

COLLISION COURSE

The Government's Failing System for Protecting Florida Manatees from Deadly Boat Strikes



A report by
the Center for Biological Diversity

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EXECUTIVE SUMMARY

Collisions with watercraft are a persistent and often deadly threat to the endangered Florida manatee. Based on data obtained from the state of Florida, a minimum of 512 manatees died from collisions with watercraft in Florida waters from 2008-2013. Countless other manatees sustained injuries from collisions. Despite the serious threat posed by watercraft, both the Army Corps of Engineers and state of Florida continue to authorize the construction of thousands of projects that facilitate increased watercraft access to Florida waters, including marinas, boat ramps and docks. In each case, these projects are determined not to adversely affect Florida manatees and indeed, considered individually, the impacts of the projects may be minimal, but considered together these projects are almost certainly increasing the risk of manatees being struck by watercraft. There is thus a real need to consider the cumulative impacts of permitting watercraft facilities in Florida and to ensure this permitting does not drive the manatee to extinction or impede its recovery.

Under the Endangered Species Act, the Army Corps of Engineers is required to consult with the U.S. Fish and Wildlife Service to ensure that actions it permits do not jeopardize the continued existence of endangered species, including the manatee. Consultation culminates in the production of a biological opinion produced by the Fish and Wildlife Service that is supposed to consider cumulative effects. In a sidestep to this legally required procedure, the Army Corps and Fish and Wildlife Service have developed a streamlined process that utilizes a management document called the Manatee Key, which was designed to quickly identify those projects with serious affects to the manatee and let all other projects proceed with minimal analysis. One significant problem with this approach is that projects are being approved without ever considering their impacts in aggregate.

By reviewing records obtained through the Freedom of Information Act we assessed the degree to which the Manatee Key is allowing projects to proceed without consideration or mitigation of their cumulative impacts. We reviewed all permits issued since 2008 in which the Corps used the Manatee Key to determine that projects would have no adverse affects on

manatees. Our review shows that despite authorizing thousands of projects after concluding that they are not likely to adversely affect manatees, the Army Corps and Fish and Wildlife Service do not have a true accounting of permitting activities in manatee habitat or their impact on manatees.

Key findings of this study include:

- Neither the Corps nor the Fish and Wildlife Service appear to record how many watercraft access permits are issued in Florida.
- The Corps issued at least 4,086 distinct permits facilitating watercraft access using the Manatee Key from 2008-2013, an average of 683 permits per year.
- Information provided by the Corps likely represents only a fraction of the permits issued for watercraft access projects that are likely increasing risks for manatees. The National Marine Fisheries Service, for example, reported that during a similar timeframe, 2006-2010, the Corps authorized 9,195 permits just to construct docks, and from 2000-2009, the state of Florida authorized 10,266 facilities allowing watercraft access.
- Since 2000, an average of 82 manatees per year have been killed by watercraft and the proportion of watercraft collision mortalities compared to overall mortality has remained fairly constant despite increased regulation of boat speeds.

This data clearly show that the Army Corps is permitting hundreds of projects every year without considering or mitigating cumulative impacts to the manatee. The data also show that collisions with watercraft continue to be a serious problem for the manatee.

Existing protections, namely boating speed zones, are failing to provide sufficient protection for the manatee likely because of low compliance and insufficient enforcement. To rectify these problems, we recommend:

- The Corps and the Service rescind the Manatee Key and consider the cumulative impacts of permitting of all projects by all agencies that increase or enhance watercraft access in Florida waters.

- Reevaluate areas deemed “adequately protected” given ongoing manatee mortalities and lack of compliance with speed zones.
- Require additional boater education about and stricter enforcement of speed zones.

I. INTRODUCTION

The leading cause of manatee mortality in Florida is collisions with watercraft. The Florida manatee (*Trichechus manatus latirostris*), Florida’s foremost charismatic marine mammal, has enjoyed various forms of protection from human activity for over a century. Despite its protected status, and relative overall population growth, the manatee continues to face significant and ongoing threats from collisions with watercraft, destruction of habitat, cold-stress mortality, and red tide events.

Boats and other watercraft can kill and seriously injure manatees by crushing them with their hulls or cutting them with their propeller blades. They can also harass manatees and can damage their seagrass habitat causing them to alter their natural behavior.¹ In the last several years county-specific manatee protection plans and manatee speed zones have been created, yet the rate of manatee mortality due to watercraft collisions as a percentage of total human-caused mortality throughout Florida has remained relatively the same.

The U.S. Army Corps of Engineers (“Corps”) and state of Florida issue permits to authorize projects that facilitate watercraft access, such as boat ramps, marinas, and commercial and private docks. These permits, however, are issued without consideration or mitigation of cumulative impacts to the manatee and its habitat. Through these actions, the Corps, U.S. Fish and Wildlife Service (“Service”), and the state of Florida are contributing to the deaths of hundreds of manatees and are retarding their recovery.

To assess the degree to which permits utilizing the Manatee Key are being issued without consideration of cumulative impacts, we requested through the Freedom of Information Act all permits allowing watercraft access issued by the Corps from 2008 through 2013 in which the Corps concluded the permitted activity was not likely to adversely affect the manatee. We also obtained data on manatee mortalities from the state of Florida, which we used

to map the location of permitted projects in relation to manatee mortality. This data make clear that the Corps is issuing permits for hundreds of projects every year that increase watercraft access without considering or mitigating cumulative impacts to manatees. Underscoring the importance of this failure, we reviewed the status of the Florida manatee, current regulations and the serious threat posed by watercraft. We recommend that the agencies reevaluate their process for issuing permits in order to ensure proper consideration and mitigation of cumulative effects on the Florida manatee.

II. THE STATUS OF THE FLORIDA MANATEE AND THE SERIOUS THREATS POSED BY WATERCRAFT

Manatees, the likely source of nautical tales about mermaids, can be found in warm waters throughout the Caribbean. Not exactly sirens of the sea, manatees are rotund and grey, and move so slowly they typically have either algae or barnacles -- depending on the salinity of the water -- growing on their thick blubbery skin. They pass the time leisurely swimming about, resting, and maintaining their half-ton body weight by grazing on seagrass.

The Florida manatee (*Trichechus manatus latirostris*) is a subspecies of the West Indian manatee (*Trichechus manatus*) and is generally restricted to coastal and inland waters of peninsular Florida. There is no statistically robust estimate reflecting the current total population size of the Florida manatee stock. However, the most recent Florida Fish and Wildlife Conservation Commission (“FWC”) synoptic survey of Florida manatees in January 2014 recorded 4,824 manatees.² The FWC attempts to annually conduct these winter counts of manatees at warm water sites when conditions allow it. It counted 4,834 manatees in 2011 and 5,076 in 2010.³

While manatees can live more than 60 years in the wild, only about half make it to adulthood. The FWC identifies and records eight categories of manatee mortality: cold stress, other natural, watercraft, flood gate/canal lock, other human-related, perinatal, undetermined, and verified/not recovered. Despite their thick skin, manatees are quite intolerant of cold water and when temperatures drop, manatees seek refuge in warm water – usually freshwater springs

or power plant discharges. When they experience prolonged exposure to cold temperatures, manatees may suffer cold stress which can lead to death. In 2010, FWC documented 282 deaths attributable to the cold,⁴ and in 2011, 112 deaths due to cold weather.⁵ Other natural sources of mortality include infectious and non-infectious disease, birth complications, natural accidents, red tides, and natural catastrophes. Perinatal deaths are those that are not determined to be human-related where the manatee is less than five feet long. Undetermined and verified/not recovered are categories for manatee deaths of unknown causes.

Human-caused direct mortality and injury result from collisions with watercraft, water control structures, and fishing gear.⁶ Historically, the greatest source of manatee mortality has been collisions with watercraft (Figure 1). From 1974-2013, 21 percent of manatee mortality was attributed to watercraft. However, the Service notes “[n]o estimate of the true number of manatee deaths exists because the number of carcasses not found or unreported is unknown.”⁷ Indeed, in that same timeframe, the cause of death could not be determined for 31 percent of salvaged manatees; watercraft mortality likely makes up some unknown percentage of that category.

Manatee Mortality 1974-2013

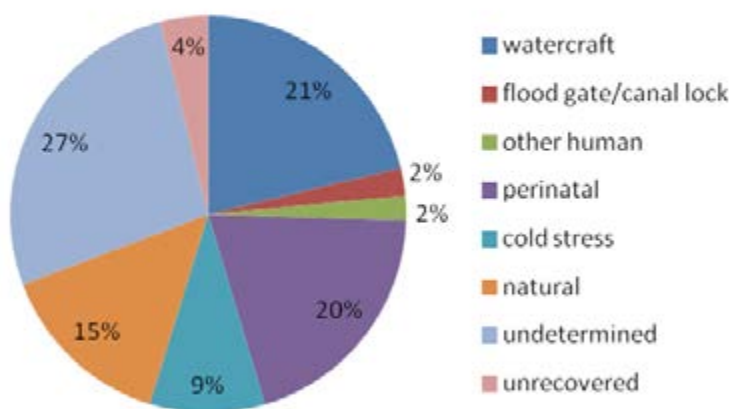


Figure 1. Causes of manatee mortality 1974-2013⁸

Manatees that are hit by watercraft may suffer injuries from propeller wounds or crushing from the hull. A leading expert on manatees concluded “[w]

atercraft-related mortality is having the greatest impact on manatee population growth and resilience... elimination of this threat alone would greatly reduce the probability of quasi-extinction.”⁹ However, the situation does not appear to be improving despite efforts to raise awareness and enact speed zones. Modern boats are designed to be able to go faster in shallower waters, potentially increasing threats to manatees and their seagrass habitats. Manatees may not hear an oncoming boat, or have time to move, or may move from shallow water to the channel. Manatees suffering from cold stress or red tide may be slower to respond to oncoming watercraft.

The true impact of watercraft collisions goes beyond reported mortalities because manatees are not always killed. In fact, individual manatees are often identified by scars made by cuts from boat propellers.¹⁰ Of the 88 manatees that received critical care from 2008-2012, 75 were injured by boats.¹¹ Watercraft can also harass manatees causing them to alter their natural behavior.¹² Secondary harmful effects from boating activities include stress such as the disruption of normal breeding behavior, calf rearing, migration and feeding. An increase in the probability of unsuccessful mating, perinatal mortality, prevention of reaching freshwater resources and warm-water refugia, and decreasing the availability of food resources all contribute to the reduction of the manatee population in Florida. These effects are likely to decrease successful reproduction.

In 2011 the Marine Mammal Commission – a U.S. agency established to provide independent oversight of marine mammal conservation policies and programs carried out by federal agencies – found that “[o]ver the past ten years, boat strikes have killed between 75 and 100 manatees per year. The principal means of minimizing such deaths are boat speed regulations and limitations on new docks and marinas near manatee habitats.”¹³ To date most efforts have focused on the former to the exclusion of the latter.

III. THE FAILURE TO CONSIDER OR PREVENT CUMULATIVE IMPACTS TO MANATEES FROM PERMITTING WATERCRAFT INFRASTRUCTURE

The Florida manatee is one of Florida’s most celebrated species. It enjoys protection under several state and federal laws, and even has its own

license plate.¹⁴ Despite its high profile, it remains inadequately protected from its primary threat: watercraft. To address high rates of manatee mortality due to collisions with watercraft, the Corps and Service prepared a guidance document for permitting watercraft facilities in Florida called the Manatee Key. The purpose of the Key is to expedite Corps and state permitting while minimizing risks to the Florida manatee. Yet, despite its implementation, watercraft collisions remain the leading known cause of mortality. One potential reason that manatee mortality has remained fairly constant despite the enactment of stricter regulations on boat speeds is that the Corps and State have continued to permit an ever-increasing number of watercraft access projects, such as boat ramps, docks and lifts. To substantiate this concern, we analyzed data from the Corps, state, and other federal agencies. We discovered that the agencies are issuing hundreds of permits every year without accounting for their likely cumulative impact on manatees. We found that the Key and the protection measures it relies on are insufficient to protect manatees from high rates of mortality.

A. The Current Regulation of Watercraft Infrastructure Permitting

Although the Florida manatee is protected by several layers of state and federal regulations, these regulations do not appear to adequately protect the manatee from collisions with watercraft, as evidenced by the fact that collisions continue to be the leading cause of mortality. The Florida legislature enacted the Florida Manatee Sanctuary Act in 1978 which declares all of Florida to be a manatee refuge and sanctuary and makes it unlawful to “annoy, molest, harass, or disturb or attempt to molest, harass, or disturb any manatee.”¹⁵ As an endangered species, manatees are similarly protected under the federal Endangered Species Act (“ESA”), which prohibits “take” of listed species – making it unlawful to harass, harm, pursue, hunt, shoot, wound, kill, trap capture, or collect, or attempt to engage in any such conduct.¹⁶

The ESA also requires federal agencies to consult with the Service to “insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of habitat of such species ... determined

... to be critical.”¹⁷ When an agency determines that its proposed action, like permitting projects that facilitate watercraft access, “may affect listed species or critical habitat” according to the statute and regulations, it must engage in formal consultation with the Service.¹⁸ To complete formal consultation, the Service must provide the action agency with a “biological opinion” explaining how the proposed action will affect the listed species or habitat,¹⁹ and it must address the “no jeopardy” and “no adverse modification” prongs of Section 7.²⁰ If the Service determines that the action is likely to result in the incidental taking of a threatened or endangered species, the biological opinion typically also includes an incidental take statement, which specifies measures that the Service considers necessary to minimize take, sets forth terms and conditions to implement such measures, establishes a numeric limit on take, and includes monitoring and reporting requirements.²¹

1. The Manatee Key

The Manatee Key has largely supplanted consultation by allowing the Corps to unilaterally determine which projects may affect, but are not likely to adversely affect and thus avoid formal consultation. Because formal consultation does not occur, the Service does not produce a biological opinion, explaining how the proposed action will affect the listed species or habitat,²² or an incidental take statement specifying measures to minimize take.²³ The Manatee Key has thus supplanted a substantial source of mitigation of harm to manatees.

In 2011, the Corps prepared a biological assessment concerning all new watercraft access projects in the State of Florida and the use of a Manatee Key in authorizing those projects. It acknowledged that “[t]he greatest human-related threat to manatees in Florida is collisions with boats,”²⁴ and that “watercraft mortality accounts for the largest fraction of human-related manatee deaths in Florida, and in most regions is unconditionally the predominant cause of death.”²⁵ The Corps also authorized a State Programmatic General Permit (SPGP IV-R1) for the state of Florida, pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act with the state also relying on the Key for issuing permits. The State Programmatic General Permit is authorized for use throughout the state except in Monroe County, and includes shoreline stabilization, boat ramps, boat launch areas, associated structures, docks, piers, and

maintenance dredging of canals and channels.

In April 2013, the Corps issued a revised version of the Manatee Key. The Manatee Key allows the Corps to determine whether it needs to consult with the Service for impacts to manatees for certain types of projects. The 2013 Manatee Key states that for all “may affect” determinations made pursuant to the Key, the Corps is to refer to the Service’s March 21, 2011, Biological Opinion on the 2011 Manatee Key “for guidance on eliminating or minimizing potential adverse effects resulting from the proposed project.”²⁶ For all “not likely to adversely affect” determinations made pursuant to the Key, the Service concurs and the Corps need not consult with the Service.

Neither the Corps nor the Service prepared an environmental analysis which would have included a cumulative effects analysis prior to developing and authorizing the 2011 Manatee Key, the 2011 State Programmatic General Permit, and the 2013 Manatee Key.²⁷

2. Marine Mammal Protection Act

The manatee is also protected under the Marine Mammal Protection Act (“MMPA”).²⁸ Before the Service can issue an incidental take statement for a marine mammal, it must first comply with the MMPA. Congress enacted the MMPA to preserve currently healthy marine mammal populations and replenish waning marine mammal populations.²⁹ To those ends, the MMPA imposes a general moratorium on the taking of marine mammals absent a permit.³⁰ Authorization of take is only allowed if found to be small in number and to have a negligible impact on the species in question.

In January 2000, following record-setting watercraft-related manatee mortality, Save the Manatee Club filed lawsuits against the Service, Corps, and state of Florida for failing to protect manatees from deadly collisions with boats.³¹ A year later the Parties agreed that the Service would set up new manatee refuges and sanctuaries; the Service and Corps would analyze the effects of Corps-permitted projects on manatees and their habitat; the Service would produce a MMPA take rule; the Service and Corps would produce criteria for permits for projects that increase boat traffic; the Service would explain how it would enhance

enforcement of existing speed zones; and the Service would produce a new manatee recovery plan.

In 2001, the Service undertook to create a MMPA take rule for manatee mortalities due to watercraft-related activities. However, it concluded that levels of take were already too high and declined to finalize a MMPA rule for watercraft activities, including the Corps’ authorization of watercraft-related projects. To date, the Service has not promulgated a MMPA take rule for manatees. Because there is no MMPA take regulation, there continues to be a “no take” standard for manatees regarding watercraft activities that are reviewed under the ESA. In other words, there is an absolute prohibition against killing or harming manatees, which at this time, is being repeatedly violated by the Corps when it issues permits for new watercraft access projects.

B. The Corps and Florida are Permitting Thousands of Projects Facilitating Watercraft Access That are Harming Manatees

Recognizing that manatee mortality as a percent of overall mortality has stayed relatively the same despite increased regulation of boat speeds and other measures, we endeavored to determine whether the Manatee Key is doing anything to limit construction of new watercraft access projects through consideration and mitigation of cumulative impacts. We discovered an overall lack of accurate or transparent record keeping, indicating that neither the Service nor the Corps is tracking how many projects are approved and where and what their effect is on manatees.

In order to determine the extent to which the Corps is issuing permits for structures that facilitate additional watercraft access presenting potential risks to manatees, we requested through the Freedom of Information Act records of all Corps-issued permits since 2008 issued using the Manatee Key that it concluded would have no adverse affects. We received two spreadsheets with incomplete and duplicate information about permits, including the project name, permit number, permit type, action type, coordinates, and start and end dates. A key limitation of the data is that it does not include a detailed description of each project, so it was difficult to determine what type of activity had been permitted. Additionally, there were often multiple entries for the same permit.

To overcome these limitations, we used the permit number to eliminate duplicates and the project name and permit type to categorize the permits into ten project categories: boat lift, boat ramp, boat slip, dock, dock and boat lift, dredge, marina, pier, structure, and unknown. Using the coordinates provided by the Corps, we then mapped all of the permits to visually display the geographic extent of the permitted projects.

Separately, we obtained data on manatee mortalities from the state of Florida, including location and date of recovery and probable cause of death if known. We used this data to characterize the scope of the problem of watercraft mortality by overlaying manatee mortalities onto our map of permits.

In total the Corps approved at least 4,086 distinct permits facilitating watercraft access through the Manatee Key for activities that it concluded were not likely to adversely affect manatees, including 261 in 2008, 673 in 2009, 687 in 2010, 709 in 2011, 832 in 2012, and 934 in 2013, or an average of 683 per year. The Corps concluded that 4,038 of these projects may affect, but were not likely to adversely affect manatees and concluded that 48 would have no effect. Of these, we were able to determine a project type for 3,563 of the projects, including 1,116 docks, 758 boat lifts, and 467 piers (Table 1).

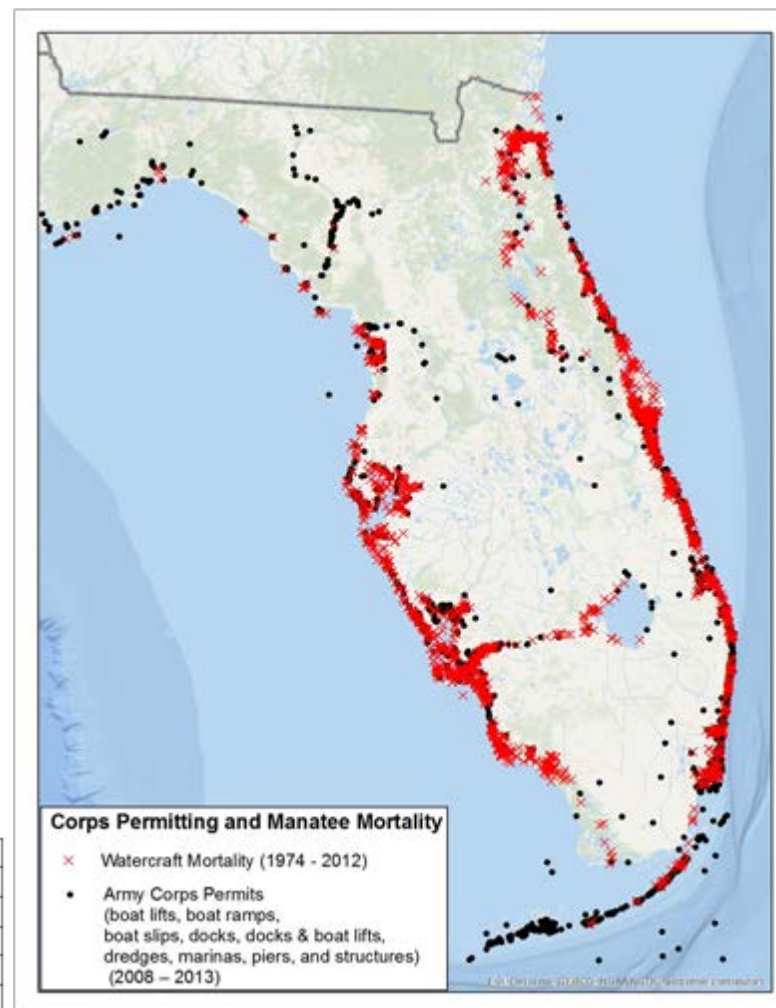
Table 1. Number and type of projects permitted 2008-2013 based on a conclusion using the Manatee Key that they were not likely to adversely affect manatees.

Project Type	Number 2008-2103
Boat lifts	758
Boat ramps	65
Boat slips	18
Docks	1,116
Docks & boat lifts	558
Dredges	212
Marinas	66
Piers	476
Structures	304

Permitted projects were widely distributed across Florida within the range of the Florida manatee (Figure 2). Manatee mortalities from watercraft are similarly widely distributed across the species' range reflecting how ubiquitous watercraft infrastructure and traffic is in Florida (Figures 2 and 3). For every single one of the permits issued, the Corps concluded that manatees would not be harmed and, when considered

in isolation, the impacts from any one of these projects is likely very small or at least difficult to determine. However, considered cumulatively, these permits for thousands of projects facilitating watercraft access throughout the range of the manatee are very likely placing manatees at greater risk of collision and in the process is impairing recovery.

Figure 2. The distribution of manatee mortality attributable to watercraft from 1974-2012 and permitting of select new watercraft facilities in Florida from 2008-2013.

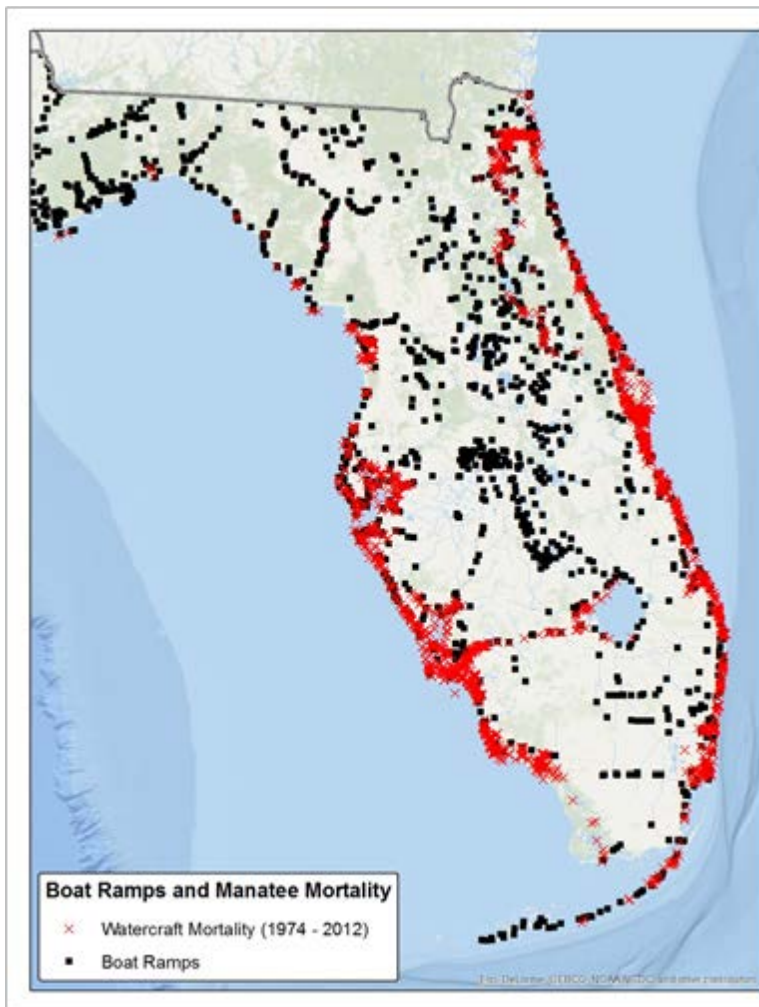


It is important to note that the data collected from the Army Corps does not capture all permitted activity. At best it reflects only those permits for which the Army Corps determined via the Manatee Key no adverse effects for the manatee. For example, in 2012, the National Marine Fisheries Service reported that from 2006-2010, the Corps authorized 9,195 permits to construct docks.³² Therefore, the Army Corps has likely authorized many more projects that may affect manatees than their data reflects.

Moreover, not captured by the Corps' data are the

projects authorized under the State Programmatic General Permit (“SPGP” or “General Permit”) issued by the state of Florida. From 2000-2009, this General Permit was used 19,927 times to authorize in-water construction activities throughout Florida (not including the Panhandle), and 52 percent (10,266) were for facilities that allow watercraft access (single family boat ramps, docks, and piers).³³ From 2010-2011, DEP reviewed an additional 5,166 projects under the General Permit. FWC maintains a website indicating existing boat ramps and manatee mortality attributable to watercraft collisions. This map shows the extensive presence of boat ramps and illustrates the overlap between boat ramps and manatee mortality attributable to watercraft (Figure 3).

Figure 3. The distribution of manatee mortality attributable to watercraft from 1974-2012 and permitting and existing boat ramps in Florida. <http://ocean.floridamarine.org/mrgis/>.



The data and maps document considerable overlap between where watercraft access projects are constructed and where manatees are turning up dead

from collisions with watercraft. They also indicate that the agencies authorizing these activities are not adequately assessing the impact these projects are having on manatees. This is likely mostly attributable to the failure of the Manatee Key to accurately anticipate the effects of these activities.

C. Permitting of Thousands of Projects Facilitating Watercraft is Likely Leading to Collisions with Manatees and Impairing Further Recovery

The Service acknowledges that “[a] serious threat to this species is the indirect and cumulative injury and mortality caused by watercraft operating from watercraft access facilities.”³⁴

The Service recognizes that “an increasing human population and intensive coastal development are long-term threats to the manatee, and that manatee survival will depend on maintaining the integrity of ecosystems and habitat sufficient to support a viable manatee population in the midst of this growing human population,”³⁵ and that because the manatee has a low reproductive rate, a decrease in adult survivorship due to watercraft collisions could contribute to a long-term population decline.³⁶ The Service has further acknowledged that a 1 percent change in adult survival likely results in a corresponding change in the rate of population growth or decline.³⁷ The Marine Mammal Commission has also concluded that “the number of boat-related deaths is large and has undoubtedly slowed the recovery of Florida manatees.”³⁸

Since the Manatee Key was implemented in 2008, manatee mortality from boat strikes has only slightly decreased as a percent of total mortality. From 2008-2013, there have been 512 manatee mortalities linked to boat collisions. Past concurrence letters on the Manatee Key have concluded that the Corps’ use of the Key will not adversely impact manatees or result in take, yet manatee deaths from boat strikes have persisted at high rates. Already this year, 47 manatees have died from collisions with watercraft.³⁹ Significantly, that is more than three times the number of manatees that the Service estimates can be killed without impairing the species’ recovery.⁴⁰

Watercraft mortality continues to be the leading cause of human-caused mortality. Since data was first collected in 1974, there has been an increasing trend in

the number of manatees killed annually by watercraft (Figure 4). FWC records indicate that from 1974 to 2013, of the 9,666 carcasses that were salvaged, 2,464 were definitively killed by human causes.⁴¹ Of that 2,464, 83 percent (2,052), were killed by collisions with watercraft. From 2008-2013, of the 2,404 carcasses that were salvaged, 578 were killed by human causes. Of that 578, 86 percent (512), were killed by watercraft collisions.

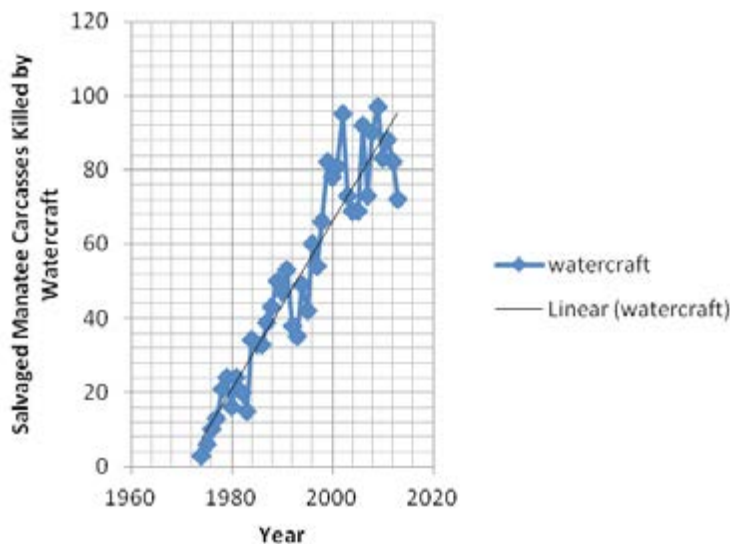


Figure 4. Manatees killed by watercraft 1974-2013

Although increased mortality due to watercraft collisions likely relates, in part, to growth of the Florida manatee population, the fact that collision mortality as a proportion of total mortality has remained relatively constant strongly indicates that the problem is growing commiserate with growth in both the manatee and human population and continuing authorization of watercraft access projects (Figure 5).

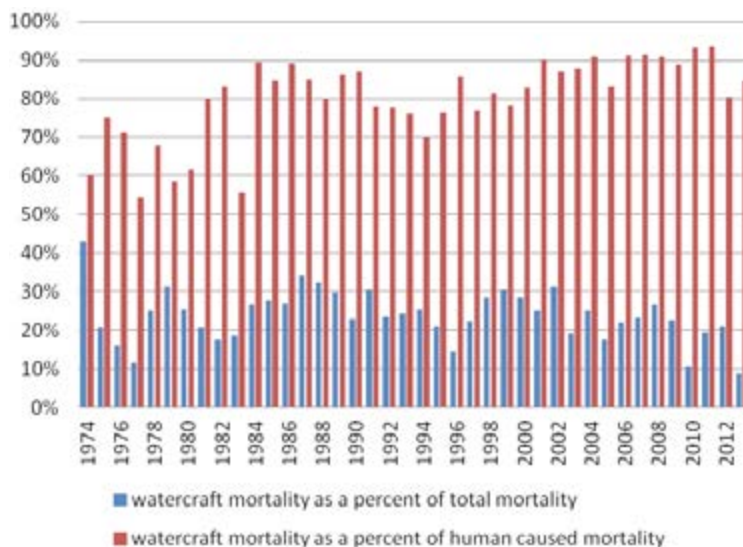


Figure 5. Watercraft mortality as a percent of both total and human-caused mortality

In 2012 the National Marine Fisheries Service found that the Corps' Nationwide Permit 36 to construct boat ramps jeopardizes the continued existence of endangered and threatened seagrass and harms manatees:⁴²

over 64,200 acres of seagrasses, which provide important forage for the endangered West Indian manatee and which contain populations of the threatened Johnson's seagrass, were moderately or severely damaged by boat propellers in Florida, partially as an indirect effect of boat ramps authorized by this Nationwide Permit. NWP 36 has also had ecologically significant indirect effects on endangered West Indian manatees in Florida: between 1986 and 1992, watercraft collisions accounted for 37.3% of manatee deaths, where the cause of death could be determined, by providing access to increased numbers of watercraft.

It is evident that neither the Corps nor the Service is evaluating the cumulative effects of issuing these permits. The current and reasonably foreseeable future level of watercraft-related mortalities in the context of climate disruption, the unsustainable number of high manatee mortalities associated with recent cold weather winters and red tide and unusual mortality events must also be considered. The trend in periodic severe cold air outbreaks is expected to continue through at least the end of the century, continuing to put the survival of the manatee at risk.⁴³ The intensity, duration and frequency of winter storms will continue to increase as polar winds, resulting from the melting of the arctic ice, move south along the continent.⁴⁴ The 2010 and 2011 winter months were particularly hard for the manatee when 393 manatee carcasses were salvaged due to cold stress. Additionally, the last two years there has seen a spike in mortality due to an unknown toxic source. These threats act synergistically and cumulatively to weaken the manatee's opportunities for recovery.

D. Other Protection Measures are Not Adequate to Protect the Manatee

The Manatee Key provides a series of requirements, that if met, allow permits to be issued absent consultation in areas that have “adequate protection measures,” which to date, includes the entire range of the manatee in Florida except Braden River.⁴⁵ According to the Service adequate protection measures consist of speed zones and the signage and enforcement necessary to ensure the zones are followed. Unfortunately, speed zones alone have to date been largely ineffective at reducing manatee mortalities.

Efforts to establish speed zones began in 1989 when state and county agencies were ordered to do so throughout 13 key counties. Speed zones are designated by the Florida Fish and Wildlife Conservation Commission under rule and published in the Florida Administrative Code. There are several types of speed zones, including motorboat no entry (year round); idle speed zones (year round; Nov. 15-Apr. 30); slow speed zones (year round; Nov. 15-Apr. 30); maximum 25 mph/slow speed buffer zones (year round); and some speed zones that include or exclude channels. The Service makes the assumption that designation of manatee speed zones will protect manatees,⁴⁶ finding, for example, that:

[m]anatees are especially vulnerable to fast moving power boats. The slower a boat is traveling, the more time a manatee has to avoid the vessel and the more time the boat operator has to detect and avoid the manatee. Nowacek (2000) documented manatee avoidance of approaching boats. Wells (1999) confirmed that at a response distance of 20 meters, a manatee’s time to respond to an oncoming vessel increased by at least 5 seconds if the vessel was required to travel at slow speed. Therefore, the potential for take of manatees can be reduced if boats are required to travel at slow speed in areas where manatees are expected to occur.⁴⁷

Given that manatee mortalities have continued despite speed zones, it appears the assumption that speed zones are adequate is unsupported at least as enacted and implemented to date. Although information on patrol hours, ratio of officers to boats or slips, or

numbers of citations issued is limited, the information that is available does not suggest enforcement is stringent or is working to reduce manatee mortalities. Indeed, compliance is only about 50 percent, with 10 to 15 percent of boats blatantly disregarding speed zones.⁴⁸ Additionally, speed restrictions may not be enough at 25 mph, as reports show that strikes occur at reported speeds between 15-40 mph.⁴⁹

Furthermore, as Craig Pittman reported in his book *Manatee Insanity*, enforcement officers are often reluctant to issue tickets.⁵⁰ One Florida Fish and Wildlife Conservation Commission officer explained that despite observing several county deputies speeding in manatee speed zones, “state wildlife officers never give their county counterparts a ticket because ‘[we] don’t want to start a war with them.’”⁵¹ Meanwhile federal enforcement officers report that they are unable to take enforcement action on many speeders who violate manatee zones,⁵² and that some boaters don’t even know what a channel marker is much less a slow speed zone sign.⁵³

Laist and Shaw suggest speed zones may not work for the following reasons: (1) the fact that the speeds are still too fast for manatees to avoid collision; (2) boater compliance rates are too low to reduce the collision risk; (3) the type or extent of the speed zones is insufficient to protect manatees; or (4) the zones are somewhat effective, but the increase in manatees and boats has outpaced the speed zones’ ability to reduce collisions.⁵⁴ We suspect that all of these reasons may be in play in Florida, but more site-specific investigation is required.

IV. RECOMMENDATIONS & CONCLUSION

So far this year at least 47 manatees have died from collisions with watercraft,⁵⁵ and another 72 manatees died from collisions with watercraft in 2013.⁵⁶ Clearly, manatees are continuing to die from collisions with watercraft. Permitting hundreds of more projects facilitating watercraft access using the Manatee Key is unlikely to improve the situation. To address this grievous situation, we recommend the following:

- The Corps and the Service rescind the Manatee Key and consider the cumulative impacts of permitting of all projects by all agencies that increase or enhance watercraft access in Florida waters.

- Reevaluate areas deemed “adequately protected” given ongoing manatee mortalities and lack of compliance with speed zones.
- Require additional education about and stricter enforcement of speed zones.

Manatees unnecessarily suffer traumatic injury and death from unintentional collisions with watercraft. Too many manatees have needlessly died from these collisions and it is time the Corps and Service truly accounted for the toll of permitting thousands of projects facilitating watercraft access. Neither agency appears to know exactly how many activities are permitted, where they are permitted, or the extent of cumulative impacts on the manatee. The agencies should immediately evaluate the status of the manatee, their assumptions about the adequacy of manatee speed zones, and dramatically improve their processes for authorizing these activities.



Endnotes

- ¹ U.S. Fish and Wildlife Service. Final Environmental Impact Statement, Rulemaking for the Incidental Take of Small Numbers of Florida Manatee (*Trichechus manatus latirostris*) Resulting from Government Programs Related to Watercraft Access and Watercraft Operation in the State of Florida, Mar. 2003, http://www.fws.gov/northflorida/Manatee/Documents/MMPARules/FinalEIS/CHAPTER_I_FEIS_MAR_2003.pdf.
- ² <http://myfwc.com/research/manatee/projects/population-monitoring/synoptic-surveys/>; Due to warm weather, synoptic surveys were not conducted in 2012 or 2013, <http://myfwc.com/research/manatee/projects/population-monitoring/winter-2013/>.
- ³ *Id.*
- ⁴ Barlas, M.E., C.J. Deutsch, M. deWit, L.I. Ward-Geiger (Eds.). 2011. Florida manatee cold stress related unusual mortality event, January – April 2010. Final Report. FWC/FWRI File F-2852-10-11-F. Florida Fish and Wildlife Research Institute. St. Petersburg, FL. 125 pp.
- ⁵ FWC FWRI Manatee Mortality Statistics 2012.
- ⁶ U.S. Fish and Wildlife Service, Florida Stock (Stock Assessment Report) Jan. 2014 (*hereinafter* SAR 2014) at 4.
- ⁷ *Id.*
- ⁸ Data from <http://www.myfwc.com/research/manatee/rescue-mortality-response/mortality-statistics/>.
- ⁹ Runge, M.C., C.A. Sanders-Reed, C.A. Langtimm, and C.J. Fonnesebeck. 2007. A quantitative threats analysis for the Florida manatee (*Trichechus manatus latirostris*). Final report to U.S. Fish and Wildlife Service, Jacksonville, FL. Intergovernmental Contract no. 40181-5-N012 (Mar. 2007). U.S. Geological Survey Open-File Report 2007-1086. 34 pp.
- ¹⁰ <http://myfwc.com/research/manatee/projects/photo-identification/program/>.
- ¹¹ SAR 2014 at 6; USFWS Manatee Rescue, Rehabilitation, and Release Program Reports 2012.
- ¹² FWC 2006 Final Biological Status Review of Florida Manatee.
- ¹³ Letter from Marine Mammal Commission to USFWS, Sept. 21, 2011, available at http://mmc.gov/letters/pdf/2011/annual_mtg_fws_92111.pdf.
- ¹⁴ <http://myfwc.com/research/manatee/trust-fund/license-plate/>.
- ¹⁵ Section 370.12(2).
- ¹⁶ 16 U.S.C. § 1538.
- ¹⁷ 16 U.S.C. § 1536(a)(2) (Section 7 consultation).
- ¹⁸ 50 C.F.R. § 402.14(a).
- ¹⁹ 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14.
- ²⁰ 50 C.F.R. § 402.14(g)(4).
- ²¹ 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i).
- ²² 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14.
- ²³ 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i). As explained below, the Service cannot issue an incidental take statement because it has not complied with the Marine Mammal Protection Act.
- ²⁴ Watercraft Access Facilities in the State of Florida Biological Assessment, p. 3.
- ²⁵ *Id.*
- ²⁶ 2013 Manatee Key, pp. 1-2.
- ²⁷ National Environmental Policy Act, 42 U.S.C. §§ 4321, *et seq.*
- ²⁸ Co-plaintiffs included The Humane Society of the United States, Defenders of Wildlife, Sierra Club, Animal Welfare Institute, International Wildlife Coalition, United States Public Interest Research Group, International Fund for Animal Welfare, Florida Audubon Society, Florida Defenders of the Environment, Audubon Society of Southwest Florida, Responsible Growth Management Coalition, Environmental Confederation of Southwest Florida, Citizens Association of Bonita Beach, Florida Public Interest Research Group, Biscayne Bay Foundation, Sanibel-Captiva Audubon Society, The Pegasus Foundation, and individuals.
- ²⁹ NMFS BiOp 12 USACE SAJ General Permit Renewal Dec. 19, 2012 at 10, http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/reg_bo/sajprogrammatic-usace2012.pdf.
- ³⁰ NMFS Programmatic BiOp Dec. 11, 2011 SPGP IV-RI, from 2006-2010, 1,488 permits were for the installation of minor structures including mooring pilings, small mooring dolphins, non-commercial information signage, boat lifts, hoists, davits, or other minor structures that would have less environmental impact than a small dock (under SAJ-17), and 3,256 were for the repair, replacement, or installation of single-family piers designed to accommodate not more than four vessels and normal appurtenances such as boat hoists, boat shelters with open sides, stairways, walkways, mooring pilings, and dolphins (under SAJ-20).
- ³¹ Co-plaintiffs included The Humane Society of the United States, Defenders of Wildlife, Sierra Club, Animal Welfare Institute, International Wildlife Coalition, United States Public Interest Research Group, International Fund for Animal Welfare, Florida

Audubon Society, Florida Defenders of the Environment, Audubon Society of Southwest Florida, Responsible Growth Management Coalition, Environmental Confederation of Southwest Florida, Citizens Association of Bonita Beach, Florida Public Interest Research Group, Biscayne Bay Foundation, Sanibel-Captiva Audubon Society, The Pegasus Foundation, and individuals.

³² NMFS BiOp 12 USACE SAJ General Permit Renewal Dec. 19, 2012 at 10, http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/reg_bo/sajprogrammatic-usace2012.pdf.

³³ NMFS Programmatic BiOp Dec. 11, 2011 SPGP IV-RI, from 2006-2010, 1,488 permits were for the installation of minor structures including mooring pilings, small mooring dolphins, non-commercial information signage, boat lifts, hoists, davits, or other minor structures that would have less environmental impact than a small dock (under SAJ-17), and 3,256 were for the repair, replacement, or installation of single-family piers designed to accommodate not more than four vessels and normal appurtenances such as boat hoists, boat shelters with open sides, stairways, walkways, mooring pilings, and dolphins (under SAJ-20).

³⁴ 2011 BiOp at 3.

³⁵ USFWS BiOp for Tidewater, SAJ-2003-10791.

³⁶ O'Shea, T.J., C.A. Beck, R.K. Bonde, H.I. Kochman, and D.K. Odell, 1985, An analysis of manatee mortality patterns in Florida 1976-1981. *Journal of Wildlife Management*. 49:1-11.

³⁷ Marmontel, M., S.R. Humphrey, and T.J. O'Shea. 1997. Population Viability Analysis of the Florida Manatee (*Trichechus manatus latirostris*) 1976-1991. *Conservation Biology*. 11(2): 467-81.

³⁸ Letter from Marine Mammal Commission to USFWS, Sept. 21, 2011, available at http://mmc.gov/letters/pdf/2011/annual_mtg_fws_92111.pdf.

³⁹ Florida Fish and Wildlife Conservation Commission. Fish and Wildlife Research Institute: Manatee Mortality Statistics.

⁴⁰ SAR 2014. The Service estimates the potential biological removal ("PBR"), the annual maximum number of animals, not including natural mortality, that may be removed while allowing that stock to reach or maintain its optimum sustainable population level ("OSP" which is the number of animals which will result in the maximum productivity of the species), for manatees is 14.

⁴¹ <http://www.myfwc.com/research/manatee/rescue-mortality-response/mortality-statistics/>.

⁴² NMFS BiOp to Corps re NWP, Feb. 17, 2012.

⁴³ Kodra, Evan, Karsten Steinhaeuser, and Auroop R. Ganguly, *Persisting Cold Extremes Under 21st Century Warming Scenarios*. *Geophysical Research Letters*. Vol. 38, L08705, 1-5,1 (2011).

⁴⁴ Overland, James E., and Muyin Wang, *Large-scale Atmospheric Circulation Changes are Associated with the Recent Loss of Arctic Sea Ice*. *Tellus*. Vol. 62(A) 1-9, 8 (2010); *See also*, Strey, Sara T., William L. Chapman, and John E. Walsh, *The 2007 Sea Ice Minimum: Impacts on the Northern Hemisphere Atmosphere in Late Autumn and Early Winter*. *Jour. Geophysical Research*, Vol. 115, D23103, 1-13 (2010).

⁴⁵ FWS 2011 Manatee Key Programmatic BO Appendices, p. 1, available at http://www.fws.gov/northflorida/Manatee/Manatee_Key_Programmatic/20110321_gd_Appendix%20A_2011_Florida%20Manatee%20Key%20Programmatic%20BO.pdf.

⁴⁶ FWS, Interim Strategy on Section 7 Consultations under the Endangered Species Act for Watercraft Access Projects in Florida that May Indirectly Affect the Florida Manatee, 66 Fed. Red. 43885 (Aug. 21, 2001), <http://www.gpo.gov/fdsys/pkg/FR-2001-08-21/html/01-21069.htm>.

⁴⁷ USFWS BiOp for Tidewater, SAJ-2003-10791.

⁴⁸ Calleson, C.S. and R.K. Frohlich. 2007. Slower boat speeds reduce risks to manatees. *Endangered Species Research*. 3:295-304.

⁴⁹ *Id.*

⁵⁰ Pittman, C. 2010. *Manatee Insanity*. University Press of Florida.

⁵¹ *Id.* at 154.

⁵² *Id.*

⁵³ *Id.* at 155.

⁵⁴ Laist, D.W. and C. Shaw, Preliminary Evidence that Boat Speed Restrictions Reduce Deaths of Florida Manatees, *Marine Mammal Science* 22(2):472-79 April 2006.

⁵⁵ <http://myfwc.com/media/1777172/YearToDate.pdf>.

⁵⁶ <http://myfwc.com/media/2470902/YearToDate.pdf>.