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The Magnuson Stevens Act and its Ten Year Rebuilding Timeline: Science or Fiction? [1]

By
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Introduction

Under the Magnuson Stevens Act (MSA), regional Fishery Management Councils must develop a rebuilding plan for every overfished fishery, and must "specify a time period for rebuilding . . . that shall be as short as possible . . . and not exceed 10 years."[3] Not only is this ten year time frame completely arbitrary and not based on any scientific reasoning, it is riddled with legal, operational, and other scientific issues. This paper is designed to briefly outline some of those issues and analyze the proposed redrafting of the rebuilding provision in the United States House of Representatives' Discussion Draft issued on December 18, 2013.

The arbitrary nature of a ten year rebuilding requirement is not a new issue. No scientific basis or analysis was involved at all in choosing a period of ten years.[4] The requirement was a purely political decision. In fact, there are no scientific grounds for justifying any specific value as a standard for a fish stock rebuilding time.[5] For the past several years, scientists, fishermen and Congress have highlighted the need for reconsideration of this provision. In both 2010 and 2012, in an effort to invoke reform,

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[1] I would like to extend many thanks to Dr. Brian J. Rothschild for his assistance in the writing of this paper.

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[3] MSA § 304(e)(4)(A)(i)-(ii).

[4] Rothschild, Brian J. "Rewriting the Magnuson-Stevens Act". Keynote Address, 2013 Pacific Marine Expo, Seattle, WA. November 20, 2013.

[5] Committee on Evaluating the Effectiveness of Stock Rebuilding Plans of the 2006 Fishery Conservation and Management Reauthorization Act, Ocean Studies Board, *Evaluating the Effectiveness of Fish Stock Rebuilding Plans in the United States,* National Academy of Sciences, 2013, National Research Council, 2013, p.37. Available at http://www.nap.edu/openbook.php?record_id=18488 [hereinafter NRC Report].

thousands of commercial and recreational fishermen from across the nation rallied in Washington, DC. [6] Additionally, legislators have made multiple attempts to introduce more flexibility into the law, through such proposals as the Flexibility in Rebuilding American Fisheries Act 2009[7] and the Flexibility and Access in Rebuilding American Fisheries Act of 2011.[8] While no change to the current law has yet been enacted, awareness of the issue has been continually heightened. Most recently, on December 18, 2013, the U.S. House of Representatives released a Discussion Draft called "Strengthening Fishing Communities and Increasing Flexibility in Fisheries Management Act," to address MSA reauthorization and needed changes to the Act. Among the several proposals in the Discussion Draft is the elimination of the ten year rebuilding period and acknowledgement that depletion of fish stocks may owe to factors other than fishing.

Legal Issues

One of the initial problems with a mandatory ten year rebuilding timeline is that it creates conflict within the law itself. Taking into account that a defined rebuilding schedule cannot be justified by science, a ten year requirement, or any time specific deadline at all, is contrary to the MSA's stated purpose to "promote domestic commercial and recreational fishing under *sound* conservation and management principles"[9] through "the best scientific information available."[10] The MSA's intended policy to utilize "the best scientific information available; [which] involves, and is responsive to the needs of, interested and affected States and citizens"[11] is impossible to realize and is violated when an arbitrary ten year timeline overrides those needs of affected parties.

A rigid rebuilding schedule cannot coexist with socioeconomic impact considerations, as required by National Standard 8.[12] The two concepts are at odds with each other and, as a result, true balance is impossible to achieve. In fact, the ten year rebuilding timeframe is considered by the agency to be the only management option available, thus leading to meaningful alternatives not being considered.

Perhaps the starkest example of this can be found within the New England groundfish industry. In the case of the New England groundfish fishery, the combination of the ten year timeline and highly controversial rebuilding targets, has both in the past and present required measures so draconian as to virtually guarantee the permanent non-participation of some of this country's oldest fishing communities to be considered as the only management options available.[13] This has currently led to the

[6] Keep Fishermen Fishing Rally, March 21, 2012. United We Fish Rally, February 24, 2010.
[7] H.R. 1584, S. 1255.
[8] H.R. 3061, S. 632.
[9] MSA § 2(b)(3), emphasis added.
[10] MSA§ 2(c)(3).
[11] Ibid.
[12] "Conservation and management measures shall…take into account the importance of fishery resources to fishing communities by utilizing economic and social data…in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities." MSA § 301 (a)(8).
[13] Frulla, David. *Re: Consideration of Revision to National Standard 1 Guidelines,* letter to John H. Dunnigan, Director, Office of Sustainable Fisheries, National Marine Fisheries Service, April 16, 2003, as legal counsel for the

Secretary of Commerce declaring an Economic Disaster and Congress appropriating disaster relief funds to the area. What is even more concerning is that there is no indication that jobs lost in New England are being found in other fishing ports outside the region. The pace of rebuilding, not the rebuilding itself, is what drives this type of impeding economic and social devastation.[14]

As the law now reads, both the ten year rebuilding requirement and the socioeconomic interests of fishing communities are intended to formulate management plans. However, in its agency interpretation and management practice, the ten year requirement is interpreted as controlling, completely negating any legal safeguards for the fishing communities. [15] The ten year rebuilding period provision therefore defeats the purpose of the Act, nullifies other provisions of the MSA, and departs from fisheries management having a solid foundation on science. The legal issues with the ten year rebuilding period lead to further scientific, management, and socioeconomic issues.

Scientific Issues

In 2010, at the request of Congressman Barney Frank and Senator Olympia Snowe, NOAA funded a study by the highly respected and prestigious National Academy of Sciences' (NAS) National Research Council (NRC) regarding the MSA's rebuilding requirements, particularly the arbitrary ten year timeline. To complete the study the NRC formed the Committee on Evaluating the Effectiveness of Stock Rebuilding Plans of the 2006 Fishery Conservation and Management Reauthorization Act (hereinafter, "Committee") of highly distinguished fisheries experts throughout the nation. The resulting report was recently released in September 2013. The NRC strongly advocated for the removal of the ten year timeline and recommended approaches that "focus more on meeting selected fishing mortality targets than on exact schedules for attaining biomass targets" such as is presently in place with the ten year requirement.[16]

The Committee also found that "mixed outcomes of rebuilding plans have added to concerns about significant social and economic costs associated with the implementation of time-constrained rebuilding plans". The Committee concluded that a legal and policy scheme that places a strict timeline on biomass targets must be reconsidered. The Committee made several findings throughout the report, including acknowledging that rebuilding is often slower than expected. The Committee attributed slow rebuilding to due to ecological and environmental conditions and other variables, such as the high uncertainties surrounding population projections used in rebuilding analysis. Therefore, keeping fishing mortality at a constant level below that at the current target of maximum sustainable yield (MSY) "may forgo less yield and have fewer social and economic impacts than a rule that requires ever more severe controls to meet a predetermined schedule for reaching a biomass target", i.e. a slower pace of

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Trawler's Survival Fund, Associated Fisheries of Maine Groundfish Group, Fisheries Survival Fund, and the Long Island Commercial Fishing Association.

[14] Ibid.

[15] See National Standard 1 Guidelines, NOAA Fisheries/National Marine Fisheries Service, according to which agency interpretation of the MSA will always result in the ten year timeline overriding socioeconomic impacts. Available at http://www.nmfs.noaa.gov/sfa/laws_policies/national_standards/documents/national_standard_1_cfr.pdf, accessed December 14, 2013.

[16] NRC Report, n 5, p.2.

rebuilding is preferred over one that forces intensifying controls to try to keep rebuilding on schedule. [17] In fact, of the five key findings of the Committee, all of which have been suggested as reasons for policy change, the most detailed and deliberated upon is that dealing with the removal of a strict rebuilding schedule, thus suggesting a strong consensus and belief among the Committee for a change in the law.[18]

a. Uncertainty and Data Limitations are in Direct Conflict with the Fixed Timeline

Uncertainty and data limitations were also discussed by the Committee. Under the MSA, fishery stocks are managed according to the concept of maximum sustainable yield (MSY). However, MSY "is not fixed" and management reference points based on MSY "have a level of uncertainty that depend on the amount and quality of information available". Even in the case of data-rich species, estimates may be imprecise. [19] To require fish stocks to rebuild within a fixed timeframe while the target they must reach is itself unfixed, not to mention uncertain, is unrealistic. In plain language, the MSA as it is written today mandates that stock projections hit a moving target that cannot be defined, but do so within a defined period.

To compound this issue, the Committee report found that the stock projections themselves are uncertain and subject to a high degree of variability. The majority of stock assessments and associated projections do not include all relevant sources of uncertainty, such as ecosystem dynamics, environmental conditions, etc; therefore, "the variation shown in projections underestimates the true level of uncertainty involved and expectations associated with rebuilding timelines should be tempered given these considerations."[20] Another reason for uncertainty is variation among assessment and/or projection models themselves. Oftentimes, models can be intrinsically imprecise, or different models can produce different outcomes, even to the point of one model designating a stock as overfished while another designates it as healthy.[21] Some models actually produce results that are pure impossibilities.[22]

This significant variability in models and projections combined with the ten year rule leads to discontinuity in management because a small change in information or model assumptions can lead to a major change in stock status and rebuilding time.[23] In 2010, for example, the scientific status of New England pollock was found to have a 600% discrepancy between assessments only months apart.[24] While this degree of variability may not occur in every case, the effect that such possible uncertainty can, and does, have on related quotas is enormous. By such resulting sharp increases or decreases in quota and rebuilding time on a regular basis, is in essence like a yo yo[25], producing a steady amount and

[17] Ibid, p. 2, 5.
[18] Ibid.
[19] Ibid, p. 3.
[20] Ibid, 91.
[21] Rothschild, Brian. Personal Interview. December 14, 2013.
[22] See for example, the Transboundary Resources Assessment Committee Status Report 2012/01 for Georges Bank yellowtail flounder/ Available at http://www2.mar.dfo-mpo.gc.ca/science/trac/TSRs/TSR_2012_01_E.pdf, p. 7, Figure 2. Accessed December 20, 2013.
[23] NRC Report, n 5, p 88.
[24] Saving Seafood, "New England Officials Thank Commerce Secretary for Pollock Increase but Call for More Action". Available at http://www.savingseafood.org/washington/new-england-elected-officials-thank-commerce-secretary-but-say-more-is-n-3.html. Accessed December 19, 2013.
[25] NRC Report, n 5, p. 169.

supply of fish to the market becomes an impossibility. The sharp increases and decreases and inconsistent supply of fish to the market result in a number of consequences, including, but not limited to fishing communities losing markets to foreign imports,[26] fishermen receiving low prices for their catch, and the inability of a fishing community to develop a stable economy. How effective management is translates into how economically prosperous a fishing community is. The effects of "yo yo" science and management puts both the Nation and fishing communities at a disadvantage.

b. Science and Law must shift towards fluid methodology that accounts for dynamic ecosystem functions

Science is increasingly recognizing ecological and other factors that play a large part in the rebuilding of fisheries. Population behavior that depends on the ecosystem state has been termed "nonlinear dynamics". Nonlinear dynamics includes regime shifts among species and natural cycles.[27] The existence of nonlinear dynamics, as well as a growing consensus on the importance of the ecosystem and multi-species effects, "has profound implications for the way we should think about . . . how we model fish populations, and ultimately our expectations for stock rebuilding."[28] Although a complex issue to address in a management sense, headway is being made, and a move away from using purely static, statistical methods as have been heretofore relied upon is being identified as the way forward.[29] This is a major paradigm shift and a positive step in the right direction as far as fishery management is concerned and must be mirrored by management requirements. If science and analysis must move away from rigid methodology that is disconnected from the environment, rigid statutory rebuilding requirements must do the same.

Environmental conditions, natural cycles, and predator-prey relationships are all dynamic ecosystem functions that cannot be managed by a ten year timeline. All of these, however, play an important role in understanding and properly managing fisheries. For example, examination of a long time series of Alaskan fishery catches has shown that climate effects and marine survival have been the major driving forces in variability of these species. A similar study of declining groundfish populations in the Northwest Atlantic in the 1990s indicates that the decline was largely due to environmental variation, rather than the prevailing view that overfishing was the culprit.[30]

It is also important to note that stock sizes do not naturally remain static. Some species such as striped bass are highly cyclical. In fact, recorded historical data of striped bass shows inexplicable appearances and reappearances of the stock that scientific fishery management does not and cannot take into account using current static methods.[31] Natural regime shifts (i.e. natural fluctuations in stock

[26] The US currently imports 91% of its seafood, resulting in a large and growing annual seafood trade deficit of more than $10.4 billion. NOAA FishWatch, Seafood Facts. Available at http://www.fishwatch.gov/farmed_seafood/outside_the_us.htm. Accessed December 21, 2013.
[27] NRC Report, n. 5, p. 124.
[28] Ibid, p. 125.
[29] Ibid, p. 127, 128. As far as stock analysis is concerned "the problem has been the use of static linear methods to investigate a nonlinear dynamical system."
[30] OECD/J.Davis, "Rebuilding fisheries: Challenges for fisheries managers", in OECD, *The Economics of Rebuilding Fisheries: Workshop Proceedings,* OECD Publishing, 2010, p. 34.
[31] Vorpahl, Stuart. Speech given at Southampton College, March 18, 1970.

size) are quite common. Regime shifts create a dilemma for developing and assessing the performance of rebuilding plans. Basing rebuilding targets on an earlier, high abundance regime can make rebuilding, especially in a fixed time frame, unattainable under new prevailing environmental conditions.[32]

In addition to regime shifts, predation can also be a key force in whether or not a prey species can rebuild within a timeline. Dogfish, a predator, is a good example. If it takes 2.4 million metric tons of prey to support 400,000 tons of dogfish, a predator, in a single fishing year, and the total recreational and commercial catch of those prey species ranges from merely 10-20,000 metric tons for the same year,[33] the pertinent question that managers must ask is: Should dogfish or fishermen be considered the most critical aspect of management of those prey species? Where the predation is the largest contribution to lowering the biomass, it should necessarily follow that dogfish are the most critical to management. However, if only fishing mortality is managed and predator consumption is unaccounted for, it is likely that in many cases a rebuilding schedule will be unpredictable because the underlying reason for a slow rebuilding process of a prey species, predator consumption, is not considered.

Nature prohibits all stocks from reaching their targets at the same time, notwithstanding a ten year schedule. Due to the environment, cycles, and predation, it is a physical impossibility for all stocks to exist at MSY, providing that it could be defined, at the same time. Issues of single species management and rebuilding become especially evident when dealing with multispecies fisheries. The lack of multispecies management causes many species managed under the multispecies umbrella to perpetually fall short of management directives. Predators and prey cannot exist at historic levels at the same time. Neither can species competing for the same food source. Natural cycles do not all coincide, and therefore will not reach a pinnacle simultaneously. However, this is exactly what the law mandates: for all stocks to reach a historic target within a ten year period. Such a requirement cannot be supported by science or nature.

Management Issues

One of the major causes of illegitimacy in enforcing a ten year rebuilding schedule is the fact that the entire focus of fisheries management to date has been first on crediting any situation involving perceived low fish stocks on fishing, and then controlling fishing to return a population of fish to what is presumed to be an optimum level.[34] However, there is ample information evidencing that fishing mortality caused by human harvest is neither the primary cause for poor conditions of fish stocks nor the reason for healthy conditions of fish stocks. Simply put, if harvesting was the only contributing factor to fish stock health, every stock should rebuild to its optimum level if harvesting were kept within the bounds of issued regulations or quota. However, this is not the case in the real world. Once a specified timeline is chosen, and associated fishing restrictions enacted, the outcome will always be variable and rebuilding may be faster or slower than expected.[35]

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[32] NRC Report n. 5, p. 132.

[33] Stolpe, Nils. "The Dogfish Follies", Available at http://www.fishnet-usa.com/dogfishfollies.html. Accessed December 21, 2013.

[34] Stolpe, Nils. "Blame It All on What They're Catching", April 15, 2006, p. 1.

NRC Report, n. 5, p. 98.

In New England, for example, due to complexity of regulations, many groundfish stocks are continuously underfished, i.e. below target Total Allowable Catches (TACs), every year.[36] Despite being underfished, groundfish stocks continue to be considered as not rebuilt, and some even continue to be designated as overfished.[37] In extreme cases where there is a complete prohibition on fishing, such as Southern New England/Mid Atlantic winter flounder, timely rebuilding may not be achieved even by a complete ban on harvest.[38] Fishing for Atlantic salmon, also, has been prohibited since 1987,[39] yet the species has not yet recovered and has continued to be in such poor condition that in 2000 it was listed under the Endangered Species Act.[40] It is clear from the cases of Atlantic flounder and salmon that other factors are at work besides harvesting in rebuilding fish stocks and that any stringent rebuilding timeline, let alone an arbitrary and unscientific ten year rebuilding requirement, may not be accomplished by simply controlling harvest. Yet harvesting and fishing effort are the only factors considered by the MSA and management scheme. This is not to say that rebuilding cannot occur, but that adherence to a strict deadline based on one contributing factor, fishing mortality, is not always a possibility, and to attempt to enforce such a flawed reality is a management failure from the beginning.

The types of mortality also complicate the issue of management and rebuilding. Fisheries management classifies mortality under only two sources: fishing mortality and "natural mortality".[41] Natural mortality is used as an all inclusive term to cover mortality due to predators and old age; but also pollution and any other man made causes other than fishing are considered to be natural mortality.[42] Pollution can have serious impacts in fish stocks and can, rather than fishing mortality, be the cause of a decline in biomass and designation of an "overfished" status.[43]

For example, the level of the Atlantic menhaden population is far more dependent on water quality than on fishing pressure.[44] Therefore, in order to ensure a healthy and sustainable menhaden fishery, as much as it depends on human actions, monitoring of and restrictions on estuary and marine

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[36] Stolpe, Nils. " Chronic Underfishing: The Real New England Groundfish Crisis", 2009, p. 2-3, also see Tables 1 and 2. Available at http://www.fishnet-usa.com/chronic_underfishing.htm. Accessed December 7, 2013.

[37] See NOAA Fisheries Service Stock List. Available at https://www.st.nmfs.noaa.gov/sisPortal/sisPortalMain.jsp. Accessed December 21, 2013.

[38] NRC Report, n. 5, p. 98.

[39] Atlantic Salmon Biological Review Team, "Status Review for Anadromous Atlantic Salmon (Salmo salar) in the United States", 2006, p. 115. Available at http://www.nmfs.noaa.gov/pr/pdfs/statusreviews/atlanticsalmon.pdf. Accessed December 21, 2013.

[40] NOAA Fisheries, Office of Protected Resources, Atlantic Salmon. Available at http://www.nmfs.noaa.gov/pr/species/fish/atlanticsalmon.htm. Accessed December 21, 2013.

[41] Stolpe, Nils, n 34, p. 2. See also, NOAA Northeast Fisheries Science Center, " Status of Fishery Resources off the Northeastern US". Available at http://www.nefsc.noaa.gov/sos/intro/definitions.html. Accessed December 21, 2013.

[42] Ibid.

[43] For a good analysis of the effects of pollution as opposed to fishing pressure on the striped bass population, see Matthiessen, Peter. *Men's Lives*, 1986, Chapter 15.

[44] Saving Seafood, "Atlantic Menhaden: Facts and Unsubstantiated Claims". Available at http://www.savingseafood.org/conservation-environment/atlantic-menhaden-facts-and-unsubstantiated-c.html. Accessed December 21, 2013. "The success of menhaden recruitment is far more dependent on environmental conditions -- weather, water quality and atmospheric pressure – than on anything else, including restrictions on commercial fishing". See also Wood, R.J. and H.M. Austin, 2009. Synchronous multidecadal fish recruitment patterns in Chesapeake Bay, USA. Canadian Journal of Fisheries and Aquatic Sciences, 66, p. 496-508.

pollution in their range is actually more necessary than fishing restrictions. Pollution had a large part to play in the current condition of Atlantic salmon. Historically, Atlantic salmon ran in almost every major river north of the Hudson, but the stock was severely depleted by the early 19th century, and by the end of the 19th century had been extirpated from three of the five rivers with the largest populations (Androscoggin, Merrimack and Connecticut).[45] It is not coincidental that the progressive extermination of Atlantic salmon took place during New England's Industrial Revolution. Degradation of water quality and damming of rivers are recognized to be large contributors to decline in abundance.[46] Interestingly, there is a definite correlation between rising coastal populations, and therefore pollution and environmental interference, and the health of coastal fisheries.[47] Therefore, it is important to consider the ramifications of blindly focusing on one aspect of managing fishery resources, i.e. fishing mortality, when attempting to rebuild a stock, because other issues, manmade and natural are such huge contributors, and they may or may not be able to be managed effectively within a fixed timeframe.

It is also important to note, however, that the current system of fisheries management actually increases fishing mortality, the one aspect that it does manage. This is due to regulatory bycatch or discards and complexity of regulations. If a stock is on a rebuilding schedule, but is forced to be discarded, no clear positive objective is met. Instead, fish are wasted, particularly in multispecies fisheries, where one species may have a low or zero possession limit in order to reach rebuilding target but will undoubtedly be caught amongst other species. A management system that forces dead discards of fish does not contribute to a rebuilding schedule.

Socioeconomic Issues

The length of time the law requires for stocks to rebuild is of dire consequence to fishing families, a "keep your boat, keep your job, feed your family" type of consequence, because adherence to a strict rebuilding schedule forces deep quota cuts in the short term that often result in expulsion from the industry for those affected by the cuts.[48] These individuals will have no future chance to participate in the fisheries they have helped to rebuild, as intended by the MSA, because they cannot survive economically in the meantime. Parties affected do not only include fishing vessels, owners and crews; they include vessel and crew support services, supply services, handling and marketing services, and other ancillary businesses that will not have the capacity or ability to reappear once rebuilding of a stock has been achieved if the interim quota cuts have been too drastic.[49]

Common sense dictates that as long as stocks are increasing, a strict rebuilding schedule is unnecessary.[50] Current analysis is demonstrating not only how the ten year timeline is putting undue pressure on fishing communities but also how modifying the ten year mandate results in significant economic gains. For example, in one study the expected net economic benefits increased between 3.5%

[45] NOAA Fisheries, n. 40.
[46] Ibid.
[47] Stolpe, Nils, n. 34.
[48] Stolpe, Nils. "Of Blood and Turnips", 2002, p. 3. Available at http://www.fishingnj.org/netusa20.htm. Accessed December 16, 2013.
[49] Stolpe, Nils. "Is It Really About Saving the Fish?", 2003, p. 6. Available at http://www.fishingnj.org/netusa24.html. Accessed December 16, 2013.
[50] Stolpe, n. 48.

and 19.4% when rebuilding timelines were extended from 10 to 20 or 30 years, with average TACs during that period increasing between 46% and 97%.[51] For fishing communities, these numbers are tremendous and can mean the difference between profit and bankruptcy. In other words, a ten year timeline, or any timeline, is not necessary to rebuild fish stocks; rebuilding, if necessary, can be done at a slower pace, achieving the same end result of healthy stocks, but with fewer negative socioeconomic consequences and the permanent removal of industry participants.

Discussion Draft

The most significant management aspect of the recently released Discussion Draft, the "Strengthening Fishing Communities and Increasing Flexibility in Fisheries Management Act", is rewriting Section 304 of the MSA. The Discussion Draft version, "Rebuilding Depleted Fisheries" makes two key alterations to the existing law. First, it distinguishes between fisheries depleted due to fishing and fisheries depleted due to other factors. Second, eliminates the ten year rebuilding timeline. It instead bases a rebuilding schedule on the time a stock would be rebuilt without fishing occurring plus one mean generation, with exceptions including environmental conditions, situations where rebuilding cannot be effective only by limiting fishing activities, mixed stock fisheries, and situations where rebuilding would have significant economic harm for fishing communities. While the National Research Council has determined that no fixed timeline can be scientifically justified for a rebuilding schedule, as well as the fact that this provision would also make such a schedule contingent upon the uncertainty of stock projections, it is a step in the right direction. Importantly, the Discussion Draft provides for the possibility of alternative rebuilding strategies such as fishing mortality targets, an approach recommended by the NRC.

The Discussion Draft, in recognizing currently ignored contributors to stock size and health such as environment, predator prey relationships, unexpected events, biological and ecological factors other than fishing, represents a huge paradigm shift in fisheries management. It also attempts to introduce more balance between conservation and socioeconomic objectives by acknowledging that economic harm to fishing communities may be taken into account in developing the nature and immediacy of rebuilding strategies. All of these are necessary for more effective fisheries management. The Discussion Draft does, however leave some issues unresolved. By continuing to leave MSY as an undefined and unfixed term but the benchmark for determining depleted or non depleted fisheries, scientific ambiguity remains. By reinstating rebuilding schedules for these depleted fisheries, albeit flexible and subjective rebuilding schedules, management will still be reliant upon the uncertainty of stock projections and models, and "yo yo" management may persist.

Conclusion

A better way to manage our nation's fisheries would be to depart from current flawed methodology and adopt a policy closer to that advocated by the National Academy of Sciences, by shifting focus away from meeting scheduled rebuilding targets and concentrating instead on meeting

[51] NRC Report, n. 5, p.146. Available at http://www.nap.edu/openbook.php?record_id=18488.

selected fishing mortality targets. The ten year rebuilding requirement should be eliminated. The concept of "rebuilding" should be replaced with a management system based on maximizing yield, and therefore economic productivity is a factor. The elusiveness of defining MSY, the uncertainty of biological reference points, stock projections, and rebuilding targets require a change of management methods. Rather than attempt to predict both an undefined MSY and probabilities of a stock reaching this target within a certain period, it is more effective to simply estimate current biomass and allow for a safe percentage of this biomass to be taken through fishing mortality. This would disperse much of the uncertainties associated with stock projections, increase focus and resources on obtaining accurate and up to date data, and also provide more stability for fishing communities. [52]

Finally, it is important to remember the reasons we manage fisheries. We manage fisheries so that we have a continual, sustainable resource and a continual, sustainable fishing community. If we lose one, we lose the other, and fisheries management ceases to have a purpose or reason to exist. If any provision of the law jeopardizes or hinders the health or understanding of either of these, revision is a necessity. An unscientific rebuilding requirement that causes socioeconomic harm does not meet the MSA's objective "to promote domestic commercial and recreational fishing under sound conservation and management principles". It is time to bring the law back to its purpose, based on both solid scientific foundation and economic viability.

[52] NOAA's newly proposed Georges Bank yellowtail assessment is seemingly following this format. Traditional assessment methods will be replaced by an assessment which incorporates cutting edge scientific data from various sources, including independent surveys, to estimate current biomass and then will proceed to determine appropriate harvest levels for the upcoming fishing year. See Saving Seafood. Available at http://campaign.r20.constantcontact.com/render?ca=32c0ebda-d173-403e-869b-64a5cf1a3998&c=ea91ba90-5058-11e3-975b-d4ae529a848a&ch=ec4f2200-5058-11e3-975e-d4ae529a848a. Accessed January 24, 2014.