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the House Committee on Small Business
"Joint Oversight Hearing"

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Chairman Bishop, Chairman Chabot, Ranking Member Grijalva, Ranking Member Velazquez, and members of the committees – thank you for the opportunity to provide written testimony for this hearing entitled, "Restricted Access at Biscayne National Park and Implications for Fishermen, Small Businesses, the Local Economy and Environment."

My name is Dr. Jerry Ault. I am a long time resident of Key Biscayne, Florida (Miami-Dade Co.), and a Professor of Marine Biology and Fisheries at the University of Miami. I love to sport fish and have since I was a young boy. To be a good fisherman requires deep understanding of the ocean, fish behaviors, habitats and population dynamics. For that reason, I am fortunate that today my avocation is my vocation. I am an internationally renowned marine fisheries scientist with expertise in the theory and application of quantitative methods to assess fish population and ecosystem risks to exploitation and environmental changes with a particular focus on the Florida coral reef ecosystem. I am considered the world's foremost expert on Atlantic tarpon & bonefish.

For more than 25 years my research has focused on assessment and management of coastal and coral reef fishery ecosystems. I have published more than 200 journal articles, book chapters, and technical reports on integrated ecosystem-wide survey designs, multispecies fisheries stock assessments, marine reserve design and evaluation, and ecosystem modeling. I am uniquely qualified to comment on the dynamics of complex marine fishery ecosystems and expected responses to human pressures, and the biological and economic consequences.

While this may sound like rocket science, the principles and practices of sustaining productive fisheries are really not that complicated! Fisheries science, a branch of renewable natural resource management, focuses on the long-term sustainability of fish species that are exploited by humans. When the catches exceed the rate at which a population can replenish itself, the fishery is deemed unsustainable and corrective measures are put in place. Corrective measures include regulations or limits on catch, effort (numbers of vessels or participants), fish sizes and time-area closures.

Let's examine the facts for the Florida coral reef fishery ecosystem. The ecosystem is inhabited by 500 fish species and supports valuable fishing and tourism industries. Marine recreational fishing in Florida is a multibillion dollar enterprise, an order of magnitude larger in economic value than commercial fishing, generating more in annual revenues than the entire Florida citrus industry. The south Florida ecosystem has been under significant human stress for a long time. Human population growth has been explosive over the past century, a product of air conditioning and Florida's fabulous natural resources. At the end of World War II (1945), there were about 1.9 million persons in Florida; but by late 2014 the State's population reached 20.0 million persons, surpassing New York as the third most populous in the Union (**Fig 1**, upper panel). Population doubling time is now 18 years. From 1964-2014 the fleet of recreational vessels in southern Florida grew more than 500% (**Fig. 1**, lower panel). Doubling time of that fleet 13 years, mostly due to disposable cash. On the other hand, the commercial fleet size remained flat, nonetheless there have been tremendous increases in fishing efficiency due to outstanding technological advances in geographic positioning systems (GPS), hydroacoustics, communication networks, etc. With continued population growth the numbers of recreational anglers are potentially unlimited.

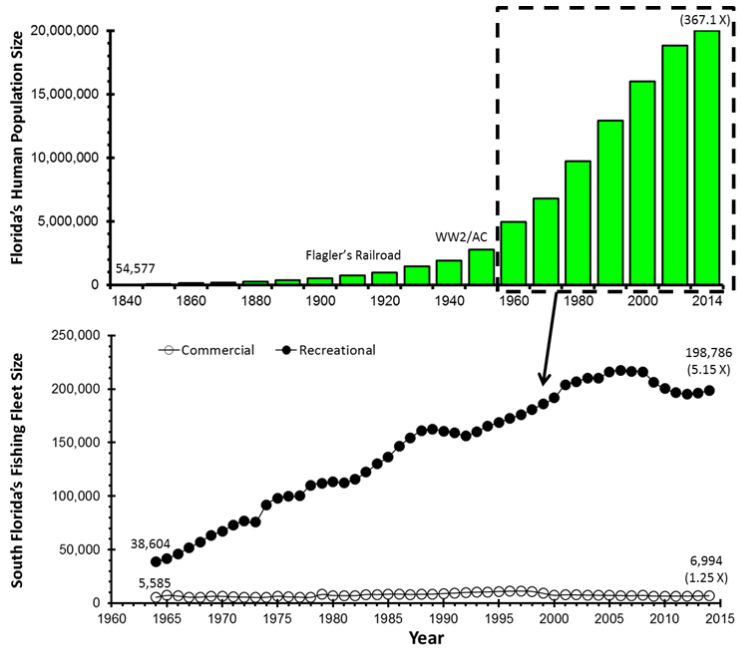

Figure 1.- Growth of south Florida: (A) Florida's human population sizes (1840- 2014); and, (B) south Florida commercial (open circle) and recreational (dark circle) fishing fleet sizes (1964-2014).

Numerous indicators have revealed reef fish populations in the Florida coral reef ecosystem are currently experiencing unsustainable rates of exploitation. Reef fish landings in south Florida

have declined precipitously (about 95%) since the 1960s. Declining landings trends with increasing fishing effort are not sustainable. Catches have shifted over time from being dominated by commercial to recreational fishers. Today greater than 85-90 % of total fishing mortality of reef fishes is attributed to recreational fishing pressures. Recent additional symptoms are overt declines in barracuda catches, which has exacerbated public distress. The average size of groupers in the catch has plummeted to less than 20% of what it was in the 1960s. There have also been significant reductions in average size of most reef fishes in the catches.

In Biscayne National Park, Nassau grouper and jolthead porgy crashed in the 1970s, major population shifts have occurred. Currently the bulk of the catch of snappers is undersized and more than 99.9% of recreational fishing trips taken in Biscayne National Park fail to catch groupers. South Florida coral reefs are in fact "Florida's Yellowstone". But unfortunately they aren't what the typical traveler expects for a National Park. The Park is in comparatively worse condition than the region because it is proximal to the downtown Miami environment.

Scientific assessments show that 28 of 40 (70%) reef fish stocks in the snapper-grouper complex currently have less than minimum 30% spawning potential ratios (SPR, a ratio of current spawning stock size to unfished) required by state, federal, and international standards for sustainability. Some populations SPRs are less than 1% of their historical abundance.

These declines are well documented for many species in southeastern Florida, including barracuda, hogfish, black grouper, mutton snapper, yellowtail snapper, red grouper, jolthead porgy, goliath grouper, Warsaw grouper, snowy grouper, Speckled hind, and others. A formerly common species, Nassau grouper, is being considered for endangered species listing. The notion that current Florida fishing regulations prevent overfishing and everything is "hunky-dory" is not accurate.

Overfishing of the predators (groupers & snappers) is exacerbated by overfishing of key prey resources. This, coupled with irregular water management policies, have also deleteriously affected the Park's natural resources. Pink shrimp, a critical food source for reef & game fishes, have had commercial catches from Biscayne Bay grow from about 200,000 pounds per year in the 1980's to over 1,500,000 pounds in most recent years. These immature shrimp captured as bait for the recreational fleet, have never had a chance to spawn and have zero reproductive input into future shrimp population sustainability. These declines in prey resources may explain why, for example, the bonefish population is less than 30% of their historical abundance, despite the fact that they are not extracted and are considered game fish by the State of Florida.

So, when we look closely at the sustainability of Florida reef fishery resources, we find that the rate of fishing mortality on the reef fish stocks is 2-4 times the level that produces maximum sustainable yield (MSY). The resources are thus not sustainable as defined by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA). The MSRA also compels the Federal government to implement corrective measures. Moreover, the decline in the ecological condition of the resources has significant economic implications. The '*opportunity lost cost*' (OLC) is an economic measure of lost revenues resulting from people that say "fishing in the Florida Keys is not what it used to be, I'm going to Belize". The OLC has been estimated to be in excess of $1 billion per year for the south Florida ecosystem!

Reef fishes are especially prone to overfishing because of their ecology, life history, longevity, large size, high economic value, limited habitat, predictable location in space and time, vulnerability to fishing gear, and high release mortality. They are difficult to manage by size limits and effort controls alone, since these kinds of fishing regulations are difficult to enforce and require high survival of released fish to be effective. This is evidenced by the fact that size and bag limits have been in place for more than two decades in southern Florida and have not prevented overfishing. In fact, many exploited reef fish species are not currently regulated (e.g. great barracuda, jolthead Porgy).

Something must be done to ameliorate the overfishing of reef fish stocks in south Florida under the mandate of the MSRA. A viable strategy is to implement a spatial closure (Marine Reserve) in conjunction with traditional fishery management to manage fishing outside of reserves. Protected areas with no exploitation have received high levels of public support on land. For example, duck hunters in North America saved duck hunting by establishing wildlife refuges where hunting was not allowed. In fact, the underlying principles are the same in marine waters as they are on land. Marine reserves have been documented worldwide to protect fish populations and increase abundance, current fishery yields, and reproductive capacity that ensures fishery yields into the indefinite future. In coral reef ecosystems, marine reserves have proven to be an especially effective management tool because reef fishes have high site fidelity and thus remain inside reserve boundaries for long periods of time.

Our published research has demonstrated that Dry Tortugas reserves enhanced abundance, yields, and reproductive capacity of reef fishes. For south Florida, we found that 35-60% of the population of spawning adults for principal exploited species resided within Tortugas reserves. This build-up of adult spawners in the Tortugas provides an additional upstream source of larvae that may settle as young juveniles in downstream areas in Monroe, Miami-Dade, Broward and Palm Beach counties, including Biscayne National Park (BNP). The BNP marine

reserve could provide additional safe settlement sites that will protect these juveniles that should ultimately enter the fishery.

The Tortugas reserves were implemented as a joint effort by the National Park Service, NOAA and the State of Florida Fish & Wildlife Conservation Commission (FWC). FWC worked and funded cooperative research with NPS to evaluate the efficacy of the Tortugas marine reserves. The aforementioned positive results were so convincing that the FWC subsequently gave overwhelming approval to a 5-year extension of that effort. For this reason it is a bit difficult to understand the reticence of the State for implementing the BNP marine reserve which only helps to build the currently depleted regional resource base, and will sustain reef fish resources for generations of the public and industry in Florida?

The State of Florida has been quoted as saying marine reserves are a "last resort." In actuality, the last resort is closing a fishery entirely; which has happened in Florida for goliath and Nassau groupers (1990), queen conch (1975 commercial; 1985 recreational), stony corals, and sea turtles. Some fishermen proposed closing the fishery for great barracuda at a 2015 public FWC meeting. It does not make sense to establish reserves after everything is depleted. Like National Parks, it is best to protect areas before they are destroyed. Marine reserves represent an environmental insurance policy of sorts, they are best used for precautionary management. Increasing reef fish population abundance in south Florida only serves to help build small businesses and their revenues, put more fish and fishermen on the water in Florida, and sustain the legacy that made Florida "*Fishing Capital of the World*."

Again, thank you for the opportunity to provide this written testimony.