

WATERSHED WATCH

ST. MARY'S RIVER WATERSHED ASSOCIATION
PO Box 94, St. Mary's City, MD 20686

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OYSTER RESTORATION IN ST. MARY'S RIVER

By Robert W. Paul and Roger D. Stone

W holly contained within St. Mary's County, the St. Mary's River historically was one of the most pristine watersheds on the western side of the Chesapeake Bay and supported a commercially viable oyster fishery. Though still among the cleanest waterbodies on the western side of the Chesapeake Bay, the St. Mary's River watershed is beset by the consequences of rapid development in recent years: increasing pollution and erosion, and declines in water quality and biological diversity.

One important casualty in the St. Mary's River is the native oyster (*Cassostrea virginica*). In the mid-twentieth century the species remained so abundant in the river that the oysters "did not grow to large size, presumably because of overcrowding." But by the mid-1980s the local mortality rate reached 80% for a combination of reasons including principally the arrival of the parasitic diseases MSX and Dermo.

Spat settlement on wild oyster reefs in the river has been poor in recent years, far from sufficient for the river to make a proportional contribution to Maryland's ambitious goal to increase oyster biomass tenfold by 2010 from a 1994 baseline. For

this reason, wrote Dr. Donald W. Meritt, program director at the Horn Point Lab at the University of Maryland Center for Environmental Sciences, that "plans are to greatly expand efforts using hatcheries as tools for oyster rehabilitation in Maryland."

Richard Pelz, founder and proprietor of the Circle C Oyster Ranch on St. Jerome Creek in St. Mary's County, places seed oysters in plastic nets and attaches these to floats where they grow not on the seafloor but close to the surface, somewhat protected from blue crabs by polyurethane mesh. Over 15 years of oyster farming in St. Jerome Creek, though no scientific analysis confirms this, Pelz alleges biodiversity increases near Circle C's cluster of floats. Water quality has also improved, he claims.

The extent to which oysters can "clean up" water is often exaggerated: though their filtration ability is prodigious, they can filter only what comes to them. Nonetheless, Pelz says that improvements in St. Jerome Creek's water quality vouch for their impressive capabilities. The SMRWA-led oyster restoration project, conducted between the fall of 2006 and the fall of 2007, served the broad need to test these assertions and the efficacy of using this method to improve water quality and oyster production in the St. Mary's River. What follows is an abbreviated version of the scientific report prepared after the completion of extensive field studies and lab work. **[Continued on page 2]**



Bob and Kevin prepare a float for return to the water.

SPECIAL POINTS OF INTEREST:

- *Annual Meeting 11 AM, April 12 at Trinity Church Parish Hall*
- *Join the SMRWA discussion group! Check us out at www.SMRWA.org*
- *Receive a free rain barrel by joining today—see page 3*
- *Amendments to Bylaws—page 5*

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HAVE YOU RENEWED YOUR MEMBERSHIP?

If your mailing address label on this newsletter has a red dot on it, then it is time to renew your membership. Take a few minutes to drop a check in the mail to us. Thank you.

Oyster Project continued

Procedures

In the principal SMRWA experiment, ten Circle C kits (each including a 3' by 6' float, three bags containing a total of about 600 seed oysters and securing devices) were deployed in the river near St. Mary's College of Maryland (SMCM) by October 30, 2006. Each of 10 waterfront homeowners who have docks along the St. Mary's River north of St. Inigoes Creek and south of the freshwater St. Mary's River (Tippity Witchity Island) agreed to "host" a Circle C float as well as an adjacent second float containing shells but no live oysters. Owners and locations (Figure 1) of these properties are as follows: Peter and Susan Messitte, Jim and Karen Nutter, Captain Russell Crenshaw, Jr. and Mrs. Flavienne Crenshaw, Doug and Cynthia Gardiner, Gary and Linda Williams, Doug and Robin Cook, Mr. & Mrs. Richard Timbie / Dr. & Mrs. John Harmon, Tom Schmidt, Mr. & Mrs. Robert Maddox, and Elmer & Johnie Brown.

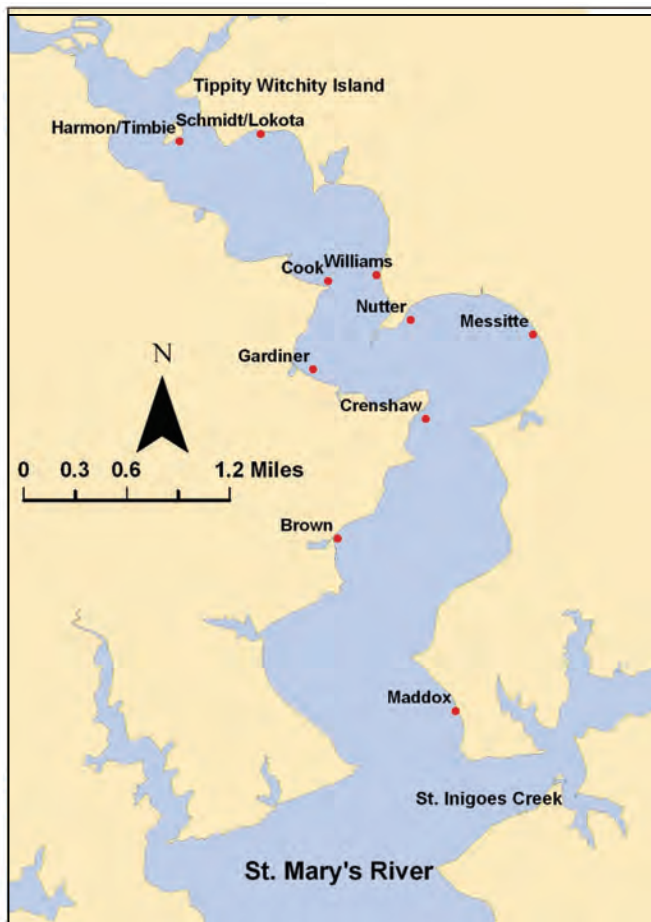


Figure 1. Locations of SMRWA sites where Circle C oyster floats were placed.

Figure 2. Research coordinator, Henry Bush, pulls a float from the St. Mary's River while volunteers record data.



During the winter of 2007, while the live oysters in the floats remained dormant because of 40 degree F or lower temperature water the floats were given regular checks to assure moorings and floats were weathering the winter. Thanks to the combination of very cold weather, ice formation, and very low tides during February 2007, however, most of our original oysters literally froze to death. At three docks we experienced 100% mortality. At only two of the docks did high percentages of oysters survive. We replaced the dead oysters in the early spring of 2007.

Last summer we measured the diversity of organisms colonizing all oyster bags at each site on five different cruises. On each sampling date we left the college dock by 9 a.m. and used the St. Mary's College of Maryland's 25 foot C-Hawk vessel to pull floats from the water. **[Continued on page 3]**



SPRING MEMBERSHIP DRIVE

ATTENTION MEMBERS—Receive a free rain barrel by recruiting a family SMRWA membership from one of your neighbors.

It's easy! Simply ask your neighbor to join the St. Mary's River Watershed Association at the \$50 family membership level. Use the form on page 7 of this newsletter or the form on our web site. Mail the form along with a check payable to SMRWA for \$50 to us and include a note stating who will receive a free rain barrel. Call 301-862-3517 for more information or to arrange a barrel pick up.

WRAS Program Gets Underway

SMRWA has been awarded a \$25,000 Stewardship Grant from the Chesapeake Bay Trust in order to develop a comprehensive management plan for the St. Mary's River and its surrounding drainage basin. Application has also been made to National Oceanic & Atmospheric Administration. Still we will need an additional

\$40,000 to complete this two-year project. We have asked the county commissioners to match these grants with \$30,000—and we need your support in convincing our county commissioners . . .

Please give them a call or drop them a line and tell them that saving the St. Mary's River is important to you and that today's investment

in a plan will greatly increase the county's access to future restoration and preservation grant monies. *\$30,000 spent today could return millions of dollars in revenue to the county over the next ten years.*"

For more information or to become involved in the process, visit:

<http://www.SMRWA.org>
or call Bob at 301-862-3517

The WRAS Program will launch a web site in April. Please look for it:

<http://www.StMarysPlanning.com>

Oyster Project continued

Results

At the conclusion of preliminary experiments, we opened all bags used in all 10 trials. Our objective was to determine if there were significant differences between the bags with live oysters and between the bags with non-living shell. What became clear was that oyster shell that is contained in bags and fastened to floats develops a complex community of surface-dwelling organisms that is similar to a community that would be associated with naturally occurring oyster bars. More specifically, our experiment on the river—as well as smaller concurrent experiments conducted under more controllable conditions at the Chesapeake Bay Field Lab and at St. Mary's College of Maryland—confirm that:

In controlled experiments at CBFL, farm-raised Circle C oysters in bags outperformed bags that contained dead shell in filtering and removing material

from the water. This may seem like a nonsensical result, but dead oyster shells are colonized by organisms that filter water just as oysters do. If this filtration is not assessed, then the results of other experiments can be misinterpreted.

In controlled lab experiments individ-

ual farm-raised Circle C oysters removed significantly greater amounts of sediments and algae from St. Mary's River water than did individual oysters from native oyster beds in the St. Mary's River. **[continued on page 4]**



Controlled environments at the Chesapeake Bay Field Lab—photo courtesy of Kevin Boyle.

Oyster Project continued

Results continued . . .

We expected that the bags with living oyster shell, deployed on the river, would attract a different community of organisms compared to the dead bags. However, this was not the case; there was no difference in content between living and dead bags deployed on the floats. Therefore, the presence of living oysters does not make a significant difference in attracting organisms.

However, the community of organisms found in both living oyster bags and dead shell bags was quite similar to the community of organisms that would be associated with natural oyster bottom. Therefore, floating aquaculture bags provides a good habitat and refuge for other organisms in the estuary (mostly oyster bed-dwelling fish and invertebrates).

The most important scientific finding of this study was that suspended bags of selectively-bred, Circle C oysters in the St. Mary's River behave very much like native oysters do in the bottom oyster beds. They attract the same surface-dwelling organisms, as well as motile invertebrates, and fish that one would find in bottom oyster communities. It seems that the structure of oyster shells within bags provides a good and complex habitat for colonization, regardless of whether the shell is alive or

not. Therefore, **floats promote and sustain oyster reef biological diversity.**

We also found, to our considerable surprise, that non-living shell (and its associated surface colonizing community) filters significant amounts of St. Mary's River water to remove total suspended solids (TSS). Living oysters, however, compared to their non-living counterparts, have a significantly greater capacity to remove TSS from the water column. While we expect that the water quality of the St. Mary's River could be drastically improved by using oyster aquaculture techniques and floats, it is unclear how many floats would be necessary to purge the river of unwanted algae and sediments. Inorganic sediments washing into the river as a consequence of erosion and storm events need to be controlled in other ways.

It is also clear that selectively bred, Circle C oysters are **not the panacea** for all the ills that befall the native *Crassostrea virginica* oyster because winter mortality was significant in this project. This mortality also thwarted our attempts to study Circle C oyster growth in the St. Mary's River. While the reasons for the death of our oysters on floats remains obscure, we do know that using oysters on aquaculture floats has its own set of idiosyncratic problems. For example,

native oysters are largely immune to the problem of long exposure to freezing air temperatures, but oysters stranded on floats during extremely low tides will likely be killed.

Financial Support

The major financial support needed to conduct our experiments came in the form of a \$35,000 grant from the National Fish and Wildlife Foundation. Most welcome supporting grants of \$5,000 each came from the Abell and Spring Creek Foundations and the project could not have been completed without the enthusiastic participation of numerous student and other volunteers.

[continued on page 5]



spring creek foundation

THE ABELL FOUNDATION

FOUNDING MEMBERS OF THE ST. MARY'S RIVER WATERSHED ASSOCIATION

—CONTINUED FROM NOVEMBER—

Sunshine Caterers

Matt Robinson

Sandra Hunt & Ken Reed

Rich Pelz

Leeanne Carr & Carol Edick

Andy Kozak & Becky Boyles

Steve & Dana Van Abbema

Sarah Houde

Cynthia Koenig

Michael & Jody Fagnano

George & Janet Fiackos

Patrick & Jean Murphy

Lee & Karen Soderberg

Kate, Joe, & Quaylen Lamarre

Grant Keiner & Alexis Roberts

Scott Keiner & Bronwen Trice

Elizabeth Keiner

David Ellsworth

The Pototsky Family

Larry & Judy Meyers

Jon & Jennifer Nash

Thomas Holden

Dan Ingersoll & Kate Meatyard

John & Alice Gaskin

Elfreda & Walter Mathis

Jeanne Davis

Scott McGuire

Daniel Eksuzian & Ilona Berk

David & Marilyn Triantos

Bernard & Mary Ridgell

Dave & Marta Kelsey

Nancy & Wayne Hunter**

**This ends our list of Founding Members.

OFFICIAL NOTICE TO SMRWA MEMBERS

*** CHANGES TO THE ASSOCIATION'S BYLAWS ***

During the annual meeting at 11 AM on Saturday, April 12, 2008, at Trinity Church Parish Hall in St. Mary's City, the membership will take up proposed amendments to the Association's Bylaws. The intent of the changes is 1) to facilitate the holding of meetings via electronic means, 2) to more clearly define the proxy vote, and 3) to grant authority to the Board of Directors to make any future amendments to the Bylaws. Specific text of the amendments follows. The full text of the Bylaws, as they were originally written and currently stand, can be found on our web site or downloaded at:

<http://www.smrwa.org/pdfdocs/By-Laws.pdf>

Teleconference Meetings. Subject to the requirement of notice, members of the Board of Directors or of any committee thereof may participate in and hold a meeting by means of a conference telephone or similar communications equipment if all persons participating can hear each other at the same time, and participation in the meeting shall constitute presence in person at the meeting.

Electronic Mail Voting. As may occur from time to time and necessitated by urgency and time constraints, any action required to be taken at a meeting of the Board of Directors may be taken exclusively by electronic mail without an in-person meeting as long as the exact text to be considered and/or the exact phrasing of the motion to be considered is transmitted to the Directors; and that, all Directors are given a stated time period for transmission of their vote on such matter of at least 72 hours and not to exceed ten days from the time that the electronic mail requesting such action is transmitted. Quorum requirements for such electronic mail voting will be the President's reception of electronic mail votes from a majority of Directors.

Amendments. These Bylaws may be amended by a two-thirds vote of Directors present at a regular or special meeting provided that notice of the purpose and the text of the amendment has been stated in the notice of the meeting.

Oyster Project continued

Conclusion

As oyster aquaculture experiments proliferate around the Bay, we hope and expect that these results will provide guidance to others. Our full report will soon be posted on the SMRWA website, and also made available free of charge on a CD.



Workers hoist floats onto dock for inspection.

I would like to become a member of the SMRWA

| Annual Membership Options | Price |
|---|----------|
| <input type="checkbox"/> Individual | \$35.00 |
| <input type="checkbox"/> Family | \$50.00 |
| <input type="checkbox"/> Senior | \$20.00 |
| <input type="checkbox"/> Student/Limited Income | \$10.00 |
| <input type="checkbox"/> Corporate <i>suggested</i> | \$500.00 |
| <input type="checkbox"/> Other | _____ |

Total: _____

Yes, I would like to become an active member/volunteer

Please make checks payable to:
St. Mary's River Watershed
Association and mail this form
along with your check to the
address below:

PO Box 94
St. Mary's City, MD 20686

Name

Address

Email Address

Phone



OUR MISSION

To protect, improve, and promote the well-being of the St. Mary's River Watershed through the collaborative efforts of economic, agricultural, environmental, social, cultural, and political stakeholders in the community.

We're on the web!
www.smrwa.org

Notice to Members (Public is invited)

SMRWA Annual Meeting—11 AM, Saturday, April 12

Trinity Church Parish Hall, St. Mary's City
Located across from Kent Hall
on Trinity Church Road
Featured speaker:



Fred Tutman

Patuxent Riverkeeper Fred Tutman

*Wealth and pollution—
do the common people have any rights?*

Lunch will be served. Bring a friend.

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NOTICE: ANNUAL MEETING
11 AM Saturday, April 12 at Trinity Church
Parish Hall—Bring a friend.

