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Report T-622
The Status of Florida Tree Snails
(Liguus fasciatus), Introduced
to Everglades National Park



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INTRODUCTION

The Florida tree snail, Liguus fasciatus, in the family Bulimulidae, is unique among land snails in North America because of its bright colors and variable patterns. This species is tropical in origin being derived from West Indian forms. It is restricted to the tropical hardwood hammocks scattered throughout south Florida including the Florida Keys. There are 58 named color forms. Of these, 10 are extinct in their native habitat and 4 may soon become extinct. Other color forms are threatened by the eminent destruction of their habitat. It was the threat of extinction that prompted four snail collectors (Jones, Winte, Humes, and Von Paulsen) to approach the Superintendent of Everglades National Park in 1957 with the idea of introducing threatened color forms into the park. This report summarizes the results of this 23-year project.

GENERAL HISTORY, TAXONOMY AND DISTRIBUTION

History and Taxonomy

Early in the 1800's, naturalists and collectors found and collected Liguus in the Florida Keys. Several of these collections were taken to American and British museums. Thomas Say (1825) was the first to name and describe a Florida tree snail.

Until the early 1900's the tree snails of Florida were not well known because access to the region was limited and difficult. The Everglades, Atlantic Coastal Ridge and Florida Keys were sparsely populated and mostly unexplored. The building of the overseas railroad from Miami to Key West from 1904 to 1912 and the Ingraham Highway to Flamingo opened up more areas. At this time Charles T. Simpson began to travel the entire length of the railroad and highway system. He collected extensively in the hammocks of the Atlantic Coastal Ridge and Florida Keys. With the completion of the Tamiami Trail, connecting Miami with the west coast in 1928, the interior of south Florida became more accessible. The tree snail was discovered in the area now known as Pinecrest, further inland than it had ever been found before (Clench and Boss 1967). Joseph Farnum, Henry Frampton, Richard Deckert, followed by William Clench and others, visited and collected here.

Henry A. Pilsbry (1912) made the first study of the zoogeography and variations of Liguus in Florida. He named 15 forms as subspecies, classified under three species, L. solidus, L. fasciatus and L. crenatus. In 1920, Simpson described 18 new subspecies, bringing the total named forms to 35. Later papers by W. J. Clench (1929, 1933, 1935, 1942), H. G. Frampton (1932), M. F. Doe (1937), A. Pflueger (1934) and M. DeBoe (1933) described an additional 17 forms. Clench and Fairchild (1939) published a classification of Florida Liguus, which recognized 3 subspecies, solidus, lignumvitae, and roseatus under a single species L. fasciatus. The definitive taxonomic work on Florida Liguus was published by Pilsbry in 1946. He classified Liguus under a single species, 8 subspecies, 16 forms with 31 varieties. Since 1942, eight additional forms have been described (Humes 1954; Young 1952; Jones 1979) making a total of 58 color forms. Pilsbry's taxonomic system is still the most widely used.

Distribution

The genus Liguus is native to Cuba, the Isle of Pines, Hispaniola, and Florida (Pilsbry 1946). The Florida tree snail is considered by most authors (Pilsbry 1946 and Simpson 1929) to have immigrated from Cuba. Figure 1 shows the distribution of the Liguus in south Florida. It was once found on the east coast as far north as Yamato in Palm Beach County and south through the Florida Keys to Key West. Inland, it occurs in hammocks from Immokalee southward through the Big Cypress Swamp and Everglades National Park (Young 1951). On the west coast it has been found on the shell mounds in the Ten Thousand Islands as far north as Marco Island, Collier County (Pilsbry 1946, Simpson 1921).

The area in which the tree snails are found have been divided into arbitrary geographical regions (Figure 1) and the hammocks in each region have been named and/or numbered. These regions are as follows: (1) Long Pine Key (LPK), located at the south end of the Atlantic Coastal Ridge inside Everglades National Park; (2) Central Plains (CP), the area lying south of an east-west line approximately 3.5 miles south of the Loop Road (S.R. 94); (3) Pinecrest (PC) region, the area around the Loop Road (S.R. 94); (4) Collier County (CC), the area north of the Tamiami Trail (U.S. 41); (5) Upper Keys, from Biscayne Bay to Lower Matecumbe Key; (6) Middle Keys, from Long Key to Bahia Honda Key; (7) Lower Keys, from Little Pine Key to Key West; (8) West Coast, from Lostman's Key to Marco Island; (9) Cape Sable and south coast; and (10) Atlantic Coastal Ridge.

PROJECT HISTORY

In 1957 a project to save the various color forms of Florida tree snails was proposed to Everglades National Park by Ralph H. Humes, and was approved by Superintendent Daniel B. Beard. Participating on the project were Archie L. Jones, Erwin C. Winte, Captain C. C. Von Paulsen, and Humes. They were long-time snail collectors and had become concerned over the decline and loss of various color forms. The purpose of this project was the preservation of those color forms whose native habitat occurred outside of Everglades National Park. This was accomplished by transplanting color forms into Everglades hammocks that were devoid of Liguus.

The product of this project over the past 23 years has been the successful introduction of 51 color forms into hammocks located in the rocky glade land immediately north of Long Pine Key (Figure 2). Since their introduction into the park, pictus, pseudopictus, solidulus, splendidus and septentrionalis have become extinct in their native locations. During the course of the project, delicatus, subcrenatus, and vonpaulseni have declined in their native habitat and may soon occur only in Everglades National Park.

Over this 23-year period much information was accumulated by Jones and Winte in the form of field notes and maps. Although some data are available in annual investigators reports (1957, 1958, 1962, 1965, 1967, 1968, 1969, 1970, 1971, and 1972), these reports gave only written description of the work for that particular year and not the exact location of each introduction into the park. To remedy this, in 1977 the park began to document the exact locations, color form(s) present, and history of each introduction.

METHODS

Introduction Area

Figure 2 shows the location of the introduction sites. The area is bounded on the south by the main park road, on the north by the park boundary, on the east by Taylor Slough and on the west by Shark Slough. This area is called the "rocky glades." It is characterized by oolitic limestone outcroppings in a sawgrass (Cladium jamaicensis) marsh with scattered tropical hardwood hammocks. Tropical hardwood species most commonly found are wild tamarind (Lysiloma latisiliquum), willow-bustic (Dipholis salicifolia), gumbo limbo (Bursera simaruba), and poisonwood (Metopium toxiferum). The hammocks vary in size from approximately 3 to over 10,000 square meters. There are approximately 400 hammocks in the area.

Mapping

A map was made to determine the exact location of each introduction. From January 1977 to March 1978, monthly trips were made in the introduction area. Hammocks were systematically mapped. Aerial photos were used to map each hammock. Hammocks were ground-truthed to determine the color form(s) present. Data recorded were hammock number, color form(s), origin of color form(s) and date introduced.

STATUS OF COLOR FORMS

The status of the Florida tree snail differs among color forms. Some forms, such as castaneozonatus, are common and widespread throughout the overall range of the species. Other color forms, such as fuscoflammellus, are rare and restricted to one or two hammocks. Populations of most color forms have changed during the past 50 or 60 years. The primary cause has been habitat destruction because of development. Extinction has also occurred as a result of natural causes such as fires and hurricanes. Fire destroyed the hammocks in which farnumi and viol-afumosus occurred. The 1935 hurricane destroyed the color form dohertyi. Of the 10 color forms extinct in their native habitat (Table 1), 8 are from the Florida Keys.

The following is a brief summary of the status of each color form in its native habitat and those introduced in Everglades National Park. This information is based on the field observations of Jones and Winte.

STATUS

Color Form	Native	Introduced	Site Number
<u>alternatus</u>	Known only from Timm's (type locality) and Black Point Creek Hammock of the Atlantic Coastal Ridge. Occurs uncommonly with other color forms. Black Point Creek Hammock is destroyed.	Established in 3 mixed colonies.	2, 64, 115
<u>aurantius</u>	Common in the hammocks of PC, CC, and CP regions. Uncommon in the hammocks of LPK and Brickell Hammock. Occurs in mixed colonies except for a few pure colonies in the PC region, of which 2 were destroyed by fire.	Established in 3 pure and 2 mixed colonies.	33,74,88,125,211
<u>barbouri</u>	Common and widespread in the PC, CC and CP regions. Usually found in mixed colonies.	Established in 9 pure and 12 mixed colonies.	1, 7, 11, 29, 31, 44, 57, 76, 91, 94, 96, 131, 148, 149, 169, 177, 180, 187, 207, 223, 225
<u>beardi</u>	Rare in mixed colony. Known only from a single hammock north of LPK region. Probably extinct except in park hammocks.	Established in 2 mixed colonies.	109, 159
<u>capensis</u>	Formerly common in mixed and pure colonies on Cape Sable, Flamingo and Cuthbert Lake. Presently found only at NW Cape Sable.	Established in 6 pure colonies.	47, 48, 134, 152, 156, 167
<u>castaneozonatus</u>	Abundant and widespread throughout the CC, PC, CP, and LPK regions, along the Atlantic Coastal Ridge, Ten Thousand Islands, Chokoloskee, Cape Sable and Upper Keys. Also found on Key Vaca. Occurs almost entirely in mixed colonies. Probably extinct at Key Vaca and Chokoloskee. Threatened at Marco Island.	Established in 15 mixed colonies.	5,10,12,17,18,19, 54, 92, 98, 99, 100, 145, 175, 218, 230
<u>castaneus</u>	Occurs commonly in mixed colonies in LPK, rarely in Brickell and Cox's Hammock.	Established in 3 mixed colonies.	110, 147, 164
<u>cingulatus</u>	Uncommon. Found primarily in mixed colonies along the Atlantic Coastal Ridge, East and Middle Cape Sable, LPK, PC, CC, and CP. Formerly found on Key Largo and Key Vaca.	Established in 3 pure and 5 mixed colonies.	3, 30, 45, 120, 181, 218, 230, 231

STATUS

Color Form	Native	Introduced	Site Number
<u>clenchi</u>	Uncommon in mixed colonies. Found only in the PC, CC, and CP regions.	Established in 9 mixed colonies.	11, 21, 73, 82, 83, 84, 98, 112, 180
<u>crassus</u>	Probably the rarest color form of Florida <u>Liguus</u> . Occurred only on Big Pine and Ramrod Keys. Very rare in mixed colonies. Extinct.	None.	
<u>deckerti</u>	Rare, occurring only in mixed colonies. Known only from Brickell Hammock, LPK hammocks 55 and 26, PC hammocks 40 and 43 and Cox's Hammock.	Established in 1 pure and 5 mixed colonies.	39, 77, 153, 175, 212, 220
<u>delicatus</u>	Formerly common in mixed colonies on Upper and Lower Matecumbe Keys and Indian Key. Found now only in Upper Hammock of Lower Matecumbe Key. Introduced on Lignum Vitae Key. This form will probably soon become extinct within its native range.	Established in 2 pure and 2 mixed colonies.	8, 13, 63, 128
<u>dohertyi</u>	Formerly occurred as a monomorphic colony in one beach hammock on Lower Matecumbe Key. Extinct. The hammock was destroyed by the 1935 hurricane.	None.	
<u>dryas</u>	Common in mixed colonies. Formerly found on No Name and Little Pine Keys. No longer found on No Name Key.	Established in 2 pure and 7 mixed colonies.	203, 209, 216, 217, 221, 227, 228, 237, 241
<u>eburneus</u>	Common in mixed and pure colonies on Atlantic Coastal Ridge and LPK region.	Established in 3 mixed colonies.	31, 32, 202
<u>elegans</u>	Common in Atoll Hammock (pure colony), rare in Upper Keys, CC, LPK, and PC. Occurs in mixed and pure colonies.	Established in 2 pure colonies.	233, 234
<u>elliottensis</u>	Uncommon in mixed colonies of Upper Keys, and Key Vaca. Possibly extinct on Elliott Key (type locality), elsewhere unchanged.	None.	
<u>evergladesensis</u>	Uncommon in mixed colony. Known only from a single hammock in the CC region.	Established in 4 pure colonies.	67, 70, 81, 165

STATUS

Color Form	Native	Introduced	Site Number
<u>farnumi</u>	Uncommon in mixed colonies. Known only from PC hammocks number 7, 8 and 23. Extinct in PC 7 and possibly PC 8.	None.	
<u>floridanus</u>	Formerly common in mixed colonies. Found only in PC, CP, and CC regions.	Established in 7 pure and 5 mixed colonies.	11, 15, 16, 73, 75, 105, 106, 155, 172, 197, 208, 211
<u>framptoni</u>	Uncommon in mixed colonies. Known only from a few hammocks north of LPK region.	Established in 4 mixed colonies.	17, 18, 19, 59
<u>fuscoflammellus</u>	Known only from Timm's Hammock, Atlantic Coastal Ridge. Found rarely in mixed colony.	Established in 4 pure and 7 mixed colonies.	60, 71, 72, 115, 189, 190, 193, 194, 195, 200, 231
<u>gloriasylvaticus</u>	Known only from CC 10 (Bloodhound Hammock), CC 14 and Meon Hammock. Common in mixed colonies. Now found only in CC 10.	Established in 3 pure and 4 mixed colonies.	15, 16, 23, 24, 28, 126, 171
<u>graphicus</u>	Formerly common in mixed colonies of Lower Keys. Common but now restricted to Little Pine and No Name Keys.	Established in 5 pure and 5 mixed colonies.	76, 85, 89, 94, 103, 107, 127, 138, 162, 237
<u>humesi</u>	Uncommon in mixed colonies. Known only from a few hammocks north of LPK region.	Established in 1 pure and 4 mixed colonies.	17, 18, 19, 89, 95
<u>innominatus</u>	Rare in mixed colonies. Known only from No Name and Little Pine Keys. No specimens have been collected in recent years. May not be distinguishable from <u>graphicus</u> , with which it occurs.	Introductions were attempted of 2-year-old individuals. Later inspection proved them to be <u>graphicus</u> .	
<u>kennethi</u>	Rare in mixed colony. Known only from PC 13. Probably extinct except in park colonies.	Established in 1 pure and 1 mixed colonies.	20, 65
<u>lignumvitae</u>	Formerly common in mixed colonies on Lower Matecumbe Key and Lignum Vitae Key. Three pure colonies occurred on Lower Matecumbe Key, but were destroyed.	Established in 5 pure and 2 mixed colonies.	133, 135, 136, 137, 138, 139, 184
<u>livingstoni</u>	Uncommon to common in mixed colonies. Found in PC, CC, CP, LPK and Atlantic Coastal Ridge.	Established in 6 mixed colonies.	12, 50, 97, 102, 218, 230

STATUS

Color Form	Native	Introduced	Site Number
<u>lineolatus</u>	Common in mixed colonies of the Upper Keys, Marco Island and Cape Sable. Found in pure colony on Russell's Key.	Established in 2 pure and 2 mixed colonies.	133, 143, 141, 144
<u>lossmanicus</u>	Abundant and widespread throughout the CC, CP, PC, LPK, Atlantic Coastal Ridge and Lostman's Key in the Ten Thousand Islands, occurring in both pure and mixed colonies.	Established in 14 mixed colonies.	1, 11, 21, 73, 82, 83, 84, 102, 142, 144, 148, 180, 218, 231
<u>lucidovarius</u>	Rare in mixed colonies. Known only from PC hammock 11	Established in 8 mixed colonies.	21, 82, 83, 84, 112, 116, 122, 166
<u>luteus</u>	Abundant throughout LPK and Atlantic Coastal Ridge. Also found on Key Vaca. Occurs in mixed and pure colonies. Near extinction on Key Vaca (type locality).	Established in 1 pure and 9 mixed colonies.	4, 17, 18, 19, 147, 164, 211, 218, 226, 230
<u>margaretae</u>	Rare in mixed colony. Known only from one hammock north of LPK region. Probably extinct except in park colonies.	Established in 1 pure and 2 mixed colonies.	109, 159, 235
<u>marmoratus</u>	Formerly uncommon and widespread throughout CC, PC, CP, and Atlantic Coastal Ridge. Also found on Cape Sable, Chokoloskee, Key Vaca and occasionally in the LPK region. Occurs in mixed colonies. Extinct on Cape Sable, Chokoloskee, and Key Vaca (type locality).	Established in 12 pure and 14 mixed colonies.	4, 11, 14, 33, 39, 77, 92, 104, 110, 111, 114, 118, 132, 145, 150, 153, 175, 199, 204, 205, 212, 214, 215, 222, 224, 231
<u>matecumbensis</u>	Formerly common in one pure colony on Upper Matecumbe Key (type locality) and in mixed colonies at Elliott Key, Flamingo and Coot Bay Hammocks. Now rare at type locality on Upper Matecumbe Key. Uncommon at Flamingo and Coot Bay.	Established in 1 pure colony.	210
<u>miamiensis</u>	Common throughout the Atlantic Coastal Ridge, LPK, PC, CC, and CP. Found primarily in mixed colonies. Only one pure colony (PC 37).	Established in 3 pure and 5 mixed colonies.	5, 54, 86, 87, 107, 198, 218, 230
<u>mosieri</u>	Uncommon in PC and LPK regions and along Atlantic Coastal Ridge. Found only in mixed colonies.	Established in 1 pure and 4 mixed colonies	12, 52, 218, 230, 231

STATUS

Color Form	Native	Introduced	Site Number
<u>nebulosus</u>	Found only in CC 10 (Bloodhound Hammock). Uncommon in mixed colony.	Established in 4 mixed colonies.	15, 23, 90, 171
<u>ornatus</u>	Uncommon throughout Atlantic Coastal Ridge, LPK, CC, PC, and CP regions. Upper Florida Keys only on Totten Key and Key Largo. Occurs in mixed colonies.	Established in 5 pure and 12 mixed colonies.	12, 29, 30, 32, 100, 101, 130, 133, 141, 142, 143, 144, 158, 204, 218, 230, 232
<u>osmenti</u>	Found only on Howe Key. Common in pure colony.	Established in 1 pure and 3 mixed colonies.	121, 227, 228, 236
<u>pictus</u>	Formerly very rare in mixed and pure colonies on Big Pine Key and Key West. Extinct except in park colonies.	Established in 4 pure and 7 mixed colonies.	35, 38, 40, 60, 129, 140, 146, 173, 200, 237, 239
<u>pseudopictus</u>	Rare, formerly found only in the Middle Hammock of Lower Matecumbe Key. Extinct except in park colonies.	Established in 10 mixed colonies.	62, 68, 69, 123, 200, 205, 209, 216, 217, 219
<u>roseatus</u>	Formerly common and widespread throughout CP, CC, PC, LPK, Atlantic Coastal Ridge, Cape Sable, Ten Thousand Islands, and Upper Keys regions. Found in mixed and pure colonies. Endangered, if not extinct, in the Ten Thousand Islands and Cape Sable regions.	Established in 7 pure and 10 mixed colonies.	10, 37, 49, 53, 97, 98, 99, 100, 101, 102, 160, 161, 201, 202, 207, 218, 230
<u>septentrionalis</u>	Formerly common in beach hammocks of Atlantic Coastal Ridge from Yamato to Fort Lauderdale. Found only in pure colonies. Extinct except in park colonies.	Established in 5 pure and 8 mixed colonies	34, 58, 90, 91, 149, 193, 194, 195, 200, 206, 223, 229, 238
<u>simpsoni</u>	Formerly found in Upper Hammock in Lower Matecumbe Key, Plantation Key and Lignum Vitae Key. Common in mixed colonies. Now rare on Lower Matecumbe Key. Extinct on Plantation Key. It is doubtful it was ever native to this key.	Established in 6 pure and 3 mixed colonies.	6, 13, 63, 123, 124, 154, 176, 178, 179
<u>solidulus</u>	Formerly common in Lower Keys region. Primarily in mixed colonies, one pure colony known from Stock Island. Extinct except in park colonies.	Established in 3 pure and 8 mixed colonies.	40, 42, 62, 129, 140, 146, 174, 200, 203, 237, 240

STATUS

Color Form	Native	Introduced	Site Number
<u>solidus</u>	Formerly rare. Known only from Key West, No Name Key, Little Pine Key and Watson's hammock on Big Pine Key. Found only in mixed colonies. Extinct.	None	
<u>solisoccasus</u>	Rare in mixed colonies. Known only from PC 101, CC 6 and 9.	Established in 3 mixed colonies.	1, 148, 204
<u>splendidus</u>	Found only in Middle Hammock of Lower Matecumbe Key. Rare in mixed colony. Extinct except in park colonies.	Established in 4 pure and 4 mixed colonies.	3, 22, 62, 68, 69, 78, 93, 185
<u>subcrenatus</u>	Formerly abundant in pure and mixed colonies on Lower Matecumbe Key and in a pure colony on Windley's Key. It is now extinct in all the Keys colonies except the Upper Hammock of Lower Matecumbe where it is endangered.	Established in 3 pure and 2 mixed colonies.	13, 43, 63, 66, 80
<u>testudineus</u>	Uncommon in Brickell and Matheson Hammocks of Atlantic Coastal Ridge. Found only in mixed colonies.	Established in 7 mixed colonies.	12, 166, 213, 218, 222, 224, 230
<u>vacaensis</u>	Formerly common, now rare in mixed colonies of Middle and Upper Keys, and Flamingo area.	None	
<u>versicolor</u>	Common in the mixed colony of Osteen Hammock (LPK 23). Uncommon or rarely found in other LPK hammocks. Rare in Brickell Hammock.	Established in 12 pure and 5 mixed colonies.	25, 46, 55, 56, 117, 119, 151, 157, 158, 163, 168, 183, 191, 193, 194, 195, 196
<u>violafumosus</u>	Formerly common in pure colonies. Known only from PC hammocks number 28 and 30. Extinct.	None.	
<u>vonpaulseni</u>	Formerly common in pure colony on Middle Torch Key. Endangered.	Established in 7 pure and 3 mixed colonies.	23, 26, 27, 36, 79, 120, 170, 181, 186, 188
<u>walkeri</u>	Common in the LPK and PC regions. Found in mixed colonies, and one pure colony (PC 9, type locality).	Established in 1 pure colony.	9
<u>wintei</u>	Common in pure colonies in a few hammocks north of LPK region.	None.	

INTRODUCTION SITES

A total of 51 color forms have been introduced into 241 sites (hammocks) in Everglades National Park between 1957 and 1980. For each site introduction the following information is given: (1) site (hammock) number, (2) color form or forms present, (3) year of introduction, and (4) origin of color form (geographical location). Asterisk (*) indicates those color forms that were not introduced but have become established as a result of 1) progeny of introduced forms and/or 2) immigration from nearby hammocks.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
1	<u>solisoccasus</u> * <u>lossmanicus</u> * <u>barbouri</u>	1976	CC 9, Collier Co.
2	<u>alternatus</u> * <u>fuscoflammellus</u> * <u>castaneozonatus</u>	1973	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
3	<u>cingulatus</u> <u>splendidus</u>	1961 1961	Brickell Hammock, Atlantic Coastal Ridge, Dade Co. Lower Matecumbe Key, Upper Keys, Monroe Co.
4	<u>marmoratus</u> * <u>luteus</u>	1961	Key Vaca, Middle Keys, Monroe Co.
5	<u>castaneozonatus</u> * <u>miamiensis</u>	1961	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
6	<u>simpsoni</u>	1961	Upper Hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
7	<u>barbouri</u>	1961	PC 2, Monroe Co.
8	<u>delicatus</u>		Lower Matecumbe Key, Upper Keys, Monroe Co.
9	<u>walkeri</u>	1976	PC 9, Monroe Co.
10	<u>castaneozonatus</u> <u>roseatus</u>		Native
11	<u>clenchi</u> * <u>lossmanicus</u> * <u>marmoratus</u> * <u>floridanus</u> * <u>barbouri</u>	1964	Herald Sign Road, north of 50 mile bend, Tamiami Trail, Collier Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
12	<u>castaneozonatus</u> <u>livingstoni</u> <u>mosieri</u> <u>testudineus</u> <u>ornatus</u> <u>lossmanicus</u>	1964	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
13	<u>subcrenatus</u> <u>delicatus</u> <u>simpsoni</u>	1964	Upper Hammock of Lower Matecumbe, Upper Keys, Monroe Co.
14	<u>marmoratus</u>	1964	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
15	<u>nebulosus</u> * <u>gloriasylvaticus</u> * <u>floridanus</u> hybrids	1964	CC 10, Collier Co.
16	<u>floridanus</u> * <u>gloriasylvaticus</u>	1964	CC 10, Collier Co.
17	<u>humesi</u> <u>framptoni</u> <u>luteus</u> <u>castaneozonatus</u>	1965	North of LPK, Everglades National Park, Dade Co.
18	<u>humesi</u> <u>framptoni</u> <u>luteus</u> <u>castaneozonatus</u>	1965	North of LPK, Everglades National Park, Dade Co.
19	<u>humesi</u> <u>framptoni</u> <u>luteus</u> <u>castaneozonatus</u>	1965	North of LPK, Everglades National Park, Dade Co.
20	<u>kennethi</u>	1965	PC 13, Monroe Co.
21	<u>lucidovarius</u> <u>clenchi</u> * <u>lossmanicus</u>	1971	PC 11, Dade Co.
23	<u>nebulosus</u> * <u>gloriasylvaticus</u> <u>vonpaulseni</u>	1964 1966	CC 10, Collier Co. Middle Torch Key, Lower Keys, Monroe Co.
24	<u>gloriasylvaticus</u>	1962	CC 10, Collier Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
25	<u>versicolor</u>	1962	Osteen Hammock (LPK 23), Dade Co.
26	<u>vonpaulseni</u>	1959	Middle Torch Key, Lower Keys, Monroe Co.
27	<u>vonpaulseni</u>	1959	Middle Torch Key, Lower Keys, Monroe Co.
28	<u>gloriasylvaticus</u>	1959	CC 10, Collier Co.
29	<u>barbouri</u> (blue)	1969	PC 55, Dade Co.
	<u>ornatus</u>		Key Largo, Upper Keys, Monroe Co.
30	<u>cingulatus</u>	1969	North of LPK, Dade Co.,
	<u>ornatus</u>		Key Largo, Upper Keys, Monroe Co.
31	<u>barbouri</u> (Binky)	1969	PC 89, Dade Co.
	<u>eburneus</u>		North of LPK, Dade Co.
32	<u>ornatus</u>	1969	Key Largo, Upper Keys, Monroe Co.
	<u>eburneus</u>		North of LPK, Dade Co.
33	<u>marmoratus</u> <u>aurantius</u>	1969	PC 22, Dade Co.
34	<u>septentrionalis</u>	1969	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co.
35	<u>pictus</u>	1969	Big Pine Key, Lower Keys, Monroe Co.
36	<u>vonpaulseni</u>	1969	Middle Torch Key, Lower Keys, Monroe Co.
37	<u>roseatus</u>	1972	Upper Key Largo, Upper Keys, Monroe Co.
38	<u>pictus</u>	1972	Big Pine Key, Lower Keys, Monroe Co.
39	<u>deckerti</u> <u>marmoratus</u>	1972	LPK 55, Dade Co.
40	<u>solidulus</u>	1977	Stock Island, Lower Keys, Monroe Co.
	<u>pictus</u>		Big Pine Key, Lower Keys, Monroe Co.
41	Unknown		

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
42	<u>solidulus</u>	1971	Stock Island, Lower Keys, Monroe Co.
43	<u>subcrenatus</u>	1969	Upper hammock of Lower Matecumbe, Upper Keys, Monroe Co.
44	<u>barbouri</u> (blue)	1977	PC 55, Dade Co.
45	<u>cingulatus</u>	1973	Upper Key Largo, Upper Keys, Monroe Co.
46	<u>versicolor</u>	1973	Osteen Hammock (LPK 23), Dade Co.
47	<u>capensis</u>	1973	Northwest Cape Sable, Monroe Co.
48	<u>capensis</u>	1973	Northwest Cape Sable, Monroe Co.
49	<u>roseatus</u>	1974	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
50	<u>livingstoni</u>	1974	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
51	<u>virginus</u>	1974	Haiti, West Indies
52	<u>mosieri</u>	1974	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
53	<u>roseatus</u>	1974	Upper Key Largo, Upper Keys, Monroe Co.
54	<u>miamiensis</u> <u>*castaneozonatus</u>	1974	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
55	<u>versicolor</u> (white tip)	1973	North of LPK. Hammock number 183 this report, Dade Co.
56	<u>versicolor</u> (white tip)	1973	Site number 183 this report, North of LPK, Dade Co.
57	<u>barbouri</u>	1973	Roberts Lake Strand, Pinecrest region, Monroe Co.
58	<u>septentrionalis</u>	1973	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co.
59	<u>framptoni</u>	1973	North of LPK, Everglades National Park, Dade Co.
60	<u>pictus</u>	1969	Big Pine Key, Lower Keys, Monroe Co.
	<u>fuscoflammellus</u>	1969	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
61	<u>solidulus</u>	1969	Stock Island, Lower Keys, Monroe Co.
	<u>fuscoflammellus</u>	1969	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
62	<u>pseudopictus</u> <u>splendidus</u>	unknown	Site number 69 this report, north of LPK, Dade Co.
63	<u>subcrenatus</u> <u>delicatus</u> <u>simpsoni</u>	1962	Upper hammock of Lower Matecumbe, Upper Keys, Monroe Co.
64	<u>alternatus</u> * <u>castaneozonatus</u> * <u>fuscoflammellus</u>	1958	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
65	<u>kennethi</u>	1958	PC 13, Monroe Co.
66	<u>subcrenatus</u>	1967	Upper Hammock of Lower Matecumbe, Upper Keys, Monroe Co.
67	<u>evergladesensis</u>	1958	8 miles north of Forty Mile Bend, Collier Co.
68	<u>pseudopictus</u>	1962	Middle Hammock of Lower Matecumbe, Upper Keys, Monroe Co.
	<u>splendidus</u>	1973	
69	<u>pseudopictus</u> <u>splendidus</u>	1965	Site number 68 this report.
70	<u>evergladesensis</u>	1973	8 miles north of Forty Mile Bend (U.S. 41), Collier Co.
71	<u>fuscoflammellus</u> (pink tip)	1958	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
72	<u>fuscoflammellus</u> (white tip)	1958	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
73	<u>clenchi</u> * <u>lossmanicus</u> * <u>floridanus</u>	1970	unknown
74	<u>aurantius</u>	1970	PC 10, Dade Co.
75	<u>floridanus</u>	1961	CP 8, Dade Co.
76	<u>barbouri</u>	1962	PC 89, Dade Co.
	<u>graphicus</u>	1962	Little Pine Key, Lower Keys, Monroe Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
77	<u>deckerti</u> * <u>marmoratus</u>	1966	LPK 55, Dade Co.
78	<u>splendidus</u>	1962	Middle Hammock of Lower Matecumbe, Upper Keys, Monroe Co.
79	<u>vonpaulseni</u>	1961	Middle Torch Key, Lower Keys, Monroe Co.
80	<u>subcrenatus</u>	1958	Upper hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
81	<u>evergladesensis</u>	1958	8 miles north of Forty-mile Bend (U.S. 41) Collier Co.
82	<u>lucidovarius</u>	1958	PC 11, Dade Co.
	* <u>clenchi</u>	1958	PC 88, Dade Co.
	* <u>lossmanicus</u>		
	* <u>hybrids</u>		
83	* <u>lucidovarius</u>	1958	PC 11, Dade Co.
	* <u>clenchi</u>	1958	PC 88, Dade Co.
	* <u>lossmanicus</u>		
	* <u>hybrids</u>		
84	<u>lucidovarius</u>	1958	PC 11, Dade Co.
	<u>clenchi</u>		PC 88, Dade Co.
	<u>lossmanicus</u>		
	<u>hybrids</u>		
85	<u>graphicus</u>	1970	No Name Key, Lower Keys, Monroe Co.
86	<u>miamiensis</u>	1962	PC 37, Dade Co.
87	<u>miamiensis</u>	1962	PC 37, Dade Co.
88	<u>aurantius</u>	1970	PC 10, Dade Co.
89	<u>graphicus</u>	1969	Little Pine Key, Lower Keys, Monroe Co.
	<u>humesi</u>	1969	North of LPK, Everglades National Park, Dade Co.
90	<u>nebulosus</u>	1969	CC 10, Collier Co.
	<u>septentrionalis</u>	1969	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
91	<u>barbouri</u> (blue)	1969	PC 55, Dade Co,
	<u>septentrionalis</u>	1969	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co.
92	<u>marmoratus</u> * <u>castaneozonatus</u>	1962	Cox's Hammock, Atlantic Coastal Ridge, Dade Co.
93	<u>splendidus</u>	1962	Middle Hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
94	<u>barbouri</u>	1968	PC 89, Dade Co.
	<u>graphicus</u>	1968	Little Pine Key, Lower Keys, Monroe Co.
95	<u>humesi</u>	1962	North of LPK, Everglades National Park, Dade Co.
96	* <u>floridanus</u>	1962	Eight miles north of Forty-Mile Bend (U.S. 41), Collier Co.
97	<u>livingstoni</u> * <u>roseatus</u>	1978	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
98	* <u>castaneozonatus</u> * <u>roseatus</u>	unknown	Upper Key Largo, Upper Keys, Monroe Co.
99	<u>castaneozonatus</u> * <u>roseatus</u>	1962	Upper Key Largo, Upper Keys, Monroe Co.
100	<u>ornatus</u> * <u>castaneozonatus</u> * <u>roseatus</u>	1962	Upper Key Largo, Upper Keys, Monroe Co.
101	<u>ornatus</u> * <u>roseatus</u>	1962	Upper Key Largo, Upper Keys, Monroe Co.
102	<u>livingstoni</u> * <u>roseatus</u> * <u>lossmanicus</u>	1968	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
103	<u>graphicus</u>	1969	No Name Key, Lower Keys, Monroe Co.
104	<u>marmoratus</u>	1962	PC 22, Dade Co.
105	<u>floridanus</u>	1958	8 miles north of Forty-Mile Bend (U.S. 41), Collier Co.
106	* <u>floridanus</u>	1958	8 miles north of Forty-Mile Bend (U.S. 41), Collier Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
107	<u>graphicus</u>	1969	No Name Key, Lower Keys, Monroe Co.
	<u>miamiensis</u>	1977	P.C. #37, Dade Co.
108	<u>cingulatus</u>	1970	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
	<u>barbouri</u> (green form)		From along Loop Road (S.R. 94), Pinecrest Dade and Monroe Counties
109	<u>beardi</u> * <u>margaretae</u>	1970	PC 88 and PC 11, Dade Co.
110	<u>castaneus</u> (black form) * <u>marmoratus</u>	1973	Loop Road (S.R. 94), Pinecrest Region, Dade or Monroe Co.
111	<u>marmoratus</u>	1973	Small hammock west of PC 24, Monroe Co.
112	<u>lucidovarius</u> * <u>clenchi</u>	1972	PC 11, Dade Co.
113	<u>beardi</u>	1974	PC 88 and PC 11, Dade Co.
114	<u>marmoratus</u>	1973	Small hammock west of PC 24, Monroe Co.
115	<u>fuscoflammellus</u> <u>alternatus</u> * <u>castaneozonatus</u>	1973	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
116	<u>lucidovarius</u>	1973	PC 11, Dade Co.
117	<u>versicolor</u>	1973	Site number 183 this report, north of LPK, Dade Co.
118	<u>marmoratus</u>	1973	Small hammock west of PC 24, Monroe Co.
119	<u>versicolor</u>	1973	Context Road north of Long Pine Key, Dade Co.
120	hybrid (<u>vonpaulseni</u> x <u>cingulatus</u>)	1973	Unnumbered hammock from LPK region, Dade Co.
121	hybrid (<u>osmenti</u> x unknown)	1972	From hammocks along 7-mile road, Hole-in-the-Donut area, Dade Co.
122	<u>lucidovarius</u>	1975	PC 11, Dade Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
123	<u>simpsoni</u> <u>pseudopictus</u>	1969	Upper Hammock of Lower Matecumbe, Upper Keys, Monroe Co. Middle Hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
124	<u>simpsoni</u>	1969	Upper Hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
125	<u>aurantius</u>	1973	PC 10, Dade Co.
126	<u>gloriasylvaticus</u>	1969	CC 10, Collier Co.
127	<u>graphicus</u>	1969	No Name Key, Lower Keys, Monroe Co.
128	<u>delicatus</u>	1962	Upper Hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
129	<u>pictus</u> <u>solidulus</u>	1962	Big Pine Key, Lower Keys, Monroe Co. Stock Island, Lower Keys, Monroe Co.
130	<u>ornatus</u>	1974	Upper Key Largo, Upper Keys, Monroe Co.
131	<u>barbouri</u>	1962	Roberts Lake Strand, Pinecrest Region, Monroe Co.
132	<u>marmoratus</u>	1962	CC 13, Collier Co.
133	<u>ornatus</u> * <u>lineolatus</u> * <u>lignumvitae</u> *hybrids	1967	Totten Key, Upper Keys Lignum Vitae Key, Upper Keys, Monroe Co.
134	<u>capensis</u>	1969	Northwest Cape Sable, Monroe Co.
135	* <u>lignumvitae</u>	1961	Lignum Vitae Key, Upper Keys, Monroe Co.
136	<u>lignumvitae</u>	1958	Lignum Vitae Key, Upper Keys, Monroe Co.
137	* <u>lignumvitae</u>	1961	Lignum Vitae Key, Upper Keys, Monroe Co.
138	<u>graphicus</u> * <u>lignumvitae</u>	1962 1961	Big Pine Key, Lower Keys, Monroe Co. Lignum Vitae Key, Upper Keys, Monroe Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
139	* <u>lignumvitae</u>	1961	Lignum Vitae Key, Upper Keys, Monroe Co.
140	<u>pictus</u>	1965	Big Pine Key, Lower Keys, Monroe Co.
	<u>solidulus</u>		Stock Island, Lower Keys, Monroe Co.
141	<u>ornatus</u> * <u>lineolatus</u> *hybrids	1971	Totten Key, Upper Keys, Dade Co.
142	<u>ornatus</u> * <u>lossmanicus</u> *hybrids	1971	Totten Key, Upper Keys, Dade Co.
143	<u>lineolatus</u> * <u>ornatus</u>	1967	Totten Key, Upper Keys, Dade Co.
144	<u>lineolatus</u> * <u>ornatus</u> * <u>lossmanicus</u> *hybrids	1970	Totten Key, Upper Keys, Dade Co.
145	* <u>castaneozoneatus</u> * <u>marmoratus</u>	1971	Cox's Hammock, Atlantic Coastal Ridge, Dade Co.
146	<u>pictus</u>	1971	Big Pine Key, Lower Keys, Monroe Co.
	<u>solidulus</u>		Stock Island, Lower Keys, Monroe Co.
147	<u>castaneus</u> * <u>luteus</u>	1976	Deckert Hammock, Long Pine Key Region, Dade Co.
148	<u>solisoccasus</u> * <u>lossmanicus</u> * <u>barbouri</u>	1976	CC 6, Collier Co.
149	<u>septentrionalis</u> <u>barbouri</u>	1970	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co. PC 55, Dade Co.
150	<u>marmoratus</u>	1970	Unknown
151	<u>versicolor</u>	unknown	Site number 183 this report, north of Long Pine Key, Dade Co.
152	<u>capensis</u>	1973	Northwest Cape Sable, Monroe Co.
153	<u>deckerti</u> * <u>marmoratus</u>	1973	LPK 55, Dade Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
154	<u>simpsoni</u>	1973	Upper hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
155	<u>floridanus</u>	1973	Bloodhound Hammock, (CC 10) Collier County
156	<u>capensis</u>	1974	Hammock on northwest Cape Sable, Monroe Co.
157	<u>versicolor</u>	1974	LPK 72, Dade Co.
158	<u>versicolor</u> <u>ornatus</u>	1974	Context Road area, north of LPK, Dade Co.
159	<u>beardi</u> * <u>margaretae</u>	1974	PC 88 and PC 11, Dade Co.
160	<u>roseatus</u>	1974	Upper Key Largo, Upper Keys, Monroe Co.
161	<u>roseatus</u>	1974	Upper Key Largo, Upper Keys, Monroe Co.
162	<u>graphicus</u> (green line form)	1974	Big Pine Key, Lower Keys, Monroe Co.
163	<u>versicolor</u> (white tip)	1974	Hammock number 183 this report, north of LPK, Dade Co.
164	<u>castaneus</u> * <u>luteus</u>	1976	LPK 31, Dade Co.
165	<u>evergladesensis</u>	1974	Eight miles north of Forty-Mile Bend (U.S. 41), Collier Co.
166	<u>lucidovarius</u> <u>testudineus</u>	1974	PC 11, Dade Co. Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
167	<u>capensis</u>	1974	Hammock on northwest Cape Sable, Monroe Co.
168	<u>versicolor</u>	1974	LPK 72, Dade Co.
169	<u>barbouri</u> (blue form)	1963	PC 55, Dade Co.
170	<u>vonpaulseni</u>	1963	Middle Torch Key, Lower Keys, Monroe Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
171	<u>nebulosus</u> <u>*gloriasylvaticus</u>	1967	CC 10, Collier Co.
172	<u>floridanus</u>	1968	CC 10, Collier Co.
173	<u>pictus</u>	1958	Big Pine Key, Lower Keys, Monroe Co.
174	<u>solidulus</u>	1958	Stock Island, Lower Keys, Monroe Co.
175	<u>marmoratus</u> <u>*deckerti</u> <u>*castaneozonatus</u>	1974	LPK 55, Dade Co.
176	<u>simpsoni</u>	1957	Upper hammock of Lower Matecumbe, Upper Keys, Monroe Co.
177	<u>barbouri</u>	1957	PC 2, Monroe Co.
178	<u>simpsoni</u>	1957	Upper hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
179	<u>simpsoni</u>	1957	Upper hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
180	<u>clenchi</u> <u>lossmanicus</u> <u>barbouri</u>	1976	Hammock number 183 this report, north of LPK, Dade Co.
181	<u>vonpaulseni</u> <u>cingulatus</u>	1975	Middle Torch Key, Lower Keys, Monroe Co. Native
182	unknown	unknown	unknown
183	<u>versicolor</u>		Native, north of LPK, Dade Co.
184	<u>lignumvitae</u>	1963	Lower hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
185	<u>splendidus</u>	1960	Middle Hammock, Lower Matecumbe Key, Upper Keys, Monroe Co.
186	<u>vonpaulseni</u>	1963	Middle Torch Key, Lower Keys, Monroe Co.
187	<u>barbouri</u>	1963	PC 2, Monroe Co.
188	<u>vonpaulseni</u>	1963	Middle Torch Key, Lower Keys, Monroe Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
189	<u>fuscoflammellus</u> (pink tip)	1958	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
190	<u>fuscoflammellus</u> (white tip)	1958	Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
191	<u>versicolor</u> (new form)		Native, north of LPK
192	<u>septentrionalis</u>	1961	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co.
193	<u>septentrionalis</u> <u>fuscoflammellus</u>	1957	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co. Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
	* <u>versicolor</u>		Site number 196 this report, Dade Co.
194	<u>septentrionalis</u> <u>fuscoflammellus</u>	1957	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co. Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
	* <u>versicolor</u>		Site number 196 this report, Dade Co.
195	<u>septentrionalis</u> <u>fuscoflammellus</u>	1957	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co. Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
	* <u>versicolor</u>		Site number 196 this report, Dade Co.
196	<u>versicolor</u> (white tip)		Native, north of Long Pine Key, Dade Co.
197	<u>floridanus</u>	1962	CP 8, Dade Co.
198	<u>miamiensis</u>	1978	PC 37, Dade Co.
199	<u>marmoratus</u>	1958	Little Pine Key, Lower Keys, Monroe Co.
200	<u>pictus</u> <u>pseudopictus</u> <u>fuscoflammellus</u> <u>septentrionalis</u> <u>solidulus</u>	1958	Big Pine Key, Lower Keys, Monroe Co. Middle hammock of Lower Matecumbe Key, Upper Keys, Monroe Co. Timm's Hammock, Atlantic Coastal Ridge, Dade Co. Boca Raton, Atlantic Coastal Ridge, Palm Beach Co. Stock Island, Lower Keys, Monroe Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
201	<u>roseatus</u>	1958	Upper hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
202	<u>roseatus</u> <u>eburneus</u>	unknown	unknown unknown
203	<u>solidulus</u>	unknown	Stock Island, Lower Keys, Monroe Co.
	<u>dryas</u>	unknown	Little Pine Key, Lower Keys, Monroe Co.
204	<u>solisoccasus</u>	1965	CC 12 (PC 101), Collier Co.
	* <u>marmoratus</u> * <u>ornatus</u>	1967	PC 101, Collier Co.
205	<u>pseudopictus</u>	1965	Middle hammock of Lower Matecumbe Key, Upper Key, Monroe Co.
	<u>marmoratus</u> (blue form)	1965	Key Vaca, Middle Keys, Monroe Co.
206	<u>septentrionalis</u>	1965	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co.
207	<u>roseatus</u> <u>barbouri</u>	1958	Upper Matecumbe Key, Upper Keys, Monroe Co. PC 89, Dade Co.
208	<u>floridanus</u>	1968	PC 2, Dade Co.
209	<u>pseudopictus</u>	1976	Middle hammock of Lower Matecumbe Key, Upper Keys, Monroe Co.
	<u>dryas</u>		Little Pine Key, Lower Keys, Monroe Co.
210	<u>matecumbensis</u>	1959	Upper Matecumbe Key, Upper Keys, Monroe Co.
211	<u>aurantius</u> <u>floridanus</u> * <u>luteus</u>	1958	LPK, Dade Co. CP 8, Dade Co. Unknown
212	<u>deckerti</u> * <u>marmoratus</u>	1975	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
213	<u>testudineus</u> *Brickell color forms	1958	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
214	<u>marmoratus</u>	1958	PC 22, Dade Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
215	<u>marmoratus</u> (blue form)	1958	Key Vaca, Middle Keys, Monroe Co.
216	<u>pseudopictus</u> <u>dryas</u>	1958	Middle Hammock of Lower Matecumbe Key, Upper Keys, Monroe Co. Little Pine Key, Lower Keys, Monroe Co.
217	<u>pseudopictus</u> <u>dryas</u>	1963	Offspring from site number 216 this report
218	<u>luteus</u> <u>lossmanicus</u> <u>miamiensis</u> <u>ornatus</u> <u>livingstoni</u> <u>cingulatus</u> <u>mosieri</u> <u>roseatus</u> <u>castaneozoneatus</u> <u>testudineus</u>	1958 and 1962	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
219	<u>pseudopictus</u> Brickell color forms	1959	Middle Hammock of Lower Matecumbe Key, Upper Keys, Monroe Co. Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
220	<u>deckerti</u>	1978	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
221	<u>dryas</u>	1974	Little Pine Key, Lower Keys, Monroe Co.
222	<u>marmoratus</u> <u>testudineus</u>	1961 1958	Stock from an introduced colony on Little Pine Key, Lower Keys, Monroe Co. Original source from Brickell Hammock, Atlantic Coastal Ridge, Dade Co. Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
223	<u>septentrionalis</u> <u>barbouri</u> (blue form)	1975 1975	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co. PC 55, Dade Co.
224	<u>testudineus</u> <u>marmoratus</u>	1959	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
225	<u>barbouri</u> (blue form)	1962	PC 55, Dade Co.
226	<u>luteus</u>	1958	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
227	<u>dryas</u>	1958	Little Pine Key, Lower Keys, Monroe Co.
	<u>osmenti</u>		Howe Key, Lower Keys, Monroe Co.
228	<u>dryas</u>	1958	Little Pine Key, Lower Keys, Monroe Co.
	<u>osmenti</u>		Howe Key, Lower Keys, Monroe Co.
229	<u>septentrionalis</u>	1958	Boca Raton, Atlantic Coastal Ridge, Palm Beach Co.
230	<u>miamiensis</u> <u>cingulatus</u> <u>castaneozonatus</u> <u>testudineus</u> * <u>luteus</u> * <u>lossmanicus</u> * <u>ornatus</u> * <u>livingstoni</u> * <u>mosieri</u> * <u>roseatus</u>	1974	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
231	<u>marmoratus</u>		Cox's Hammock, Atlantic Coastal Ridge, Dade Co.
	<u>cingulatus</u> * <u>mosieri</u> * <u>lossmanicus</u>	1974	Brickell Hammock, Atlantic Coastal Ridge, Dade Co.
	* <u>fuscoflammellus</u>		Timm's Hammock, Atlantic Coastal Ridge, Dade Co.
232	<u>ornatus</u>	1974	Mahogany Hammock, Everglades National Park, Dade Co.
233	<u>elegans</u>	1975	Atoll Hammock, Everglades National Park Dade Co.
234	<u>elegans</u>	1975	Atoll Hammock, Everglades National Park Dade Co.
235	<u>margaretae</u>	1975	PC 88 and PC 11, Dade Co.

Site Number	Color Form(s) present	Year Introduced	Origin of Color Form
236	<u>osmenti</u>	1978	Howe Key, Lower Keys, Monroe Co.
237	<u>pictus</u> <u>graphicus</u> <u>dryas</u> <u>solidulus</u>	1978	Big Pine Key, Lower Keys, Monroe Co. No Name Key, Lower Keys, Monroe Co. Little Pine Key, Lower Keys, Monroe Co. Stock Island, Lower Keys, Monroe Co.
238	<u>septentrionalis</u>	1978	Boca Raton, Palm Beach Co.
239	<u>pictus</u>	1978	Big Pine Key, Lower Keys, Monroe Co.
240	<u>solidulus</u>	1978	Stock Island, Lower Keys, Monroe Co.
241	<u>dryas</u>	1978	Little Pine Key, Lower Keys, Monroe Co.

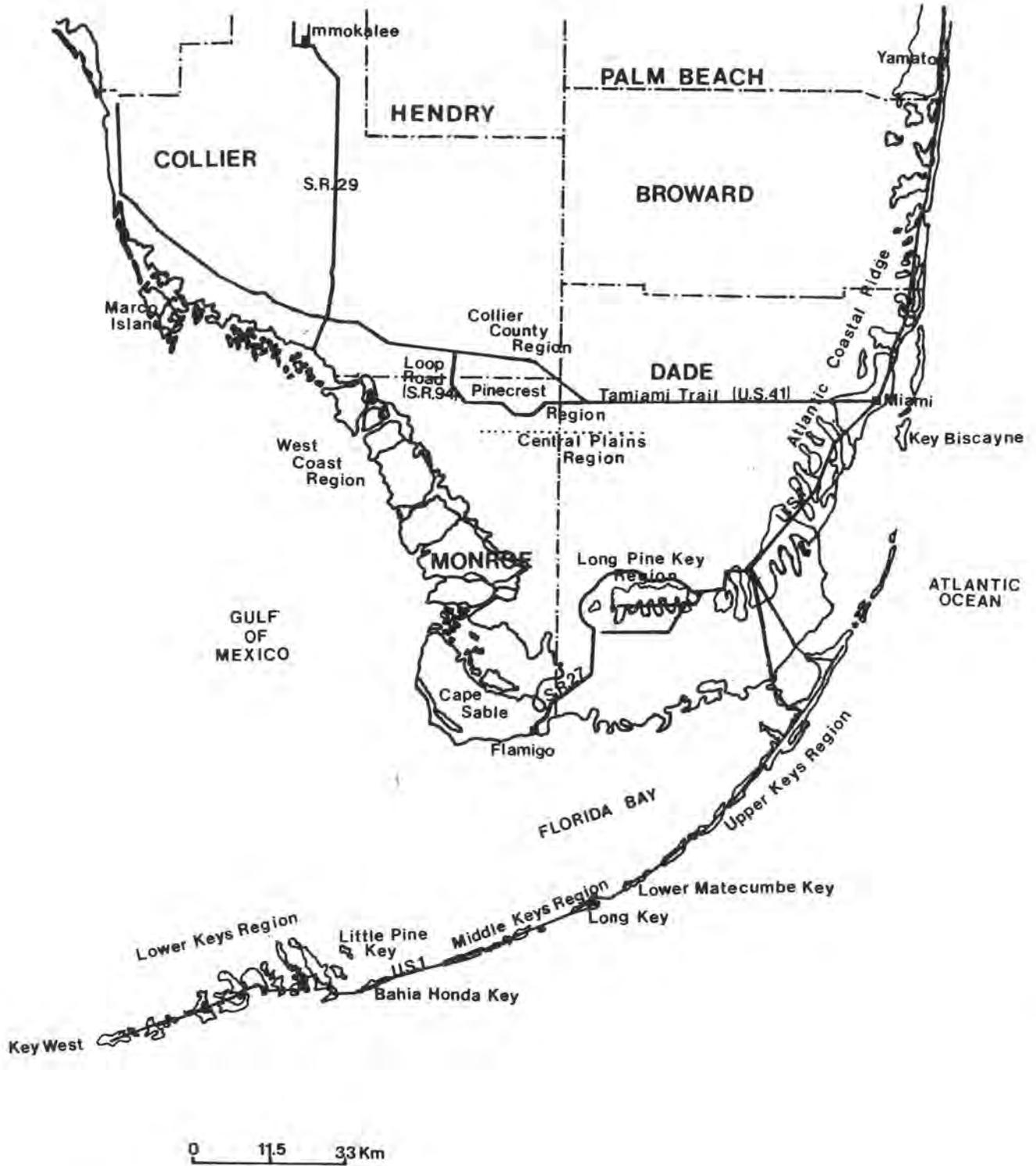


Figure 1. Distribution and geographical regions of Florida tree snails.



Figure 2. Area of introduced Florida tree snails in Everglades National Park.

Table 1. The 58 color forms of the Florida tree snail, Liguus fasciatus. Asterisk (*) indicates color forms extinct in their native habitat.

<u>alternatus</u>	<u>livingstoni</u>
<u>aurantius</u>	<u>lossmanicus</u>
<u>barbouri</u>	<u>lucidovarius</u>
<u>beardi</u>	<u>luteus</u>
<u>capensis</u>	<u>margaretae</u>
<u>castaneozonatus*</u>	<u>marmoratus</u>
<u>castaneus</u>	<u>matecumbensis</u>
<u>cingulatus</u>	<u>miamiensis</u>
<u>clenchi</u>	<u>mosieri</u>
<u>crassus*</u>	<u>nebulosus</u>
<u>deckerti</u>	<u>ornatus</u>
<u>delicatus</u>	<u>osmenti</u>
<u>dohertyi*</u>	<u>pictus*</u>
<u>dryas</u>	<u>pseudopictus*</u>
<u>eburneus</u>	<u>roseatus</u>
<u>elegans</u>	<u>septentrionalis*</u>
<u>elliottensis</u>	<u>simpsoni</u>
<u>evergladesensis</u>	<u>solidulus*</u>
<u>farnumi*</u>	<u>solidus*</u>
<u>floridanus</u>	<u>solisoccasus</u>
<u>framptoni</u>	<u>splendidus*</u>
<u>fuscoflammellus</u>	<u>subcrenatus</u>
<u>gloriasylvaticus</u>	<u>testudineus</u>
<u>graphicus</u>	<u>vacaensis</u>
<u>humesi</u>	<u>versicolor</u>
<u>innominatus</u>	<u>violafumosus*</u>
<u>kennethi</u>	<u>vonpaulseni</u>
<u>lignumvitae</u>	<u>walkeri</u>
<u>lineolatus</u>	<u>wintei</u>

LITERATURE CITED

- Clench, W. J. 1929. Some new Liguus from the Florida Everglades. *Nautilus* 43:18-21.
- Clench, W. J. 1933. A new Liguus from Florida. *Nautilus* 46:91-92.
- Clench, W. J. 1935. New races of Liguus from Florida and Cuba. *Nautilus* 48:121-125.
- Clench, W. J. 1942. A new race of Liguus from the Lower Keys of Florida. *Proc. New England Zool. Club* 19:69-71.
- Clench, W. J. and G. B. Fairchild. 1939. The classification of Florida Liguus. *Proc. New England Zool. Club* 17:77-86.
- Clench, W. J. and K. J. Boss. 1967. The Henry G. Frampton collection of Florida Liguus. *Occ. Pap. Mollusks, Harv.* 3:36.
- De Boe, M. O. 1933. A new color form of Liguus from a new area of the Florida Everglades. *Nautilus* 47:68-69.
- Doe, M. F. 1937. Tree snails of south Florida. *Nature Mag.* 29:82-84.
- Frampton, H. G. 1932. Three new subspecies of Floridian Liguus. *Proc. Biol. Soc. Wash.* 45:55-58.
- Humes, R. H. 1954. A new color form of Liguus: Liguus fasciatus form wintei Hum. *Gastropodia* 1:10.
- Jones, A. L. 1979. Descriptions of six new forms of Florida tree snails, Liguus fasciatus. *Nautilus* 94:153-159.
- Pflueger, A. 1934. A new variety of Liguus. *Nautilus* 47:121-122.
- Pilsbry, H. A. 1912. Variation and zoogeography of Liguus in Florida. *J. Acad. Nat. Sci. Philad.* 15:429-471
- Pilsbry, H. A. 1946. Land mollusca of North America (North of Mexico). *Acad. Nat. Sci. Philad. Monogr. No. 3 Vol. 2 pt. 1*, p. 37-102.
- Say, T. 1825. Descriptions of some new species of fresh-water and land shells of the United States. *J. Acad. Nat. Sci. Philad.* 5:122.
- Simpson, C. T. 1920. New Floridian subspecies of the genus Liguus *Proc. Biol. Soc. Wash.* 33:121-126.
- Simpson, C. T. 1921. Florida west coast Liguus. *Nautilus* 35:20-22.

Young, F. N. 1951. Vanishing and extinct colonies of tree snails, Liguus fasciatus, in the vicinity of Miami, Florida. Occ. Pap. Mus. Zool. Univ. Mich. No. 531, 21 p.

Young, F. N. 1952. Liguus pictus Reeve not extinct. Nautilus 66:71-72.