, it is not addressed further in this review.

B. Recovery Criteria

1. Does the species have a final, approved recovery plan containing objective, measurable criteria? Yes

2. Adequacy of recovery criteria.

a. Do the recovery criteria reflect the best available and most up-to-date information on the biology of the species and its habitat? Yes

b. Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)? Yes

3. List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information. For threats-related recovery criteria, please note which of the 5 listing factors are addressed by that criterion. If any of the 5-listing factors are not relevant to this species, please note that here.

Criteria for reclassification of beach jacquemontia from endangered to threatened:

1. Enough demographic data are available to determine the appropriate numbers of self-sustaining populations and sites needed to ensure 20 to 90 percent probability of persistence for 100 years.

Demographic information, such as numbers of sites and populations, numbers of individuals in a population, recruitment, dispersal, growth, survival, and mortality, are needed to conduct population viability and risk assessment analyses. Some of this information has been obtained for beach jacquemontia, partially satisfying this criterion. An extensive survey of the species was conducted in 2000 by Fairchild Tropical Botanic Gardens (FTBG) to quantify population size, describe plant and habitat condition, and map natural populations (Maschinski et al. 2003). Sixteen potential sites were identified and surveyed to determine existence or extirpation. Nine of the 10 extant natural populations were surveyed and 760 individuals were located.

Results of more recent surveys indicate that the total number of individuals in wild populations has declined since 2000 to 666 individuals (Maschinski et al. 2005a, 2005b, 2006b). These declines have been documented in all studied populations and indicate a 13 percent decrease in the total wild population size since 2000 (Maschinski et al. 2006d). Because the three largest populations have not been surveyed since 2001, declines in number of extant individuals may be even greater (Thorton 2006 in litt.). If seedling recruitment is lower than mortality in these populations, as it is in the populations that have been monitored (Maschinski 2006 in litt.), this would lead us to believe that these populations are following the same trend of decline. Demographic studies at four sites monitored since 2000 indicate that total area occupied is decreasing in size and there is a reduction in stem density (Maschinski et al. 2003, Pipoly et al. 2006). Seedlings were observed in demographic plots for the first time in 2004 and a new patch of plants was observed in 2005 (Pipoly et al. 2006, Maschinski et al. 2006c). However, only 13 of the original 19 patches at these four sites are surviving (Maschinski et al. 2006c). The study of patches seems to be an appropriate method for long-term monitoring (Thorton 2006 in litt.).

Studies have demonstrated that beach jacquemontia seeds are able to persist in a seed bank for more than a year, suggesting enough seed survival to allow opportunities for population stabilization during infrequent favorable germination conditions (Maschinski et al. 2005a). Long-term seed survival was observed in one site 2 years after a heavy fruiting event.

Larger jacquemontia populations have greater genetic diversity than smaller ones (Maschinski et al. 2003, Maschinski and Wright 2006). It is interesting to note that genetic variation between populations is low, but within populations it is high (Maschinski et al. 2003). Results indicated that there is gene flow between populations but no significant relationship between geographic and genetic distance (Maschinski et al. 2003).

“From 2001 through 2005, FTBG introduced 935 beach jacquemontia plants in seven experiments in five locations using plants propagated *ex situ*. Reintroductions have dramatically increased the number of plants in the wild by 72 percent. Survival from the time of transplant to 2005 ranged from 2%-97%” (Maschinski and Wright 2006). Both human and natural factors have contributed to mortality of reintroduced plants (Maschinski et al. 2006b). Plants at one site inadvertently came in contact with herbicide during efforts to control exotic species. At several sites, plants have been buried by sand during natural coastal events and large tidal surges associated with hurricanes. In a study of outplanted individuals planted along an environmental gradient within the coastal dune, factors such as salt spray, wind, and extreme high tides affected survivorship of the plants closest to the ocean, and shading and herbivory affected plants furthest from the ocean (Maschinski et al. 2003, 2005a). A longer period of time will be required before reintroduced populations can be considered to be self-sustaining (Maschinski 2006 in litt., Maschinski and Wright 2006).

Both reintroduced and natural populations are experiencing more mortality than recruitment (Maschinski 2006 in litt.). The variability in the stability of populations over the 3 years of the Maschinski et al. (2003) study indicated that long-term data on mortality and recruitment are needed to develop an accurate population viability analysis model for this species. Researchers determined that there is a large amount of variation in growth and that recruitment varies in time and space, as evidenced by the high production of fruit and seed and lack of recruitment. Further genetic studies are also needed to address this criterion.

2. These sites, within the historic range of beach jacquemontia, are adequately protected from further habitat loss, degradation, and fragmentation.

All but one of the known populations is located on public land in parks or recreation areas operated by State, county, or local governments. These sites are all highly valued as open space; we do not know to what extent public policies ensure that the parks will not be encroached upon by new facilities. Although the threat associated with trespassing on dunes where plants can get trampled has been reduced at some sites, it may continue to be a problem if the level of enforcement is not adequate (Bradley 2006 in litt.). Plants may be destroyed or severely damaged by pedestrian traffic associated with trespassing in these areas. This criterion addresses listing factors A, D, and E.

3. These sites are managed to maintain the coastal strand to support beach jacquemontia.

Management practices have generally favored maintenance of the coastal strand inhabited by beach jacquemontia, but we have not assessed to what extent the parks will be able to maintain the native vegetation over the long-

term. Vegetation and species diversity maps have been distributed to managers for eight of the nine sites on public lands (Maschinski et al. 2003). A meeting of 20 project collaborators, including land managers, biologists, and naturalists from Miami-Dade, Broward, and Palm Beach Counties, the State of Florida, the City of Boca Raton, and researchers from FTBG and Florida International University was held in April 2001 to identify research opportunities and management needs at each site. Site-specific management recommendations and protocols for monitoring and outplanting jacquemontia populations were developed from the communication fostered through this meeting.

In spring 2002, a coastal dune stabilization project was conducted in the City of Boca Raton's Red Reef Park (Maschinski et al. 2003). This site was planted with native coastal species and 18 jacquemontia plants. Coastal dune areas are also being restored within Carlin Park and South Inlet Park, managed by Palm Beach County Department of Environmental Resources Management (Walesky 2005 in litt.). Exotics removal is occurring in several parks, including Carlin Park, South Inlet Park, and Red Reef Park (Bass 2005 in litt.). Attempts have been made to protect the plants from woody encroachment at Loggerhead Park; however, the 12 original plants located at this site have perished and only 3 recruits remain (Walesky 2005 in litt.). This criterion addresses listing factors A and E.

4. Monitoring programs demonstrate that populations of beach jacquemontia on these sites support the appropriate numbers of self-sustaining populations, and those populations are stable throughout the historic range of the species.

The most recent complete inventory of natural populations indicates that no population has more than 250 plants, and four populations have less than 10 individuals (Maschinski et al. 2003). Existing populations are very small, but they are spread throughout the historic range of the species. Over the past 5 years, seven experimental reintroductions of jacquemontia have been conducted at high priority sites (Maschinski and Wright 2006). Demographic monitoring indicates that transplanted individuals grow well, and approximately 50% of the plants have produced flowers and fruits (Maschinski and Wright 2006). However, the small patches of jacquemontia with few stems are most vulnerable to extirpation (Pipoly et al. 2006, Maschinski et al. 2006d). Because little recruitment has been seen, it is uncertain whether natural or introduced populations are self-sustaining (Maschinski 2006 in litt., Maschinski and Wright 2006).

Criteria for delisting the beach jacquemontia:

1. There are an adequate number of geographically distinct, self-sustaining populations throughout its historic range to ensure 95 percent probability of persistence for 100 years. The recovery [plan] identifies management

recommendations, such as translocations, that are necessary to accomplish this objective.

See reclassification criterion 1 above for information about developing self-sustaining populations throughout the historic range. Over the past 5 years, six experimental reintroductions and at least one augmentation of beach jacquemontia have been conducted at high priority sites and efforts are continuing (Maschinski et al. 2006a). Site-specific management recommendations and protocols for monitoring and outplanting jacquemontia populations were developed and disseminated to land managers at most of the parks (Maschinski et al. 2003).

2. Persistence of the species is ensured for 100 or more years. This will be further defined once this species is reclassified.

See reclassification criterion 1 above.

Listing factors B and C are not relevant to this species.

C. Updated Information and Current Species Status

1. Biology and Habitat –

a. Abundance, population trends (e.g., increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate), or demographic trends: Results of recent surveys indicate that the total number of individuals in wild populations has declined (Maschinski et al. 2005c, 2006d; Pipoly et al. 2006; Maschinski and Wright 2006). These declines have been documented in all studied populations and indicate a 13% decrease in the total wild population size since 2000 (Maschinski et al. 2006d). None of the wild populations is comprised of more than 250 individuals and 66% have fewer than 100 plants (Maschinski and Wright 2006). Demographic studies at four sites monitored since 2000 indicate that total area occupied is decreasing in size and there is a reduction in stem density (Maschinski et al. 2003, Pipoly et al. 2006). These small patches with few stems are the most vulnerable to extinction (Maschinski et al. 2006d, Pipoly et al. 2006).

Although seedling recruitment was shown to be rare in wild populations as indicated in studies from 2000-2005, some recruitment has been documented (Maschinski et al. 2005c, Pipoly et al. 2006). Seedlings were observed in demographic plots for the first time in 2004 and a new patch of plants was observed in 2005 (Pipoly et al. 2006, Maschinski et al. 2006c). However, only 13 of the original 19 patches at these four sites are surviving (Maschinski et al. 2006c). The reduction in both area and proportion of study plots occupied in all but one census year suggests that growing conditions are becoming less favorable,

through competition with other plants, canopy cover, and amount of water available for seedling recruitment. (Pipoly et al. 2006).

Beach jacquemontia is a long-lived plant with an unknown lifespan that is pollinated primarily by small bees and bee flies and produces 0 to 4 seeds per fruit (Pinto-Torres et al. 2002). Experimental crosses demonstrated that this species has a mixed mating system (Maschinski and Wright 2006). Studies indicate that growth, reproduction, and mortality vary greatly across space and time (Maschinski et al. 2003, 2006d, Pipoly et al. 2006). It was also noted that germination and seedling survival may be regulated by winter rainfall (Pipoly et al. 2006).

Experimental introductions conducted between 2001 and 2005 have increased the total population size by 516 plants (72%) to 1,229 plants (Maschinski and Wright 2006). In seven experiments conducted in five sites using plants propagated *ex situ* at FTBG, 935 individuals were introduced with survival estimates varying from 2 to 97 percent (Maschinski and Wright 2006). Growth of transplanted individuals has been good and about 50 percent have produced flowers and seed (Maschinski and Wright 2006). Although these plants are contributing pollen and seed, no recruitment has been observed at these introduction sites (Maschinski and Wright 2006, Maschinski et al. 2006d).

b. Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding): Because of small population size, isolation of populations, and genetic drift, beach jacquemontia may be experiencing inbreeding depression (Pinto-Torres 2002). In recent analyses, genetic diversity of natural populations was positively correlated with population size (i.e., diversity was generally lower in small fragmented populations and higher in larger ones) (Maschinski and Wright 2006). However, levels of genetic variation were low between populations and high within populations (Maschinski et al. 2003). The study also noted gene flow across populations and showed no significant relationship between geographic and genetic distance (Maschinski et al. 2003). Despite having a mixed mating system and the ability to set viable seed through selfing or outcrossing, pollinations across populations had the highest likelihood of setting fruit and seed (Maschinski et al. 2003). According to analyses, eight populations of beach jacquemontia are genetically very similar (Maschinski and Wright 2006).

c. Taxonomic classification or changes in nomenclature: None. The Integrated Taxonomic Information System (ITIS 2007) was checked while conducting this review.

d. Spatial distribution, trends in spatial distribution (e.g., increasingly fragmented, increased numbers of corridors), or historic range (e.g., corrections to the historical range, change in distribution of the species' within its historic range): The remaining habitat where beach jacquemontia

occurs is highly fragmented and isolated throughout its range, with variation in size, occupied area, and extent of isolation among fragments (Maschinski and Wright 2006). Demographic studies at four sites monitored since 2000 indicate that total area occupied is decreasing in size and there is a reduction in stem density (Maschinski et al. 2003). Seedlings were observed in demographic plots for the first time in 2004 and a new patch of plants was observed in 2005. However, only 13 of the original 19 patches at these four sites are surviving (Maschinski et al. 2006c). Research has shown that small patches containing few plants are the most vulnerable to extinction (Maschinski et al. 2006d). Growing conditions appear to be becoming less favorable through competition with other plants, canopy cover, and amount of water available for seedling recruitment, as evidenced by the declines in occupied area and proportion of study plots occupied in annual censuses in all but 1 year (Pipoly et al. 2006).

e. Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem): According to Maschinski et al. (2003), beach jacquemontia tends to grow in somewhat open sites with more grasses and vines and fewer woody species, often found inland between the foredune and hammock. The two largest populations occur on sites with more sunlight, lower concentrations of salts and cations (especially magnesium), and lower soil moisture than other sites (Maschinski et al. 2003). Site characteristics such as salt spray, sand change, soil moisture, species composition, and species abundance varied tremendously between the sites. For many of these variables, there appeared to be a gradient of change from the coast inland (Maschinski et al. 2003). For example, many of the nutrient levels were higher away from the coast.

Coastal development has left only small, isolated fragments of habitat for this species. The juxtaposition of these fragments between development areas has made management of these properties very difficult by limiting opportunities for prescribed burning used to create open conditions and by introducing exotic species that impede the growth of these plants by competition for sunlight and nutrients.

All but one of the known populations is located on public land in parks or recreation areas operated by State, county, or local governments. Coastal dune stabilization, restoration, and/or exotics removal projects are being conducted at several of the parks to improve habitat conditions (Maschinski et al. 2003, Bass 2005 in litt., Walesky 2005 in litt.). Attempts have been made to protect the plants from woody encroachment at Loggerhead Park; however, the 12 original plants located at this site have perished and only 3 recruits remain (Walesky 2005 in litt.). These sites are all highly valued as open space, but continued long-term management will be necessary to maintain the habitat needed for this species.

f. Other: Although thousands of beach jacquemontia seeds are produced each year, there is little or no seed bank, and viability over time is a concern (Maschinski et al. 2003). Seed burial experiments resulted in 0-59% viability of

seeds after 1 year, but tests have not been conducted to determine long-term seed bank survival in the wild (Maschinski et al. 2003, Pipoly et al. 2006).

Results of greenhouse studies indicate that propagation of beach jacquemontia from seeds or cuttings can be easily achieved (Maschinski et al. 2003). Seeds were propagated in both light and dark conditions and germination rates ranged from 0-90% based on collection site, parent, storage technique, and storage duration (Maschinski et al. 2003). Of seed stored for 62 months, 25% was viable (Maschinski et al. 2003).

Over 7,000 seeds have been collected from eight wild populations and sent for long-term storage at the National Center for Genetic Resources and Preservation in Ft. Collins, Colorado. An additional 1,711 seeds were collected from these populations to be used for reintroductions (Maschinski et al 2006d).

2. **Five-Factor Analysis -**

a. Present or threatened destruction, modification or curtailment of its habitat or range: Coastal development has been the primary threat to habitat within the range of beach jacquemontia. Other threats to habitat include beach erosion, beach raking, and foot and vehicle traffic (Pipoly et al. 2006). The remaining habitat where beach jacquemontia occurs is highly fragmented and isolated throughout its range, with variation in size, occupied area, and extent of isolation among fragments (Maschinski and Wright 2006). The juxtaposition of these fragments between developed areas has made management of these properties very difficult by limiting opportunities for prescribed burning used to create open conditions and by introducing exotic species that impede the growth of beach jacquemontia by competing for sunlight and nutrients.

All but one of the 10 populations is located on public land in parks or recreation areas operated by State, county, or local governments. These sites are all highly valued as open space; we do not know to what extent public policies ensure that the parks will not be encroached upon by new facilities. Although the threat associated with trespassing on dunes where plants may be trampled has been reduced at some sites, it may continue to be a problem if the level of enforcement is not adequate (Bradley 2006 in litt.). Plants may be destroyed or severely damaged by pedestrian traffic associated with trespassing in these areas. Coastal dune stabilization, restoration, and/or exotics removal projects are being conducted at several of the parks to improve habitat conditions (Maschinski et al. 2003, Bass 2005 in litt., Walesky 2005 in litt.). Management practices have generally favored maintenance of the coastal strand inhabited by beach jacquemontia, but we have not assessed to what extent the parks will be able to maintain the native vegetation over the long-term. Overall, destruction, modification, and curtailment of habitat continue to be the largest threats to the species.

b. Overutilization for commercial, recreational, scientific, or educational purposes: Not known as a threat.

c. Disease or predation: Not known as a threat when listed. Researchers have noted more recently that young plants may be susceptible to herbivory by rabbits (Pinto-Torres et al. 2002, 2004; Maschinski et al. 2003, 2005c).

d. Inadequacy of existing regulatory mechanisms: Managing agencies have adequate regulatory tools to protect these lands as long as the level of law enforcement is adequate.

e. Other natural or manmade factors affecting its continued existence:

Limited geographic distribution, fragmentation of remaining habitat into small segments isolated from each other, and the small sizes of populations are other factors affecting this species. Because most extant populations are very small, it is doubtful that many are large enough to be viable. The small sizes of existing populations (none over 250 but most less than 100 individuals) and the small total number of existing wild plants (estimated at about 666 individuals) means that the viability of existing populations is questionable, an imminent and possibly high-magnitude threat (Maschinski and Wright 2006).

Catastrophic events such as hurricanes, that once were beneficial for beach jacquemontia populations because of the open areas that they created and their seed dispersal effects (Pinto-Torres et al. 2003, 2004), may now negatively affect the species through storm damage or post-storm damage, because of the limited numbers of individuals and populations in existence (Service 1996, Maschinski and Wright 2006, Maschinski et al. 2005a, 2005c, 2006a, 2006b). Beach erosion is also a concern for these small populations (Pinto-Torres 2002). In order to ensure long-term survival, populations will require active management to maintain open areas that were once naturally created by hurricanes and fires (Maschinski and Wright 2006). Vegetation restoration and management programs are costly, and the availability of funding is never assured; therefore, habitat modification on protected lands remains an imminent threat.

Exotic species, such as Brazilian pepper (*Schinus terebinthifolius*), Australian pine (*Casuarina equisetifolia*), and coinvine (*Colubrina asiatica*), also pose a threat. These aggressively growing plants compete with beach jacquemontia for sunlight and nutrients. Coastal dune stabilization, restoration, and/or exotics removal projects are being conducted at several of the parks where the species occurs to improve habitat conditions (Maschinski et al. 2003, Bass 2005 in litt., Walesky 2005 in litt.). Although exotics control has been initiated in these areas, there are sites where control has not been implemented. Also, it is not known what the long-term effects of these management actions will be on the populations (Maschinski and Wright 2006). Also, the Center for Plant Conservation's plant profile for this species lists recreation as a potential threat (Fellows 2007).

D. Synthesis - The final, approved recovery plan for beach jacquemontia contains objective measurable criteria that reflect the best available and most up-to-date information on the biology of the species and its habitat and address all three of the listing factors relevant to the species. Even though the majority of beach jacquemontia populations occur on public lands, habitat degradation continues to affect the extant populations. The limited distribution and small populations render the species vulnerable to random natural or human induced events, such as hurricanes and encroachment of invasive exotic species. The total number of individuals in wild populations has declined since 2000, as indicated by a decrease in the size of the total area occupied and a reduction in stem density at four sites (Maschinski et al. 2003, Pipoly et al. 2006). Very little recruitment has been observed in wild populations. These trends suggest that growing conditions are becoming less favorable through competition with other plants, canopy cover, and amount of water available for seedling recruitment. Although only four populations have been monitored annually, these populations span most of the range of the species and are therefore representative of range-wide species trends.

According to analyses, eight populations of beach jacquemontia are genetically very similar and the populations may be experiencing inbreeding depression. Although thousands of beach jacquemontia seeds are produced each year, there is little or no seed bank and viability over time is a concern. Results of greenhouse studies indicate that propagation of beach jacquemontia from seeds or cuttings can be easily achieved. Seeds have been collected from wild populations for both long-term storage and reintroductions. Threats to this species remain similar to those identified at the time of listing and no new threats have been observed that are cause for serious concern.

The small area of habitat in beachfront parks inherently limits recovery opportunities, but park managers are implementing management strategies to protect existing populations and accept population augmentations and reintroductions. Site-specific management recommendations and protocols for monitoring and outplanting beach jacquemontia populations have been developed and disseminated to land managers at most of the parks, and habitat restoration is underway at many of the sites (Maschinski et al. 2003). However, because vegetation restoration and management programs are costly, and the availability of funding is never assured, habitat modification on protected lands remains an imminent threat. Over the past 5 years, seven experimental reintroductions of the species have been conducted at high priority sites and efforts are continuing (Maschinski and Wright 2006). These plants are contributing pollen and seed to the population, but no recruitment has been observed at these introduction sites. Although there has been some progress in recovery efforts for the beach jacquemontia, this species continues to meet the definition of endangered under the Endangered Species Act.

III. RESULTS

A. Recommended Classification:

The recovery criteria for downlisting/delisting have not been met; therefore, no change in classification is warranted.

- Downlist to Threatened**
- Uplist to Endangered**
- Delist** (*Indicate reasons for delisting per 50 CFR 424.11*):
 - Extinction*
 - Recovery*
 - Original data for classification in error*
- No change is needed**

IV. RECOMMENDATIONS FOR FUTURE ACTIONS - Additional research and monitoring needs to be conducted. Historical reviews marking the changes in dune vegetation over the range of the species should be conducted to understand the role of ecosystem changes in the status of the population. Potential habitat identified through aerial photographs in the three counties of interest should be surveyed with landowner permission and conservation agreements/management recommendations should be pursued. Partnerships should be promoted to share information, conduct collaborative research on coastal dune habitat conservation, and provide land managers and the interested public with information about coastal ecosystems, threats, recovery actions, and associated rare biota. The private property where the species is known to occur should be acquired if possible or if development occurs, we should work with the landowner to design the development such that plants are not destroyed, dune vegetation remains, and provisions are made for managing the population.

Experimental reintroductions and monitoring should continue to assess protocols for outplanting. Work should be done to increase the number of geographically distinct, self-sustaining populations of *jacquemontia* within its historic range through reintroduction of plants to protected sites and augmentation of populations where needed. This should be implemented in conjunction with coastal dune habitat restoration when possible to re-establish and maintain the entire complex of herbaceous plants historically present in the dune flora of south Florida. Genetic diversity of plants used in reintroductions should be assessed to ensure long-term viability of outplanted populations.

The degree to which protective measures (e.g., marking plants, installing fencing) are being implemented should be assessed. Management actions should be coordinated with those of other rare coastal species for which protective measures are being implemented. Agencies should be re-convened to evaluate the current status of protection and the level of implementation of management practices at each park and to discuss current levels of support, threats to habitat and individual plants, and any obstacles to management. Public access should continue to be managed to prevent trespassing on the dunes and enforce “no trespassing” regulations. Public education should be implemented to educate visitors about this rare species and help control public access to the dunes.

Additional demographic research should be conducted, individual plants should be tagged, and microhabitat changes should be tracked. Additional monitoring will be needed to document and assess population declines or increases. Further genetic studies

are needed. When enough demographic data are available, a population viability analysis should be conducted. Exotic species removal will have to be continued and public awareness of the threats affecting beach jacquemontia should be addressed. The role of fire in the establishment and management of the species should be examined.

V. REFERENCES -

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**U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of
Beach Jacquemontia (*Jacquemontia reclinata*)**

Current Classification Endangered
Recommendation resulting from the 5-Year Review

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change is needed

Appropriate Listing/Reclassification Priority Number, if applicable 2

Review Conducted By Marilyn Knight

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve  Date 9-29-07

The lead Field Office must ensure that other offices within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. The lead field office should document this coordination in the agency record.

REGIONAL OFFICE APPROVAL:

The Regional Director or the Assistant Regional Director, if authority has been delegated to the Assistant Regional Director, must sign all 5-year reviews.

Lead Regional Director, Fish and Wildlife Service

Approve  Date 5/30/07

The Lead Region must ensure that other regions within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. If a change in classification is recommended, written concurrence from other regions is required.

Cooperating Regional Director, Fish and Wildlife Service

Concur Do Not Concur

Signature _____ Date _____

APPENDIX A: Summary of peer review for the 5-year review of beach jacquemontia (*Jacquemontia reclinata*)

If peer review was conducted, record information regarding how peer review was conducted and the results of peer review. If peer review was conducted in order to fulfill requirements of the OMB Peer Review Bulletin (PRB), reporting and posting information regarding peer review may be required. Information also may be provided as attachments.

A. Peer Review Method: The Service conducted a standard level of peer review. Recommendations for peer reviewers were solicited from Florida Department of Agriculture and Consumer Services and Fairchild Tropical Botanic Garden (a non-governmental organization). Additionally, one official peer reviewer and one unofficial peer reviewer were selected by the Service. Three official peer reviewers and one unofficial reviewer participated in this review. Individual responses were requested and received from each peer reviewer.

B. Peer Review Charge: See attached guidance.

C. Summary of Peer Review Comments/Report: Peer review comments were substantial and provided insights that were beneficial in conducting this review. Comments and concerns covered a variety of topics including continuation of declines in numbers of individuals and deterioration of habitat; the rate of mortality over recruitment in both wild and introduced populations; the appropriateness of studying patches for long-term monitoring; the distinction between natural and reintroduced populations; the increase of plants in the wild as a result of reintroductions; the possible conversion of populations from wild, extant populations to those comprised primarily of reintroduced individuals; the inability of ongoing demographic studies to determine whether the largest existing populations sustain enough genetic variation to support evolutionary change; and the benefits of re-convening the agencies concerned with the species to evaluate the current status of protection, the level of implementation of management practices, and to discuss current levels of support, threats to habitat and individual plants, and any obstacles to management.

Suggestions for future actions were to direct experimental work on the role of fire in establishment and management of the species; incorporate more of an educational component into recovery actions for the public; establish partnerships to examine conflicting management practices between removing woody vegetation and exposing sea turtle nesting beaches to lights; control public access to dunes and incorporate a public outreach component to educate visitors; conduct historical reviews to track changes in dune vegetation; encourage more large-scale efforts to restore, establish, and maintain coastal dune vegetation and associated rare plants; implement exotic plant control and invasive and hardwood vine control where needed; seek to acquire private property where the species occurs or design development such that plants and dunes are not destroyed but protected and managed; conduct further genetic studies; conduct additional reintroductions in conjunction with dune restoration projects; continue long-term demographic monitoring; and re-convene the agencies concerned with the species to re-evaluate the current status and management of the species.

D. Response to Peer Review: The Service was in agreement with all comments and concerns received from peer reviewers. Comments were incorporated into the 5-year review form as appropriate.

Guidance for Peer Reviewers of Five-Year Status Reviews

U.S. Fish and Wildlife Service, South Florida Ecological Services Office
June 7, 2006

As a peer reviewer, you are asked to adhere to the following guidance to ensure your review complies with Service policy.

Peer reviewers should:

1. Review all materials provided by the Service.
2. Identify, review, and provide other relevant data apparently not used by the Service.
3. Not provide recommendations on the Endangered Species Act (ESA) classification (e.g., endangered, threatened) of the species.
4. Provide written comments on:
 - Validity of any models, data, or analyses used or relied on in the review.
 - Adequacy of the data (e.g., are the data sufficient to support the biological conclusions reached). If data are inadequate, identify additional data or studies that are needed to adequately justify biological conclusions.
 - Oversights, omissions, and inconsistencies.
 - Reasonableness of judgments made from the scientific evidence.
 - Scientific uncertainties by ensuring that they are clearly identified and characterized, and that potential implications of uncertainties for the technical conclusions drawn are clear.
 - Strengths and limitation of the overall product.
5. Keep in mind the requirement that we must use the best available scientific data in determining the species' status. This does not mean we must have statistically significant data on population trends or data from all known populations.

All peer reviews and comments will be public documents, and portions may be incorporated verbatim into our final decision document with appropriate credit given to the author of the review.

Questions regarding this guidance, the peer review process, or other aspects of the Service's recovery planning process should be referred to Cindy Schulz, Endangered Species Supervisor, South Florida Ecological Services Office, at 772-562-3909, extension 305, email: Cindy_Schulz@fws.gov.