

## NASA Stennis Space Center Environmental Resources Document

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### 6.0 Endangered and Threatened Species

#### 6.1 Endangered Species Act

The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) was enacted "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and to provide a program for the conservation of such endangered species and threatened species." The term endangered species applies to "any species that is in danger of extinction throughout all or a significant portion of its range." A threatened species is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The Secretary of Interior in conjunction with the Secretary of Commerce makes determination of threatened and endangered species.

A species may be designated either threatened or endangered because of any of the following factors:

- Current or threatened destruction, modification, or curtailment of its habitat or range
- Over utilization of the species for commercial, recreational, scientific, or educational purposes
- Disease or predation
- Inadequacy of existing regulations
- Other natural or manmade factors affecting continued existence of the species

Section 7 of the Endangered Species Act requires Federal agencies to ensure that any action authorized, funded, or carried out by the agency "is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species." The regulations require consultations with United States Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service if any listed species or their habitat may be affected by any agency activity.

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### 6.2 Flora

Currently, 142 plant species that occur in the site area (Hancock County, and/or St. Tammany parish) are ranked by the Mississippi Department of Wildlife, Fisheries and Parks (MDWFP)(1), and the Louisiana Department of Wildlife and Fisheries (LDWF)(2). These plants are listed as “special concern” because they are known or suspected to occur in low numbers. State ranks are assigned by each state's Natural Heritage Program, which may result in a variance of species ranking from state to state. The lists of “special concern” species were obtained from the Mississippi Natural Heritage Program and the Louisiana Natural Heritage Program and are shown on Tables 6-1 and 6-2. State ranks are based on factual information of a species occurrence.

The Louisiana Quillwort (*Isoetes louisianensis*) is the only plant species in the site area that is listed as endangered by the United States Fish and Wildlife Service (3) and critical imperiled by the LDWFP. Its habitat includes sand and gravel beach bars in small to medium sized blackwater streams of riparian/bayhead forest communities. A total of fifty-two species listed are critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

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Table 6-1 Louisiana "Special Concern" Plants

Scientific Name	State Common Name	State Rank
CHRYSOPSIS GOSSYPINA SSP HYSSOPIFOLIA	A GOLDEN ASTER	S1
PTEROGLOSSASPIS ECRISTATA	A WILD COCO	S2
OBOVARIA UNICOLOR	ALABAMA HICKORYNUT	S1
BAYHEAD SWAMP	BAYHEAD SWAMP	S3
CALOPOGON BARBATUS	BEARDED GRASS-PINK	S1
CHASMANTHIUM ORNITHORHYNCHUM	BIRD-BILL SPIKEGRASS	S2
MAYACA FLUVIATILIS	BOG MOSS	S2
BOTTOMLAND HARDWOOD FOREST	BOTTOMLAND HARDWOOD FOREST	S4
CLIFTONIA MONOPHYLLA	BUCKWHEAT-TREE	S1
SCIRPUS ETUBERCULATUS	BULRUSH	S1
RHYNCHOSPORA CHAPMANII	CHAPMAN BEAKRUSH	S2
RHYNCHOSPORA CILIARIS	CILIATE BEAKRUSH	S1?
POTAMOGETON PERFOLIATUS	CLASPING-LEAF PONDWEED	S1
TOFIELDIA RACEMOSA	COASTAL FALSE-ASPHODEL	S2S3
COASTAL LIVE OAK-HACKBERRY FOREST	COASTAL LIVE OAK-HACKBERRY FOREST	S1S2
AGALINIS APHYLLA	COASTAL PLAIN FALSE-FOYGLOVE	S1
SALIX CAROLINIANA	COASTAL PLAIN WILLOW	S1
JUSTICIA AMERICANA	COMMON WATER-WILLOW	S1?
PHYSOSTEGIA CORRELLII	CORRELL'S FALSE DRAGON-HEAD	S1
CAREX DECOMPOSITA	CYPRESS-KNEE SEDGE	S1
CYPRESS-TUPELO SWAMP	CYPRESS-TUPELO SWAMP	S4
ILEX CASSINE	DAHOON HOLLY	S?
ZIGADENUS LEIMANTHOIDES	DEATH CAMUS	S1
TRICHOMANES PETERSII	DWARF FILMY-FERN	S2
QUERCUS MINIMA	DWARF LIVE OAK	S?
EASTERN LONGLEAF PINE SAVANNAH	EASTERN LONGLEAF PINE SAVANNAH	S1
ELLIPTIO CRASSIDENS	ELEPHANT-EAR	S2S3
CHAMAELIRIUM LUTEUM	FAIRY WAND	S2S3
LYCOPODIELLA CERNUA	FERN	S2
MACRANTHERA FLAMMEA	FLAME FLOWER	S2
RHYNCHOSPORA COMPRESSA	FLAT-FRUIT BEAKRUSH	S1S2
AGALINIS LINIFOLIA	FLAX-LEAF FALSE-FOYGLOVE	S1
FRESHWATER MARSH	FRESHWATER MARSH	S3S4
XYRIS FIMBRIATA	FRINGED YELLOW-EYED GRASS	S4
COREOPSIS NUDDATA	GEORGIA TICKSEED	S1S2
LOPHIOLA AUREA	GOLDEN CREST	S2S3
HARDWOOD SLOPE FOREST	HARDWOOD SLOPE FOREST	S3
SIUM SUAVE	HEMLOCK WATER-PARSNIP	S2
POLYGALA HOOKERI	HOOKER MILKWORT	S1
INTERMEDIATE MARSH	INTERMEDIATE MARSH	S3S4
LUPINUS VILLOSUS	LADY LUPINE	S2
ISOTRIA VERTICILLATA	LARGE WHORLED POGONIA	S2S3
SABATIA MACROPHYLLA	LARGE-LEAVED ROSE GENTIAN	S2S3
COELORACHIS TESSELLATA	LATTION JOINT GRASS	S?
CIRSIIUM LECONTEI	LECONT'S THISTLE	S?
RHYNCHOSPORA SCIRPOIDES	LONG-BEAKED BALDRUSH	S1
ISOETES LOUISIANENSIS	LOUISIANA QUILLWORT	S1
SELAGINELLA LUDOVICIANA	LOUISIANA SPIKEMOSS	S1
CALOPOGON MULTIFLORUS	MANY-FLOWERED GRASS-PINK	S1
ASCLEPIAS MICHAUXII	MICHAUX MILKWEED	S2

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Table 6-1(continued) Louisiana "Special Concern" Plants

RHYNCHOSPORA MILIACEA	MILLET BEAKRUSH	S2
ANDROPOGON MOHRII	MOHR BLUESTEM	S?
ILEX MYRTIFOLIA	MYRTLE HOLLY	S2S3
NATIONAL CHAMPION TREE	NATIONAL CHAMPION TREE	
RUELLIA NOCTIFLORA	NIGHT-FLOWERING WILD-PETUNIA	S1
BURMANNIA BIFLORA	NORTHERN BURMANNIA	S2
SCLERIA LITHOSPERMA	NUT-RUSH	S1?
MYRICA INODORA	ODORLESS BAYBERRY	S1S2
OLD GROWTH LONGLEAF PINE	OLD GROWTH LONGLEAF PINE	
CALOPOGON PALLIDUS	PALE GRASS-PINK	S1S2
PARONYCHIA ERECTA VAR CORYMBOSA	PARONYCHIA CORYMBOSA	SE
SARRACENIA PSITTACINA	PARROT PITCHERPLANT	S3
PINE FLATWOODS	PINE FLATWOODS	S3
PINE SAVANNAH	PINE SAVANNAH	S2S3
STIPULICIDA SETACEA	PINELAND SCALY-PINK	SE
UTRICULARIA PURPUREA	PURPLE BLADDERWORT	S?
AGALINIS FILICAULIS	PURPLE FALSE-FOXGLOVE	S1
CROTALARIA PURSHII	RATTLEBOX	S3S4
RIPARIAN FOREST	RIPARIAN FOREST	S3S4
PODOSTEMUM CERATOPHYLLUM	RIVERWEED	S1
SABATIA ARENICOLA	SAND ROSE-GENTIAN	S1
ILEX AMELANCHIER	SARVIS HOLLY	S2
RHYNCHOSPORA DEBILIS	SAVANNAH BEAKRUSH	S1?
SERENOA REPENS	SAW PALMETTO	S1
OENOTHERA HUMIFUSA	SEA BEACH EVENING PRIMROSE	S?
UNIOLA PANICULATA	SEA OATS	S2
HELENIUM BREVIFOLIUM	SHORTLEAF SNEEZEWEED	S1
SLASH PINE/POST OAK	SLASH PINE/POST OAK	S3S4
SLASH PINE-CYPRESS/HARDWOOD FOREST	SLASH PINE-CYPRESS/HARDWOOD FOREST	S2S3
LIATRIS TENUIS	SLENDER GAY-FEATHER	S1
CROTALARIA BREVIDENS	SLENDER LEAF RATTLE BOX	SE
ELEOCHARIS ELONGATA	SLIM SPIKE-RUSH	S1?
PANICUM TENERUM	SOUTHEASTERN PANIC GRASS	S1S2
UTRICULARIA JUNCEA	SOUTHERN BLADDERWORT	S?
LILIUM CATESBAEI	SOUTHERN RED LILY	S1
DROSER A INTERMEDIA	SPOON-LEAVED SUNDEW	S2
RHYNCHOSPORA DIVERGENS	SPREADING BEAKRUSH	S1
CLEISTES DIVARICATA	SPREADING POGONIA	S1
LYCOPODIELLA CERNUA VAR CERNUA	STAGHORN CLUBMOSS	S2
SUBMERGENT VASCULAR VEGETATION (ESTUARINE)	SUBMERGENT VASCULAR VEGETATION (ESTUARINE)	S1S2
DULICHIMUM ARUNDINACEUM	THREE-WAY SEDGE	S?
UPLAND LONGLEAF PINE FOREST	UPLAND LONGLEAF PINE FOREST	S3
WATERBIRD NESTING COLONY	WATERBIRD NESTING COLONY	
FUIRENA SIMPLEX	WESTERN UMBRELLA-GRASS	S?
BARTONIA VERNA	WHITE SCREWSTEM	S4?
PLATANThERA BLEPHARIGLOTTIS VAR CONSPICUA	WHITE-FRIDGE ORCHIS	S1
PINGUICULA LUTEA	YELLOW BUTTERWORT	S2
PLATANThERA INTEGR A	YELLOW FRINGELESS ORCHID	S2S3
EASTERN HILLSIDE SEEPAGE BOG		

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Table 6-2 Mississippi "Special Concern" Plants

Scientific Name	State Common Name	State Rank
CHAMAECYPARIS THYOIDES	ATLANTIC WHITE CEDAR	S2
CALOPOGON BARBATUS	BEARDED GRASS-PINK	S2S3
HIBISCUS COCCINEUS	BRILLANT HIBISCUS	S2
LILAEOPSIS CAROLINENSIS	CAROLINA LILAEOPSIS	S2S3
RHYNCHOSPORA STENOPHYLLA	CHAPMAN BEAKRUSH	S1?
PINGUICULA PLANIFOLIA	CHAPMAN'S BUTTERWORT	S2
PHYSALIS ANGUSTIFOLIA	COAST GROUND-CHERRY	S3S4
CAREX EXILIS	COAST SEDGE	S2
AGALINIS APHYLLA	COASTAL PLAIN FALSE-FOXGLOVE	S2S3
AMSONIA LUDOVICIANA	CREOLE PHLOX	SH
RHYNCHOSPORA CURTISSII	CURTISS'S BEAKRUSH	S1
XYRIS DRUMMONDII	DRUMMOND'S YELLOW-EYED GRASS	S2
MACRANTHERA FLAMMEA	FLAME FLOWER	S3?
COREOPSIS NUDATA	GEORGIA TICKSEED	S1S2
SPIRANTHES LONGILABRIS	GIANT SPIRAL LADIES'-TRESSES	S2S3
EPIDENDRUM CONOPSEUM	GREEN-FLY ORCHID	S2
XYRIS SCABRIFOLIA	HARPER'S YELLOW-EYED GRASS	S1S2
VACCINIUM ASHEI	HIGHBUSH BLUEBERRY	S1S2
POLYGALA HOOKERI	HOOKER'S MILKWORT	S1S2
ILEX AMELANCHIER	JUNEBERRY HOLLY	S3
RHYNCHOSPORA MACRA	LARGE BEAKRUSH	S3
GORDONIA LASIANTHUS	LOBLOLLY BAY	S3S4
CALOPOGON MULTIFLORUS	MANY-FLOWER GRASS-PINK	S1
ERYNGIUM AQUATICUM	MARSH ERYNGO	S1
ILEX MYRTIFOLIA	MYRTLE HOLLY	S3S4
PANICUM NUDICAULE	NAKED-STEMMED PANIC GRASS	S2
RUPELLIA NOCTIFLORA	NIGHT-FLOWERING RUELLIA	S2
BURMANNIA BIFLORA	NORTHERN BURMANNIA	S3S4
RUPELLIA PEDUNCULATA SSP PINETORUM	PINE BARREN RUELLIA	S3
LACHNOCAULON DIGYNUM	PINELAND BOGBUTTON	S2
UTRICULARIA PURPUREA	PURPLE BLADDERWORT	S2S3
PHASEOLUS SINUATUS	SANDHILL BEAN	S1S2
ELEOCHARIS ELONGATA	SLIM SPIKE-RUSH	S1
EULOPHIA ECRISTATA	SMOOTH-LIPPED EULOPHIA	S1S2
PINGUICULA PRIMULIFLORA	SOUTHERN BUTTERWORT	S3
JUNIPERUS SILICICOLA	SOUTHERN RED CEDAR	S2
CLEISTES DIVARICATA	SPREADING POGONIA	S3
ERIOCAULON TEXENSE	TEXAS PIPEWORT	S2S3
AGALINIS FILICAULIS	THIN STEMMED FALSE-FOXGLOVE	S2?
SAGERETIA MINUTIFLORA	TINY-LEAVED BUCKTHORN	S2
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER	S2S3
PLATANThERA INTEGRA	YELLOW FRINGELESS ORCHID	S3S4
SYNGONANTHUS FLAVIDULUS	YELLOW PIPEWORT	S2?

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Table 6-1 and 6-2 (continued) "Special Concern" Plants

- (1) Plants receive no formal legal protection by state law in Mississippi other than that provided for in trespass laws.
- (2) State status/ranks are assigned by each state's Natural Heritage Program. State information was obtained from the Louisiana Natural Heritage Program and the Mississippi Natural Heritage Program. The State lists for Mississippi and Louisiana includes more species than the Federal endangered and threatened species list.

### STATE RANK

- S1 Critically imperiled because of extreme rarity (5 or fewer occurrences) or because of some factor(s) making it especially vulnerable to extirpation.
- S2 Imperiled because of rarity (6 to 20 occurrences) or because of some factor(s) making it very vulnerable to extirpation.
- S3 Rare and uncommon (21 to 100 occurrences).
- S4 Apparently secure (more than 101 occurrences).
- S5 Demonstrably secure in state (1000+ ).
- SH Of historical occurrence but no recent records verified within the last 20 years, and suspected to be still extant.

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### 6.3 Fauna

Seventy-two animal species are listed as “special concern” by either the MDWFP and/or LDWF and have ranges that include Hancock County and/or St. Tammany parish (1,2). These “special concern” species are listed on Tables 6-3 and 6-4. All species that are listed as either **endangered** or **threatened** by the MDWFP and/or the LDWF are listed on Table 6-5. Their federal status is also indicated. The italicized species are listed as endangered or threatened for Hancock County and St. Tammany Parish by the USFWS.

#### 6.3.1 *Wildlife species that have ranges which include SSC*

The following ranked and listed wildlife species have ranges which include SSC: Gulf sturgeon (*Acipenser oxyrinchus desotoi*), eastern indigo snake (*Drymarchon corais couperi*), Florida panther (*Felis concolor coryi*), gopher tortoise (*Gopherus polyphemus*), bald eagle (*Haliaeetus leucocephalus*), red-cocked woodpecker (*Picoides borealis*), and American peregrine falcon (*Falco peregrinus*)(1).

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*), a subspecies of the Atlantic sturgeon, is listed as threatened by USFWS and LDWF, and endangered by MDWFP. The ecological survey conducted in 1988-documented sturgeon in the Pearl River, where the sturgeon apparently inhabits the deep pools. A long, V-shaped snout, a blue to black colored back, and rows of scutes along the back and sides, identifies the Gulf sturgeon. The range of the Atlantic sturgeon is along the Atlantic coast from Labrador, Newfoundland to northeast Florida and along the Gulf coast from Tampa Bay, Florida to Lake Pontchartrain, Louisiana. The Gulf sturgeon is found in the Gulf coast portion of this range. Sturgeons inhabit shallow waters along the continental shelf and are also found in coastal rivers (10).

The eastern indigo snake (*Drymarchon corais couperi*) is listed as threatened by USFWS and endangered by MDWFP. The eastern indigo snake is a large snake, 1.5 to 2.1 meters (60 to 84 inches) in length, and is a shiny bluish-black color with smooth scales. The snake feeds on small mammals, birds, frogs, and snakes and is usually found in large, unsettled areas. The historical range of the eastern indigo snake is from southeastern Georgia south to the Florida Keys and west to extreme southeastern Mississippi. Although this historical range does not include Hancock County, government agencies have released some of these snakes in Harrison and Marion Counties in Mississippi in the 1980s. In the late 1990’s, intensive searches found no indigo snakes and no direct evidence of their presence. But there are some possible suitable habitats. (11).

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The Florida panther (*Felis concolor coryi*) is listed as endangered by USFWS, MDWFP, and LDWF. Although the ecological surveys conducted at SSC have not documented the occurrence of Florida panthers at the facility and no conclusive physical evidence of panthers has been found to date, several eyewitness accounts of panther sightings within the SSC Fee Area and Buffer Zone have been reported. The head and body of the panther average 1.1 to 1.4 meters (42 to 54 inches) in length, the tail is about 0.76 to 0.9 meters (30 to 36 inches) long, and the average height at the shoulders is 0.66 to 0.79 meters (26 to 31 inches). The color of the Florida panther varies from tawny to grey, with dark brown or black on the tip of the tail, the back of the ears, and the sides of the nose. The panther feeds primarily on deer, but will also hunt rabbits, mice, and birds. The panther is solitary, mostly nocturnal, and seldom seen. It occurs mostly in wilderness areas of forest or swamp, with a range from southern Florida along the Gulf of Mexico coast to eastern Louisiana (4).

The gopher tortoise (*Gopherus polyphemus*) is classified as threatened by USFWS and LDWF, and endangered by MDWFP. A small population of gopher tortoises has been documented in the Buffer Zone at the north edge of the SSC Fee Area, just outside the north gate, by the ecological surveys conducted in 1988, 1991, and 1994. Keiser observed a gopher tortoise and its burrow in the central portion of the western Fee Area during a survey in 1994 (10). Gopher tortoises have also been reported in other locations throughout the northern and northeastern areas of the Buffer Zone. During the 1998 surveys of the simple fee area, the only evidence for the existence of the gopher tortoise was one definite burrow, one possible burrow and a single adult gopher tortoise repeatedly sighted in 1994. It is presently believed that gopher tortoise are either absent as site residents or present in very small numbers where habitats may be suitable. The gopher tortoise ranges in size from 0.15 to 0.24 meters (6 to 9.5 inches), and has broad, unwebbed feet and an unhinged plastron. The gopher tortoise occurs in sandy regions where it can burrow into tunnels. These tunnels slope downward from the surface, level off underground, and may be up to 10.7 meters (35 feet) long. The tortoises emerge from the burrows daily to feed on grass, leaves, fruit, and berries. The gopher tortoise occurs in sandy regions of the coastal plain from extreme southern South Carolina to extreme eastern Louisiana and most of Florida (6,11).

The bald eagle (*Haliaeetus leucocephalus*) is classified as threatened by USFWS and endangered by MDWFP and LDWF. The bald eagle was sighted at SSC in surveys conducted in 1994 and 1991, along the Pearl River and on Endeavor Boulevard, respectively (10). It is a very large bird with a wingspan of 2.1 to 2.4 meters (7 to 8 feet) and is identified by its white head and white tail. The range of the eagle is from Alaska and Canada to the southern United States. The eagle is usually

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found along coasts, rivers, and large lakes. The known nesting range of the bald eagle extends into southern Alabama and has been expanding in recent years as far as Georgia (6).

The red-cocked woodpecker (*Picoides Borealis*) is classified by endangered by the USFWS, MDWFP and LDWF. Red-cocked woodpeckers (RCW) are endemic to the southeastern U.S., where they are tied to old-growth pine forests. Populations of this species historically occurred in roughly the southern half of Mississippi. The species has failed to appear in any of the recent surveys (11).

The American Peregrine Falcon (*Falco peregrinus*) was delisted in August 1999, by the USFWS, but is still listed as endangered/threatened by MDWFP and LDWF. The historic breeding range of the species covered much of North America from coast to coast but the use of pesticides has all but extirpated Peregrines from the eastern portion of their range. A few Peregrines migrate through the eastern U.S., wintering along the Gulf Coast and farther south. During recent surveys, no Peregrines were seen. The occurrence of Peregrines at SSC would best be described as incidental and irregular (11).

Foster Wheeler Environmental Corp conducted an ecological risk assessment survey in western portions of the Fee Area at SSC in 1995. The assessment was conducted at the Sanitary Landfill (Site 002), Recreation Disposal Area (Site 006), Air Force Disposal/Pesticide Operations Area (Site 007), and Building 2205 Combined Sites (Site 011). Several ranked and listed animal species were observed at SSC during the 1995 surveys, or sightings were referenced in the assessment report. These species included American alligator (*Alligator mississippiensis*) in corridors between sites in 1994 and at Site 002 in 1995; gopher tortoise (*Gopherus polyphemus*) at Site 007 in 1994; ringed sawback/map turtle (*Graptemys oculifera*) at Sites 002, 006, and 007 in 1994; alligator snapping turtle (*Macroclmys temminckii*) in corridors between sites in 1994; and Louisiana black bear (*Urus americanus luteolus*) at Site 006 in 1994 (10).

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Table 6-3 Louisiana "Special Concern" Animals

Scientific Name	State Common Name	State Rank
FALLICAMBARUS ORYKTES	A CRAWFISH	S2S3
PROCAMBARUS SHERMANI	A CRAWFISH	S2
ALOSA ALABAMAE	ALABAMA SHAD	S1
MACROCLEMYS TEMMINCKII	ALLIGATOR SNAPPING TURTLE	S3
ELANOIDES FORFICATUS	AMERICAN SWALLOW-TAILED KITE	S1S2B
AIMOPHILA AESTIVALIS	BACHMAN'S SPARROW	S3
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	S2N,S3B
CYCLEPTUS ELONGATUS	BLUE SUCKER	S2S3
NOTROPIS WELAKA	BLUENOSE SHINER	S1S2
ACCIPITER COOPERII	COOPER'S HAWK	S2B,S3N
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	S2S3
MALACLEMYS TERRAPIN	DIAMONDBACK TERRAPIN	S2
RANA CAPITO SEVOSA	DUSKY GOPHER FROG	SH
MICRURUS FULVIUS FULVIUS	EASTERN CORAL SNAKE	S2
OPHISAURUS VENTRALIS	EASTERN GLASS LIZARD	S3
REITHRODONTOMYS HUMULIS	EASTERN HARVEST MOUSE	S3S4
AMBYSTOMA TIGRINUM	EASTERN TIGER SALAMANDER	S1
FUSCONAIA EBENA	EBONYSHELL	S3
FELIS CONCOLOR CORYI	FLORIDA PANTHER	SH
HEMIDACTYLIUM SCUTATUM	FOUR-TOED SALAMANDER	S1
NOTURUS MUNITUS	FRECKLEBELLY MADTOM	S2S3
PERCINA LENTICULA	FRECKLED DARTER	S1
GOPHERUS POLYPHEMUS	GOPHER TORTOISE	S1
PSEUDOTRITON MONTANUS	GULF COAST MUD SALAMANDER	S1
ACIPENSER OXYRINCHUS DESOTOI	GULF STURGEON	S1S2
POTAMILUS INFLATUS	INFLATED HEELSPLITTER	S1
URSUS AMERICANUS LUTEOLUS	LOUISIANA BLACK BEAR	S2
TRICHECHUS MANATUS	MANATEE	SZN
LAMPROPELTIS CALLIGASTER RHOMBOMACULATA	MOLE KINGSSNAKE	S1S2
PSEUDACRIS ORNATA	ORNATE CHORUS FROG	S1
PANDION HALIAETUS	OSPREY	S2B,S3N
POLYODON SPATHULA	PADDLEFISH	S3
GRAPTEMYS GIBBONSI	PASCAGOULA MAP TURTLE	S3
PERCINA AURORA	PEARL DARTER	SH
RHADINAEA FLAVILATA	PINE WOODS SNAKE	S1
FARANCIA ERYTROGRAMMA	RAINBOW SNAKE	S2
PICOIDES BOREALIS	RED-COCKADED WOODPECKER	S2
PROCAMBARUS BIVITTATUS	RIBBON CRAWFISH	S1S2
GRAPTEMYS OCULIFERA	RINGED MAP TURTLE	S2
MOXOSTOMA CARINATUM	RIVER REDHORSE	S1S3
LAMPSILIS ORNATA	SOUTHERN POCKETBOOK	S?
AMPHIUMA MEANS	TWO-TOED AMPHIUMA	S3S4

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Table 6-4 Mississippi "Special Concern" Animals

Scientific Name	State Common Name	State Rank
ALOSA ALAMABAE	ALABAMA SHAD	S1
AIMOPHILA AESTIVALIS	BACHMAN'S SPARROW	S3?B,SZN
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	S1B,S2N
EUPHYES BAYENSIS	BAY ST. LOUIS SKIPPER	S1
ICTIOBUS NIGER	BLACK BUFFALO	S3
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	S3?B,SZN
PTERONOTROPIS WELAKA	BLUENOSE SHINER	S3
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	S1
MICRURUS FULVIUS	EASTERN CORAL SNAKE	S3S4
DRYMARCHON CORAIS COUPERI	EASTERN INDIGO SNAKE	S1
FELIS CONCOLOR CORYI	FLORIDA PANTHER	SH
GOPHERUS POLYPHEMUS	GOPHER TORTOISE	S2
THAMNOPHIS PROXIMUS ORARIUS	GULF COAST RIBBON SNAKE	S?
BUFO VALLICEPS	GULF COAST TOAD	S3
REGINA RIGIDA SINICOLA	GULF CRAYFISH SNAKE	S3?
NERODIA CLARKII CLARKII	GULF SALT MARSH SNAKE	S2?
ACIPENSER OXYRINCHUS DESOTOI	GULF STURGEON	S1
NOTROPIS CHALYBAEUS	IRONCOLOR SHINER	S2
HETERANDRIA FORMOSA	LEAST KILLIFISH	S3
FALCO COLUMBARIUS	MERLIN	SZN
MALACLEMYS TERRAPIN PILEATA	MISSISSIPPI DIAMONDBACK TERRAPIN	S2
ANAS FULVIGULA	MOTTLED DUCK	S3B,S4N
PSEUDOTRITON MONTANUS	MUD SALAMANDER	S2S3
POLYODON SPATHULA	PADDLEFISH	S3
RHADINAEA FLAVILATA	PINE WOODS SNAKE	S3?
CORYNORHINUS RAFINESQUII	RAFINESQUE'S BIG-EARED BAT	S3?B,S3?N
FARANCIA ERYTROGRAMMA	RAINBOW SNAKE	S2
RANA HECKSCHERI	RIVER FROG	S1
STERNA MAXIMA	ROYAL TERN	S1B,S4N
FUNDULUS JENKINSI	SALTMARSH TOPMINNOW	S3
TYRANNUS FORFICATUS	SCISSOR-TAILED FLYCATCHER	SAB,SAN
GASTROCOPTA PELLUCIDA	SLIM SNAGGLETOOTH	S?
HETERODON SIMUS	SOUTHERN HOGNOSE SNAKE	SH
PLEGADIS CHIHII	WHITE-FACED IBIS	SZN

### STATE RANK

- S1 Critically imperiled because of extreme rarity (5 or fewer occurrences) or because of some factor(s) making it especially vulnerable to extirpation.
- S2 Imperiled because of rarity (6 to 20 occurrences) or because of some factor(s) making it very vulnerable to extirpation.
- S3 Rare and uncommon (21 to 100 occurrences).
- S4 Apparently secure (more than 101 occurrences).
- S5 Demonstrably secure in state (1000+).
- SH Of historical occurrence but no recent records verified within the last 20 years, and suspected to be still extant. (B or N may be used as a qualifier of numeric ranks and indicating whether the occurrence is breeding or nonbreeding)

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Table 6-5 Mississippi and Louisiana Threatened and Endangered Species List

SPECIES NAME	COMMON NAME	FEDERAL STATUS
<b>BIVALVIA</b>		
ACTINONAIAS LIGAMENTINA	MUCKET	
CYCLONAIAS TUBERCULATA	PURPLE WARTYBACK	
ELLIPTIO ARCTATA	DELICATE SPIKE	
ELLIPTIO DILATATA	SPIKE	
EPIOBLASMA BREVIDENS	CUMBERLANDIAN COMBSHELL	LE
EPIOBLASMA PENITA	SOUTHERN COMBSHELL	LE
EPIOBLASMA TRIQUETRA	SNUFFBOX	
LAMPASILIS PEROVALIS	ORANGE-NACRE MUCKET	LT
LEXINGTONIA DOLABELLOIDES	SLABSIDE PEARLYMUSSEL	C
MARGARITIFERA HEMBELI	LOUISIANA PEARLSHELL	LT
MEDIONIDUS ACUTISSIMUS	ALABAMA MOCCASINSHELL	LT
PLETHOBASUS CYPHYUS	SHEEPNOSE	
PLEUROBEMA CURTUM	BLACK CLUBSHELL	LE
PLEUROBEMA DECISUM	SOUTHERN CLUBSHELL	LE
PLEUROBEMA MARSHALLI	FLAT PIGTOE	LE
PLEUROBEMA PEROVATUM	OVATE CLUBSHELL	LE
PLEUROBEMA RUBRUM	PYRAMID PIGTOE	
PLEUROBEMA TAITIANUM	HEAVY PIGTOE	LE
POTAMILUS CAPAX	FAT POCKETBOOK	LE
<i>POTAMILUS INFLATUS</i>	<i>INFLATED HEELSPLITTER</i>	LT
PTYCHOBANCHUS FASCIOLARIS	KIDNEYSHELL	
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	
QUADRULA METANEVRA	MONKEYFACE	
QUADRULA STAPES	STIRRUPSHELL	LE
<b>MALACOSTRACA</b>		
FALLICAMBARUS GORDONI	CAMP SHELBY BURROWING	C
<b>INSECTA</b>		
NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	LE
<b>OSTEICHTHYES</b>		
<i>ACIPENSER OXYRINCHUS DESOTOI</i>	<i>GULF STURGEON</i>	LT
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	
ETHEOSTOMA BLENNIOIDES	GREENSIDE DARTER	
ETHEOSTOMA RUBRUM	BAYOU DARTER	LT
NOTROPIS BOOPS	BIG EYE SHINER	
NOTROPIS CHALYBAEUS	IRONCOLOR SHINER	
NOTURUS EXILIS	SLENDER MADTOM	
NOTURUS MUNITUS	FRECKLEBELLY MADTOM	
NOTURUS STIGMOSUS	NORTHERN MADTOM	
PERCINA AURORA	PEARL DARTER	C
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	
PHENACOBIVUS MIRABILIS	SUCKERMOUTH MINNOW	
PHOXINUS ERYTHROGASTER	SOUTHERN REDBELLY DACE	

## NASA Stennis Space Center Environmental Resources Document

Table 6-5 (continued) Mississippi and Louisiana Threatened and Endangered Species List

SCAPHIRHYNCHUS ALBUS	PALLID STURGEON	LE
SCAPHIRHYNCHUS SUTTKUSI	ALABAMA STURGEON	PE
<b>AMPHIBIA</b>		
AMPHIUMA PHOLETER	ONE-TOED AMPHIUMA	
ANEIDES AENEUS	GREEN SALAMANDER	
EURYCEA LUCIFUGA	CAVE SALAMANDER	
GYRINOPHILUS PORPHYRITICUS	SPRING SALAMANDER	
RANA CAPITO SEVOSA	MISSISSIPPI GOPHER FROG	PE
<b>REPTILIA</b>		
CARETTA CARETTA	LOGGERHEAD; CABEZON	LT
CHELONIA MYDAS	GREEN TURTLE	(LE-LT)
DERMOCHELYS CORIACEA	LEATHERBACK; TINGLAR	LE
DRYMARCHON CORAIS COUPERI	EASTERN INDIGO SNAKE	LT
ERETMOCHELYS IMBRICATA	HAWKSBILL; CAREY	LE
FARANCIA ERYTHROGRAMMA	RAINBOW SNAKE	
GOPHERUS POLYPHEMUS	GOPHER TORTOISE	LT
GRAPTEMYS FLAVIMACULATA	YELLOW-BLOTCHED MAP TURTLE	LT
GRAPTEMYS NIGRINODA	BLACK-KNOBBED MAP TURTLE	
GRAPTEMYS OCULIFERA	RINGED MAP TURTLE	LT
HETERODON SIMUS	SOUTHERN HOGNOSE SNAKE	
LEPIDOCHELYS KEMPII	KEMP'S OR ATLANTIC RIDLEY	LE
PITUOPHIS MELANOLEUCUS LODINGI	BLACK PINE SNAKE	C
PSEUDEMYDAS ALABAMENSIS	ALABAMA REDBELLY TURTLE	LE
<b>AVES</b>		
CAMPEPHILUS PRINCIPALIS	IVORY-BILLED WOODPECKER	LE
CHARADRIUS ALEXANDRINUS	SNOWY PLOVER	(PS)
CHARADRIUS MELODUS	PIPING PLOVER	(LE-LT)
FALCO PEREGRINUS	PEREGRINE FALCON	Delisted
GRUS AMERICANA	WHOOPING CRANE	LE
GRUS CANADENSIS PULLA	MISSISSIPPI SANDHILL CRANE	LE
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LT
MYCTERIA AMERICANA	WOOD STORK	(PS)
NUMENIUS BOREALIS	ESKIMO CURLEW	LE
PELECANUS OCCIDENTALIS	BROWN PELICAN	LT
PICOIDES BOREALIS	RED-COCKADED WOODPECKER	LE
STERNA ANTILLARUM ATHALASSOS	INTERIOR LEAST TERN	(PS)
THRYOMANES BEWICKII	BEWICK'S WREN	
TYMPANUCHUS CUPIDO ATTWATERI	ATTWAATER'S GREATER PRAIRIE CHICKEN	LE
VERMIVORA BACHMANII	BACHMAN'S WARBLER	LE
<b>MAMMALIA</b>		
BALAENOPTERA MUSCULUS	BLUE WHALE	LE
BALAENOPTERA PHYSALUS	FINBACK WHALE	LE
BALAENOPTERA BOREALIS	SEI WHALE	LE
PHYSETER MACROCEPHALUS	SPERM WHALE	LE
FELIS CONCOLOR CORYI	FLORIDA PANTHER	LE
MYOTIS GRISESCENS	GRAY MYOTIS	LE
MYOTIS SODALIS	INDIANA OR SOCIAL MYOTIS	LE
TRICHECHUS MANATUS	MANATEE	LE
URSUS AMERICANUS	BLACK BEAR	LT

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Table 6-5 (continued) Mississippi and Louisiana Threatened and Endangered Species List

<b>PTERIDOPHYTA</b>		
<i>ISOETES LOUISIANENSIS</i>	<i>LOUISIANA QUILLWORTQ</i>	<i>LE</i>
<b>DICOTYLEDONEAE</b>		
APIOS PRICEANA	PRICE'S POTATO BEAN	LE
LINDERA MELISSIFOLIA	PONDBERRY SPICEBUSH	LE
SCHWALBEA AMERICANA	AMERICAN CHAFFSEED	LE

### STATUS CODES

- LE    **ENDANGERED.** A species that is in danger of extinction throughout all or a significant portion of its range.
- LT    **THREATENED.** A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- C2    **CANDIDATE CATEGORY 2.** Species for which information now in possession of the U.S. Fish and Wildlife Service indicates that proposing to list as an endangered or threatened species is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules.
- 3C    **SUBCATEGORY 3C.** Species that are now considered to be more abundant and/or widespread than previously thought, and/or not subject to any identifiable threat.
- NS    **NO STATUS.**

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### 6.4 Animal Control Procedures and Monitoring at SSC

In an effort to prevent injury to SSC employees and visitors, SSC has established procedures regarding the control of alligators, abandoned and injured wildlife, domestic pets, rodents, birds and bats, panthers, and bears (8). These procedures include the following:

- Do not feed the alligators
- Contact NASA Environmental Management if abandoned, injured wildlife and nuisance animals are found
- Contact Site Security if domestic pets are found
- Contact the Trouble Desk if rodents, birds, and bats are found.

A procedure for panther/bear sightings was also established. Panther sightings are to be reported to the NASA Environmental Laboratory at SSC operated by the Technical Services Support contractor. A poster and a record form to be completed when a panther is sighted have been circulated throughout the facility. When a sighting is reported, laboratory personnel attempt to collect hard evidence, such as tracks or fur, in the vicinity of the reported sighting. Additional efforts concerning the Florida panther and other species, such as the Louisiana black bear, are coordinated with U.S. Fish and Wildlife Service. SSC tracks sightings of the Florida panther, the Louisiana black bear, and other species through a telephone "hotline" established for that purpose.

### 6.5 Major Environmental Considerations for Proposed Actions

There is a significant number of threatened, endangered, and ranked species with ranges that include SSC. Therefore, any development at the facility should include a survey for any species listed or ranked by USFWS or MDWFP that are likely to occur in the SSC area. Once a listed species is identified, the appropriate State or Federal agency should be consulted regarding any activity that could affect the habitat of that species. All construction and testing operations must be coordinated through NASA Environmental Management so that environmental impacts can be properly assessed.

### 6.6 Memberships

NASA is a member of the Black Bear Conservation Committee. This committee represents the combined efforts of numerous agencies, companies, organizations, and universities, which share a strong commitment to black bear restoration and management (5). In addition, NASA is a member of

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the Hancock Chamber Environmental Committee, which fosters government and industry collaboration and cooperation within Hancock County.

### 6.7 References

1. Mississippi Natural Heritage Program, March, 2001, species lists, Museum of Natural Science, Mississippi Dept. of Wildlife, Fisheries, and Parks, Jackson, MS.
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5. Conant, R., and Collins, J.T., 1991, A Field Guide to Reptiles and Amphibians, Eastern and Central North America, Boston, Mass., Houghton Mifflin Company.
6. Peterson, R. T., 1980, A Field Guide to the Birds of Eastern and Central North America, Boston, Mass., Houghton Mifflin Company.
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9. Page, L.M., and Burr, B.M., 1991, A Field Guide to Freshwater Fishes of North America North of Mexico, Boston, Mass., Houghton Mifflin Company.
10. Foster Wheeler Environmental Corp., 1996, Final Ecological Risk Assessment, Stennis Space Center.
11. Dr. P.K Lago and Dr. E.D. Keiser, Survey of Five Endangered Animal Species at the Stennis Space Center, Hancock County, Mississippi, Final Report, August 5, 1998.