NATIONAL REPORT

-UNITED STATES OF AMERICA-

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I. Information on Wild Populations

a. Species of seahorses in U.S. waters

As many as seven species of seahorses may occur in the waters of the United States (excluding territories). *Hippocampus fisheri* and possibly *H. histrix* and *H. kuda* occur in Hawaii; *H. ingens* occurs in California; and *H. erectus, H. reidi*, and *H. zosterae* occur along the Atlantic and Gulf of Mexico coasts.

b., c. Distribution, abundance, and biological data

Little information is available regarding *Hippocampus fisheri*. This species definitely occurs in Hawaii, but records from Lord Howe Island and New Caledonia are equivocal (Lourie *et al.*, 1999). Taxonomic confusion complicates the literature on this species from Hawaii. For instance, in their volume on the fishes of Hawaii, Gosline and Brock (1960) list *H. fisheri* as a synonym of *H. kuda*. Lourie *et al.* (1999) indicate that museum specimens of *H. fisheri* were either collected offshore or from the stomachs of pelagic fishes. Based on the limited information at hand, we would assume that this is a rare, offshore species in Hawaiian waters, but Hoover[1] indicates that, although it is not frequently seen because of its offshore habitat, it is more abundant than *H. kuda* in Hawaii. *Hippocampus fisheri* adult heights range from 5 to 8 cm, and little is known regarding its life history (Lourie *et al.*, 1999).

The abundances (and perhaps even the presence) of *H. histrix* and *H. kuda* in Hawaii are questionable. Gosline and Brock (1960) include *H. histrix* in the Hawaiian ichthyofauna based on a single specimen collected by Fowler in 1928. Gosline and Brock (1960) also indicate that *H. kuda* is the abundant seahorse species in Hawaii, but as mentioned above, these authors did not recognize *H. fisheri*. Lourie et al. (1999) discuss the taxonomic problems associated with both *H. histrix* and *H. kuda* but include Hawaii in the range of both species. However, Kuiter (2000) indicates that *H. fisheri* may be the only seahorse found in Hawaii. Based on the information we have uncovered to date, we conclude that the most

abundant seahorse in Hawaii is an offshore form, probably *H. fisheri*, and that *H. histrix* and *H. kuda* are either rare or absent in Hawaiian waters. *Hippocampus histrix* occurs at depths of at least 6 m and may be associated with sparsely vegetated substrates and/or sea-squirts and sponges (Lourie et al., 1999). Its adult height ranges from 8 to 14 cm, and little is known regarding its life history (Lourie et al., 1999).

Hippocampus kuda has been found in various inshore and estuarine habitats (e.g., mangroves, seagrass, mud bottom) and in drifting Sargassum (Lourie et al., 1999). Its adult height ranges from 7 to 17 cm, it matures in 7 to 8 months, and it is not known to be monogamous (Lourie et al., 1999).

The only species of seahorse from the Pacific coast of the continental U.S. is *Hippocampus ingens*. This species occurs from San Diego, California to Peru, including the Galapagos Islands and the Gulf of California (Miller and Lea, 1972; Fritzsche, 1980).

Hippocampus ingens is rare in California waters and is apparently only present during periods of high water temperature (Miller and Lea, 1972; Lourie *et al.*, 1999). This is one of the largest seahorse species, measuring from 13-19 cm (Lourie *et al.*, 1999). Little is known about the biology of this species, except that it appears to occur in deeper water than do many other seahorse species (10 m to maximum of 60 m [Lourie *et al.*, 1999; Fritzsche, 1980]) and is commonly associated with gorgonians or black coral (Humann and DeLoach, 1993).

Of the three species of *Hippocampus* that occur along the coastlines of the eastern U.S., *H. reidi* is the least abundant. This species occurs in the Western Atlantic from North Carolina through the Florida Keys and the Caribbean to Rio de Janeiro, Brazil (Vari, 1982). In his review of Western North Atlantic seahorses, Vari (1982) examined only 4 specimens from U.S. waters: one from off North Carolina and three from the east and west coasts of Florida. Other U.S. literature records are all from Florida: 1) Christensen (1965), one specimen, southeast coast; 2) Starck (1968), "rare", Keys; 3) Weinstein and Heck (1979), one specimen, southwest coast; 4) Gilmore *et al.* (1981), "rare", mid-east coast; and 5) Tremain and Adams (1995), one specimen, mid-east coast. Several offshore records from New Jersey to Chesapeake Bay and a record from Louisiana mentioned under the name *Hippocampus obtusus* by Hardy (1978) may also represent *H. reidi*. This is a moderate-sized seahorse, with adult height ranging from 10-18 cm (Lourie *et al.*, 1999). It has been collected at depths ranging from 15 to 55 m and is associated with gorgonians, seagrasses, mangroves or floating mats of *Sargassum* (Lieske and Myers, 1994; Lourie *et al.*, 1999). *Hippocampus reidi* forms monogamous pair bonds in the wild (Lourie *et al.*, 1999).

Hippocampus erectus occurs in the Western Atlantic from Nova Scotia, Canada, along most of the Atlantic and Gulf of Mexico coasts of the U.S., throughout the Caribbean, and along the Atlantic coast of South America to Uruguay (Hardy, 1978; Vari 1982). With the exception of rare specimens of *H. reidi*, this is the only species of seahorse found north of Florida on the Atlantic coast of the U.S. *Hippocampus erectus* is not common north of New York (Bigelow and Schroeder, 1953) but is common in many Atlantic coast estuaries from Florida to New York (Gilmore *et al.*, 1981; Murdy *et al.*, 1997; Able and Fahay, 1998), with the possible exception of some estuaries with little seagrass (e.g., Georgia estuaries and nearshore marine waters sampled by Dahlberg [1972] and Hoese [1973] and South Carolina estuaries sampled by Shealy *et al.* [1974]).

In Florida, *H. erectus* has been collected in most estuaries but is least common in estuaries of northeast Florida and the western panhandle (see presentation of monitoring results below). In the northern Gulf of Mexico (west of Florida), this species is "common" in Alabama (Boschung, 1992) and occurs in estuarine or nearshore marine waters of Mississippi (Franks *et al.*, 1972), Louisiana (Guillory, 1982), and Texas (Hoese, 1958; Parker, 1965). However, few studies conducted in the northern Gulf of Mexico are useful for determining the abundance of *H. erectus* in this region. Most northern Gulf studies merely list a

few specimens or include this species in faunal lists without any indication of abundance (e.g., Hoese, 1958; Parker, 1965; Franks *et al.*, 1972; Guillory, 1982). Many studies conducted in this region include extensive species lists but do not include specimens of *Hippocampus* (e.g., Arnold *et al.*, 1960; Fox and Mock, 1968; Adkins and Bowman, 1976; Felley and Felley, 1986; Zimmerman and Minello, 1984; Felley, 1987, 1989; Baltz *et al.*, 1993, 1998; Gelwick *et al.*, 2001). As mentioned above, for South Carolina and Georgia estuaries, many of these studies that include no *H. erectus* were conducted in areas with no seagrass. One extensive field survey of this species in Texas (Matlock, 1992) suggests that populations in that state are "small but stable"; however, it is unclear whether sampling effort remained the same over the 15-year course of this study. Adult height in this species ranges from 6 to 19 cm (Lourie *et al.*, 1999).

Most commonly found at depths beyond 1m, *H. erectus* has been collected to depths of 73 m and is associated with natural material (seagrass, gorgonians, sponges, mangroves, etc.) as well as human-made structures (Matlock, 1992; Lieske and Myers, 1994; Lourie *et al.*, 1999). A study of the reproductive biology of this species indicates they are monogamous, with the sex ratio skewed towards females (Teixeira and Musick, 2001). *Hippocampus erectus* can be abundant in the bycatch of shrimp fisheries (Baum *et al.*, 2003), and more data are needed to determine the impact of the fishery on populations of this species.

Hippocampus zosterae is a very diminutive seahorse with a restricted geographic range and well-defined habitat preferences. This species occurs in insular locations including Bermuda, the Bahamas, and Cuba; along Atlantic continental shorelines from northeast Florida through the Florida Keys; and in the Gulf of Mexico south to the Gulf of Campeche (Ginsburg, 1937; Vari, 1982; Dennis *et al.*, 2001). In Florida waters, *H. zosterae* occurs in most estuaries but is more abundant in south Florida and the Keys (see presentation of monitoring results below). In the U.S. Gulf of Mexico west of Florida, *H. zosterae* is widely distributed but does not appear to be common in many areas. Various authors report the presence of this species but give little indication of its abundance in either estuarine or nearshore marine waters of Alabama (Boschung, 1992), Mississippi (Ginsburg, 1937; Franks *et al.*, 1972), Louisiana (Guillory, 1982), or Texas (Ginsburg, 1937). Also, the numerous studies conducted in the northern Gulf of Mexico which produced no *Hippocampus* specimens indicate that this species is probably not very abundant in many areas (see above). Several studies indicate that *H. zosterae* occurs in at least moderate numbers in Texas waters, often in association with seagrass habitat (e.g., Hoese, 1958; Hook, 1991; Sheridan and Minello, 2003). This is one of the smallest species of seahorses, with adult height ranging from 2 to 3 cm (Lourie *et al.*, 1999), and it forms monogamous breeding pairs (Masonjones and Lewis, 1996, 2000).

Several studies conducted in Florida waters document abundance trends and habitat preferences of *H. zosterae*. Sheridan *et al.* (1997) and Matheson *et al.* (1999) indicated that this species was among the more abundant fishes associated with the seagrass canopy in Florida Bay during both the 1980s and 1990s but that abundance of this species declined in western Florida Bay over that decade. Also in Florida Bay, Matheson *et al.* (unpublished data)[2] found that *H. zosterae* was more abundant in higher salinity (~29 ppt and higher) portions of the bay, in areas with denser seagrass and higher seagrass canopies, and in areas with either mixed seagrass beds or beds dominated by *Syringodium filiforme*. Ecological factors correlated with *H. zosterae* distribution were also investigated in Florida Bay by Masonjones (unpublished data). Areas with robust seahorse populations generally included beds of *Thalassia testudinum* or mixed seagrass dominated by *T. testudinum*. These sites had moderate seagrass coverage (measured as blade density), moderate species diversity, mean salinities of 33.1 ppt and mean water temperatures of 31.12 C (measured during June, 2003). In terms of specific predictors of seahorse habitat, seahorse populations were significantly correlated with water flow, with individuals more likely to be found in low-flow areas.

These low-flow areas tended to have sediment with relatively high organic content and are relatively protected bays and lagoons. Seagrass beds in higher flow areas (like near bridge cuts) never had measurable populations of *H. zosterae*. On a fine scale, the distribution of *H. zosterae*, as has been described for other seahorse species, is quite patchy. Of 20 healthy seagrass beds surveyed in 2003 in the Florida Keys, only eight had seahorses and only five of those had robust populations (i.e., more than two seahorses recovered with a modified pushnet per sampling event). In areas with robust populations, the density of seahorses is roughly 0.4± 0.25 seahorses/m^2 (mean± standard deviation) (Masonjones, unpublished data). The same patterns have been observed for Tampa Bay, Florida populations of *H. zosterae* in terms of both their abundance and patchy distribution.

d. Monitoring programs

Within the United States, most estuarine and nearshore fish monitoring takes place at the state level, with most programs utilizing both state and federal funds. Most coastal states in the U.S. have some sort of monitoring program in place, with most programs focusing on a few select species (generally those which are important in recreational or commercial fisheries). Few programs attempt to monitor entire fish communities. Only Florida has programs in place that monitor both wild populations and harvest rates for seahorses. This is primarily because Florida has both a community-level fisheries-independent monitoring program and an extensive fisheries-dependent monitoring program and because Florida is the only state with large enough inshore populations of seahorses to support a fishery which is detectable in commercial landings data. Florida's monitoring programs are discussed below.

The Florida Fish and Wildlife Conservation Commission's (FWC) Florida Marine Research Institute (FMRI) conducts applied marine research and monitoring in Florida's estuarine and nearshore marine environments. The FMRI conducts both fisheries-dependent and fisheries-independent monitoring programs. The fisheries-dependent monitoring (FDM) program monitors the commercial and recreational fisheries of Florida and will be described in detail below in Section II. The fisheries-independent monitoring (FIM) program monitors populations of estuarine fishes and selected macroinvertebrates throughout the state.

The mandate to provide accurate accounting of the condition of Florida's fisheries resources requires knowledge of the relative abundance of stocks at particular life stages. To gain this knowledge, biologists must conduct studies and gather data that are free of the reporting or gear biases usually associated with information obtained from recreational and commercial fishers. To this end, in 1988, scientists initiated the FIM program to monitor juvenile fish recruitment into Tampa Bay; since then, the program has expanded to include seven estuarine systems and the Florida Keys (Figure 1) and to include adult-fish monitoring. In this program, scientists use statistically valid sampling techniques to collect data that are used to estimate relative abundance of juvenile and adult fishes and invertebrates. More than two million fish and invertebrates are identified, counted, and released alive each year. These data provide juvenile recruitment indices and adult age tables used to evaluate the effects of current fishery regulations and predict future stock levels.

The FIM program consists of a number of interconnected components. The program's routine, stratified-random sampling regime generates information concerning the size-at-age, population age structure, and reproductive condition of many species. In addition to information about juvenile recruitment and adult abundance that can be used in stock assessments for important recreational and commercial fishery species, the FIM program produces data and specimens used in life-history, invasive-species, and fish-health studies and in studies directed at human health issues (e.g., mercury levels in edible fishes). This community-level fisheries-independent monitoring program uses a multi-gear approach to collect data on fishes and selected invertebrates from a wide range of habitats and life history stages. A 21.3-m center bag seine is used to collect juvenile and sub-adult fishes in shallow areas (< 1.8 m); a 6.1-m otter trawl is used to collect

juvenile, sub-adult, and adult fish in deep water (1.0-7.6 m); a 183-m haul seine is used to collect sub-adult and adult fish in shallow water (< 2.5 m) along shorelines; a 183-m purse seine is used to collect sub-adult and adult fishes in intermediate depths (1.0-3.3 m); and visual surveys are used to monitor reef fishes in the Florida Keys at depths to 30 m.

A stratified-random sampling design is used by the FIM program in all study areas. Each area is divided into sampling zones based on geographic and logistical criteria. Each zone is further subdivided into 1 sq.nm grids, and a subset of these grids is randomly selected for sampling. In most cases, the number of monthly samples collected in each zone with each gear is proportional to the number of grids in the zone that can be sampled with a particular gear. A single sample is collected at each randomly selected site, except during the visual sampling in the Florida Keys (four, 5 m radius, point-counts censuses are conducted per site). Sampling grids are stratified by habitat and depth, thereby identifying the gear types that can be used in each grid. All sampling is conducted during daytime hours (one hour after sunrise to one hour before sunset). Several different, habitat-dependent deployment techniques are used with some sampling gears, especially the 21.3 m seine.

All FIM sampling efforts generate both biological and environmental data. The sample work-up technique is similar for all net-collected samples, regardless of gear type or sampling regime. All fish and selected invertebrates are identified to the lowest practical taxonomic level, counted, and measured (standard length for most teleosts, height for seahorses, precaudal length for sharks, disc width for rays, carapace width for crabs, and post-orbital head length for shrimp). Animals are then released except for representative samples of each taxon (for laboratory confirmation of field identifications) and samples required for specific research projects.

During visual surveys of reef fishes, estimated lengths (natural total length) of selected reef fish species are recorded (5 cm length intervals for fishes <60 cm and 10 cm intervals for fishes >60 cm) by trained divers using SCUBA. Environmental data collected with each sample include water quality parameters, habitat characteristics, and physical parameters, such as current and tidal stage.

For seahorses, the most productive and quantitative sampling gear is the dropnet or throw-trap (usually 1-m^2). Dropnets were used to sample seagrass habitats in Tampa Bay and Charlotte Harbor from 1989 through 1994 and in the Indian River Lagoon from 1990 through 1994. Estimated densities of seahorses based on samples collected with dropnets were higher than those based on any other FIM program sampling gear (see below). Dropnets are a very quantitative gear for sampling small, cryptic, slow-moving organisms such as seahorses, but they are not efficient at collecting larger more mobile species. The latter factor led to the removal of this gear type from the regular FIM sampling regime.

Throw-traps similar to the FIM program dropnets have been used recently by FIM program biologists to study seagrass-associated fauna in Florida Bay (Matheson et al., 1999; Matheson et al., unpublished data[3]).

Data collected by scientists in the FIM program indicate both spatial and temporal trends among seahorse populations in Florida. Both *Hippocampus zosterae* and *H. erectus* were generally more abundant in middle to southern portions of the Florida peninsula (Figure 2). *Hippocampus zosterae* was also moderately abundant in the western panhandle, and *H. erectus* was also moderately abundant in the eastern panhandle.

Hippocampus zosterae was the most abundant seahorse in shallow water, represented by seine and dropnet collections, and *H. erectus* was the most abundant species in deeper water, represented by trawl collections.

Annual abundance estimates for both species varied, with some indication of an increase in more recent years (Figures 3 and 4).

II. Nature of Seahorse Fisheries

a. Commercial, Artisanal, Subsistence

In the U.S., commercial seahorse fisheries are limited to the state of Florida. As mentioned above, the commercial harvest of seahorses in Florida is monitored by the Fisheries-Dependent Monitoring (FDM) program. Florida law (Chapters 370.021, .06 (2) (a) and Administrative Code 16R-5.002) requires that anyone wishing to sell their catch of saltwater products must have a valid Saltwater Products License, and that licensed wholesale dealers must maintain records of each sales transaction. This is accomplished by the dealer filling out a Marine Fisheries Trip Ticket for each purchase of saltwater products from a fisherman. Retailers who produce their own products must also maintain records of the saltwater products that they produce for sale through their retail license. Trip tickets are used to quantify commercial landings (pounds and value) of fish and shellfish. Annual landings of about 120 million pounds worth an estimated $200 million dollars are reported on 380,000-445,000 trip tickets. This information provides resource managers with a measure of fishing effort (trips) and trends in fisheries. Required information includes Saltwater Products License number, dealer's license number, date of purchase, time fished, county landed, gear fished, number of sets, traps pulled, species code, size code (if species graded), amount of catch (usually in pounds), area fished, depth, unit price, and dollar value.

In addition to the trip ticket program, Florida has a biostatistical sampling program. This program involves fisheries scientists visiting commercial fish houses and sampling the catch as it is off-loaded. Biostatistical samplers gather information on length frequencies of landed catch by gear type; verify species identification; collect hard parts, biological tissues, and gonads; provide direct contact with fishermen and dealers; and provide information which can be used to verify trip ticket data. Currently eight samplers conduct approximately 1500 interviews per year.

Data collected by the FDM program indicate that seahorses are harvested commercially in Florida; both as a targeted fishery and as bycatch in trawl fisheries targeting other species (primarily shrimp).

b. Estimated number of fishers

The FDM program has on record approximately 40 saltwater products license holders with reported commercial landings of seahorses or pipefishes. This number has held fairly constant since 1996, with 60 or more license holders from 1991 to 1994. The majority of these fishers reported landings from the southeast Florida/Keys region, and these landings were based on between 150 and 325 commercial trips/year (Figures 5 and 6).

c. Type of gear used

Most of the Florida seahorse harvest is conducted by divers using nets or by fishers using trawls (as bycatch in a live, bait-shrimp fishery); gear type was not recorded for approximately 24% of the seahorses landed. Some specimens are also harvested by seine or dredge. From 1990 to 2003, divers collected 18 to 90% of the annual harvest of *Hippocampus zosterae* and trawlers collected 0 to 60%. Gear type was not specified for 27% of the total landings of *H. zosterae*, with 84% of these fish being harvested during the early 1990s. From 1990 to 2003, divers harvested 0 to 70% of *H. erectus* and 0 to 85% were harvested by trawlers. Overall, divers collected approximately 90% of the *H. zosterae* harvested in the southeast Florida/Florida Keys region and slightly more than 50% of those harvested in southwest Florida. Divers also collected approximately 48% of the *H. erectus* harvested in the southeast Florida/Florida Keys region.

d. Licensing/Permitting requirements

As stated above, Florida law (Chapters 370.021, .06 (2) (a) and Administrative Code 16R-5.002) requires that anyone wishing to sell their catch of saltwater products must have a valid Saltwater Products License and that licensed wholesale dealers must maintain records of each sales transaction.

e. Preferred markets (Live vs. Dried), if any

Most of the seahorses harvested in Florida are sold dried in the curio market, but a substantial number are also sold live in the aquarium trade (John Field, U.S. Fish and Wildlife Service, pers. comm.).

f. Volume landed, if known

The number of seahorses landed per year varies, but from 1990 to 2003, it has ranged from approximately 6,000 to 111,000 animals/year. *Hippocampus zosterae* comprised more than 91% of this harvest, with *H. erectus* and unidentified seahorses each comprising slightly more than 4%.

Harvest of *H. zosterae* has varied sporadically from 2,142 to 98,779 individuals per year, with lower harvest rates (<25,000 fish) in 6 of the 14 years in the dataset and higher harvest rates (>60,000 fish) in 7 of these years (Figure 7). Harvest of *H. erectus* has varied from 428 to 7,250 individuals per year, with approximately 4,000 to more than 7,000 fish harvested per year from 1990 to 1992 and less than 3,000 harvested in all subsequent years (Figure 8). The vast majority of *H. zosterae* are landed in southwest Florida, and a substantial number are also landed in the southeast Florida/Florida Keys region (Figure 7). On the other hand, most *H. erectus* appearing in harvest were landed in the southeast Florida/Florida Keys region, a moderate number were landed in the Big Bend region, and relatively few were landed in southwest Florida (Figure 8).

g. Conservation programs for seahorses

In 1983, the Florida Legislature created the Marine Fisheries Commission to conserve and manage Florida's marine fisheries. This commission was mandated with the task of ensuring the health and abundance of Florida's marine resources, using management decisions that are fair and equitable to all the people of Florida. To do this, the Commission requires considerable background information that includes current and accurate utilization rates of our marine resources.

The state was mandated by this same law to establish a Marine Fisheries Information System to gather the kinds of fisheries data necessary for management and research.

III. Extent of International Trade

a. Number of levels (Buyers, Middlemen, Exporters, etc.)

The United States is probably one of the largest importers of live seahorses for the ornamental fish market (Wabnitz *et al.*, 2003) and also imports significant quantities of dried seahorses (USFWS, 2003)[4]. The United States also exports live and dried seahorses, although volumes are small in the context of global trade. See Section (e) below for more detail.

The import industry for live seahorses is characteristic of the U.S. marine ornamental fish market. Import operations act as wholesalers, purchasing live seahorses from foreign suppliers, acclimatizing them, and then distributing them to retail outlets throughout the country.

Transshippers are also involved in the trade, importing specimens and then directly shipping them to retail outlets without intervening in care (Wabnitz et al., 2003).

Import and distribution patterns for dried seahorses are less clear, mainly because federal and state authorities have not monitored this industry prior to the CITES listing for *Hippocampus*.

Seahorse capture fisheries and exports are centered in the state of Florida, which has the only known commercial seahorse fishery in the country. Other states have either unsuitable habitat for seahorses, or actively prohibit the collection of seahorses without a permit. The domestic fishery and export business for seahorses is quite simple, with seahorses taken primarily as bycatch in a live, bait-shrimp fishery and by divers in state waters. Some shrimp fishermen choose to obtain the required state license and sell seahorses, which must be landed alive as per state regulations. As noted above, the state also licenses wholesalers who either export specimens (alive and dried) or sell them to domestic retailers as prices dictate.

There are also limited quantities of aquacultured seahorses available from at least one U.S captive-breeding operation. This business sells directly to retail customers through the internet, bypassing wholesalers and retail outlets.

b. Information on value, retail, and wholesale prices

State and federal agencies collect little information on seahorse prices. The aquaculture operation mentioned in paragraph a) above sells specimens for USD$30-$150 per piece, whereas commercial bait shrimp fishermen sell their bycatch seahorses for about USD$1 per animal to wholesalers (J. Field, U.S. Fish and Wildlife Service, pers. comm.).

c. Customs/CITES involvement at ports

The U.S. Fish and Wildlife Service (USFWS) is the primary agency involved in federal wildlife law enforcement, including implementation of CITES provisions for import and export. USFWS inspectors are stationed at 15 designated ports throughout the country, and process over 100,000 shipments each year. U.S. seahorse importers and exporters, like all wildlife traders in the country, must purchase a standard wildlife import/export license each year, and pay fees to process each shipment they receive at a U.S. port. USFWS inspectors analyze each shipment's paperwork, including the importer's license, and make case-by-case decisions whether to perform visual inspections of the shipment itself.

Wildlife inspectors consider several factors when deciding whether to perform a visual inspection, including the species' status in the wild, the importer's violation record, and the species' CITES status. Currently, USFWS inspects approximately 25% of all wildlife shipments (seahorses and other species), and these inspections may cover the entire shipment or just selected specimens.

d. Relationship between CITES offices and Fisheries Agencies

Under the U.S. constitution, almost all fisheries management in coastal waters is the responsibility of state (provincial) governments. This applies to seahorses, which are only commercially harvested in the waters of the state of Florida in the United States. The USFWS is a federal (national) agency with sole responsibility for enforcing CITES measures for the United States. The federal U.S. National Marine Fisheries Service (NMFS) provides technical expertise on various seahorse issues and has joined with the USFWS and the Florida state government to work collaboratively on implementing the CITES seahorse listing for the United States. The state government has already begun work with the USFWS to develop a public relations and outreach plan for seahorse harvesters and wholesalers after the listing becomes effective in 2004.

e. Amount of Exports

From 1996 to 2003, the U.S. Fish and Wildlife Service recorded 33 records of seahorse exports, with nearly 1,000 live animals and thousands of dried specimens for either the curio or medicinal trade. In the same time period, the U.S. Fish and Wildlife Service recorded more than 200 imports including more than 31,000 live animals and hundreds of thousands of dried specimens. These values probably largely underestimate the U.S. trade volumes since 1) they occurred prior to the CITES listing and the associated record-keeping, and 2) most seahorses are traded with other tropical fish and coded as such by customs officials in the United States. The CITES listing (effective May 2004) should help to correct this bias in U.S. trade data, since the treaty will require seahorse shipments to be declared to the species level.

Chinese Taipei reported approximately 500 kg of seahorse imports from the United States from 1983-2000, although some of these may be re-exports[5]. The state of Florida showed seahorse harvest ranging from 6,000 to 111,000 animals per year from 1990-1998, but it is unclear how many of these were exported.

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Figure 1
Florida Localities Mentioned in Text

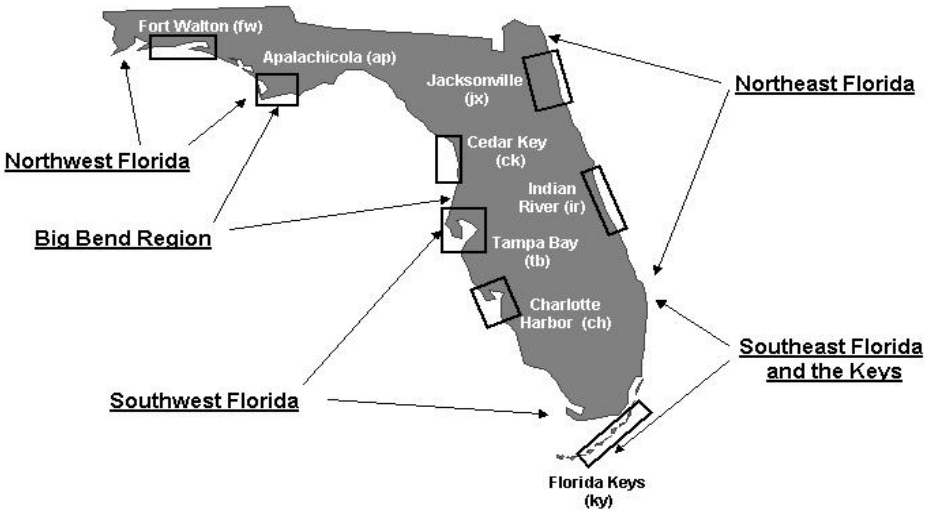

Figure 1: Florida localities sampled by the Fisheries-Independent Monitoring Program (smaller text and rectangles) and Florida regions as defined by the Fisheries-Dependent Monitoring Program (underlined text and arrows).

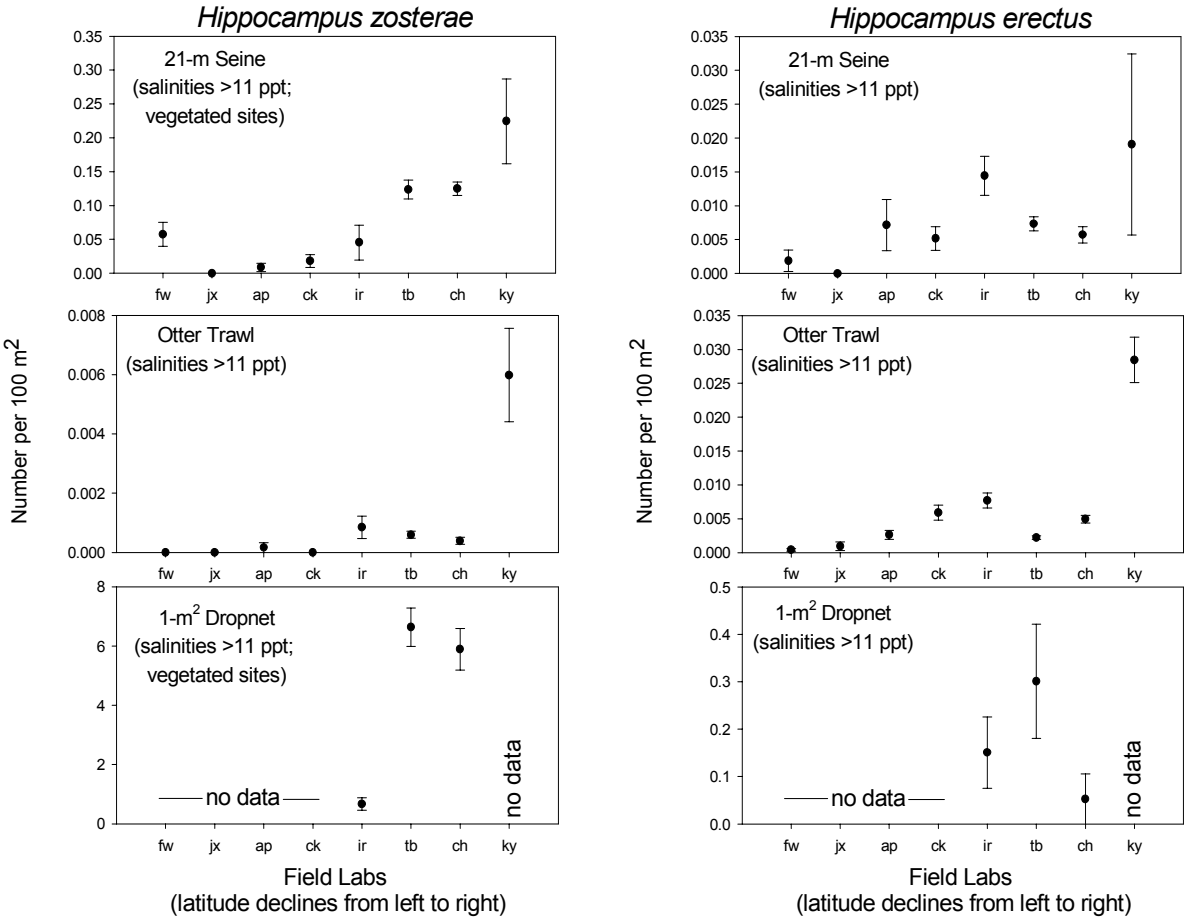

Figure 2: Relative abundances of *Hippocampus zosterae* and *H. erectus* in 8 estuarine systems in Florida. Data collected by the Fisheries-Independent Monitoring Program of the Florida Fish and Wildlife Conservation Commission. Years included in dataset as follows: Fort Walton (fw) —1992-1997, Jacksonville (jx) — 2001-2002, Apalachicola (ap) — 1998-2002, Cedar Key (ck) — 1996-2002, Indian River (ir) — 1990-2002, Tampa Bay (tb) — 1989-2002, Charlotte Harbor — 1989-2002, and the Florida Keys (ky) — 1997-2002. Although the entire estuarine systems were sampled, data were filtered to include only habitats where seahorses are likely to occur: salinities > 11 ppt and, for *H. zosterae* seine and dropnet data, vegetated substrates. Values represent mean ± one standard error.

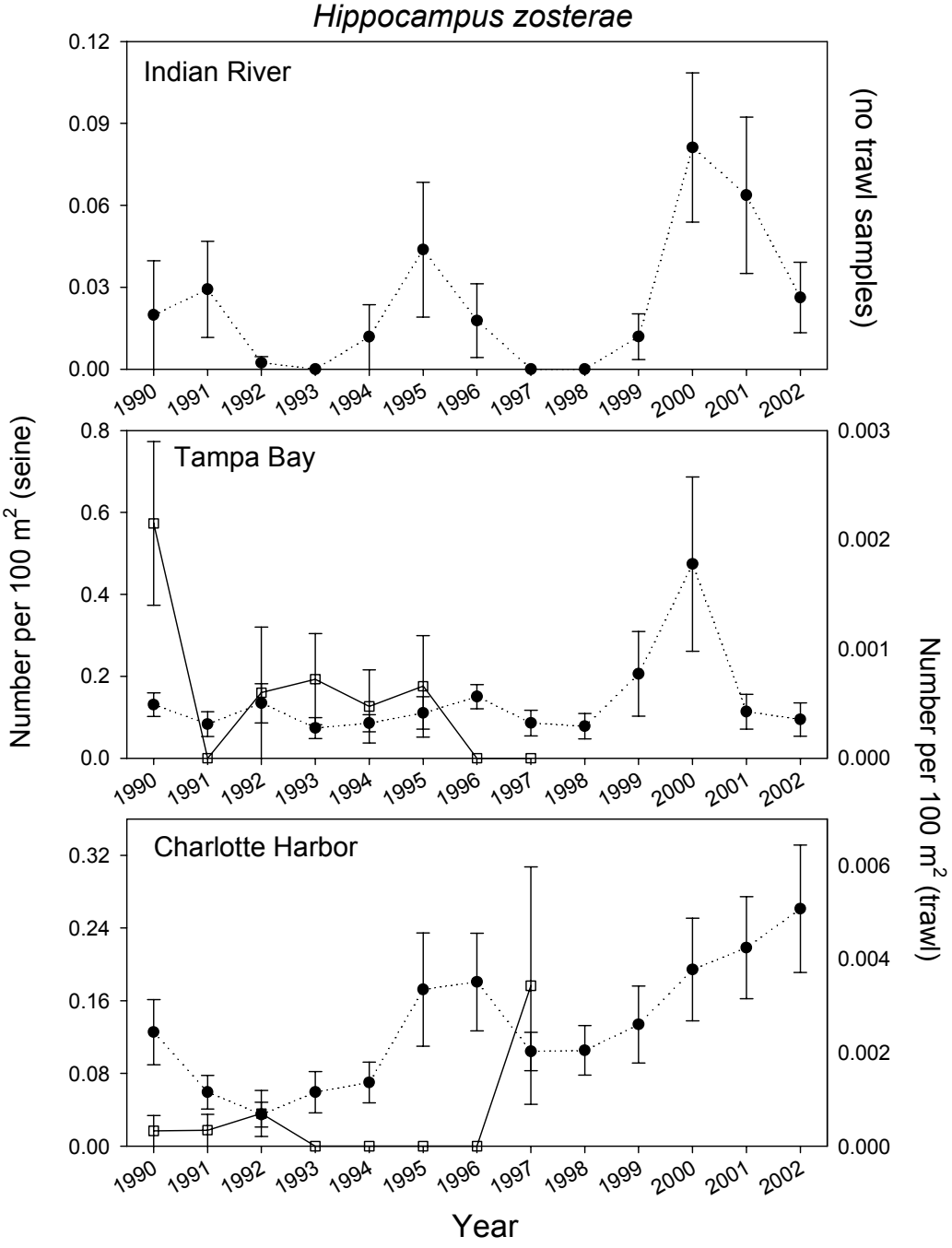

Figure 3: Annual relative abundance of *Hippocampus zosterae* from 1990 through 2002 in three estuarine systems in Florida. Data collected by the Fisheries-Independent Monitoring Program of the Florida Fish and Wildlife Conservation Commission. Data from spring (Mar-May) and fall (Sept-Dec). Although the entire estuarine systems were sampled, data represent only habitats where seahorses are likely to occur: salinities > 11 ppt and vegetated substrates (seines only). Seines represented by solid circles and dotted lines, and trawls represented by open squares and solid lines. Values represent mean ± one standard error.

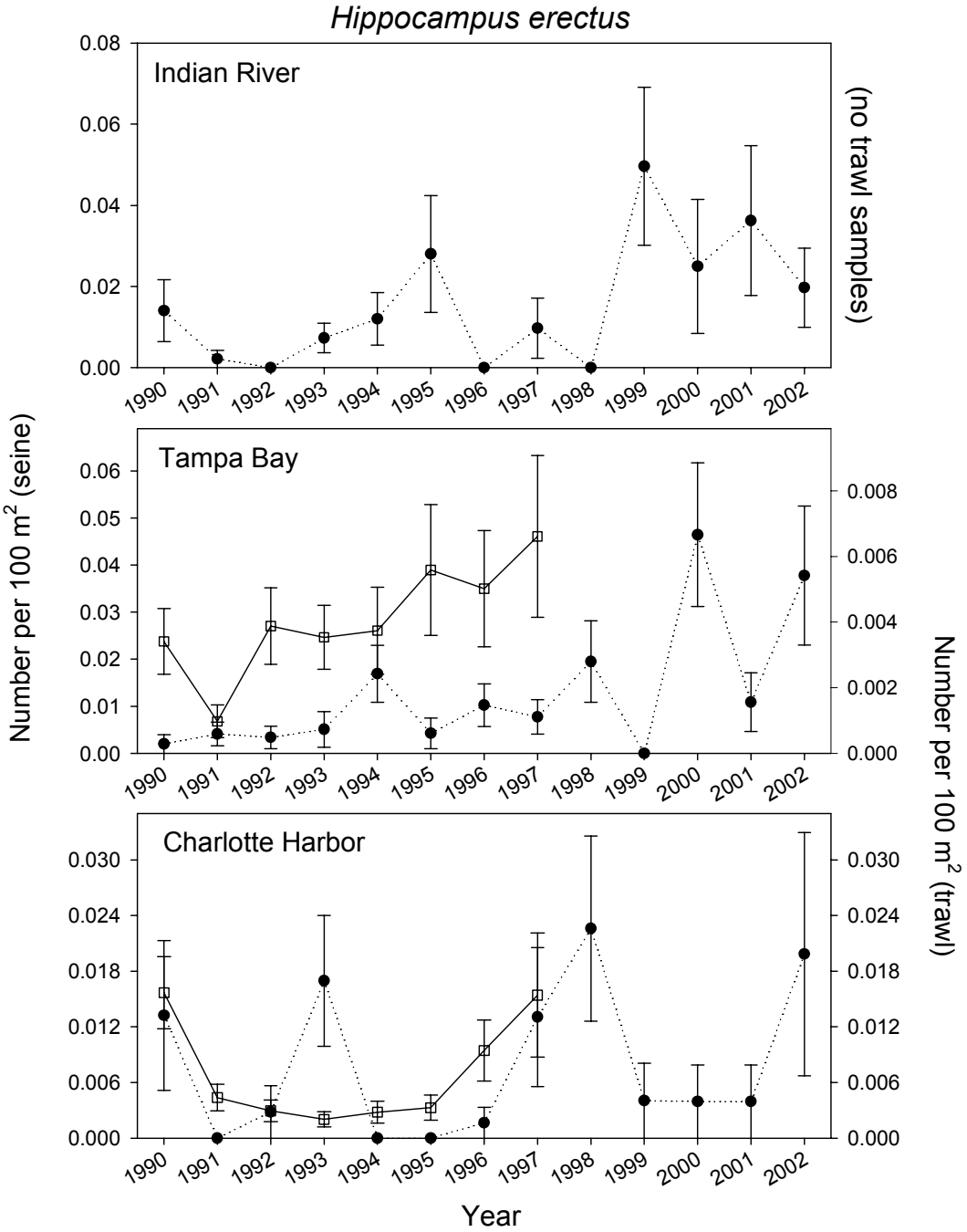

Figure 4: Annual relative abundance of *Hippocampus erectus* from 1990 through 2002 in three estuarine systems in Florida. Data collected by the Fisheries-Independent Monitoring Program of the Florida Fish and Wildlife Conservation Commission. Data from spring (Mar-May) and fall (Sept-Dec). Although the entire estuarine systems were sampled, data represent only habitats where seahorses are likely to occur: salinities > 11 ppt. Seines represented by solid circles and dotted lines, and trawls represented by open squares and solid lines. Values represent mean ± one standard error.

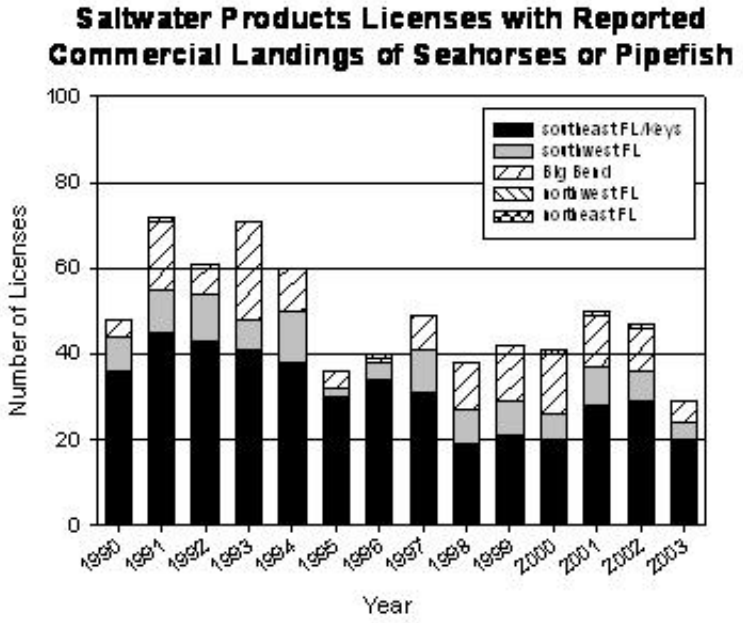

Figure 5: Annual saltwater products licenses with reported commercial landings of seahorses or pipefish in five Florida regions. Data collected by the Fisheries-Dependent Monitoring Program of the Florida Fish and Wildlife Conservation Commission.

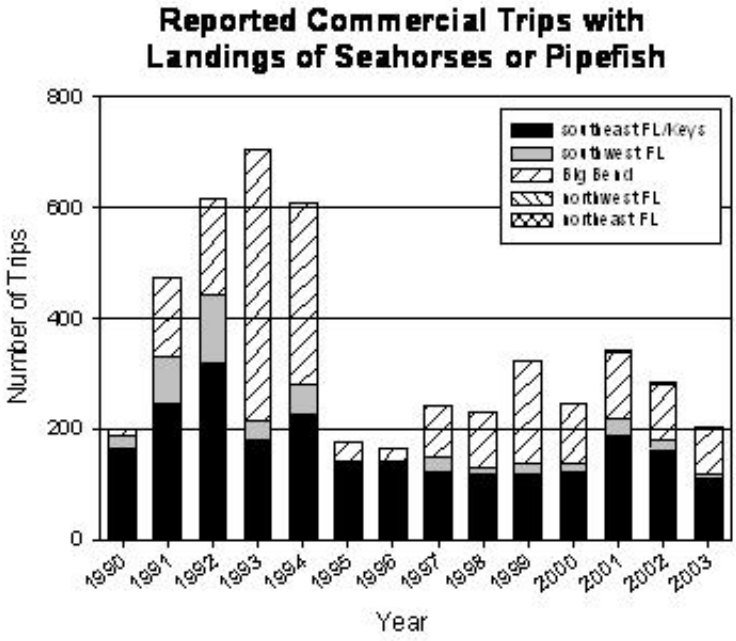

Figure 6: Annual reported commercial trips with landings of seahorses or pipefish in five Florida regions. Data collected by the Fisheries-Dependent Monitoring Program of the Florida Fish and Wildlife Conservation Commission.

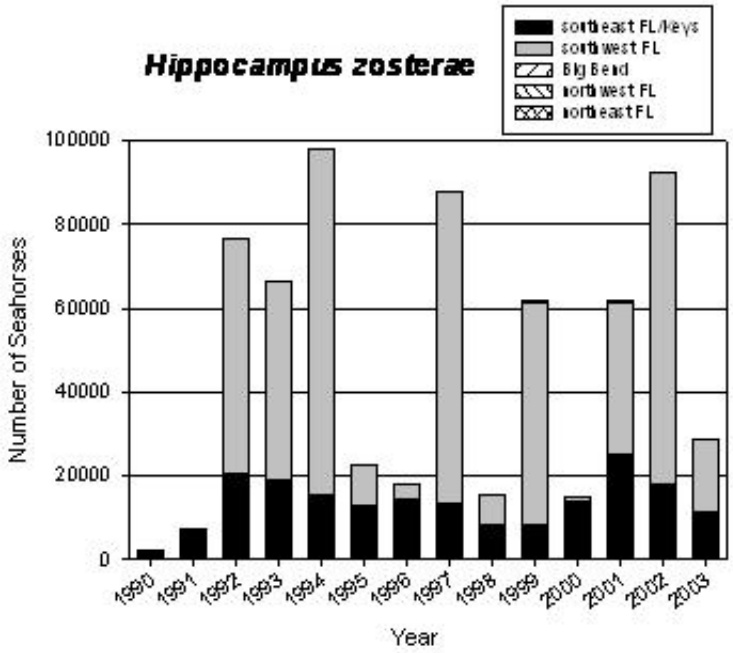

Figure 7: Annual commercial harvest of *Hippocampus zosterae* in five Florida regions. Data collected by the Fisheries-Dependent Monitoring Program of the Florida Fish and Wildlife Conservation Commission.

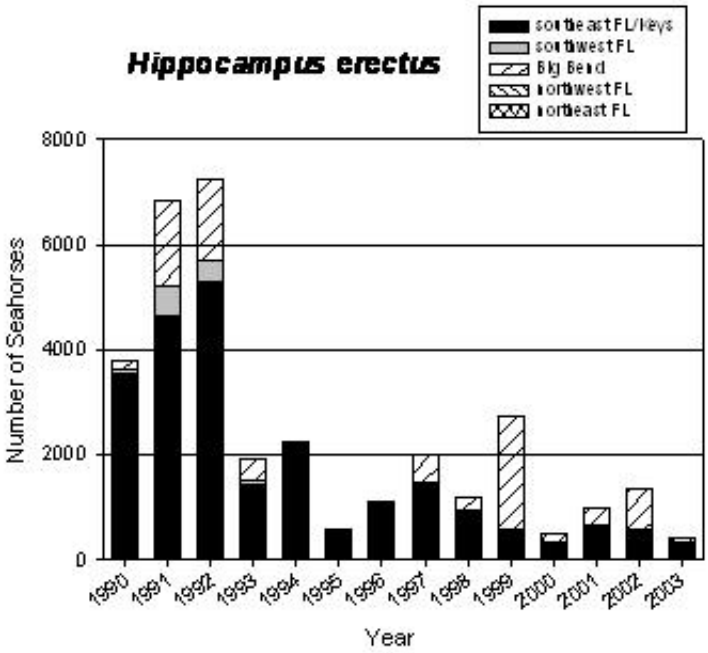

Figure 8: Annual commercial harvest of *Hippocampus erectus* in five Florida regions. Data collected by the Fisheries-Dependent Monitoring Program of the Florida Fish and Wildlife Conservation Commission.