
HABITAT CONSERVATION PLAN

Gulf State Park Infrastructure Improvements and Restoration Gulf Shores, Alabama

Submitted to the:

U.S. Fish and Wildlife Service

for the:

**Alabama Department of Conservation and
Natural Resources**

March 2014

Prepared by:

**Volkert, Inc.
316 South McKenzie Street Foley,
Alabama 36535
(251) 968-7551**

Contents

1.0	Project Background	1
1.1	Project Modifications	5
1.1.1	Master Plan (TE-072831-0)	5
1.1.2	Beach Pavilion Modification (Permit Number TE-072831-1)	9
1.1.3	Gulf State Park Fishing Pier Modification.....	13
1.1.4	Planned Dune Restoration and Enhancement Project (NRDA).....	16
1.2	Action Area and Restoration Activities	22
1.2.1	Restoration Project – Fishing Pier	27
1.2.2	Restoration Project – Engineered Berm.....	28
1.2.3	Restoration Project – Volunteer Dune Enhancement	29
1.2.4	Completed Dune Restoration.....	29
1.2.5	Restoration Project – NRDA Recovery	31
2.0	Habitat Conservation Plan	34
3.0	Habitat Types within the Project Boundary	38
3.1	Wet Beach	38
3.2	Primary Dunes.....	39
3.3	Interdune Swales	41
3.4	Secondary Dunes.....	41
3.5	Scrub Dunes	42
3.6	Wetlands.....	43
3.7	Disturbed Land.....	43
4.0	Alabama Beach Mouse Habitat Ecology	44
4.1	Range and Critical Habitat	44
4.2	Status within the Action Area	50
4.3	The Effects of Hurricanes	50
4.4	Population Estimates.....	52
5.0	Other Federally Listed Species That May Occur in the Action Area	54
5.1	Green Sea Turtle.....	55
5.2	Loggerhead Sea Turtle	55
5.3	Kemp’s Ridley Sea Turtle	56
5.4	Red Knot	56
5.5	Piping Plover	57
6.0	Direct and Indirect Effects on Affected Species	61
6.1	Direct Effects.....	61
6.1.1	Alabama Beach Mouse	61
6.1.2	Sea Turtle Species.....	64
6.1.3	Bird Species	64
6.2	Indirect Effects	65

6.2.1	Alabama Beach Mouse	65
6.2.2	Sea Turtles	66
7.0	Conservation Plan	68
7.1	Minimization and Mitigation Measures	68
7.1.1	Project Redesign	69
7.1.2	Project Area Construction Signage.....	70
7.1.3	Construction Materials and Waste Removal.....	70
7.1.4	Alabama Beach Mouse Disturbance during Construction.....	72
7.1.5	Dune Walkovers.....	73
7.1.6	Information and Advisory Signs.....	75
7.1.7	Outdoor Lighting	76
7.1.8	Property Fences.....	77
7.1.9	Predator and House Mouse Control.....	77
7.1.10	Dune Restoration and Management.....	78
7.1.11	Beach Cleaning and Beach Driving.....	83
8.0	Monitoring Unforeseen Circumstances and Adaptive Management Measures	84
9.0	Goals, Objectives, and Monitoring.....	86
10.0	Permit Amendments	88
10.1	Informal Amendments.....	88
10.2	Formal Amendments	88
11.0	Conclusions.....	89
11.1	Adverse Impacts.....	89
11.2	Beneficial Impacts.....	90
12.0	Summary.....	92
13.0	References.....	94

Figures

Figure 1: Project Vicinity – Gulf State Park Infrastructure Improvements and Restoration.....	3
Figure 2: Original Site Construction Plans and Defined Action Area.....	7
Figure 3: Alabama Beach Mouse Net Gain Determination.....	8
Figure 4: Planned Pavilion Restoration and Modified Footprint (ITP Modification 1).....	12
Figure 5: Permitted Lodge Complex (2004) and Pier Construction (2006) (ITP Modification 2)...	15
Figure 6: Footprint and Floor Plan for Interpretive Center.....	20
Figure 7: Original Action Area Boundary and Acreages.....	25
Figure 8: Updated Action Area Boundary with Revised Acreages.....	26
Figure 9: Dune Restoration at Old Pier – December 2012.....	28
Figure 10: Engineered Berm – 2013.....	28
Figure 11: Christmas Tree Restoration Area – 2013.....	29
Figure 12: Dune Restoration Areas (October 2013).....	32
Figure 13: 2013 Trapping Results – Alabama Beach Mouse Recovery Program.....	37
Figure 14: Multiple mouse tracks.....	41
Figure 15: Designated Critical Habitat in Gulf State Park - 1985 and 2007.....	46
Figure 16: 2003 Alabama Beach Mouse Critical Habitat and Occupied Areas.....	49
Figure 17: Designated Critical Habitat for Overwintering Piping Plover – Alabama.....	59
Figure 18: Designated Critical Habitat for Overwintering Piping Plover – Florida.....	60

Tables

Table 1: Summary of Alabama Beach Mouse Critical Habitat and Required Restoration – 2004 ..	30
Table 2: Restored and Proposed Habitat Restoration Areas – 2013.....	33

Appendices

Appendix A: Planning Guidance Documents from USFWS:	
1 - Recommended Measures to Minimize Lighting Impacts to Wildlife Habitat.....	98
2 - Best Management Practices for Beach Driving – Mechanized Beach cleaning on Alabama’s Coastal Beaches.....	100
3 - US Fish and Wildlife Service Approved Native Plant List for Alabama Beach Mouse Habitat Areas.....	101

1.0 Project Background

This report is being prepared, as requested by the U.S. Fish and Wildlife Service (Service), to update the existing Habitat Conservation Plan (HCP) submitted to the Service in 2004. This report is intended to provide a description of the project variations from the originally envisioned Master Plan for demolition and rebuilding the Hotel and Convention Center (Hotel Complex) at Gulf State Park (GSP) developed in 2003 (Garcia, 2003).

The project is located in the GSP south of Alabama Highway 182 (SR 182) between Gulf Shores and Orange Beach, Alabama. The initial area for this project included a private parcel on the eastern boundary of GSP. This 0.9 acre parcel has been removed from the current map for the project Action Area (**Figure 1**).

The 2004 HCP resulted from an initial Biological Assessment (BA) of the proposed Master Plan for GSP. During the development of the BA it became apparent that the primary impact resulting from the Master Plan activities would involve the federally listed Alabama Beach Mouse (ABM) and designated ABM Critical Habitat (CH) within the Action Area (AA) for the project. The BA was repurposed to become a HCP which detailed potential ABM Habitat within the proposed AA as well as the existing known information for the ABM population within the AA. Additionally it detailed other federally listed species that were potentially found or could potentially be impacted within the proposed AA and required consultation.

Due to hurricane impacts starting with Hurricane Fredric in 1979 and progressing through Hurricanes Erin and Opal (1995), Georges (1998), Ivan (2004), and Katrina (2005), GSP experienced damage to infrastructure, buildings, and the coastal dune system. The Master Plan was developed to address damages from past hurricane events and to provide a vision for the reconstruction of the outdated and repaired Hotel Complex.

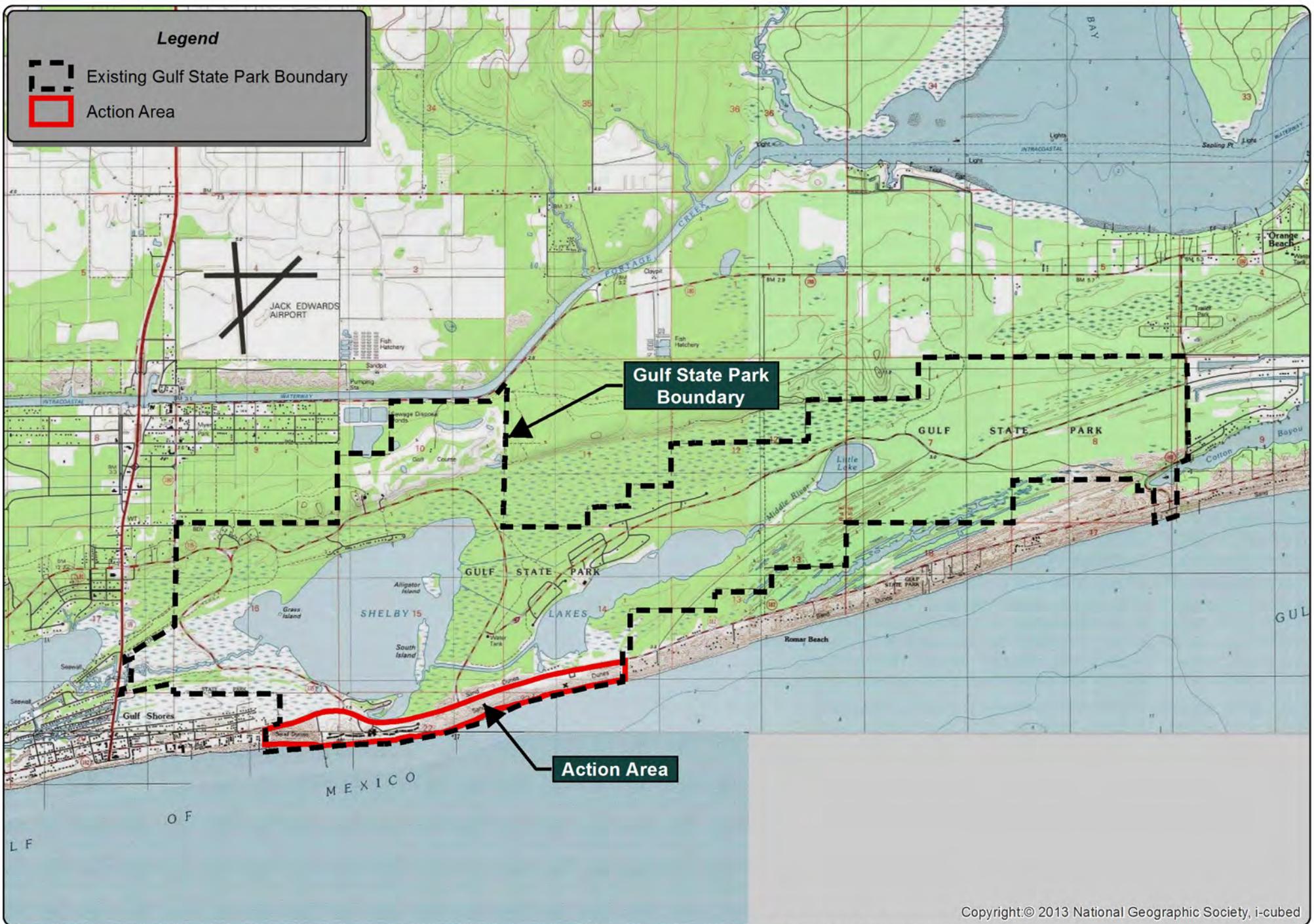
In 2004, Hurricane Ivan nearly demolished the Beach Pavilion (Pavilion) and badly damaged the existing Hotel Complex. In 2005, Hurricane Katrina also hit the Alabama

Gulf Coast doing further damage to what was left of the Hotel and related infrastructure on the GSP. Work that resulted from activities at GSP started with the demolition of the previously condemned (2001) Pavilion in 2004 under the Incidental Take Permit issued in 2002 (USFWS, 2004c).

In 2006, The Alabama Department of Conservation and Natural Resources (ADCNR) had the remnants of the Hotel Complex demolished, and the site remained vacant until 2008 when the pier and associated parking lot was reconstructed within a portion of the proposed former Hotel footprint (USFWS, 2006a; 2006b). This reduced the available area for the newly planned Lodge and Conference Center (Lodge Complex) from an initial 33.5 acres (2004) to 21.6 acres (2013).

Legend

-  Existing Gulf State Park Boundary
-  Action Area



Gulf State Park Boundary

Action Area

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0 2,000 4,000 Feet
1 inch = 4,000 feet



Note: This map is for presentation use only and not to be used for construction purposes.

Figure 1
Project Vicinity - Gulf State Park
Infrastructure Improvements & Restoration

Near that time, the new Pavilion and associated parking lot was also built. The original proposed Pavilion footprint was 10.7 acres and included three separate parking lots.

With these changes to originally planned infrastructure, ADCNR also was provided with revisions to their resulting Incidental Take Permits (ITP) for the Alabama Beach Mouse (ABM) that was based on existing conditions.

By updating the HCP, this report will maintain a record of the project development, current status, and new project items that are part of the Gulf State Park Enhancement Project. With this updated report USFWS agrees that the initial requirement for 22.7 acres of ABM habitat restoration has taken place.

The planned Gulf State Park Enhancement Project is proposed to be partially funded with Natural Resource Damage Assessment (NRDA) early restoration funds to compensate for loss of recreational use resulting from the *Deepwater Horizon* explosion and blowout that occurred in 2010. Since activities included in the NRDA enhancement project will take place within the previously defined AA, it was decided that the updated HCP would include information concerning those plans and their potential impact to ABM, ABM CH, and other listed species. However, the planned Gulf State Park Enhancement Project is separate from the habitat restoration required of ADCNR for the Fishing Pier, Beach Pavilion, and Lodge complex projects. All restoration required as part of the original ITP and subsequent modifications have been completed.

This updated HCP also includes language to address modifications that have been completed over the intervening years. The modifications were considered by the Service to be minor in the context of the original HCP. Thus, modifications to the original Biological Opinion and ITP were made while maintaining the original HCP as the basis decision document (USFWS, 2004b; 2004c).

The existing Biological Opinions issued by the Service and their detailed conservation measures are also still in full force based on the minor modifications made to the original project plans and subject to the modified ITP.

1.1 Project Modifications

From the initiation of the Master Plan permitting to the present there have been several changes to the final vision for the state-owned land that is located along the Gulf of Mexico within the GSP. The various impacts to ABM CH corresponding to each of these changes have been documented.

1.1.1 Master Plan (TE-072831-0)

The first HCP developed for the AA was in conjunction with the proposed demolition and reconstruction of the former Hotel and Convention Center (Hotel Complex) and Pavilion (Volkert, 2004; USFWS, 2004a; 2004b; 2004c). The original HCP referenced a Master Plan for renovations and rebuilding of GSP developed in 2003 (Garcia, 2003) (**Figure 2**). Permits that were part of the Master Plan had not been issued by the time that Hurricane Ivan struck Gulf Shores, Alabama on September 16, 2004. Hurricane Ivan severely damaged the remaining structures to the point where complete demolition of the Hotel Complex was the preferred alternative proposed in the Environmental Assessment (USFWS 2004a).

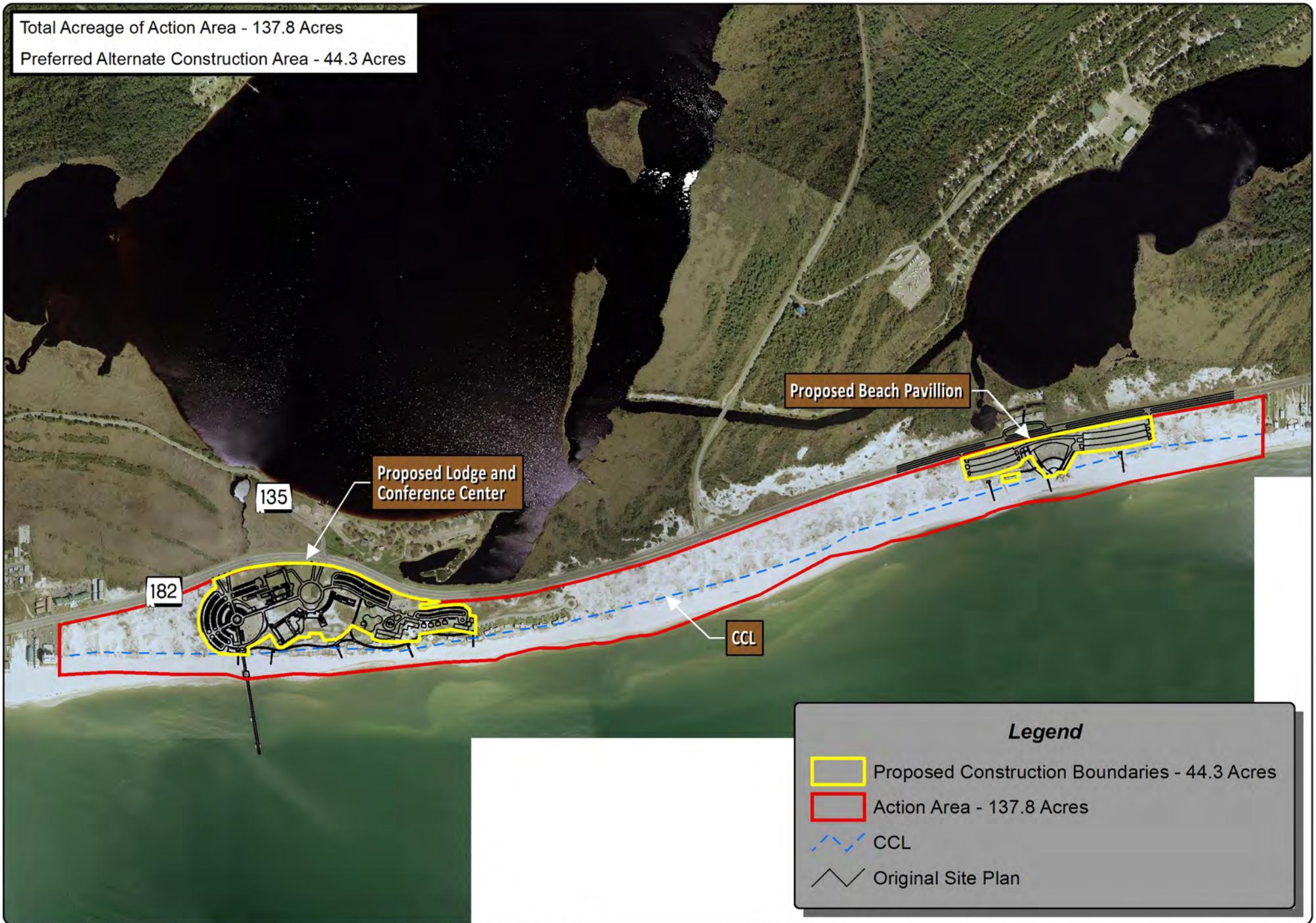
In 2002 the proposed Master Plan included demolition of the existing hotel and convention center at GSP in Gulf Shores, Alabama and the rebuilding of a Lodge and Conference Center and Beach Pavilion. A Biological Opinion associated with the HCP was written on December 22, 2004, which documented the consultation process followed in the completion of the HCP and the information developed as part of the original project Environmental Assessment completed in August of 2004.

For the original Preferred Build Alternative in the HCP, the impact to ABM CH was calculated as the difference between the amount of available habitat that would be destroyed by construction (11.6 acres) and the amount of proposed habitat restoration that would be completed (14.7 acres). The result was a calculated net gain in ABM CH of 3.1 acres (**Figure 3**). This calculation included the designated ABM CH within

GSP, the areas known to provide the Primary Constituent Elements for ABM CH, and the known areas of habitation within the AA. These were mapped within the AA east of the Lodge complex to the eastern boundary of the GSP. All of this information was eventually used for the calculation of the first ITP.

An Incidental Take Permit (ITP TE072831-0) was issued in response to the original HCP on December 23, 2004.

Total Acreage of Action Area - 137.8 Acres
Preferred Alternate Construction Area - 44.3 Acres

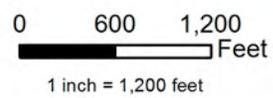


Total Acreage of Action Area: 137.8 Acres
 Preferred Alternate Construction Area: 44.3 Acres
 Current PCE of CH: 90.2 Acres
 PCE of CH Disturbed by Preferred Alternate: 11.6 Acres
 Dune Restoration for Preferred Alternative: +14.7 Acres
 Preferred Alternate PCE of CH: 93.4 Acres
 Net Gain of PCE of CH: +3.1 Acres



Legend

- Proposed Construction Boundaries
- Action Area
- Preferred Alternate PCE of CH
- Preferred Alternate Disturbed PCE of CH
- Current Occupied Habitat
- Preferred Alternate Dune Restoration



Note: This map is for presentation use only and not to be used for construction purposes.

Figure 3
Alabama Beach Mouse
Net Gain Determination

1.1.2 Beach Pavilion Modification (Permit Number TE-072831-1)

The original project was modified through an informal request from the ADCNR to the Service dated February 7, 2005. This modification followed the destruction of the existing Hotel Complex by storm surge from Hurricane Ivan and the demolition of the existing pavilion.

In 2000 the existing Pavilion stage extended onto the beach almost to the mean high tide line. The 2004 plan for reconstruction of the Pavilion area included three parking lots with a central pavilion structure, central Amphitheatre and a small bandstand on the western wing of the site (**Figure 4 – top**). This plan was later amended to include an eastward shift of the planned Beach Pavilion as well as a reconfiguration of the attendant parking lot to combine the three existing parking lots into a single lot. The planned bandstand was removed from the new plan drawings (a total of 0.2 acres). The shift and footprint minimization of the planned Pavilion and parking area within the previously planned footprint was determined to result in a net gain of 2.65 acres to designated ABM CH (**Figure 4 - bottom**) (USFWS, 2005).

In the ITP the final net gain to ABM CH was determined by USFWS to be due to footprint minimization and not proposed restoration, thus the returned acreage was not added to the restoration total of 14.7 acres that was shown in the initial ITP. The resulting first modification to the Incidental Take Permit (ITP-TE-072831-1) was issued on April 6, 2005 (USFWS, 2005).

It was noted at the time of the permit issuance and prior to demolition of the entire Pavilion that ABM was known to occupy the area beneath the pavilion. ABM was trapped from the area prior to demolition. The new planned Pavilion infrastructure eliminated the previously existing pavilion stage location and returned it to potential ABM habitat. With the beach re-nourishment, the open beach area grew from the 2003 conditions and

this widened sandy area became available for use by ABM. The removal of the stage (approximately 0.3 acres) would appear to represent “returned” habitat for ABM that was not included in the first ITP modification.

There were no supporting documents made available for this report that substantiate the means for determining the acreage returned to ABM habitat by the re-permitting of the Pavilion footprint. Comparison of the plan drawing footprints for ITP from the 2003 HCP and this HCP revision has some noticeable variations. All available plan drawings appear to exclude some of the original pavilion location.

There is no supporting mapping available for this report identifying the areas returned to ABM habitat for the previous permit modification. Therefore, the calculated value of 2.65 acres of ABM habitat returned cannot be specifically re-determined from existing documents based on text in the modified ITP (USFWS, 2005).

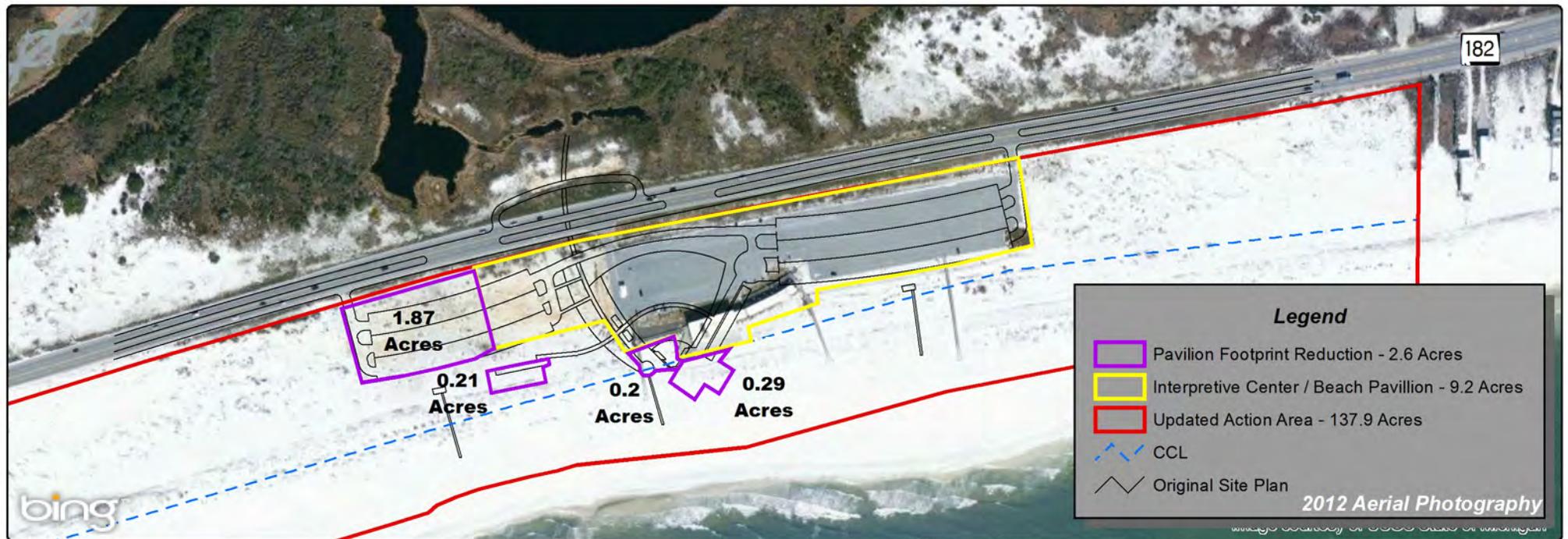
In **Figure 4**, the top and bottom depictions of the original and proposed Pavilion footprints are the best record of plan drawings available from the previous HCP and for this current report.

In an effort to provide equivalent plan drawings, the separate depictions were overlaid onto high resolution aerial photography from 2003 and 2012. The existing infrastructure was compared to the drawing boundaries and the lines were adjusted to fit the actual ground structure outlines. Once the two permitted areas were adjusted for their individual dates, the two were compared to each other and line variances were resolved.

The acreage has been resolved based on newer technology. Previous inaccuracies in the delineation for the ITP at the pavilion that was provided have now been corrected. The values represented in **Figure 4**

are considered to be accurate. The number of returned acres has been measured to be 2.5 acres of the original 11.8 acres of the original pavilion footprint depicted in 2003. If the habitat returned through the demolition of the Pavilion stage is considered, the total returned habitat in this area would amount to 2.8 acres.

While there is a difference of 0.1 acre between the current (2.5) and the past (2.6) “returned” acres, this is considered to be accounted for by comparing the level of accuracy of GIS in 2003 to 2014.



1.1.3 Gulf State Park Fishing Pier Modification

A second informal modification to the 2004 HCP was made in response to a request from ADCNR on June 16, 2006. This modification resulted from Hurricane Ivan's severe damage of the GSP fishing pier and associated parking lot and the need to relocate both facilities into an area considered less vulnerable to storm over-wash and breaches that occurred between Lake Shelby and the Gulf of Mexico.

The original pier was planned to be at the westernmost portion of the former Hotel complex. A circular parking lot was planned west of the entrance road which already existed.

The new pier location was moved east to within the footprint of the planned Lodge and Conference Center (Lodge Complex). Additionally, the southern boundary of the original ITP for the Lodge Complex was straightened. This reduced the overall planned footprint for all development on GSP from 44.3 acres to the current 41.1 acres¹. Land that included the entrance and parking area for the damaged pier was returned back to potential ABM Critical Habitat (**Figure 5**). The overall footprint for the proposed Lodge Complex (now including the pier) was reduced to the existing 31.9 acres from an initial 33.5 acres.

The modification included the removal of pavement and red clay base material associated with the destroyed parking lot, filling the area with sand, and planting dune vegetation to return ABM habitat back into the overall project AA.

For ABM CH the modification resulted in the net gain of 1.8 acres (restored pier and parking lot gain of 8 acres; construction of pier in

¹ Acreage calculated for the permitted area (44.3 original -2.65 permit modification one pavilion -1.8 permit modification two pier = 39.85 acres of permitted take area). However, old maps and estimates of acres affected vary over time with the actual footprint of on the ground structures and effects due to imprecise measuring techniques. The general ITP outline has been reduced over time and to facilitate future calculation purposes, GIS boundaries for the current polygon is 41.1 acres and we consider the ITP footprint to be 41.1 acres.

previously undisturbed ABM CH loss of 6.2 acres). The modification documented the total net gain of approximately 4.9 acres of ABM critical habitat from the original HCP (3.1 acres in the original; 1.8 acres in the modification).

In the original HCP there was a designation of approximately 110 acres of suitable habitat available in GSP for occupation by ABM. Following Hurricane Ivan, habitat suitable for ABM in GSP was assessed by the Service as zero acres (USFWS, 2006a). Based on that premise the overall plan, as modified, would result in restoration of 22.7 acres of ABM suitable habitat. This included the restoration of habitat from the first ITP (14.7 acres) added to the restoration of the former pier location (8 acres).

The Service issued a modified ITP on December 6, 2006, (TE-072831-2) following the modification of the Biological Opinion (USFWS, 2006a; 2006b).



1.1.4 Planned Dune Restoration and Enhancement Project (NRDA)

The proposed NRDA Dune Restoration and Enhancement Project was not part of the original HCP or any of the ITP modifications associated with the planned development at GSP. The restoration that was documented as part of the ITP modifications (22.7 acres) is not part of the proposed NRDA project. However, the proposed restoration will benefit the overall ABM habitat within GSP. As the restoration areas develop, there will be an increase in both ABM suitable habitat and the areas providing Primary Constituent Elements (PCE) to suitable habitat within GSP.

According to the determination of Critical Habitat, PCE are defined as:

1. Space for individual and population growth, and for normal behavior;
2. Food, water, light, air, minerals or other nutritional or physiological needs;
3. Cover or shelter;
4. Sites for breeding, reproduction, and rearing of offspring; and
5. Habitat that is protected from disturbance or is representative of the historical geographic and ecological distribution of a species.

Some of the proposed NRDA project (including revised plans for the Lodge Complex) will occur within the originally designated AA and therefore are bound by any provisions of the original HCP and this revised HCP. Current plans associated with the GSP Enhancement Project are being partially funded through money associated with the NRDA and include five separate building/infrastructure projects:

1. Rebuilding the GSP Lodge and Conference Center,
2. Ecological Restoration and Enhancement of Degraded Dune Habitat,
3. Interpretive Center Building,
4. Research and Education Center, and
5. Visitor Enhancement projects (trails).

Lodge and Conference Center

Of the above list, only the Lodge and Conference Center, Ecological Restoration, and Interpretive Center will be completed in the defined AA in GSP. The Lodge Complex plans have been changed to limit the amount of buildings and their overall footprint. The Project's commitment to use native landscaping also should contribute to an improved beach environment.

Landscape plantings would be restricted to native species typical of the habitats existing or to be created on the site including wetlands and primary, secondary, and scrub dunes. The stormwater swales would be planted with native wetland species such as Sea Oxeye Daisy (*Borrchia frutescens*), Smooth Cordgrass (*Spartina alterniflora*), Sand Cordgrass (*Spartina patens*), and Black Needlerush (*Juncus effusus*) and would be interpreted as a model sustainable landscape practice for coastal areas. Though, landscape plantings would be limited to native plant species as much as possible, however, in some instances non-native ornamental plants may be used within the permitted footprints of the lodge and conference center. A list of USFWS approved native vegetation will be used in the landscape planning for the Lodge and Conference Center to the maximum extent possible (**Appendix A**) and a landscaping plan will be provided to the USFWS for review and approval.

The proposed lodge will be elevated and retain an open first floor beneath the main building that will not impede sand movement. This will aid in the development of sand dune habitat near the lodge and should also improve conditions for ABM within the areas of development.

The footprint is being reduced from the original project that proposed a hotel, inn, cottages, and associated infrastructure that would have had an approximate footprint of 33.5 acres. The current plan will reduce the overall footprint to 31.9 acres. This is further divided into the fishing pier

(10.3 acres) and the Lodge complex and supporting infrastructure footprint (21.6 acres) (**Figure 5**).

Ecological Restoration of Dune Habitat

The Ecological Restoration and Enhancement component of the NRDA project is expected to increase the extent of improved ABM habitat with a 50 acre area of enhanced dune habitat. The enhanced 50 acres will be available for ABM population and use. Areas not directly restored as ABM dune habitat will be allowed to develop naturally. The enhancement area is proposed to contain several dune variants that can be used for improved ABM use.

At this time there are no specific restoration plans that locate areas of planned enhancement within the AA. These will be coordinated with the Service prior to implementation.

Interpretive Center

The Interpretive Center is composed of two buildings (Auditorium and Gallery) and the associated elevated walkways and deck area (**Figure 6**). There will be elevated walkways on each approach from the existing parking lot. An elevated boardwalk will surround the Dune Restoration Exhibit. The buildings will comprise approximately 3,500 square feet. They will be located on a larger deck area that will be used for a gathering area.

The Interpretive Center is being built within the undeveloped area that was part of the ITP modification for the Beach Pavilion (ITP-TE-072831-1). Of the 9.2 acres covered in the ITP, only 7.4 acres were built out for the pavilion and parking areas. With the buildings for the Interpretive Center accounting for approximately 0.1 acre, the remaining footprint for the center will include the elevated gathering deck and the elevated walkways around the interior display area. The overall footprint of the buildings and dune restoration exhibit area is 1.8 acres.

Landscape plantings would be limited to native plant species as much as possible, however, in some instances non-native ornamental plants may be used within the permitted footprint of the Interpretive Center. A list of USFWS approved native vegetation will be used in the landscape planning for the Lodge and Conference Center to the maximum extent practical (**Appendix A**).

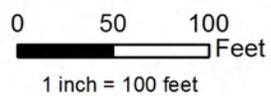
Legend

-  Interpretive Center Floor Plan
-  Interpretive Center - 1.8 Acres
-  Pavillion Area



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Note: This map is for presentation use only and not to be used for construction purposes.

Figure 6
Footprint & Floorplan for Interpretive Center

The Interpretive Center will be constructed in an area that currently is undeveloped but previously disturbed land that was part of the original Beach Pavilion infrastructure. Because this area was previously a parking lot it provides limited PCE. This area is included in TE-072831-01 and take has already been authorized.

While the dune restoration exhibit could provide potential habitat for ABM, the entire area will be impacted by construction. As a means to minimize or avoid potential take of ABM during maintenance activities, a survey will be conducted prior to plan land disturbance. Where ABM is found, the individuals will be properly relocated. GSP will coordinate with USFWS prior to the survey and any potential relocation.

During operation of the Interpretive Center it is expected that there will be frequent visitation by educational groups. While there will be rules in place to prohibit intrusion into the display area, it is likely that disturbances will be frequent for maintenance of displays. ABM habitation within the Interpretive Center footprint can be expected, as habitat will be created for exhibits.

The Interpretive Center footprint is nearly all elevated structure. As such, the development of dunes beneath the center could provide areas that could be available for future habitation by ABM. ADCNR will retain the dune exhibit area for future exhibition space which will include regular maintenance of structures and displays to optimize the visitor experience. By leaving the open space within the exhibition center natural, ADCNR expects to allow development of suitable habitat for ABM. Should any future development plans in this area discover habitation by ABM; the ADCNR will coordinate with the Service regarding any removal or avoidance requirements.

The Interpretive Center will be subject to the daily operational hours in

place for all GSP educational centers. It will primarily be used during daylight hours. However, GSP planning for the Interpretive Center could include night time activities on some occasions. All windows and lighting at the Interpretive Center will be wildlife friendly so that night activities will not pose a risk to ABM, Sea Turtles or nesting birds.

1.2 Action Area and Restoration Activities

Gulf State Park is 6,150 acres of coastal habitat adjacent to the Gulf of Mexico in Baldwin County, Alabama. The Park contains habitats which range from beachfront, primary, secondary, and scrub dunes, to wetland, swale, and maritime forest habitats as well as fresh/brackish water coastal lakes (Little Lake, Middle Lake and Lake Shelby).

The AA is located in Sections 21-23, 14, and 15, Township 9 South, and Range 4 East. The boundary of the AA is defined by the property parcel boundary data available from the Baldwin County Tax Assessor's Office. The portion of GSP which encompasses the AA is bounded by private parcels located in the towns of Gulf Shores (west) and Orange Beach (east). The northern limit of the AA is at the southern boundary of the Alabama Department of Transportation (ALDOT) right-of-way for State Road 182 (Gulf Beach Highway). The southern boundary approximates the mean high tide line for the Gulf of Mexico.

The AA described in the original HCP, Biological Opinion, and ITP was estimated as 137.8 acres and encompassed the general vicinity of the former GSP infrastructure (Lodge, Pier and Pavilion). Recent reevaluations of available geographic data have changed this estimated area.

Based on the previously defined boundaries, the original AA was estimated as 179.9 acres within the defined County Parcel information. An initial boundary for the AA included a private parcel on the east boundary for GSP (**Figure 7**). The inclusion of the private parcel was determined to be a scrivener's error. That 0.9 acre parcel has been eliminated from the current AA boundary. In the

determination of the AA initially, disturbed areas or areas where infrastructure existed were eliminated from the overall AA because they did not provide any aspect of CH for the ABM. With the removal of the buildings and infrastructure associated with the Lodge Complex and the Beach Pavilion, the area that was within the AA was re-determined to be 135.7 acres before the removal of the private parcel.

Using the same method for determining the AA (subtract construction areas) with the adjusted AA boundary, the reduced infrastructure footprints, and the planned development, the actual acreage contained in the AA is now estimated at approximately 137.9 acres (**Figure 8**).

The AA was originally defined in terms of the Alabama Beach Mouse Critical Habitat Designation (USFWS, 1985) (**see also Figure 3**). Prior to Hurricane Ivan's passage approximately 110 acres of the AA were considered as habitat suitable for ABM. Of that total suitable habitat, only 90.24 acres within the AA exhibited PCE of CH for ABM. Only 55.8 acres of that 90.24 were known to be inhabited by ABM (USFWS, 2004a).

Prior to Hurricane Ivan, the area from the mean high water line at the Gulf of Mexico to Gulf Beach Highway (SR 182) was designated as ABM CH. Project modifications that have occurred since the 2004 HCP have made minor changes to the areas being impacted or restored, but the overall AA has not changed with respect to the ABM CH designation.

Habitat in the GSP considered to be suitable for ABM was reduced from 110 acres prior to Hurricane Ivan to zero (0) following the storm passage. The Service also determined that ABM was likely extirpated from the low lying habitat in the GSP (USFWS, 2004a; 2006a). In keeping with this determination, upon the issuance of the 2006 Biological Opinion modification, all habitat restoration efforts associated with the planned developments were determined to be a total net gain of ABM suitable habitat (22.7 acres). Since the 2006 ITP

modification a total of 36.8 acres of dune habitat has been restored. This exceeds the required 22.7 acres originally required for this project.





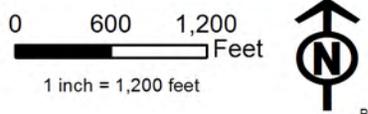
Note:
Action Area Boundary is at SR182 Right of Way

Legend

-  Fishing Pier - 10.0 Acres
-  Interpretive Center / Beach Pavillion - 9.2 Acres
-  Lodge Complex ITP - 21.6 Acres
-  Updated Action Area - 137.9 Acres
-  Baldwin County Parcels - 179.0 Acres

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Note: This map is for presentation use only and not to be used for construction purposes.

Figure 8
Updated Action Area
Boundary with Revised Acreages
(2012 Aerial)

Path: \\192.188.10.6\Envir\PROJECTS\330\334001 - ADCNR Gulf State Park Hotel & Conference Ctr\GIS\Map Documents\Figure 8 Updated Action Area Boundary.mxd

Critical Habitat for ABM was revised in 2007 (USFWS 2007). This new CH included the entire area south of SR 182 and added some areas north of the roadway. The 2007 map of critical habitat did exclude the already permitted areas for the Lodge and Conference Center and the Pavilion. Within Unit 5 which includes GSP lands, the available ABM CH increased to a total of 192 acres, which included the right of way for SR 182 (Gulf Beach Highway). The ALDOT right-of-way is not included in the Action Area being examined in this HCP. The increase in acreage was due to the capture of ABM in secondary and scrub dune habitat north of the 182 roadway. Designated ABM CH and habitat north of the SR 182 right-of-way is also outside the Action Area for this HCP.

1.2.1 Restoration Project – Fishing Pier

The ITP modification for the reconstruction of the fishing pier was issued in 2006. At that time, the mitigation for construction of the pier was planned to be 8 acres of restored dune habitat at the previous location of the pier. The new fishing pier was to be relocated within the footprint of the Lodge complex while the old location was to be returned to ABM CH. The pier relocation was estimated to impact approximately 6.2 acres (0.2 acres for the pier, 6 acres for the relocation of the infrastructure including a parking lot). At the time, a total of 1.8 acres of habitat was documented to be gained as the result of the ITP modification.

Within the Modified Biological Opinion the Service reconsidered the overall project impacts to reflect the loss of habitat from Hurricane Ivan and to provide credit to ADCNR for all restoration activities to follow. From the pre-Ivan assessment of habitat suitable for ABM within GSP (110 acres) the Service recognized that Hurricane Ivan had damaged all suitable habitat and declared that the suitable habitat post-Ivan was zero (0) acres. Thus, the entire 8 acres of restoration would go directly to the overall proposed project restoration associated with the HCP (14.7 acres in 2004, plus 8 acres to equal 22.7 acres).

In 2010 dune restoration in the old pier footprint was initiated (**Figure 9**). By the end of the restoration effort the total restored dune habitat that



Figure 9: Dune Restoration at Old Pier - December 2012.

could be considered suitable for ABM was increased to 8.2 acres. This is an additional net gain of 0.2 acre of suitable habitat from the original planned restoration effort associated with the pier relocation.

These areas are being monitored and are showing good growth and recruitment of dune vegetation. A recent field review of the restoration area also discovered evidence of the presence of suitable habitat and the presence of ABM within the restored area (Lynn, 2013).

1.2.2 Restoration Project – Engineered Berm

As part of the beach nourishment project that followed the destruction of Hurricane Ivan, a berm was constructed to provide some protection for infrastructure between the mean high water and SR 182. The engineered berm was supplemented with Sea oats (*Uniola paniculata*) planting and allowed to develop (**Figure 10**).

The berm is approximately 10,350 feet long (2 miles). With the planting



Figure 10: Engineered Berm – 2013

and development, the berm is now providing suitable habitat for ABM. Recent trapping by the Service and Volkert’s field review indicate that this berm now supports a population of ABM (Lynn, 2013).

This is a successful restoration of suitable habitat amounting to an additional 13.6 acres. The area is considered to be currently inhabited by ABM.

1.2.3 Restoration Project – Volunteer Dune Enhancement

The GSP continues to restore suitable dune habitat as part of their efforts to involve the community and to contribute to the overall restoration of ABM CH in the GSP. Since 2008, volunteers have implemented Christmas tree dune restoration and planted other areas in front of and behind the engineered berm (**Figure 11**).

The Christmas tree dune restoration is performed by placing three Christmas trees end to end in a horseshoe shape with the opening facing to the southeast. This is considered to be the predominant direction for sand movement in GSP. The Christmas trees are covered with sand and the perimeter of the dunelet is planted with a 70:30 mix of dune plant species (70 percent Sea oats and 30 percent other minor species).



Figure 11: Christmas tree Restoration Area – 2013.

The minor species used are beach evening primrose (*Oenothera humifusa*), beach morning glory (*Ipomea pes-caprae*), coastal panicgrass (*Panicum amarum* var. *amarulum*), and beach elder (*Iva imbricata*). Several recruit species are found in the more established areas of dune restoration.

Overall, the volunteer restoration efforts now account for an additional 15.0 acres of restored dune habitat.

1.2.4 Completed Dune Restoration

With the dune restoration efforts that have been accomplished to date, the GSP commitment to the restoration of 22.7 acres has been accomplished and exceeded (**Table 1**). The table details the values contained in the Biological Opinions and each of the ITPs (TE072831) for habitat restoration required or habitat returned (TE072831-01). The values are

not presented as additive. They represent the values contained within the original ITP and each modification. The final line represents information in the most recent modification and what is currently required for ADCNR restoration. The calculation of net gain for TE072831-02 is the 4.9 acres that is based on pre-Ivan impact to ABM habitat (3.1 for the initial ITP and 1.8 acres returned with the pier reconstruction and adjustment of the Lodge and Convention Center permit area). The restoration acres include the original 14.7 acres and the addition of 8.0 acres of restoration associated with the old pier location. The acres are expressed relative to the consideration that post-Ivan ABM habitat was reset to zero by USFWS.

Table 1: Summary of Alabama Beach Mouse Critical Habitat and Required Restoration

	Action Area (acres)	Available Suitable Habitat (acres)	Area Occupied	ABM Habitat lost to construction	ABM Habitat to be restored	Net Gain
Pre-Hurricane Ivan	137.9	110 90.2 PCE	55.8	44.3	14.7	3.1
Post Ivan	137.9	0	0	0	14.7	0
TE072831-1	137.9	0	Unknown	41.65	2.65 (returned)	0
TE072831-2	137.9	0	Unknown	42.5	22.7	4.9

References: USFWS 2004a; 2004b; 2005; 2006a; 2006b; Volkert 2004.

A field review of the GSP AA on October 14, 2013, was primarily for the purpose of delineating the restored dune areas, including the engineered berm, and to determine the total amount of dune restoration that has occurred since the 2004 HCP and ITP modifications were issued.

The engineered berm accounts for 13.6 acres of dune restoration. With the 8.2 acres of restored dune habitat near the pier, a total of 21.8 acres were restored prior to the GSP volunteer efforts. With the addition of 15.0 acres of dune restoration, a total of 36.8 acres of restored dune habitat currently exist (**Figure 12**).

1.2.5 Restoration Project – NRDA Recovery

With the potential to enhance 50-acres of dune habitat being undertaken by the NRDA enhancement project, the increase of PCE for ABM could be nearly four times what had been envisioned in the 2004 HCP (**Table 2**).

The total potential PCE that could be made available to ABM for re-population, reproduction, shelter, and feeding that would result from the proposed developments is approximately 86.8 acres. This area approaches the initial amount of suitable habitat containing PCE thought to be present in pre-Ivan lands south of SR 182 (90 acres).



This net benefit to the species of restored and protected habitat will help in future attempts to relocate and repopulate areas that are now devoid of ABM and improve the chances for survival of existing populations of ABM within the AA.

Table 2: Summary of Alabama Beach Mouse Critical Habitat Restored and Proposed – 2013

	Action Area (acres)	Available Suitable Habitat	Approved ITP Area	Restored Habitat	ABM Habitat Net Gain or Enhancement
Restoration at Pier				8.2	8.2
Engineered Berm				13.6	13.6
Volunteer Restoration				15.0	15.0
Current conditions and planned restoration	137.9	36.8	41.1		50 (proposed enhancement)
References: USFWS 2004a; 2004b; 2005; 2006a; 2006b; Lynn, 2013; Volkert 2004.					Total – 86.8 acres

2.0 Habitat Conservation Plan

This Habitat Conservation Plan addresses the plans for the conservation and restoration of suitable habitat for the Alabama Beach Mouse (*Peromyscus polionotus ammobates*) within and near the areas proposed for redevelopment at GSP. This plan also includes unoccupied critical habitat which is defined as areas designated CH, not permanently or seasonally occupied, but necessary to either stabilize the population or assure eventual recovery (NMFS and USFWS, 1998).

After Hurricane Ivan, the entire 179 acre area of GSP south of SR 182 was still considered ABM CH but the Service also determined that the ABM had been extirpated in much of the low-lying habitat within their range, including GSP. Further, the Service stated that following the 2005 hurricane season, ABM were still not present in the proposed project area (USFWS, 2006a). In order to maintain an understanding of the effects of the action for the project on the CH for the species, as modified in 2005, the Service maintained the description of impacts relative to acres impacted by construction while accepting that the CH had been completely altered by Hurricane Ivan. Thus all designated CH was repurposed as unoccupied CH. Any incidental takes would be discussed in terms of the potential presence of the ABM.

ABM is a federally listed endangered species with designated Critical Habitat within the proposed areas of development described in Section 1 above (USFWS, 1985; 2007). Based on the presence of designated CH for ABM within the AA for this project, the Habitat Conservation Plan will address the species affected by and potentially impacted by the activities being undertaken or proposed for GSP. Other federally listed species will be described and potential impacts to them will be addressed separately.

Since the initial ITP issued for GSP in 2003 there have been two modifications resulting in supplemental ITP and Biological Opinion. The incidental take will result from several activities that have occurred or are proposed to occur at GSP. Activities within the AA of the GSP previously included in the HCP and modifications have included:

1. Demolition, reconstruction, occupancy, use, operation, and maintenance of the Lodge Complex (demolition completed);
2. Construction activities and use of the fishing pier and associated parking (completed in 2006); and
3. Demolition, reconstruction and use of the Beach Pavilion and associated parking (completed in 2006);

Activities still planned for completion include the following NRDA funded projects:

1. Construction, use, and maintenance of the Interpretive Center (still planned);
and
2. Proposed NRDA-funded dune restoration and enhancement (proposed 50 acres).

Each of these activities could result in incidental take of ABM.

This revised HCP includes the impacts associated with the described facility construction and habitat restoration activities. The taking related to the projects is incidental to an otherwise lawful activity on publicly owned land and, thus, is eligible for the incidental take permit provisions of Section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended. This HCP is submitted as a statutory component of applications for incidental take permits by the Alabama Department of Conservation and Natural Resources (the Applicant). The ITP sought is for a period of thirty years.

The official designation of ABM CH associated with this HCP includes all GSP lands south of SR 182. Some areas that are designated as CH may, however, have been disturbed by paving, building construction and other development activities. These previously disturbed areas are not suitable or habitable for the ABM and would therefore not exhibit CH PCE. In 2003, field investigation and analysis of previous trapping data by the Service, determined that only a portion (90.3 acres) of the AA (137.8 acres) exhibited constituent elements of CH at the time of the 2004 HCP report (refer to **Figure 3**).

There is no available data specifically detailing the current areas providing PCE or the

areas currently occupied by ABM. The most recent trapping report does indicate that success criteria are being met (population estimated to be more than the initial number transferred; at least 50 percent of suitable habitat occupied). Further population studies will be completed in the coming years as the reintroduced population expands its size and extent. Trapping results also indicate some of the population is located in the designated critical habitat north of SR 182 (**Figure 13**). This is outside the AA considered for this HCP.



GULF STATE PARK ABM CAPTURES

- NO
- YES
- ~ CCL

Note: This map is for presentation use only and not to be used for construction purposes.

3.0 Habitat Types within the Project Boundary

The entire AA covered in this HCP is located in the designated Coastal Zone for the state of Alabama. This includes the waters and lands lying seaward of the continuous 10-foot contour line extending seaward to the outer limit of the United States territorial sea.

Baldwin County is located in the Coastal Plain Physiographic Province (GSA, 1988). Three formations occur within Baldwin County; the Citronelle formation, the undifferentiated Miocene Series (Miocene age), and the Holocene-aged alluvial, coastal, and low terrace deposits. The Holocene-aged coastal deposits comprise the entire area of GSP. Along the gulf beaches the coastal deposits include fine to medium quartz sand with shell fragments and accessory heavy minerals.

The specific soil series located in the project area is the Coastal Beaches series (NRCS, 1964). The Coastal Beaches series soils are described as well-sorted fine to coarse sand with minor amounts of shell and accessory minerals. These soils occur along the Gulf coastline and are deposited on slopes from zero to five percent. Where the wind has blown the soils into dunes, the slopes on the landward sides can be as steep as fifteen percent.

The following sections describe the habitats that were present within the AA prior to Hurricane Ivan. Terminology and plant identifications follow the vegetation classification completed for barrier island plant communities (Gibson and Looney, 1992; Looney, et al., 1993). While not all described habitats currently exist within the AA, these habitat descriptions will serve as representations of potential future habitats that could be restored within designated ABM CH.

3.1 Wet Beach

The wet beach area consists of the un-vegetated shoreline. The wet beach is a marine intertidal habitat with a foreshore and backshore. The foreshore is variously exposed depending on tides and waves. The backshore, which is only submerged during storm surges, is a transitional area between the foreshore and the primary dune line. The wet beach consists primarily of well-sorted, fine to coarse sand with minor amounts of shell. Typical species of the wet beach

environment include the Mole crab (*Uca panacea*), Ghost crab (*Ocypode quadrata*), a burrowing amphipod (*Orchestia platensis*), Coquina (*Donax variabilis*), and polychaete worm (*Scolelopsis squamota*). Common shorebirds include plovers, sandpipers, yellowlegs, and dowitchers.

The upper dry edge of this habitat could be a foraging area for ABM. For the purposes of the delineation of ABM CH, the total available habitat is determined from the existing wrack line, which represents the most recent high tide elevation.

While the wet beach is not specifically designated as critical habitat for the Northwest Atlantic Distinct Population Segment Loggerhead Sea Turtle it does provide Physical or Biological Feature 2 (Habitats Protected from Disturbance or Representative of the Historical, Geographic, and Ecological Distributions of the Species) that is part of the overall critical habitat designation (USFWS, 2013a). A nesting beach requires natural coastal processes to be a part of the critical habitat. This includes all of the tidal and sand movement that takes place in the area consistently inundated by normal tidal cycle activity. The natural coastal processes that help shape the wet beach and coastal habitat are part of the loggerhead nesting beaches.

Wet beach is also considered to be general habitat for the three other sea turtle species as well as winter/foraging habitat for Red Knot and Piping Plover (USFWS 2001; 2013b). Wet beach is considered to be general foraging habitat for migratory shorebirds.

3.2 Primary Dunes

Primary dunes (including incipient and foredunes) establish an abrupt habitat change from the adjacent un-vegetated backshore. The primary dunes in the AA were destroyed by Hurricane Frederic in 1979. Between Hurricane Fredric and Hurricane Ivan, the primary dune field had rebuilt to include some individual dunes with heights of five to ten feet. In comparison to the pre-Fredric primary dune heights, this was still considered as a recovering habitat. Post Hurricane

Ivan, there were no elevated primary dunes remaining.

As part of the restoration of the beach systems in coastal Alabama, following the Hurricane Ivan and Katrina passages, the beaches in Gulf Shores and Orange Beach, including the GSP, were re-nourished. This increased the distance from the existing primary dune line and the new wet beach.

A shoreline berm was engineered as part of the re-nourishment activity. This berm of sand was placed in the upper reaches of the re-nourished beach with the purpose of protecting developing habitat behind it as well as protecting the existing and proposed GSP infrastructure.

In the interim, normal wind-blown sand movement has created incipient dunes that consist of a single pioneer plant species to a bundle of species making up effective aeolian sand trapping feature and contributing to the increase in height and width of these incipient primary dune fields. In four locations volunteer planting efforts have created small primary dunes waterward of the engineered berm. These have been successful and continue to increase in area and height.

Currently there are five deliberate breaches in the engineered dune. One is associated with the construction of the fishing pier. The pier is elevated enough to allow for primary dune development beneath the structure; however, it is unlikely that there will be strong vegetation growth beneath the structure. The other four breaches accommodate dune walkover structures. These breaches can funnel moving sand to the interior open sand areas that have been restored or are proposed to be restored.

Common plants of primary dunes are sea oats, sea rocket (*Cakile constricta*), seaside bluestem (*Schizachyrium maritimum*), beach elder (*Iva imbricata*), and beach panicgrass. This habitat is considered prime for providing all PCE for the ABM. This area also provides habitat for nesting sea turtles (3 species), proposed critical habitat for the Loggerhead Sea Turtle and beach nesting for some migratory birds.

3.3 Interdune Swales

Interdune swales are lower elevation sand flats within the primary and secondary dune fields. The low flat aspect of the habitat either intercepts the groundwater or ponds rainwater due to the presence of organic material in the fine sands that make up the primary soil. These habitats can be either dry or wet, depending on the season, relative elevation, and recent rain activity.

Travel between dune systems by ABM is believed to provide enough of the PCE for designation as CH. The recent field survey found evidence of mouse movement between existing secondary dunes and the open sand flats (**Figure 14**).



Figure 14: Multiple mouse tracks.
(Travelling between restored dunes behind the engineered berm west of the Beach Pavilion)

Interdune swales are generally bare sand but when vegetated are characterized by the presence of saltmeadow cordgrass (*Spartina patens*), yaupon (*Ilex vomitoria*), various sedge species (*Cyperus* spp., *Fimbristylis* spp.), squareflower (*Paronychia erecta*), and rustweed (*Polypremum procumbens*). The wetter swales will also have small patches of black needle rush (*Juncus roemerianus*), and umbrellagrass (*Fuirena scirpoidea*).

In addition to ABM, this habitat is attractive to ground nesting birds, including the Least Tern. The lack of sand movement is ideal for these ground nesters. The shell hash and other material that does not move with wind as easily as sand, provide the camouflage needed to hide nests and eggs. GSP has a small active Least Tern presence that they monitor. They erect cautionary and exclusionary signage in the nesting areas and monitor progress throughout the nesting season.

3.4 Secondary Dunes

Secondary dunes develop inland of the primary dune line. In natural sequencing of habitats, the secondary dune field begins after the primary dune line. Generally, these are lower than the developing primary dune field and have higher

plant density.

Secondary dunes within the affected area extend northward to SR 182 and continue to some degree on the north side of the highway. This area is characterized by small, gently rolling dunes that rise above the adjacent land surface to typical heights of 3 to 8 feet. These are areas that have been restored by GSP personnel with volunteer help.

Some PCE for ABM CH can be found in this habitat and there is evidence of ABM use within this habitat type.

In the natural state, these secondary dunes develop over a longer period of time and can contain sea oats and seaside bluestem. Some woody species such as camphorweed (*Heterotheca subaxillaris*), beach evening primrose, golden aster (*Chrysopsis godfreyi*), and bush goldenrod (*Chrysoma pauciflosculosa*) can also be present in natural dunes. In the restored areas, the camphorweed is growing as a recruit species with beach evening primrose (planted) growing well.

3.5 Scrub Dunes

North of the secondary dune field are isolated areas consisting of scattered, discontinuous dunes up to twelve to fifteen feet above mean sea level (msl). Where the dune system has been allowed to develop without being destroyed by storms or development, these dunes are characterized by tree and bush species that are longer lived than the herbaceous species found in the secondary dunes. These dune systems are typically the remnants of earlier periods of dune building along the Gulf coast. Many show the scars of storm surge and recent hurricane events that have reduced their overall area through erosion.

Scrub dunes, especially at their peak elevations, are vegetated predominantly by dwarf tree species, including sand live oak (*Quercus geminata*), myrtle oak (*Q. myrtifolia*), Chapman's oak (*Q. chapmanii*), and scattered sand pine (*Pinus clausa*). The shrub species commonly found in these dune areas can include false rosemary (*Ceratiola ericoides*), gopher apple (*Licania michauxii*) and laurel leaf

greenbriar (*Smilax laurifolia*).

These higher dune areas have been speculated to be potential refugia for ABM during hurricane events.

3.6 Wetlands

At the time of the initial HCP development, a total of 1.1 acres consisting of seven small wetland areas, were found within the AA. Six of the wetlands were located west of the entrance road to the state park pier. The fourth wetland was located just east of the entrance road to the state park pier. All of the wetlands consist of wet swales that are dominated by saltmeadow cordgrass. Following the Hurricane Ivan storm surge and associated sand movement across the entire AA, the wetland areas were no longer present at the surface.

3.7 Disturbed Land

Disturbed land is an area that does not contain a natural biotic community. These conditions exist when the natural community has been altered by activities including agriculture, construction of housing, and industrial development. The former Lodge Complex, the Beach Pavilion, associated parking lots, paved surfaces, dune habitats disturbed by pedestrian traffic, and all landscaped areas in the project area are considered disturbed land and comprised approximately 44.9 acres for the 2004 HCP. Disturbed areas are expected to be used by some wildlife. ABM has been known to use debris and discarded wood for shelter or as a burrow protection.

4.0 Alabama Beach Mouse Habitat Ecology

Trapping data are useful in developing considerations about the ABM population stability and responses to hurricanes and other natural factors. The data also reveal aspects of ABM biology that are not clearly understood.

The ABM can survive a series of hurricanes that occur more often than historic records would predict. As anticipated, immediate post-hurricane population levels are more severely depressed in periods between hurricanes occurring in close succession than in cases where hurricane frequencies approximated the historical frequency.

Following destructive storms, the ABM population relies on the use of interior dune areas as their primary habitat, the length of such dependency varying with the extent of the storm's adverse impact to the primary and secondary dunes and the corresponding length of time required for recovery of PCE (e.g. food plants, cover, dune elevation, burrow sites) in suitable habitat.

As the primary and secondary dune areas recover after a hurricane, ABM explores the recovering areas and gradually begins to recolonize them. The ABM exploration patterns appear to indicate the importance of landscape corridors that allow ABM to move between the primary/secondary dune area and the scrub and interior dune areas.

ABM also frequent interior dune and interdune habitats extending much further inland, away from the Gulf of Mexico than previously believed. The extent, duration, and reasons for this use are not clearly understood. ABM can also occupy areas near single-family homes, where requisite habitat elements exist.

4.1 Range and Critical Habitat

Critical Habitat was designated concurrent with the listing of the ABM in 1985. Within the Endangered Species Act (ESA) critical habitat is defined as those areas of land, waters, and associated PCE deemed essential to the conservation of that species. Designation of CH is expected to assist in the recovery of a listed species to the point where the protective measures within the Endangered Species Act are no longer necessary and the species can be delisted. The CH was expanded

throughout the range of ABM in 2007.

In the 2004 HCP, ABM CH was defined as extending along 10.6 miles of beaches in Alabama, in three separate blocks, from Fort Morgan State Park eastward to GSP. For that designation, the ABM CH in GSP was shown as 146.2 acres (**Figure 15**) (Volkert, 2004).



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VOLKERT

0 600 1,200 Feet
1 inch = 1,200 feet



Note: This map is for presentation use only and not to be used for construction purposes.

Legend

-  Added ABM Critical Habitat 2007 - 30.0 Acres
-  Returned Critical Habitat 2006 - 8.1 Acres
-  ABM Critical Habitat 1985 - 146.2 Acres

Figure 15
Designated Critical Habitat in
Gulf State Park - 1985 & 2007

For the revision to the CH designation in 2007, the area of CH in Baldwin County was designated as 1,211 acres (USFWS, 2007). The defined CH areas in Alabama increased from 3 units to 5 blocks. The area stated to be within GSP was increased to 192 acres. The location of the CH in GSP was modified to include 30 acres north of SR 182. More recent reporting of the status of the ABM population indicates an increase in distribution to 2,450 acres (USFWS, 2009). No changes to the 192 acre CH in GSP was made as of 2009. The action area for this habitat conservation plan includes all areas south of SR 182 within Gulf State Park which accounts for 179.0 acres of CH. This action area value includes all developed and disturbed lands (**Figure 8**).

In 2003 the Service determined that only a portion (90.3 acres) of the AA (134.8 acres) exhibited the PCE of CH. Of that only 55.8 acres were thought to be populated (**Figure 16**). All of this information had been derived from historic trapping reports and resulting population estimating software.

Following the extirpation of ABM from GSP a repopulation program was initiated in 2010. The introduction of 11 mating pairs has been monitored to understand early population dynamics and movement of individuals within GSP. Monitoring of the individuals occurred in 2012 and 2013. The most recent survey was completed in January 2013. The results of 600 trap nights determined that 64 individuals of all age groups were captured and processed. This included 100 trap nights within the secondary dune habitat north of SR 182. These results indicate that the reintroduction program is meeting reintroduction success criteria. The mice were found within the primary (engineered) dune habitat and some of the restored dune habitat that has been created recently. Trapping results also indicate some of the ABM individuals are located in the designated critical habitat north of SR 182 (**Figure 13**). The field review conducted on October 9, 2013, indicated that ABM can be found within the restored dune habitat seaward and landward of the engineered berm as well as within the berm itself. The amount of inhabited dune habitat has not been completely determined.

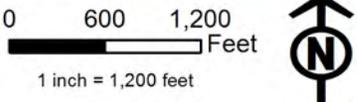
The ABM Recovery Plan was based on CH and required, as the interim recovery objective, establishment of three distinct, self-sustaining populations, one in each of the three CH zones, with a minimum of 50 percent of the CH protected and occupied by beach mice (USFWS, 1987). The USFWS has concluded from recent trapping information and track tube monitoring that the ABM is occupying most likely any and all available habitat (more than just critical habitat) at Gulf State Park (i.e., from the City of Gulf Shores to the City of Orange Beach and beyond in some cases). Because the ABM appears to be moving towards its recovery goal, it appears the implementation of this HCP is helping to aid in the species recovery.

Total Acreage of Action Area: 137.8 Acres
 Constituent Elements of Critical Habitat in Action Area: 90.3 Acres
 ABM Occupied Habitat in Action Area: 55.8 Acres
 Total Wetlands in Action Area: 1.1 Acres
 Total Disturbed in Action Area: 44.9 Acres



Legend

- Current Wetlands
- Action Area
- Current Occupied Habitat
- Current CE of CH



Note: This map is for presentation use only and not to be used for construction purposes.

Figure 16
2003 Alabama Beach Mouse Critical Habitat and Occupied Areas

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4.2 Status within the Action Area

By 1989, the ABM appeared to have been extirpated from the GSP unit of CH (Holler and Rave 1991). Predation by feral cats was thought to have been a contributing factor. In 1997, after a program to remove the feral cats from the GSP unit of CH was implemented, ten ABM were reintroduced to the Park. This population had grown to approximately 70 individuals by 2001 (Lynn, 2001).

At the time of the 2004 HCP, within the AA the ABM was documented to occur from east of the beachside cottages (at the old Hotel complex) to the eastern boundary of the AA (east of the condemned beach pavilion) (Lynn, 2000; 2001). This area constituted approximately 55.8 acres. The population density of this area based on a total population of 70 individuals was approximately 1.25 mice per acre.

Current conditions are in a state of recovery. Following the passage of Hurricane Ivan, the Service determined that the ABM population in GSP had been extirpated in the low lying areas of the park south of SR 182. However as stated previously, eleven (11) mating pairs were reintroduced into the park and monitoring efforts indicate the reintroduction program is meeting success criteria. As of 2013, some natural dune development has begun. Plant density and dune elevations throughout the impacted habitats are not at the same level as pre-Ivan conditions. Continued dune enhancement and restoration will only benefit the ABM and coastal environment. While there are recent reports of beach mice in the AA using several of the dune restoration areas and the planted berm at the gulf front, there is no current estimate of the existing population or population density. Much of the improved area contains tracks and other indications of habitation by the ABM.

4.3 The Effects of Hurricanes

Since 1851, 23 recorded hurricanes have affected the Alabama Gulf Coast (NOAA, 2013). There is a 10 percent chance in any given year that a storm surge, equal to or greater than seven feet, will strike the Fort Morgan-Gulf Shores area.

Although the ABM evolved with hurricanes, it appears that the human development and other reduction of its historic range have significantly increased the likelihood of the species being brought to extinction by a single catastrophic storm.

The Service examined closely the available information on how several recent hurricanes affected the ABM. The most comprehensive treatment on this subject relied on trap/re-trap data through and after Hurricane Opal (Swilling, 2000; Swilling and Wooten, 2002; Swilling, et al., 1998). Specifically, Hurricanes Georges, Frederic, Elena, Opal, and Danny were examined. The Service concluded that:

1. ABM has existed for hundreds of years in an environment subject to recurring hurricanes.
2. ABM respond directly to hurricanes in the following ways; (1) drowning, (2) surviving in place (burrows), and (3) fleeing to interior areas (refugia) at higher elevations that are not inundated by storm tides.
3. Some ABM movement from primary and secondary dune areas to interior habitats occurs coincidental to a storm or just after a storm.
4. Interior dunes and access landscape corridors may be essential habitats for ABM survival of a hurricane.
5. Different ABM populations respond differently to hurricanes and post-hurricane conditions.
6. The impact of a hurricane on ABM populations differs depending upon the season, with mid-summer storms typically causing the greatest stress, since that is the season when populations are lowest.
7. Food supplies for the ABM may be adversely affected for an extended period of time by a hurricane and post-hurricane conditions.
8. ABM populations reflect some natural resilience to hurricanes, with demonstrated recovery to historical population levels over time in the absence of storms at greater than historical frequencies.

Wooten and Holler (1999) concluded that not all effects of hurricanes are adverse to beach mice. Following Hurricane Opal, heterozygosity increased on all three Perdue Unit trapping grids. This furthers the Service theory that hurricanes play a natural role in the population dynamics of the beach mice that are not always “catastrophic.”

4.4 Population Estimates

ABM population estimates are only snapshots in time of what is the typical dynamic nature of small rodent populations with a life period of less than one year. “Because of naturally frequent and dynamic population fluctuations, accurate and reliable estimates of population size are not available; and the number of ABM incidentally taken cannot be directly predicted. These data are not available, nor can such data be practically acquired” (USFWS, 1999).

In ABM population studies conducted prior to the completion of the 2004 HCP, the most important data were those that confirmed whether habitat was occupied and that showed relative abundance or density of ABM. Data on abundance and density obtained by trapping have been used to compare populations in two or more areas.

However, in some cases, that data obtained was determined to be of questionable value for comparisons, owing to significant differences in trapping pressure (i.e., the number of trap- nights per acre between the areas being compared). More particularly, when trapping pressure declined below a certain threshold (generally in the range of twenty-five to thirty trap nights per acre), the effectiveness of trapping is greatly reduced, creating the likelihood that trapping either will fail to capture ABM within population areas or will yield capture rates that are not only low in an absolute sense, but that are so disproportionate to effort as not to be comparable to areas trapped at higher pressures. Conversely, when trapping pressure reaches or exceeds the threshold for the situations being compared, comparisons of abundance are more meaningful.

ABM populations decline as residential and commercial development displaces or erodes available habitat. However, no precise relationship is known to quantify how local ABM population size or population persistence will decrease as suitable habitats decline with increasing residential density and habitat fragmentation. Historical and recent evidence indicates that ABM does persist in habitat remnants within low to medium density residential developments. In the final analysis, the effects of habitat alterations have at least one common denominator, and that is the quantity of occupied habitat lost.

The Service adopted habitat-based assessments to determine the amount or extent of incidental taking in 1994 when considering an ITP application associated with the Kiva Dunes residential/resort development project. This was largely based on advice from Auburn University researcher Dr. Nicholas Holler, who recommended this approach over the nearly unattainable option of reliable population estimates.

This method, too, has shortcomings. The area lost to a project can be precisely quantified in acres. However, depending on location, known parameters of habitat quality, and other less well understood variables, habitat losses in some areas may produce effects either more or less severe than other areas. Recognizing this, the Service nevertheless concluded, “As a conservation measure, the habitat-based approach with numerical measures of habitat loss and proportion of habitat loss will not underestimate the proportionate loss of individual ABM” (USFWS, 1999). This approach has remained in use by the Service and is consistent with the mandate of the Endangered Species Act that decisions be based on the best available scientific and commercial data.

Following the extirpation of ABM from GSP in Hurricane Ivan, the Service reintroduced the species to GSP in March 2010. A total of eleven (11) pairs of ABM were released into the park.

5.0 Other Federally Listed Species That May Occur in the Action Area

There are four species of sea turtles that are found swimming in the Gulf of Mexico near the Alabama coast: the leatherback sea turtle (*Dermochelys coriacea*), the green sea turtle (*Chelonia mydas*), the loggerhead sea turtle (*Caretta caretta*), and the Kemp's ridley sea turtle (*Lepidochelys kempii*). Potentially found within the project area are the overwintering population clusters of the piping plover (*Charadrius melodus*) and the red knot (*Calidris canutus rufa*).

The sea turtles can be found in the near shore waters and in some of the estuaries in Alabama. Of these four species, only three are recorded to nest on Alabama beaches. The primary nesting species and those most likely to be impacted by the proposed projects is the loggerhead. Kemp's ridleys nest in very low numbers in Alabama.

The loggerhead sea turtle nests at night usually between high water and the top of the primary dune (NMFS and USFWS, 1991a, 1991b). Green sea turtles which also nest at night usually nest higher on the beach close to the toe of the dunes and sometimes in the dunes. According to information gained from several postings on the Share the Beach and the AL.com websites, a total of 11 Kemp's ridley sea turtle nests have been recorded on Alabama beaches since 2005. Kemp's ridleys are a daytime nesting species. The primary nesting areas for this species are in Mexico and Texas.

The Service considers beaches within the GSP as potentially more suitable for nesting as they are not as adversely affected by development as Orange Beach and Gulf Shores, however, developed beaches do support sea turtle nesting, sometimes attracting more nests than undeveloped beaches at GSP. Most of these beaches are less illuminated and have fewer recreational visitors use the beach at night. During the 2002 season, a total of 5 sea turtle nests were discovered along the beach within the study area. As of October 11, 2013, a total of 80 nests were documented for the nesting year along the Alabama coast. The GSP beaches, however, only accounted for 4 nests (2 viable) in the 2013 nesting season (Share the Beach, 2013).

Principal factors determined as influencing the decline of sea turtle populations are: human encroachment, including poaching for eggs and meat; disease epidemics; and predation of eggs and hatchlings by crabs, birds, raccoons, coyotes, foxes, and fish. Within the GSP raccoon, fox, and coyote are known to live. For swimming turtles unmanaged fishing practices are a principle human impact on sea turtle mortality, although these impacts have been reduced with the introduction of Turtle Excluder Devices (TED).

5.1 Green Sea Turtle

The green sea turtle (*Chelonia mydas*) is circumglobal in tropical and sub-tropical waters. The Florida population of this species is federally listed as endangered; elsewhere the species is listed as threatened. Primary nesting beaches in the southeastern United States occur in a six-county area of east-central and southeastern Florida, where nesting activity ranges from approximately 350 to 2,300 nests annually (NMFS and USFWS 1991b). Recent years have recorded the first Green sea turtle nests along the Alabama Shore (AL.com, 2012; 2013).

The project is not likely to adversely affect the green sea turtle (USFWS, 2004b; 2006a).

5.2 Loggerhead Sea Turtle

The Northwest Atlantic Ocean Distinct Population Segment of the loggerhead turtle (loggerhead) (*Caretta caretta*) is listed as a threatened species throughout its range (USFWS, 2013a). This species is circumglobal, preferring temperate and tropical waters. In the southeastern United States, 50,000 to 70,000 nests are deposited annually. About 90 percent of southeastern U.S. nesting occurs in Florida (NMFS and USFWS 1991a).

The loggerhead turtle is by far the most common of sea turtles found nesting along beaches in coastal Alabama. The waters of the Gulf of Mexico at the Alabama coast and the beaches at GSP are included in the proposed critical habitat for the Distinct Population of loggerhead sea turtle.

The project is not likely to adversely affect the loggerhead sea turtle (USFWS, 2004b; 2006a).

5.3 Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle (*Lepidochelys kempii*) is listed as an endangered species throughout its range (USFWS and NMFS, 1992). Adults are found mainly in the Gulf of Mexico. Immature turtles can be found along the Atlantic coast as far north as Massachusetts and Canada. The species' historic range is tropical and temperate seas in the Atlantic Basin and in the Gulf of Mexico. This species is known to forage in Mobile Bay as juveniles during times of the year when blue crabs are abundant.

Nesting occurs primarily in Tamaulipas, Mexico, where virtually the entire population of these turtles nests along about ten miles of beach. Recent observations at this nesting beach indicate that there was a substantial increase in the number of nesting females using that site during the 2000 nesting season as compared to nesting records from 1999 (Witzell, et al., 2004). The species occasionally nests in Texas and other southern states, including an occasional nest in North Carolina and Alabama. The Alabama coastal beaches see few regular nests for this species. Within the last 5 years there has been an average of two nests per year recorded for the Alabama coast.

The project is not likely to adversely affect the Kemp's ridley sea turtle (USFWS, 2004b; 2006a).

5.4 Red Knot

The Rufa Red knot (*Calidris canutus rufa*) is a medium-sized shore bird that breeds in the arctic and migrates primarily along the east coast of the United States to southern South America (Tierra del Fuego) (USFWS, 2011). It is classified as a molluscivore that eats hard shelled mollusks, but can also feed on shrimp and crab-like organisms (USFWS 2013b). Some indication is that they do feed on coquina clams (*Donax* spp.) which occur along Alabama coast in the lower wet beach habitat within the active wave zone (USFWS 2011). This is

seaward of the wrack line that defines the Action Area.

Some individuals are found overwintering in the Gulf of Mexico region. The southwest coast of Florida and Texas are the primary location for these overwintering individuals in the southern United States. Research using a well-known birding website (www.ebird.org) the number of Red knot sightings in their records indicate that 17 individuals have been recorded from 1981 (2 sighted at Alabama Point) to 2013 (2 sighted at Lake Shelby in the Gulf State Park, Alabama). These numbers suggest that the species is an infrequent visitor to Alabama beaches and even less so to GSP.

Habitat used by Red knots in migration and wintering areas are similar in character, generally coastal marine and estuarine (partially enclosed tidal areas where fresh and salt water mixes) habitats with large areas of exposed intertidal sediments. In North America, Red knots are found along sandy, gravel, cobble beaches, tidal mudflats, salt marshes, shallow coastal impoundments, and lagoons, and peat banks (USFWS, 2013b). Suitable foraging habitat for this species would be found either at the Gulf of Mexico wet beach shoreline or in the mud flats associated with the Shelby Lakes located north of SR 182. Neither of these foraging areas is within the AA for this project.

The species is currently being recognized as threatened by the USFWS. The final determination has not been finalized. Critical habitat has not been determined at this time.

The project is not likely to adversely affect the Red knot (if listed).

5.5 Piping Plover

The Piping plover (*Charadrius melodus*) is a small shorebird that has an expansive population range. It is listed as both threatened and endangered depending on the location and time of the year. Breeding areas in North America occur in the Great Lakes region (endangered), the Northern Great Plains (threatened), and the Atlantic Coast (threatened). For the Northern Gulf Coast,

the overwintering populations are considered threatened.

Critical habitat for the overwintering populations has been designated in each of the Gulf Coast states (Texas, Louisiana, Mississippi, Alabama, and Florida). For Alabama, the overwintering CH is on the western tip of the Fort Morgan Peninsula, the western end of Dauphin Island, and the Isle aux Herbes in the Mississippi Sound (Alabama Units 1-3) (**Figure 17**). None of these locations is near the GSP. For Florida, the nearest overwintering population is located at the Big Lagoon State Park north of Perdido Key (**Figure 18**) (USFWS, 2001).

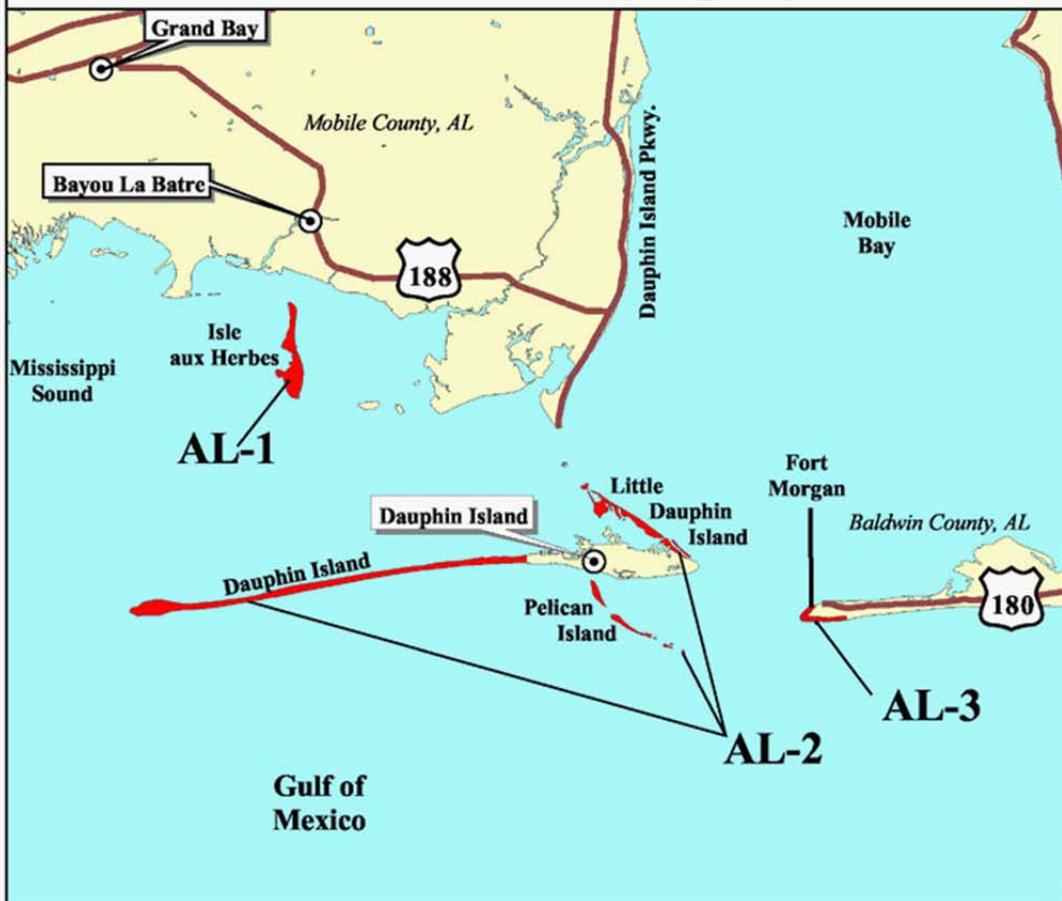
Bird observation records for the Piping plover are rare in the location of the project. A total of 7 sightings between 2006 (1 at GSP Lake Shelby) and 2013 (5 on SR 12 east of GSP) were found at the birding website (www.ebird.org).

There is no critical habitat for the overwintering piping plover designated in the vicinity of the Action Area. There is no indication that there will be any adverse impact to this species resulting from this project or any of the proposed activities within the AA.

Piping plovers use wide, flat, open, sandy beaches with very little grass or other vegetation. The plovers eat marine worms, insect larvae, beetles, crustaceans, mollusks and other small marine animals and their eggs. Food is obtained by foraging on beaches, dunes and in tidal wrack.

The project is not likely to adversely affect the piping plover.

General locations of the designated critical habitat for the Wintering Piping Plover.



General Area



Distance: Miles

0 6 12



Legend

- ⊙ City / Town
- ⚡ Major Road / Highway
- Land
- Critical Habitat

Use Constraints: This map is intended to be used as a guide to identify the general areas where Wintering Piping Plover critical habitat has been designated. Included within the designation of critical habitat are all land areas to the mean lower low water. Refer to the narrative unit descriptions as the precise legal definition of critical habitat.

Alabama Units: 1, 2 and 3

Some locations have been slightly enlarged for display purposes only.

Figure 17: Designated Critical Habitat for Overwintering Piping Plover – Alabama.

General locations of the designated critical habitat for the Wintering Piping Plover.



General Area

Distance: Miles
0 5 10

Legend

- City / Town
- Major Road / Highway
- Land
- Critical Habitat

Use Constraints: This map is intended to be used as a guide to identify the general areas where Wintering Piping Plover critical habitat has been designated. Included within the designation of critical habitat are all land areas to the mean lower low water. Refer to the narrative unit descriptions as the precise legal definition of critical habitat.

Florida Units: 1, 2 and 3

Some locations have been slightly enlarged for display purposes only.

Figure 18: Designated Critical Habitat for Overwintering Piping Plover – Florida

6.0 Direct and Indirect Effects on Affected Species

6.1 Direct Effects

6.1.1 Alabama Beach Mouse

Based on the 2004 HCP and the ITP modifications in 2005 and 2006, the areas of completed and proposed construction have been included in the permitting for the incidental take of Alabama Beach Mouse. The new Interpretive Center will be built within the existing permitted footprint for the Beach Pavilion and associated infrastructure (9.2 acres). The Lodge and Conference Center will be built within the remaining permitted 21.6 acre footprint. For direct construction impacts, there will be no need to readdress the ITPs already issued for these locations.

The 2004 extirpation of ABM from GSP also means that previously determined population densities used to calculate incidental take are not applicable for new construction and therefore take has been calculated using habitat as a surrogate. Direct effects of new construction will necessarily be considered in terms of acres impacted and potential loss of suitable habitat or habitat that is determined to provide PCE for ABM. In addition to direct effects from construction, there could be direct effects to ABM from lighting during operation of the Park. Because ABM are nocturnal, changes in light regimes could change foraging behaviors and reduce fitness if mice must seek areas further from lighting sources to find food or if they forage less due to the presence of additional lighting. Lighting can also result in indirect effects (see below). The lighting systems for the re-establishment of the lodge and construction of the interpretive center would be designed to minimize direct and indirect illumination of ABM habitats. Directed, recessed, and shielded lighting would be used to light only the areas necessary for safe and efficient pedestrian and vehicular traffic and reduce unnecessary illumination of ABM habitat. Techniques to control light overspill and brightness from interior spaces and windows, pedestrian trails, boardwalks, and outdoor areas would include the best available lighting technologies and effective light management programs and systems. Means to avoid and minimize these direct and indirect effects are listed below.

In addition, maintenance of existing walkovers within the Park could directly impact the ABM. Existing walkovers on GSP installed after the hurricane seasons of 2004 and 2005, were installed in accordance with all state and local laws (i.e., usually 5 feet above grade). However, the pre-hurricane heights of local dunes were not taken into account during the rebuilding of boardwalks and the grade was fairly flat due to the hurricanes. Subsequently, several boardwalks require sand maintenance where dune elevation has overtaken walkovers. To minimize impacts of existing walkover maintenance: (1) consider raising the boardwalks such that maintenance isn't needed; (2) until boardwalks are raised, and prior to maintenance surveys for mice burrows and tracks will be conducted in the area needing maintenance. Burrows and tracks will be flagged and avoided where possible. If avoidance isn't possible, a permitted biologist will relocate the mice from the area during maintenance; and (3) until the boardwalks are raised, upon the initial maintenance action, the area will be kept free of sand (using hand tools) such that it doesn't begin to encroach upon the boardwalk and no additional maintenance with heavy. Burrows and tracks will be flagged and avoided where possible. If avoidance isn't possible, a permitted biologist will relocate the mice from the area during maintenance. In addition, the existing dune height (or desired height of dunes) will be recorded. When boardwalks need to be repaired or replaced, they will be installed in accordance with state and local laws and using the existing or desired dune height as a baseline to apply the clearance above grade requirement. This measure will avoid the future need for take during sand maintenance adjacent to walkovers.

Planned NRDA dune enhancement is proposed to enhance 50 acres of suitable habitat for ABM in the AA and other designated ABM CH in GSP. At this time the actual construction and enhancement areas have not been defined.

ADCNR is now developing plans for the Gulf State Park Enhancement Project. The proposed GSP Enhancement Project (proposed project) includes ecologically-sensitive improvements designed to enhance access and improve visitor experience, restore degraded ecosystems, and provide an expansion of the park's

environmental education programs to further tell the story of the diverse ecosystem found at GSP. The proposed project serves as cost-effective compensation for the loss of human use along the Alabama Gulf Coast as a result of the *Deepwater Horizon* oil spill in 2010.

Restoration would include the creation of sand movement corridors through the existing berm at strategic locations to allow for the natural buildup of dunes immediately behind the berm. The dunes would then be restored and enhanced by planting native vegetation such as sea oats, seaside bluestem, beach elder, camphorweed, beach evening primrose, and beach panicgrass. The dune vegetation would stabilize existing dunes and allow for sand accretion, thus increasing the areal coverage of enhanced dune habitat.

Construction of the proposed dune enhancement may result in a taking of the ABM incidental to the clearing, excavating, grading, filling and other construction activities involved in completing the project.

ADCNR will work with the Service to determine the timing, construction methods and the location and dimensions for proposed corridors in the existing engineered berm. These corridors will be made to enhance the movement of sand inland in the area between the Lodge Complex and the Beach Pavilion area.

Post-construction incidental taking, which will be controlled by appropriate restrictions and management practices, could occur as a result of improper lighting, poor refuse management practices, improper deployment of construction materials and equipment, improper maintenance practices, introduction of house cats and house mice, improper pest control practices, and increased pedestrian traffic on dune habitats occupied by ABM.

The remaining construction should not result in any direct effects to the four sea turtle species or the piping plover. Considerations for sea turtle nesting season and piping plover overwintering will be coordinated with the Service as part of the enhancement activities.

6.1.2 Sea Turtle Species

For the proposed construction of the Lodge and Convention Center and the Interpretive Center, direct impacts to nesting sea turtles will be primarily due to artificial lighting used during construction and operation of the project. Any lighting used during construction would be designed to avoid adverse impacts to sea turtles and the use of lighting during the nighttime hours would be minimized during construction. As stated above for beach mouse, the lighting systems for the re-establishment of the lodge and construction of the interpretive center would be designed to minimize direct and indirect illumination of sea turtle habitats as well. The techniques to control light overspill and brightness from interior spaces and windows, pedestrian trails, boardwalks, and outdoor areas would include the best available lighting technologies and effective light management programs and systems. A lighting plan will be developed for the project using guidance provided by USFWS (**Appendix A**). The lighting plan will be submitted to USFWS for review and approval.

As part of Biological Opinions and ITP issued for other developments along the Alabama coastline, the Service has stated that, “construction of the boardwalks during the sea turtle nesting season could cause take of nesting sea turtles, their nests, or emerging hatchlings as a result of boardwalk support piling installation or equipment or material storage.” Construction of dune walkovers will address potential direct impacts to sea turtles. The main method for avoiding direct impact would be to restrict dune walkover construction to the period outside sea turtle nesting season (May 1-October 31). If dune walkover construction is attempted within this period, surveys for sea turtle nests will be done prior to initiation of construction. If nests are found, construction will be delayed until the nest has hatched.

6.1.3 Bird Species

Lighting during construction should not be an issue concerning direct impact to these species. Dune walkover construction will need to be considered for direct impact to nesting shorebirds (Least Tern) and the overwintering species (red knot

and piping plover). Surveys for nests will be initiated prior to construction. No construction will commence until nests are gone.

6.2 Indirect Effects

6.2.1 Alabama Beach Mouse

The ABM may be indirectly affected by:

1. Introduction of house mice, a species thought to compete directly with the ABM for limited natural food resources, while also being supported by humans;
 - a. House mice will be controlled through trapping and refuse control.
2. Free-ranging domestic cats that could prey upon resident ABM;
 - a. Cats will be controlled by trapping.
3. Unmanaged foot traffic through dune structures, which destroys dune vegetation and thereby initiates additional extensive dune degradation through subsequent wind erosion;
 - a. This will be controlled by the placement of dune walkovers.
4. Storm surges through foot paths in the dunes, with subsequent backwashing and further erosion from storm water;
 - a. This will be controlled by the placement of dune walkovers.
5. Lighting of the natural habitat remaining around buildings and facilities, which might subject ABM to feeding behavioral changes (also a direct effect) and to increased predation;
 - a. Development of a lighting plan will use applicable aspects of the USFWS recommended measures to minimize lighting impacts to wildlife habitat (**Appendix A**).
 - b. Once a lighting plan for currently proposed and future structures is developed, it will be submitted to FWS for review and approval. The lighting plan may include a combination of: low pressure sodium lights, fully shielded

fixtures, amber LED bulbs, fully shielded street lights, sea turtle friendly windows, or other new wildlife-friendly lighting technologies as they are developed.

6.2.2 Sea Turtles

Human occupancy and recreational use of the residential areas and commercial facilities can also contribute to an indirect take of nesting and hatchling sea turtle species as a result of garbage or refuse management.

Recreational uses of the dune systems can cause dune erosion and the loss of habitat required for sea turtle nesting. Further, human occupancy of the project may create a likelihood of injury or death to sea turtle hatchlings through collapse of nests by foot traffic, crushing developing embryos, or entombing emerging hatchlings.”

Visitor use of beaches can adversely affect nesting sea turtles, incubating egg clutches, and hatchlings (National Research Council 1990). The most serious threat caused by increased human presence on the beach is the disturbance of nesting females. Beach disturbance can cause turtles to shift their nesting beaches, delay egg-laying, and select poor nesting sites (Murphy, 1985). Sea turtles are most prone to human disturbance during the initial phases of nesting, from the point of emergence from the water through egg-cavity excavation (Hirth and Samson 1987; Witherington and Martin, 2003).

One of the most critical acts that a hatchling sea turtle must accomplish takes place immediately after it emerges from the nest. Under natural conditions, hatchlings that have just emerged from the sand crawl in a frenzy directly from nest to the sea. They usually do it en masse. The zeal is justified, given the potentially fatal consequences of delay. Hatchlings that are impeded from reaching the sea, or that have their sea finding disrupted by unnatural stimuli, often die from exhaustion, dehydration, predation, and other causes. The potential for human disturbance of

hatchlings is even greater than with adult turtles because of the small size of the hatchlings and the large number of hatchlings on the beach.

Artificial lighting resulting from coastal development can result in disorientation (loss of bearings) and mis-orientation (incorrect orientation) of nesting and hatchling sea turtles (Witherington and Martin, 2003; Witherington and Bjorndal, 1991). Visual cues are the primary sea-finding mechanism for hatchlings (Mrosovsky and Carr, 1967; Mrosovsky and Shettleworth, 1968; Nelson, 1988; MacPherson, 1998).

Therefore, lights along the beach may deter female turtles from coming ashore to nest, disorient females trying to return to the surf after nesting, and disorient and mis-orient emergent hatchlings on the developed and adjacent non-developed beaches. Any source of bright, direct lighting can profoundly affect the orientation of hatchlings, both during the crawl from the beach to the ocean and thereafter, as they begin swimming offshore.

Lighting of the natural habitat around buildings and facilities, might subject nesting sea turtles or hatchlings to increased predation. Inappropriate lighting in these areas may alter nesting or hatching sea turtle behavioral patterns.

Once a lighting plan for currently proposed and future structures is developed, it will be submitted to FWS for review and approval. The lighting plan may include a combination of: low pressure sodium lights, fully shielded fixtures, amber LED bulbs, fully shielded street lights, sea turtle friendly windows, and other new wildlife-friendly lighting technologies as they are developed. All lighting plans will use the information contained in the USFWS “Recommended Measures to Minimize Lighting Impacts to Wildlife Habitat” (**Appendix A**).

7.0 Conservation Plan

This plan describes those conservation actions to be undertaken as binding conditions of the initial and modified ITPs, including adaptive measures to respond to changed circumstances as required by the recently codified “No Surprises” rule (NMFS and USFWS, 1998). The applicant will provide for mitigation and minimization of impacts to the endangered ABM and the above referenced endangered/threatened species of sea turtles.

7.1 Minimization and Mitigation Measures

In 2003 approximately 90.24 acres of PCE for critical habitat were found within the 137.8 acre AA. Following the passage of Hurricane Ivan in 2004 the area capable of providing PCE was reduced to zero (0) by the Service. During the post-Ivan assessment, the Service determined that it was likely that the population of ABM that had existed within the AA had been extirpated. When considering the proposed projects, all dune restoration efforts were then considered net gain of suitable habitat for ABM repopulation. Following the second modification of the ITP and modification to the Biological Opinion issued by the Service, all formerly proposed habitat restoration was considered to meet the 22.7 acres of net gain in ABM habitat that was documented in the ITP.

In the original HCP and ITP, the expected completion of the required 22.7 acre dune habitat restoration and the reduced footprint from the constructed or disturbed area was expected to yield a total of 93.4 acres of PCE of CH.

Based on the revised construction footprints, and calculations using the 137.9 acre AA, the existing and planned improved ABM habitat could reach approximately 86.8 acres. This includes the existing and completed 36.8 acres of restoration and the planned 50 acres of NRDA restoration (see **Table 1**).

Before Hurricane Ivan, USFWS estimated that the ABM population occupied approximately 55.8 acres of the 90.2 acres of available suitable AMB habitat that was providing PCE. Hurricane Ivan extirpated the ABM from low lying areas of GSP. Following a reintroduction of ABM to the park in 2010, success criteria for

that effort appear to have been exceeded. Trapping information from January 2013 found all age groups represented and tracks and burrows were found throughout the park on all trap lines. Recent information from USFWS indicates that “from recent trapping information and track tube monitoring that the ABM population is occupying most likely any and all available habitat at Gulf State Park (Pers. Com. – Bill Lynn, USFWS, Daphne Field Office).

Considering that the population introduction effort is nearly three years old, the number of individuals found, the representation of all life stages, and indications of continued reproduction as well as increasing occupied area appears to give hope for a larger occupied area as the restoration areas increase and develop.

The total of 36.8 acres of restored dune habitat is providing increasing improved habitat for the expansion of the reintroduced ABM population. The anticipated 50 acre dune enhancement that will be part of the proposed NRDA recovery effort should significantly improve the available habitat and the potential for ABM population expansion in GSP.

7.1.1 Project Redesign

The built environment and proposed construction footprint for each of the infrastructure projects has been reduced from the initial plans. The Beach Pavilion was moved to the east and built within a much smaller footprint. The addition of the Interpretive Center (NRDA proposed project) will fit within the existing footprint and provide some natural area that could contribute some PCE to the existing ABM population. Because the Interpretive Center will include displays that demonstrate methods to create and enhance dunes in addition to on-going maintenance that is required to keep sand from accumulating on walkways, it is envisioned that continual coordination and surveys will be required to avoid take.

The reconstruction of the Fishing Pier provided for the saving of approximately 8 acres of planned infrastructure and has, with the restoration recently completed in that old Pier footprint, provided suitable

habitat for use and occupation by ABM.

The pier redesign also reduced the overall footprint for the Lodge Complex and Pier from 33.5 acres to 31.9 acres. This redesign has also resulted in rethinking the Lodge building itself. New design plans are aiming to improve the green infrastructure in GSP and work toward the sustainability goals of the U.S. Green Building Council through its Leadership in Energy and Environmental Design (LEED) green building program. The concept of an elevated hotel that allows for free sand movement beneath the structure could reduce the potential impact to ABM habitat as part of the operation and maintenance of the Lodge complex.

The resulting reduction in construction footprint and increase in restored dune habitat will result in an increase in available habitat for the recovering ABM population. With the addition of the CH north of SR 182, which opens the population to occupation and use of the existing high tertiary dunes, the overall outlook for the ABM in GSP is much improved from previous plans at GSP.

7.1.2 Project Area Construction Signage

The limits of construction for the project area will be clearly marked, for the duration of construction, with a continuous fence, cable, or other substantial marking device. Signage will be posted at intervals of no less than one hundred feet along its limits, with each such sign to include the following, or essentially similar language:

**“Absolutely no construction activity or other entry
permitted beyond this point. For further information,
contact construction superintendents’ office.”**

7.1.3 Construction Materials and Waste Removal

At all times during construction, a “prime contractor” shall be identified by

the applicant and shall be designated (and required by written terms of his contract) to be responsible for assuring provision of refuse disposal equipment. The capacity of such equipment, and arrangements for waste removal, shall be such as to ensure at all times the secure storage of the total volumes of solid waste generated onsite during intervals between collection dates.

Lumber, metals, masonry, and other building materials will not be allowed to be kept, stored or accumulated except upon such areas of the property that are a part of the planned developed footprint.

No rental tenant, contractor, guest, or other person entering the property may dispose of any refuse capable of attracting rodents except within a tightly-closed rodent-proof and scavenger-proof refuse container. It shall be the responsibility of the applicant to assure the availability of such a container or containers, in good repair and of sufficient capacity to contain such amounts of refuse as may accumulate between scheduled pick-ups. In addition to the refuse containers provided for disposal of residential solid waste, one or more refuse containers will be provided at the site of the swimming pool areas and at a point at or near the north end of each common-use dune walkover.

All such containers shall be monitored to ensure that they are kept closed, except when waste is being deposited or removed for disposal. A procedure shall be established for timely removal of refuse so as to avoid exceeding the capacity of the containers between waste removal intervals. If any container becomes altered or damaged such that it is incapable of sufficiently tight closure to exclude rodents and/or scavengers, it shall be repaired immediately; or, if irreparably damaged, it shall be replaced within twenty-four hours of discovery of damage.

In the case where any prime contractor is employed in the initial

construction of the onsite amenities, one or more rodent-proof and scavenger-proof refuse containers of sufficient size to avoid exceeding capacity between waste removal intervals shall be delivered to the work site prior to the initiation of any construction work. The applicant shall personally inspect each such refuse container employed (storage volume; closure mechanism) and the frequency of refuse removal. The waste-hauling contractor serving this equipment shall be furnished with a copy of the informational/educational brochure developed for this habitat conservation plan. The contract with the waste removal contractor shall make specific reference to the requirements of this paragraph.

7.1.4 Alabama Beach Mouse Disturbance during Construction

The construction area will be trapped for ABM the week prior to construction. All captured mice will be relocated to either sparsely occupied habitat on the south side of Highway 182 or to occupied habitats on the north side of the highway. The construction area will be silt fenced (or similar) in an effort to prevent intrusion of ABM into the construction area. Silt fencing will be maintained until construction is complete for the particular structure.

It is possible that during the construction of the proposed improvements, one or more burrows occupied by ABM may be encountered, with resultant disturbance of the mice. In such circumstances, where observation confirms the actual presence of mice, including any nestling young, work at and for a radius of at least fifty feet from the point of observation shall temporarily cease.

The applicant will immediately notify the designated representative of the Service, providing details of the activity and of the observation of mice. The Service representative may within a 72 hour period relocate as many mice as feasible from the area of observation. If circumstances indicate such capture is infeasible, the Service representative will advise the

applicant to proceed, providing advice as to any reasonable modification of construction technology, procedure, or timing that will reduce or avoid further localized adverse effects on the mice in the area of the disturbance.

If at any time during initial land development activity or subsequent residential construction or occupation, any ABM is killed, the “responsible party” (i.e., either the applicant or his contractor) shall immediately place the specimen in secure refrigerated storage and shall, within twenty-four hours, contact the designated representative of the Service. The Service shall make arrangements for transfer of the specimen to appropriate custody, or shall direct other disposition thereof.

If any ABM is injured during or following construction activity, and is thereby immobilized or otherwise traumatized sufficiently that it readily may be captured, the responsible party shall:

1. Take custody of the injured mouse, using due caution to avoid further injury;
2. Remove the mouse to a secure, quiet indoor location away from any extremes of temperature;
3. Immediately notify the designated Service representative concerning circumstances of the injury and apparent condition of the injured mouse; and
4. Follow such instructions as the Service representative provides concerning custody, care and disposition.

7.1.5 Dune Walkovers

The applicant proposes to install six piling-supported dune walkovers at the new lodge which will extend from the south edge of the developed footprint of the development area to the north edge of the wet beach. After the dune management program has been completed and approved, the alignment of each walkover will be established in consultation with and with approval of the Service and the Alabama Department of

Environmental Management (ADEM). Final alignments, including any necessary routing around or across existing major dunes, will be based upon the best prediction of the future configuration of dunes in response to the dune enhancement measures of the dune management plan.

Construction of the dune walkovers will include surveys for sea turtle nests and nesting birds prior to commencement of construction. In the event that nests are found, construction of walkovers will be delayed until turtles have hatched and birds have left.

Some portions of walkovers may have to be constructed at higher-than-usual elevations in order to remain above the anticipated heights of dunes under development, within or closely adjacent to the walkover corridor.

The applicant will take responsibility to insure that foot traffic is managed and that the practice of accessing and using the beach areas with off-road capable vehicles is eliminated except for park personnel and emergency vehicles. The approved beach accesses will consist of a path wide enough to accommodate the vehicle(s) that will be used by Park personnel. Currently, beach access by vehicles is limited to six locations: two at the fishing pier, on the eastern edge of the old Lodge site, and two at the Beach Pavilion and one at the western end of the park. Vehicular access points are subject to fire marshal approval of the site plan. If the fire marshal requires a different location or type access than the existing locations a minor (informal) change may be required.

No equipment may be used for dune walkover construction or new walkover maintenance by the applicant except that which is essential to these purposes. All dune walkover construction activities will be conducted in a “top-down” manner in order to prevent further degradation of the dunes. Any disturbed areas outlying the outer edges of the walkovers will be restored. Dune walkovers protect the dune vegetation

and topography from degradation by foot traffic and subsequent wind or water erosion and, thus protect beach mice by conserving their habitat.

Existing walkovers on GSP installed after the hurricane seasons of 2004 and 2005, were installed in accordance with all state and local laws (i.e., usually 5 feet above grade). However, the pre-hurricane heights of local dunes were not taken into account during the rebuilding of boardwalks and the grade was fairly flat due to the hurricanes. Subsequently, several boardwalks require sand maintenance where dune elevation has overtaken walkovers. To minimize impacts of existing walkover maintenance: (1) consider raising the boardwalks such that maintenance isn't needed; (2) until boardwalks are raised, and prior to maintenance surveys for mice burrows and tracks will be conducted in the area needing maintenance. Burrows and tracks will be flagged and avoided where possible. If avoidance isn't possible, a permitted biologist will relocate the mice from the area during maintenance; and (3) until the boardwalks are raised, upon the initial maintenance action, the area will be kept free of sand (using hand tools) such that it doesn't begin to encroach upon the boardwalk and no additional maintenance with heavy. Burrows and tracks will be flagged and avoided where possible. If avoidance isn't possible, a permitted biologist will relocate the mice from the area during maintenance. In addition, the existing dune height (or desired height of dunes) will be recorded. When boardwalks need to be repaired or replaced, they will be installed in accordance with state and local laws and using the existing or desired dune height as a baseline to apply the clearance above grade requirement. This measure will avoid the future need for take during sand maintenance adjacent to walkovers.

7.1.6 Information and Advisory Signs

The applicant shall install signs (one at each end of the walkovers), visible to users of each dune walkover, from a point within twenty-five feet of its landward point of entry. The signs shall advise walkover users of the

presence and endangered status of the ABM, its dependence upon the sand dune system for food and shelter, and the need to protect this system by confining foot traffic to the dune walkover. The signs will also alert visitors to avoid beach nesting birds and nesting sea turtles. The applicant will be required to maintain the signs.

The applicant shall keep on hand one or more replacement signs for prompt replacement of any sign requiring replacement. In any instance in which an in-use sign is destroyed, or is so damaged as to be clearly illegible, it shall be repaired or replaced within five working days of such loss or damage.

7.1.7 Outdoor Lighting

A lighting plan will be developed and implemented consistent with available guidance and subject to Service approval. (See **Appendix A** for recommended measures to also minimize lighting impacts to wildlife habitat).

Directional outdoor floodlights or other lights that illuminate the primary dunes lying south of the property, the wet beach seaward of such dunes, or any portion of the Gulf of Mexico will not be installed upon nor used on the property. The light emitting and/or reflecting portions of any light sources (including bulbs, tubes, reflectors, or globes) on the property shall be shielded or recessed, such that no portion of the cone or beam of light from any such sources is directed toward any area south of the crest of the primary dune. The purpose of this provision is to prevent interference with potential nesting activity of threatened subspecies of sea turtles that may from time to time come ashore onto beaches along the AA. The turtles use natural illumination to navigate to nesting areas. Lighting that overwhelms the faint illumination of starlight can interfere with the turtle' instinctive method of locating nesting beaches (Witherington and Martin, 2003).

This provision is also included to prevent interference with nocturnal activities of the ABM (Bird, Branch, and Miller, 2003).

7.1.8 Property Fences

Any fence installed on the perimeter of developed portions of the property will be of a vertical lattice, split rail design, shadowbox design, or other design incorporating openings along its entire length of an adequate width to permit unimpeded movement of beach mice through the fence. Fences shall not be installed that could also impede sea turtle or nesting birds. The design of the fence shall be such that accumulation of windblown sand at the base of the fence will provide no impediment to such movement. Where necessary, approved fencing, or signage will be installed to funnel pedestrian traffic to utilize existing vehicular trails, thereby avoiding impacts to dune habitat at boardwalks or existing vehicular access points.

The applicant will regularly inspect the fence(s) and will remove any accumulations of litter or refuse so as to prevent development of habitat capable of sheltering house mice or attracting predators (e.g., foraging cats or foxes) that might prey upon beach mice.

7.1.9 Predator and House Mouse Control

No free-roaming cats shall be allowed as pets, or otherwise, within the permit area. Dogs shall be restricted to developed areas of the park only and not allowed in dune or beach habitat. Park guidelines require dogs to be on leashes at all times. The declaration of conditions, and restrictions for the property will prohibit tenants, or others, from supporting the presence of domestic or free-roaming, feral cats by providing food, shelter, or any other life-supporting elements.

If, during routine monitoring and reporting, surveys disclose the presence of cats and/or cat tracks in CH or in the developed parts of the project, immediate control measures will be instituted.

Means of control will be established, funded, and carried out by the applicant. Results will be reported during normal reporting cycles to the

Service. In addition to cats, trapping efforts will include the red fox and coyote. Any trapped predators will be taken to the local animal control facility.

Prevention of house mice from being introduced into the area is intended by the refuse management conditions imposed by this plan. However, if house mice are determined to exist based on routine trapping operations required under terms of this plan and permit, a house mouse trapping and extermination effort will be initiated and continued until trapping results show that control over house mice has been established.

7.1.10 Dune Restoration and Management

Dune restoration and enhancement measures are offered as a means of increasing the habitat support to ABM as a compensating measure for unavoidable habitat loss. The permittee will implement a program for monitoring, protecting, enhancing, and maintaining dunes in the permit area. The permittee will retain a qualified dune management consultant with demonstrated expertise in dune management to oversee this program. The objective of the dune management program will be to identify and implement physical and biological measures for the protection and enhancement of dune conditions beneficial to the feeding, nesting and sheltering of the ABM.

It is recognized that dune management, particularly as it may affect specific species of plants and animals, is an evolving technology, and that practitioners of such a technology must necessarily stay abreast of current and emerging information in this field. Accordingly, the permittee's dune management consultant, prior to implementing any specific dune management measures within the permit area, shall develop a written dune management protocol for the permit area.

The protocol shall:

1. Summarize available information concerning management of coastal

sand dunes, including information on physical methods for the restoration of eroded dunes, “blown-out” dunes, dunes otherwise damaged by natural forces or by human influences, and techniques for planting of dune vegetation.

2. Assess the condition of the dune system within the permit area as a baseline for the planning of dune management measures. This assessment shall include mapping of the dune system as necessary to depict elevation contours, vegetative cover patterns, and indicators of damage (blow-outs, other extensive areas lacking adequate vegetative cover, and areas of dead, diseased, or otherwise stressed vegetation).
3. Establish specific objectives for dune management in the permit area, including, but not limited to;
 - a. Enhancement of elevation differences in areas of suboptimal variation in surface relief;
 - b. Planting and encouragement of a plant species associations favoring species of known preference and with high food value for ABM;
 - c. Promotion of protective dune configurations in areas deemed potentially most vulnerable to wind and tidal erosion.

The protocol shall be completed within six months of the issuance of the ITP and submitted to and approved by the Service and ADEM prior to implementation of any measures described in the protocol. This will be required except in the event of any major damage to the dune system between permit issuance and the approval of the protocol. In that case, the applicant’s dune management consultant will promptly assess the extent of such damage; report findings to the Service and ADEM; and implement such measures as are deemed reasonable and necessary by the Service and ADEM for stabilization and restoration of damaged dune habitat.

Within sixty days after approval of the protocol, the dune management consultant shall prepare an annual work plan for dune management

activities for a one-year period, to commence no later than sixty days following approval of the plan by the Service and ADEM. The annual work plan shall;

- Identify and describe in detail the specific dune management measures to be implemented during the first year of implementation of the dune management plan;
- Describe the beneficial results anticipated as a result of these activities; and
- Set forth a schedule for implementing the planned activities.

The work plan shall be submitted to and approved by the Service and ADEM, with such reasonable modifications as deemed necessary, subject to funding provisions of this plan. If at any time during the implementation of annual work plan measures, a hurricane or other major destructive storm causes substantial damage to the dune system, the dune management consultant will promptly evaluate the effects of such storm damage and will revise the annual work plan to reflect any dune management and restoration needs that are not sufficiently provided for in the annual plan. Proposed revisions of the annual work plan will be submitted to the Service and ADEM for review and concurrence before proposed work is commenced.

On the anniversary date of approval of the first year's annual work plan, and on each successive anniversary date thereafter for thirty years, or other time period as approved by the Service, the dune management consultant shall submit to the Service and ADEM an annual progress report and a work plan for the coming year's dune management program. Each such work plan shall include, for the coming year, the basic elements prescribed above for the initial year's work plan.

The progress report shall describe:

- The dune management measures implemented during the previous year;

- The extent to which the beneficial results anticipated from such measures have been, or are being, accomplished;
- An explanation of the reason(s) for any failure to complete any activity that was a part of the previous year's work plan; and
- The consultant's recommendations, if any, for modifications of the plan to enhance progress toward plan objectives.

The report shall include topographic mapping and photographs as necessary to document any major damage occurring to the dune system during the reporting year. Major damage, for purposes of this report, shall include any blow-out of the primary dune system, any erosion damage that results in an estimated twenty-five percent or greater reduction of the height of any line of primary dunes for a lateral distance of two hundred feet or more, or any damage, either from tidal scouring or from sand deposition or erosion, that results in a loss of all, or essentially all, dune vegetation over any area of 0.25 acre or more of any primary dune.

The applicant's dune management program, as contemplated in this conservation plan, is not intended to supplant or override natural dynamic forces affecting the evolution of coastal dune systems within the permit area. It is recognized that these natural forces may be both constructive and destructive. It is further recognized, however, that employment of proven technologies for erosion control and dune growth and for planting of desirable plant species can be used to accelerate the rate of dune recovery from the impacts of erosive forces, and to, thereby, extend the intervals during which dunes provide high quality support for life functions of ABM, including feeding, nesting, and sheltering.

Accordingly, such measures for dune stabilization, protection, and enhancement as may be implemented shall be undertaken with an emphasis upon cooperation with natural forces of wind, water, and tidal action, recognizing the dynamic nature of dune systems and the natural forces that

shape them, all the while in pursuit of attainable adjustments favoring habitat requirements of the ABM.

Enhancements in habitat quality can be achieved by improvements in vegetation and surface topography in the secondary dune/swale area and should increase the ABM population in this habitat zone. By providing higher overall average dune elevations and a larger total number of secondary dunes, the proposed dune management program also will increase protection for the species during periodic higher-than-normal tidal incursions onto the property, all the while retaining the highest elevations further north as refugia during larger “catastrophic” storm events.

Success criteria will be based on the stabilization of restored dune areas as well as the positive growth of the ABM population in the AA, as determined through seasonal trapping.

Areas disturbed, but not permanently converted through construction, will be restored to the maximum extent practicable. The applicant will retain a professional engineering firm, with recognized competence in protection, restoration, and enhancement of coastal dune systems, for providing planning, construction, and post-construction guidance in the conservation of the scrub dune vegetation and topography.

Based on that guidance, the applicant will undertake prescribed dune conservation measures, such as the planting of native scrub vegetation and the selective placement of sand movement corridors. Sand movement corridors are openings in the engineered berm that allow for the accretion of sand in interior dune fields. These measures will be undertaken with the goal of maintaining and enhancing the physical stability of the scrub dunes and preservation of a natural plant cover of value for a wildlife habitat and as an aesthetic amenity of the project. The engineering firm responsible for the dune management will be given the goal of enhancement of the primary

dune system to increase the value of that habitat for the ABM. An objective of increasing dune habitat value for ABM is to raise the level of ABM density on undeveloped portions of the project.

The plan for the dune restoration system will be developed in consultation with the Service.

7.1.11 Beach Cleaning and Beach Driving

Operating vehicles on the beach can destroy wildlife habitat and be harmful or fatal to wildlife. Following low impact beach driving guidelines (including minimizing vehicle access, the number of trips per day, and using low impact vehicles/tires for non-emergency needs) and beach cleaning guidelines for emergency or other approved beach access and activities can minimize impacts to wildlife, including federally protected species. (See **Appendix A** for Best Management Practices for beach driving and mechanized beach cleaning.)

8.0 Monitoring Unforeseen Circumstances and Adaptive Management Measures

Where conditions posing a significant risk to the species covered by the conservation plan make it difficult to achieve a particular biological objective, adaptive management is to be incorporated into the conservation plan to allow for changes considered necessary to meet the mitigation/conservation objectives. Specifically, the lack of certainty must pose a significant risk to the species. Given the substantial nature of the conservation actions of this plan, biological uncertainties, while acknowledged to exist, are not believed to pose a significant risk to the species, and, thus, require an adaptive management strategy. Nevertheless, adaptive procedures are incorporated under certain changed circumstances that may be reasonably expected to occur.

Unforeseen circumstances are those that were not, or could not, be anticipated by the conservation plan, but which are at the time considered to pose a substantial and adverse change in the status of the covered species. According to the “No Surprises” Rule, the Service has the burden of demonstrating that unforeseen circumstances exist, using the best scientific and commercial data available (NMFS and USFWS, 1998). These findings must be clearly documented and based upon reliable, technical information regarding the status and habitat requirements of the affected species.

In assessing the biological significance of such unforeseen circumstances, the Service will consider, but not be limited to, the following factors:

1. The size of the current range of the affected species;
2. The percentage of range adversely affected by the conservation plan;
3. The percentage of range conserved by the conservation plan;
4. The ecologic significance of that portion of the range affected by the conservation plan;
5. The level of knowledge about the affected species and the degree of specificity of the species’ conservation program under the conservation plan; and
6. Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected

species in the wild.

Changed Circumstances/Adaptive Management Procedures may include but are not limited to:

1. In any given year there is a ten percent change in available ABM habitat providing PCE to ABM due to a hurricane with a seven-foot storm surge making landfall in the Gulf Shores area. (Larger hurricanes pose a significant biological risk to the ABM.)
2. If such an event were to occur, resulting in an overwash of CH in the area, the permittee and the Service shall meet as soon as possible following such an occurrence and determine the necessary actions to be implemented, including, but not limited to the following which will be implemented by the applicant:
3. Trapping in the higher scrub nearest the overwashed CH to evaluate, on a site-specific basis, the role of scrub refugia during and after storm events. Post-storm trapping will in all cases include the corridor in the western portion of the project area.
4. Dune restoration measures, as deemed necessary to restore CH to its pre-storm condition (post construction and dune restoration condition).
5. Supplemental feeding as advised by the Service.
6. Any other reasonable conservation actions by and with the consent of the permittee based on guidance from the Service.
7. Relocation of ABM as appropriate and necessary.

9.0 Goals, Objectives, and Monitoring

The applicant agrees to permit Service personnel, or other properly permitted and qualified persons designated by either agency, to enter the property at any time for the purpose of monitoring compliance with conditions of the permit and for the purpose of trapping, when deemed necessary, to monitor the ABM population.

During the spring and fall of each calendar year, the permittee will perform a seasonal trapping survey on the property for the purposes of documenting presence or absence of house mice (*Mus musculus*), a known competitor of ABM, and monitoring the condition of the ABM, including its general distribution, condition, and reproductive status. Each survey will be performed by qualified and permitted agents of the permittee, approved by the Service, and will be performed in accordance with a survey protocol to be submitted by the applicant. The trapping surveys will commence during the first season following issuance of the ITP in order to develop a baseline. In addition, house mouse trapping will be conducted during demolition and construction in order to control their population. All house mice captured will be euthanized.

After construction, the presence of house mice will be considered in excess if their number trapped exceeds five percent of the total number of captured rodents. In such case, the permittee, using a permitted contractor, will undertake a monthly competitor control trapping program. This trapping program will remove house mice until such time as this species occurrence falls below five percent of the total number of rodents trapped. At that point, the monthly competitor control trapping program will cease and the seasonal trapping survey (e.g., spring, summer, and fall) will be resumed.

Concurrently with each seasonal trapping survey, the permittee will conduct a census for the presence, absence, or evidence (e.g., tracks, scat) of free-roaming or feral cats (*Felis catus*) within the property. Walking transects will be established so as to provide census coverage of the entire project area, including both developed and undeveloped areas. Actual sightings of free-roaming cats and observed presence of tracks will be recorded, together with any information on free-roaming cats obtained from residents, contractors, or other persons occupying, using, or employed on the property. Upon confirmation of

the presence of free-roaming cats, the permittee will initiate cat control measures sufficient to eliminate or reduce the cat population to such level that a repeated census, assuming the same census methodology, discloses no evidence of cats.

Concurrently with each trapping survey, the permittee's trapping contractor will make observations during night hours when outdoor lighting of the project buildings and other facilities are in use. The trapping contractor will note and make a written record of any directional lighting, or other artificial lighting, that (1) illuminates the primary and secondary dunes fields, the wet beach seaward of such dunes, or any portion of the Gulf of Mexico; or (2) projects any portion of a cone or beam of light toward any area south of the crest of the primary dunes. The applicant will be advised of any such findings within twenty-four hours and will make such adjustments of outdoor lighting as are required to prevent illumination that is potentially adverse to sea turtles and the nocturnal activities of the ABM.

10.0 Permit Amendments

10.1 Informal Amendments

Informal amendments include minor modifications of the plan that may be processed administratively by written notification and subsequent concurrence by the Service. Informal amendments without amending the underlying Section 10(a)(1)(B) permit are permissible and indicated, provided the changes do not cause a net adverse effect on the listed species significantly different from that considered in the original plan and permit, or result in a failure to meet performance measures of that permit.

Examples may include:

1. Changes in trapping house mice, or cat control measures, or changes in monitoring and reporting requirements.
2. Any minor changes which would not produce a net negative change in effect to the ABM beyond that anticipated in the original permit issuance.
3. Minor changes in building footprints that do not produce a net negative change in effect to the ABM beyond that anticipated in the original permit issuance.
4. Minor changes to outdoor lighting for affects to ABM, sea turtles and nesting birds may be reviewed by the service and approved informally.
5. Other minor miscellaneous activities not addressed in this plan.

10.2 Formal Amendments

Formal amendments are based on changes that produce a net adverse effect on the species greater than those considered in the plan development and permit issuance. Formal amendments require written notification and the same justification and supporting information for compliance with a standard ITP application, including habitat conservation planning requirements, and compliance with issuance criteria.

11.0 Conclusions

Activities detailed in this HCP will result in direct and indirect impacts, both adverse and beneficial, to the species listed in this HCP.

11.1 Adverse Impacts

The primary direct adverse impacts to species are related to construction activities.

1. The irreversible alteration of 41.1 acres of coastal habitat that will be displaced by construction of proposed and existing (permitted) infrastructure.
2. The possible death or injury of ABM at any life stage by being crushed or entombed in their burrows;
 - a. These impacts may occur from construction impacts through site preparation, heavy equipment operation, and earth moving;

Construction activities result in impermeable features (roads, parking areas, sidewalks, buildings and other surfaces) that completely replace the existing natural land cover with concrete, asphalt, or other similar “hard” materials. These impermeable surfaces effectively convert the natural areas to habitat unusable by ABM and eliminate all PCE within the impacted area.

Project areas may be altered by other landscape features that, although not impermeable, will eliminate ABM PCE in the affected area. These areas include stormwater collection and retention associated with parking areas and landscaped areas. Additional direct impacts also include artificial lighting.

Indirect adverse impacts are those that could result from human occupancy and use of the constructed infrastructure. These include:

- Potential interspecific competition resulting from introduction of house mice;
- Destruction of vegetation and resultant dune erosion from pedestrian traffic across dunes;

- Increased predation on beach mice;
- Artificial lighting.
- Habitat fragmentation (i.e., isolation of areas of ABM habitat from other areas of ABM habitat); and
- Interference with sea turtle nesting behavior as a result of improper lighting.

Habitat fragmentation can have the potential to reduce the effective breeding population and interfere with mouse movements normally associated with seasonal availability of food.

11.2 Beneficial Impacts

Beneficial effects of the proposed activities consist of numerous monitoring, mitigation, and habitat enhancement measures of the HCP. These measures, which are designed to avoid, reduce, minimize, and/or compensate for adverse effects of the proposed activities are summarized below:

- The eventual planned infrastructure build-out and restoration efforts will result in a net gain of 4.9 acres of ABM habitat;
- The agreed upon restoration of 22.7 acres of ABM suitable habitat has resulted in increased available habitat for the developing ABM population;
- Existing restoration/enhancement (36.8 acres) has exceeded the initial required amount of restored ABM suitable habitat by 14.1 acres;
- Proposed dune enhancement could improve suitable habitat by as much as 50 acres within the AA.

Implementation of a comprehensive dune management, protection, and enhancement program will be designed and overseen by a qualified expert. This program will include the entire designated ABM habitat in the AA. The objective of the program will be to increase ABM population density through substantial long-term enhancement of habitat quality. This dune management program will have, as a primary objective, the accelerated rehabilitation of dune habitat

damaged by wind or water events. Shortening the intervals during which post-storm habitat quality is severely depressed will help to optimize ABM population recovery following unavoidable storm-induced population depressions. Additionally, by creating the conditions from which tertiary dune habitat can evolve, storm refugia could be created that could improve the potential for long term ABM population increase and retention within GSP.

Other measures that can be taken to benefit the dune habitat will include:

- Reduction of pedestrian damage to dunes through the construction of dune walkover structures between the south end of the developed areas and the wet beach of the Gulf of Mexico;
- Protection of beach dunes, including associated CH, from off-road vehicular traffic;
- Creation of sand movement corridors to allow sand accretion north of the engineered berm;
- Development of a monitoring program to track ABM numbers and to detect the presence of competitors and predators and provisions for removal or reduction of undesired species as necessary;
- Enforcement of requirements for the proper storage of building materials and solid waste; and
- An exterior lighting plan to avoid or minimize potential effects or artificial lighting on predation and nocturnal behavior of ABM as well as nesting behavior of sea turtles.

Written guidance for contractor personnel and public use of the beach and dune complex will be provided through signage along beach access points. These signs will provide information to the target audience that will inform them of the presence of ABM and the potential presence of sea turtles on the property. The information contained in the signs will inform beach users of the regulatory restrictions and penalties and specifying protective measures to be followed to avoid harm to these species.

12.0 Summary

The taking related to the projects covered by the existing permit is incidental to an otherwise lawful activity on publicly owned land, and, thus, is eligible for the incidental take permit provisions of Section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended.

This HCP is submitted as a statutory component of the application for incidental take permit sought by the Alabama Department of Conservation and Natural Resources (the Applicant). The ITP sought is for a period of thirty years.

The official designation of ABM CH includes all GSP lands south of Highway 182 and approximately 30 acres north of the roadway (USFWS, 1985; 2007) (see **Figure 15**). Areas that are designated as CH may, however, have been disturbed by preexisting infrastructure. These areas are not suitable or habitable for the ABM and do not exhibit Primary Constituent Elements.

In 2004, for the initial HCP, the Service determined that only a portion (90.24 acres) of the AA (135.7 acres) exhibited CH PCE. Following the destruction of Hurricane Ivan, the available area of suitable habitat that contained PCE was reduced to zero. The Service also determined that the ABM had been extirpated from the AA within GSP.

In 2003, approximately 55.8 acres of the designated CH in the AA exhibited PCE while also being occupied by the ABM (Lynn, 2000; 2001). In 2010, the Service reintroduced a small population of ABM. A recent trapping and population study report indicates that the population is meeting success criteria set for that reintroduction (Lynn, 2013). In the interim, dune restoration efforts have increased habitat available for repopulation and are being used. Recent information indicates that the ABM in the park are occupying most likely any and all available habitat (more than just critical habitat) at Gulf State Park and include areas north of SR 182 (Lynn, 2013; Bill Lynn, Pers. Com., 2014).

In 2004 when the initial HCP was developed, trapping data from the Service indicated that ABM was not routinely found in the areas expected to be impacted by the planned infrastructure construction. These areas are now covered by the ITP and modifications.

No additional area will be removed from ABM CH for new construction.

The initial HCP and related ITP and modifications required ADCNR to restore 22.7 acres of the AA to provide suitable ABM habitat. Construction of the engineered berm contributed 13.6 acres of restored habitat. An additional 8.2 acres were restored in the former location of the Gulf Fishing Pier. ADCNR has a standing habitat restoration program that has resulted in the enhancement of 15 acres of ABM habitat within the AA. The ADCNR has thus been able to enhance 36.8 acres of ABM habitat. This enhanced habitat exceeds the initial Service restoration of 22.7 acres required for the original HCP and ITPs by 14.1 acres. The proposed NRDA enhancement project is expected to result in the enhancement of up to 50 acres of ABM suitable habitat.

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Appendix A

Guidance and Planning Documents from USFWS

1. Recommended Measures to Minimize Lighting Impacts to Wildlife Habitat
2. Best Management Practices for Beach Driving – Mechanized Beach cleaning on Alabama’s Coastal Beaches
3. US Fish and Wildlife Service Approved Native Plant List for Alabama Beach Mouse Habitat Areas.

Recommended Measures to Minimize Lighting Impacts to Wildlife Habitat

Depending on building design, construction footprint, and timing of construction activities, proposed projects may affect wildlife through increased human use and artificial lighting (both temporary and long term). For example, artificial lights near the beach can deter adult females from nesting and disorient hatchling and nesting sea turtles trying to reach the sea. Disoriented sea turtles that travel inland toward artificial lights often die from dehydration, depredation by fire ants and ghost crabs, or vehicle impacts. Artificial lighting may deter Alabama beach mice from foraging in their natural habitat due to increased predation risk.

We recommend implementing the following measures to minimize potential artificial lighting impacts to wildlife during construction activities or during occupancy of the site:

- Submit lighting plan using attached form for each fixture and site plan showing placement of fixtures to Alabama Ecological Services Field Office for review.
- Design and position exterior artificial lighting fixtures so that the point source of light, or any reflective surface of the light fixture, is not directly visible from the beach or dunes.
- Design, locate, install, and position all exterior lights and illuminated signs in such a manner that they illuminate only the target area; do not cause light trespass and glare onto adjacent beach or dune habitat; and do not directly, indirectly, or cumulatively illuminate areas seaward of frontal dunes. This is best achieved with low-pressure sodium lighting fixtures and/or lights that are hooded or shielded from the beach or adjacent dunes.
- Design interior lighting to minimize excess light spillover by avoiding or reducing ceiling mounted lights, installing curtains or blinds, and locating lamps and other light sources away from windows.
- Prohibit up-lighting (light above a 90 degree, horizontal plane).
- Install tinted glass (45% or less light transmittance value from inside to outside) or apply window tint on all windows and glass doors within line-of-sight of the beach.
- Restrict landscaping lights to the developed portion of the property only, using mushroom type fixtures no more than 12 inches above the ground, with amber LED bulbs of lowest watts necessary (for example, 7 watts or less).
- Walkway lighting should incorporate bollard fixtures less than 36 inches in height with seaside shields and LPS lamps (for example, 18 watts or less), or amber or red LED bulbs.
- Restrict roadway lighting to poles 20 feet in height or less and parking lot lighting to poles 12 feet in height or less, both with LPS bulbs (for example, 35 watts or less) in shielded or full cut-off fixtures. Avoid installing parking lot lights on the exterior perimeter of the lot adjacent to dune habitat.
- Install and use unlit dune walkovers to access the beach following ADEM and the City of Gulf Shores walkover construction guidelines. Construction of walkovers should occur outside of sea turtle nesting and hatching season (May 1 – October 31).
- Restrict temporary lighting of construction sites during sea turtle nesting season (May 1 - October 31) to the minimum amount necessary.

For specific techniques on sea turtle-friendly lighting, see the following websites:

<http://myfwc.com/seaturtle/>

http://www.fws.gov/daphne/es/Sea_Turtles/Sea_Turtle_Index.html

<http://www.darksky.org/>

EXTERIOR LIGHTING PLAN REVIEW FOR THE PROTECTION OF SEA TURTLES

File #: _____ ERP #: _____ Project Name: _____
 Date: _____ Reviewer: _____

Approval is not recommended for boardwalk lights, up lights, tree strap downlights, fountain lights, pond lights, private balcony lights, and decorative lighting.

Fixture Label	Fixture Type And Quantity	Manufacturer And Catalog #	Lamp type And wattage	Mounting Type and height	Location of fixture on Structure and/or Landscape *	Structure Level **
YES NO						

Fixture Label	Fixture Type And Quantity	Manufacturer And Catalog #	Lamp type And wattage	Mounting Type and height	Location of fixture on Structure and/or Landscape *	Structure Level **
Approved	Reason Not Approved***	Recommendations and Comments				
YES NO						

* L (Landward side of structure)
 B (Beach side of structure)
 S (Shore perpendicular side of structure)

** Ground Level (Level 1)
 Second Level, Third Level etc.
 Pool Deck
 Roof Top

*** A Excessive Wattage
 B Wrong Type of Lamp
 C Not Adequately Shielded
 D Mounted Too High
 E Too Many Fixtures
 F Inadequate or Inaccurate Information Provided
 G Decorative, not necessary for human safety

**Best Management Practices for
Beach Driving – Mechanized Beach Cleaning
on Alabama's Coastal Beaches**

The Alabama Gulf coast is home to a number of threatened and endangered species and many migratory birds. The beach itself is important nesting habitat for sea turtles, seabirds and shorebirds. Sea turtle nesting and hatching season in Alabama is May 1 – October 31. Alabama's sea turtle nesting habitat includes all sandy beaches adjoining the waters of the Gulf of Mexico in the coastal counties of Mobile and Baldwin. On the beach, nesting habitat extends from the high tide line to the top of the frontal dune (or berm if present).

Shorebirds use similar habitat for nesting in Alabama mid-February –August 31 and are particularly vulnerable to human disturbance resulting in nest abandonment April-August. Beach wrack, or seaweed, deposited on beaches by tidal action, contains small sea life that is an important food source for shorebird chicks. Beach wrack also serves as cover for both chicks and sea turtle hatchlings.

Operating vehicles on the beach can destroy wildlife habitat and be harmful or fatal to wildlife. Following these low impact beach driving and beach cleaning guidelines for emergency or otherwise approved beach access and activities minimizes impacts to wildlife, including federally protected species.

- **Leave beach wrack to decompose naturally, especially in front of active shorebird and sea turtle nesting areas.**
- **If beach cleaning is necessary, only clean seaward of the high tide line and during the daytime; avoid working on the beach at night.**
- **Wait until after 9:00 AM so that authorized/permitted sea turtle patrol has completed their nesting surveys.**
- **Enter only at designated access points and proceed directly to the hard-packed sand near or below the high tide line.**
- **Avoid driving on the upper beach or over wrack line areas of dense seaweed which may contain sea turtle hatchlings or shorebird nests and fledglings.**
- **Maintain at least a 10-foot buffer near dunes, beach vegetation, marked sea turtle nests and posted shorebird nesting sites.**
- **Keep rake depth to two inches or less into the beach surface.**
- **Use only vehicles with 10-PSI tire pressure to minimize ruts, particularly in front of marked nesting areas.**
- **Drive slowly and obey speed limits so that bird eggs, chicks, and sea turtle hatchlings may be observed and avoided.**
- **Remove all collected material from the beach; call the number below to discuss other options.**
- **Sea turtle, migratory birds, and beach mice are protected by law.**

**U.S. Fish and Wildlife Service
Alabama Ecological Services Field Office
1208 Main Street
Daphne, AL 36526**

**For more information contact:
Dianne Ingram, USFWS
(251) 441-5839**

Revised June 2013

**US Fish and Wildlife Service Approved Native Plant List for Alabama Beach Mouse
Habitat Areas 2010**

Scientific Name	Common Name	Height	Primary & Secondary Dune	Inter-dunal	Scrub dune
Trees					
<i>Magnolia grandiflora</i>	Southern Magnolia	60'-90'			X
<i>Osmanthus americanus</i>	Wild Olive	70'			X
<i>Pinus clausa</i>	Sand Pine	20'			X
<i>Pinus elliottii</i>	Slash Pine	80'-100'			X
<i>Quercus geminata</i>	Sand Live Oak	30'			X
<i>Quercus myrtifolia</i>	Myrtle Oak	40'			X
<i>Quercus virginiana maritima</i>	Sand Live Oak	40'-50'			X
Medium to Large Shrubs & Small Trees					
<i>Callicarpa americana</i>	Beautyberry	5'			X
<i>Ilex vomitoria</i>	Yaupon Holly	20'			X
<i>Iva frutescens</i>	Marsh-Elder	11'		X	
<i>Rhus copallina</i>	Winged Sumac	10' (30')		X	X
<i>Sabal palmetto</i>	Cabbage Palm		X		X
<i>Serenoa repens</i>	Saw Palmetto	10' (30')			X
Small Shrubs, Ground Covers, and Grass forms					
<i>Asclepias humistrata</i>	Sandhill Milkweed				X
<i>Bignonia capreolata</i>	Cross Vine				X
<i>Cakile lanceolata</i>	Sea Rocket		X		
<i>Ceratiola ericoides</i>	Seaside Rosemary				X
<i>Chrysoma pauciflosculosa</i>	Seaside Goldenrod		X		X
<i>Conradina canescens</i>	Beach Heather		X		X
<i>Cyperus sp.</i>	Sedge			X	
<i>Distichilis spicata</i>	Inland salt grass			X	
<i>Helianthus debilis*</i>	sunflower				X
<i>Heterotheca subaxillaris</i>	Aster (Camphor)		X		X
<i>Hydrocotyle bonariensis</i>	Pennywort		X	X	X
<i>Ipomoea pes-caprae</i>	Railroad Vine		X		
<i>Ipomoea imperati</i> (formerly <i>stolonifera</i>)	Beach Morning Glory		X		
<i>Iva imbricata</i>	Sea shore elder		X		
<i>Licania michauxii</i>	Gopher Apple				X
<i>Oenothera humifusa</i>	Evening primrose		X		
<i>Panicum amarum</i>	Seaside Panicum		X	X	
<i>Physalis augustifolia</i>	Ground cherry		X		X
<i>Pteridium aquilinum</i>	Bracken fern				X
<i>Polygonella gracilis</i>	Joint weed		X		X
<i>Polygonella polygama</i>	Jointweed		X		X
<i>Schizachyrium scoparium</i> (formerly <i>maritimum</i>)	Bluestem		X		X
<i>Tradescantia ohiensis</i>	Spiderwort			X	X
<i>Uniola paniculata</i>	Sea Oats		X		X
<i>Muhlenbergia capillaris</i>	Muhly grass			X	

* currently introduced to Baldwin County, but native to Escambia County, FL.