United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecosystem Office
P.O. Box 2676
Vero Beach, Florida 32961-2676

December 21, 1998

MEMORANDUM

To: GARD, Area III, Atlanta, GA

From: Project Leader, South Florida Field Office, Vero Beach, FL

Subject: Transmittal of Documents for Consideration of Issuance of Incidental Take Permit to Driscoll Properties, Inc., Driscoll Foundation, Inc., and Ocean Reef Community Association.

Attached please find our Biological Opinion, Finding of No Significant Impact, Environmental Action Statement, and Set of Findings for your review and consideration for issuance of the subject permit. An electronic version of these documents is also included in the attached disk. If you have questions about any of the information in these documents, please contact me or Mike Jennings of my staff.

attachments

Findings and Recommendation on Application by Driscoll Properties, Inc., Driscoll Foundation, Inc., and Ocean Reef Community Association for an Incidental Take Permit for the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly.

I. Description of Proposal

Driscoll Properties, Inc., Driscoll Foundation, Inc., and Ocean Reef Community Association (Applicants) have applied to the U.S. Fish and Wildlife Service (Service) for a permit to incidentally take Key Largo cotton mice, Key Largo woodrats, and Schaus swallowtail butterflies under the authority of section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)(Act). The Applicants' proposal includes on-site minimization measures to reduce adverse effects that this project may have on federally listed species. The Applicants also propose both on-site and off-site mitigation to compensate for unavoidable adverse affects.

The Applicants propose to alter suitable habitat for the three aforementioned federally listed species that occur on 49 residential lots located within an existing residential-golf course community known as Ocean Reef Club. The clearing of vegetation in preparation for residential construction is expected to destroy or degrade about 19.6 acres of tropical hardwood hammock, which is the principle vegetative community used by the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly. The 49 residential lots are located in section 24, Township 59 South, Range 40 East and section 19, Township 59 South, Range 41 East, North Key Largo, Monroe County, Florida.

II. Incidental Take Permit Issuance Criteria - Analysis and Findings

1. Criterion - The taking will be incidental.

   Findings - The take will be incidental to the otherwise lawful activity that would occur as a result of clearing and construction activities related to the proposed project.

2. Criterion - The Applicants will, to the maximum extent practicable, minimize and mitigate the impacts of the taking.

   Findings - The Service finds that the Applicants have developed an adequate habitat conservation plan (HCP) pursuant to the incidental take permit (ITP) requirements provided in the Act and implementing regulations. The HCP provides for measures to minimize project impacts on-site, these measures include:

1. Protection of 20 to 80 percent of the tropical hardwood hammock vegetation on each lot, in accordance with Monroe County ordinance.

2. Establishment of covenant restrictions which prohibit free-ranging domestic animals

Unavoidable adverse affects to Key Largo cotton mice, Key Largo woodrats, and Schaus swallowtail butterflies will be mitigated both on-site and off-site. The HCP provides for the following mitigation measures:

1. Preservation about six acres of tropical hardwood hammock on-site through conservation easement to the State of Florida.

2. Restoration of the area encompassed by the conservation easement, including planting of endemic tropical hardwood plants species and control of exotic vegetation.

3. Restoration of about five acres of tropical hardwood hammock off-site, including planting of endemic tropical hardwood hammock vegetation and control of exotic species.

4. Construction of 30 rock piles within the conservation easement area (10 piles) and tropical hardwood hammock restoration sites (20 piles), for the purpose of providing additional nesting substrates for endemic rodents.

3. Criterion - The Applicant will ensure that adequate funding for the HCP and procedures to deal with unforeseen circumstances will be provided.

Findings - As discussed in the Environmental Assessment, two of the three current Applicants previously received and ITP to take Key Largo cotton mice, Key Largo woodrats, and Schaus swallowtail butterflies. Under the previous ITP, the permittees committed to provide funding necessary to comply with the terms and conditions of the previous ITP. Most of the mitigation measures have already been funded or are currently being funded. As a result, the Service believes that the Applicants for the current ITP have previously provided adequate funding and have committed additional resources to ensure that the remaining mitigation measures will be completed.

4. Criterion - The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

Findings - The Act's legislative history establishes the intent of Congress that this issuance criterion is identical to a regulatory finding of "no jeopardy" under section 7(a)(2) [see 50 CFR 402.03]. As a result, issuance of this section

10(a)(1)(B) permit was reviewed by the Service under section 7 of the Act. In the biological opinion, which is attached hereto and incorporated herein by reference, the Service concluded that issuance of the incidental take permit is not likely to jeopardize the continued existence of the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly.

5. Criterion - Additional measures as required by the Director of the Service will be implemented.

Findings - The Environmental Assessment (EA) and HCP have incorporated all elements necessary for issuance of a section 10(a)(1)(B) permit. These elements are addressed elsewhere in this recommendation memorandum.

6. Criterion - The Director of the Service has received the necessary assurances that the plan will be implemented.

Findings - The permit will only be effective when the mitigation measures have been carried out in accordance with the special conditions of the permit. Failure to perform the obligation outlined by the conditions of the section 10(a)(1)(B) permit may be grounds for suspension or revocation of the permit.

III. General Criteria and Disqualifying Factors - Analysis and Findings

The Service has no evidence that the permit application should be denied on the basis of criteria and conditions set forth in 50 CFR 13.21(b)-(c).

IV. Public Comments

The Service received no responses during the public notice period, therefore none are addressed in this section.

V. Recommendations on Issuance of Permit

Based on our findings with respect to the permit application, EA, and HCP, the Service recommends issuance of the section 10(a)(1)(B) incidental take permit, PE-004859-0 for up to 40 Key Largo cotton mice, three woodrats, and 19.6 acres of habitat suitable for Schaus swallowtail butterflies, to the Applicants.

Geographic Assistant Regional Director, Area III _____ Date _____

10(a)(1)(B) permit was reviewed by the Service under section 7 of the Act. In the biological opinion, which is attached hereto and incorporated herein by reference, the Service concluded that issuance of the incidental take permit is not likely to jeopardize the continued existence of the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly.

5. Criterion - Additional measures as required by the Director of the Service will be implemented.

Findings - The Environmental Assessment (EA) and HCP have incorporated all elements necessary for issuance of a section 10(a)(1)(B) permit. These elements are addressed elsewhere in this recommendation memorandum.

6. Criterion - The Director of the Service has received the necessary assurances that the plan will be implemented.

Findings - The permit will only be effective when the mitigation measures have been carried out in accordance with the special conditions of the permit. Failure to perform the obligation outlined by the conditions of the section 10(a)(1)(B) permit may be grounds for suspension or revocation of the permit.

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_____ _____

Geographic Assistant Regional Director, Area III Date

UNITED STATES FISH & WILDLIFE SERVICE

ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council of Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, we have established the following administrative record and have determined that the **issuance of a Section 10(a)(1)(B) Incidental Take Permit and approval of the associated Habitat Conservation Plan of Driscoll Properties, Inc., Driscoll Foundation, Inc., and Ocean Reef Community Association (Applicants) for take of the endangered Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly in association with otherwise lawful activities:**

____ is a categorical exclusion as provided by 516 DM2, Appendix 1 and 516 DM 6. No further documentation will be made.

_X_ is found not to have significant environmental effects as determined by the attached Environmental Assessment and Finding of No Significant Impact.

____ is found to have significant effects, and therefore a "Notice of Intent" will be published in the Federal Register announcing the decision to prepare an Environmental Impact Statement before the project is considered further.

____ is not approved because of unacceptable environmental damage, or a violation of Fish and Wildlife Service mandates, policy, regulations, or procedures.

____ is an emergency situation within the context of 40 CFR 1 506.11. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Supporting Documents:

Biological Opinion, Environmental Assessment, Statement of Findings, the Applicant's Habitat Conservation Plan, Permit, and responses to public comments.

Signature Approval:

_____

GARD Area III Date

FINDING OF NO SIGNIFICANT IMPACT

Proposed Issuance of an Incidental Take Permit to
Driscoll Properties, Inc., Driscoll Foundation, Inc., and
Ocean Reef Community Association
Authorizing Incidental Take of the
Key Largo Cotton Mouse, Key Largo Woodrat, and Schaus Swallowtail Butterfly
on North Key Largo for a 5-year period

The Fish and Wildlife Service (Service) proposes to issue an Incidental Take Permit (ITP) to Driscoll Properties, Inc., Driscoll Foundation, Inc., and Ocean Reef Community Association (Permittees) to authorize an amount and extent of incidental take of the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly, resulting from the otherwise lawful clearing of 49 residential lots in North Key Largo, Monroe County, Florida. The clearing of 49 residential lots will result in the destruction of about 19.6 acres of habitat that support the above mentioned species. The Service proposes to coordinate with the Permittees and implement a Habitat Conservation Plan (HCP) pursuant to section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (Act) to ensure compliance with section 9 of the Act.

In addition to the preferred alternative, which is the issuance of an ITP as conditioned by the submitted HCP, the Service considered a no action alternative and an alternative that would have led to acquisition of some or all of the habitat of the above mentioned Federally listed species. The acquisition alternative was not fully evaluated due to findings by the Service that the lands covered by the HCP had never been considered for purchase under existing local, county, or State acquisition programs. The Service believes that parcels covered under this HCP were not previously considered for acquisition due to their relatively small size, juxtaposition to existing residential development, and high costs. Implementation of the preferred alternative is expected to result in the loss of about 20 acres of suitable habitat while conserving about 6 acres and restoring another 5 acres. The protection and restoration of habitat will occur within and adjacent to large tracts of public land which was acquired and is managed for Federally listed species and other rare flora and fauna. The preferred alternative enhances the value of these conservation lands and is expected to result in conservation benefits to the endangered Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly while meeting the needs of the affected landowner.

The Service's issuance of an ITP is not expected to result in substantial environmental, social, or economic effects. Residential development within North Key Largo and all of Monroe County is guided by strict protective ordinances currently in effect under Monroe County's Comprehensive Plan. The Comprehensive Plan has established goals and objectives for avoiding or minimizing the adverse effects of urban growth on many of the human and natural resources that exist within the County. The issuance of the ITP and subsequent residential development that will occur as a result of the issuance of the ITP are

within the scope of the Comprehensive Plan, and as such, the Service's proposed action is not expected to result in adverse beyond those anticipated in the Comprehensive Plan.

Issuance of the ITP will in the taking of one or more individuals of the three federally listed species identified above. The Service outlined the effect of take in the Environmental Assessment (copy attached) and discussed the biological implications of such take in the inter-Service section 7 consultation and concluded that the take of federally listed species would not jeopardize their continued existence and that the adverse affects anticipated due to the issuance of the ITP would be adequately mitigated. The Applicant's HCP identified several minimization and mitigation strategies that had either previously been implemented, were ongoing, or proposed, that would mitigate the effects of take of federally listed species. These measures include the perpetual protection of habitat and the restoration of habitat.

The proposed issuance of an ITP to the Applicant would not have any significant adverse effects on wetlands and floodplains, pursuant to Executive Orders 11990 and 11988 because no wetland resources occur within the footprint of the residential development that will be affected by the issuance of this ITP.

The issuance of this ITP by the Service has been thoroughly coordinated with all interested and/or affected parties. Service policy requires that the public be notified of HCPs received and provided the opportunity to comment on any subsequent NEPA documentation prepared. In this case, the Service published an Announcement of Availability of the Applicant's HCP and Environmental Assessment and request comments during the 30 day public comment period. In addition, the Service provided copies of the HCP and Environmental Assessment to the Florida Game and Fresh Water Fish Commission for review and comment. No substantial comments were received by the public or the Florida Game and Fresh Water Fish Commission.

Copies of the Environmental Assessment are available by written request to Mr. Mike Jennings, U.S. Fish and Wildlife Service, P.O. Box 2676, Vero Beach, Florida 32960 or Mr. Richard Gooch, U.S. Fish and Wildlife Service, 1875 Century Boulevard, Suite 200 Atlanta, Georgia 30345.

Therefore, it is my determination that the proposal does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969, as amended. As such, an environmental impact statement is not required. This determination is based on the following factors (40 CFR 1508.27):

1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment. The issuance of the ITP will only directly affect the federally listed species for which it authorizes take. The indirect effects of issuance of this ITP are expected to be related to the construction and occupancy of 49 residential units in North Key Largo. Much of Key Largo and

surrounding areas have already experienced substantial urban development and the additional urban pressures that will be generated by the residents of the 49 homes be constructed as a result of the issuance of this ITP will not significantly add either beneficially or adversely to the existing effects on the human environment. Pages 10 through 12 of the EA address this issue by reference to Monroe County's Comprehensive Plan.

2. The action will not have a significant effect on public health and safety. The issuance of this ITP and the subsequent construction and occupancy of 49 residential units do not increase the risk of public health and safety. Pages 10 through 12 of the EA address this issue by reference to Monroe County's Comprehensive Plan.

3. The project will not significantly effect any unique characteristics of the geographic area such as the proximity to historic or cultural resources, wetlands, floodplains, wild and scenic rivers, or ecologically critical areas. Within the area affected by the proposed action, the Service is not aware of any unique characteristics that will be affected. Pages 10 and 11 and Table 1 of the Environmental Assessment references Monroe County's Comprehensive Plans which identifies cultural resources, wetlands, and other unique ecological resources and implements protective measures for these important resources.

4. The effects on the quality of the human environment are not likely to be highly controversial since residential and commercial development already exists extensively on Key Largo. The construction of 49 additional single family residences is not expected to substantially change the quality of the human environment. This issue is also addressed within Monroe County's Comprehensive Plan and is referenced by incorporation in the Environmental Assessment on pages pages 10 through 11.

5. The actions do not involve highly uncertain, unique, or known environmental risks to the human environment. Residential development is not expected to involve unknown risks to the human environment since extensive urbanization currently existing adjacent to the Project site and throughout Key Largo. Pages 6 through 8 of the Environmental Assessment address this topic.

6. The action in this decision will not establish a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration. The issuance of an ITP does not establish a precedent since future projects that may require an ITP must be evaluated independently by the Service. Future ITPs may or may not be issued depending on the results of environmental analyses.

7. There will be no cumulatively significant impacts on the environment. The cumulative effects of the proposed action has been analyzed in pages 12 through 15 of the accompanying Environmental Assessment. Consideration of other similar

activities, past actions, and in foreseeable future actions concluded that the proposed action was not significant.

8. The action will not affect any site listed in, or eligible for, listing in the National Register of Historic Places, nor will they cause loss or destruction if significant scientific, cultural, or historic resources. Monroe County's Comprehensive Plan identifies the need to protect cultural resources and implements regulatory protective measures to protect these resources. Incorporation by reference of the County's Comprehensive Plan on pages 10 through 11 of the Environmental Assessment ensures protection of cultural resources, if present. The State of Florida's Division of Historical Resources also reviewed their files and determined that no significant archaeological or historical sites were recorded for the Project site.

9. The actions are not likely to adversely affect endangered or threatened species, or their habitats. The Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly will be affected by the proposed action as indicated on pages 10 through 12 of the Environmental Assessment. The Service's intra-Service section 7 consultation concluded that the effects of issuance of the ITP would not jeopardize the continued existing of these species.

10. The actions will not lead to a violation of Federal, state, or local laws imposed for the protection of the environment. Page 2 of the Environmental Assessment indicate that the Service shall ensure compliance with other applicable Federal laws. Urban development in Monroe County is strictly regulated under the County's Comprehensive Plan. That document is replete with regulatory mechanisms necessary to ensure compliance with local and County ordinances and State and Federal laws prior to development approval. The residential development that would occur due to the issuance of the ITP has undergone County review and is therefore anticipated to be in full compliance with all ordinances and laws.

References

Provided in the Service's Statement of Finding, Environmental Assessment, Biological Opinion, authorizing ITP, and other aspects of the administrative record on this action.

_____

Regional Director Date

INTRA-SERVICE BIOLOGICAL OPINION

FOR THE ISSUANCE OF AN INCIDENTAL TAKE PERMIT

TO

DRISCOLL PROPERTIES, INC., DRISCOLL FOUNDATION, INC., AND

OCEAN REEF COMMUNITY ASSOCIATION,

NORTH KEY LARGO, MONROE COUNTY, FLORIDA

SOUTH FLORIDA FIELD OFFICE

VERO BEACH, FLORIDA

December 2, 1998

The U.S. Fish and Wildlife Service (Service) has prepared this intra-Service Biological Opinion (Opinion) under section 7(a)(2) of the Endangered Species Act (16 U.S.C. 1531 et seq.)(Act) in response to the proposed issuance of a section 10(a)(1)(B) incidental take permit (ITP) to Driscoll Properties, Inc., Driscoll Foundation, Inc., and Ocean Reef Community Association (Applicants). Issuance of the ITP would result in the take of the endangered Key Largo cotton mouse (*Peromyscus gossypinus alapaticola*), Key Largo woodrat (*Neotoma floridana smalli*), and Schaus swallowtail butterfly (*Papilio aristodemus*).

This Opinion is based on information provided in the Applicant's Habitat Conservation Plan (HCP), the Service's draft Technical/Agency Draft Multi-species Recovery Plan for the Threatened and Endangered Species of South Florida (MSRP)(USFWS 1998a, 1998b), Monroe County Comprehensive Plan (Monroe County 1997a, 1997b, 1997c), and other available information. This Opinion does not address requirements of other environmental statutes, such as the National Environmental Policy Act or the Fish and Wildlife Coordination Act. A complete record of this consultation is maintained and available for review at the Service's South Florida Field Office, Vero Beach.

Consultation history

On June 6, 1990, Driscoll Properties, Inc., and Driscoll Foundation, Inc., received an ITP (PRT-736470) which authorized take of the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly during clearing of land in preparation for residential development. That permit expired on May 31, 1995 and only 19 homes were constructed out of the 89 residential lots previously covered under that ITP.

On July 30, 1997, a representative of Driscoll Properties, Inc. and Driscoll Foundation, Inc. contacted the Service requesting an extension to PRT-736470.

On August 11, 1997, the Service requested information from the former ITP permittees indicating that the terms and conditions of PRT-736470 had been met.

On March 13, 1998, the former permittees contacted the Service in writing indicating that most of the terms and conditions of PRT-736470 had been satisfied and again requested an extension to PRT-736470.

On August 11, 1998, the Service contacted a representative of the former permittees indicating that PRT-736470 could not be extended because it was no longer an active permit. The Service indicated that the former permittees would have to obtain a new ITP in order to be covered from the prohibitions of take under section 9 of the Act.

On September 2, 1998, Service staff met with a representative of the former permittees to discuss submission of a new HCP and ITP and to review suitability of remaining habitat for the three

federally listed species identified above. Service staff also review mitigation efforts implemented under the terms and conditions of PRT-736470.

On September 10, 1998, the Service received a draft copy of an HCP and ITP application for review and on October 13, provided the applicants with recommendations on modifications to the HCP.

On October 21, 1998, the applicants submitted a revised draft HCP and asked for additional comments from the Service.

On October 28, 1998, the Service contacted the applicants indicating that the HCP appeared completed and recommended submittal.

On October 30, 1998, the Service received the final HCP and ITP application.

BIOLOGICAL OPINION

I. Description of the proposed action

The proposed Federal action under review is the Service's issuance of an ITP that would authorize the take of Key Largo cotton mice, Key Largo woodrats, and Schaus swallowtail butterflies on 49 residential lots located within plats 18 and 19 of Ocean Reef Club, Harbor Course (Project). The Project is located in section 24, Township 59 South, Range 40 East and section 19, Township 59 South, Range 41 East, North Key Largo, Monroe County, Florida (Figure 1 and 2).

Over the next ten years the Applicants anticipate the need to clear vegetation from 49 residential lots in preparation for residential construction. The residental lots in question contain tropical hardwoods which provide habitat for the three federally listed species idenfied above. The clearing of vegetation and scarification of soils within the Project site will destroy or fragment 19.6 acres of suitable habitat for the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly. Habitat loss is expected to occur gradually over the 10 year permit period.

As indicated above, Driscoll Properties, Inc. and Driscoll Foundation, Inc. previously obtained an ITP for the take of Key Largo cotton mice, Key Largo woodrats, and Schaus swallowtail butterflies on 89 residential lots within plats 18 and 19 of Ocean Reef Club, which included the 49 lots covered under the current ITP application. The terms and conditions of the previous ITP required minimization and mitigation measures that would sufficiently compensate for the loss of federally listed species. Since these measures were nearly all completed as part of the compliance with PRT-736470 and no additional take of federally listed species is anticipated as a result of issuance of the current ITP, additional mitigation measures are not proposed.

Minimization and mitigation measures that were implemented or are ongoing as a result of the issuance of the former ITP include:

Mitigation Measures Completed

- About six acres of tropical hardwood hammock within the Project site were preserved and conveyed via conservation easement to the Florida Game and Fresh Water Fish Commission.

- Covenant restrictions were developed and implemented throughout plats 18 and 19 of Ocean Reef Club which prohibited free-ranging pets.

- Tropical hardwood hammock restoration, including planting of vegetation and control of exotic plants, was initiated on three sites totaling about five acres.

- A total of thirty rock piles were constructed within the tropical hardwood hammock restoration sites (20 piles) and within the conservation easement (10 piles), for the purpose of providing additional sources of rodent nest sites.

Mitigation Measures Ongoing

- Monitoring of tropical hardwood hammock restoration success.

- Control of exotic vegetation in tropical hardwood hammock restoration areas.

Minimization Measures Ongoing

- Monroe County ordinance requires that between 20 and 80 percent of tropical hardwood vegetation be saved on residential lots to serve as open space. The amount of tropical hardwood vegetation that must be saved is determined by calculating a Habitat Evaluation Index (HEI) which is then used to assign one of three categorical values to described the relative value of the vegetative community within a residential lot. High quality tropical hardwood hammocks require an 80 percent set aside, moderate quality require a 60 percent set aside, and low quality hammocks require a 40 percent set aside. Highly disturbed hammocks are not addressed under the HEI process but require a 20 percent set aside according to county ordinance. Lots that were cleared pursuant to PRT-736470 were assigned index values of moderate or disturbed. Accordingly, 20 to 40 percent of the area of these lots were designated open space. Any lots that are cleared for preparation of residential construction due to issuance of this ITP will also be required to set aside between 20 to 80 percent of the lot for open space requirements under Monroe County ordinance.

- All vegetation on lots covered under this ITP would be felled by hand and left on the ground for a minimum of 14 days, after which, heavy equipment may be used to dispose of felled vegetation and remove stumps. Manual felling of vegetation reduces the risk of mortality to Key Largo cotton mice and Key Largo woodrats by providing sufficient time for these rodents to disperse from the lot prior to the use of heavy equipment.

For the purposes of this Opinion, the Service considers the action area to include all habitat in northern Key Largo occupied by one or more of the three federally listed species covered by this Opinion. In general, the action area can be described as those lands predominately covered with tropical hardwood vegetation north of the intersection of U.S. Highway 1 and State Road 905 north to the Project site (Figure 3).

II. Status of the species

The status of the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly addressed in this Opinion have been thoroughly reviewed and discussed in the Service's recent draft Multi-species Recovery Plan for the Threatened and Endandered Species of South Florida (MRSP) (U.S. Fish and Wildlife Service 1998a, 1998b). Those documents are incorporated by reference and should be used to obtain specific information about the status of the three federally-listed species addressed in this Opinion. The information below was wholly or partially excerpted from the MRSP's overview of each species and provides a brief description of their status and trends.

Key Largo cotton mouse

This subspecies of cotton mouse historically occurred within tropical hardwood hammocks from Plantation Key north to Key Largo. It is now found only on the northern portion of Key Largo, generally north of the intersection of U.S. 1 and County Road 905. Urban growth in the upper Keys has resulted in substantial loss of habitat. As of 1991, 41.2 percent of all tropical hardwood hammock vegetation had been cleared. Of the remaining tropical hardwood hammock vegetation in southern portions of Key Largo and Plantation Key, most is too small or degraded to provide suitable habitat for the Key Largo cotton mouse.

In addition to the direct loss of habitat, Key Largo cotton mice are likely affected by predation from free-ranging and feral domestic cats as well as fire ants (*Solenopsis invicta*), competition with black rats (*Rattus rattus*), and natural stochastic events such as hurricanes. Though little is known regarding the extent to which these factors affect cotton mice, it is generally believed that these adverse factors have and continue to negatively affect Key Largo cotton mice populations. However, no long-term systematic surveys are currently conducted to evaluate population trends. For additional details

regarding the status and trends of this species see MRSP pages 2-85 to 2-94 (U.S. Fish and Wildlife Service 1998a).

Key Largo woodrat

The Key Largo woodrat is a subspecies endemic to Key Largo. Historically, it occurred throughout this Key within mature tropical hardwood hammocks. As with the Key Largo cotton mouse, this species has also been adversely affected by habitat loss due to urban growth. Currently, the Key Largo woodrat is thought to exist only in the northern portion of Key Largo. The remaining habitat represents about one-half of the historic habitat of this species.

The Key Largo woodrat and Key Largo cotton mouse are essentially biologically and ecologically similar. Accordingly, many of the threats identified above for the Key Largo cotton mouse also apply to the Key Largo woodrat. Similarly, no systematic surveys are currently underway throughout the remaining range of this species, but populations of this species are thought to be in decline. For additional details on the status and trends of this species see MSRP pages 2-197 to 2-209 (U.S. Fish and Wildlife Service 1998a).

Schaus swallowtail butterfly

The Schaus swallowtail butterfly historically occurred from southern Dade County to Key Largo, Monroe County. Recent reintroduction efforts may have extended the range of this species to Lower Matecumbe Key. This species requires mature tropical hardwood hammock vegetation for both life stages. Urban growth has resulted in the loss and fragmentation of habitat throughout its range. Currently, the largest known populations of this butterfly occur from Elliot Key, Key Biscayne National Park south to northern Key Largo.

This species is currently threatened by natural stochastic events such as freezes, droughts, fires, and hurricanes; habitat destruction and fragmentation; use of pesticides for mosquito control; mortality associated with collisions with automobiles; predation; parasites; and collection. For additional details about the status and trends of this species see MSRP pages 5-5 to 5-17 (U.S. Fish and Wildlife Service 1998a).

Analyses of the Species Likely to be Affected

The three species described above have declined in abundance and distribution due primarily to habitat loss and degradation. They are endemic to extreme southern Florida and require relatively large patches of mature tropical hardwood hammock vegetation to persist. All three species are anticipated to be adversely affected by the issuance of the

ITP, although implementation of mitigation measures will provide for the restoration of habitat for these species.

III. Environmental Baseline

Status of the species within the action area

Several surveys have been conducted on North Key Largo to assess densities of endemic rodents (Brown 1978, Hersh 1978, Barbour and Humphrey 1979, Humphrey 1988, Frank et al. 1997). Frank et al. (1997) summarized the findings of these surveys and compare them with their most recent survey results which suggest a decline in the densities of Key Largo cotton mice and Key Largo woodrats on North Key Largo. Earlier surveys found mean cotton mice densities of 4.6 to 8.6 per acre, while woodrat densities ranged from a mean of 0.5 to 3.1 per acre. By contrast, Frank et al. (1997) found mean cotton mice densities of 2.5 per acre and woodrat densities of 0.4 per acre. However, comparison of the above results is difficult because none were replicates of one another, there were substantial differences in sampling effort, and the extent of natural variation in rodent population numbers and density are not known and may have masked affects due to anthropogenic causes.

In addition to observed declines in density estimates, Frank et al. (1997) also found endemic rodents to be absent from areas where they were previously found to be numerous. In contrast, they found larger numbers of black rats and fire ants in these localities and surmised that competition and predation may have influenced the current distribution of Key Largo cotton mice and Key Largo woodrats, especially in the southern portions of North Key Largo. Frank et al. (1997) also indicated that the number of woodrat stick nests found within grided survey areas were less abundant than in other areas previously surveyed, suggesting a decline in woodrat numbers in certain areas.

In 1990, Stout (1990) conducted site specific rodent surveys within the Project area and concluded that Key Largo cotton mice were rare within the Project site and that Key Largo woodrats were rare or absent from the Project site. This finding differed from earlier surveys conducted within lands adjacent to the Project site, where the cotton mice population was estimated to be 80 (standard error of 4.2, 95 percent confidence interval) and the woodrat population was estimated at 14 (standard error of 2.1, 95 percent confidence interval). However, direct correlation of the survey results within and adjacent to the Project site was not possible because density estimates were calculated differently (Stout 1990).

The above information suggests that rodent populations in North Key Largo have likely declined in some areas. However, as pointed out by Frank et al. (1997), small mammal populations fluctuate widely and observed densities may represent natural fluctuations

within the normal range of densities for these species. Therefore, interpretation of the status of the two endemic rodents on North Key Largo with existing survey data is problematic due to the long interval between survey efforts and relatively short duration of each survey. Only with long-term systematic monitoring of populations can patterns of abundance be assessed.

The Service's previous assessment of survey data recognized these limitations and during consideration of the issuance of an ITP for the Project site in 1990, the Service assumed the number of affected individuals of Key Largo cotton mice and Key Largo woodrats equaled the greatest number of individuals observed during surveys conducted during the mid-1980s on adjacent lands.

Evaluating the status of endemic rodents within the Project site is further confounded by the fact that the habitat conditions within the Project site have been substantially altered since many of the earlier surveys were conducted. The existing habitat conditions are generally considered to be worse than in 1990. Since that time, 19 homes have been constructed within the Project site and all access roads have been improved (paved). These activities have increased fragmentation of the remaining habitat and has likely decreased the ability of Key Largo cotton mice and Key Largo woodrats to persist in certain portions of the Project site. However, the overall affects of these sources of disturbance on the abundance and distribution of these species cannot be determined without current surveys.

The lack of survey data for Schaus swallowtail butterflies preclude assessment of the status of the species based on numbers or distribution of the population. Recent observations of butterflies within the Project site have been opportunistic and in some cases anecdotal. Although male Schaus swallowtail butterflies appear to be loosely territorial, no designations of occupied territories have been made within the Project site. It is not known whether Schaus swallowtail butterflies reproduce within the Project site, consequently, effects of pesticides to eggs or larvae are unknown.

Factors affecting the species' environments within the action area

Habitat for the Key Largo cotton mouse and Key Largo woodrat are adversely affected by the existing level of fragmentation due to previous residential development adjacent to and intermingled with the action area. Increasing fragmentation may decrease the chances of securing a mate, limit food resources, and expose these rodents to increased risk of predation. The drift of pesticides used for adult mosquito control may also adversely affect these species through contamination of some food resources (Hennessey *et al.* 1992, Frank *et al.* 1997). Although free-ranging and feral cats are prohibited within the Project site, other residential developments do not restrict or control domestic cats. It is likely, therefore, that predation by domestic animals from neighboring residential areas

negatively affects rodent populations within the action area (Frank *et al.* 1997). Fire ants may also pose a threat to nesting or young rodents in some areas of southern North Key Largo, especially where disturbances to vegetation or soil exists. The extent to which ants prey on endemic rodents is not known. Black rats may compete with endemic rodents for food resources and breeding sites. Recent surveys have documented an increase in black rat densities and distribution in some areas of North Key Largo (Frank *et al.* 1997) and are suspected as a factor that decreases habitat suitability for endemic rodents.

Past and ongoing application of pesticides for mosquito control adversely affects Schaus swallowtail butterflies in the Project site. Although Monroe County's Mosquito Control District has agreed to avoid application of pesticides within publicly owned lands, which include the majority of remaining habitat for the Key Largo cotton mouse and Key Largo woodrat, drift of pesticides is known to occur into no spray zones (Hennessey et al. 1992). The use of pesticides for mosquito control within the residential areas of Ocean Reef Club probably adversely affect butterflies within the Project area when application of pesticides and butterfly use of the Project site coincide. If eggs are laid within or adjacent to the Project site, pesticide application may also adversely affect the eggs or larva of Schaus swallowtail butterflies. The extent to which this occurs is not known.

Previous habitat fragmentation decreases habitat quality and increases risk of predation while butterflies traverse open, unvegetated areas. However, habitat fragmentation probably does not affect Schaus swallowtail butterflies to the same extent as terrestrial species since they can easily fly between patches of suitable habitat. Schaus swallowtail butterflies are hit and killed by motor vehicles, but the frequency with which this occurs and the resulting effect on the population is not known.

IV. Effects of the Action

Factors to be considered

The issuance of an ITP will result in the clearing of tropical hardwood hammock vegetation on 49 residential lots over the next 10 years. As a result, habitat for the three federally listed species addressed in this Opinion will decrease in size and become increasingly fragmented. If residential development occurs on all 49 lots within the 10 year period for which the ITP is active, about 20 acres of habitat will be destroyed or severely degraded.

Analyses for effects of the action

Several indirect adverse affects are likely to occur to the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly as a result of issuance of this ITP.

However, since no suitable habitat will remain within the Project site upon full development of the 49 lots, these indirect effects are expected to adversely affect the species outside of the action area.

The issuance of the ITP will indirectly result in the construction and occupation of homes. Occupants are anticipated to own and operate motor vehicles on existing roads and highways on Key Largo. State Road 905 is the main access road to the action area and bisects occupied Schaus swallowtail butterfly habitat. The Service anticipates that the increase of vehicle use resulting from issuance of this ITP may contribute to road mortalities of Schaus swallowtail butterflies. However, the extent to which the increase in motor vehicle use of roads on Key Largo will adversely affect the butterfly cannot be quantified because no information exists to assess the rate at which current motor vehicle use affects this species.

An increase of 49 homes within the Project site is also expected to result in an increase in the number and distribution of black rats. Urban settings are known to be attractants to black rats and where homes will be located adjacent to publicly owned conservation lands, the Service believes that increasing black rat populations will compete with and adversely affect populations of Key Largo cotton mice and Key Largo woodrats. Frank et al. (1997) found that where endemic rodent populations had declined, a corresponding increase in black rat densities were observed. Adverse affects of increasing black rat populations would likely be most detrimental to endemic rodents occupying habitat immediately adjacent to urban areas. The effects of competition between exotic and endemic rodents is not well understood, therefore, quantification of adverse affects cannot be provided at this time.

Species' response to the proposed action

The three species addressed in this Opinion are likely to decrease in numbers and distribution within the Project site as a result of the gradual loss of habitat during the duration of the ITP. The rate at which these species decline will be dependant on the demand for residential development in Ocean Reef Club and the tolerances of each species to habitat fragmentation. The Service believes that loss and degradation of remaining habitat will be gradual. However, as the remaining habitat decreases in size and quality, the Service anticipates that ability of the increasingly fragmented habitat to provide the necessary biological and ecological functions to support Key Largo cotton mice and Key Largo woodrats will be reduced beyond the species' minimum requirements. As a result, the Service believes that these species may be extirpated prior to complete residential buildout within the Project area. Because of their mobility and ability to traverse otherwise unsuitable habitat, Schaus swallowtail butterflies are likely to occasionally use even small patches of remaining habitat within the Project site. Accordingly, the Service expects Schaus swallowtail butterflies to continue to use the

Project area until most of the 49 residential lots have been cleared. If sufficient tropical hardwood hammock buffers are retained under Monroe County's ordinance requirements, butterfly use may continue after completion of residential development. However, butterflies using the Project site in the future would be subjected to periodic pesticide applications.

The response of the population of Key Largo cotton mice, Key Largo woodrat, and Schaus swallowtail butterfly to the issuance of the ITP will likely be minor and if systematic monitoring were being conducted the results would probably be undetectable. As indicated above, the Project site currently represents relatively poor habitat for the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly because habitat within the Project area is already adversely influenced by existing residential development. In addition to the low quality of this habitat, the Project site represents a relatively small component of remaining habitat for these species. The 19.6 acres of fragmented tropical hardwood hammock that is anticipated to be destroyed due to issuance of this ITP represents about one percent of the remaining significant undisturbed tropical hardwood hammock vegetation in northern Key Largo (Monroe County 1997a). Given the relatively low quality of habitat in combination with small acreage that will be lost, the Service generally believes the effects of the issuance of the ITP will be minor.

V. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

As indicated above, much of the remaining suitable habitat for Key Largo cotton mice, Key Largo woodrats, and Schaus swallowtail butterflies has been acquired for conservation purposes and most cumulative effects that may occur in these areas are expected to result in beneficial effects to federally listed species. Habitat restoration is ongoing or anticipated for many conservation lands and these activities will likely increase the ecological value of existing habitat. In some cases, restoration activities may result in the re-establishment of tropical hardwood hammocks in locations where previous scarification had destroyed this vegetative community. No systematic restoration plan currently exists for the public lands which support the three federally listed species addressed in this Opinion, therefore quantification of restoration is not possible.

Several future actions are expected to result in adverse affects to the three federally listed species addressed in this Opinion. The Service is aware of one project that proposes to locate an electrical service substation on about 2 acres of tropical hardwood hammock vegetation on North Key Largo. In addition to the direct loss of habitat, development of this substation would likely

create a barrier between adjacent Key Largo cotton mouse and Key Largo woodrat habitat, which would effectively fragment populations of these rodents in the southern portion of North Key Largo. Adverse affects to Schaus swallowtail butterflies are anticipated due to the loss of habitat.

The Service expects that Schaus swallowtail butterflies will continue to be killed by motor vehicles on North Key Largo. However, no information is available to assess the effect of this source of mortality; mortalities are known to occur but they have not been quantified. Without knowing the current mortality rate due to collisions with motor vehicles it is impossible to predict future losses of the Schaus swallowtail butterfly or the extent to which this source of mortality will affect Schaus swallowtail populations.

Use of chemicals for the control of adult mosquito populations will continue on North Key Largo and it is likely that introduction of these chemicals into Key Largo cotton mouse, Key Largo woodrat and Schaus swallowtail butterfly habitat will adversely affect these species in the future (Hennessey et al. 1992, Frank et al. 1997). Though Monroe County's Mosquito Control District has agreed not to apply pesticides within publicly protected conservation lands, drift of chemicals has been identified as a risk to federally listed species (Hennessey et al. 1992), particularly in habitat adjacent to residential areas. Non-target insects, such as the Schaus swallowtail butterfly, are especially vulnerable to the types of chemicals used to control adult mosquitos. Although rodents are less likely to be directly killed by these chemicals, long-term exposure to them by way of contamination of food sources may result in bioaccumlation to levels that are lethal or that adversely affect behavioral or reproductive activities.

The cumulative effects of pesticides application adjacent to habitat occupied by the Key Largo cotton mouse, Key Largo woodrat, and Schaus swallowtail butterfly cannot be quantified because: (1) the numbers of individual animals that will be exposed at any one time cannot be determined, (2) the number and extent of pesticide applications cannot be predicted, and (3) the long-term affects of the various chemicals used to control adult mosquitos is not known for the two federally listed rodents.

Conclusion

After reviewing the current status of the species addressed in this Opinion, the environmental baseline for the action area, effects of the proposed action, and the cumulative effects, it is the Service's Opinion that the issuance of the proposed ITP is not likely to jeopardize the continued existence of the Key Largo cotton mouse, Key Largo woodrat, or Schaus swallowtail butterfly. No critical habitat has been designated for these species, therefore, none will be affected.

The above determination was made after careful consideration of past, present, and future actions that have, are, and may affect the three federally listed species addressed in this Opinion. The Service acknowledged that about 50 percent of the historic habitat for the Key Largo cotton mouse and Key Largo woodrats have been lost due to past urban development. However, much

of the remaining habitat is now protected, with about 2,000 acres of suitable habitat under State of Florida or Federal ownership. Within protected habitat, these species are affected by secondary impacts associated with urban growth such as competition with black rats, predation from feral or free-ranging domestic cats, and the chronic effects of pesticides. At first glance, these adverse factors would appear sufficient to result in the extirpation of one or both of the endemic rodents over time. However, these adverse factors have been present for many decades on North Key Largo, and though the most recent survey data suggests these rodents are in decline, the fact remains that both species have persisted in the presence of these deleterious conditions. That these species are still extant given the long-term presence of adverse factors, suggests sufficient recruitment and survival occurs to offset some, if not all, of the adverse demographic effects of competition, predation, and exposure to pesticides. While some concern exists over the current observed decline, it is the Service's opinion that this apparent decline in rodent densities is likely the result of natural cyclical population fluctuations which are known to occur in most rodent species.

Like the two endemic rodents, Schaus swallowtail butterflies have lost over one-half of their historic habitat due to urbanization. However, of the habitat that remains, much is under public ownership and is protected from further loss. The core population of Schaus swallowtail butterflies occurs within Key Biscayne National Park. These sites are protected from many of the adverse affects described in this Opinion. Therefore, although Schaus swallowtail butterflies have been and will be adversely affected by natural stochastic events and the influences of urbanization on North Key Largo, many of the anthropogenic factors are not present within the core population area of this species. As a result, the Service does not envision that the issuance of this ITP in combination with all other factors affecting the Schaus swallowtail butterfly will result in jeopardy to this species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the Service so that they become binding conditions of any grant or permit issued, for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (1) fails to assume and implement the terms and conditions or (2) fails to require the Applicant to adhere to the terms and conditions of the incidental take permit through enforceable terms and conditions that are added to the permit, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Applicant must report the progress of the action and its impact on the species to the Service as specified in the ITP.

Amount or Extent of Take Anticipated

The Service estimates that 40 cotton mice and three woodrats will be taken as a result of issuance of this ITP. The level of take was extrapolated based on the Service's 1991 biological opinion which previously addressed the effects of take on the three federally listed species addressed in this Opinion. In the former biological opinion, the Service determined that 20-70 cotton mice and 1-5 woodrats would be taken as a result of complete buildout of plats 18 and 19 of Ocean Reef Club. However, because not all of the lots were cleared, suitable habitat for federally listed species remain within the Project site; the Service estimates that about 56 percent of the habitat remains. Assuming that the maximum number of rodents anticipated to be taken by the Service in the previous biological opinion were present, 40 cotton mice (0.56 x 70) and three woodrats (0.56 x 5) may be incidentally taken due to the issuance of this ITP. Incidental take will be in the form of habitat loss.

The Service anticipates that incidental take of Schaus swallowtail butterflies will be difficult to detect and enumerate for the following reasons: (1) butterflies are not territorial and use suitable habitat unpredictably and (2) long-term surveys have not been conducted to determine the extent to which butterflies use the Project site. However, incidental take of these species can be anticipated by the loss and/or fragmentation of tropical hardwood hammock associated with residential development in plats 18 and 19 of Ocean Reef Club. Incidental take will be in the form of habitat loss.

Effect of Take

In the accompanying Opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and prudent measures and terms and conditions

The Applicant's HCP prescribes methods to minimize on-site habitat disturbances and deal with unforeseen future circumstances. These actions represent reasonable and prudent measures the Service believes are necessary and appropriate to minimize impacts. Measures as described in

the HCP and incorporated in the ITP constitute non-discretionary, binding terms and conditions of the authorizing permit that the Applicant must implement for the exemptions to the section 9 prohibitions against take to apply.

The reasonable and prudent measures, with its implementing terms and conditions, is designed to minimize the impact of incidental take that might otherwise result from the proposed actions. The Service believes that Key Largo cotton mice, Key Largo woodrats, and Schaus swallowtail butterflies will be incidentally taken as a result of issuance of the ITP. If, during the course of the actions resulting from issuance of this ITP, additional habitat is altered which would result in an increase in this level of incidental take, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measure provided. The Service must immediately provide an explanation of the causes of the taking and review the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Pages 2-95 to 2-101, 2-211 to 2-217, and pages 5-19 to 5-27 of the MSRP (U.S. Fish and Wildlife Service 1998b) identify actions necessary to recover the Key Largo cotton mouse, Key Largo woodrat, and the Schaus swallowtail butterfly, respectively. For the purposes of this document, these actions should be considered appropriate conservation recommendations for implementation by the Service.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed issuance of an ITP by the Service. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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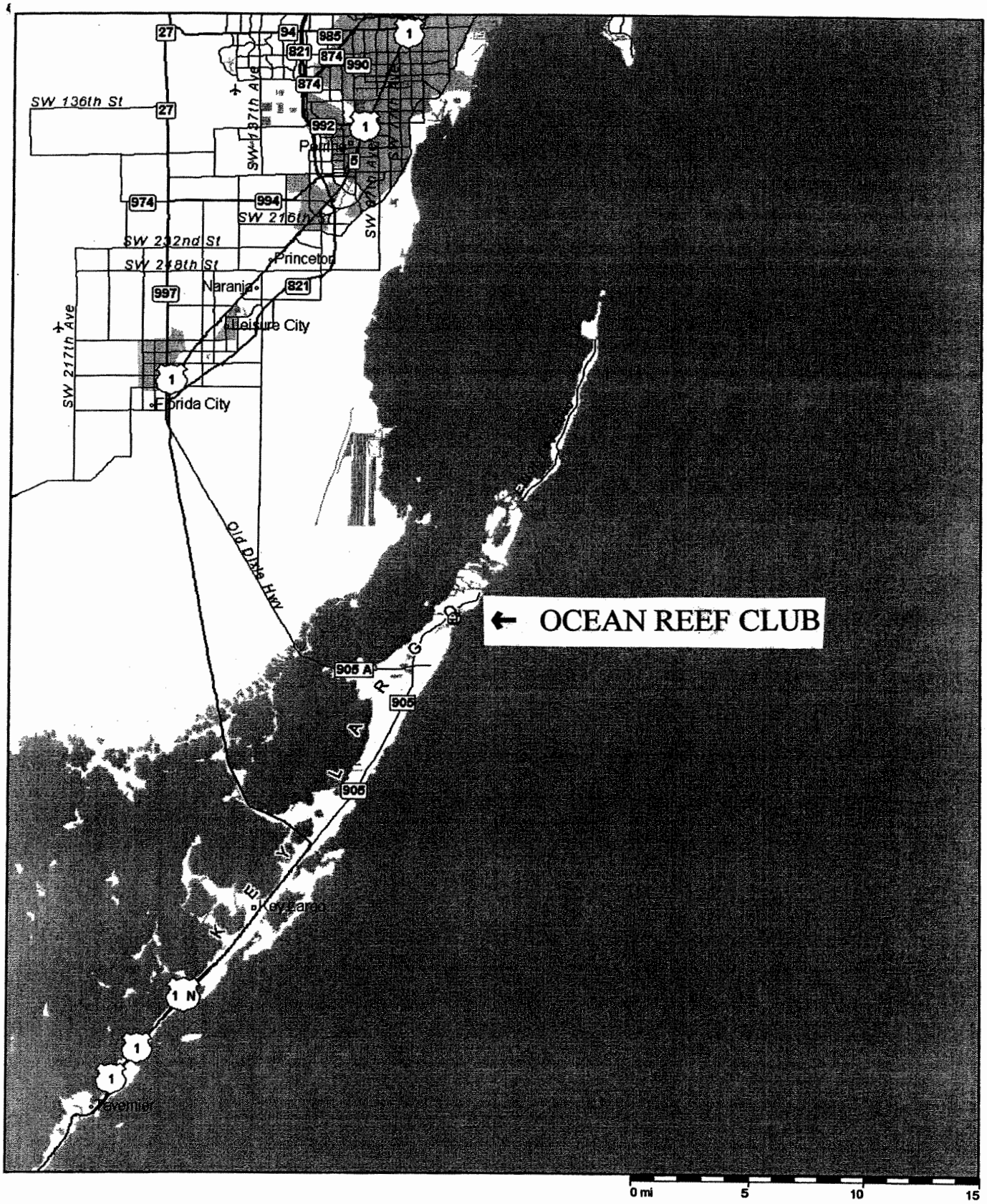

Figure 1. Location of Ocean Reef Club, North Key Largo, Monroe County, Florida.

Fig 3

MONROE COUNTY YEAR 2010 COMPREHENSIVE PLAN

NATURAL FEATURES

Surface Water Resources

- Long Key Inlet — Bays, Basins, Embayments, Lagoons, Bights, Sounds
- Broad Creek — Channels, Cuts, Tidal Creeks
- Lake Surprise — Lakes
- Open Water (Includes Salt Ponds, Submerged Lands, and Man-made Water Bodies)

Floodplains

- Areas Determined to be Outside the 100-Year Floodplain

Wetlands

- 620 — Mangroves
- 640 — Salt Marsh and Buttonwood Wetlands
- 641 — Freshwater Wetlands

Beaches And Berms

- 710 — Beach (with Associated Berm)

Upland Vegetation

- 426 — Tropical Hardwood Hammocks
- 411 — Pinelands

Disturbed And Developed Land

- D — Developed Land
- 740 — Disturbed Land

Wildlife Habitat Areas

Endangered Species, Threatened Species or Species of Special Concern (Vertebrates and Invertebrates)

- Documented Sighting (2)
- Total Known Range (2)
- Concentrated Range (2)

(2) Note that there are no existing or planned public waterside or shoreside uses of any kind known to the Florida Keys.
(2) See "Florida Keys Comprehensive Plan, Volume I" (Monroe County Department of Planning, 1993) for identification of this data.

Source: Please see the divider page that precedes this map series.

Adopted Jan. 1996

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MONROE COUNTY, FLORIDA

MAP 1

Feb. 1992

Figure 3. Natural features of North Key Largo, including vegetative communities (from Monroe County 1997c).