

Collier County Manatee Protection Rule Review
Preliminary Identification of Areas for LRRC Review

March 2016

Prepared by Florida Fish and Wildlife Conservation Commission (FWC) staff for use by the Collier County Local Rule Review Committee (LRRC)

Please refer to the accompanying document (**Manatee Data Review and Summary for Collier County**) for a discussion and summary of the primary data and analyses used during the preliminary review. Maps of the existing FWC manatee protection zones are included as an appendix to the data review document.

Reasons for reviewing the Collier County manatee protection rule

The FWC Manatee Management Plan (MMP) provides a state framework for conserving and managing manatees in Florida. The MMP is complementary to the federal Florida Manatee Recovery Plan, with both plans describing actions that will ensure the manatee's long-term survival. One of the many tasks called for in the MMP is to review existing manatee protection zones based on the most current data to determine if modifications are warranted. The FWC rule for Collier County is identified for review in the MMP primarily because new manatee and boating data have both been collected in recent years and it is one of the older rules.

The first state zones in the county, addressing only the Port of the Islands / Faka Union Canal area, were adopted in 1983 and amended in 1987. A rule addressing manatee protection needs throughout the county was adopted in 1990, and amended in 1997 based in part on recommendations included in the Manatee Protection Plan developed by Collier County and approved in 1995. A comprehensive review of manatee protection needs in the county has not been performed since the countywide rule was last amended almost 20 years ago. There are existing local zones in a few locations as well as some federal regulations that apply in the 10,000 Islands area; most of these zones exist for boating safety purposes but some are for resource protection purposes other than manatee protection. While these zones were not established specifically to protect manatees, the zones do provide some incidental protection of manatees.

The number of people living in Collier County has increased considerably since zones were first established. U.S. Census data indicate the total population more than doubled between 1990 and 2014, growing from 152,099 in 1990 to an estimated population of 348,777 in 2014. The number of registered vessels in Collier County also has increased over this period but not by as much as the overall population. The number of vessels registered in the county increased by over 7,700 between 1993 and 2015 (from 14,781 to 22,536). (The increase was close to 10,500 vessels at its peak but the number declined between 2006 and 2011 – likely because of issues related to the economic downturn – before slowly increasing the last few years.) These figures do not account for vessels registered in other areas that are brought in and used by visitors and seasonal residents. Even so, this information suggests that manatees continue to face risks on area waterways as a consequence of boat operation.

Summary of review process and development of preliminary recommendations

When evaluating the potential need for changes to the existing zones, FWC staff placed the greatest emphasis on analyses involving comparisons of manatee sighting data from when the zones were initially created (1986-93) versus more recent use (2006-08); and analyses that looked at the spatial overlap between recent manatee use and boat traffic (referred to as spatial overlap analysis) – because where manatees were seen during recent surveys and where there was high spatial overlap between manatee use and boat use are critical factors in determining where manatees are most at risk of being struck by boats. Other factors and data were also considered, such as manatee telemetry data, mortality data, water depth, habitat availability (e.g., seagrass), locations of boat access facilities and marked channels, sign-posting considerations, and issues related to overall zone complexity and the ease with which boaters would be able to understand the zones. (Note on mortality data: With regard to zone configurations staff did not place a lot of significance on the precise location of carcass recoveries for boat-related manatee deaths because of the inability in most cases to know the relationship between where a manatee was struck and where it was recovered. Mortality data also do not provide much information on the potential for sub-lethal injuries, which is an important consideration when assessing risk.)

As discussed in the manatee data review document, the areas surveyed for manatees in 2006-08 and 1986-93 were similar in most areas but not identical, with the 10,000 Islands and Goodland Bay areas not surveyed at all during the more recent surveys. In all surveyed areas, the data do not account for manatees that may have been present but not counted due to a variety of potential biases. Because these biases can and likely do vary spatially and temporally, counts should not be assumed to represent the absolute number of manatees that may have been using the areas when the surveys were flown. Given the nature of the surveys, it is not possible to account for these biases; and not accounting for them limits how much significance should be placed on the counts and on observed changes over time. Nevertheless and with these caveats in mind, some comparisons can be made between the two periods.

Considering just the areas that were surveyed during both periods, the number of manatees seen in Collier County during aerial surveys was similar between 1986-93 and 2006-08 but with the mean number of manatees seen per survey being slightly lower for the more recent surveys. A comparison of manatee distribution during each period showed some potential shifts in use, with the most noticeable change being a decrease in the proportion of manatees seen in the Central Region (Naples area) and a roughly corresponding increase in the proportion of manatees seen in the South Region (Marco area). In general, however, most areas of Collier County that had higher counts of manatees during the 1986-93 period also had higher counts in the recent surveys, with observed manatee use generally being the highest in the South Region.

Despite the increases in human population and the numbers of boats being operated in the county, boat-related manatee mortality for the county as a whole has not increased and has actually decreased. The annual average number of boat-related deaths was at its highest level for the 1990-99 period, followed by a modest decline for the 2000-09 period and a substantial decline for the 2010-15 period. Looking at sections of the county, the averages for the Central Region and 10,000 Islands also showed substantial declines for the 2010-15 period while the averages for the North Region and South Region have remained fairly stable since the 1990-99 period.

Given the number of manatees seen during recent aerial surveys was similar to what was observed in the past and that boat-related manatee mortality has been relatively stable or decreasing, available information suggests the boat-related risks manatees face at the countywide level have not changed significantly as a result of increases in the human population and/or changes to the characteristics of the area (e.g., habitat availability, etc.). For this reason, large scale changes to the existing rule do not appear to be needed to address changes in risk. However, this does not necessarily mean that no changes are needed anywhere to address risks in site-specific areas or that rule changes may not be warranted for other reasons, such as to reduce zone complexity or to remove or modify zones that may not provide a significant benefit.

As part of the review process, FWC staff has met with staff from the County and the city of Naples as well as FWC law enforcement. Staff conducted a public meeting on March 7, 2016, to gather input on local views and concerns (see accompanying summary). Over the years many individuals and local governments have contacted FWC with suggestions for areas that may need new or modified zones and these areas were examined as part of the review process as well.

Based on the data review and other factors discussed above, FWC staff identified a number of zones or issues that **may** warrant a change. This document identifies and discusses each of these zones or issues. At this time staff has not made a determination as to whether any potential changes should be presented to the FWC Commissioners for consideration. Prior to making a final determination, staff will fully evaluate the input provided by the LRRC. The FWC requests that the LRRC review the identified zones and issues and provide recommendations as to what changes, if any, it believes should be proposed. This document should not be construed to limit what information the LRRC may consider or what changes can be recommended. The LRRC report may contain any recommendations the LRRC deems worthy and the FWC response to the LRRC report will address all recommendations.

General issues to consider that are not associated with only one site-specific area

Seasonality: All existing zones are in effect year-round. Would seasonal zones be more appropriate in some areas? Seasonal variation generally increases from south to north in the county, with the more northern regions showing a more noticeable decrease in manatee use during the cold season. Manatee-boat spatial overlap is significantly less during the cold season in all regions. Boat-related manatee mortality shows less seasonality, with more boat-related deaths during the cold season in 10,000 Islands and the North Region. Seasonal zones would complicate zone marking and possibly increase boater confusion.

30/20 zones: This is the only county that has 30/20 zones, which allow speeds up to 30 mph in marked channels but require speeds of 20 mph or less in all other areas. Should this zone type continue to be used? Many boaters likely operate at similar speeds whether they are in or out of a channel in these zones. Boating studies conducted throughout the state have consistently found that a large proportion of boats are operated at speeds at or below 30 mph even when there are no speed limits. Enforcement of numerical speed limits creates logistical issues because of the need for officers to be equipped with, and trained to use, radar guns and for the radar guns to be maintained and re-calibrated on a regular basis. If 30/20 zones are not used, what is the alternative? Potential alternatives would likely vary based on each zone's site-specific characteristics.

Permits for commercial fishing and professional fishing guide activities: The existing rule allows for permits to be issued for these activities. Currently there are 41 active permits, nine that cover commercial fishing activities, 31 that cover guiding activities, and one that covers both. The MMP recommends permits only be available for commercial fishers while actively setting nets (i.e., not for other commercial fishing activities or any guiding activities). Permits have been limited to just net-setting in other recent rules (Pinellas, Sarasota). Should the permit provisions be similarly changed in this rule?

Notes on areas where zone changes may be warranted

Site-specific areas identified as potentially warranting a change to the existing manatee protection zones are discussed below. Figures showing the locations of the site-specific areas are included for each region. As used in the descriptions of the existing zones and potential changes: "30/20" means a zone that allows speeds up to 30 mph in marked channels but requires speeds of 20 mph or less in all other areas; "30/SS" means a zone that allows speeds up to 30 mph in marked channels but requires Slow Speed or less in all other areas.

Table 9 summarizes the manatee density and manatee-boat spatial overlap by summary area and selected site-specific sub-areas. As compared to the overall mean for the surveyed areas in Collier County, mean manatee density and manatee-boat spatial overlap values in the site-specific areas are characterized using the following relative scale: **Very High** (≥ 7 times the all months overall mean); **High** (≥ 3 times but < 7 times the all months overall mean); **Moderate** (> 1 but < 3 times the all months overall mean); **Low** (\leq the all months overall mean).

Potential zone changes: North Region (Figure 65)

N1: Little Hickory Bay Central

Existing Zones: The central section of the bay is a 30/20 zone pursuant to the existing FWC rule. There is a 30/SS zone immediately to the south and another 30/SS zone in the northern section of the bay near Bonita Beach Road.

Why Identified: Potential higher risk area.

Although documented manatee use and Boat Overlap were low during both seasons, this area is the location of one of the three boat-related deaths recorded in the county where the responsible vessel is known and also the location of one of the four reported collisions that are not associated with a known manatee death. The very narrow width of the central section of Little Hickory Bay increases risks and could have been a factor in the collisions. The death associated with the known vessel occurred in December 2008 near marker 6 (about one mile north of Wiggins Pass). The vessel was a stern-drive 26-foot vessel traveling on plane at about 25 knots. The witnessed collision not

associated with a death occurred in April 2015 between markers 4 and 5. The vessel was a 24-26 foot vessel with twin outboards traveling at about 25 mph.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change all or part of the narrow section (roughly between markers 5 and 18) to a shore-to-shore Slow Speed zone. The total length of the channel in this section is approximately 1.3 miles.

Additional 30/20 Issue: Should any changes be made to the existing 30/20 zone immediately north of Area N1? If the existing zone is not left in place, one option would be to remove the zone entirely while another option would be to change it to a 30/SS zone (to match the area to the north).

N2: Cocohatchee River

Existing Zones: Most of the river (going upstream from a little east of Marina Bay and Island Marina) is a 30/20 zone pursuant to the existing FWC rule. There is a shore-to-shore Slow Speed zone on the lower section of the river (to the west) and the inshore portion of Wiggins Pass.

Why Identified: Potential to simplify the rule and reduce zone complexity. Narrow waterway with moderate manatee use in the western section of the river.

Warm season manatee density for this area was moderate (1.1 times greater than the overall mean density), with all but one of the manatees seen west of US 41. No manatees were observed during aerial surveys flown during the cold season. Three manatees fitted with telemetry tags had locations recorded in the river; all were west of US 41 and all occurred during the warm season. Most of the river is very narrow with many curves, and there does not appear to be a marked channel. The existing zone likely has very little effect on boat traffic.

Option 1: Take no action and leave the existing zone in place.

Option 2: Remove the 30/20 zone east of US 41 and change the 30/20 zone west of US 41 to a shore-to-shore Slow Speed zone. The total length of the 30/20 zone west of US 41 is approximately 1.1 miles.

Option 3: Remove the entire 30/20 zone and leave the area without an FWC zone.

N3: Vanderbilt Lagoon

Existing Zones: This area is a shore-to-shore Slow Speed zone pursuant to the existing FWC rule. The Slow Speed zone continues into Water Turkey Bay and Wiggins Pass to the north. Current information indicates there is a local Idle Speed zone in this area.

Why Identified: Zone may not be necessary for manatee protection purposes

Warm season manatee density for this area was low (0.1 times the overall mean density) and no manatees were observed during the cold season. Fast Overlap also was low; however, this is not surprising given the existing zones. One manatee fitted with a telemetry tag had several locations recorded in the area during the warm season.

Option 1: Take no action and leave the existing zone in place.

Option 2: Remove the Slow Speed zone and leave the area without an FWC zone. If there is a valid local Idle Speed zone in this area, removal of the FWC zone would have no impact on the water.

N4: Doctors Pass / Moorings Bay

Existing Zones: There are no zones in this area pursuant to the existing FWC rule. A local Idle Speed zone existed in this area since on or before 1994 but the zone was ruled to be null and void in 2014 because it was part of a citywide ordinance that was invalidated on procedural grounds.

Why Identified: Zone requested by the city of Naples

Manatee density for this area was low (less than 0.4 times the overall mean density) during both seasons. Fast Overlap also was low; however, this is not surprising given the local Idle Speed zone that was in effect when the boating data were collected. One manatee fitted with a telemetry tag had several locations recorded in the bay during the warm season.

Option 1: Take no action and leave the area without an FWC zone.

Option 2: Add a Slow Speed zone.

Potential zone changes: Central Region (Figure 66)

C1: Naples Bay North

Existing Zones: This section of the bay is an Idle Speed zone pursuant to the existing FWC rule while the central section is a 30/SS zone and the Gordon River to the north is a Slow Speed zone. Current information indicates there may be a local Idle Speed zone on all or part of the Gordon River. Prior to the citywide ordinance being invalidated in 2014, there were other local zones in Naples Bay, possibly including all or part of this area. All or part of the bay was a local Slow Speed zone on weekends and holidays.

Why Identified: Potential to simplify the rule and reduce zone complexity

Manatee density for this area was low (less than 0.2 times the overall mean density) during both seasons. Fast Overlap also was low, which is not surprising given the existing Idle Speed zone. Three manatees fitted with telemetry tags had locations recorded in this section of the bay or in the Gordon River.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change the existing zone to a shore-to-shore Slow Speed zone (to match the area to the north).

Option 3: Change all or part of the existing zone to a 30/SS zone (to match the area to the south).

C2: Naples Bay South

Existing Zones: This section of the bay is a 30/SS zone pursuant to the existing FWC rule. There is an Idle Speed zone to the west (Area C3) and the 30/SS zone continues into Dollar Bay to the south (Area C4). Prior to the citywide ordinance being invalidated in 2014, most or all of the bay was a local Slow Speed zone on weekends and holidays.

Why Identified: Potential higher risk area. Very high Fast Overlap during the warm season and high Fast Overlap during the cold season.

Manatee density for this area was low (less than 0.9 times the overall mean density) during both seasons. Fast Overlap was very high (8.8 times the overall mean) during the warm season and high (3.8 times the overall mean) during the cold season, mainly due to the density of fast boats. Of the four reported manatee-boat collisions in the county that are not associated with a manatee death, one occurred in this general area. A boat operator reported striking a manatee in April 2015 while traveling at about 25 mph just north of Dollar Bay (with no additional information provided).

Option 1: Take no action and leave the existing zone in place.

Option 2: Change all or part of the existing zone to shore-to-shore Slow Speed zone.

C3: Gordon Pass

Existing Zones: The section of the pass between markers 7 and 10, including the Port Royal canal system to the north, is an Idle Speed zone pursuant to the existing FWC rule while the area to the east (Area C2) is a 30/SS zone; there are no FWC zones west of marker 7.

Why Identified: Potential to simplify the rule and reduce zone complexity

Manatee density for this area was low (less than 0.3 times the overall mean density) during both seasons. Fast Overlap also was low, which is not surprising given the existing Idle Speed zone. Two manatees fitted with telemetry tags had locations recorded in this area but others likely passed through on their way in or out of the pass.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change the existing zone to a shore-to-shore Slow Speed zone.

Option 3: Change the existing zone to a 30/SS zone. The merits of this option may be affected by whether changes are made to Area C2 to the east.

C4: Dollar Bay

Existing Zones: This bay is a 30/SS zone pursuant to the existing FWC rule. There is a 30/SS zone to the north in Naples Bay (Area C2) and The Narrows, immediately to the south, is a shore-to-shore Slow Speed zone between markers 52 and 47.

Why Identified: Potential higher risk area. High Fast Overlap and moderate manatee density during the warm season.

Manatee density for this area was moderate (1.1 times the overall mean density) during the warm season and low during the cold season. Fast Overlap was high (4.4 times the overall mean) during the warm season but low during the cold season. A boat operator reported striking a manatee in April 2015 while traveling at about 25 mph just north of Dollar Bay (see C2, above).

Option 1: Take no action and leave the existing zone in place.

Option 2: Change all or part of the existing zone to shore-to-shore Slow Speed zone. The total length of the channel in this section is approximately 3.0 miles.

C5: Halloway Island North

Existing Zones: This area is a 30/SS zone pursuant to the existing FWC rule. The Narrows, immediately to the north, is a shore-to-shore Slow Speed zone between markers 52 and 47. Rookery Bay, to the east, is a 30/20 zone.

Why Identified: Potential higher risk area. High Fast Overlap and moderate manatee density during the warm season.

Manatee density for this area was moderate (1.9 times the overall mean density) during the warm season and low during the cold season. Fast Overlap was high (6.3 times the overall mean) during the warm season but low during the cold season.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change the existing zone to a shore-to-shore Slow Speed zone. The total length of the channel in this section is approximately 0.5 miles.

C6: Halloway Island South

Existing Zones: The area containing the main channel is a 30/SS zone pursuant to the existing FWC rule; there are no FWC zones in the areas leading to Hurricane Pass on the east and west sides of Little Marco Island. The 30/SS zone continues to the north and to the east (Area C10).

Why Identified: Potential higher risk area. Very high Fast Overlap and high manatee density during the warm season, with numerous recent boat-related manatee carcass recoveries.

Manatee density for this area was high (4.9 times the overall mean density) during the warm season and low during the cold season. Fast Overlap was very high (17.4 times the overall mean) during the warm season but low

during the cold season. The warm season Fast Overlap value was the highest of any of the site-specific areas that were evaluated. Five boat-related manatee deaths have been recorded in this area since 2007. All five were recovered between April and August within a roughly 0.75-mile section north and east of Little Marco Island, with four of the deaths attributed to acute injuries.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change all or part of the existing zone / unregulated area to a shore-to-shore Slow Speed zone. The total length of the main channel in this section is approximately 1.5 miles.

C7: Little Marco Island

Existing Zones: There are no FWC zones in this area. There is a local Idle Speed zone in the southern end of the area, in and around Hurricane Pass and the southern end of Keewadin Island.

Why Identified: Potential higher risk area. High Fast Overlap and moderate manatee density during the warm season.

Manatee density for this area was moderate (1.1 times the overall mean density) during the warm season and low during the cold season. Fast Overlap was high (3.0 times the overall mean) during the warm season but low during the cold season.

Option 1: Take no action and leave the area without an FWC zone.

Option 2: Add a Slow Speed zone in all or part of the area.

C8: Hall Bay North

Existing Zones: This area is a 30/SS zone pursuant to the existing FWC rule.

Why Identified: Potential higher risk area. Narrow waterway with moderate manatee density and moderate Fast Overlap during the warm season.

Manatee density for this area was moderate (1.8 times the overall mean density) during the warm season and low during the cold season. Fast Overlap was moderate (2.5 times the overall mean) during the warm season but low during the cold season. Risk is higher in this section of the creek because it is much narrower than other sections.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change the narrow section to a shore-to-shore Slow Speed zone. The total length of this section is 0.3 miles.

C9: Johnson Bay North

Existing Zones: This area is a 30/SS zone pursuant to the existing FWC rule. The 30/SS zone extends to the west (Area C6) and to the south (Area C11).

Why Identified: Potential higher risk area. Very high Fast Overlap and high manatee density during the warm season.

Manatee density for this area was high (4.5 times the overall mean density) during the warm season and low during the cold season. Fast Overlap was very high (8.8 times the overall mean) during the warm season but low during the cold season.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change all or part of the existing zone to a shore-to-shore Slow Speed zone. The total length of the channel in this section is approximately 1.1 miles.

C10: Johnson Bay Central

Existing Zones: This area is a 30/SS zone pursuant to the existing FWC rule. The 30/SS zone extends to the north (Area C10), the south toward Capri Pass (Area C12), and to the southeast into other parts of Johnson Bay.

Why Identified: Potential higher risk area. Very high Fast Overlap and high manatee density during the warm season.

Manatee density for this area was high (3.6 times the overall mean density) during the warm season and low during the cold season. Fast Overlap was very high (9.5 times the overall mean) during the warm season but low during the cold season.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change all or part of the existing zone to a shore-to-shore Slow Speed zone. The total length of the channel in this section is approximately 1.5 miles.

Additional 30/20 Issues in the Central Region

There are existing 30/20 zones in Rookery Bay, the waterways north and east of Isle of Capri (west of SR 951), and in McIlvane Bay. Should any changes be made to these 30/20 zones? If the existing zones are changed, one option would be to remove the zones entirely.

Potential zone changes: South Region (Figure 67)

S1: Marco River North

Existing Zones: This area is a 30/SS zone pursuant to the existing FWC rule, including all waters in the marked channel within 300 feet of the SR 951 Bridge. The 30/SS zone continues on the south side of SR 951. There is an Idle Speed zone west of this area leading to Big Marco Pass, including the interior bays and canals of Marco Island (Area S2). Current information indicates there may be a local Idle Speed zone overlaying all or part of the FWC Idle Speed zone but the validity of that zone is uncertain.

Why Identified: Potential higher risk area. Very high manatee density and very high Fast Overlap during the warm season.

Manatee density for this area was very high (7.2 times the overall mean density) during the warm season and low during the cold season. Fast Overlap also was very high (13 times the overall mean) during the warm season but low during the cold season. The warm season manatee density value was the highest of any of the site-specific areas that were evaluated while the Fast Overlap value was the second highest. Most of the documented manatee use occurred in the northern portion of the area, in the Slow Speed portion of the exiting zone, while most of the documented higher speed boat activity occurred in or near the main channel in the southern portion of the area. The one manatee that was tracked using a GPS telemetry tag used this area over a 2-day period and he also spent his time in the northern portion of the area. Given the existing zones and the manatee and boat use patterns, the risks to manatees in this area may not be as high as the spatial overlap analysis suggests; however, risks are likely to be high as manatees leave the northern portion of the area and have to travel in or cross the marked channel to get to other areas. Risks may be highest within approximately 0.4 miles of the SR 951 Bridge.

Option 1: Take no action and leave the existing zones in place.

Option 2: Include all or part of the main channel in the Slow Speed zone. The total length of the main channel running through this area is approximately one mile.

S2: Marco Interior

Existing Zones: Most of Big Marco Pass and the interior canals and waterways in Marco, including Collier Bay, is an Idle Speed zone pursuant to the existing FWC rule. The areas to the east of Big Marco Pass (Area S1) and in Caxambas Pass to the south (Area S4) are 30/SS zones, while Barfield Bay (Area S3) is a 30/20 zone. Current information indicates there may be a local Idle Speed zone overlaying all or part of the FWC Idle Speed zone but the validity of that zone is uncertain.

Why Identified: Potential to simplify the rule and reduce zone complexity

Manatee density for this area was high (3.1 times the overall mean density) during the warm season and moderate (2.1 times the overall mean density) during the cold season. Fast Overlap was moderate (1.8 times the overall mean) during the warm season but low during the cold season. Relatively low Fast Overlap is not surprising given the existing Idle Speed zone. Much of the documented manatee use occurred in Collier Bay and in the areas immediately north of Caxambas Bay. The one manatee that was tracked using a GPS telemetry tag used this area over several days; he also used mostly Collier Bay and the eastern end of Caxambas Bay near Pass Key.

Option 1: Take no action and leave the existing Idle Speed zone in place.

Option 2: Change the existing Idle Speed zone to a Slow Speed zone (to be more consistent with the areas to the east and south). If there is a valid local Idle Speed zone in this area, in those areas covered by the local zone a change to the FWC zone would have no impact on the water.

S3: Barfield Bay

Existing Zones: Most of this bay, Blue Hill Bay, and Blue Hill Creek is a 30/20 zone pursuant to the existing FWC rule. The area immediately to the west (Area S2) is an Idle Speed zone and the area to the east (leading to Goodland and Coon Key Pass) is a 30/SS zone.

Why Identified: Potential to simplify the rule and reduce zone complexity

Warm season manatee density for this area was moderate (1.4 times greater than the overall mean density) but only the western and southern portions of Barfield Bay were surveyed during the recent surveys. Much of the documented manatee use in Barfield Bay was in the southwest portion near Caxambas Bay (with much of this usage occurring in the portion of the bay covered by the existing Idle Speed zone). The one manatee that was tracked using a GPS telemetry tag used this area over several days; he was mostly in the eastern end of Caxambas Bay/southwestern portion of Barfield Bay near Pass Key, with a few locations recorded in Blue Hill Creek. Most of this area is shallow and there does not appear to be any marked channels. Very little boat traffic was observed in this area. The existing zone likely has very little effect on boat traffic.

Option 1: Take no action and leave the existing zone in place.

Option 2: Remove the 30/20 zone but add a Slow Speed zone in the south end of Barfield Bay, with the eastern boundary running from the south end of David Key to the south end of Pig Key and then along the western shoreline of the unnamed island southeast of Pig Key and then south to Horrs Island. This option would probably be practicable only if Option 2 is pursued for the zones in the interior of Marco Island (Area S2, above).

S4: Caxambas Bay

Existing Zones: This area is a 30/SS zone pursuant to the existing FWC rule. There is an Idle Speed zone to the north (Area S2) and the 30/SS zone extends to the south, approximately 0.8 miles farther to the west to near marker 5, and approximately one mile farther to the east to marker 3. There does not appear to be a marked channel running through this portion of the bay, except in the extreme northeast and northwest portions where the main marked channel enters and exits the existing Idle Speed zone. There also is a marked channel immediately north of Kice Island, running between Caxambas Pass and Snook Hole Channel.

Why Identified: Potential higher risk area. Very high manatee density and high Fast Overlap during the warm season.

Manatee density for this area was very high (7.7 times the overall mean density) during the warm season and low during the cold season. Fast Overlap was high (4.8 times the overall mean) during the warm season but low during the cold season. The warm season manatee density value was the second highest of any of the site-specific areas that were evaluated.

Option 1: Take no action and leave the existing zone in place.

Option 2: Change the 30/SS to Slow Speed (i.e., include the marked channels) except for the western end where the channel exits Area S2 and joins the existing 30/SS zone to the west. This would have a very limited effect on the water since most of the area is Slow Speed now given the lack of marked channels. The total length of the existing main channel that would be added on the east end is approximately one-quarter mile.

S5: Goodland

Existing Zones: The immediate vicinity of Goodland, including the internal basins and canals, is an Idle Speed zone pursuant to the existing FWC rule while the rest of Goodland Bay is a Slow Speed zone. There is a 30/SS zone to the south that extends to just south of marker 3 in Coon Key Pass.

Why Identified: Potential to simplify the rule and reduce zone complexity

This area was not surveyed during the recent surveys. From a manatee protection perspective, there is very little difference between an Idle Speed zone and a Slow Speed zone.

Option 1: Take no action and leave the existing zones in place.

Option 2: Change the existing Idle Speed zone to Slow Speed to match the rest of the bay. The total length of the marked channel in the Idle Speed zone is just under one mile.

Additional Issue: Should the canals on either side of San Marco Road (CR 92) on the north side of Goodland Bay be excluded from the zone? These canals are included in the existing Slow Speed zone based on the description of the zone; however, these canals are not shown on the maps that were created when the rule was adopted so it is uncertain if these canals were intended to be included. The canals were not flown during the recent or previous aerial surveys and only one manatee carcass (undetermined category) has been recovered from the canals. Five manatees fitted with telemetry tags have had at least one location recorded in the vicinity of the canals but none of these manatees had locations recorded in the canal on more than two days.

Additional 30/20 Issues in the South Region

There are existing 30/20 zones in Unknown Bay and in Upper Addison Bay. Should any changes be made to these 30/20 zones? If the existing zones are changed, one option would be to remove the zones entirely.

Potential zone changes: 10,000 Islands (Figures 68-69)

T1: Port of the Islands

Existing Zones: The Port of the Islands area is an Idle Speed zone pursuant to the existing FWC rule while the rest of Faka Union Canal is a Slow Speed zone.

Why Identified: Change in characteristics of the area; potential to simplify the rule and reduce zone complexity

This area has long been a major aggregation area for manatees, especially during the winter, because of the fresh water that flows over the weir north of US41 and the warmer water available in the basins (because of the thermocline created by the interaction between the fresh water and the saltwater flowing in from the Gulf).

Ongoing projects associated with Everglades restoration are anticipated to alter the current flow of fresh water into

the system. In addition, a new waterway feature is being created just south of Port of the Islands, on the west side of the canal, as part of the restoration work. This feature is designed to provide a new warm water area for manatees to use given the reduced availability of warm water in the basins that is expected after restoration work is completed.

Option 1: Take no action and leave the existing zones in place.

Option 2: Add a No Entry or Motorboats Prohibited zone in the new waterway feature west of the canal. The purpose of this zone would be to reduce potential harassment or disturbance of manatees.

Option 3: Possibly in addition to Option 2, change the existing Idle Speed zone to Slow Speed to match the rest of the canal. The total linear length of the existing Idle Speed zone is just under two miles. Unlike the other existing Idle Speed zones in the county that are identified for a potential change to Slow Speed, the high level of manatee use in this area is more likely to warrant continued designation as an Idle Speed zone.

T2: Barron River

Existing Zones: The Barron River west of SR29 is an Idle Speed zone pursuant to the existing FWC rule. The area east of SR29 is a 30/20 zone while the area in Chokoloskee Bay adjacent to the mouth of the Barron River is a Slow Speed zone. Current information indicates there is a local Idle Speed zone overlaying all or part of the FWC Idle Speed zone and including some additional areas west of SR29.

Why Identified: Potential to simplify the rule and reduce zone complexity

This area was not surveyed during the recent surveys. From a manatee protection perspective, there is very little difference between an Idle Speed zone and a Slow Speed zone.

Option 1: Take no action and leave the existing zones in place.

Option 2: Change the existing Idle Speed zone to Slow Speed to match the adjacent zone in Chokoloskee Bay. In those areas covered by the local zone, a change to the FWC zone would have no impact on the water.

Additional 30/20 Issues in 10,000 Islands

There are existing 30/20 zones in most waters of 10,000 Islands outside of Everglades National Park, with the exception of the Faka Union Canal / Port of the Islands area and the immediate vicinity of Everglades City. Should any changes be made to these 30/20 zones? If the existing zones are changed, one option would be to remove the zones entirely.

List of Tables

(See data summary document for Tables 1-8)

Table 9 Manatee Density and Manatee-Boat Spatial Overlap by Area and Selected Sub-Areas

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(See data summary document for Figures 1-64; Appendix contains maps of existing zones)

Figure 65 Areas where revised protection zones may be warranted; North Region

Figure 66 Areas where revised protection zones may be warranted; Central Region

Figure 67 Areas where revised protection zones may be warranted; South Region

Figure 68 Areas where revised protection zones may be warranted; 10,000 Islands (West)

Figure 69 Areas where revised protection zones may be warranted; 10,000 Islands (East)

Table 9: Manatee Density and Manatee-Boat Spatial Overlap by Area and Selected Sub-Areas

Location	Seasonal Period: All Months				April - October				November - March			
	Manatee Density [1]	Overlap [2]	"Fast" Overlap [3]	Overlap Ratio [4]	Manatee Density [1]	Overlap [2]	"Fast" Overlap [3]	Overlap Ratio [4]	Manatee Density [1]	Overlap [2]	"Fast" Overlap [3]	Overlap Ratio [4]
North Region (Northern Passes)	0.09	0.33	0.07	0.22	0.13	0.50	0.14	0.27	0.03	0.12	0.01	0.10
Little Hickory Bay	0.04	0.10	0.02	0.17	0.05	0.14	0.02	0.15	0.01	0.02	0.01	0.36
N1: Little Hickory Bay Central	● 0.05	0.13	● 0.02	0.15	● 0.04	0.14	● 0.01	0.09	● 0.07	0.10	● 0.04	0.36
Wiggins Pass / Cocohatchee River	0.16	1.15	0.22	0.19	0.24	1.80	0.44	0.24	0.03	0.27	0.01	0.03
N2: Cocohatchee River	● 0.25	0.18	● 0.05	0.25	● 0.40	0.12	● 0.12	1.00	● 0	0	● 0	--
Vanderbilt Estates	0.05	0.19	0.06	0.31	0.09	0.36	0.12	0.34	0.001	0.01	0.0003	0.06
N3: Vanderbilt Lagoon	● 0.03	0.02	● 0.002	0.31	● 0.04	0.05	● 0.004	0.34	● 0	0	● 0	--
Clam Bay	0.18	0.05	0.04	0.86	0.30	0.12	0.11	0.87	0	0	0	--
Doctors Pass / Moorings Bay	0.11	0.21	0.06	0.26	0.13	0.22	0.09	0.41	0.07	0.25	0.03	0.12
N4: Doctors Pass / Moorings Bay	● 0.11	0.21	● 0.06	0.26	● 0.13	0.23	● 0.09	0.41	● 0.08	0.26	● 0.03	0.13
Central Region (Naples)	0.09	0.33	0.09	0.26	0.09	0.33	0.09	0.26	0.05	0.06	0.01	0.12
Gordon River	0.03	0.04	0.01	0.20	0.04	0.10	0.02	0.20	0	0	0	--
Naples Bay / Gordon Pass	0.10	1.01	0.46	0.45	0.12	1.55	0.72	0.46	0.07	0.408	0.203	0.50
C1: Naples Bay North	● 0.04	0.50	● 0.03	0.05	● 0.07	0.86	● 0.06	0.07	● 0	0	● 0	--
C2: Naples Bay South	● 0.27	4.16	● 1.93	0.46	● 0.32	5.66	● 2.81	0.50	● 0.20	2.50	● 1.20	0.48
C3: Gordon Pass	● 0.09	0.22	● 0.07	0.32	● 0.11	0.48	● 0.13	0.27	● 0.05	0.02	● 0.02	1.00
Dollar Bay Area	0.30	1.23	0.81	0.66	0.35	1.68	1.20	0.71	0.23	0.32	0.17	0.52
C4: Dollar Bay	● 0.34	1.35	● 0.90	0.67	● 0.39	1.86	● 1.34	0.72	● 0.25	0.32	● 0.18	0.55
Rookery Bay Area	0.35	1.32	0.47	0.35	0.54	2.69	0.98	0.36	0.04	0.02	0.02	0.64
C5: Holloway Island North	● 0.43	1.99	● 1.13	0.57	● 0.70	3.71	● 1.99	0.54	● 0	0	● 0	--
C6: Holloway Island South	● 1.11	3.72	● 2.58	0.69	● 1.80	7.25	● 5.53	0.76	● 0	0	● 0	--
C7: Little Marco Island	● 0.25	7.12	● 0.43	0.06	● 0.41	16.07	● 0.96	0.06	● 0	0	● 0	--
C8: Hall Bay North	● 0.41	0.87	● 0.31	0.35	● 0.66	1.22	● 0.80	0.65	● 0	0	● 0	--
Johnson Bay Area	0.49	0.81	0.44	0.55	0.77	1.59	1.02	0.64	0.05	0.04	0.01	0.19
C9: Johnson Bay North	● 1.02	1.90	● 1.20	0.63	● 1.65	4.02	● 2.81	0.70	● 0.01	0.0001	● 0	0
C10: Johnson Bay Central	● 0.81	1.91	● 1.34	0.70	● 1.30	3.80	● 3.02	0.80	● 0	0	● 0	--
South Region (Marco Island)	0.27	0.66	0.13	0.20	0.27	0.66	0.13	0.20	0.10	0.08	0.01	0.13
Collier Bay / Tarpon Bay Area	0.72	2.22	0.63	0.28	1.05	3.87	1.11	0.29	0.18	0.20	0.05	0.25
S1: Marco River North	● 2.75	6.26	● 2.28	0.36	● 4.26	11.65	● 4.13	0.35	● 0.31	0.24	● 0.11	0.46
S2: Marco Interior	● 0.99	2.01	● 0.38	0.19	● 1.13	3.06	● 0.58	0.19	● 0.76	0.53	● 0.09	0.18
Addison Bay / Marco River Area [a]	0.32	0.39	0.12	0.31	0.32	0.63	0.20	0.32	0.31	0.12	0.04	0.36
Caxambus Pass Area [b]	0.94	0.80	0.21	0.26	1.16	1.11	0.34	0.31	0.57	0.34	0.05	0.16
S3: Barfield Bay [b]	● 0.36	0.07	● 0.00	0.00	● 0.50	0.03	● 0.00	0.00	● 0.14	0.001	● 0	0.00
S4: Caxambas Bay	● 1.79	1.32	● 0.84	0.64	● 2.81	2.39	● 1.53	0.64	● 0.13	0.10	● 0.04	0.41
Cape Romano Area [c]	0.20	0.40	0.07	0.19	0.29	0.59	0.10	0.16	0.06	0.14	0.05	0.34
Goodland Bay Area [d]	--	--	--	--	--	--	--	--	--	--	--	--
S5: Goodland [d]	--	--	--	--	--	--	--	--	--	--	--	--
10,000 Islands [d]	--	--	--	--	--	--	--	--	--	--	--	--
T1: Port of the Islands [d]	--	--	--	--	--	--	--	--	--	--	--	--
T2: Barron River [d]	--	--	--	--	--	--	--	--	--	--	--	--
Combined Areas [e]	0.46	0.96	0.32	0.33	0.62	1.65	0.59	0.36	0.20	0.17	0.05	0.28
Gulf of Mexico	0.11	0.84	0.26	0.30	0.15	1.56	0.52	0.33	0.04	0.10	0.03	0.29
Combined Areas plus Gulf	0.36	0.96	0.32	0.33	0.49	1.65	0.59	0.36	0.16	0.17	0.05	0.28

Manatee Density (Sub-Area Icons) "Fast" Overlap (Sub-Area Icons)

● ≤ all months mean ● ≤ all months mean

● > 1x but < 3x all months mean ● > 1x but < 3x all months mean

● ≥ 3x but < 7x all months mean ● ≥ 3x but < 7x all months mean

● ≥ 7x all months mean ● ≥ 7x all months mean

[1] Manatee Density: Mean manatee density per survey for the 2006-08 period (ArcGIS kernel density using a 325 m search radius)

[2] Overlap: Mean manatee-boat spatial overlap value (ArcGIS kernel density for manatees times the kernel density for boats)

[3] "Fast" Overlap: Mean manatee-boat spatial overlap value using only boats with observed speeds of "planing," "cruising," or "plowing" (ArcGIS kernel density for manatees times the kernel density for "fast" boats)

[4] Overlap Ratio: Ratio of Fast Overlap to Overlap (Column [3] value divided by Column [2] value). In some cases this ratio may appear incorrect based on the Overlap and Fast Overlap values but this is due to the Overlap and Fast Overlap values only being shown to two decimal places.

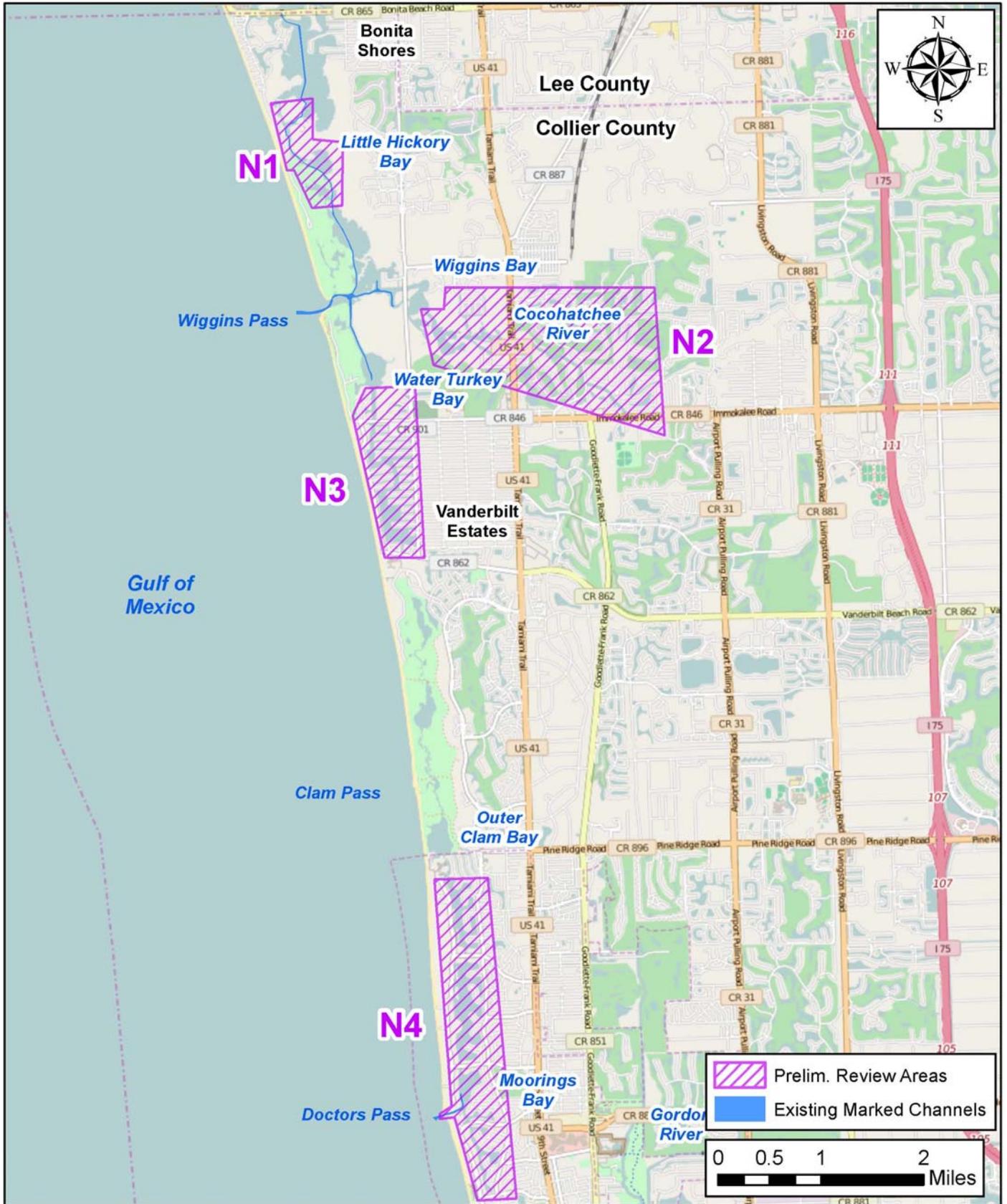
[a] Most of Addison Bay and the southern portion of the Marco River were not surveyed during 2006-08 manatee aerial survey effort

[b] The eastern portion of Barfield Bay was not surveyed during 2006-08 manatee aerial survey effort

[c] Only the western and southern portions of the Cape Romano Area were surveyed during 2006-08 manatee aerial survey effort

[d] Goodland Bay Area and 10,000 Islands areas not surveyed during 2006-08 manatee aerial survey effort

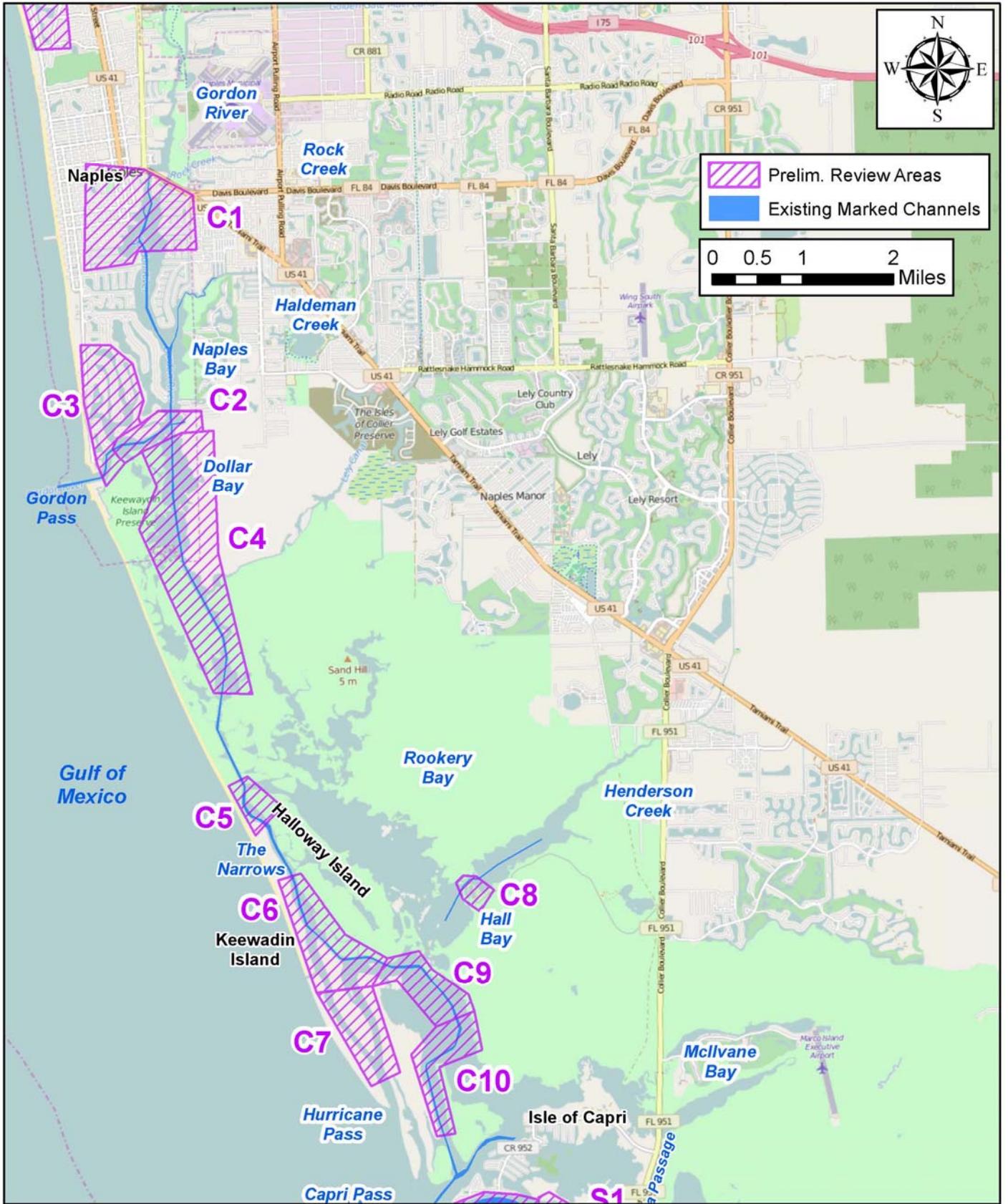
[e] Does not include the Gulf of Mexico or areas that were not surveyed for both manatees and boats (Goodland Bay area and 10,000 Islands)



Areas where changes to protection zones may be warranted (March 2016)
 Collier County: North Region

Florida Fish & Wildlife Conservation Commission
 Division of Habitat and Species Conservation
 Imperiled Species Management Section
 620 South Meridian Street, Mail Station 6A
 Tallahassee, FL 32399-1600
 Tel: 850-922-4330 Fax: 850-922-4338

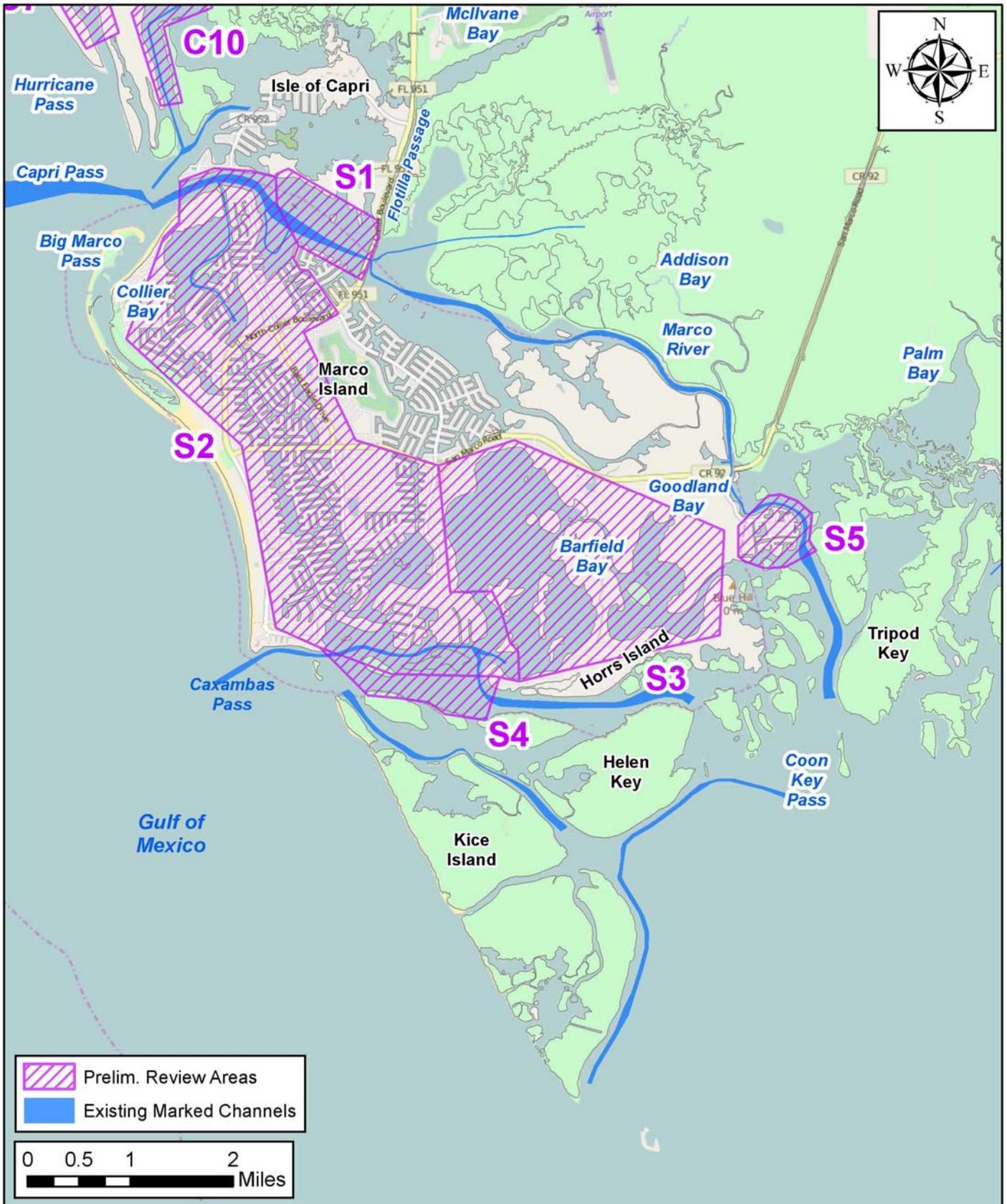
Figure 65



Areas where changes to protection zones may be warranted (March 2016)
 Collier County: Central Region (Naples)

Florida Fish & Wildlife Conservation Commission
 Division of Habitat and Species Conservation
 Imperiled Species Management Section
 620 South Meridian Street, Mail Station 6A
 Tallahassee, FL 32399-1600
 Tel: 850-922-4330 Fax: 850-922-4338

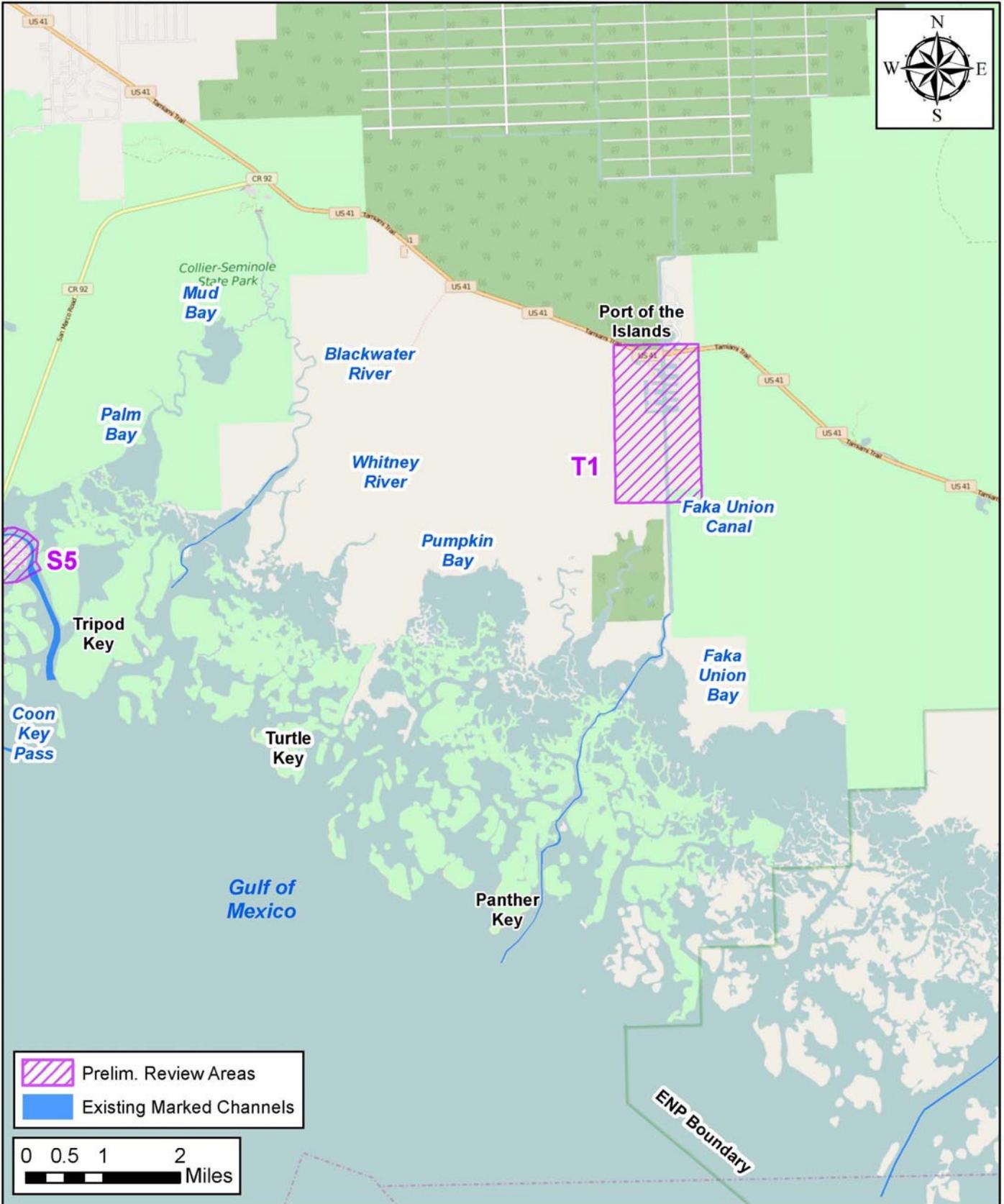
Figure 66



Areas where changes to protection zones may be warranted (March 2016)
 Collier County: South Region (Marco)

Florida Fish & Wildlife Conservation Commission
 Division of Habitat and Species Conservation
 Impaired Species Management Section
 620 South Meridian Street, Mail Station 6A
 Tallahassee, FL 32399-1600
 Tel: 850-922-4330 Fax: 850-922-4338

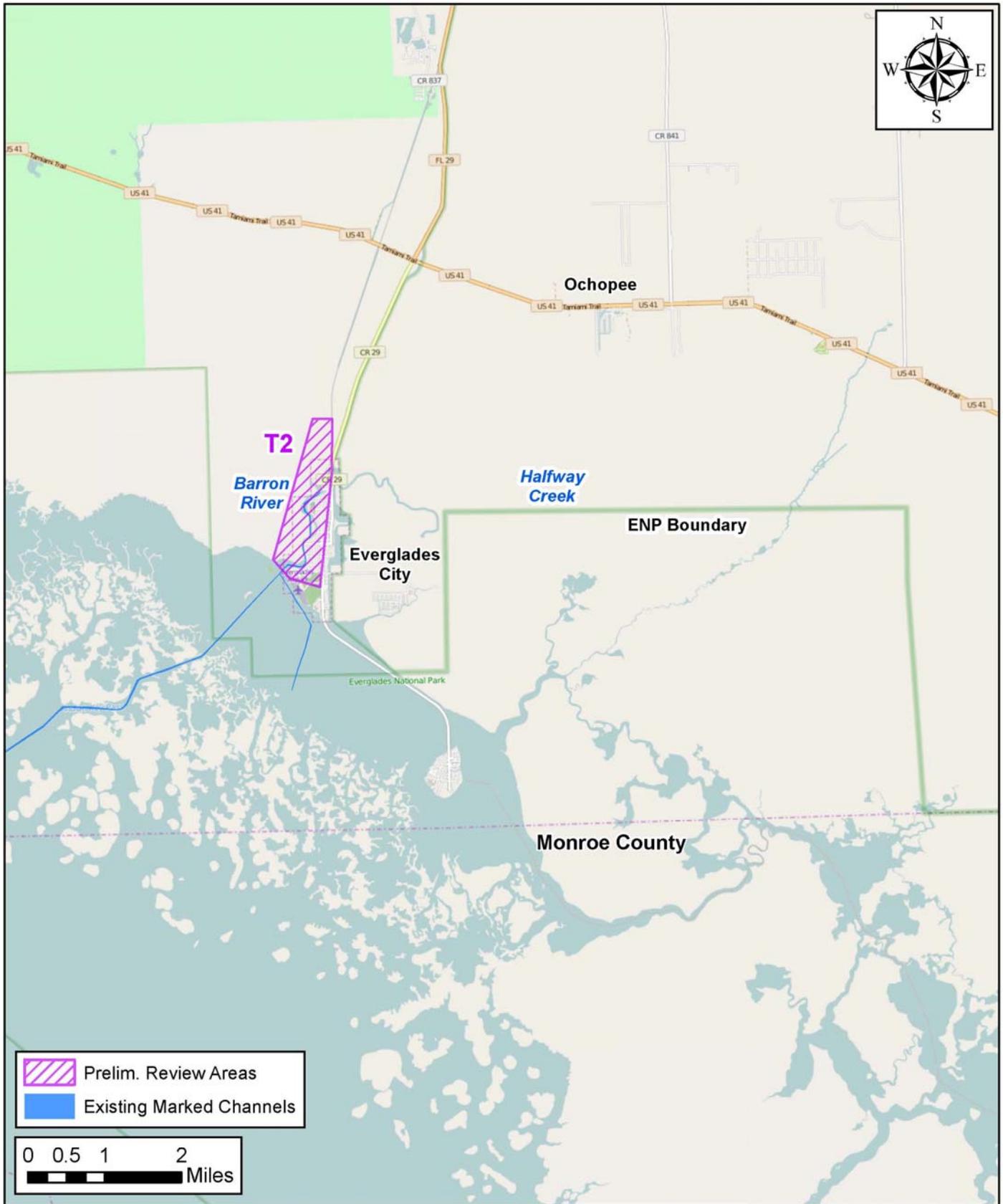
Figure 67



Areas where changes to protection zones may be warranted (March 2016)
 Collier County: 10,000 Islands (West)

Florida Fish & Wildlife Conservation Commission
 Division of Habitat and Species Conservation
 Imperiled Species Management Section
 620 South Meridian Street, Mail Station 6A
 Tallahassee, FL 32399-1600
 Tel: 850-922-4330 Fax: 850-922-4338

Figure 68
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Areas where changes to protection zones may be warranted (March 2016)
 Collier County: 10,000 Islands (East)

Florida Fish & Wildlife Conservation Commission
 Division of Habitat and Species Conservation
 Imperiled Species Management Section
 620 South Meridian Street, Mail Station 6A
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Figure 69
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