

2010 Northeast Regional Redfish Symposium

This report is a summary of the Northeast Regional Redfish Symposium held in Danvers, Massachusetts, on Nov. 4, 2010. The Symposium was attended by over 50 fisheries scientists, industry members, fisheries managers and extension workers. Many important contributions emerged from lively discussion throughout the event that caught the attention of both regional and national media. The key themes and recommendations for further and future consideration that emerged from the symposium are presented here. The recommendations do not represent the opinion of the steering committee or the collective voice of symposium attendees, but are intended to capture the individual voices heard during the meeting. The symposium themes used to organize this summary include Redfish Status and Biology, International Perspectives, Gear and Regulations, and Marketing. After presenting the main contributions within these topic areas, the symposium themes are integrated into a broader, summary message.

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Introduction

Although redfish is a term used for many species of fish around the world, in the Gulf of Maine redfish generally means Acadian redfish (*Sebastes fasciatus*). A schooling species 8-12 inches long that can live nearly 60 years, Acadian redfish are typically found in waters between 200 and 2,000 feet deep. The New England Acadian redfish fishery began in the 1930s and peaked with landings greater than 130 million pounds in 1942. The fishery developed as freezing techniques allowed for fish markets to be developed across the United States. Frozen Acadian redfish were caught, packed, shipped and sold in untapped markets thousands of miles from the coast and were particularly popular in the Upper Midwest. There, Acadian redfish were sold as “ocean perch” and met the demand for an inexpensive fish to be served, for example, as part of the Catholic tradition of eating fish on Friday nights.

The strength of this market combined with efficient fishing practices and the species’ biological traits (long-lived, late maturation and low reproductive rates) led to the overfishing of redfish in the Gulf of Maine. As a result, redfish landings began to decline dramatically in the mid-1940s. This decline was exacerbated when the large otter trawlers (>150 gross registered tons) targeting redfish were forced to use larger mesh sizes that do not efficiently capture redfish, a species smaller than most other groundfish species targeted by trawlers. Last year, just 3.7 million pounds of redfish were harvested from the Gulf of Maine and the demand for redfish has largely disappeared.

Today, changes in the politics and regulations in Northeast fisheries along with changes in the regional marine ecosystem may be opening a new chapter for Acadian redfish in the Gulf of Maine. Recent population estimates indicate that Acadian redfish stocks are recovering. The recovery is strong enough that fisheries managers are now allowing for an increased sustainable catch for this species that, if fully exploited, could make it the third most heavily fished groundfish in New England. For fishermen, this means a new opportunity to make money, and in this era of increasingly restricted access to fish stocks within sustainably managed fisheries, new opportunities like this are few and far between.

But what sort of opportunity is there for fishermen? And what would a sustainable fishery from the perspective of fishermen and fisheries scientists look like? The goal of this symposium was to begin to answer these questions. Overall, the Redfish Symposium was intended to synthesize the state of our knowledge regarding the biology, ecology and population dynamics of various redfish species and to generate recommendations to guide future biological research, development of innovative and selective harvest practices, and development of new and effective market strategies. In short, the symposium was designed to begin planning for a sustainable Gulf of Maine redfish fishery.



Status and Biology

Currently there are four redfish species (genus *Sebastes*) commercially exploited in the North Atlantic Ocean: Golden Redfish (*S. marinus*), Deepwater Redfish (*S. mentella*), Acadian redfish and the Norway Haddock (*S. viviparus*). The Acadian redfish is the species currently being examined for potential fisheries along the coast of New England and in the Gulf of Maine.

The Acadian redfish is very different from other groundfish. The species is long-lived (the oldest recorded age is 58 years, Penttila et al. 1989), slow growing and believed to have a 50% maturity rate at five years old when it is about eight inches long (O'Brien et al. 1993). Females typically grow larger and live longer than males (Penttila et al. 1989). Redfish bear live young, and two periods of peak larval extrusion may indicate separate spawning periods for populations off the Scotian Shelf (late March) and in the Gulf of Maine (early June; Klein-MacPhee and Collette, 2002). These characteristics give Acadian redfish a low fecundity reproductive strategy compared with other species managed in the New England multispecies groundfish complex. Recruitment is sporadic and difficult

to predict and a strong new cohort may be introduced to the population as infrequently as every 5-10 years (Klein-MacPhee and Collette, 2002).

Redfish species are often difficult to tell apart and Acadian redfish sub-stock structure is not well understood. Dr. Alexandra Valentin from the Department of Fisheries and Oceans in Mont-Joli, Canada, reports that in the Gulf of Saint Lawrence two different redfish species that are difficult to distinguish have very different population trends and managers are struggling with how to focus fishing pressure on the more abundant of the two. There is hope for such an approach because fisheries scientists there are continually improving their understanding of small-scale differences in stock distributions and habitat utilization.

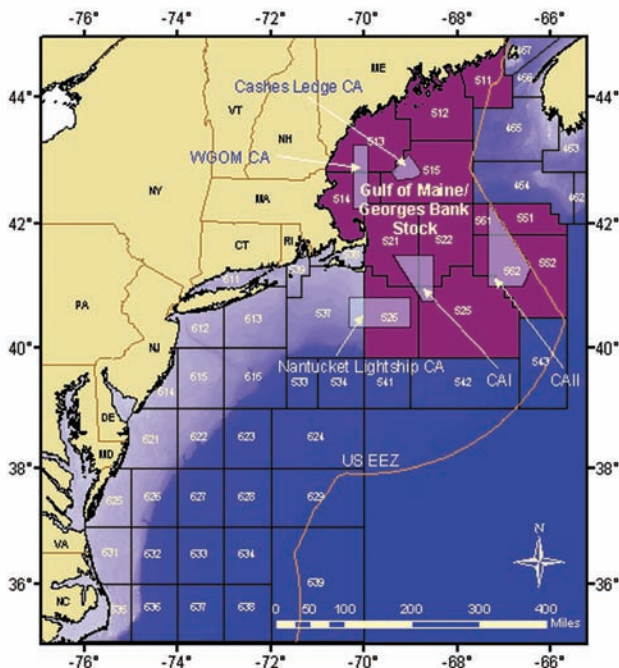


Figure 3.1. Statistical areas used to define the Gulf of Maine/Georges Bank Acadian redfish stock.

In the past three decades, there has not been a designated fishery for the Acadian redfish and the stock appears to be recovering well. The last Acadian redfish assessment was conducted in 2008 when the stock was still considered overfished, although projected to meet rebuilding goals by 2011. Survey indices since the 2008 assessment indicate the stock is on target for predictions made at that time. Fishing mortality continues to be significantly lower than levels that fisheries scientists and managers would allow for maximum sustainable yield.



Recommendations

- 1. *More frequent stock assessments***
Recruitment is infrequent and difficult to predict, therefore it is important to capture when strong recruitment occurs in order to best manage redfish stocks.
- 2. *Improve our understanding of small-scale movement and schooling behavior***
Improving our knowledge in this area will be important for designing effective, well-targeted fishing practices and implementing an appropriate approach to management.
- 3. *Improve our understanding of species distribution, age-at-maturity and sub-stock structure***
Age-at-maturity and sub-stock structure of Acadian redfish, along with the distribution of similar species, are not well understood, yet these are important data to create an effective redfish management plan. Improving knowledge in these areas was a strong emphasis of the keynote speakers who offered perspectives from established redfish fisheries.

“Redfish has an extremely different life history and that has very important implications for its productivity and its resilience. This uniqueness is what we need to consider if we’re talking about a targeted fishery for redfish.”

– Steve Cadrin



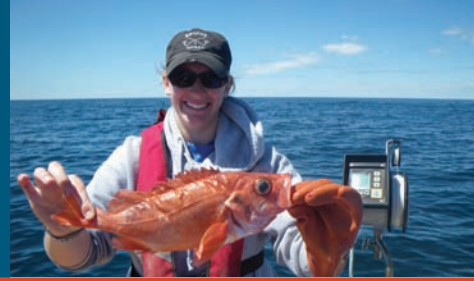
International Perspectives

Two keynote speakers from countries with significant redfish fisheries — Dr. Alexandra Valentin from the Department of Fisheries and Oceans in Mont-Joli, Canada, and Dr. Kristjan Kristinsson from the Marine Research Institute in Reykjavik, Iceland — traveled to Danvers for the symposium to share their experiences with the group. Dr. Valentin spoke about the two main commercial species of redfish in the Gulf of St. Lawrence and Laurentian Channel: *Sebastes fasciatus* and *S. mentella*. *Sebastes mentella* population levels are low, are threatened by overfishing and are difficult to distinguish from *S. fasciatus*. Dr. Valentin discussed how current management reduces fishing pressure for both species in areas where *S. mentella* is most abundant, focusing instead on areas where *S. fasciatus* dominates, thus minimizing the impact of fishing on *S. mentella*. She recommended that research focus on improving understanding of small-scale habitat use and stock-structure for Acadian redfish and using that information to more effectively manage the species.

Dr. Kristjan Kristinsson reviewed the extensive redfish fishery in Iceland that focuses on *S. marinus* and *S. mentella*. He discussed the influence of international fisheries (German and Soviet Union) on stocks off Iceland. He emphasized the vulnerability of redfish populations to overfishing and presented a cautionary message to the group as it considered developing the redfish fishery in the Gulf of Maine. Specifically, he recommended that measures should be taken to protect juvenile redfish in the Gulf of Maine. He applauded the broad range of interests represented at the symposium and emphasized the importance of developing a redfish management plan based on dialogue among managers, scientists and fishermen.

“In forming your management plan, you should make clear objectives based on dialogue from managers, scientists and stakeholders.”

– Kristjan Kristinsson



Recommendations

1.

Improve the understanding of small-scale habitat use and stock structure for redfish species in a particular area

Knowledge of small-scale distribution data will allow managers to focus fishing pressure on healthy stocks that can be resilient to exploitation.

2.

Protect juvenile redfish

Habitat use for adults is typically different from that of juvenile redfish. This knowledge can be used to improve survivorship of younger fish, which in turn could increase recruitment and enhance population resilience to fishing pressure or environmental variability.

3.

Build a communication structure among managers, scientists and fishermen

Effective and efficient lines of communication among everyone involved in the fishery are necessary in order to create and maintain a sustainable fishery.



Summary of Gear and Regulations

In order to benefit the market and sustain stocks of Acadian redfish and other fish species, it is imperative to develop the equipment and regulations for catching redfish. To date, trawling has been the primary method for catching redfish. In order to target redfish, fishermen trawl at lower speeds in deep water to allow the mouth of the net to fully open and capture the schooling fish. Fishermen reel the nets in at relatively fast speeds to reduce the potential for fish loss after being caught. Fishermen must use a 6.5-inch diamond mesh based on current regulation for a groundfish fishery that targets other species but this does not capture redfish as efficiently as smaller mesh sizes. Fishermen feel this is a mismatch for the smaller redfish and is causing significant numbers of younger redfish that escape the net during the haul to be killed. A smaller mesh would enable fishermen to more effectively target legal-sized redfish schools and to limit this wastefulness. In response, sector managers have requested an exemption from the requirement to use a 6.5-inch mesh so fishermen can use a smaller mesh when targeting redfish. In general, improved knowledge of fish schooling behavior and alternative trawl gear and mesh size appropriate to the fishery would improve the ability of fishermen to catch redfish and reduce bycatch and waste of undersized fish.

In addition, deep trawls using large nets and a fast return haul that is currently used for redfish requires relatively powerful boats. Therefore, redfish are not typically targeted by smaller vessels in the fleet and thus has resulted in little historical catch for smaller vessels. Consequently, little quota has been made available to smaller boats under the catch-share sector system, which assigns quota based on records of historical landings. Smaller boats might capture some of the unused redfish quota, but gear and allowable catch are not currently available for these vessels.

In a project based at the Gulf of Maine Research Institute (GMRI), the use of jigging machines to catch redfish has been explored. These machines consist of a series of hooked and baited fishing lines that are designed for easy installation onto any fishing vessel. Two issues arose from the initial trials of the redfish jigging systems. First, jigging machines are computer-operated so if malfunctions occur they are nearly impossible to fix at sea. Second, the catch rate of redfish was low with the jigging machines. Further development and testing is required if this approach is going to make sense for fishermen to adopt.

Recommendations



1. Fishermen requested use of smaller mesh cod ends in a targeted redfish fishery

A trawl net should have a mesh size and design that lets the fishermen maximize the total quantity of fish caught while still allowing other non-targeted fish to escape.

2. Explore and develop alternative fishing technology to target redfish

The appropriate mesh size and trawling technique for capturing redfish is not currently being used. Alternative methods for both large and small vessels, if developed and adopted by the fleet, would benefit the fishery.

3. Explore ways to allow access to redfish for a broader range of boats

Currently, redfish are underutilized by fishermen who have the redfish quota. Allowing more fishermen access might provide commercial opportunity for a wider cross-section of the fishing fleet.

“If we’re going to optimize our redfish harvest, we would need to try to avoid redfish in the mixed species fisheries and target redfish in a targeted fishery.”

– Steve Cadrin



Marketing

The redfish market quickly became the focus during the symposium as it appeared obvious that current demand for redfish through traditional markets is limited. A range of marketing techniques were discussed at the symposium. Redfish is currently an inexpensive fish, selling at between \$0.40 - \$1.00/pound off the boat. Consumers are not familiar with redfish, and its unusual size, shape, appearance and historical use, in part, as lobster bait make “branding” of redfish a difficult challenge for marketers. Today, the price-point is significantly higher for fish weighing more than a pound than it is for smaller fish. Redfish have a shorter shelf life than other fish and the species’ unique size and shape make it so the fish cannot be processed with other like-species, further compounding the problem of developing new markets. As a result, greater care and new processing capacity may be required if demand for redfish were to increase.

Solutions to these problems would need to be created for the redfish market to emerge. Currently, there is a very thin market for high value landings through direct, local marketing. Large fresh fillets of redfish might be sold in these high-end markets and the rest would need to be sold as a low-cost, high quality fillet. Redfish could be sold in larger markets if it can be marketed as a less expensive alternative source to receive the health benefits of eating fish. Another possibility would be to sell gutted and headed fish to Asian markets that could then be re-sold as fillets to the U.S. bulk markets. An additional idea that was proposed was to solicit large sales from the government, which might use redfish to feed the military, prisoners and to school children. In general, the difficulties of developing a market for redfish appear to be significant and remain the primary challenge for the U.S. redfish fishery.

“The problem is the market. You can increase the catch all you want, all you’re going to do is decrease the profits. Without development of a larger market there is no point in landing more fish than we already are.”

– Mike Walsh



Recommendations

1. *Develop marketing strategies to build a true brand for redfish*
If consumers begin to identify redfish as a good-tasting fish, they will look for it in markets and pay a higher price.

2. *Explore the market to sell large fillets to high-end, local markets*
Large fillets can be sold to regions of the U.S. where the demand for fresh fish is high but the supply is very low. Redfish may also be sold to regional consumers that are willing to pay a higher price for sustainable, fresh, local fish.

3. *Develop an advertising campaign to market redfish as a high quality and low cost seafood option*
Consumers who would not typically purchase fish due to the high cost may begin to buy redfish if it is advertised as being a high quality product for a low price.

4. *Explore larger-scale markets for smaller fillets*
For example, small fillets can be sold to international buyers that can cheaply process and then resell the fish on the global market. The U.S. government may also be approached regarding purchasing redfish in order to supply the military or other branches of government with healthy, domestically sourced food.

5. *Contact government food distribution services*
A constant buyer of large quantities of redfish can be established by making sections of the government, such as institutions or the military customers.

6. *Explore selling to European nations as “sustainably harvested” redfish*
For example, Germans already consume a lot of redfish, but they are balking at purchasing redfish from Iceland because they believe that country is poorly and unsustainably managing its redfish fisheries.



Summary

Acadian redfish are unusual because they are long-lived, fast-maturing (compared to other redfish species), with low reproductive and natural mortality rates. These characteristics imply that management and exploitation of this species should be developed cautiously. Our experience in the U.S. of historically overfishing redfish stocks in the 1940s and 1950s combined with the track record of international redfish fisheries further underscores the importance of caution while developing a redfish fishery. However, key elements of Acadian redfish biology (e.g., stock sub-structure and age-at-maturity) are not well understood. Based on the advice of the international colleagues present at the symposium, this knowledge will be critical to developing effective redfish management as this fishery is developed. Improved gear and more friendly regulatory measures could improve the fishery while expanding access to a broader range of boats in the fleet and should be explored. However, the current allowable catch for redfish is 11 million pounds below the level deemed “sustainable” by fisheries managers. So, although the redfish fishery must proceed with caution, biologists, managers and fishermen seem to agree that we have other problems to consider before we need to worry about the risks of overfishing redfish. The most important issue appears to be that today’s small catches of redfish should meet current demand. Without a larger market and improved demand, fishermen are not likely to capitalize on the remaining redfish quota.

The fishery faces an unusual situation and a unique challenge, one that requires managers, scientists and fishermen to work collaboratively. An improved redfish market must be developed for fishermen to take advantage of the redfish quota that is available to them. This marketing problem falls outside of the expertise traditionally provided by managers, scientists and fishermen, but is likely to be left to fishing communities themselves. The solution is not obvious but will likely be a combination of direct marketing, improved branding, increased processing capacity and finding creative avenues for tapping into a larger market for relatively inexpensive redfish. However, given the sensitivity of this species to overfishing, fish biologists, gear engineers and managers have important work to do and must stay engaged and involved as the redfish fishery grows to ensure a sustainable redfish fishery in the Gulf of Maine into the future.

“One alternative is to promote redfish as a high-quality product that people can afford.”

– Dan Georgianna

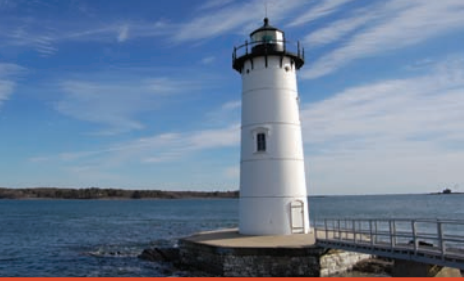
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Participant Bios

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President of the Gloucester Seafood Display Auction Larry Ciulla provided suggestions for how to create a long-term market for the Acadian redfish.

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Dan Georgianna is Chancellor Professor of Economics at the University of Massachusetts-Dartmouth, where his focus on marine resource economics, comparative economic systems and economic history has allowed him to study the processing and marketing capacity for redfish.

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Tim Miller, Ph.D.

Tim Miller is a mathematical statistician for the population dynamics branch of the Northeast Fisheries Science Center. He conducted the 2008 stock assessment for Acadian redfish fisheries and presented an update on this report based on newer data.

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Michael Pol is an aquatic marine biologist at the Massachusetts Department of Fish and Game and is a founder of REDNET.

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Keynote speakers

Alexandra Valentin, Ph.D.

Alexandra Valentin works at the Department of Fisheries and Oceans in Mont-Joli, Canada. Her work focuses on the integration and understanding of smaller-scale stock-structure into redfish management.

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Kristjan Kristinsson, Ph.D.

Kristjan Kristinsson discussed the work he has done at the Marine Research Institute in Reykjavik, Iceland. He has been involved in management of redfish species and provided suggestions for a developing redfish fishery in the Gulf of Maine based on his experience and that of Iceland in general.

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