FISHERY IMPACTS - OSLO BOAT RAMP IMPROVEMENT PROJECT (OBR)

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The expansion of parking and boat ramp construction at the present Oslo Road boat ramp will have deleterious impact on local fisheries.

The basic question is, "Do you want, spotted seatrout, snook, tarpon and red drum to fish for, or do you want more parking space for more fishermen, trucks and trailers resulting in fewer snook, tarpon, spotted seatrout and red drum?" It is as simple as that.

I assume it is just through lack of knowledge that some fishermen are lobbying for the paving and expansion of the Oslo Road boat launch area, and they do not know that this project will negatively impact the very species they are planning to catch. Most fishermen do not capture larval and juvenile (20- 30 mm TL, = @ 1.0 in. in length) snook, tarpon, red drum and spotted seatrout. So it is understandable that they would not know that the habitat that will be extirpated by the Oslo Road expansion will impact their fisheries.

Before these fish can reach legal size and be caught on hook and line, they must spend a critical developmental period in mangrove swamps and seagrass meadows in shallow near shore waters only inches deep. They do this to escape predation and to obtain enough food to rapidly grow to maturity in a year or two, over 8-10 yrs for tarpon.

Extensive historical studies of the life history and ecology of fishes of the Indian River Lagoon (see appended list) demonstrate that the four prime fishery species, that most fishermen attempt to catch, snook, tarpon, spotted seatrout and red drum, depend directly on seagrass and mangrove microhabitats like those around the Oslo boat ramp.

The environmental resource report produced by G.K. Environmental, Inc. insinuates that the impoundment at this location does not have sufficient connection to the Indian River Lagoon based on assumptions. There is a single culvert at this location. Historical data has shown that a single culvert can have significant influence on biological diversity and water quality in a 50-300 acre impoundment, particularly in the vicinity of the culvert site (Gilmore et al 1982, 1983, 1984, 1985, 1986, 1987; Gilmore 1987a; Gilmore and Eames 1987), which in this case, is that portion of the impoundment to be impacted by the proposed project, filled for a holding pond and parking facilities.

The habitat configuration, topography, vegetative state, and hydrology associated with the Oslo boat ramp represent prime habitat for larval and juvenile tarpon, snook, spotted seatrout and red drum. Some of the earliest scientific work on these species was done at this location by scientists with the Florida Medical Entomological Laboratory (Harrington 1958, 1966, Harrington and Harrington 1960).

The mangrove rivulus, *Rivulus marmoratus*, is a listed species (NMFS, FDEP, Taylor and Snelson 1992; Musick et al 2000). Rivulus was previously captured at this location by the late Dr. Robert Harrington, world renown scientist with the Florida Medical Entomology Laboratory. It is likely that rivulus occurs in wetlands around the Oslo boat ramp today (Harrington and Rivas 1958, Harrington 1961, 1967, 1971, RGG pers comm. with Dr. Robert Harrington FMEL, Mr. Larry Weber, Collier County Mosquito Control 1985-86; Jim Haegar, FMEL and William Bidlingmeyer, 1989.).

TARPON, *Megalops atlanticus*

Larval tarpon recruit to the wetlands and impounded mangrove swamps at Oslo Road. The first detailed description of stage II larval tarpon was made based on specimens captured in the wetlands adjacent to Oslo Road (Harrington 1958, 1966, Harrington and Harrington 1960). Stage II larval tarpon enter impounded wetlands through culverts, like the one just south of the Oslo boat ramp, or in sloughs connecting the wetland, like those north of the Oslo boat ramp. This typically occurs during high water, late summer and fall sea level rise (Gilmore and Davis 1996; Davis 1998; Gilmore 1999).

Post larval tarpon metamorphose into juveniles in the impounded mangrove wetlands of the Indian River Lagoon and may be so common in some impoundments that fly fishermen actually target these tarpon for sport. Juvenile tarpon may spend considerable time in these habitats as they do not mature until they reach lengths over 100 cm, between 7-10 yrs old.

Tarpon are obligate air breathers as juveniles and enter mangrove forest and impoundment habitats nearly devoid of dissolved oxygen (Gilmore and Davis 1996; Davis 1998; Gilmore 1999). They can also readily leave ocean salinities to freshwater in a few hours with no ill effects. They are well adapted to great variation in water quality. Mangrove impoundments are still optimum habitat for juvenile tarpon as evidenced by their abundance in impoundments of the Indian River Lagoon.

The shallow slough on the south side of Oslo Road connects to the Indian River Lagoon through the single culvert in the south dike. This area resembles juvenile tarpon habitat found elsewhere in the Lagoon. It will be extirpated by the planned parking lot and retention pond.

Tarpon are one of the most protected game fishes in Florida, yet too often critical larval and juvenile tarpon habitat is extirpated by development in impounded mangrove wetlands of the Indian River Lagoon. Indian River Lagoon mosquito impoundments serve as major juvenile tarpon nursery habitat (Gilmore and Davis 1996; Davis 1998).

COMMON SNOOK, *Centropomus undecimalis*

Like tarpon juvenile snook seek very shallow peripheral habitats when they first recruit to Indian River Lagoon wetlands at 15-25 mm TL (5/8 to 1 inch). During my own research programs we captured up to 1,500 juvenile snook in a single culvert trap set for 3 hrs in an Indian River Lagoon impoundment. Huge numbers of juvenile snook may enter an impounded mangrove wetland through a single culvert like that in the dike south of the Oslo boat ramp (Gilmore et al 1982, 1983, 1984, 1985, 1986, 1987; Gilmore 1987a; Gilmore and Eames 1987) . This typically occurs in November and December when Lagoon water levels are high.

This is one of the first habitats juvenile snook seek in their fight for survival. Most juvenile snook die from predation. Snook, spotted seatrout and tarpon will eat early juvenile snook. So early juvenile snook seek just a few inches of water in backwater locations that large snook cannot reach. We have captured over 12,000 juvenile snook in Indian River Lagoon mosquito impoundments demonstrating the great value of Lagoon impoundments to the regional snook fishery.

Peterson and Gilmore (1988, 1991) demonstrated that juvenile common snook (< 150 mm SL) are adapted to very low oxygen conditions (<1.0 ppm) both physiologically and behaviorally and are capable of spending considerable time in impounded wetland and natural mangrove forest communities where dissolved oxygen is limited and salinity may vary.

As with the tarpon, the ditch on the south side of Oslo road is juvenile snook habitat due to its proximity to the single culvert connecting this impoundment to the Lagoon.

This single culvert is important. Our studies indicate that even with the installation of over 20 additional culverts in a single impoundment, the oldest culvert with historical use by juvenile snook is preferred by juvenile snook entering the impoundment. The slough sound of the road is likely the prime snook settlement site at this location. This habitat used by snook would be filled and made into a parking lot and storm water retention pond. We have estimated juvenile snook densities of 10-30 per sq m in similar settings in nearby impoundments studied for several years (Gilmore et al 1982, 1983, 1984, 1985, 1986, 1987; Gilmore 1987a; Gilmore and Eames 1987)

Historical data on fish densities in Indian River Lagoon impounded wetlands provide data that demonstrates that all species of fish inhabiting impounded wetlands can produce an average of 10,000 fish per acre, including the prime prey of impoundment juvenile snook, mosquitofish, *Gambusia holbrooki*, (Gilmore et al. 1983, Lusckovich and Gilmore 1995.). The proposed expansion of Oslo road and parking facilities for fishermen will extirpate 2.6 acres of impounded wetland, or a potential annual production for 26,000 fish. This not only includes snook and tarpon, but their principal prey, poeciliids and cyprinodonts. The overall fishery production of the impoundment south of Oslo road will decline.

It is important to note that the slough, ditches and culver connecting the Indian River Lagoon to the impoundment are all on the north end of the impoundment in the area to be impacted by the Oslo boat ramp expansion project. This virtually guarantees negative impact on tarpon and snook utilizing this impoundment.

SPOTTED SEATROUT, *Cynoscion nebulosus*

Like snook and tarpon, juvenile spotted seatrout depend on shallow near shore waters for refuge when first settling. They depend on seagrass, most notably shoalgrass, *Halodule wrightii* particularly sparse beds growing near shore. This is the principal seagrass at the Oslo boat ramp site. Very shallow sparse shoal grass is the principal microhabitat for post larval, early juvenile spotted seatrout. As spotted seatrout juveniles grow they move into deeper seagrass meadows. Adult spotted seatrout feed along seagrass margins and will consume their young if available, reason for the small juvenile to hug the shoreline (Gilmore 1988; Peebles and Tolly 1988; McMicheal and Peters 1989; Rydene 2003).

Unlike tarpon and snook, spotted seatrout spawn in the Indian River Lagoon. FWC sponsored surveys of spotted seatrout spawning sites conduced from 1990-1994 demonstrated that the prime spawning sites between Fort Pierce and Grant, Florida were in the Intra-Coastal Waterway (ICW) just south of the Wabasso Bridge, directly off the Oslo boat ramp and from Round Island south to the Harbor Branch Oceanographic Institution (Gilmore 1994). This conclusion is based on 300 nocturnal acoustic transect surveys performed during this study, 1990-1994 and earlier, 1978-1981 (Mok and Gilmore 1983). This survey found principal spotted seatrout spawning occurs adjacent to the Oslo Boat ramp between ICW markers 159 and 160 (Gilmore 1994, 1996, 2003).

Principal juvenile spotted seatrout settlement sites are adjacent to spawning sites indicating that the seagrass meadows adjacent to the Oslo boat ramp are likely to be principal habitat for newly settled post larval and juvenile spotted seatrout.

Unfortunately, recent studies of increased boat use of specific areas of the Indian River Lagoon system (example, Canaveral National Seashore, Mosquito Lagoon) indicate that there is a proportional increase in prop scarring and damage to seagrass meadows associated with increased boat use and recreational fishing activity using power boats. Since the seagrass meadows adjacent to the Oslo boat ramp are exceptionally shallow, < 1 m (39 in) deep for over 100 m from shore, it is likely that increased power boat usage in this area will increase prop scarring in adjacent seagrass meadows, increase boat wake activity, increase water turbidity and thus reduce viable spotted seatrout habitat at this location.

It is likely that this increased boating activity will lead to a reduction in spotted seatrout recruitment to the fishery in this portion of the Indian River Lagoon and thus lower fishermen captures of this species in the future.

RED DRUM, *Sciaenops ocellata*

A single seine haul using a small bait net captured several juvenile red drum at the shore line where G.K. Environmental, Inc. conducted Transect Number 4 in their preliminary environmental assessment, permit application. This indicated that juvenile red drum settle at the kayak launch beach a few yards north of the Oslo boat ramp.

Red drum, like snook, tarpon and spotted seatrout, are very specific about where they settle as post larvae and juveniles. If juveniles are captured at a location, it is typical for this location to produce juveniles in the future and be a primary settlement site for years if the environment is relatively stable. This red drum collection site is where the proposed fishing pier is to be constructed. There is no evidence that newly recruited juvenile red drum settle under fishing piers or docks. Catfish do. Would the Oslo fishermen like to trade their red drum in for catfish?

SUMMARY

Impoundment wetland habitat, near shore seagrass and shallow sand bottom at the Oslo Road Boat Ramp support ecosystems that are known to provide essential nurseries for Indian River Lagoon tarpon, snook, spotted seatrout and red drum. The proposed construction of the parking sites and a retention pond north of Oslo Road will extirpate some of the most productive nursery habitat observed at this site.

Increased boat traffic is known to increase seagrass meadow damage and decline. This will impact the quality and quantity of spotted seatrout nursery habitat. Since one of the principal spotted seatrout spawning sites is adjacent to the Oslo Boat Ramp is it likely that the shallow near shore seagrass meadows in this region of the Indian River Lagoon support spotted seatrout. It is also likely that this decline will be more significant at this location due to its proximity to a documented spotted seatrout spawning aggregation site.

The question remains, "Are the fishermen that use the Oslo boat ramp willing to sacrifice the production of red drum, spotted seatrout, tarpon and common snook for more boats, trucks and trailers?" If so, fishermen will loose some of their catch for greater Lagoon access. These predictions are based on extensive surveys of tarpon, snook, spotted seatrout and red drum habitat in the Indian River Lagoon by various scientists over 53 yrs.

Fishermen should not underestimate the cumulative impact of each project that displaces an acre or two of fishery habitat. Like their favorite fishing holes, the diminutive juvenile snook, tarpon, spotted seatrout and red drum have their favorite nursery sites. In this case, one favorite nursery site is where their proposed parking lot and holding pond are planned.

Fisheries are declining as other developments continue to displace impounded mangrove communities up and down the Indian River Lagoon. Coupled with declines in water quality, red tides, toxic algal blooms and increases in fish disease, regional fish populations are declining. If Oslo boat ramp fishermen want to help insure an additional decline in these fish populations, they will do so if they plan to displace valuable fish habitat adjacent to the Oslo boat ramp.

The G.K. Environmental, Inc. report did not address fish, even the listed species, the mangrove rivulus. This report insinuated that the impounded wetland is not essential fish habitat in its present state even though a single culvert is present. There is extensive scientific evidence to the contrary documenting fish use of impounded wetlands along the entire length of the Indian River Lagoon. This misconception is unfortunate as the principal negative impact of the Oslo boat ramp construction will be permanent habitat extirpation for snook and tarpon, habitat degradation for spotted seatrout and red drum. I assume that most of the fishermen that plan to use this boat ramp will be targeting these species as adults.

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