United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

March 27, 2007

Memorandum

To: Jeffrey Weller, Chief of Planning and Permitting, Southeast Regional Office
Attention: Victoria Davis

From: Paul Souza, Field Supervisor, South Florida Ecological Services Office

Subject: Biological opinion addressing effects of issuing a recovery permit (TE125595-0) to Jane Indorf for research on the rice rat

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed issuance of a section 10(a)(1)(A) recovery permit to conduct research on the federally endangered rice rat (*Oryzomys palustris natator*) within the lower Florida Keys, Monroe County, Florida. This document is prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*).

This biological opinion is based on published literature, research reports, the permit application and subsequent correspondence, telephone conversations, field investigations, and other sources of information. A complete administrative record of this consultation is on file at the South Florida Ecological Services Office (SFESO) in Vero Beach, Florida.

Consultation History

On April 27, 2006, the Service's Southeast Regional Office received a recovery permit application from Jane Indorf (Applicant) of the University of Miami. Permit number TE125595-0 was assigned for the proposed research.

On May 1, 2006, the SFESO received a request from the Southeast Regional Office for formal consultation on the recovery permit mentioned above.

On May 15, 2006, the SFESO contacted the Southeast Regional Office via email to concur that the proposed action was likely to adversely affect the listed species and initiated formal consultation.

On May 15, 2006, the SFESO contacted the Applicant, via email requesting electronic versions of information provided in her permit request.

On May 15, 2006, the Applicant supplied electronic copies of application materials to the SFESO.

On June 5, 2006, the SFESO contacted the Applicant for additional on the proposed project.

On January 25, 2007, the Applicant provided additional information on the proposed project.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The proposed research will occur on the Saddlebunch Keys, part of the Great White Heron National Wildlife Refuge (GWHNWR) Monroe County, Florida. The objective of this research project is to obtain genetic information on the rice rat as part of a larger study on the marsh rats of the southeastern United States. These studies will help to better determine morphological variation, dispersal and colonization patterns of marsh rats across their present range.

Rice rats will be trapped using vented 7.5 x 8.8 x 22.5 cm Sherman (Sherman Traps Incorporated, Tallahassee, Florida, USA) live traps. Three trapping grids will be established at sites where rice rats where previously trapped in 2004-2005 (Perry 2005). Traps will be set up in three parallel lines, 10 meters (m) apart, with 10 traps placed at 10 m intervals for a total of 30 traps per grid.

Traps will be baited with a mixture of oats, sunflower seeds, and peanut butter to provide attractive bait for the small mammals. Traps will be set on 4 consecutive nights per trapping session and checked daily no later than 2 hours after sunrise. Traps will be closed during the day. Trap setting will be conducted in the evening hours. Where the sampling area includes flooded habitat, traps will be set up on Styrofoam floats. Trapping will be conducted during the spring, summer, and fall of 2007.

Captured rice rats will be restrained in a modified pillowcase, an acceptable method of restraint according to the American Society of Mammalogists' (1998) *Guidelines for the Capture, Handling, and Care of Mammals*. No rice rats are expected to be injured or killed. In the unlikely event of injury, rice rats will be euthanized using halothane and cervical dislocation.

Standard measures will be recorded for each animal, including lengths of ear, right hind foot, tail, head and body. Weight, gender, and reproductive condition of each animal will also be recorded. Each animal will be given a uniquely numbered monel self-piercing ear tag. Tags are inserted near the base of the pinnae, where thicker cartilage prevents tags from tearing. Data will be collected on any non-target mammals caught. These might include black rats (*Rattus rattus*) and the Lower Keys cotton rat (*Sigmodon hispidus exsputus*). Black and Lower Keys cotton rats will also be ear-tagged as above, in order to assess their abundance and distribution relative to the rice rat, and released at the point of capture.

Red imported fire ants (*Solenopsis invicta*) are capable of inflicting serious injury and death on small mammals that are restrained in live traps. To avoid the potential injury or mortality of live-trapped small mammals, fire ant control will be initiated prior to and during the entire study period. Extinguish Professional Fire Ant Bait (Extinguish) will be used to exterminate and deter fire ants in the vicinity of the trapping sites. Extinguish uses an insect growth regulation hormone (Methoprene) to control reproduction and reduce fire ant colonies within 8 to 10 weeks following application. All application of Extinguish will follow label instructions.

Extinguish will be broadcast (consistent with product labeling) over the entire upland trapping area at the rate of 1.2 to 1.7 grams (g) of product per hectare (1 to 1.5 pounds [lbs] of product per acre) using a hand broadcast spreader. Application will begin 2 months prior to the initiation of trapping, and will continue quarterly throughout the study period. In addition to broadcast application, all visible fire ant mounds located throughout the study area and on the adjacent roadsides will be treated with 44.4 to 74 milliliters (3 to 5 tablespoons) of Extinguish placed directly onto the fire ant mound.

Total DNA will be extracted from tail clippings taken during trapping. The terminal portions of rice rat tails (0.5 cm) will be clipped with scissors and cleaned with rubbing alcohol. Before cutting, the rat's tail will be numbed in ice cold ethanol. The rats' tails will be cleaned with rubbing alcohol before being released to prevent infection. Each tail tip will be stored in a 20 percent DMSO (6 M NaCl) solution for transport back to the lab.

The mitochondrial DNA control region and cytochrome b gene will be sequenced from each sample. Nine microsatellite loci will be analyzed employing 9 pairs of marsh rice rat specific primers (Wang et al. 2000). These data will be used for phylogenetic and population genetic analyses. Phylogenetic trees will be constructed in the program PAUP (Swofford 2002) using mtDNA sequence data from silver rice rats as well as mainland marsh rice rats (*O. palustris*). Regional genetic diversity will be analyzed by calculating mtDNA nucleotide diversity (θ) using the software package Arlequin (Schneider et al. 2000). MtDNA haplotype diversity (A) and nucleotide diversity among populations (d_A) will also be calculated to assess the level of geographic structuring of genetic diversity. To determine the degree of isolation among populations, the present level of gene flow between the lower keys' silver rice rat population and marsh rice rat populations on the mainland will be estimated using F_{ST} measures and the θ measure of sequence divergence (Weir and Cockerham 1984). To measure the genetic diversity within the silver rice rat population, the microsatellite data will be used to calculate the mean number of alleles per a locus (A), observed heterozygosity (H_o) and expected heterozygosity (H_E; Simonsen et al. 1998) using the program FSTAT 2.9.3.2 (Goudet 2002). F_{IS} will be calculated to assess the level of inbreeding within the population. Genetic material will be collected throughout the study.

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The Service has determined that the action area for this project to be the Saddlebunch Keys within the GWHNWR, in the lower Florida Keys, Monroe County.

STATUS OF THE SPECIES AND CRITICAL HABITAT RANGEWIDE

The following discussion is summarized from the South Florida Multi-species Recovery Plan (MSRP) (Service 1999), as well as from recent research publications and monitoring reports. A complete silver rice rat life history discussion may be found in the MSRP. Critical habitat for the rice rat was designated in 1993 (58 FR 46030)

Species/critical habitat description

Rice Rat

The Service listed the rice rat as an endangered species in 1991 (56 FR 19809), primarily because much of its wetland habitat had been destroyed by residential and commercial construction activities. Critical habitat for the rice rat was designated in 1993 (58 FR 46030). Critical habitat encompasses all lands and waters above mean low tide at Little Pine Key, Water Keys, Big Torch Key, Middle Torch Key, Summerland Key north of U.S. Highway 1, Cudjoe Key north of U.S. Highway 1, Johnston Key, Raccoon Key, and Lower Saddlebunch Keys, south of U.S. Highway 1 but not including lands in T. 67 S., R. 27 E., Section 8 and north 1/5 of Section 17. The principal activity within the critical habitat is the operation of the National Key Deer Refuge (NKDR), the boundaries of which encompass seven of the nine keys with critical habitat (Service 1993).

The rice rat is variously considered to be a subspecies (*Oryzomys palustris natator*) of the wider ranging species of rice rat (*O. palustris*), and as a full species (*O. argentatus*). Spitzer and Lazell (1978) described the rice rat as a full species, from specimens obtained on Cudjoe Key in 1973. Subsequently, Goodyear and Lazell (1986) and Goodyear (1991) further characterized it as a species. However, Humphrey and Barbour (1979), Barbour and Humphrey (1982), Humphrey and Setzer (1989) and Humphrey (1992) debated that view and consider it to be a subspecies. The Service list of endangered and threatened wildlife and plants (50 CFR 17.11) lists it as *O. p. natator*. The rice rat is geographically separated from the nearest congeners, *O. p. palustris*, by at least 83 kilometers (km) (Humphrey and Barbour 1979, Goodyear 1987). The nearest such population is in Everglades National Park, in the southern end of the mainland. Goodyear (1987) included four Upper and Middle Keys in her survey efforts, and captured no rice rats.

Rice rats are semi-aquatic, omnivorous, generalized rats endemic to the Lower Keys. They appear to differ from *O. p. palustris*, the nearest congener, in having a more silvery pelage, a narrower skull, and more slender nasal bones (Spitzer and Lazell 1978). The distribution and ecology of the rice rat are summarized in Service (1999).

Life history

Suitable habitat for the rice rat includes freshwater marsh, saltwater marsh, and mangrove habitats. Rice rats typically use three zones that are delineated by their salinity and topography: (1) low intertidal areas, (2) salt marsh flooded by spring or storm tides, and (3) buttonwood transitional areas that are slightly more elevated and only flooded by storm tides (Goodyear 1987). In general, they use mangrove habitats primarily for foraging, and higher-elevation salt marsh habitat for nesting and foraging (Forys et al. 1996). They also tend to use various vegetation zones during different seasons. During the dry season (March to April, and December to January) they use low marsh more frequently, while during the wet season they use mid- and higher-elevation salt marsh habitats more frequently (Forys et al. 1996). Mitchell (1996) proposed that the certain relatively pristine keys with apparently suitable habitat may fail to support rice rats due to a lack of a combination of the three vegetative communities described above (Goodyear 1987).

Rice rats may also move from one patch of habitat to another in response to seasonal fluctuations in water levels or food availability (Smith and Vrieze 1979). Saltgrass (*Distichlis spicata*) and seashore dropseed (*Sporobolus virginicus*) are the main materials used in nest construction, though other materials such as buttonwood, mangrove, or saltwort are also used (Spitzer 1983). The type locality for the rice rat was a freshwater marsh on Cudjoe Key (Spitzer and Lazell 1978). However, they were only trapped in the three zones typified above, and not reported from freshwater again (Goodyear 1987; Mitchell 1996; Wolf 1987; Forys et al. 1996), until several were captured in freshwater marshes on Cudjoe and Big Torch Keys during 1994-1996 (Mitchell 1996). These individuals also used adjacent salt marsh.

Critical habitat for the rice rat was designated in 1993 (58 FR 46030). Some of the major constituent elements of this critical habitat that require special management considerations or protection are mangrove swamps containing red mangrove, black mangrove, white mangrove, and buttonwood; salt marshes, swales, and adjacent transitional wetlands containing saltwort, saltgrass and seashore dropseed; and freshwater marshes.

Rice rats feed on a variety of plants and animals. Their diet and foraging habitat overlaps extensively with that of syntopic black rats (Goodyear 1992). They utilize several sources of fresh water including surface water associated with freshwater lenses, water droplets on vegetation, and pools of water collected in tree holes (Spitzer 1983, Goodyear 1987). Mitchell (1996) proposed that the certain relatively pristine keys with apparently suitable habitat, may fail to support rice rats due to a lack of freshwater.

The rice rat is a small, semi-aquatic rodent adapted to the unique island habitats of Florida's Lower Keys. It requires wetlands, especially large areas of adjacent or contiguous habitat. The large home ranges it occupies (up to 11 ha for males; Spitzer 1983), and the very low densities at which it is found (fewer than 3 per ha), may be the result of limited food or freshwater resources (Forys et al. 1996). Mitchell (1996) found rice rat densities to be low. Accordingly, estimates of home range size were large, 10 to 100 times larger than that for "normal" rats and mice. She suggested the rice rats far-ranging habits may be explained by the tidal fluctuations inherent in their environment. However, previous telemetry studies were very limited in scope, providing observational data on only two to three rats at each of three study sites (Goodyear 1987). While those data provide a good baseline from which to conduct a more intensive effort, more quantitative telemetry studies of larger scale will be required in order to provide managers with more reliable information.

Population dynamics

Reproduction occurs throughout the year, influenced by a variety of ecological factors (Wolfe 1982). Rice rats construct simple spherical nests, about 15 cm in diameter that are usually built on the ground or slightly elevated in grasses (Spitzer 1983).

Mitchell (1996) calculated rice rat density estimates for nine local sites. She found density estimates to range only up to 0.79 rice rats per ha among sites. Among years, estimates ranged from 0 to 0.79 rice rats per ha at one site. She stated these values are an order of magnitude lower

than for "normal" rats and mice. Forys et al. (1996) surveyed for 9,960 trap nights on nine keys between 1995 and 1996. Minimum known alive estimates ranged from 0 to 14 among sites and seasons. The extrapolated estimates of the minimum number of rice rats per ha ranged from 0 to 7.

Mitchell (1996) proposed the certain relatively pristine keys with apparently suitable habitat, such as Mallory and Porpoise Keys, are too small to support rice rat populations. Several larger Keys that failed to reveal rice rats lacked the combination of the three vegetative communities described above (Goodyear 1987). It is likely on certain small and medium sized islands, rice rat establishment is inhibited due to a lack of refugia during extreme conditions such as during high tides, or due to this factor in combination with other factors. Larger islands may provide more diverse microhabitats and habitat components such as travel corridors, or at least a more consistent level of availability and safety.

Status and distribution

The rice rat has been documented to occur on 12 islands throughout the Lower Keys. These include Little Pine, Howe, Water, Middle Torch, Big Torch, Summerland, Raccoon, Johnston, Cudjoe, Upper Sugarloaf, Lower Sugarloaf, and Saddlebunch Keys (Vessey et al. 1976; Goodyear 1984, 1987, 1992; Wolfe 1986, 1987; Forys et al. 1996; Mitchell 1996; Perry 2005). Critical habitat is designated on all of these islands, and most are within or partly within the NKDR or GWHNWR boundaries.

Goodyear (1987) conducted trapping surveys on 17 keys between 1973 and 1984. Effort included 11,952 trap nights. In that period, 31 individual rice rats were captured on the nine keys with positive results to date. Wolfe (1987) conducted trapping surveys between 1986 and 1987. He surveyed four keys with U.S. Navy holdings. Effort included 3,663 trap nights. In those surveys, five individual rice rats were captured, only on Saddlebunch. Mitchell (1996) conducted trapping surveys on 16 keys between 1994 and 1996. Effort included 10,376 trap nights. There were 60 individual rice rats were captured, and 137 re-captures. The total number of keys with documented rice rats was brought to 12. She also calculated estimates of rice rat density for nine local sites. These included data from the 1980s that had not been reported previously. These estimates ranged from 0.00 to 0.79 rice rats per ha among years and sites. The sample of between year comparisons is too small to indicate temporal trends. Forys et al. (1996) conducted trapping surveys on nine keys between 1995 and 1996. Effort included 9,960 trap nights. In that period, there were 251 total captures of 99 individual rice rats. Overall grid trapping success was 3 percent.

Humphrey and Barbour (1979) conducted limited surveys between 1978 and 1979. Surveys were conducted at six sites on five keys, Cudjoe, Little Torch, Middle Torch, Sugarloaf, and Big Pine. Effort included 670 trap nights. These authors captured no rice rats, and prematurely reported the taxa to be extinct. These data were also reported in Barbour and Humphrey (1982), in addition to an observation that another party detected an extant population on Raccoon Key. Frank (1994) reported high trapping success on Raccoon Key during March 1994. Effort included 510 trap nights. In that period, there were 55 captures, with 10.8 percent trapping success. The high abundance of rice rats in this unique case may be related to an artificial source of food on the island. The site had spilled food associated with a monkey colony.

Trapping has been conducted on Big Pine and Boca Chica Keys. Despite apparently suitable habitat, rice rats have not been detected on Boca Chica Key (Goodyear 1987, Wolfe 1987, Perry 2005). A single rice rat was captured on northern Big Pine Key during a 2004-2005 survey (Perry 2005). They were not trapped on Annette, No Name, Crab, Geiger, Little Torch, Porpoise, Mallory, Lower Snipe, Middle Snipe, or Ramrod Keys, either. However, based on the availability of suitable habitat and proximity to existing populations, the rice rat may also occur on several other islands in the Lower Keys, including but not limited to No Name, Little Torch, Ramrod, and Boca Chica Keys. They do not occur in the Middle or Upper Keys, presumably due of the lack of suitable habitat within the salinity tolerances of the rice rat (Goodyear 1987).

Along with other endangered terrestrial mammals endemic to the Lower Florida Keys, the rice rats faces continued encroachment and habitat fragmentation due to human development (Forys et al. 1996). The species requires large, intact marsh systems for its conservation. A large amount of occupied rice rat habitat has been protected through public acquisition and management, but significant areas also remain in private ownership. Although the wetlands inhabited by the rice rat are generally protected through wetland regulations, the threat of critical habitat loss still exists because permits to destroy wetlands can be obtained with sufficient mitigation.

Historically, the main threat to the rice rat has been degradation, fragmentation, and loss of habitat due to urbanization. Rice rats require expanses of high-quality salt marsh and estuarine habitats. Freshwater marsh, saltwater marsh, and mangrove habitats have many beneficial qualities, and Federal, State, and Monroe County permits are required for residential or commercial construction that impact them. The conservation of the rice rat may be adversely affected by construction activities for residential and commercial development, as well as by mangrove trimming. These activities can cause direct mortality of individuals through land clearing and habitat loss. Fragmentation results in isolated patches of habitat too small to support the rice rat. Additional threats on the viability of the rice rat have been difficult to quantify because of the low population densities of this species throughout the Lower Keys.

The development of residential areas and accumulation of solid waste encourages the establishment and increases the densities of feral and domestic cats, black rats, raccoons, and exotic fire ants. Cats are predators of rice rats and black rats may be competitors. Feral and domestic cats are abundant throughout the Lower Keys, and forage in the higher elevation salt marsh habitats used by the rice rat. Because rodents are often the most abundant items in a domestic cat's diet (Churcher and Lawton 1989), cat predation is believed to be a major threat to the rice rat. Rice rats and black rats use habitats that overlap, and islands with high densities of black rats have been suggested to support few rice rats. Dietary overlap has been shown to be far higher than that between pairs of native rodent species, and black rats have been implicated in the extinction of rice rat congeners on islands (Goodyear 1992). These data suggest black rats may out-compete rice rats for food and habitat resources. In areas of suitable habitat, the occurrence of black rats may preclude the continued existence of rice rats. Pesticides used to control black rats may also threaten the rice rat. Raccoons are capable of killing both adult and juvenile rice rats, and their populations are unnaturally high in some areas of the Lower Keys. Exotic fire ants may cause direct mortality of rice rats. Exotic fire ants have been documented to cause declines

in populations of small mammals in Texas (Killion and Grant 1993). The ants are attracted to mucous, so newborn rice rats are vulnerable to predation (Forys et al. 1996).

The small, isolated, and widely distributed populations of rice rats are also vulnerable to extinction through random demographic fluctuations, loss of genetic variability caused by small population size, and hurricanes that may affect the entire population. Degradation and loss of habitat due to urbanization remains the main threat to the rice rat. Construction activities typically result in the direct loss of habitat as well as secondary effects that extend into surrounding habitats. Related secondary effects include habitat fragmentation, resource limitation, vehicular access, and an increase in the densities of roads, raccoons, and exotic plants and animals. Fragmentation interferes with rice rat dispersal, foraging, and nesting.

Marshes that are close to human impacts may still be capable of supporting rice rats (Forys et al. 1996). However, factors such as dredge and fill activity, mosquito ditching, and solid waste dumping may disrupt natural hydrological processes including tidal flows and water circulation patterns. The alteration of the natural hydrologic regime may facilitate the advancement of exotic plants and animals in rice rat habitat, and otherwise fragment and alter habitat. Water level and habitat changes may cause nesting failure and influence where rice rats can forage, reducing the ability of the habitat to support them.

ENVIRONMENTAL BASELINE

The environmental baseline includes the effects of past and ongoing human and natural factors leading to current status of the species and their habitats.

Rice Rat

Status of the species/critical habitat within the action area

The action area constitutes public lands within the range of the species. The majority of the associated area is managed for endangered species, including the rice rat (Service 1993). The action area encompasses a similar proportion of the species range. The combination of Federal ownership and critical habitat designations affords significant protections in the areas common to both. Trapping and genetic sampling will be conducted in these areas.

Factors affecting the species habitat within the action area

The action area constitutes public lands within the range of the species. The principal activity within the critical habitat is the operation of the GWHNWR. On private lands within critical habitat, threats to the rice rat, including habitat loss from development, feral and domestic cats, exotic fire ants, and alteration of surface and atmospheric water conditions still remain. These threats may result in the loss and fragmentation of the remaining rice rat habitat that occurs on private lands. Any habitat loss will constitute a permanent reduction in the population of this species, and reduce the viability of the remaining population. Because of the low density of rice

rat populations in the Florida Keys and the limited distribution of this species, reducing the quantity and quality of its remaining habitat and the size of its remaining populations increases its risk of extinction.

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the species and/or critical habitat and its interrelated and interdependent activities. All activities authorized by the Service under section 10(a)(1)(A) of the Act must meet permit issuance criteria at 50 CFR 17.22 and 17.32. All activities considered must be justified in relation to enhancement of survival and recovery, effects to the wildlife species, peer review, and qualifications of permittees. By definition, authorized activities should benefit species recovery with minimal adverse effects by qualified permittees.

Factors to be considered

Beneficial Effects - The proposed research will provide genetic information on the rice rat as part of a larger study on the marsh rats of the southeastern United States. These studies will help to better determine morphological variation, dispersal and colonization patterns of marsh rats across their present range. In addition, data from these surveys will help to determine the status of the rice rat in GWHNWR. The expected benefit of the proposed research is that it will ultimately aid in the recovery of the rice rat.

Adverse Effects - Handling of the rice rat may result in incidental injury or death of individuals. While this type of effect is uncommon with proper training or experience in handling of rodents, the potential for such injuries or deaths remains.

Species' response to the proposed action

Although the Applicant does not anticipate any injury or mortality of rice rat, the capture, handling, and bleeding of this species may result in injury or mortality of some individuals. Once confined within traps, the rice rat may be subject to depredation by predators, such as raccoons or fire ants. All live traps will have a mechanism to prevent raccoons from opening traps that contain rats to minimize the potential for this type of mortality. The Sherman live traps have locking doors to prevent raccoon predation.

The capture, handling, and bleeding of the rice rat is needed to help determine morphological variation, dispersal and colonization patterns of marsh rats across their present range. In addition, data from these surveys will help to determine the status of the rice rat in GWHNWR. The expected benefit of the proposed research is that it will ultimately aid in the recovery of the rice rat.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological 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.

Because nearly the entire remaining potential habitat for the rice rat within the action area occurs within publicly-owned land, actions resulting in cumulative effects are unlikely. Management activities within natural habitat in GWHNWR are entirely conservation-oriented. The Service is not aware of any State, local, or private activities that are reasonably certain to occur within the action area that would adversely affect the rice rat.

SUMMARY OF EFFECTS

Although short-term, adverse effects to the rice rat may occur from trapping, and handling, which may result in injury or death; this research will lead to an increased understanding of the biological status the rice rat within the action area. The net effect of the research is beneficial.

CONCLUSION

After reviewing the status of the rabbit and the rice rat, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the issuance of a recovery permit, as proposed, is not likely to jeopardize the continued existence of the rabbit or the rice rat and is not likely to destroy or adversely modify designated critical habitat for the rice rat.

INCIDENTAL TAKE STATEMENT

Sections 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 a 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 such as 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 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 that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the Service so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in action 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 statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. 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 incidental take statement.

AMOUNT OR EXTENT OF TAKE

Incidental take is expected to occur from trapping, handling and bleeding rice rat. The Service anticipates the trapping, handling and bleeding may result in the injury or death of one individual rice rat over the duration of the permit.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined this level of anticipated take is not likely to result in jeopardy to these species.

REASONABLE AND PRUDENT MEASURES

The Service believes the applicant has incorporated all reasonable and prudent measures necessary and appropriate to minimize impacts of incidental take of the rice rat. The applicant and designated agents acting on behalf of the applicant must provide resumes or summary of qualifications demonstrating their ability to safely conduct trapping and handling of the rice rat. To monitor the effect and extent of take, the applicant must provide a written report on the results of the research activities. The applicant will immediately cease all activities if an individual rice rat is injured or killed.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The Service shall require the applicant and designated agents acting on behalf of the applicant to furnish resumes or summary of qualifications demonstrating their ability to safely conduct trapping and handling. Only those individuals who can demonstrate they hold all necessary permits and have sufficient experience to trap and handle the rice rat with a minimum of risk to the species, and those individuals that are capable of recognizing indications of injury or ill health in the species will be permitted.

2. The reporting and monitoring requirements outlined in the section 10(a)(1)(A) permit will also satisfy the reporting/monitoring requirements required pursuant to section 7 of the Act and its implementing regulations.

3. Permit issuance will be conditioned to require the permittee and designated agents acting on behalf of the permittee to immediately cease all activities if an individual rice rat is injured or killed and to report any such injury or death to the Service (Field Supervisor, South Florida Ecological Services Office; 1339 20th Street; Vero Beach, FL 32960; 772-562-3909; or Big

Pine Key Sub-office, 305-872-2753), and the National Key Deer Refuge (28950 Watson Boulevard, Big Pine Key, Florida 33043).

4. Upon locating a dead, injured, or sick threatened or endangered species, initial notification must be made to the nearest Service Law Enforcement Office (9549 Koger Boulevard, Suite 111; St. Petersburg, Florida 33702; 727-570-5398). Secondary notification should be made to the Florida Fish and Wildlife Conservation Commission; South Region; 3900 Drane Field Road; Lakeland, Florida, 33811-1299; 1-800-282-8002. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or in the handling of dead specimens to preserve biological material in the best possible state for later analysis as to the cause of death. In conjunction with the care of sick or injured specimens or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed. Permitted activities that appear to be resulting in excessive injury or death will be immediately suspended until more protective measures or an alternative resolution can be initiated.

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 further minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service should continue to implement the MSRP (Service 1999).

REINITIATION NOTICE

This concludes formal consultation on this action as outlined in the request. As required by 50 CFR 402.16, reinitiation of formal consultation is required if:

1. The amount or extent of incidental take is exceeded;

2. New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion;

3. The 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.

If you have any questions, please contact Mark Salvato at 772-562-3909, extension 340.

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