The Northeast Fish Rapper

Newsletter of the Northeastern Division of the American Fisheries Society

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In This Issue:

Editors

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President's Message

by NED President, Jim Armstrong

Greetings Fellow NEDers! The year has flown by and our Division Meeting as well as the Annual AFS Meeting in Quebec City have just ended. As you are probably quite aware by now, the Annual AFS Meeting provided the venue for our Division Business Meeting this year. The highlight of the Business Meeting was the awards – we bestowed the Meritorious Service Award to Michele Dionne, the President's Award to Alan Libby, and the Webster Award to Brian Rothschild. Both Alan and Brian were clearly very humbled and grateful for the awards and it was the highlight of my term in Office to be able to confer the awards to them. Michele passed away July 4, 2012. Her family will be presented with the award at a future Southern New England Chapter Meeting.

The timing of this newsletter is a bit off as my term has actually ended and this letter is actually an edited version that was originally submitted before the Business Meeting. As of August 20, John Cooper has taken the reins as our new Division President. Congratulations John! Stepping up into the President-Elect position is Kristen Ferry, and Jason Vokoun is our new Vice President. Chris Millard continues in his role as Secretary-Treasurer for another year.

The Division and its member Chapters expended a lot of energy this year in preparation for the Annual AFS Meeting. We were instrumental in assisting AFS staff and leadership, as well as the Quebec local arrangements folks with budget and symposia decisions, abstract submittals, fundraising, auction items, and more. I would like to take this opportunity to thank everyone who stepped up and helped out. In particular, I need to thank Randy Jackson and John Cooper for their hard work and patience on the Contributed Papers Committee. They showed incredible tolerance for the intermittent and often inconsistent flow of information and tasking assignments and have paid their dues many times over. Also, I would like to thank Chris Millard for his hard work getting AFS Units to step up and offer donations large and small to the overall meeting budget. I thank Justin Davis of CT DEEP for his tremendous help in coordinating the John Moring Student Travel Awards. We were not able to give as many as we would like to have, but Justin reports that the recipients were very grateful for this Division award which is given in remembrance of one of NED's most respected leaders. I would like to thank Kristen Ferry for helping me in the fundraising effort. I think we were both reminded why we chose to go into fisheries science and not sales for our careers. Finally I would like to thank all those who either donated or got others to donate items for the Skinner Auction. I hope all of your efforts will be appreciated as we raise funds to make travel to the meeting possible for worthy students.

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President's Message

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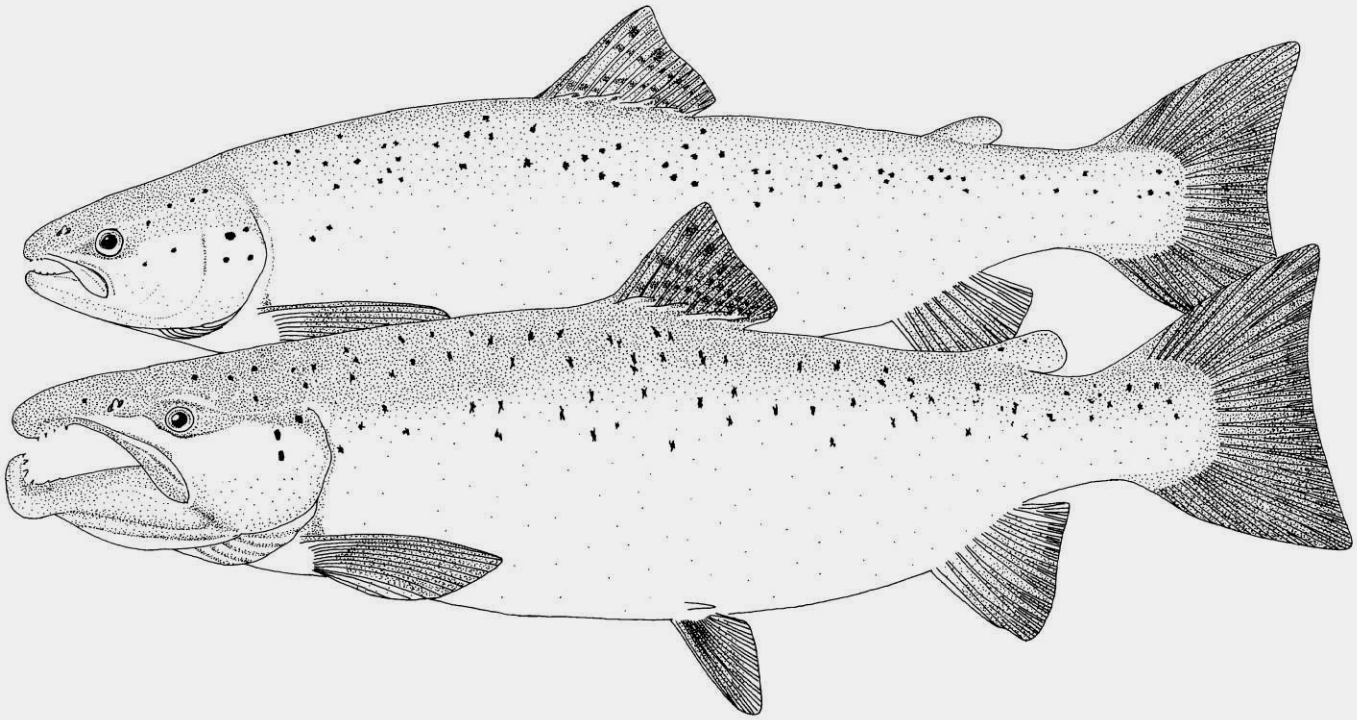
As George Maynard and Jocelyn Runnebaum take over as editors of the Fish Rapper, I have to say a very special thank you to Megan Altenritter for her many years of inspiring people from the Division to contribute items and then to assemble them into our illustrious newsletter. Megan brought a cheerful and positive attitude to this challenging volunteer assignment and I hope she knows that her efforts were very much appreciated!

And many thanks to the rest of you as well. To all of you who donate your time and energy at the Division, Chapter, Student Sub-Unit, or any level within AFS. The fisheries community benefits in a very real way as you work to make meetings a success, as new students make contacts to further their academic career or begin a professional one, as ideas about new directions in research are spawned at an evening social, and as colleagues who have years of service in our field are reunited to share memories over a beer or two. I wish the new ExComm all the best and thank the Division for giving me the opportunity to have served.

Jim Armstrong
President, Northeastern Division, AFS
jarmstrong@mafmc.org

Outgoing editor, Megan Altenritter with a 16 pound lobster from Cobscook Bay, Maine



Atlantic salmon print by Dr. John Cooper from "Island Life, An Isle Royale Nature Guide."

Upcoming Meetings and Workshops

2014 Annual Meeting of the Mid-Atlantic Chapter of the American Fisheries Society

Cape Henlopen State Park, Lewes, Delaware, USA
N38° 46'0" W75° 5'43"
November 5-7, 2014

Call for Speakers:
The Mid-Atlantic Chapter of the American Fisheries Society is pleased to announce a call for oral presentations for the Chapter's annual meeting. The Chapter is seeking 15-minute presentations (followed with a 5-minute Q&A) as well as posters on a wide variety of topics, ranging from work in headwaters to coastal systems and everything in between.

If you are interested in presenting please contact Chapter President Dewayne Fox:
dfox@desu.edu
or visit the chapter's website for more information:
MAC.fisheries.org.
Don't forget to follow us on Facebook:
https://www.facebook.com/MidAtlanticAFS

14th Flatfish Biology Conference

Water's Edge Resort
Westbrook, Connecticut, USA
December 3-4, 2014

Call for Speakers:
You are invited to participate in the 14th Flatfish Biology Conference to be held on December 3rd & 4th at Water's Edge Resort in Westbrook CT. This meeting offers an opportunity for researchers who study flatfish to come together to share their findings. First held in 1986, the Flatfish Biology Conference welcomes presentations on all aspects of flatfish research and encourages student participation.

Check our website for conference details:

http://nefsc.noaa.gov/nefsc/Milford/flatfishbiologyworkshop.html

For more information contact :

Renee Mercaldo-Allen
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203-882-6549

Upcoming Meetings and Workshops

FLOW 2015

Protecting Rivers and Lakes in the Face of Uncertainty
Third International Conference on Instream Flows
Portland, Oregon, USA
April 28-30, 2015

FLOW 2015 is a problem-solving workshop that will be held in Portland, Oregon from April 28 to 30, 2015. Sessions will focus on approaches and strategies that have effectively resolved uncertainty for: 1) federal regulatory needs; 2) state and provincial fish and wildlife agencies; and 3) non-governmental organizations, industries, and municipalities. Special emphasis will be placed on opportunities for integrating new and traditional instream flow methods. Emphasis will also be placed on understanding how existing laws and regulations address uncertainty by allowing or requiring decisions to be made based on the best available data and science. Facilitated discussions will capture the perspectives of all attendees after each session. As with previous IFC conferences, the emphasis on interdisciplinary problem-solving will create networking opportunities that benefit aquatic resources and attendees long after the end of the workshop. Learn more about FLOW 2015 and Sponsor, Trade Show, and Poster opportunities at:
<http://www.instreamflowcouncil.org/flow-2015>

INSTREAM FLOW COUNCIL
FLOW 2015
SCIENCE · POLICY · PUBLIC DIALOGUE

The Instream Flow Council is a nonprofit organization dedicated to improving instream flow programs to protect and restore aquatic resources. http://www.instreamflowcouncil.org

INSTREAM FLOW COUNCIL

Notices and Announcements

ExComm Seeks Input on Investment Strategy

The NED ExComm is soliciting ideas from the membership concerning the allocation of the Division's investments. Below are two suggestions for consideration. Additional suggestions will be considered.

The goal for the investments is to have a fund source of about $50,000 that will produce income sufficient to cover the expenses of the Division, which would include operating costs, student awards, and possible symposia. The Division has reduced expenses over the past seven years, partly due to more support for officer travel from agencies and companies, fewer student awards, reduced conference call services, and reduced costs for the newsletter (electronic distribution rather than paper). These reductions are subject to change depending on the support for officer travel and we cannot count on the reductions always being possible. Income has also been reduced, partly in investments and the membership rebate from AFS.

The current investment allocation is 85% in the American Century Core Plus Bond Fund and 15% in the American Century Prime Money Market. *(continued on next page)*

OVERVIEW

	Core Plus Fund	Prime Money Market Fund	Utilities Fund
Ticker	ACCNX	BPRXX	BULIX
NAV	$10.85	$1	$17.71
Total Assets	$97,307,750.41	$1,976,979,534.91	$399,428,712.97
Morningstar Category	Intermediate-Term Bond	-	Utilities
Morningstar Rating	★★★☆☆	-	★★★☆☆
Funds Rated in Category	Out of 931	-	Out of 66
Minimum	$2,500	$2,500	$2,500
Expense Ratio	0.65%	0.58%	0.68%
Redemption Fee	-	-	-

PERFORMANCE

	Core Plus Fund	Prime Money Market Fund	Utilities Fund
1 Year	4.12%	0.01%	17.35%
3 Year	3.83%	0.01%	12.46%
5 Year	5.28%	0.02%	14.34%
10 Year	-	1.60%	10.56%
Life	5.68%	2.85%	8.31%
30 Day SEC Yield	2.32%	-	3.14%
7 Day SEC Yield	-	0.01%	-
Inception Date	11/30/2006	11/17/1993	3/1/1993

Notices and Announcements

ExComm Seeks Input on Investment Strategy

(Continued from previous page)

Suggestions from John Cooper

The American Century Core Plus Bond fund has returned 5.6% over the past 5 years and the Prime money market fund has returned 1.6% for 10 years. With current inflation running at 2%, the money market fund is losing money each year. My suggestion is to move the funds in the money market (about $6500) into the Bond fund, and move the current amount in the Bond fund to the American Century Utilities fund (returning 8% over 20 years). This should result in an income of about $2880 per year and will help the division continue to add to our resources.

The Quebec City meeting this year might be one of the more expensive meetings (certainly the most expensive I have attended) and we need to generate more income to cover the expenses for this year as well as in the future.

Response from Desmond Kahn

John, thanks for taking the initiative to present this to the Committee. I would like to add to my comments in the attachment that we have had two major, major drops in the stock market over the last fifteen years, where stocks lost 40% to 50% or more. In the 2008 crash, the Division had funds in the stock market and lost a large amount. I don't have the records, but I believe we lost at least 40%. The Utility fund you mentioned is a stock fund, investing in utility companies. To take our funds, which you suggested were to provide operating income, and invest them in stock funds is to take a relatively high risk of a steep decline. The stock market is often erratic. I don't think it is appropriate for funds that are an organization's source of income. On the other hand, bonds are relatively stable investments, especially compared to stocks. They provide a steady income in monthly dividends. If interest rates begin to climb, bond funds will temporarily, for months to maybe a year or more, decline in value. Yet, while the share price will decline, the funds will continue to pay out monthly dividends. Eventually, the funds will regain their market value.

A way to get an income stream that is often convenient is to have the monthly dividends pay out to a money market fund. That way, you will have cash waiting for use. No, money market funds do not currently have a yield, but it is not always a good idea to sell shares of a bond fund every time we need cash.

To get the possibility of greater yields on our holdings, we would have to take much greater risk. That does not seem advisable to me. I learned that lesson in 1999 and 2008. Instead, we should take what the market offers us with less risk. If we are getting 5%, we are doing very well. Most bond funds are only getting 3% or 4%.

Dr. John Cooper is the founder of Cooper Environmental Research.

Dr. Desmond Kahn recently retired from the Delaware Division of Fish and Wildlife.

Notices and Announcements

Input Sought on Alewife and Blueback Herring

NOAA seeks current and retired commercial, recreational, and personal use harvesters to share observations of alewives and bluebacks

Throughout August and September, NOAA Fisheries is conducting a voluntary coast-wide survey of individuals who have fished for alewives and/or blueback herring either commercially, recreationally, or for personal use at some point in their lifetime.The goal of this survey is to gather first-hand observations to better understand alewife and blueback population trends and to improve NOAA's efforts to restore these fish populations along the east coast.

Through the 15-minute telephone survey, NOAA will ask commercial, recreational and tribal fishermen a series of questions. We will seek their insights on the following:

- whether local alewife and blueback populations are increasing or decreasing;
- if the timing of the annual run has changed from previous years;
- if fish size is different than it was in the past; and
- what are the greatest threats to these two species' long-term survival and how best to address those threats.

"There is a lot we can learn from fishermen who see daily changes in the aquatic environment that can help us restore alewife and blueback herring populations."

-- Dan Kircheis, NOAA Fisheries

For more information or to participate in the survey please call Dan Kircheis at 207-866-7320 or email:

dan.kircheis@noaa.gov.

For more information on NOAA's efforts to conserve river herring, please visit:

<http://www.greateratlantic.fisheries.noaa.gov/protected/riverherring/>

Justin Southerland holds a blueback herring (top) and an alewife (bottom) up for a picture at the Orland River, in Orland, Maine.

Photo Credit: Julia Beaty, University of Maine, School of Marine Sciences

Chapter and Subunit Updates

Update from the Southern New England Chapter

Sixty-two people, including 16 students, attended the June 18 summer meeting of the Southern New England Chapter at the University of Connecticut's Wilfred B. Young Building in Storrs, CT. SNEC Board of Directors members Eric Schultz and Jason Vokoun, both on the university faculty, led the way in organizing this meeting along with considerable assistance from the UConn Student Sub-chapter members. The famously good ice cream from UConn's Dairy Bar was a welcome repast for attendees during the afternoon meeting break on a warm late spring day.

Following opening remarks by Chapter President-elect Heidi Fitzpatrick, fourteen presentations were made, including four by students. Topics included the CT DEEP catfish stocking and community waters fishing programs, status of marine ornamental aquaculture in the U.S., comparison of methods for back-calculating length-at-age of Atlantic salmon, monitoring American eel migration in a coastal CT stream, using natural tags to distinguish river herring natal origins, biodiversity and trophic structure of the Bear Seamount cephalopod community, guppy frequency-dependent mate selection, localized extirpation and genetic structure of CT bridle shiner, physiological effects of catch and release on summer flounder, an evaluation of subsistence harvesting of coastal resources in CT, and evaluating an environmentally-explicit stock recruitment model for Gulf of Maine Atlantic cod. Abstracts of all papers are available on the Chapter's website, found at www.snec.fisheries.org. James Prosek, a noted artist and author from Easton, CT, gave the meeting's keynote address, entitled "Joining Words to the World: How and Why We Name Things in Nature". James recounted his growth as an artist, fisherman, and naturalist from his lifetime experiences and how these influenced his artistic interpretations of fish and birds, many of which he showed to the audience.

At the Chapter's annual business meeting Treasurer Glenn Chamberlain reported that the Chapter has over $19,000 in available funds and is in good financial shape. Professionalism Chair Sean Lucey noted the importance of members nominating individuals or organizations for the various Chapter awards, which have been scarce in recent years. Members approved a motion that the Chapter will support a bid from Boston to host the 2018 Parent Society Meeting. At this time, this notion has received support from NOAA Fisheries-Northeast Fisheries Science Center and the Massachusetts Division of Marine Fisheries. It is hoped that other agencies and organizations within the tri-state region will join in and provide support or resources towards this meeting. Sean Lucey reported that the city of Providence is independently pursuing a bid for this national conference. Sean also asked for topics for workshops, which would be held for the benefit of Chapter members. The goal is to have a workshop organized and scheduled before next summer.

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Karina Mrakovcich (right) presents Jan-Michael Hessenauer with the Saul B. Saila Best Student Paper Award

Students from the UConn sub-unit dish out Dairy Bar ice cream

Chapter and Subunit Updates

Update from the Southern New England Chapter

(continued from previous page)

Several awards were given in conjunction with the annual Chapter business meeting. Jan-Michael Hessenauer of the University of Connecticut was awarded the Saul B. Saila Best Student Paper Award for his presentation at the last winter meeting entitled "Looking for Patterns of Fisheries Induced Evolution in Largemouth Bass Populations from Historically Fished and Unfished Lakes". It was announced that Ryan Knotek of the University of New England won the Best Student Poster Award for "The Survival of Rajids Discarded in the New England Scallop Dredge Fisheries". Kasey Pregler of the University of Connecticut and Owen Nichols of the University of Massachusetts received Student Travel Awards to defray costs in attending the AFS National Meeting. Tracy Maynard was presented a Special Achievement Awards for her efforts on the Education Committee in promoting and recognizing student achievements. Greg Skomal of the Massachusetts Division of Marine Fisheries was given the Award of Excellence for his outstanding work in the research and conservation of sharks, particularly the white shark in Atlantic waters.

Student presenters included Sydney Marcks, Patrick Vogt, Kasey Pregler, and Jan-Michael Hessenauer

At the close of the business meeting, Heidi Fitzpatrick assumed the office of President. Her first action was to present the now Past-President Syma Ebbin with a Certificate of Appreciation for her services while as President.

Syma Ebbin (left) receives a Certificate of Appreciation from Heidi Fitzpatrick for her service as chapter president

Tracy Maynard receives the Chapter Special Achievement Award from Sean Lucey

Glenn Chamberlain ascended to the office of President-Elect and Stephen Dwyer was elected as the new Secretary-Treasurer. The next Chapter meeting is tentatively scheduled to be held in January 2015, at a location in Rhode Island. Note that this meeting will include posters as well as oral presentations. Also, pending additional planning, next summer's meeting may be held at the University of Massachusetts-Dartmouth campus

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Chapter and Subunit Updates

Update from the Southern New England Chapter

(continued from previous page)

Greg Skomal (right) receives the Chapter's Award of Excellence from Sean Lucey

James Prosek spoke about his art and connections to the natural world, including fish and fishing.

Update from the Maine Student Sub-Unit

The University of Maine student sub-unit enjoyed another successful year! Last fall and spring the sub-unit held many meetings and hosted several guest speakers, including UMaine graduate Dimitry Gorsky, a fisheries biologist with the USFWS. Many of our student members participated in the 2014 Atlantic Salmon Ecosystems Forum in January, and the annual Maine Cooperative Fish and Wildlife Research Unit meeting in April. In early April, the sub-unit hosted a new event, an R workshop led by a few of our student members. The workshop focused on using basic functions in the statistical program, and was attended by undergraduates, graduate students, and faculty from the sub-unit and the UMaine chapter of The Wildlife Society (TWS). Throughout the spring, members participated in the Flat Fish project as part of the World Fish Migration Day celebration.

Outgoing Sub-Unit President Andrew O'Malley holds a flat sturgeon in the Penobscot River as part of World Fish Migration Day's Flat Fish campaign to raise awareness of migratory fishes.

Chapter and Subunit Updates

Update from the Maine Student Sub-Unit

(continued from previous page)

Graham Griffin hauls ice during a winter gill-netting effort as part of an ongoing smelt study. "This is wicked hahdcore, bub."

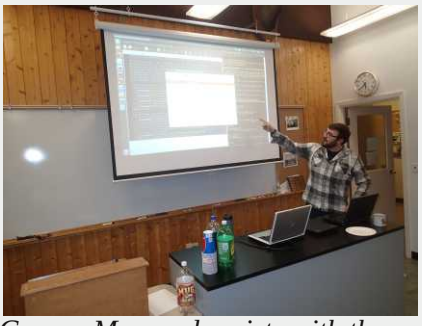
In May, the sub-unit assisted the Penobscot River Restoration Trust in its annual Penobscot River clean up, and continued its victorious streak in the annual bowling night showdown with the UMaine student chapter of TWS. This August, many of our members will be attending the 2014 American Fisheries Society meeting in Quebec City.

The student sub-unit is pleased to announce new officers for the 2014 – 2015 school year: President Dan Weaver; Vice President Lisa Izzo; Secretary Marie Martin; and Treasurer Meg Begley. This year, we hope to increase student enrollment and involvement through continued community outreach, workshops, and seminars.

Students and faculty enjoy a night of pizza and computer programming as part of our first annual R workshop.

Andrew O'Malley, Rebecca Fontes, and Betsy Irish collecting smelt broodstock.

Rebecca Fontes holds a flat river herring and a live river herring at the Souadabscook Stream.



George Maynard assists with the programming in R workshop.

Fisheries in the News

Atlantic Salmon in Warmer Waters

Recent Study Shows Cardiac Plasticity May Help Salmon Cope with Global Climate Change

by Lisa Izzo

Atlantic salmon have been affected by many anthropogenic changes in recent decades, with global climate change becoming an increasing threat to wild populations. While some species of fish have the option to move to cooler waters as temperatures warm, salmon return to natal rivers to spawn each year, making climate change a problem for a species already in decline throughout much of its range. A recent study, however, suggests that there may be hope that wild Atlantic salmon could adapt to warming temperatures.

The study, conducted by a group of researchers from the University of Oslo and the University of British Columbia, observed cardiac plasticity in fish from two populations of Atlantic salmon in Europe. Funded by the Norwegian Research Council, the study addressed questions about how climate change could affect salmon distribution.

The authors originally hypothesized that the two populations, from the northern (Alta River in Norway) and southern (Dordogne River in France) limits of the European distribution, would be locally adapted to their thermal environment. Eggs from both of the wild populations were hatched in a nursery and reared at either 12ºC or 20ºC for a few months before testing. The results differed from the original hypothesis, with fish from both populations responding similarly to temperature increases over short periods of time.

Researchers discovered that fish raised in 12ºC water could handle temperatures up to 21-23ºC before developing cardiac arrhythmias, whereas fish raised in 20ºC didn't develop cardiac arrhythmias until 27.5ºC. This was true for both the Alta River salmon and the Dordogne River salmon, despite coming from different natural environments.

"The results are surprising. A fish faced with uncomfortably warm temperatures might relocate or even die if it is too extreme. Here we have evidence for warm acclimation of a commercially and culturally important fish species," said Tony Farrell, one of the authors on the study and Chair in Sustainable Aquaculture at the University of British Columbia, in a press release by UBC published in mid-July. This study demonstrates that the plasticity of maximum cardiac performance in Atlantic salmon is not based on local adaptation, but instead based on individual thermal history. This plasticity may help the species cope with warming waters from climate change.

Lisa Izzo is a graduate research assistant at the University of Maine studying upstream migration of Atlantic salmon. She can be contacted at lisa.izzo@maine.edu

The study was recently published in Nature Communications. For more information, please visit:
Media Release-University of British Columbia
http://news.ubc.ca/2014/07/17/atlantic-salmon-also-show-capacity-to-adapt-to-warmer-waters/

Journal Reference:
Anttila, K., Couturier, C.S., Øverli, Ø., Johnsen, A., Marthinsen, G., Nilsson, G.E., & Farrell, A.P. Atlantic salmon show capability for cardiac acclimation to warm temperatures. Nature Communications, 5:4252 DOI: 10.1038/ncomms5252 (2014).

Fisheries in the News

Crowdfunding for Genetic Sequencing of Peacock Bass

by Jocelyn Runnebaum

Amazonian peacock bass are facing increasing challenges from overexploitation and habitat degradation. Population structures for peacock bass are not well defined due to genetic variation in the face of natural selection in different environments. Genetic variation among sub-populations may allow peacock bass to better adapt to specific environments, thus making sub-populations unique and not interchangable. Researchers at Rutgers and Texas A&M University are seeking to raise funds ($7,120) through Experiment.com to use next-generation sequencing technology to analyze peacockbass samples they have already obtained. This research is aimed at understanding the genetic and ecological divergence of peacock bass populations to provide better management tools.

Find out more at Amazon Fishing News http://acuteangling.com/Newsletters/14SummerAAnews2.pdf or view their YouTube video at http://youtu.be/FanE7-a0Wyk.
To donate visit the Experiment.com site at https://experiment.com/projects/whycan-t-amazon-fishes-adapt-to-extreme-environments

Jocelyn Runnebaum is a graduate research assistant at the University of Maine studying the discard mortality rate of cusk in the lobster fishery. She can be contacted at jocelyn.runnebaum@maine.edu

Sea Lamprey as Vectors of Marine-Derived Nutrients in Freshwater Streams

by Daniel Weaver

Spawning lamprey in Sedgeunkedunk Stream.

Historically, many freshwater systems in Maine were linked to the marine environment by spawning migrations of adult anadromous fishes. These fish served as vectors of marine-derived nutrients that were transported into freshwater and incorporated into stream and lake food webs. Many anadromous fish populations have declined due to migration barriers, habitat loss, and overfishing thereby reducing or eliminating nutrient subsidies to these systems. We examined the nutrient dynamics of semelparous sea lamprey carcasses. In the laboratory, carcass decay liberated phosphorus (NH_4^+) and nitrogen (NO_3^-) for up to three weeks with faster decay at warmer temperatures. In the field, nutrients from carcasses placed in a small stream enriched the system over a three week period. Nutrient diffusing substrates were used to demonstrate increased algal growth and nitrogen limitation in the stream. Algal growth (chlorophyll a) increased by 57-71% in the presence of lamprey carcasses. This research provides quantitative results as to the ecological role of anadromous sea lamprey and underscores the importance of connectivity to coastal stream systems.

Daniel Weaver is a graduate research assistant at the University of Maine studying the effects of spawning sea lamprey on freshwater systems. He can be contacted at daniel.weaver@maine.edu.

Fisheries in the News

A Collaborative Approach to Bycatch Conservation Research

by Jocelyn Runnebaum

Fisheries biologists and anthropologists from the University of Maine have teamed up with Maine lobster harvesters to study bycatch in the Maine lobster fishery. The lobster fishery is now Maine's bread-and-butter fishery supporting several fishing communities and over 5,000 harvesters. Bycatch remains a sensitive topic in many U.S. fisheries due to the increase in regulations and operating costs to fishermen. Species conservation is an important aspect of our society, a decision that arises in several congressional acts over the past 100 years. The Magnuson-Stevens Fishery Conservation and Management Act reaffirms this decision through requiring bycatch reduction or reducing bycatch mortality in all U.S. fisheries. Cusk (Brosme brosme) are considered a NOAA "Species of Concern" and are a "Candidate Species" for the Endangered Species Act due to declining populations over the past 50 years. Cusk has a seasonal interaction with the Maine lobster fishery with a perceived discard mortality rate of 100% due to barotrauma. UMaine researchers are investigating the effectiveness of recompression to treat barotrauma and increase the chance of survival of cusk. This research is also looking into the perceptions of fisheries resources and bycatch within industry, management, and science communities. For the official news story please visit: http://umaine.edu/mitchellcenter/home/news/news-2/ssi-funded-team-works-with-lobstermen-to-study-fish-caught-in-traps/

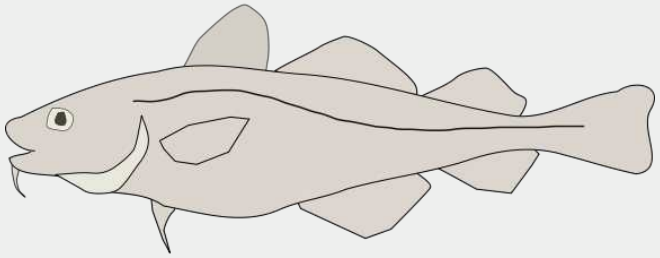
Jocelyn Runnebaum is a graduate research assistant at the University of Maine studying the discard mortality rate of cusk in the lobster fishery. She can be contacted at jocelyn.runnebaum@maine.edu.

Recent Publications

Impacts of seasonal stock mixing on the assessment of Atlantic cod in the Gulf of Maine

Cao, J., Truesdell, S. B., and Chen,Y. (2014). Impacts of seasonal stock mixing on the assessment of Atlantic cod in the Gulf of Maine. – ICESJournal of Marine Science, doi: 10.1093/icesjms/fsu066.

Atlantic cod (Gadus morhua) in the Northwest Atlantic off New England and southern Atlantic Canada exhibit a complex population structure. This region has three independently assessed stocks [Georges Bank, Gulf of Maine (GOM), and the 4X stock], all of which are known to mix with each other. Assessments of these stocks, however, assume no interpopulation mixing. Using simulations, we evaluated impacts of ignoring mixing resulting from seasonal migrations on the GOM assessment. The dynamics of the three stocks were simulated according to different scenarios of interstock mixing, and a statistical catch-at-age stock assessment model was fitted to the simulated GOM data with and without mixing. The results suggest that, while mixing causes measurable bias in the assessment, under the conditions tested, this model still performed well. Of the bias that does exist, spawning-stock biomass estimates are relatively sensitive to mixing compared with estimates of recruitment and exploitation rate. The relative timing of seasonal migration of the three stocks plays a critical role in determining the magnitude of bias. The scale and trends among years in the bias were driven by how representative the catch and survey data were for the GOM stock; this representation changed with the mixing rates.



An evaluation of an inshore bottom trawl survey design for American lobster (Homarus americanus) using computer simulations

Cao, J., Y. Chen, J.-H. Chang, and X. Chen. 2014. An evaluation of an inshore bottom trawl survey design for American lobster (Homarus americanus) using computer simulations. J. Northw. Atl. Fish. Sci., 46: 27–39. doi:10.2960/J.v46.m696

This paper evaluates the performance of six possible sampling designs to estimate the population abundance index for American lobster using computer simulations. These designs include simple random sampling (SRS), systematic sampling (SYS) and stratified random sampling with four stratification schemes (i.e., based on region, depth, sediment and region × depth). For the stratified random design with region and depth being used for stratification, we evaluated the performances of different strategies for allocating sampling efforts. Simulations were implemented on the "true" populations which were estimated annually from 2002 to 2008 for both spring and fall based on a general additive model model developed in a separate study. Relative Estimation Error (REE), Relative Bias (RB) and design effect were used to measure the precision, accuracy and efficiency of mean estimation for different designs. On average, SYS tended to yield the most precise and efficient estimate of mean with specified sample size. However, its estimates tended to be biased and its performance varied with sample sizes and realizations of "true" population, thus changed with lobster distribution. Appropriate stratification, such as using depth to determine strata, significantly improved the precision and efficiency over SRS. Sediment, which is related to lobster distribution, was found to have little contribution to the improvement of the performance over SRS when it is used to determine strata. Also, allocating samples to each stratum based on variance or mean of previous year improved precision and efficiency. This study suggests that current design (i.e., region-depth stratified design) used in the survey had stable performance across years and seasons.

Recent Publications

Looking east along the face of the former Veazie Dam on the Penobscot River. The dam was removed in 2013.

An assessment of fish assemblage structure in a large river

Kiraly, I. A., Zydlewski, J., & Hayes, D. (2014). An assessment of fish assemblage structure in a large river doi:10.1002/rra

The Penobscot River drains the largest watershed in Maine and once provided spawning and rearing habitats to 11 species of diadromous fishes. The construction of dams blocked migrations of these fishes and likely changed the structure and function of fish assemblages throughout the river. The proposed removal of two main-stem dams improved upstream fish passage at a third dam, and construction of a fish bypass on a dam obstructing a major tributary is anticipated to increase passage of and improve habitat connectivity for both diadromous and resident fishes. We captured 61,837 fish of 35 species in the Penobscot River and major tributaries, through 114 km of boat electrofishing. Patterns of fish assemblage structure did not change considerably during our sampling; relatively few species contributed to seasonal and annual variability within the main-stem river, including smallmouth bass Micropterus dolomieu, white sucker Catostomus commersonii, pumpkinseed Lepomis gibbosus, and golden shiner Notemigonus crysoleucas. However, distinct fish assemblages were present among river sections bounded by dams. Many diadromous species were restricted to tidal waters downriver of the Veazie Dam; Fundulus species were also abundant within the tidal river section. Smallmouth bass and pumpkinseed were most prevalent within the Veazie Dam impoundment and the free-flowing river section immediately upriver, suggesting the importance of both types of habitat that supports multiple life stages of these species. Further upriver, brown bullhead Ameiurus nebulosus, yellow perch Perca flavescens, chain pickerel Esox niger, and cyprinid species were more prevalent than within any other river section. Our findings describe baseline spatial patterns of fish assemblages in the Penobscot River in relation to dams with which to compare assessments after dam removal occurs.

Comparison of Two Sampling Designs for Fish Assemblage Assessment in a Large River

Ian A. Kiraly, Stephen M. Coghlan Jr., Joseph Zydlewski & Daniel Hayes (2014) Comparison of Two Sampling Designs for Fish Assemblage Assessment in a Large River, Transactions of the American Fisheries Society, 143:2, 508-518

We compared the efficiency of stratified random and fixed-station sampling designs to characterize fish assemblages in anticipation of dam removal on the Penobscot River, the largest river in Maine. We used boat electrofishing methods in both sampling designs. Multiple 500-m transects were selected randomly and electrofished in each of nine strata within the stratified random sampling design. Within the fixed-station design, up to 11 transects (1,000 m) were electrofished, all of which had been sampled previously. In total, 88 km of shoreline were electrofished during summer and fall in 2010 and 2011, and 45,874 individuals of 34 fish species were captured. Species-accumulation and dissimilarity curve analyses indicated that all sampling effort, other than fall 2011 under the fixed-station design, provided repeatable estimates of total species richness and proportional abundances. Overall, our sampling designs were similar in precision and efficiency for sampling fish assemblages. The fixed-station design was negatively biased for estimating the abundance of species such as Common Shiner Luxilus cornutus and Fallfish Semotilus corporalis and was positively biased for estimating biomass for species such as White Sucker Catostomus commersonii and Atlantic Salmon Salmo salar. However, we found no significant differences between the designs for proportional catch and biomass per unit effort, except in fall 2011. The difference observed in fall 2011 was due to limitations on the number and location of fixed sites that could be sampled, rather than an inherent bias within the design. Given the results from sampling in the Penobscot River, application of the stratified random design is preferable to the fixed-station design due to less potential for bias caused by varying sampling effort, such as what occurred in the fall 2011 fixed-station sample or due to purposeful site selection.

Recent Publications

The Status of Environmentally Enhanced Hydropower Turbines

El estado de las turbinas hidroeléctricas ambientalmente mejoradas

Timothy W. Hogan, Glenn F. Cada & Stephen V. Amaral (2014) The Status of Environmentally Enhanced Hydropower Turbines, Fisheries, 39:4, 164-172, DOI: 10.1080/03632415.2014.897195

Environmentally enhanced hydroelectric turbines have been developed to reduce injury and mortality of downstream-migrating fishes and to improve downstream water quality. Significant progress has been made in the past decade in the development of such turbines and in the methods to evaluate their biological and power generating performance. Full-scale demonstrations have verified the performance of Voith Hydro's minimum gap runner turbine, which maintains high survival rates for fish while producing more power than conventional designs. Despite a promising pilot study and subsequent design enhancements, similar full-scale demonstrations of the fish-friendly Alden turbine have yet to be conducted. Furthermore, the tools with which to predict and evaluate the performance of new turbine designs are available and are continually being improved. This article provides a status update of advances in this field over the past decade.

Las turbinas hidroeléctricas ambientalmente mejoradas se desarrollaron para reducir los daños y mortalidad en los peces migratorios en los ríos y para mejorar la calidad del agua en éstos. Se ha logrado un progreso significativo en la última década en el desarrollo de las turbinas y de los métodos de evaluación de su desempeño en cuanto a generación de poder e impacto biológico. Demostraciones a escala real han servido para verificar el desempeño de una hidroturbina Voith de mínimo distanciamiento, la cual mantiene altas tasas de supervivencia en los peces al mismo tiempo que produce mayor cantidad de poder en comparación a los diseños tradicionales. Pese al prometedor estudio piloto y a las subsecuentes mejorías en el diseño, aún están por realizarse demostraciones similares en escala real de la turbina Alden “ictiológicamenteamigable”. De hecho, las herramientas con las que se predice y evalúa el desempeño de nuevos diseños de turbinas, ya están disponibles y se encuentran en un continuo proceso de mejoramiento. Este artículo muestra una actualización del estado y avances en este campo durante la última década.

Anadromous sea lampreys (Petromyzon marinus) are ecosystem engineers in a spawning tributary

Hogg, R. S., Coghlan, S. M., Zydlewski, J., & Simon, K. S. (2014). Anadromous sea lampreys (Petromyzon marinus) are ecosystem engineers in a spawning tributary. Freshwater Biology, 59(6), 1294–1307. doi:10.1111/fwb.12349

1. Sea lampreys (Petromyzon marinus) disturb the substratum during nest construction and alter the physical habitat, potentially affecting other stream organisms. We quantified differences in depth, velocity, fine-sediment coverage, embeddedness, intragravel permeability and benthic invertebrate assemblages (density and diversity) among nest mounds, nest pits and undisturbed reference locations over a 4-month period after June spawning.
2. In 2010 and 2011, immediate and persistent effects of nest construction were assessed in summer (July) and in autumn (late September to early October), respectively. Randomly selected nests were sampled annually (25 each in summer and autumn).
3. Nest construction increased stream-bed complexity by creating and juxtaposing shallow, swift, rocky habitat patches with deep, slow, sandy habitat patches. Mounds had a 50–143% less cover of fine sediment, and a 30–62% reduction in embeddedness, compared to pits and reference locations. These physical changes persisted into the autumn (almost 4 months).
4. Five insect families contributed 74% of the benthic invertebrate abundance: Chironomidae (27%), Hydropsychidae (26%), Heptageniidae (8%), Philopotamidae (7%) and Ephemerellidae (6%). Densities of Hydropsychidae, Philopotamidae and Heptageniidae were up to 10 times greater in mounds than in pits and adjacent reference habitat. In summer, mounds had twice the density of Chironomidae than did pits, and 1.5 times more than reference habitats, but densities were similar among the habitats in autumn.
5. These results suggest that spawning sea lampreys are ecosystem engineers. The physical disturbance caused by nest-building activity was significant and persistent, increasing habitat heterogeneity and favouring pollution-sensitive benthic invertebrates and, possibly, drift-feeding fish.

Recent Publications

A regional neural network ensemble for predicting mean daily river water temperature

DeWeber, J. T., & Wagner, T. (2014). A regional neural network ensemble for predicting mean daily river water temperature. Journal of Hydrology, 517, 187–200. doi:10.1016/j.jhydrol.2014.05.035

Water temperature is a fundamental property of river habitat and often a key aspect of river resource management, but measurements to characterize thermal regimes are not available for most streams and rivers. As such, we developed an artificial neural network (ANN) ensemble model to predict mean daily water temperature in 197,402 individual stream reaches during the warm season (May–October) throughout the native range of brook trout Salvelinus fontinalis in the eastern U.S. We compared four models with different groups of predictors to determine how well water temperature could be predicted by climatic, landform, and land cover attributes, and used the median prediction from an ensemble of 100 ANNs as our final prediction for each model. The final model included air temperature, landform attributes and forested land cover and predicted mean daily water temperatures with moderate accuracy as determined by root mean squared error (RMSE) at 886 training sites with data from 1980 to 2009 (RMSE = 1.91 _C). Based on validation at 96 sites (RMSE = 1.82) and separately for data from 2010 (RMSE = 1.93), a year with relatively warmer conditions, the model was able to generalize to new stream reaches and years. The most important predictors were mean daily air temperature, prior 7 day mean air temperature, and network catchment area according to sensitivity analyses. Forest land cover at both riparian and catchment extents had relatively weak but clear negative effects. Predicted daily water temperature averaged for the month of July matched expected spatial trends with cooler temperatures in headwaters and at higher elevations and latitudes. Our ANN ensemble is unique in predicting daily temperatures throughout a large region, while other regional efforts have predicted at relatively coarse time steps. The model may prove a useful tool for predicting water temperatures in sampled and unsampled rivers under current conditions and future projections of climate and land use changes, thereby providing information that is valuable to management of river ecosystems and biota such as brook trout.

Toxicity of the harmful dinoflagellate Cochlodinium polykrikoides to early life stages of three estuarine forage fish

Rountos, K., Tang, Y., Cerrato, R., Gobler, C., & Pikitch, E. (2014). Toxicity of the harmful dinoflagellate Cochlodinium polykrikoides to early life stages of three estuarine forage fish. Marine Ecology Progress Series, 505, 81–94. doi:10.3354/meps10793

Harmful algal blooms (HABs) caused by the dinoflagellate Cochlodinium polykrikoides have increased in geographic extent, frequency, and duration in coastal areas worldwide. These blooms have negatively impacted many coastal fisheries, causing mass mortalities of both wild and farmed fish. Forage fish species may be particularly susceptible to HABs as they feed on plankton and are highly abundant in coastal ecosystems where these blooms occur. While mortalities associated with HABs have been well documented for juvenile and adult fish, the potential impacts to early life stages (i.e. embryos and eleutheroembryos) have not been explored. We conducted a series of toxicity experiments using a clonal laboratory culture of C. polykrikoides and 3 forage fish species (Atlantic silverside Menidia menidia, inland silverside M. beryllina, and sheepshead minnow Cyprinodon variegatus) all common on the US East Coast. Our experiments demonstrated that C. polykrikoides caused mortalities in both embryos and eleutheroembryos, but that sensitivity to acute toxicity differed among fish species (M. beryllina > M. menidia > C. variegatus) and among life stages (eleutheroembryos > embryos). Although embryos were somewhat resistant to C. polykrikoides biotoxins until they hatched, once they hatched, they experienced rapid mortality and impaired swimming ability. By testing ecologically relevant exposure times to C. polykrikoides, we found that eleutheroembryos can become incapacitated relatively quickly (i.e. within hours), and that surviving fish could recover swimming ability following removal from C. polykrikoides exposure. This research provides the first evidence of sublethal impacts on fish exposed to C. polykrikoides, and advances understanding of the potential ecosystem impacts of this harmful alga.

Recent Publications

Managing a Marine Stock Portfolio: Stock Identification, Structure, and Management of 25 Fishery Species along the Atlantic Coast of the United States

Richard S. McBride (2014) Managing a Marine Stock Portfolio: Stock Identification, Structure, and Management of 25 Fishery Species along the Atlantic Coast of the United States, North American Journal of Fisheries Management, 34:4, 710-734, DOI: 10.1080/02755947.2014.902408

In this review, stock identification methods used, resulting stock numbers and boundaries, and assessment and management context were explored for all 25 species managed by the Atlantic States Marine Fisheries Commission (ASMFC). This included invertebrates and vertebrates distributed between Maine and Florida, with a few species ranging across all these states and some ranging into the Gulf of Mexico and the Canadian Maritimes. The effects of larval dispersal or mixing of adults in the marine environment were evident. Marine and catadromous spawners were recognized and treated as a unit stock (e.g., northern shrimp American Eel, Atlantic menhaden, bluefish, tautog), a metapopulation (American lobster, Atlantic herring), or two stocks, north and south of Cape Hatteras, a major biogeographic boundary, (black sea bass, scup, red drum, summer flounder). Estuarine and anadromous spawners were structured and managed at a finer spatial scale (horseshoe crab, Atlantic sturgeon, American shad and the river herrings blueback herring, and alewife, and spotted seatrout). A broad suite of stock identification methods have been applied to ASMFC species and reviewed here in five categories: life history traits, other phenotypic traits, genetic traits, natural marks, and applied marks. An interdisciplinary mix of methods has been achieved for a few species (striped bass, winter flounder), but only a few or no stock identification methods have been applied to others (spiny dogfish, hickory shad, spot, Spanish mackerel). Clinal phenotypic variation has contributed to several long-standing debates about stock structure; some of these have been recently reevaluated as a unit stock (Atlantic croaker, weakfish), and others are still debated. For some ASMFC species, other priorities (e.g., bycatch) dominate the uncertainty of the assessment or management process. Otherwise, stock identification remains a research priority for most of these species. Continued research of this subject should consider (1) research priorities tabulated by ASMFC review panels, (2) strategic use of interdisciplinary stock identification methods, (3) use of experiments or reaction norms to separate phenotypes from genotypes, (4) genetic surveys at a seascape scale, (5) demonstration of contingent (nongenetic) structure and its implications for management, and (6) simulation modeling. Obstacles to adopting finer-scale structure into assessments or management of ASMFC fisheries include: (1) multiple stock units are apparent but boundaries are not clear, (2) monitoring requirements for smaller areas or for mixed-stock catches are not cost effective, or (3) mixing rates within a metapopulation or across biogeographic boundaries are poorly described.

Recent Publications

Predicting use of habitat patches by spawning horseshoe crabs (Limulus polyphemus) along a complex coastline with field surveys and geospatial analyses

Landi, A. A., Vokoun, J. C., Howell, P., & Auster, P. (2014). Predicting use of habitat patches by spawning horseshoe crabs (Limulus polyphemus) along a complex coastline with field surveys and geospatial analyses. Aquatic Conservation: Marine and Freshwater Ecosystems, doi:10.1002/aqc.2440

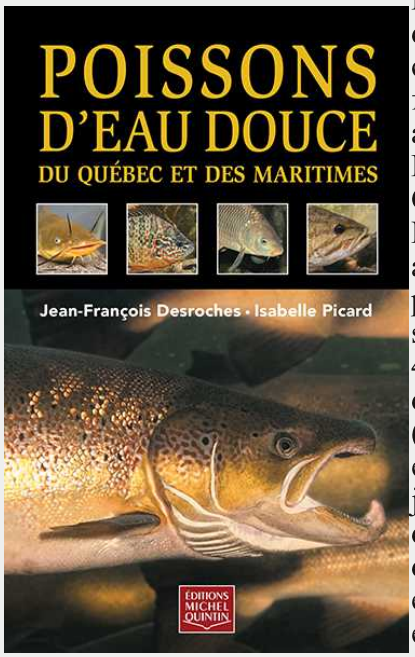
1. This research described coastal habitat characteristics at a landscape scale and followed a geospatial modelling approach to predict the probability of habitat use by the population of Atlantic horseshoe crabs (Limulus polyphemus) in Long Island Sound (LIS, USA). This approach was developed to aid in decision-making regarding management of horseshoe crab spawning locations.
2. Geospatial data layers were created within which beach slope, wave exposure, surface substrate type, and distance from offshore aggregations of crabs (i.e. hotspots) were summarized for beaches in the western, central, and eastern regions of the Connecticut coast of LIS.
3. Spawning abundances derived from field surveys conducted in May and June of 2009 and 2010 were used with remotely-sensed habitat characteristics to develop a resource selection function from a candidate model set based on polytomous logistic regression.
4. A single best model (Akaike weight=0.97) for predicting the probability of habitat use by spawning horseshoe crabs was selected using an information-theoretic approach. The parameter estimates predicted a greater probability of habitat use with increasing slope, decreasing wave exposure, and decreasing distance from offshore hotspots.
5. Small 'pocket' beaches surrounded by rocky headlands, marshes, and developed areas are the typical habitat available to support horseshoe crab spawning in LIS. As spawning densities in LIS are relatively small and suitable spawning habitat is fragmented, geospatial methods are especially useful for identifying high-use sites and maximizing the conservation value of management actions.

Freshwater fish of Quebec and the Maritimes

Poisson d'eau douce du Quebec et des Maritimes

Desroches J-F., & Picard I. (2013). Poisson d'eau douce du Quebec et des Maritimes. Editions Michel Quintin. ISBN: 2894356250, 9782894356258

Finally, the complete and detailed identification guide, the fruit of several years of work: Freshwater fish of Quebec and the Maritimes is for both the amateur outdoorsman and the scientist. There are more than 400 quality color photos (identification, males in spawning colors, females, juveniles…). Fish are well documented by species, including descriptions, similar species, reproduction, habitat, distribution, food, predators, conservation status, and other notes. There is an identification key and photo comparisons for families and comparative species. The book includes up-to-date nomenclature and distribution maps, plus appendices of mussels and crayfish.



Enfin, le guide d'identification complet et détaillé, fruit de plusieurs années de labeur: Poissons d'eau du Québec et des Maritimes comblera autant l'amateur de plein air que le spécialiste. Plus de 400 photos couleur de qualité (identification, males en fraie, femelles, jeunes…). Fiche d'identification bien documentée par espèce: description, espèces semblables, reproduction, habitat, repartition, alimentation, prédateurs, situation de l'espèces, notes. Clé d'identification des familles et galerie de photos comparatives d'espèces. Cartes de répartition et nomenclature les plus à jour. Annexes inédites sur les mulettes et les écrevisses.

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Acknowledgments

The Northeast Fish Rapper is produced by volunteers. It would not be possible without contributed content from Northeast Division members. Our next edition will be published in March 2015. We are looking for writers to contribute to our "Fisheries in the News" section. These news briefs can be based on original research, management actions, or articles published in other news outlets and should range from 350-750 words. If you have a particular interest you wish to write about, let us know! If you would like to be included when we send out a list of potential topics for news briefs, send your name and email address to Jocelyn Runnebaum or George Maynard. Additionally, we are always looking for photographs and artwork to include in the Rapper. If you have interesting pictures from field work, fishing trips, or anything else you'd care to share, send it along, no writing necessary. A big thanks goes out to everyone who contributed to this edition of the Fish Rapper.

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