

**A List of the Amphibians and Reptiles of the St. Andrew Bay
Ecosystem, Florida.**



Green Tree Frog (*Hyla cinerea*)



Gopher Tortoise (*Gopherus polyphemus*)

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For: Friends of St. Andrew Bay, Biodiversity Subcommittee

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Acknowledgements

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The St. Andrew Bay Environmental Study Team, Inc. and the Friends of St. Andrew Bay.

The St. Andrew Bay Environmental Study Team (BEST) was established in 1987 as a loosely structured non-advocacy organization with membership open to any person, industry, organization, or entity interested in the St. Andrew Bay ecosystem and its enclosed estuary, St. Andrew Bay. In 2007, the name was changed to the Friends of St. Andrew Bay (FSAB). FSAB, through its Steering Committee, proposes projects in accordance with its mission and goals statement.

The St. Andrew Bay Environmental Study Team (BEST, Inc.) is a 501(c)(3) not-for-profit Florida corporation formed in 1996 to receive and disburse funds to achieve the goals of BEST (= FSAB). The governing body of BEST, Inc. is the Board of Directors. BEST Inc. seeks and serves as the recipient of grants and donations and disburses those funds in accordance with the purpose of the grant or donation. BEST, Inc. is also responsible for its offices and employees.

The mission of BEST, Inc. and FSAB is to evaluate the status of the St. Andrew Bay ecosystem, identify problems where present, and recommend corrective actions where appropriate. Goals include providing science based information to decision makers, improving coordination and communication through forums regarding subjects of interest, and providing public education regarding the St. Andrew Bay ecosystem and its estuary.

Biodiversity Subcommittee

The purpose of the Biodiversity Subcommittee of the FSAB Steering Committee is to provide information to BEST, Inc. and the FSAB regarding the diversity of species and biotic communities of the St. Andrew Bay ecosystem. The biodiversity documents prepared by the Subcommittee are found on the FSAB website and include an inventory of the species associated with the St. Andrew Bay estuary, an inventory and herbarium collection of the vascular plants of Bay County, and other manuscripts documenting species and communities, both rare and common, in Bay County and the ecosystem.

Table of Contents

Acknowledgements	i
The St. Andrew Bay Environmental Study Team, Inc. & Friends of St. Andrew Bay	i
Biodiversity Subcommittee	i
Table of Contents	ii
Introduction	1
Materials and Methods	1
Results	3
Class -Amphibia	3
Class Reptilia	4
Listed and Tracked Species	6
Literature Cited	7
Appendix I.	8

Introduction

Dr. John Himes is employed by the Florida Fish and Wildlife Conservation Commission (FWC) and is an avid herpetologist. Mr. Paul Moler has retired after a very productive career with the FWC, but remains active and affiliated with the FWC as a herpetologist and is currently conducting research on crayfish throughout Florida. The Co-chairs of the Biodiversity Subcommittee approached Dr. Himes regarding the preparation of a list of amphibians and reptiles known from the St. Andrew Bay ecosystem. Dr. Himes enlisted the assistance of Mr. Moler and the lists were provided to the Biodiversity Subcommittee. The lists of amphibians and reptiles adds another link in the understanding of the species diversity of the St. Andrew Bay ecosystem to accompany the inventory of the biological resources of the St. Andrew Bay estuary, the inventory of vascular plants, the inventory of protected species, and other inventories of the species reported from the county and ecosystem.

The lists in the tables are the result of the work by Dr. Himes and Mr. Moler. Dr. Keppner drafted the text portion for extensive editing by the authors to make the document taxonomically correct, and to place the information in the form of previous inventories and lists of species prepared by the Biodiversity Subcommittee. The information provided in the text is basic and directed at providing a summary of the data provided in the lists.

The St. Andrew Bay ecosystem is a small ecosystem (about 1200 mi²), defined by its watershed, and is located entirely within Florida (Figure 1). The entire tidally influenced portion of the St. Andrew Bay estuary is located in Bay County. The Northwest Florida Water Management District includes St. Joe Bay in the St. Andrew Bay ecosystem. Within this small ecosystem there are a variety of habitats ranging from the sandhills area of the northern portion of the ecosystem with its numerous karst ponds and sandhills biotic community to the spring fed Econfina Creek to a variety of flatwoods, hardwood forests, swamps, steepheads, and ponds that support a variety of species including amphibians and reptiles.

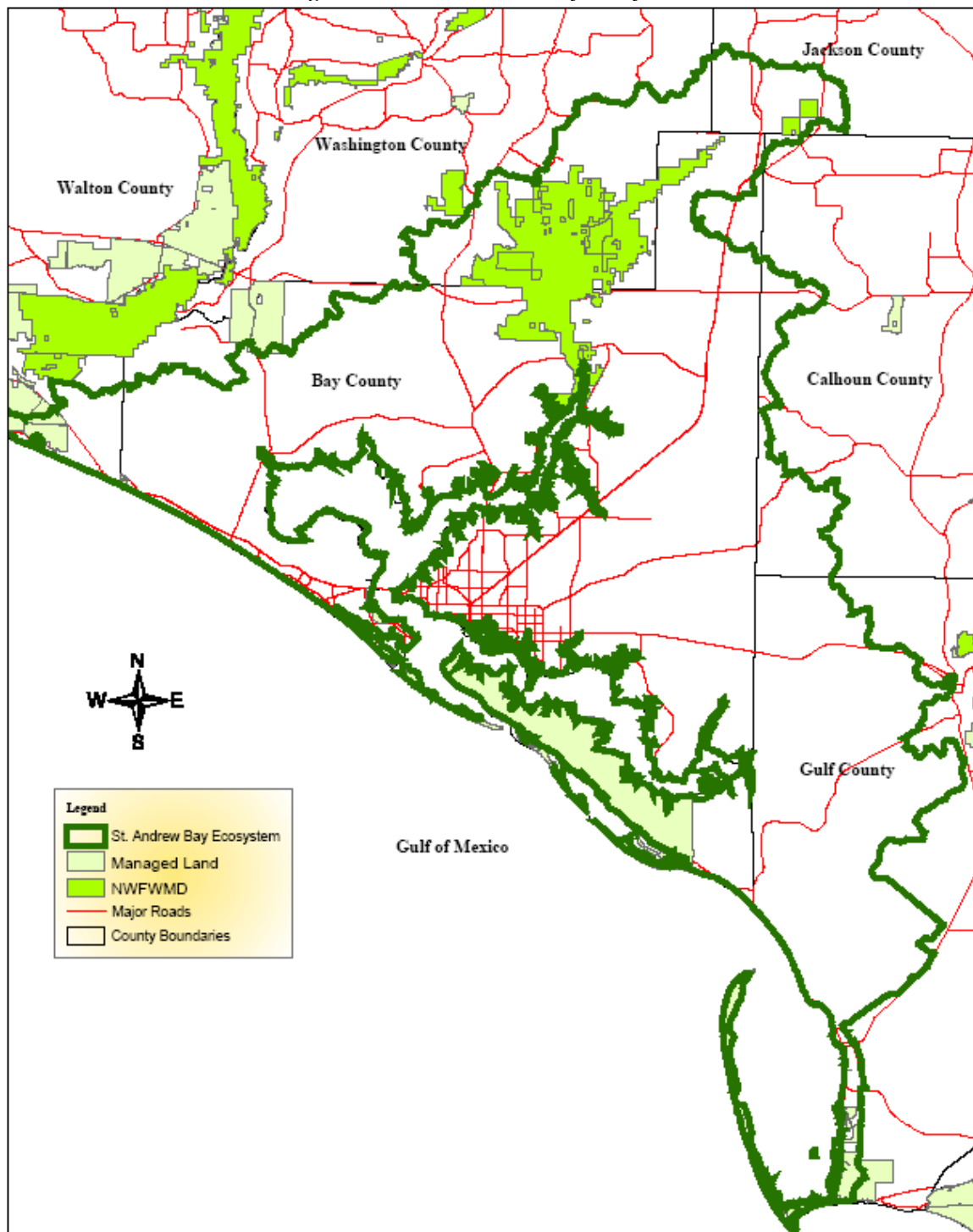
Materials and Methods

The lists below are based primarily on a 1992 review of the holdings of 48 museums and universities, most records of which are present in the Florida Museum of Natural History at the University of Florida (UF). In addition to the UF, records from the St. Andrew Bay ecosystem were present in 13 other collections: American Museum of Natural History (AMNH), Auburn University Museum (AUM), Brigham Young University Museum (BYU), Carnegie Museum (CM), Cornell University (CU), University of Kansas (KU), Los Angeles County Museum (LACM), Louisiana State University (LSU), Museum of Comparative Zoology (MCZ), North Carolina State Museum (NCSM), University of Michigan Museum of Zoology (UMMZ), United States National Museum (USNM), and the University of Texas Arlington Collection of Vertebrates (UTACV). The records of the species found by this extensive search are tied to existing specimens and the data existing for each specimen. A list of the specimens and the museum sources is appended to this report as Appendix I.

Additional records were obtained from the collections and observations of Dr. Neil Lamb, a fellow member of the FSAB, and Dr. Himes. Each record is established by a specimen and/or a photograph of the species that was observed. A superscripted 2 indicates species on the lists that have been collected or observed within the St. Andrew Bay ecosystem by Dr. Lamb (Ornate

Diamondback Terrapin only) and Dr. Himes (all other species). A superscripted 3 indicates species on the lists that possibly occur in the ecosystem, but observations by qualified people or specimens of these species have not been obtained to date. The lists are arranged by Order,

Figure 1. The St. Andrew Bay Ecosystem.



Common Name, and Genus and Species. The common names were selected from Crother (2000) and Collins and Taggart (2002).

Results

Class – Amphibia. The list in Table 1 below contains 22 native species of frogs and toads, 3 introduced species of frogs and toads, and 20 native species of salamanders that are known to occur or may possibly occur in the St. Andrew Bay ecosystem. The total number of amphibian species in the ecosystem is 43.

Table 1. Amphibians from the St. Andrew Bay Ecosystem, Florida.

Order	Common Name	Genus & Species
Anura-Frogs & Toads		
	Southern Cricket Frog	<i>Acris gryllus</i>
	Marine Toad	<i>Bufo marinus</i> ¹
	Oak Toad	<i>Bufo quercicus</i>
	Southern Toad	<i>Bufo terrestris</i>
	Fowler's Toad	<i>Bufo fowleri</i>
	Greenhouse Frog	<i>Eleutherodactylus planirostris</i> ¹
	Eastern Narrow-mouthed Toad	<i>Gastrophryne carolinensis</i>
	Bird-voiced Treefrog	<i>Hyla avivoca</i> ²
	Cope's Gray Treefrog	<i>Hyla chrysoscelis</i> ²
	Green Treefrog	<i>Hyla cinerea</i>
	Pine Woods Treefrog	<i>Hyla femoralis</i>
	Barking Treefrog	<i>Hyla gratiosa</i>
	Squirrel Treefrog	<i>Hyla squirella</i>
	Cuban Treefrog	<i>Osteopilus septentrionalis</i> ^{1,2}
	Spring Peeper	<i>Pseudacris crucifer</i> ²
	Upland Chorus Frog	<i>Pseudacris feriarum</i> ³
	Southern Chorus Frog	<i>Pseudacris nigrita</i>
	Little Grass Frog	<i>Pseudacris ocularis</i> ²
	Ornate Chorus Frog	<i>Pseudacris ornata</i>
	Gopher Frog	<i>Rana capito</i> ³
	Bullfrog	<i>Rana catesbeiana</i> ²
	Green Frog	<i>Rana clamitans</i>
	Pig Frog	<i>Rana grylio</i>
	River Frog	<i>Rana heckscheri</i>
	Southern Leopard Frog	<i>Rana sphenocephala</i>
	Eastern Spadefoot	<i>Scaphiopus holbrookii</i> ²
Caudata-Salamanders		
	Bishop's Salamander	<i>Ambystoma bishopi</i>
	Marbled Salamander	<i>Ambystoma opacum</i>
	Mole Salamander	<i>Ambystoma talpoideum</i>
	Two-toed Amphiuma	<i>Amphiuma means</i>
	One-toed Amphiuma	<i>Amphiuma pholeter</i> ³
	Southern Dusky Salamander	<i>Desmognathus auriculatus</i>
	Spotted Dusky Salamander	<i>Desmognathus conanti</i>
	Chamberlain's Dwarf Salamander	<i>Eurycea chamberlaini</i> ³
	Southern Two-lined Salamander	<i>Eurycea cirrigera</i>
	Three-lined Salamander	<i>Eurycea guttolineata</i>
	Dwarf Salamander	<i>Eurycea quadridigitata</i>

	Four-toed Salamander	<i>Hemidactylum scutatum</i> ³
	Loding's Waterdog	<i>Necturus cf. beyeri</i>
	Eastern Newt	<i>Notophthalmus viridescens</i>
	Southeastern Slimy Salamander	<i>Plethodon grobmani</i>
	Northern Dwarf Siren	<i>Pseudobranchius striatus</i>
	Mud Salamander	<i>Pseudotriton montanus</i> ³
	Red Salamander	<i>Pseudotriton ruber</i>
	Eastern Lesser Siren	<i>Siren cf. intermedia</i>
	Greater Siren	<i>Siren cf. lacertina</i> ²

¹ = Introduced. ² = Observed in the area of interest. ³ = Possibly occurs in the area of interest.

Class – Reptilia. The list in Table 2 below contains 1 native species of crocodylian, 12 native species of lizards, 2 introduced species of lizards, 35 native species of snakes, and 20 native species of turtles that are known to occur or may possibly occur in the St. Andrew Bay ecosystem. The total number of species of reptiles in the ecosystem is 70.

Table 2. Reptiles from the St. Andrew Bay Ecosystem, Florida.

Order	Common Name	Genus & Species
Crocodylia-Crocodylians		
	American Alligator	<i>Alligator mississippiensis</i>
Squamata-Lizards		
	Green Anole	<i>Anolis carolinensis</i>
	Six-lined Racerunner	<i>Aspiloscelis (= Cnemidophorus) sexlineatus</i>
	Coal Skink	<i>Eumeces anthracinus</i> ³
	Mole Skink	<i>Eumeces egregius</i> ²
	Five-lined Skink	<i>Eumeces fasciatus</i> ²
	Southeastern Five-lined Skink	<i>Eumeces inexpectatus</i> ²
	Broad-headed Skink	<i>Eumeces laticeps</i> ²
	Brown Anole	<i>Norops (= Anolis) sagrei</i> ¹
	Slender Glass Lizard	<i>Ophisaurus attenuatus</i>
	Mimic Glass Lizard	<i>Ophisaurus mimicus</i>
	Eastern Glass Lizard	<i>Ophisaurus ventralis</i>
	Fence Lizard	<i>Sceloporus undulatus</i>
	Ground Skink	<i>Scincella lateralis</i>
	Mediterranean Gecko	<i>Hemidactylus turcicus</i> ^{1,2}
	Indo-Pacific Gecko	<i>Hemidactylus garnotii</i> ¹
Squamata-Snakes		
	Cottonmouth	<i>Agkistrodon piscivorus</i>
	Scarlet Snake	<i>Cemophora coccinea</i>
	Racer	<i>Coluber constrictor</i>

	Eastern Diamondback Rattlesnake	<i>Crotalus adamanteus</i>
	Ringneck Snake	<i>Diadophis punctatus</i>
	Eastern Indigo Snake	<i>Drymarchon couperi</i> ³
	Corn Snake	<i>Elaphe guttata</i>
	Rat Snake	<i>Elaphe obsoleta</i>
	Eastern Mud Snake	<i>Farancia abacura</i>
	Rainbow Snake	<i>Farancia erythrogramma</i> ³
	Eastern Hognose Snake	<i>Heterodon platirhinos</i>
	Southern Hognose Snake	<i>Heterodon simus</i> ³
	Prairie Kingsnake	<i>Lampropeltis calligaster</i>
	Eastern Kingsnake	<i>Lampropeltis getula</i>
	Coachwhip	<i>Masticophis flagellum</i>
	Eastern Coral Snake	<i>Micrurus fulvius</i>
	Saltmarsh Snake	<i>Nerodia clarkii</i>
	Plain-bellied Water Snake	<i>Nerodia erythrogaster</i> ³
	Southern Water Snake	<i>Nerodia fasciata</i>
	Florida Green Water Snake	<i>Nerodia floridana</i> ³
	Northern Water Snake	<i>Nerodia sipedon</i>
	Brown Water Snake	<i>Nerodia taxispilota</i>
	Rough Green Snake	<i>Opheodrys aestivus</i>
	Pine Snake	<i>Pituophis melanoleucus</i>
	Glossy Crayfish Snake	<i>Regina rigida</i>
	Queen Snake	<i>Regina septemvittata</i>
	Pine Woods Snake	<i>Rhadinaea flavilata</i>
	Pigmy Rattlesnake	<i>Sistrurus miliarius</i>
	Brown Snake	<i>Storeria dekayi</i>
	Red-bellied Snake	<i>Storeria occipitomaculata</i>
	Southeastern Crowned Snake	<i>Tantilla coronata</i> ²
	Eastern Ribbon Snake	<i>Thamnophis sauritus</i>
	Eastern Garter Snake	<i>Thamnophis sirtalis</i>
	Smooth Earth Snake	<i>Virginia valeriae</i> ³
	Rough Earth Snake	<i>Virginia striatula</i>
	Testudines-Turtles	
	Florida Softshell	<i>Apalone ferox</i> ²
	Spiny Softshell	<i>Apalone spinifera</i> ³
	Loggerhead	<i>Caretta caretta</i>
	Green Turtle	<i>Chelonia mydas</i>
	Eastern Snapping Turtle	<i>Chelydra serpentina</i>
	Chicken Turtle	<i>Deirochelys reticularia</i>
	Leatherback	<i>Dermochelys coriacea</i> ²

	Hawksbill	<i>Eretmochelys imbricata</i>
	Gopher Tortoise	<i>Gopherus polyphemus</i> ²
	Atlantic Ridley	<i>Lepidochelys kempii</i>
	Eastern Mud Turtle	<i>Kinosternon subrubrum</i>
	Diamondback Terrapin	<i>Malaclemmys terrapin</i> ²
	Alligator Snapping Turtle	<i>Macrochelys temminckii</i>
	River Cooter	<i>Pseudemys concinna</i>
	Florida Cooter	<i>Pseudemys floridana</i>
	Slider	<i>Trachemys scripta</i>
	Loggerhead Musk Turtle	<i>Sternotherus minor</i>
	Common Musk Turtle	<i>Sternotherus odoratus</i>
	Eastern Box Turtle	<i>Terrapene carolina</i>

¹ = Introduced. ² = Observed in the area of interest. ³ = Possibly occurs in the area of interest.

Listed and Tracked Species

The U.S. Fish and Wildlife Service is responsible for listing and protecting species of plants and animals that are considered imperiled nationally under the Endangered Species Act. The FWC also provides protection for species that are imperiled in Florida. The Florida Natural Areas Inventory (FNAI) (2005) tracks species that they consider imperiled, but the FNAI designation is not regulatory. Table 3 lists the 19 species of amphibians and reptiles known to occur or possibly occur within the St. Andrew Bay ecosystem that are listed for protection or are tracked by FNAI.

Table 3. Listed and Tracked Species of Amphibians and Reptiles in the St. Andrew Bay Ecosystem.

Group	Genus & Species	FNAI	FWS	FWC
Frogs & Toads				
	<i>Rana capito</i> ³	S3	N	S
Salamanders				
	<i>Ambystoma cingulatum</i> ⁴	S2S3	T	S
	<i>Amphiuma pholeter</i> ³	S3	N	N
	<i>Hemidactylium scutatum</i> ³	S2	N	N
Crocodylia				
	<i>Alligator mississippiensis</i>	S4	SAT	S
Lizards				
	<i>Eumeces anthracinus</i> ³	S3	N	N
Snakes				
	<i>Crotalus adamanteus</i>	S3	N	N
	<i>Drymarchon corais couperi</i> ³	S3	T	T
	<i>Heterodon simus</i> ³	S2	N	N
	<i>Lampropeltis calligaster</i>	S2S3	N	N
	<i>Nerodia clarkii clarkii</i>	S3?	N	N
	<i>Pituophis melanoleucus mugitus</i>	S3	N	S

Turtles				
	<i>Caretta caretta</i>	S3	T	T
	<i>Chelonia mydas</i>	S2	E	E
	<i>Dermochelys coriacea</i> ²	S2	E	E
	<i>Eretmochelys imbricata</i>	S1	E	E
	<i>Gopherus polyphemus</i> ²	S3	N	S
	<i>Lepidochelys kempii</i>	S1	E	E
	<i>Macrochelys temminckii</i> ²	S3	N	S

² and ³ have the same meaning as for Tables 2 & 3. ⁴Populations of this species west of the Apalachicola River (and hence in the St. Andrew Bay ecosystem) are now considered to constitute a separate species, *Ambystoma bishopi* (Pauly et al., 2007). S1 = Critically Imperiled. S2 = Imperiled. S3 = Rare or local throughout its range. S4 = Apparently secure. S2S3 = insufficient data to establish rank. E = Endangered. T = Threatened. S = Species of Special Concern. SAT = Threatened due to similarity of appearance to a threatened species.

Literature Cited

- Collins, J. T., and T. W. Taggart. 2002. Standard Common and Current Scientific Names for North American Amphibians, Turtles, Reptiles & Crocodilians. The Center for North American Herpetology. Lawrence, Kansas. 44 pp.
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- Florida Natural Areas Inventory. 2005. FNAI – Element Tracking Summary. Florida Natural Areas Inventory, Tallahassee, FL. www.fnai.org.
- Pauly, G. B., O. Piskurek, and H. B. Shaffer. 2007. Phylogeographic concordance in the southeastern United States: the flatwoods salamander, *Ambystoma cingulatum*, as a test case. *Molecular Ecology* 16:415-429.

APPENDIX I.

Museum Specimen List (Himes and Moler)

Museum	Catalogue Number	Genus & Species	County
LSU	28963	<i>Acris gryllus</i>	BAY
CM	21467	<i>Agkistrodon piscivorus</i>	BAY
UMMZ	81174	<i>Ambystoma cingulatum</i>	BAY
AUM	22965	<i>Ambystoma opacum</i>	BAY
MCZ	42589	<i>Ambystoma talpoideum</i>	BAY
UMMZ	81195	<i>Amphiuma means</i>	BAY
UMMZ	81201	<i>Anolis carolinensis</i>	BAY
UMMZ	81209	<i>Anolis sagrei</i>	BAY
UMMZ	81171	<i>Aspidoscelis sexlineatus</i>	BAY
LSU	24277,30518-9	<i>Bufo quercicus</i>	BAY
LSU	23765	<i>Bufo terrestris</i>	BAY
CM	21366-7	<i>Bufo fowleri</i>	BAY
CM	21365	<i>Cemophora coccinea</i>	BAY
UMMZ	122519	<i>Chelonia mydas</i>	BAY
AUM	19926	<i>Coluber constrictor</i>	BAY
AUM	21565-6	<i>Crotalus adamanteus</i>	BAY
AUM	24031	<i>Deirochelys reticularia</i>	BAY
AUM	24010-18	<i>Desmognathus auriculatus</i>	BAY
AUM	24030	<i>Desmognathus conanti</i>	BAY
CU	8805	<i>Diadophis punctatus</i>	BAY
LACM	8017-8	<i>Elaphe guttata</i>	BAY
UF	63060	<i>Elaphe obsoleta</i>	BAY
AMNH	87827-9	<i>Eleutherodactylus planirostris</i>	BAY
UF	88770	<i>Eurycea cirrigera</i>	BAY
UF	88864	<i>Eurycea guttolineata</i>	BAY
CM	69357	<i>Eurycea quadridigitata</i>	BAY
AUM	24237	<i>Farancia abacura</i>	BAY
MCZ	86341	<i>Gastrophryne carolinensis</i>	BAY
BYU	40246	<i>Hemidactylus garnotii</i>	BAY
MCZ	86358-9	<i>Heterodon platirhinos</i>	BAY
AMNH	58911	<i>Hyla cinerea</i>	BAY
KU	176234	<i>Hyla femoralis</i>	BAY
AMNH	58908	<i>Hyla gratiosa</i>	BAY
UF	88783	<i>Hyla squirella</i>	BAY
LSU	40037	<i>Kinosternon subrubrum</i>	BAY
KU	175588	<i>Lampropeltis calligaster</i>	BAY
NCSM	24610	<i>Lampropeltis getula</i>	BAY
UF	49990	<i>Macrochelys temminckii</i>	BAY
UMMZ	90095	<i>Masticophis flagellum</i>	BAY
MCZ	109193-5	<i>Micrurus fulvius</i>	BAY
CM	94506	<i>Necturus cf. beyeri</i>	BAY
LSU	28835	<i>Nerodia clarkii</i>	BAY
UTACV	R-2408	<i>Nerodia fasciata</i>	BAY

UF	78393	<i>Nerodia fasciata</i>	BAY
UF	75462	<i>Nerodia taxispilota</i>	BAY
UF	56376	<i>Notophthalmus viridescens</i>	BAY
UF	67833	<i>Opheodrys aestivus</i>	BAY
UF	8808	<i>Ophisaurus attenuatus</i>	BAY
UF	88867	<i>Ophisaurus mimicus</i>	BAY
UF	109440	<i>Ophisaurus ventralis</i>	BAY
UF	88750	<i>Pituophis melanoleucus</i>	BAY
UF	89511	<i>Plethodon grobmani</i>	BAY
UF	144335	<i>Pseudacris nigrita</i>	BAY
UF	76174	<i>Pseudacris ornata</i>	BAY
UF	109826	<i>Pseudemys concinna</i>	BAY
UF	41180	<i>Pseudemys floridana</i>	BAY
UF	1953	<i>Pseudobranchius striatus</i>	BAY
UF	42999	<i>Pseudotriton ruber</i>	BAY
UF	7833	<i>Rana clamitans</i>	GULF
CM	21466	<i>Rana grylio</i>	GULF
CM	21465	<i>Rana heckscheri</i>	GULF
LACM	28775	<i>Rana sphenoccephala</i>	GULF
AMNH	108452	<i>Regina rigida</i>	GULF
AMNH	18890, 18912	<i>Regina septemvittata</i>	GULF
AMNH	20078	<i>Sceloporus undulatus</i>	GULF
AMNH	18904-6	<i>Scincella lateralis</i>	GULF
UF	9488	<i>Siren cf. intermedia</i>	GULF
USNM	218774	<i>Sistrurus miliarius</i>	GULF
AUM	31175	<i>Sternotherus minor</i>	GULF
AMNH	109060	<i>Sternotherus odoratus</i>	GULF
UF	8842	<i>Storeria dekayi</i>	GULF
UF	8812	<i>Storeria occipitomaculata</i>	GULF
UF	57757	<i>Terrapene carolina</i>	GULF
UF	84091	<i>Thamnophis sauritus</i>	GULF
UF	87950	<i>Thamnophis sirtalis</i>	WASHINGTON
UF	87954	<i>Trachemys scripta</i>	WASHINGTON
UF	88734	<i>Virginia striatula</i>	WASHINGTON