Hilborn presentation on Title II of the Ocean-Based Climate Solutions Act

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Good morning and I want to thank the members and staff for the opportunity to address this committee. My name is Ray Hilborn, I am a Professor of Fisheries and Aquatic Sciences at the University of Washington. I have been studying fisheries management for 50 years, both in the U.S. and in a number of other countries and international commissions. I currently serve on the SSC of the Western Pacific Council. My research has resulted in 300 peer reviewed journal articles, and several books including "Quantitative fisheries stock assessment and management" which is a standard reference work on fisheries management. My work has been recognized by several awards including the Volvo Environmental Prize, the International Fisheries Science Prize, and the Ecological Society of America's Sustainability Science Prize.

I am not representing any group, although I do receive research funding from a wide range of sponsors including major U.S. foundations such as the Gordon and Betty Moore Foundation, the David and Lucielle Packard Foundation and the Walton Family Foundation; NGOs such as the Environmental Defense Fund, The Nature Conservancy and the Natural Resources Defense Council; agencies including the National Science Foundation and NOAA; and commercial and recreational interest groups,

As someone who has worked in fisheries for over 50 years, and done field work in Alaska for almost 40 years, I know that global warming is real, and climate change is the major challenge to American fisheries. The key question is what are the most appropriate tools to respond?

Before we discuss how to respond to climate change we first need to set the stage. What is the state of U.S. fisheries and Oceans? U.S. fish stocks are healthy and increasing in abundance, and U.S. fisheries management is highly precautionary. Figure 1 shows the median abundance of scientifically assessed stocks in the U.S. relative to the reference point of the abundance that would produce maximum sustainable yield[1]. As you will see the median abundance has always been above the target level and has been increasing since 2000.

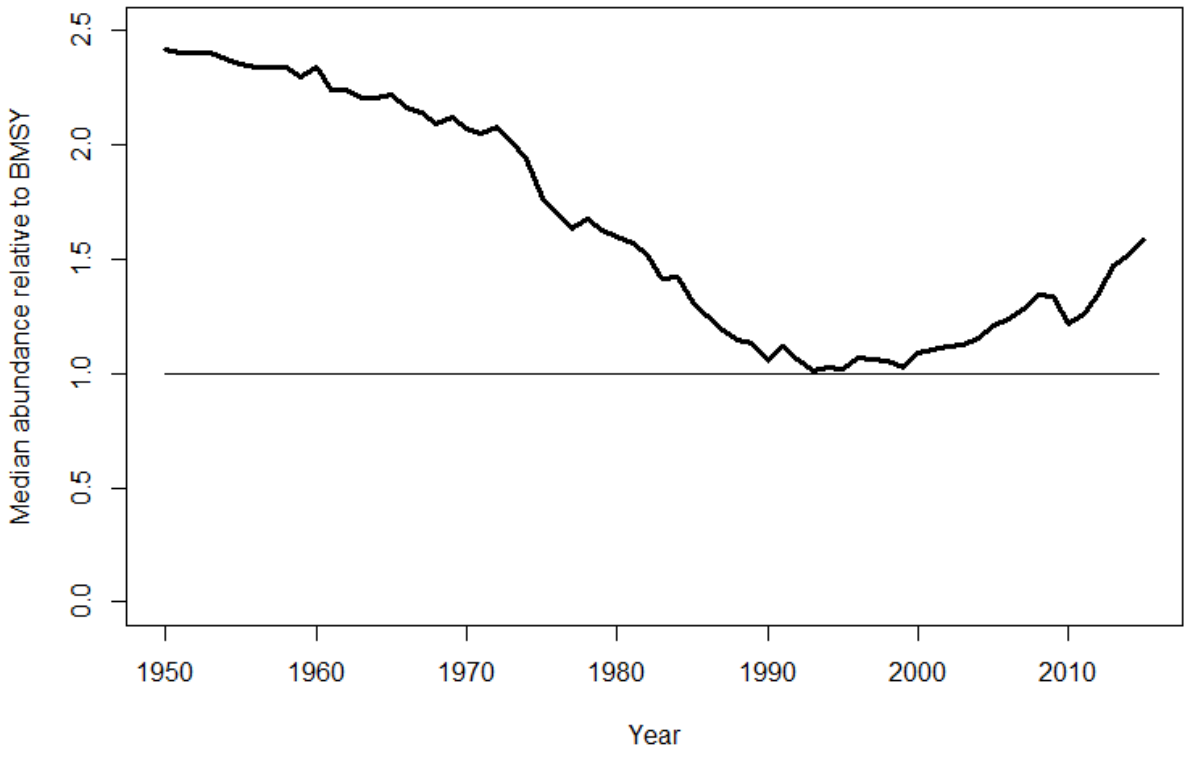

Figure 1. Median stock abundance of U.S. stocks relative to the target biomass that would produce maximum sustainable yield.

[1] Data from NOAA stock assessments and can be found in www.ramlegacy.org

In a recent paper in Proceedings of the National Academy of Sciences (*1*), we showed that overfishing is causing only a 3-5% loss in potential yield from U.S. fisheries, whereas precautionary underfishing is causing far more. Figure 2 shows the loss of U.S. fish production in millions of tons from overfishing, and from underfishing. Underfishing is simply harvesting less than would produce maximum sustainable yield. If we were to fully exploit all of our underfished resources we might increase yield by 40%. Overfishing is simply not a major concern for U.S. fisheries production: science-based management under the Magnuson-Stevens Act is working.

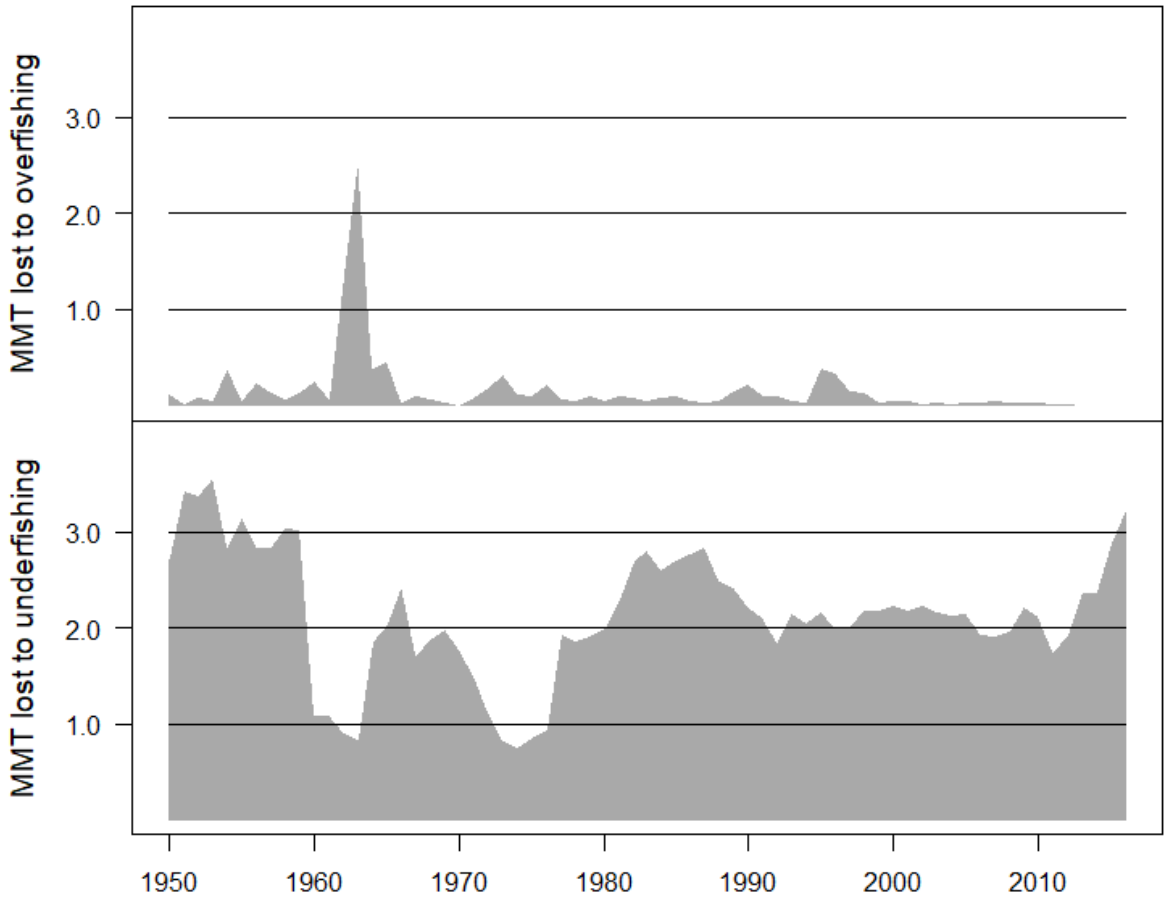

Figure 2. The amount of yield lost to overfishing and underfishing from U.S. fish stocks.

Also to set the stage, the Committee should be aware that in general U.S. fisheries produce food, protein and nutrients at much lower environmental cost than alternative land-based production

methods (*2*). Expanding crops production requires destroying native ecosystems, with most growth in global production coming from conversion of tropical forests. In contrast the well-managed U.S. fisheries maintain largely natural ecosystems that are little altered when compared to the conversion from forest to crops. Anything that reduces U.S. fish production will either cause us to import more fish from places with lower environmental standards, or rely on more land based production.

The impact of fishing on non-target species such as birds, and mammals, and on vulnerable marine ecosystems, is less well known but of more concern than overfishing target species, and to me the major challenge to sustaining our oceans and producing food from the ocean.

Climate change has two major dimensions, warming and increased variability in weather. Warming has been shown to cause species to shift their ranges (*3*), generally but not always towards the poles, and some species will become less productive and others will become more productive. We may also expect more variation from year to year in the abundance of fish stocks.

Recent examples of shifting distributions include the movement of pollock in the Bering Sea northwards, and North Atlantic right whales moving into areas of intense lobster and crab fishing. Responding to these changes in distribution requires dynamic real time management.

So how should we respond to the challenges of climate change? The U.S. has an admirable set of laws and institutions that can do this. The Regional Fisheries Management Councils have the authority, and the Magnuson-Stevens Act, the Endangered Species Act, the Marine Mammal Protection Act and other legislation gives Councils the tools to respond to climate change. We don't need a massive overhaul of existing law to tackle the challenge.

In the years ahead it will be important for fisheries management to be more flexible, allowing for changes in distribution and productivity. Areas and stocks that are high priority for protection now may not be the same in 20 years.

That brings me to Title II of the Ocean-Based Climate Solutions Act, which would require the establishment of marine protected areas that ban all commercial fishing activity in 30 percent of U.S. ocean waters by 2030. Such marine protected areas are simply the wrong tool for adapting to climate change. There are three primary objectives of the 30x30 proposal; (1) to increase target species production, (2) to protect non-target species and (3) to protect sensitive habitats. MPAs will either not help or there are better tools.

Both theory and empirical evidence shows that you cannot increase target species yield with MPAs unless overfishing is wide spread (*4*) (*5*) (*6*). Overfishing is rare in the U.S. and we would not expect MPAs to increase the yield from our fish stocks. Certainly there are typically more fish in the closed areas than outside, but remember that the fishing effort that was previously inside the MPA has been moved outside. The evidence shows that when MPAs are put in place and stocks are well managed, abundance goes up inside the closed area, and goes down outside with no-net gain.

In the highly publicized MPA network set up in California it has been shown that abundance of target species increased inside reserves, but declined outside (*7*) and that the result was no measureable increase in fish abundance (*6*).

It has been clearly demonstrated that bycatch can be best reduced by changes in fishing technology, fishing gear, or changes in incentives to alter fleet behavior. The dramatic reductions in bycatch from turtle excluder devices for trawls, acoustic pingers for gill nets, and a combination of tori lines, change in bait, circle hooks and night setting for longlines has often reduced bycatch by 90%. The

distribution of bycatch problems will change as species distribution changes. Setting aside fixed areas of the oceans is not going to be effective.

Certainly, vulnerable marine ecosystems need protection, but many Fishery Management Councils are doing that – and in a way that is science-based and has creditability with industry and other stakeholders. Moreover, these areas only need protection from mobile bottom contact gear such as trawls and dredges. There is no need to ban midwater trawling, purse seining, longlining or surface gill nets to protect corals, sponges or sea grasses. Moreover the distribution of these species may well change with climate change.

MPA advocates argue that MPAs are more resilient to climate change than fished areas; however a recent review article (*8*) entitled "Climate change, coral loss, and the curious case of the parrotfish paradigm: Why don't marine protected areas improve reef resilience?" has shown no evidence for this. Furthermore, the MPA advocates ignore that fact that 30x30 would cause 70% of U.S. oceans to see increased fishing pressure from the vessels that moved out of the 30% closed, and thus potentially be less resilient to climate change. Do we really want to make 70% of our oceans less resilient to climate change?

For none of these issues are no take MPAs the most appropriate tool, but the proposed legislation would draw staff time, resources and industry engagement away from the really effective tools. The oceans in the U.S. are under many threats beyond climate change, including ocean acidification, exotic species, land based runoff, plastics and illegal fishing. There are solutions to each of these problems, but it is not no-take MPAs – they do nothing to mitigate these problems.

I certainly agree with my colleagues in the environmental movement that we need to protect our oceans, but Title II takes the wrong approach and we can do much better if we apply the same

resources to the tools that will work. Let Councils use the effective tools to protect 100% of U.S. oceans, not apply an ineffective tool to 30%. No take areas are an inflexible, static tool, whereas agency management we already have can respond to climate change in real time.

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