



PROCEEDINGS OF THE

***FISHSMART PACIFIC WORKSHOP ON
IMPROVING THE SURVIVAL OF RELEASED
FISH FOCUSING ON
BAROTRAUMA***

May 8-9, 2012

Portland, Oregon

Prepared by

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Russ Dunn, NOAA Fisheries; Mike Nussman, American Sportfishing Association; Jim Martin, Pure Fishing; Chris Lunsford, NOAA Alaska Fishery Science Center; Dan Wolford, Pacific Fishery Management Council; Marty Golden, NOAA Fisheries, SWRO; Liz Hamilton, Northwest Sportfishing Industry Association; Chris Lowe, California State University Long Beach; Alena Pribyl, NOAA Fisheries/CA Science Policy Fellow; Tom Raftican, The Sportfishing Conservancy; and Clay Tam, Pacific Islands Fisheries Group.

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Executive Summary

Fifty individuals representing researchers, fisheries managers, anglers, communication specialists, and the sport fishing industry gathered in Portland, Oregon for the “FishSmart Pacific Workshop on Improving the Survival of Released Fish Focusing on Barotrauma.” Two days of intensive presentations and interactive discussion covered recreational fisheries from Alaska, Hawaii, and the length of the West coast to address ways of reducing mortality in fisheries that are constrained by high release mortality.

As in other FishSmart workshops, participants emphasized the need for anglers to avoid catching restricted species altogether, thereby averting the need to take special measures to help improve the fish’s chances of survival. Avoidance techniques include knowing where restricted species are likely to be caught and avoiding them, use of gears that allow anglers to better judge depths and target species that they are seeking while avoiding those that would need to be returned to the water, and changing locations when too many restricted fish are being encountered.

If a fish caught in deeper water must be released, workshop participants supported using weighted grippers, “lip hangers,” or baskets to return a fish to the depth where it was caught or as deep as possible wherever this is not possible (generally called “recompression”) as the first choice to improve survival. Venting (releasing swim bladder gasses from the fish’s body to enable it to return to deeper waters on its own) should generally be a last option. Some fish are caught at significant depths (up to 1,200 feet in Hawaii) or are too large to return using devices for recompression, necessitating venting as the only choice.

West coast rockfish (*Sebastes* spp.), a group of about 60 or more species, constituted a large part of the discussions due to the current situation where a few species with low abundance are constraining fishing for other species that are often caught in the same location and times. The high release mortality of these “choke species” prevents sustainable fishing activity for the other species. While some gaps in research remain, workshop participants coalesced around the concept that sufficient science already exists to allow managers to consider ways to incorporate “improved survival” scenarios into management and address mechanisms that would permit limited fishing in closed areas or otherwise increase fishing opportunities. Currently, the mortality rate used for management of most rockfish species caught at depths deeper than 30 fathoms (180 feet) is 100%, assuming that anglers take no special measures to improve their survival. However, numerous studies have shown that use of recompression devices when returning a fish to deeper waters significantly improves survival. Incorporating a lower release mortality rate into management scenarios for these deeper caught rockfish would potentially allow expanded fishing opportunities in some fisheries. Workshop participants stressed that existing angler dockside surveys in Oregon, Washington, and California must

incorporate questions to determine the extent of use of recompression techniques among anglers to better apply lower mortality rates into the modeling and management actions.

Management actions based on angler adoption of techniques to improve survival have already been approved in Alaska. Beginning in 2013, charter operators in southeast Alaska will be required to have a deep-water release mechanism onboard for use on rockfish that they release. Descending devices are anticipated to lower the mortality rates of released rockfish from as high as 90 percent to as low as 10 percent.

Best practices include a combination of avoidance, release techniques, and handling fish before release (see www.fishsmart.org). Workshop participants felt that voluntary adoption of these best practices and recompression techniques should be immediately implemented rather than waiting for mandated regulations. Voluntary adoption would allow greater flexibility to change as new information became available. Many anglers and Commercial Passenger Fishing Vessels (CPFV) already utilize, and aggressively promote, release techniques that improve survival but expanded communication efforts are needed to increase the number of anglers who use them in order to have a greater impact on the fish stocks. Several well established communication programs already exist and could become more effective with additional coordination. Expanded communication programs through organizations such as the Recreational Boating and Fishing Foundation could provide greater use of online and social media to reach additional audiences.

Finally, workshop participants discussed the current process of acquiring exempted fishing permits (EFP) to use in studies of gear and techniques that might increase the survival of released fish. In some cases, permit authorization can take more than two years, meaning that the time from permit application to final results and potential implementation by management entities could be 6 years or more. The process for applying for and obtaining such permits should be streamlined to allow quicker approval and initiation of studies.

The workshop was part of the larger FishSmart effort, a program lead by the sport fishing community to work with anglers and industry to improve the survival of caught and released fish. The initial phases of FishSmart are being funded by NOAA Fisheries Service through a grant to the Atlantic States Marine Fisheries Commission.

Table of Contents

| | |
|---|----|
| Acknowledgements..... | i |
| Executive Summary..... | ii |
| Introduction..... | 1 |
| Goals of the Workshop | 1 |
| Background Information..... | 2 |
| Keynote Opening | 2 |
| FishSmart Initiative | 3 |
| Recap of FishSmart Gulf of Mexico/St. Petersburg Workshop | 5 |
| Frame the Overall Issue of Barotrauma and Release Mortality | 5 |
| Regional Recreational Fisheries Impacted by High Release Mortality | 6 |
| West Coast Fisheries..... | 6 |
| Hawaii Fisheries | 6 |
| Avoidance | 7 |
| Size: Effect of catching/releasing various sizes of fish on stock sustainability | 8 |
| Venting and Decompression/Recompression: Techniques and appropriate uses of various techniques. | 8 |
| FishSmart Tackle: Techniques and gear for releasing fish..... | 9 |
| Cross Fertilization: introducing recompression gear to anglers in the Gulf and S. Atlantic | 9 |
| The Journey from Science to Management | 10 |
| From Science to Management: the Alaska Rockfish Recompression Experience | 10 |
| Issue Resolution..... | 10 |
| Best Practices and FishSmart Tackle..... | 11 |
| Develop the outline of messages | 11 |
| Develop guidance to regulatory bodies | 12 |
| Gaps in the current state of knowledge..... | 12 |
| Communication Issues..... | 13 |
| Online and Social Media | 13 |
| Region Specific Communications in the Pacific | 13 |
| Communication Recommendations..... | 14 |
| Appendix I. Participants in Pacific FishSmart Workshop..... | 16 |
| Appendix II. Agenda: FishSmart Barotrauma Workshop | 18 |
| Appendix III. Release Mortalities Incorporated in Fishery Management Council Management Plans or Stock Assessments for Barotrauma-Afflicted Species and Select Others | 22 |

Presentations available at www.FishSmart.org under “Workshops.”

Introduction

The number of fish released in U.S. marine recreational fisheries regularly exceeds 200 million each year, reaching nearly 270 million in some years and routinely accounts for 60 percent of all fish caught in these fisheries¹. In some fisheries, particularly some Pacific rockfish fisheries, the mortality of these fish after being released is constraining the rebuilding schedules for these stocks and limiting the opportunities for recreational anglers to fish for these species. Developing and implementing mechanisms to help anglers improve the survival of released fish is not only a good conservation strategy but also will likely pay dividends to anglers in the form of enhanced angling opportunities.

In 2011, the Atlantic States Marine Fisheries Commission, in conjunction with NOAA Fisheries and the recreational fisheries community, hosted a National Workshop on Barotrauma to address the growing issue of the impact of high release mortality in marine recreational fisheries, focusing particularly on fisheries impacted by high release mortality. Of the many findings from this workshop, participants recommended that the process be stepped-down to the regional level to better address region-specific and fisheries-specific issues. As a result, during 2012-2013, three regional workshops are being held: the Gulf of Mexico/South Atlantic, Pacific (covering Alaska, Hawaii, and the U.S. West Coast), and New England/Mid Atlantic. This report documents the findings of the Pacific Coast workshop held May 8-9, 2012 in Portland, Oregon.

These workshops are part of a larger effort named “FishSmart”, an outreach program in conjunction with the recreational fishing community to reduce the mortality of angler-caught and released fish. There is compelling evidence that angler behavior and gear choice can affect the success of catch-and-release, whether regulatory or voluntary, as a management and conservation strategy. Because anglers often look to natural resource agencies for guidance, and have significant insight on how to handle and release fish properly, there is a need to ensure that outreach materials are readily accessible and provide the necessary and correct information on the subject.

Goals of the Workshop

The intent of the Pacific Coast regional workshop was to identify best practices for anglers and regulatory agencies to increase the survival of angler-sought saltwater fishes, specific to the Pacific Coast, Alaska, and Hawaii fisheries being constrained by high release mortality, and develop guidance to communicate to anglers. In addition, actions that management bodies can implement to reduce the interaction between anglers and species that they must release, while still allowing for angling, were addressed.

The material developed through the workshop has several applications:

1. Identify best practices and equipment to employ by anglers and regulatory agencies in the Pacific region to increase the survival of angler-sought saltwater fishes constrained by high release mortality under a variety of conditions/fisheries.
2. Develop outline for messages directed to anglers to employ in their interaction with these saltwater species in the Pacific region.

¹ Based on NOAA Fisheries Marine Recreational Fisheries Statistics Survey, B2 “released alive” estimates.

3. Provide guidance to management bodies to reduce the interaction and lethality of such interactions, with these species by anglers through the consideration of management actions such as time/area closures, gear modifications, restrictions/usage and size restrictions and account for and incorporate release mortality/survivability into the regulatory process.

4. Identify gaps in the current state of knowledge in need of additional research efforts/funding in the Pacific region.

Background Information

Keynote Opening

Alan Risenhoover, Deputy Assistant Administrator of NOAA Fisheries

Alan Risenhoover reiterated the support of the NOAA leadership for the FishSmart effort being led by the recreational fishing community. The genesis for these workshops was in the 2010 Recreational Fisheries Summit which NOAA hosted. One of the recommendations from the recreational community during that workshop was that further investigation be made into improving the survival of fish that were prone to “barotrauma,” recognizing that high mortality rates of release fish combined with the large numbers of releases were threatening the sustainability of some very important recreational fisheries on every coast.

Additionally, NOAA is working with the recreational community to develop “Regional Recreational Fishing Action Plans” that will identify priorities of the recreational community in each of the regions. These priorities are broader than addressing barotrauma and high mortality rates and it is NOAA’s hope that they will help NOAA be more proactive in addressing recreational issues on a regional basis.

Risenhoover emphasized the importance of the goals of this workshop, not only to review the known science of the issues related to barotrauma but to find ways to convey key messages to anglers on how best to handle and release fish to reduce mortality. Having the recreational community conveying these messages within the community may deliver better results than top down messages from agencies and regulators. Additionally, innovative ideas from workshop participants for improving the management of these fisheries may spur management bodies (agencies, councils, and commissions) to consider management approaches that have not been part of their traditional approaches.

Finally, Risenhoover noted that the science behind barotrauma and improving survival is not one hundred percent complete. Workshop participants can help to identify gaps in current state of knowledge and prioritize the needed research that will provide the greatest positive impact on the way that these fisheries are managed and what anglers can do to contribute to improving the sustainability of these fisheries.

FishSmart Initiative

Gil Radonski/Andrew Loftus

(Presentation available at www.FishSmart.org)

The FishSmart Program is a proactive approach to reduce the release mortality of fish while enhancing the fishing experience. This will be accomplished through two basic approaches:

- 1) Developing fishing techniques and management approaches that reduce the catch of unwanted species or sizes, and;
- 2) Improving the survival of released fish.

The measure of our success will be at the angler/fish interface.

FishSmart is a program driven by the angling community, not a top-down government program.

FishSmart will utilize several approaches:

- 1) Collating and expanding our knowledge and understanding of released fish survival;
- 2) Developing and employing new technologies/equipment where necessary to enhance released fish survival;
- 3) Promoting the adoption of careful release techniques (best practices) to anglers, and; developing an angler communication infrastructure to disseminate best practices.

In short, FishSmart is a nationwide program to marry the scientific knowledge of the survival of released fish with on-the-ground implementation by the anglers.

The information gathered as part of the FishSmart Regional Workshops will form the foundation for the information used in the communication and outreach program, specifically integrating into the established communication infrastructure of the Recreational Boating and Fishing Foundation (RBFF) as well as into the existing communication infrastructure at the state, regional, and national levels.

Future efforts will be needed to enhance and expand the outreach component through state agencies and other communication mechanisms and to develop the information and communication infrastructure to address freshwater fisheries.

A 2011 assessment of the release mortality currently used in Council fishery management plans in the Pacific was as follows:

- Demersal shelf rockfish – assumed to be 100%
- Halibut – assumed 3.5% on circle hooks and 10% “J” hooks
- west coast rockfish as follows in the table:

| ROCKFISH | 0-10 fm | 11-20 fm | 21-30 fm | >30 fm |
|-------------------------|---------|----------|----------|--------|
| Black | 11% | 20% | 29% | 63% |
| Black & Yellow | 13% | 24% | 37% | 100% |
| Blue | 18% | 30% | 43% | 100% |
| Bocaccio | 19% | 32% | 46% | 100% |
| Brown | 12% | 22% | 33% | 100% |
| Calico | 24% | 43% | 60% | 100% |
| Canary | 21% | 37% | 53% | 100% |
| China | 13% | 24% | 37% | 100% |
| Copper | 19% | 33% | 48% | 100% |
| Gopher | 19% | 34% | 49% | 100% |
| Grass | 23% | 45% | 63% | 100% |
| Kelp | 11% | 19% | 29% | 100% |
| Olive | 34% | 45% | 57% | 100% |
| Quillback | 21% | 35% | 52% | 100% |
| Tiger | 20% | 35% | 51% | 100% |
| Treefish | 14% | 25% | 39% | 100% |
| Vermilion | 20% | 34% | 50% | 100% |
| Widow | 21% | 36% | 52% | 100% |
| Yelloweye | 22% | 39% | 56% | 100% |
| Yellowtail | 10% | 17% | 25% | 50% |
| | 0-10 fm | 11-20 fm | 21-30 fm | >30 fm |
| Cabezon | 7% | 7% | 7% | 7% |
| California scorpionfish | 7% | 7% | 7% | 7% |
| Kelp Greenling | 7% | 7% | 7% | 7% |
| Lingcod | 7% | 7% | 7% | 7% |
| Pacific Cod | 5% | 32% | 53% | 97% |
| Flatfish | 7% | 7% | 7% | 7% |
| Sharks and Skates | 7% | 7% | 7% | 7% |
| Dogfish | 7% | 7% | 7% | 7% |

Recap of FishSmart Gulf of Mexico/St. Petersburg Workshop

April 11-13, 2012

Loftus and Radonski provided a brief overview of some of the results coming from the Gulf of Mexico/South Atlantic workshop held the previous month. Although the results were too voluminous to detail in a short time, major aspects included:

- Strong support for initiating a process that expands the current regulation in the Gulf of Mexico reef fisheries requiring the use of venting tools to also allow the application of recompression devices. Although the science is not 100% complete, enough evidence exists to suggest that recompression can effectively improve the survival of fish caught and released in deep water and might be more accepted and applied among anglers.
- Encourage outreach to anglers on release techniques. The only way that mortality of released fish will be reduced significantly is to get the information on tools and techniques into the hands of anglers. Strong outreach and communication to anglers – including avid anglers and for-hire sector as well as occasional anglers – should be part of management programs in the future.
- Modified FishSmart general release guidelines. The “best practices” for releasing fish that were developed during the 2011 workshop were reviewed and slightly modified, mainly to reflect the advice related to handling fish with wet towels, as well as to recommend practices related to interaction with marine mammals (follow the NOAA guidelines).
- Discussion on modifying recommendations for depth of release in recompression. The original recommendation for releasing fish at depth was to release them at depth of capture or at least 60 feet. Workshop participants felt that if this was still an impediment, even getting fish back down to even 30 feet could be beneficial.

Frame the Overall Issue of Barotrauma and Release Mortality

Jim Martin, Pure Fishing

Jim Martin opened the topic by noting that the ethic of releasing fish has changed (e.g., largemouth bass fisheries is now approximately 90% release, wild salmon, billfish, etc. are mostly released). However, the general media hasn't fully picked up this. Nobody outside of the fishing community acknowledges this change in ethic and improved release techniques even though it has been evolving for decades.

FishSmart emerged from thoughts on this issue of many in the recreational community and driven forward by Mike Nussman of the American Sportfishing Association. The heart of the program is communication; it depends on the support of society in general recognizing the lighter impact that anglers can have on the resource. One issue that needs to be addressed is asking private anglers to think about their fishing strategy ahead of time and plan for releasing fish– whether those fish are voluntary releases (because they want to) or regulatory releases (because they can't keep the fish due to a regulation). In general, anglers hate “floaters” and want to take every step possible to avoid having released fish die. In some fisheries hooking mortality is so significant that it accounts for entirety of fishing mortality. Martin visualized the day when we have a certified angler program to allow anglers to fish in closed areas; analogous to the certified hunter program to allow hunting on goose populations in Oregon. Anglers who demonstrate knowledge and skill to maximize the survival of released fish might be issued permits to fish in normally closed areas, and in the process contribute

catch, effort, and biological data to fisheries managers for fish stocks where most fishery dependent data has been cut off after a closure.

The outcomes of this FishSmart workshop will drive the issue forward on the Pacific coast. They should include:

- Research strategy outlining a process for moving the process forward; prioritize research.
- Fleet communication strategy – all anglers CPFV, private anglers, etc. opinion leaders’.
- Management action plan – strategy to go to Council and staff to modify current strategy.
- General media – how to convey release ethic to the general media and public.

If we cannot open new opportunities through this process we have not fully met the objectives of the efforts. There will always be people in the recreational community who will create controversy; need to recognize that but be proactive in addressing issues.

Regional Recreational Fisheries Impacted by High Release Mortality

West Coast Fisheries

Dan Wolford, Chair, Pacific Fishery Management Council

(Presentation available at www.FishSmart.org)

Dan Wolford characterized the West coast fisheries (Alaska to southern California). Yelloweye rockfish are a growing concern in all areas now, not just in Washington, California, and Oregon. Yelloweye look a lot like vermilion and anglers need to be educated on distinguishing them. Giant sea bass (a prohibited species) also have an issue with barotrauma.

California license sales went from approximately 2 million in the 1970s to approximately 1 million in 2011 – many reasons, but loss of fishing opportunity is among important factors. Area closures to protect rockfish (rockfish conservation areas, cow cod conservation areas) and general MPAs (especially in California) are severely limiting open areas for rockfish, forcing anglers to move and increasing pressure on those areas that remain open. A new Alaska Board of Fisheries regulation requiring the use of fish descenders is going into effect this year. We need incentives for anglers to descend fish. If adopted, it may lead to more areas opened for limited fishing. Cowcod barotrauma is on the PFMC agenda in June with the possibility of new regulations to protect them. The present focus should be on reevaluating mortality rates for descended fish; regulations if needed can come later. Management needs to provide incentive to anglers – e.g., open closed areas, include conservation in modeling, etc. for it to be successful.

Hawaii Fisheries

Clay Tam, Pacific Islands Fisheries Group

(Presentation available at www.FishSmart.org)

Recreational fisheries in Hawaii where barotrauma mortality is the most problematic are bottom fish. It is a hook and line fishery only (all other gears are banned) with the “shallow water fishery taking place in 60 -200 feet of water and the “deepwater” fishery in 200 – 1,200 feet. There are a number of management restrictions in place for this fishery, including a recreational total bag limit of 5 “Deep 7”

species per person per day. Cooperative research is a very important part of managing this fishery. This includes a cooperative tagging program and evaluation of the “drop shot” method of returning fish down to depth (using weights up to 5 pounds) and angler workshops to get the word out on descending.

Avoidance

The issue of “avoidance” is a broad term to capture management approaches and fishing techniques designed to prevent encounters of unwanted species/sizes. The issue was discussed as a panel discussion with audience participation.

Tom Ohaus- Southeast Alaska Guide Organization. Currently, 84% of the rockfish is allocated to the commercial industry; 14% recreational. As the halibut limit goes down for recreational anglers, interest in rockfish goes up, putting more pressure on those stocks and increasing awareness of fishing practices, including avoiding fish that you cannot keep. Ohaus provided these recommendations:

- Don't target fish you can't keep.
- Make customers a part of the process and educate them about life history (e.g., 80 year old fish); most customers will make the decision themselves to avoid.
- People in the guide industry need to be told what techniques work.
- Fish shallow if possible; avoid structure if possible where rockfish live (sea floor mapping would help people avoid structure). Avoid habitat where they are found. ADFG has put a booklet out on this

Clay Tam- Pacific Islands Fisheries Group, Hawaii. Fisheries in Hawaii can target some species in waters up to 800-1,200 feet. Avoiding fish that you don't want to or can't keep is very important. One technique is to choose the appropriate hook size to help avoid smaller ones. Some giant trevally are being released at sizes of 100 pounds and larger. The size of hook and depth can help select for a particular species or size of fish. As mentioned previously, moving fishing locations or depth to avoid unwanted species/sizes is also an effective technique. Anglers and for-hire should research and understand fisheries in the area where they are fishing so that they can practice these techniques effectively. Information shared between charter operators about releasing fish and locations can make these practices effective on a larger scale.

John Holloway – Recreational Fishing Alliance see(Presentation available at www.FishSmart.org). He was involved in a 2009 Oregon Department of Fish & Game/Recreational Fishing Alliance Yellowtail Experimental Fishing Permit (EFP) to investigate fishing techniques that allowed fishing for other rockfish species but which avoided yelloweye. Yelloweye are becoming the “spotted owl” of the west coast; anglers need to avoid yelloweye hotspots while fishing in the RCA. He estimated that they caught 5.4 mt rockfish with only 2 yelloweye during the investigation. The concept is to open new areas to rockfish fishing if successful – especially yellowtail rockfish. They Used 30 feet of leader between weight and hooks + float at base of hook zone on line to keep them away from bottom. In 2009 no yelloweye were caught. The NMFS regulatory process was a nightmare – permits were not issued in time for full season (permits not a NMFS priority). Only 2 yelloweye were caught in 2011. They hope to get a change in regulations in 2013. They have a similar EFP proposed for California but issues with permits are also a challenge

Roger Thomas echoed that Experimental Fishing Permits require too much work and time to be a quick and effective solution. The process needs to be streamlined. He was involved in a five year project that showed an increase in canary rockfish abundance in each of the 5 years.

Tom Mattusch- Halfmoon Bay Charter offered these recommendations for avoidance:

- Mark spots where different species are found to allow anglers to avoid those spots.
- Educate anglers/customers to help them understand the need to increase the survival of released fish and/or avoid catches.
- Uses Shelton Fish Descender to help release fish back to depth.
- Use an elastic band attached to bottom weight to reduce shock to fish when putting it in water— sometimes need a 3 lb weight to get it down.
- If you catch a lot of prohibited fish then move.
-

Size: Effect of catching/releasing various sizes of fish on stock sustainability

Chris Lunsford, NOAA Fisheries, Alaska Fisheries Science Center

(Presentation available at www.FishSmart.org)

Chris Lunsford provided a summary of the effect of catching various sizes of fish on stock sustainability. There are two primary components to size dependent mortality:

- Does one fish have a better chance of surviving than another?
- Does one fish contribute more to the population than another (how is size selective removal impacting a population)?

There are a number of factors which impact the chance of a fish surviving after being released. Every capture event has some probability of mortality associated with it; the question is how much of a chance and how can anglers reduce the probability that a fish will die. Most anglers are familiar with immediate mortality of fish but not all appreciate delayed mortality since it is difficult to detect. A review of 274 catch and release studies showed an average (mean) mortality of 18%. Recaptured fish have a cumulative increased mortality, sometimes up to 75% after 10th recapture in some studies. Halibut shows 16% mortality if less than 32 inches – growth rates in halibut about 15% below normal in recent years – likely significantly related to ocean conditions. Fishing effects may reduce spawning potential. The young and eggs of older fish in general survive better.

Venting and Decompression/Recompression: Techniques and appropriate uses of various techniques.

Alena Pribyl, NOAA Fisheries/CA Science Policy Fellow

(Presentation available at www.FishSmart.org)

Alena Pribyl presented a summary of the known literature (published studies and others) related to rockfish release. Much of the background science has already been completed looking at recompression and venting for Pacific rockfish species in general, although some gaps still remain. Venting benefits some species over non venting but some potential problems exist, including the skill and experience of the person doing the venting which can make a major difference on whether the fish survives or not. Factors impacting survival using recompression include swim bladder thickness and elasticity, size and volume of air bladder. The healing rate of air bladders varies - black rockfish take 31 days+ to heal and mid water fish may have more problems than benthic ones. Other factors

impacting survival include behavioral changes after fish are released, the time on deck (ideally less than 5 min; greater than 10 minutes poses some significant problems), depth of capture, temperature differential (cooling on deck may help), and rough handling (including abrasion of the slime coating). Blue & black rockfish do not survive recompression very well. Canary, rougheye, bocaccio, sunset, & vermillion rockfish survive recompression at high rates. Yelloweye rockfish have a 98% survival. Recaptured rockfish shows ability to maintain reproductive fitness. Visual impairment after four days is not a problem but unknown in short term immediately after release. Some more recent studies include:

- Hannah et al. 2012. – Yelloweye, quillback and copper rockfish 100% survival.
- Hochhalter & Reed 2011 – Yelloweye rockfish 98% survival – demonstrated on small number) of fish; reproduction apparently not impacted.
- Rogers – Eyes recover in 4 days (during 1st 4 hours there may be some impact to eye function)
- Pribyl et al. in press- physiological recovery of *Sebastes* is possible following recompression.
- J. Hyde – tagging study with receivers (ongoing) – showed a bocaccio that sat on bottom for about a week then went into water column

See associated presentation for more comprehensive results.

FishSmart Tackle: Techniques and gear for releasing fish

Steve Theberge, IAP World Services/NOAA Fisheries

(Presentation available at www.FishSmart.org)

Steve Theberge has extensive experience with issues related to releasing fish on both the Pacific coast and the Gulf of Mexico. A number of tools are available, some work better under specific fishing conditions and species than others. A general challenge is posed when a lot of fish come in at the same time; reducing deck time while trying to handle a large number of fish can be difficult.

The Shelton fish descender has evolved over time – now with several different gauges to meet the needs of different size fish. Some tools are modified from other devices – a Cabela’s fish gripper can be modified into a descending device. “Fish elevators, including modified crab traps, milk crates, etc. can handle more than one fish at a time. There is no “one size fits all” so we must give anglers a choice of devices to allow them to choose one that works best for them and will be more accepting. In warm climates (e.g., Gulf of Mexico) temperature can be a big issue, especially for large fish so it is important to get them back down in cooler waters where they came from. Fostering new ideas for innovative devices and practices is important to find ones that work best under varied circumstances; involving anglers in this process is very important.

Cross Fertilization: introducing recompression gear to anglers in the Gulf and S. Atlantic

Bryan Fluech and John Stevely, Florida Sea Grant

(Presentation available at www.FishSmart.org)

Bryan Fluech and John Stevely provided a summary of recent work that they have been doing in the Gulf of Mexico and South Atlantic to involve anglers in evaluating the practicality of recompression tools. Keeping anglers involved in the management process related to barotrauma is vitally important; to do otherwise is to disenfranchise them. The general conclusions from their limited project results are:

- At a minimum, improved catch and release practices (including venting and recompression) do some fish some good.
- Not at a point yet were we can measure how much good.
- From what we know so far, recompression devices are probably a good tool for anglers to use.

See presentation for more complete results.

The Journey from Science to Management

What does it take to go from developing/compiling information to changing management and regulations?

Gway Kircher Oregon Department of Fish and Wildlife

(Presentation available at www.FishSmart.org)

Gway Kircher reviewed the regulatory process within the state and federal agencies and the fishery management council, noting the individual aspects of each and areas where the processes intersect. In general, these processes involve four primary components: Research, the Management process, establishing regulations, and enforcement. To get an Experimental Fishing Permit takes at least 2-1/2 years, maybe longer, then time to collect data (2-3 years or more), another 2 years or more to get a regulation change, and then time to implement it. She noted that education and outreach are very important in all phases of the process but that they are often not given appropriate attention.

From Science to Management: the Alaska Rockfish Recompression Experience

Chris Lunsford, NOAA Fisheries, Alaska Fishery Science Center

(Presentation available at www.FishSmart.org)

Dr. Lunsford reviewed the process of moving from Science to Fishery Management in a recent decision in Alaska. In February 2012, the Alaska Board of Fisheries passed a regulation introduced by the Southeast Alaska Guides Organization which will require all charter vessel clients to release sport caught non-pelagic rockfish at depth if not retained. The process involved with this depended on scientific findings and cooperation between the recreational community and managers.

Issue Resolution

The four workshop issues, Avoidance, Size, Fish Friendly Tackle, and Venting/Recompression, were addressed through two primary mechanisms. First, keynote speakers framed each issue, highlighting the major aspects that needed consideration by the workshop participants. Following those presentations, the participants broke into two groups with each addressing all four issues. The groups came back together and discussed the findings of each.

Best Practices and FishSmart Tackle

1. Best release techniques (including recompression) should not be made into a regulation; prefer that the angling community would adopt it as standard practice. Will require outreach and education to all segments of the recreational community.
2. Promote general handling/release techniques (e.g., minimize deck time, knotless landing nets, etc.). Survival of any fish starts with good handling techniques. These need to be promoted before any additional deep water release techniques can be effective. The general guidelines developed as part of the previous FishSmart workshop are suitable.
3. Anglers should recompress when they can and vent if no other option is available. Venting is still important under certain circumstances (e.g. Hawaii deep water fisheries) – generally better than simple surface release if fish cannot go back down on their own.
4. If returning fish to depth of capture is not possible, anglers should attempt to return them to at least 100 feet or 1/3 the depth of capture.
5. Plan your trip and equip for releasing fish-appropriate tools (release devices, etc.). Have descending gear ready to go.
6. Fishing Practices: anglers should educate themselves on habitats and depths where the species and sizes of fish that cannot be retained are located and avoid those areas. This would include, for example, such practices as not fishing below a certain depth if larger fish that cannot be retained are in deeper waters, moving fishing locations to avoid over sized or undersized fish that are routinely caught, etc.

Develop the outline of messages

1. Develop a theme such as “Operation Deep Release – Don’t Leave Floaters.”
2. Penetrate as many communication links as possible.
3. Use celebrities where possible, make celebrity of recreational fishing leader(s).
4. Create a Communications Committee – and maybe subcommittees – keep all connected.
5. Three broad messages with appropriate tone - focus on Best Practices:
 - Why is barotrauma limiting fishing?
 - Plan and equip to release before each fishing trip
 - Need to identify what techniques to use in various situations - Make simple steps 1, 2, 3, etc.).
6. Involve Trade organizations (i.e. ASA), Web sites, Fishing Clubs (i.e. Salty Dogs, Coastside Fishing Club, United Anglers of Southern California).
7. Create instructional videos – 2-or 3 being worked on at this time.
8. Have common and consistent messages that all groups use.
9. Involve dockside samplers – ask people if they have descender and give handouts.
10. Message should be emotional, moral, and ethical.

Develop guidance to regulatory bodies

1. Release techniques (descending etc.) should be first communicated and not regulated. It is important to develop angler buy-in and this will come best if the angling community is in the lead implementing the measures.
2. The Marine Fisheries Advisory Committee (MAFAC) and Fisheries Management Councils need to be briefed on the outcomes of this workshop.
3. Model the potential impacts of improved survival to use as examples to present to anglers showing potential benefit.
4. Send strongly worded letter to NOAA encouraging all Councils to begin looking into ways to incorporate improved release survival into stock assessments and management plans.
5. The charter community should detail descending and release information in their log books.
6. Recommend to Oregon and Washington to work cooperatively with their CPFV community to implement a log book system.
7. Look at ways to open areas due to restricted species. If nearly 100% of yelloweye survive using Best Practices, managers should consider opening certain areas up under a “certified angler program” applied in conjunction with some level of data collection.
8. Encourage researchers to apply techniques to maximize survival into all of their research projects.

Gaps in the current state of knowledge

1. Need to know more about long term impacts- especially for multiple captures of fish that may be 80 years or more in age.
2. Need to study behavioral interactions of descended fish.
Update survival curves based on recompression; drive change in SSC and GMT on how to track mortality.
3. Focus of research should be on “bottle neck species” that are preventing the fishing for species that are in better shape.
4. Integrate questions into RecFIN sampler regarding rockfish release – be consistent in all states:
 - a. Did you release rockfish?
 - b. Did you use recompression device?
 - c. On which species?
 - d. What depth?
5. Research on how practical different devices are in certain circumstances.
6. Need more work on how to avoid non target species – gear selectivity.
7. Evaluate success of “encouraging avoidance” (e.g., how many anglers change their fishing patterns, etc.).

Communication Issues

Online and Social Media

Andrew Loftus and Gil Radonski

Andrew Loftus provided details of the communication infrastructure of RBFF that will be utilized to reach specific target audiences (e.g., angler populations). RBFF's main outlet for information is through www.takemefishing.org, which currently hosts 4 million unique visitors and growing. They partner with state natural resources agencies (48 states currently partner with them) and have several other programs. Through these programs, they reach 1 million K-12 students and 200,000 educators, giving them a foothold to influencing the future generation of anglers on issues such as proper release techniques. "Catch and Release" was one of the top three conservation issues identified by the RBFF Conservation Roundtable. It is important to recognize that the [takemefishing.org](http://www.takemefishing.org) website is not a static "post the information and let anglers find it approach." The RBFF program is oriented around a comprehensive professional marketing and advertising campaign designed to drive anglers to the information. One application for applying this to fisheries where reduced release mortality is desired is to implement a direct marketing/advertising campaign in specific markets to reach those anglers that will be most likely to implement improved release techniques and adopt appropriate gear. In the short term, the FishSmart effort will begin to integrate information from workshops and others into the existing infrastructure of RBFF. However, this is only one avenue for reaching anglers. There are millions of anglers that we need to connect with – to accomplish this we need to utilize all possible avenues of communication including recreational fishing industry advertising, states NOAA Fisheries, Sea Grant, and others.

Region Specific Communications in the Pacific

Rick Starr, California Sea Grant

(Presentation available at www.FishSmart.org)

Effective communication needs to focus on Audiences, Avenues, and Messages. The audiences that need to be reached with information are diverse, ranging from professional anglers to the general public and policy makers. There are perhaps 10-20 different audiences depending on how you group them. The messages that each of these groups need to receive is different also. It used to be that the main mode of communication was print but there are a vast array of communication tools now available with online and electronic communication opening new avenues. The internet is flooded with information now, so successful communication must connect to Google searches which requires special focus on how and when a page comes up when Googled. However, these modes do not completely supplant traditional means. In-person communication is also highly valuable and should be integrated into a communications plan. Working with anglers and CPFV's on research efforts is one way to integrate them into the process from the ground up. Making sure that the recreational fishing community is part of the process – from research to policy implementation – will help to build "ownership" in the programs with them.

Communication Recommendations

1. Communication needs to include interactive components.
2. Update California Department of Fish & Game/ Sea Grant brochure on get rockfish to include additional devices and information.
3. NOAA should work with sportfishing groups to convey messages.
4. NOAA regions working on Regional Action Plans with communications being a component of those. Need to integrate best release messages into those.
5. Outreach should focus on (priority order):
 - a. Charter (CPFV) community
 - b. Fishing groups and opinion leaders
 - c. Outdoor media
 - d. General media
6. Instructional videos-3 videos in the works; need to coordinate to make sure core messages in each are the same.
 - a. SAC and Golden Gate Fishermen's Association working on video for all their members to utilize on barotrauma and consistent release guidelines.
 - b. Milton Love/Ray Troll video
7. Work with tackle and boating companies who sponsor fishing shows to integrate messages into those shows.
8. Develop an app to:
 - a. Help anglers avoid areas with depleted species;
 - b. Help anglers understand how to handle (release) specific species;
9. Utilize existing agency networks such as license databases, license vendor databases, etc. to reach different audiences not reachable through other means.
10. Messages to anglers should reflect why they should release fish (other than to increase survival) to motivate them such as:
 - a. Preserve fishing for your kids and future generations;
 - b. Expand opportunities to fish by conserving fish;
 - c. "Don't leave floaters."
11. Need to develop the support and involvement of the environmental NGO community.
12. Need to keep in mind that there are millions of anglers that we need to connect with – to accomplish this we need to utilize all possible avenues of communication including recreational fishing industry advertising.
13. Most states (as well as NOAA Fisheries) have established angler communication and education programs of varying intensity. We should engage with these programs to the extent possible to develop and deliver consistent messages (note that the Association of Fish and Wildlife Agencies has endorsed partnering in the FishSmart program).
14. Letter to NOAA and Council Chair from FishSmart Steering Committee – signed by all cc states.
15. Certified Angler Program – what should it be?
 - a. Maybe focus on charter captains & guides first – just to be advertised as special – no benefits;
 - b. Explore concept of data gathering and improved access for anglers–need to know for what purpose;
 - c. May be voluntary at first;
 - d. Angler gets access to other areas, maybe badge, other status aspects – enhanced communications link with agencies;

- e. How many would want to become certified – eventually involve enforcement – costs need to be looked at;
- f. May not want to spread too thin – and lose focus on barotrauma.

***** Readers are encouraged to view the associated presentations where available for complete workshop results *****

Appendix I. Participants in Pacific FishSmart Workshop May 8-9, 2012, Portland, Oregon

| | | |
|----------|-------------|---|
| Jeff | Barger | Ocean Conservancy |
| Patrick | Brown | Seaqualizer, LLC |
| John | Budrick | California Department of Fish and Game |
| Mark | Cedergreen | Westport Charterboat Association |
| Steve | Copps | NOAA Fisheries NWRO |
| John | Devore | Pacific Fishery Management Council |
| Jon | Drake | NOAA NWFSC |
| Russ | Dunn | NOAA Fisheries |
| Bryan | Fluech | Florida Sea Grant |
| Ken | Franke | Sportfishing Association of Southern CA. |
| Ivy | Fredrickson | Ocean Conservancy |
| Michelle | Gandola | Sportfishing Association of Southern California |
| Marty | Golden | NOAA Fisheries-Southwest Regional Office |
| Liz | Hamilton | Northwest Sportfishing Industry Assn |
| Bob | Hannah | Oregon Dept of Fish & Wildlife |
| Ed | Hibsch | Pacific States Marine Fisheries Commission |
| John | Holloway | RFA |
| Randy | Hupp | EcoLesser |
| Terri | Hupp | EcoLesser |
| John | Hyde | NOAA SWFSC |
| Bob | Ingles | CPFV Captain |
| Shems | Jud | Environmental Defense Fund |
| Kurt | Kawamoto | NOAA Pacific Islands Fisheries Science Center |
| Gway | Kirchner | Oregon Dept. of Fish and Wildlife |
| Jeffrey | Liederman | Seaqualizer, LLC |
| Andrew | Loftus | Loftus Consulting |
| Chris | Lowe | California State University; |
| Chris | Lunsford | NOAA Fisheries, AFSC, Juneau; |
| Jim | Martin | Berkley Conservation Institute |
| Tom | Mattusch | Halfmoon Bay Charter |
| Patrick | Mirick | Oregon Dept. of Fish and Wildlife |
| Tom | Ohaus | Southeast Alaska Guide Organization |
| Bob | Osborn | The Sportfishing Conservancy |
| Russell | Porter | Pacific States Marine Fisheries Commission |
| Alena | Pribyl | NOAA Fisheries/CA Science Policy Fellow |
| Gil | Radonski | Loftus Consulting |
| Tom | Raftican | The Sportfishing Conservancy |
| Polly | Rankin | Oregon Dept. of Fish and Wildlife |
| Heather | Reed | WDFW |
| Jeff | Richards | Angler |
| Sean | Rooney | Washington State University |
| Rick | Starr | California Sea Grant |
| Jack | Sterne | Environmental Defense Fund |

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|-------|----------|--|
| John | Stevely | Florida Sea Grant |
| Clay | Tam | Pacific Islands Fisheries Group, Hawaii |
| Steve | Theberge | IAP World Services |
| Roger | Thomas | Golden Gate Fishermen's Association |
| Dan | Tonnes | NOAA Fisheries NWRO |
| Lorna | Wargo | Washington Department of Fish and Wildlife |
| Bob | Williams | NOAA Fisheries |
| Dan | Wolford | Pacific Fishery Management Council |
| Louie | Zimm | San Diego Yacht Club Anglers |

Appendix II. Agenda: FishSmart Barotrauma Workshop May 8-9, 2012, Portland, Oregon



AGENDA FISHSMART PACIFIC WORKSHOP ON IMPROVING THE SURVIVAL OF RELEASED FISH FOCUSSING ON BAROTRAUMA

**May 8-9, 2012
Mount Adams Room
Sheraton Portland Airport Hotel
Portland, Oregon**

Workshop Goals:

Specific to the Pacific Coast, Alaska, and Hawaii fisheries being constrained by high release mortality:

1. *Identify best practices and equipment* to employ by anglers and regulatory agencies in the Pacific region to increase the survival of angler-sought saltwater fishes constrained by high release mortality under a variety of conditions/fisheries.
2. *Develop outline for messages* directed to anglers to employ in their interaction with these saltwater species in the Pacific region.
3. *Provide guidance* to management bodies to reduce the interaction and lethality of such interactions, with these species by anglers through the consideration of management actions such as time/area closures, gear modifications, restrictions/usage and size restrictions and account for and incorporate release mortality/survivability into the regulatory process.
4. Identify gaps in the current state of knowledge in need of additional research efforts/funding in the Pacific region

Tuesday May 8: Plenary

7:30 Continental breakfast available

8:00 Welcome & Logistics

8:10 Introduction- Alan Risenhoover, Acting Deputy Administrator, NOAA Fisheries

8:30 FishSmart Initiative – Gil Radonski/Andrew Loftus

8:50 Overview of Atlanta and St. Petersburg Workshop Results/Pacific Results of FMP Analysis - Gil Radonski/ Andrew Loftus

9:10 Framing the Issue of Release Mortality in General – Jim Martin

9:45 Questions

10:00 Break

10:15 Framing Regional Recreational Fisheries Impacted by High Release Mortality

- Pacific Coast (15 minutes) and Alaska (15 minutes)–Dan Wolford
- Hawaii (20 minutes) – Clay Tam

11:00 Overview of Issues

- ◆ Avoidance: Management techniques and Fishing Techniques designed to prevent encounters of unwanted species/sizes - Panel Discussion
 - Tom Ohaus-Alaska
 - Clay Tam-Hawaii
 - John Holloway-Oregon
 - Tom Mattusch- California (northern and southern)

12:00 Lunch

Lunch Speaker: The Journey from Science to Management;” what does it take to go from developing/compiling information to changing management and regulations - Gway Kircher ODFW
Including a focus on:

- identify legal thresholds for the quality of scientific information that may be the basis for revising regulations under the MSA and ESA.

- identify regulatory avenues for collaborative research to improve scientific information (e.g., EFP process).

- identify and map State and Federal regulatory processes to implement barotrauma reduction practices.

- identify and map State and Federal regulatory processes to allow increased harvest rates by implementation of best practices.

1:00: From Science to Management: the Alaska Rockfish Recompression Experience

1:15 Continue Overview of Issues (20 minutes each)

- ◆ Size: Effect of catching/releasing various sizes of fish on stock sustainability-Chris Lunsford
- ◆ Venting *and* Decompression/Recompression: Techniques and appropriate uses of various techniques. –Alena Pribyl
- ◆ Fish Friendly Tackle: Techniques and gear for releasing fish-Steve Theberge
- ◆ Cross Fertilization: introducing recompression gear to anglers in the Gulf and S. Atlantic – Bryan Fluech and John Stevely, Florida Sea Grant

2:15 Breakout groups: Loftus/Radonski group leaders

Attendees will be assigned to one of two breakout groups. The purpose of each breakout group is to delve into the current state of knowledge of each of the issues, describe what is known about the issue and address each of the four workshop objectives.

3:00 Break

3:15 Reconvene in Breakout groups

5:30 Adjourn

Wednesday May 9

7:30 Continental breakfast available

8:00 Announcements

8:15 Breakout reports-20 minutes each-each group reports on the results of their discussions addressing the 5 issues. Commonalities and divergences between groups will be identified.

9:00 Group Discussion Develop final recommendations on best practices, angler messages, and management guidance for fisheries constrained by high release mortality in the Pacific region (3 workshop goals).

- ◆ *Best practices and gear* for anglers to increase the survival of angler-sought saltwater fishes under variety of conditions (species, temperature, depth caught, hook size, etc.
- ◆ Messages for regulatory bodies
- ◆ *Develop the outline of messages* directed to anglers to employ in their interaction with these saltwater species

10:00 Break

10:15: Continue Development of Recommendations

- ◆ *Develop guidance* to regulatory bodies to reduce the interaction (avoidance) and lethality of such interactions, with those species by anglers.
- ◆ Catalogue gaps in the current state of knowledge in need of additional research efforts/funding and initial prioritization of research in the Pacific region

12:00 Lunch

1:00 Communications: Development and Delivery of Message Content: How Will We Use It?

- ◆ Online and Social Media – Andrew Loftus (20 minutes)
- ◆ Region Specific Communications in the Pacific – Rick Starr (20 minutes)

2:15 Facilitated Group Collaboration: Finding a Unifying Message: Communicating Messages on Best Practices and Management Guidance (3 workshop goals). –Andrew Loftus/Gil Radonski facilitators

Using the previous day outcomes, develop messages specific to the Pacific region for:

- ◆ Best practices and gear for anglers to increase the survival of angler-sought saltwater fishes under variety of conditions (species, temperature, depth caught, hook size, etc.
- ◆ Develop the outline of messages directed to anglers to employ in their interaction with saltwater species, and
- ◆ Develop guidance to regulatory bodies to reduce the interaction (avoidance) and lethality of such interactions, with those species by anglers.
- ◆ Communication tools and pathways

3:15 Break

3:30 Finalize Recommendations

4:15 Wrap Up- Russ Dunn, National Policy Advisor for Recreational Fisheries, NOAA Fisheries

4:30 Adjourn

Appendix III. Release Mortalities Incorporated in Fishery Management Council Management Plans or Stock Assessments for Barotrauma-Afflicted Species and Select Others

| Pacific | | | | |
|-------------------------|---------|----------|----------|--------|
| <i>ROCKFISH</i> | 0-10 fm | 11-20 fm | 21-30 fm | >30 fm |
| Black | 11% | 20% | 29% | 63% |
| Black & Yellow | 13% | 24% | 37% | 100% |
| Blue | 18% | 30% | 43% | 100% |
| Boccaccio | 19% | 32% | 46% | 100% |
| Brown | 12% | 22% | 33% | 100% |
| Calico | 24% | 43% | 60% | 100% |
| Canary | 21% | 37% | 53% | 100% |
| China | 13% | 24% | 37% | 100% |
| Copper | 19% | 33% | 48% | 100% |
| Gopher | 19% | 34% | 49% | 100% |
| Grass | 23% | 45% | 63% | 100% |
| Kelp | 11% | 19% | 29% | 100% |
| Olive | 34% | 45% | 57% | 100% |
| Quillback | 21% | 35% | 52% | 100% |
| Tiger | 20% | 35% | 51% | 100% |
| Treefish | 14% | 25% | 39% | 100% |
| Vermilion | 20% | 34% | 50% | 100% |
| Widow | 21% | 36% | 52% | 100% |
| Yelloweye | 22% | 39% | 56% | 100% |
| Yellowtail | 10% | 17% | 25% | 50% |
| <i>OTHER</i> | | | | |
| Cabezon | 7% | 7% | 7% | 7% |
| California scorpionfish | 7% | 7% | 7% | 7% |
| Kelp Greenling | 7% | 7% | 7% | 7% |
| Lingcod | 7% | 7% | 7% | 7% |
| Pacific Cod | 5% | 32% | 53% | 97% |
| Flatfish | 7% | 7% | 7% | 7% |
| Sharks and Skates | 7% | 7% | 7% | 7% |
| Dogfish | 7% | 7% | 7% | 7% |

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|----------------------|
| North Pacific |
|----------------------|

| | | | |
|----------------------------------|-------|---------|--|
| Pacific Halibut- Circle Hooks | 3.50% | Assumed | Based on longline study |
| Pacific Halibut- J Hooks | 10% | Assumed | Based on other marine species studies |
| Demersal Rockfish | 100% | Assumed | |