



# Investigating Controversial Manatee Speed Zones

## Have speed zones prevented an increase in boat-related mortality?

by Steven Webster, MW Consulting, for Citizens For Florida's Waterways



### Introduction

Manatee slow speed zones are based on the assumption that forcing recreational boats to travel slowly reduces boat-related manatee mortality. Speed zones have been the primary tool used by state and federal regulators for more than 30 years. Boat strikes cause approximately one in four manatee mortalities. Regulators say that proportion has not changed over time, leading many to question whether speed zones are effective.

In response, regulatory agencies opine that while speed zones do not appear to have reduced the proportion of boat-caused mortality, speed zones likely have prevented the proportion of boat-caused mortality from increasing as the number of boats plying Florida waterways grows.

This "prevention" assumption has been extensively discussed but never evaluated, which has led many to challenge the agencies' reliance on speed zones. Regulators (Florida Fish & Wildlife Conservation Commission, US Fish & Wildlife Service) agree there is a need for empirical studies to assess the effectiveness of existing boat speed limits, and concede their inability to do so "is a criticism well taken." They further contend, however, that no method exists to evaluate the assumption.

This presentation demonstrates one approach to evaluate whether speed zones have prevented an increase in boat-related manatee mortality. This approach is based on a simple premise:

**If speed zones have prevented an increase in the proportion of manatee deaths caused by increasing numbers of boats, then areas without speed zones should be experiencing an increase in the proportion of mortality caused by boats.**

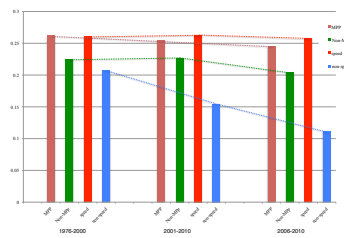
The findings do not support the belief that speed zones have prevented an increase in the proportion of boat-related mortality.

### Method

Using mortality data collected by FWC, Citizens For Florida's Waterways employed the following method:

- Mortality proportions (watercraft-related ÷ total mortality) were generated annually for all counties with watercraft-related mortality since 1976
- Counties were grouped into three categories:
  - Counties with Manatee Protection Plans and speed zones
  - Counties with speed zones but no MPP
  - Counties with neither speed zones nor MPPs
- Mortality proportions by group were plotted for three time periods:
  - 1976–2000 (predating most speed zones and MPPs)
  - 2001–2010 (most recent ten-year period)
  - 2006–2010 (most recent five-year period)
- The change in proportion for each group and time period was placed into a spreadsheet and the chart shown here.
- Deaths from cold stress, a relatively recent phenomenon that now accounts for a sizable percent of deaths, were considered.

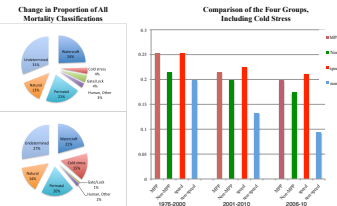
Comparison of the Proportion of Boat-Related Manatee Mortality in Four Groups, Corrected for Cold Stress



### Findings

#### Change in Mortality Rates, Excluding Cold Stress

- Counties without MPPs or speed zones (in blue) have seen a surprising decline in the proportion of manatees killed by vessels (from more than 20% 1976-2000 to just over 10% in 2006-10).
- Counties without MPPs saw a small decline from 23% to 20% during the same periods.
- Counties with speed zones but no MPPs were unchanged.
- Counties with MPPs and speed zones saw a decline of 3%.



#### Change in Mortality Rates, Including Cold Stress

- Cold stress began occurring in significant numbers only recently.
- When cold-stress is included in total mortality, all four groups showed declines in watercraft-related mortality.
- Counties without MPPs or speed zones again showed by far the largest decline.

As the pie charts show, the growing proportion of cold stress deaths results in a reduction in the proportion of deaths from all causes except "Natural," which increased by 1%. Our opinion is the chart excluding cold stress deaths provides a more realistic interpretation of the effect of zones on watercraft-related mortality.

### Discussion

Using this method, the proportion of watercraft-related deaths in counties without regulation is shown to be dropping, despite increased numbers of boats statewide. This strongly suggests there is no "prevention" benefit from speed zones.

But is this a valid approach? Reviewers have raised several concerns:

#### The method does not consider compliance as a factor.

FWC tracks manatee zone patrol hours separately from total patrol hours. We examined the effect of varying levels of enforcement on mortality and found no evidence linking increased enforcement to reduced mortality, even in those areas with double the level of patrols. Our finding has been supported by former senior FWC law enforcement.

#### As mortality ratios can vary by county, such comparisons are suspect.

It's true that the mortality rate in counties with speed zones started high, while the rate in counties without speed zones was lower. However, in counties with speed zones, the rate stayed high, while it dropped further in counties without zones. It is the change in the mortality rate over time in each group that is of concern here. Moreover, during rule-making, regulators consider any county with one or more watercraft mortality per year as "high risk," ignoring differences in county size, water area, or manatee population. We contend this approach – the change in mortality rate – is likely a more valid measure.

#### If speed zones are ineffective, why have manatee survival rates increased?

Thanks to better models, we now know that survival rates (indicating a growing population) are much higher than believed just a few years ago. However, we do not know if survival rates were necessarily lower 30 years ago than today, or whether they were simply not measured as accurately. We also don't know what factor speed zones may play in any change in survival rate.

#### What about...

Other factors, such as deaths caused by large, slow-moving vessels, deaths avoided because boats avoid an area, changes in manatee habits, etc., all come into play.

#### Lies, damn lies and statistics.

Point well taken. While the data for each group is fairly robust – several thousand total mortalities and more than 18000 watercraft mortalities – unidentified factors may skew results, which is why we are calling for a serious investigation into the benefits and costs of speed zones.

#### Data Reviewed In This Study

Probable Cause of Death	Watercraft	Cold stress	Total
<b>1976-2000</b>			
MPP	791	105	3127
Non-MPP	197	39	916
<b>2001-10</b>			
MPP	626	452	2911
Non-MPP	206	129	1037
<b>2006-10</b>			
MPP	334	319	1684
Non-MPP	101	86	582
<b>1976-2000</b>			
speed	883	119	3511
non-speed	105	25	532
<b>2001-2010</b>			
speed	756	499	3374
non-speed	76	82	574
<b>2006-10</b>			
speed	402	349	1912
non-speed	33	56	354

### Discussion (cont.)

The purpose here is to begin a long-overdue discussion regarding the effectiveness of speed zones:

- Have speed zones resulted in a measurable and significant change in mortality or survival?
- How do speed zones change boating behavior (do boats simply slow down, or go elsewhere, or stop going)?
- Are certain speed zone configurations better than others (i.e., are zones in deep water of any value)?
- Should there be specific criteria that must be met before zones can be implemented – or removed?
- Should zones be implemented solely through regulatory review, or should Local Rule Review Committees be granted a larger role?
- Does the presumed link between marine construction permits and potential threat to manatees exist, and if so, how significantly?
- How should zone "effectiveness" be evaluated?

We look forward to working with all parties in the pursuit of sound scientific inquiry that will frame future regulatory action.

### Sources & Literature

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### WHO WE ARE

Citizens For Florida's Waterways (CFFW) is a not-for-profit association promoting coexistence between man and the marine environment and the need for the responsible management of Florida's waterways. CFFW is Florida's oldest and largest advocacy organization working on behalf of recreational boaters. CFFW advocates education in the safe and considerate use of watercraft with respect for our marine environment and conservation. Learn more or join online at [www.cffw.org](http://www.cffw.org).

To contact the author:  
 phone: 321-603-2370 email: [swebster@mathews-webster.com](mailto:swebster@mathews-webster.com)