



## Dwarf Seahorse

Draft Rule

November 18, 2015

**Florida Fish and Wildlife Conservation Commission**

Division of Marine Fisheries Management

Version 3

This document summarizes a proposed draft rule to amend the Florida Fish and Wildlife Conservation Commission's (FWC) dwarf seahorse regulations in the Marine Life Chapter, 68B-42, Florida Administrative Code (FAC). The proposed draft rules would modify recreational and commercial bag limits, establish an annual commercial quota, establish an allowable harvest area for dwarf seahorses, and establish a statewide seasonal closure.

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Photo credit: Dr. Heather Masonjones

## Background

- Some stakeholders have expressed concerns about population status of dwarf seahorses
- The Commission has already substantially reduced harvest of this species
- In 2011, NOAA Fisheries received a petition to list this species under the Endangered Species Act (ESA)
- Additional management measures may be appropriate
- Further harvest reductions and strategic conservation measures are recommended
- Improving the population status of this species may prevent the need for listing



Photo courtesy of Emily Walker

Members of the environmental community have recently expressed concerns about the population status of the dwarf seahorse (*Hippocampus zosterae*). In 2011, the Center for Biological Diversity filed a petition with NOAA (National Oceanic and Atmospheric Administration) Fisheries to have the species listed under the Endangered Species Act (ESA). While the Marine Life industry and the FWC, working together as co-managers of the Marine Life fishery, have already substantially reduced commercial harvest of this species, staff believes additional management measures may be appropriate.

This presentation will include staff's recommendations, developed in coordination with the industry, to further reduce harvest and implement strategic conservation measures that will eliminate potential harvest pressure on this species in areas of quality seagrass habitat at the northern extremes of its known range. The recommended measures are expected to stabilize and improve dwarf seahorse populations throughout the state and may help prevent the need to list this species under ESA.

## Dwarf Seahorse

- Found primarily in the Gulf of Mexico
- Smallest seahorse species in Florida
  - Maximum size of about 2 inches
- Lives in seagrass beds
- Lifespan is about one year, possibly longer
- Targeted for the aquarium and curio trades
- Managed as part of the Marine Life fishery (aquarium trade)
  - Limited entry commercial fishery
  - Recreational and commercial trip limits
  - Gear restrictions
- Commercial fishery is order driven
- FWC regulations extend into federal waters



Photo courtesy of NOAA

The dwarf seahorse is primarily found in the Gulf of Mexico. It is the smallest of three seahorse species found in Florida waters with an average size of 1 inch and a maximum size of about 2 inches. Dwarf seahorses are found in shallow water seagrass flats in association with various seagrass species and macroalgae. The documented lifespan of the dwarf seahorse is about one year, though unpublished reports indicate that they may live for up to three years.

Seahorses are collected recreationally and commercially for display in home and public aquariums. They are also collected for the curio trade (dried individuals used in home décor and novelty items). The FWC's Marine Life rules govern the harvest of these aquarium species and include a limited entry program for the commercial fishery. New commercial fishers may only enter the fishery by acquiring a transferable endorsement from someone who is leaving the fishery. Dwarf seahorses, like other Marine Life species, are also subject to recreational and commercial trip limits and gear restrictions.

The commercial Marine Life fishery is also unique in that it tends to be order driven. Unlike traditional food fisheries, Marine Life collectors will often wait until they have an order from a wholesaler or retailer before collecting. This ensures they have a market and minimizes storage needs for their live product. It also means that the fisher typically has a specific number and suite of species he or she is targeting on a given trip. Individual fishers tend to specialize on certain species or types of Marine Life organisms.

There is no federal management plan for the vast majority of Marine Life species. FWC regulations extend into federal waters.

## Unique Seahorse Reproductive Behavior

- Form mating pairs
- Female deposits eggs in male's brood pouch
- Male carries eggs and gives birth to live young
  - Carries a batch of eggs 7-10 days
  - Carries multiple broods at same time
- Breed March through October



Photos courtesy of Dr. Heather Masonjones

The unique reproductive behavior of seahorses make them appealing to aquarists. The mating ritual begins when a male and a female are positioned next to each other (as shown in the photo on the left) and both show bright and/or rapid changes in coloration. Females deposit their eggs in a male's brood pouch, which he then carries until giving birth to live young in about seven to 10 days. Breeding time and juvenile growth are closely associated with day length and regional water temperatures. During the summer months, males may produce one or more broods per month, each containing up to 55 offspring. Juvenile growth is rapid with individuals reaching reproductive maturity between two and three months of age. Low reproductive rates and high parental investment may impact dwarf seahorse's ability to respond to environmental changes and/or harvest pressure. Research indicates the breeding season spans from March through October but commercial fishers report that they breed year-round in the Keys.

The picture on the right shows a pregnant male with an extended brood pouch containing brooding baby seahorses.

## Previous Management Successes

- FWC has historically worked closely with the industry to co-manage the Marine Life fishery
- Regulations first implemented in 1990
- Continued industry concerns about increased participation and harvest for the curio trade

### Previous Commission Action

- 1990: License requirements and a suite of commercial size and trip limits
- 2005: Limited entry Marine Life endorsement program
- 2009: Additional commercial trip limits (400 dwarf seahorses)

### Harvest Reduction Achievements

- Harvest rate prior to the 2009 trip limit: ~44,000/year
- Harvest rate 2010–2014: ~17,000/year
- **Average annual harvest reduced by 60%**



Photo courtesy of Dr. Heather Mesinger



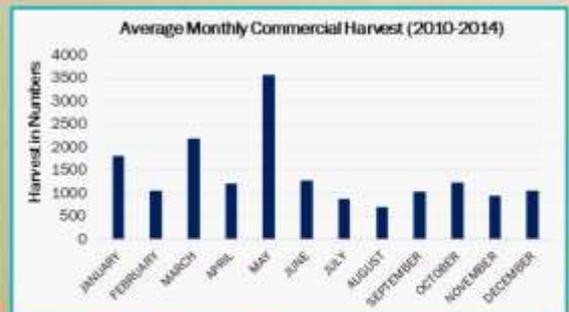
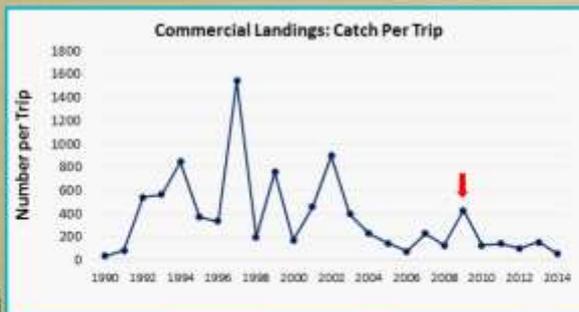
The FWC has historically enjoyed a cooperative relationship with the commercial Marine Life fishery. The FWC and its predecessor, the Marine Fisheries Commission (MFC), often rely on the Marine Life industry as the best source of information about the health of the numerous species managed under this fishery. The fishery, which targets dwarf seahorses along with hundreds of other ornamental species, provides a good example of government and industry working together to co-manage a fishery.

The MFC implemented the first Marine Life fishery regulations at the industry's request in 1990. These regulations included a requirement to purchase an open-access Marine Life endorsement for commercial harvest of managed species, along with a broad suite of commercial size limits and trip limits for a variety of Marine Life species. However, industry concern about increased participation in the fishery and large scale harvest of several species for the curio trade led the FWC to develop additional management measures for this fishery, including a limited-entry endorsement, in 2005. Staff and the industry continued to work together to improve management following the creation of the limited-entry program. In 2009 the FWC adopted another series of regulations for a wide variety of species, including the current commercial trip limit for dwarf seahorses, which is 400 dwarf seahorses per day per person or per vessel, whichever is less. This trip limit was established in close coordination with the Marine Life industry as part of an effort to evaluate management of the entire commercial Marine Life fishery, including the need for harvest limits for many species, and was based on an analysis of fishery trends and stakeholder concerns.

In the 20 years prior to the development of the current regulations (1990 – 2009), commercial harvest of dwarf seahorses averaged approximately 44,000/year. In the five years since the trip limit was adopted (2010–2014), average annual harvest has been reduced to approximately 17,000/year, a reduction in annual harvest of approximately 60% per year.

## Dwarf Seahorse Harvest

- Recreational harvest data not available
- Commercial harvest highly variable
  - Commercial trip limit of 400 dwarf seahorses effective July 1, 2009
  - Higher landings early in the calendar year
  - Majority of landings: Tampa Bay to Miami



Due to the unique nature of the Marine Life fishery, recreational harvest data are not available for dwarf seahorses.

However, like traditional fisheries commercial harvest data is reported on trip tickets. Statewide commercial harvest levels are highly variable. Because the fishery is demand driven and there are very few collectors involved in the commercial harvest, a change in demand or decrease in participation by even a single collector can have dramatic impacts on the harvest rates of dwarf seahorses. As shown in the figure on the left, catch per trip (number of dwarf seahorses per trip) was variable from 1992 to 2002, decreased in 2003, and then remained relatively low until midseason 2009, when harvest increased temporarily in anticipation of the soon-to-be-implemented commercial trip limit. The current commercial trip limit of 400 dwarf seahorses per person or per vessel per day was implemented midseason on July 1, 2009 (indicated by the red arrow in the figure), and harvest has remained steadily low since that time.

The figure on the right shows the average statewide dwarf seahorse landings (harvest in numbers) by month since 2010, the first full year under the current commercial trip limit. Reported landings are highest early in the calendar year, with the catch typically peaking in May.

The majority of landings occur from Tampa Bay to Miami.

# Considerations for Regulatory Change

## Stakeholder Concerns

- 2011: NOAA Fisheries received a petition to list the dwarf seahorse under the Endangered Species Act (ESA)
  - Fishing pressure identified as a threat
  - 90-day finding: further consideration of listing was warranted
  - NOAA Fisheries is conducting a status review of the species

## Additional management measures may be appropriate based on:

- Population status in question
- Limited geographic range and population connectivity
- Dependence on seagrass habitat
- Susceptibility to environmental changes
- Unknown levels of mortality from bait shrimp fishery



*Reducing harvest rates further could prevent the need for more drastic measures, such as listing under the ESA*

Photo courtesy of Heidi Thorold

In 2011, NOAA Fisheries received a petition from the Center for Biological Diversity to list the dwarf seahorse under the ESA. The petition identified fishing pressure, as well as habitat degradation, as threats to dwarf seahorse populations. In 2012, NOAA Fisheries released its 90-day finding concluding that the petition provided enough information to warrant further consideration of possible listing. As required by federal law, NOAA Fisheries is now conducting a thorough status review for this species and the FWC has provided all of our available data to assist with this review.

In addition to NOAA's analysis of the available data for the purposes of evaluating the need for protection under ESA, FWC has been reviewing the available information to determine if management changes are needed to improve conservation of this species. Based on staff's review of the available fishery dependent and independent data, additional management measures may be appropriate. Factors contributing to this recommendation include: the unknown population status, limited geographic range and population connectivity, dependence on seagrass habitat, susceptibility to extreme changes in environmental conditions, and unknown levels of mortality from the bait shrimp fishery.

A reduction in harvest rates could contribute to increased sustainability of Florida's dwarf seahorse population and may prevent the need for more severe measures, such as listing under the ESA.

## Population Status

- Stakeholder concerns about the population status
- Limited available data suggest small, isolated populations
- Abundant only in southern Florida and, to a lesser extent, along parts of the Texas coast and Mexico's Gulf coast
  - Largest populations are in Florida Bay
  - Indications that populations may be small and slow to rebound in the northern portions of the state
- Require seagrass habitat
- Sensitive to extreme changes in temperature and salinity



Photo courtesy of Ken Nedimyer



There is relatively little scientific information available about dwarf seahorse populations here in Florida or throughout the rest of their range. Therefore, the status of population is unknown. However, some stakeholders have expressed concern that commercial harvest rates and seagrass declines may be contributing to declines of this species. An examination of scientific literature and FWC's fisheries-independent and fisheries-dependent databases was conducted to determine the recent and historical distributions of the dwarf seahorse and trends in abundance over time. Although they are known to occur in Bermuda, the Bahamas, and Cuba, dwarf seahorses are believed to be abundant, both recently and historically, only in southern Florida and, to a lesser extent, along parts of the Texas coast and Mexico's Gulf coast. The largest populations are found in south Florida, especially Florida Bay. Recent genetic data also suggest there are several isolated populations in Florida. Some of the available data indicate the species may be of low abundance in the northern portions of the state and that populations may not rebound quickly when seagrass habitat declines temporarily.

Dwarf seahorses require seagrass habitats for their food and shelter. They are poor swimmers and use their tails to anchor themselves to vegetation, which prevents them from being swept away by currents. They are sensitive to environmental factors such as temperature and salinity, which affect basic biological functions, such as growth, reproductive rates, and feeding.

## Fisheries Independent Data

- Seahorses are detected in FWRI's fishery independent seine surveys
- Greatest abundance in Tampa Bay, Charlotte Harbor, and Florida Bay
- Rare in Apalachicola Bay, very low abundance in Cedar Key and Indian River Lagoon (IRL), and absent from NE Florida
  - IRL seahorses likely affected by seagrass die-offs
  - Seagrass is coming back in IRL but seahorse numbers in the survey have not increased



FWRI's fisheries-independent monitoring (FIM) program monitors populations of estuarine fishes and selected macroinvertebrates throughout the state. Analyses of FIM data for various Florida estuaries suggest that dwarf seahorses are most abundant in the Keys (sampling actually conducted in Florida Bay under a National Parks Service grant from 2006 to 2009), Tampa Bay, and Charlotte Harbor. Catches were highest in Florida Bay. Dwarf seahorses are rarely caught in Apalachicola Bay and were absent in samples from northeast Florida. Relative abundances in Cedar Key, Tampa Bay, and Charlotte Harbor were somewhat higher; however, abundance at Cedar Key was always lower than in Tampa Bay or Charlotte Harbor, with none collected during many years. Similar to Cedar Key, abundance in the Indian River Lagoon (IRL) was very low. Also, this species was not collected in any of the samples collected by the survey from the northern IRL during the years 2011 - 2014, likely due to the widespread loss of seagrass and drift algae from this area. While seagrass coverage is now increasing in the IRL, the number of seahorses detected by the surveys has not increased.

## Current Regulations – Recreational

- License requirements: recreational fishing license
- Bag limit: 5 of each seahorse species, within a 20-organism aggregate bag limit for all Marine Life species
- Allowable gear: limited to specific gear designed to maintain the catch in healthy condition
- Landing requirements: must be landed alive
- Closed areas: Harvest prohibited from Biscayne and Everglades national parks and John Pennekamp State Park

### Proposed Bag Limit Change

- Reduce to 5 seahorses total, within the 20-organism aggregate limit



As mentioned earlier in the presentation, there are a variety of management measures to conserve dwarf seahorses already in place through the Marine Life rules. Because Marine Life species are managed according to their value as live individuals, Marine Life regulations are designed to maximize the chances that collected organisms will survive collection and transport.

Recreational harvesters are required to have a saltwater fishing license to collect Marine Life species and are limited to five of each species per person per day, which is included in the 20-organism per day Marine Life aggregate bag limit. In order to maintain collected organisms in a healthy condition, recreational harvesters are limited to the use of specific gear types designed to maintain the catch in healthy condition. These gear include hand held nets and drop nets, storage bags, and rods to harvest dwarf seahorses. Additionally, all Marine Life organisms must be landed alive.

Harvest of all Marine Life species, including seahorses, is prohibited within Biscayne National Park. Everglades National Park, which includes the majority of Florida Bay, also prohibits all harvest of seahorses from their waters. FWC prohibits harvest of most Marine Life species, including all seahorses, from John Pennekamp Coral Reef State Park in the Upper Keys.

In order to contribute to a reduction in harvest of dwarf seahorses, staff are proposing to reduce the recreational bag limit to five total seahorses instead of five of each species of seahorse per person per day, within the 20-organism aggregate bag limit.

## Current Regulations – Commercial

- License requirements: SPL, RS, Marine Life endorsement
- Trip limit: 400 dwarf seahorses per person or per vessel per day, whichever is less
- Allowable gear: limited to specific gear designed to maintain the catch in healthy condition
- Landing requirements: must be landed alive
- Closed areas: Harvest prohibited from Biscayne and Everglades national parks and John Pennekamp State Park



### Proposed Changes

- Reduce to 200 dwarf seahorses per person or per vessel per day, whichever is less
  - Expected to decrease commercial harvest by as much as 20%
- Establish an annual commercial quota of 25,000 dwarf seahorses
- Prevent future expansion of the fishery



Photo courtesy of Heidi Thirsk

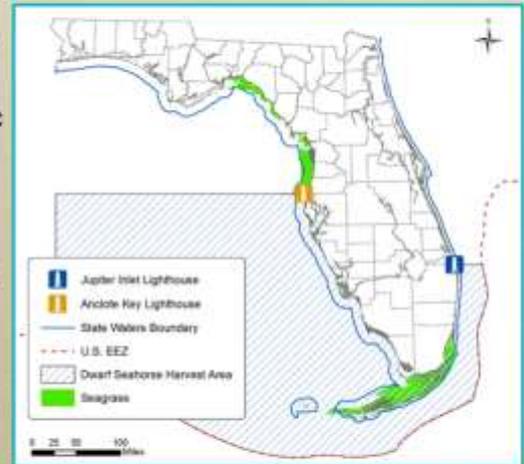
There are also management measures in place for the commercial dwarf seahorse fishery. Commercial harvesters are required to have a Saltwater Products License (SPL) with a Restricted Species (RS) endorsement and a Marine Life (ML) endorsement. The commercial Marine Life fishery is a limited entry fishery; new participants may only enter the fishery by acquiring an endorsement that is eligible for transfer from a participant leaving the fishery. Commercial harvesters are limited to 400 dwarf seahorses per person or per vessel per day, whichever is less. However, commercial harvesters that take dwarf seahorses as incidental bycatch are limited to the daily recreational bag limit of 5. Commercial fishers targeting dwarf seahorses under the proper endorsement may use the same gear types allowed for recreational harvesters, as well as small, lightweight trawls specifically designed for harvest of dwarf seahorses. Roller frame trawls may only be used by endorsement holders that hold a valid live bait shrimping license. Additionally, as is the case in the recreational fishery, all Marine Life organisms must be landed alive.

Similar to the areas closed to recreational harvest of seahorses, commercial harvest of dwarf seahorses is prohibited from Biscayne National Park, Everglades National Park, and John Pennekamp Coral Reef State Park.

In order to reduce fishery impacts to the population, staff are recommending the Commission reduce the daily commercial trip and vessel limit by half to 200 dwarf seahorses per day. A commercial trip limit of 200 dwarf seahorses could reduce overall commercial harvest by as much as 20%. This would be accomplished without impacting the majority of the commercial fishery, since approximately 88% of commercial trips land 200 or fewer dwarf seahorses. Staff are also recommending the creation of an annual commercial quota of 25,000 dwarf seahorses for the fishery in order to ensure that it does not expand again in the future. Should staff project that this annual quota is going to be met, both the commercial and recreational fisheries for dwarf seahorses would be closed until the beginning of the next fishing year (October 1). The fishery has only exceeded harvest of this 25,000 individual species once since the current trip limit was introduced (25,816 dwarf seahorses in 2013), so the proposed quota should adequately prevent fishery expansion without being overly restrictive on current participants in the fishery.

## Additional Proposed Management Measures

- Establish an allowable harvest area
  - South of Anclote Key State Park Lighthouse on the Gulf coast
  - South of Jupiter Inlet Lighthouse on the Atlantic coast
  - ENP, BNP, and Pennekamp would remain closed to harvest
- Prohibit harvest north of the established area year round
  - Prevents harvest from northern extremes of their range
- Establish a seasonal closure statewide from July through September each year
  - Expected to reduce harvest by as much as 15%



Staff are also recommending the Commission create an allowable harvest area for dwarf seahorses and establish a statewide seasonal closure to their harvest from July through September of each year. The allowable harvest area, from south of Anclote Key State Park Lighthouse on the Gulf coast to South of Jupiter Inlet Lighthouse on the Atlantic coast, will limit harvest to the areas where dwarf seahorses are most abundant. However, the waters of Everglades National Park (ENP), Biscayne National Park (BNP), and John Pennekamp Coral Reef State Park would remain closed to all seahorse harvest. Harvest of dwarf seahorses from areas north of Anclote Key State Park Lighthouse on the Gulf coast and north of Jupiter Inlet Lighthouse on the Atlantic coast would be prohibited year round. This closed area on the Gulf coincides with essential seagrass habitat that is already closed to shrimping, while the closed area on the Atlantic includes seagrass habitat in the IRL believed to be capable of supporting larger numbers of seahorses. These closures to harvest from quality seagrass habitat in the northern portion of dwarf seahorse's range, coupled with the existing closures from similar areas in the national parks and Pennekamp will ensure dwarf seahorses have areas of high quality habitat throughout their Florida range where they are free from harvest pressure.

The statewide seasonal closure will further conserve this species by preventing harvest during a portion of the breeding season. These measures would further reduce harvest rates by as much as 15%.

## Stakeholder Feedback

- Staff has been working with commercial dwarf seahorse collectors and the Marine Life community
- Some fishery participants feel further harvest reductions are unnecessary
- Broad support for creation of the allowable harvest area and recreational bag limit change
- Broad support for an annual quota
- Mixed support for commercial trip limit reduction
- General opposition to a seasonal closure



Staff has been working with participants in the commercial collection (harvest) of dwarf seahorses to develop these recommendations, along with the Florida Marine Life Association, the professional trade organization that represents the commercial Marine Life community. These efforts were focused on finding a workable management scheme that would allow the fishery to continue to operate while still furthering conservation of this species.

Industry support for staff's proposal remains mixed. Collectors would generally prefer to tighten the regulations now and prevent potential listing and total fishery closure in the future. However, several industry participants feel that this species is thriving in south Florida and that further regulation is unnecessary. The majority of the dwarf seahorse collectors support creation of the recommended allowable harvest area and the prohibition of harvest in the northern portions of the state and the industry fully supports the recommended change to the recreational bag limit.

An annual quota was recommended by the industry and is broadly supported. However, there is mixed support for a commercial trip limit reduction. Some collectors are agreeable to a trip limit of 200, while others would rather see the limit remain unchanged or reduced to no lower than 300 dwarf seahorses per trip. Several commercial collectors have expressed opposition to a seasonal closure. However, most collectors agree that the proposed timing of the closure is acceptable if a seasonal closure is necessary.

# Proposed Draft Rules

## 68B-42.0036 Closed Areas

- *Prohibit harvest of dwarf seahorses north of Anclote Key State Park Lighthouse on the Gulf coast and north of Jupiter Inlet Lighthouse on the Atlantic coast*

## 68B-42.005 Recreational Bag Limit, Recreational Closed Seasons

- *Reduce bag limit to 5 total seahorses, within the 20-organism aggregate Marine Life bag limit*
- *Statewide recreational seasonal closure for state and federal waters from July through September*
- *Close the recreational fishery if the commercial quota is reached*

## 68B-42.006 Commercial Season, Harvest Limits

- *Reduce bag limit to 200 dwarf seahorses per person and per vessel per day*
- *Create an annual quota of 25,000 dwarf seahorses*
- *Statewide commercial season closure for state and federal waters from July through September*



Photo courtesy of NOAA

The proposed draft rules would modify 68B-42.0036, FAC, to include an area closed to the harvest of dwarf seahorses north of Anclote Key State Park Lighthouse on the Gulf coast and north of Jupiter Inlet Lighthouse on the Atlantic coast.

The proposed rules would modify 68B-42.005, FAC, to reduce the recreational bag limit to five total seahorses, within the 20-organism aggregate Marine Life bag limit and establish a statewide seasonal closure for recreational harvest from state and federal waters July through September each year. The draft rules would also close the recreational fishery for the remainder of the fishing year (October 1 – September 30 each year), should the commercial quota be projected to be reached.

Additionally, the draft rules would modify 68B-42.006, FAC, to reduce the commercial bag limit from 400 to 200 dwarf seahorses per person and per vessel per day, and apply the statewide seasonal closure from July through September to the commercial fishery. The draft rules would also create an annual commercial quota of 25,000 individual seahorses and close the harvest of this species if the quota is projected to be met in any fishing year.

## Staff Recommendation

Approve the proposed draft rules to further reduce harvest by as much as one third and create additional areas of high quality habitat where harvest pressure is eliminated:

- Reduce the recreational bag limit to 5 seahorses total
- Reduce the commercial trip limit to 200 dwarf seahorses per person or vessel, whichever is less
- Create an annual commercial quota of 25,000 dwarf seahorses
- Establish a statewide seasonal closure from July through September
- Prohibit harvest north of Anclote Key State Park Lighthouse on the Gulf coast and north of Jupiter Inlet Lighthouse on the Atlantic coast



Photo courtesy of Emily Walker



*If approved and directed, return for a final public hearing at the February Commission meeting*

Staff recommend approving the proposed draft rules reducing the recreational bag limit to five total seahorses and the commercial trip and vessel limit to 200 dwarf seahorses along with an annual commercial quota of 25,000 dwarf seahorses, and establishing a statewide seasonal closure and an allowable harvest area.

If approved and directed, staff will return for a final public hearing at the February Commission meeting.