

area (Volusia County Environmental Management, 2002). Recreationists engaging in fishing or traveling may experience some inconvenience by having to go slower; however, small changes in boater behavior due to the extension of slow speed zones should not result in a significant economic impact.

For the Tomoka River, the primary activity affected by the designation is waterskiing. A ski club has used the river in an area currently designated at 40 km per hour (25 mph). This will change to slow speed for a portion of the year. The nearest alternative site where these recreationists can water ski is at least 11 to 16 km (7 to 10 miles) away (Volusia County, 2003). It is estimated that the on-the-water travel time for the skiers to reach the nearest alternative site could be up to 2½ hours. The regulation may cause some water skiers to forgo this activity, or may reduce the quality of their experience. The number of skiers that may be affected and the number of trips per year are not currently known. With additional information on the number of affected individuals, we could estimate the impact of lost or diminished skiing days given the value of a waterskiing day published in the literature. One study by Bergstrom and Cordell (1991) suggested the lost surplus value may be \$38/day (2002\$) for a day of waterskiing. They applied a multi-community, multi-site travel cost model to estimate demand for 37 outdoor recreational activities and trip values, including water skiing. The analysis was based on nationwide data from the Public Area Recreational Visitors Study collected between 1985 and 1987 and several secondary sources.

In the Halifax River, one of the activities that may be affected by the designation is personal watercraft (PWC) use. These activities are primarily taking place in the recreational zones located south of the Seabreeze Bridge and north of the Dunlawton Bridge. PWC likely represent a very small portion of vessels on the Intracoastal Waterway in Volusia County. Based on a boating activity study from 1994 to 1995, less than two percent of observations in the Intracoastal Waterway area were PWCs (based on 12,000 observations during aerial, boat ramp and shoreline, and mailing surveys) (Volusia County Environmental Management Services, 1996). The number of pleasure PWC in Volusia County in 2000 was 2,432, with 204 rental PWC (FWCC, 2000a). The nearest alternative site for using personal watercraft is near the Dunlawton Bridge, where an area

remains unrestricted between the channel and the expanded shoreline buffer, or in the Ponce Inlet vicinity, approximately 20 km (12.5 miles) downriver. Under the rule, travel time from the Daytona Beach watersports area (south of Seabreeze Bridge) to the Ponce Inlet area would be approximately one hour. Added travel time to reach alternative sites would depend on the origin of the trip, which is currently unknown. The regulation may cause some personal watercraft users to forgo this activity, or may reduce the quality of their experience. The number of PWC users that may be affected and the number of trips per year are not currently known. To the extent that these recreationists choose to forgo the activity, this could also impact local businesses that rent personal watercraft.

Currently, not enough data are available to estimate the loss in consumer surplus that water skiers in the Tomoka River or PWC users in the Halifax River will experience. While some may use substitute sites, others may forgo the activity. The economic impact associated with these changes on demand for goods and services is not known. However, given the number of recreationists potentially affected, and the fact that alternative sites are available, it is not expected to amount to a significant economic impact.

Affected Commercial Charter Boat Activities

Various types of charter boats use the waterways in the affected counties, primarily for fishing and nature tours. The number of charter boats using the Caloosahatchee, Halifax, and St. Johns Rivers, and their origins and destinations, are currently unknown. For nature tours, the extension of slow speed zones is unlikely to cause a significant impact, because these boats are likely traveling at slow speeds. The extra time required for commercial charter boats to reach fishing grounds could reduce onsite fishing time and could result in fewer trips. The fishing activity is likely occurring at a slow speed and will not be affected. In the Caloosahatchee and St. Johns Rivers, fishing charters may experience some impact from the extension of slow speed zones, depending on their origins and destinations. Added travel time may affect the length of a trip, which could result in fewer trips overall, creating an economic impact. In the Halifax River, it is likely that most fishing charters are heading offshore or to the Mosquito Lagoon and will experience little impact from the rule (Volusia County, 2003).

Affected Commercial Fishing Activities

Several commercial fisheries may experience some impact due to the regulation. Specifically, the blue crab fishery and, to a lesser extent, mullet fishing, along the Caloosahatchee River; the crab and shrimp industries in the St. Johns River; and the crab and mullet fishing industries in Volusia County may experience some economic impact. To the extent that the regulation establishes additional speed zones in commercial fishing areas, this may increase the time spent on the fishing activity, affecting the efficiency of commercial fishing. While limited data are available to address the size of the commercial fishing industry in the manatee refuges, county-level data generally provide an upper bound estimate of the size of the industry and potential economic impact. This section first provides some background on the blue crab industry in Florida, and then addresses the impact of the rule on the commercial fishing industry for each manatee refuge area.

One industry in particular that may be affected by the rule is the blue crab fishery, which represents a sizeable industry in the State of Florida. Based on a study done for the Florida Fish and Wildlife Commission, Division of Marine Fisheries (Murphy *et al.*, 2001), between 1986 and 2000 the average annual catch statewide was 6.4 million kilograms (14.1 million pounds) (39.7 million crabs). However, year to year fluctuation is significant, including highs of 8.2 million kilograms (18 million pounds) statewide in 1987 and 1996 and a low of 2.5 million kilograms (5.5 million pounds) statewide in 1991. In the last 3 years, blue crab landings have been depressed throughout the East Coast and Gulf of Mexico, though specific reasons for this are unknown at this time (FWCC, 2003d). Landings in 2001 were approximately 3.4 million kilograms (7.4 million pounds) statewide. Based on a 2001 weighted average price of \$1.06 per 0.5 kilograms (pound) of crab, this represents just under \$8 million (FWCC: FMRI, 2003). Data from 2001 on marine fisheries landings from FWCC: FMRI is preliminary and subject to revision.

Caloosahatchee River Area: Lee County, where the Caloosahatchee River Manatee Refuge is located, had 157 licensed blue crab boat operators in 2001 (FWCC: FMRI, 2003). Crabbing in the Caloosahatchee is likely to be minimally impacted by limited extension of slow speed areas. In slow speed areas crab boats have to travel at slower speeds between crab pots, thereby potentially reducing the number