

**Fishing and Boating Services
FY 2016 Budget Report
to the Sport Fisheries Advisory Commission
October 2016**

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INTRODUCTION

On September 1, 2016, as part of a reorganization within the Department of Natural Resources, Fisheries Service was renamed Fishing and Boating Services. While the Unit's name changed, its mission relative to fisheries remained the same. This report to the Sport Fisheries Advisory Commission focuses only on revenues and expenditures related to the Unit's fisheries-related funding sources and activities as described below.

Fishing and Boating Services' fisheries-related responsibilities include assessing, protecting, conserving, fairly allocating, and promoting the sustainable utilization of wild and farm-raised fish resources of Maryland for balanced ecological and socio-economic benefits. This is accomplished through scientific investigation, application of data, and proactive involvement with an informed citizenry. Fishing and Boating Service's fisheries-related responsibilities fall into four core functions:

- 1) Protect, conserve and enhance fisheries resources.
- 2) Provide and enhance fishing opportunities, including access.
- 3) Provide sustainable economic opportunities.
- 4) Promote and protect fisheries resources through public outreach and education.

Revenue from sport fishermen provides funding for almost half of all fisheries programs in Maryland. This is from the sales of fishing licenses, gasoline sales surcharges and a federal excise tax on sport fishing tackle and related equipment. Other fund sources include general funds from state taxpayer dollars, commercial license sales, state reimbursable funds such as Maryland Department of Transportation (MDOT), and grants from federal taxpayer dollars.

Natural Resources Article § 4-745 requires the Maryland Department of Natural Resources (the department) to publicly report annually the amount of sport fishing license revenues credited to and expended from the Fisheries Research & Development Fund (FR&D). In the annual preparation of plans to expend sport fishing revenues credited to FR&D, the department is also required to solicit the advice and opinions from the Sport Fisheries Advisory Commission, representative fishing and boating associations, and other interested parties. The reporting requirement is different for nontidal sport fishing license fees. For sport fishing fees associated with the nontidal fund known as the Fisheries Management and Protection Fund (FM&P), the department is required to "publicly report annually the amounts collected and the expenditures."

Because the department would not be able to manage the State's diverse and high quality fishery resources without revenue from fishing licenses, it is vital that anglers understand the importance of their contribution and how their license dollars are used. The department is committed to informing sport fishermen and providing a comprehensive report on all sport fishing license fees and other revenue sources. This report meets statutory reporting requirements, but more importantly, it is intended to provide information which helps anglers and the public understand the magnitude of their contributions and the importance of these contributions to funding programs which benefit both fisheries resources and the sport fishermen who use those resources.



BUDGET

Reporting Period and Budget Terminology

This report provides budget information for revenues and expenditures during fiscal year 2016 (FY 2016), the most recently completed fiscal year. FY 2016 was July 1, 2015 through June 30, 2016. In order to understand the information in this report, here are a few terms you will need to know:

- **SPECIAL FUNDS** – revenue from recreational fishing license sales, commercial fishing license sales and oyster bushel tax, aquaculture fees, gasoline sales surcharges (see explanation under Revenues), and agreements with non state organizations (i.e. private company’s donation for Atlantic sturgeon restoration). Recreational tidal license sale and fee revenues are deposited into the Fisheries Research and Development Fund (FR&D). Nontidal license sale revenues are deposited into the Fisheries Management and Protection Fund (FM&P).
- **FEDERAL FUNDS** – revenue from a tax on sport fishing tackle purchases (Wallop-Breaux), and federal partner grant awards from federal taxes.
- **GENERAL FUNDS** – revenue from State taxes.
- **REIMBURSABLE FUNDS** – revenue from Maryland State agencies such as Maryland Department of Transportation (MDOT).



License Sales, Revenues and Expenditures

A. License Sales

Maryland recreational fishing and crabbing licenses were sold by calendar year until September 30, 2015, when we transitioned to a 365 day license. Calendar year recreational license sales from 2011 to 2015 are shown in Table 1. License changes, including the comprehensive Coastal & Bay fishing license, short term licenses expanded to 7 days, creation of separate trout stamp for nonresidents, and Maryland Saltwater registration, were added in 2011.

There were 302,781 unique anglers in Maryland that purchased a tidal or nontidal fishing license in calendar year 2015. This does not include any free registrations or licenses, anglers less than 16 years of age and/or individuals who fish on free fishing days. The method of reporting the number of unique anglers has changed for this report. It is now calculated in a manner that is consistent with the reporting requirements for Wallop-Breaux federal funding.

Wallop-Breaux only reports on anglers and for the restoration of finfish. Therefore, crabbers are not calculated. However, using the same criteria, there were 61,234 unique recreational crabbers in Maryland in calendar year 2015.

The Wallop-Breaux Act, also commonly called the Dingell-Johnson Act, provides Federal aid to the States for management and restoration of fish. Funds are derived from a 10-percent excise tax on certain items of sport fishing tackle (Internal Revenue Code of 1954, sec. 4161), a 3-percent excise tax on fish finders and electric trolling motors, import duties on fishing tackle, yachts and pleasure craft, interest on the account, and a portion of motorboat fuel tax revenues and small engine fuel taxes authorized under the Internal Revenue Code (Sec. 9503). Funds are distributed to states based on a formula that includes the number of unique paying anglers. Therefore, this report now includes the same criteria.

Table 1. Maryland recreational license sales by calendar year

FISHING STATISTICS BY LICENSE YEAR	2011	2012	2013	2014	2015
RESIDENT NONTIDAL	105,893	108,600	112,919	115,525	119,993
NON RESIDENT NONTIDAL	11,259	11,289	10,907	11,379	12,459
3 DAY NONTIDAL	6,623	6,344	6,885	6,810	7,290
7 DAY NONTIDAL (5 Day prior to 2011)	8,175	8,094	8,695	9,190	8,993
TROUT STAMP					
RESIDENT TROUT STAMP (New 2011)	44,187	46,744	48,319	48,266	49,354
NON RESIDENT TROUT STAMP (New 2011)	6,827	6,986	6,724	6,541	7,112
NONTIDAL BLIND	104	101	82	87	82
SENIOR CONSOLIDATED LICENSE	23,224	24,675	25,985	26,216	26,940
RESIDENT BAY (and Coastal) SPORT	93,074	94,291	101,077	105,901	108,360
NON RESIDENT BAY (and Coastal) SPORT	21,011	20,937	21,045	20,155	21,179
5 DAY BAY SPORT					
RESIDENT 7 DAY BAY AND COASTAL SPORT (New 2011)	7,032	6,410	7,227	7,395	6,377
NON RESIDENT 7 DAY BAY AND COASTAL SPORT (New 2011)	17,274	16,880	17,289	17,126	16,915
PLEASURE BOAT DECAL	48,584	49,350	47,086	47,708	46,740
BAY (and Coastal) SPORT BLIND	160	122	70	76	74
BAY AND COASTAL SPORT REGISTRATION (New 2011)	58,683*	34,296	43,160	27,365	20,025
RECREATIONAL CRABBING	44,478	44,981	39,737	45,599	49,334
NON RESIDENT RECREATIONAL CRABBING	6,745	6,359	5,272	4,649	6,263
RECREATIONAL CRABBING BOAT	4,645	5,078	5,985	5,305	5,202
* Includes Potomac registrations.					

Beginning October 1, 2015 Maryland changed its annual license structure from calendar year to a 365 day term. Recreational fishing and crabbing licenses are now valid for 365 days from date of purchase (excluding 3-day and 7-day licenses) and therefore, license sales can now be reported by fiscal year. Sport fishing license sales for FY 2016 are provided in Tables 2 and 3.

Table 2. Maryland recreational license sales by fiscal year (July 1, 2015– June 30, 2016)

	Fiscal Year
FISHING & CRABBING STATISTICS	2016
RESIDENT NON TIDAL	115531
NON RESIDENT NON TIDAL	12480
3 DAY NON TIDAL	7925
RESIDENT 7 DAY NON TIDAL	6251
NONRESIDENT 7 DAY NON TIDAL	3140
RESIDENT TROUT STAMP	48017
NON RESIDENT TROUT STAMP	7407
NON TIDAL BLIND	86
SENIOR CONSOLIDATED LICENSE	27774
DAV or POW LIFETIME FISHING	212
RESIDENT BAY & COASTAL SPORT	106102
NON RESIDENT BAY & COASTAL SPORT	21915
RESIDENT 7 DAY BAY AND COASTAL SPORT	6327
NON RESIDENT 7 DAY BAY AND COASTAL SPORT (New 2011)	17077
RESIDENT BAY & COASTAL SPORT BOAT	40439
NONRESIDENT BAY & COASTAL SPORT BOAT	11055
BAY & COASTAL SPORT BLIND	85
RESIDENT BAY AND COASTAL SPORT REGISTRATION	10362
NONRESIDENT BAY AND COASTAL SPORT REGISTRATION	8752
RESIDENT RECREATIONAL CRABBING	52317
NON RESIDENT RECREATIONAL CRABBING	7009
RESIDENT RECREATIONAL CRABBING BOAT	3869
NONRESIDENT RECREATIONAL CRABBING BOAT	2729
PVT PROPERTY CRAB POT REGISTRATION	2691

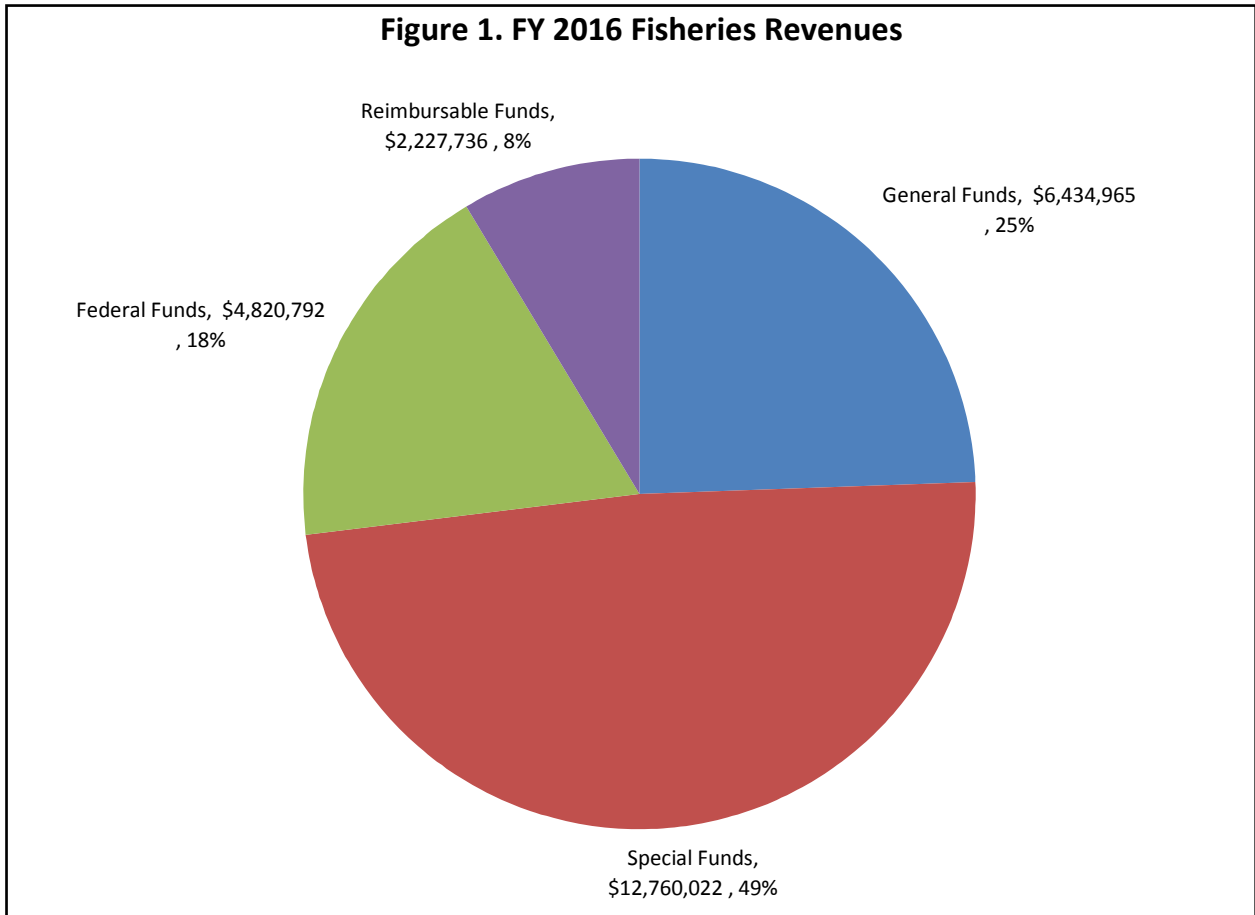
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The following licenses are issued by the department for recreational fishing businesses and contribute to the recreational license revenue.

Table 3. FY 2016 MD recreational fishing business license sales

	Fiscal Year
CHARTER STATISTICS	2016
Resident Bay & Coastal Charter Boat 6 Plus	138
NonResident Bay & Coastal Charter Boat 6 Plus	2
Resident Bay & Coastal Charter Boat Up to 6	242
NonResident Bay & Coastal Charter Boat Up to 6	9
Resident Fishing Guide with Tidal	10
NonResident Fishing Guide with Tidal	8
Resident Freshwater Fishing Guide	30
NonResident Freshwater Fishing Guide	8
Resident Limited Fishing Guide	5
NonResident Limited Fishing Guide	0
Commercial Fishing Pier License	3

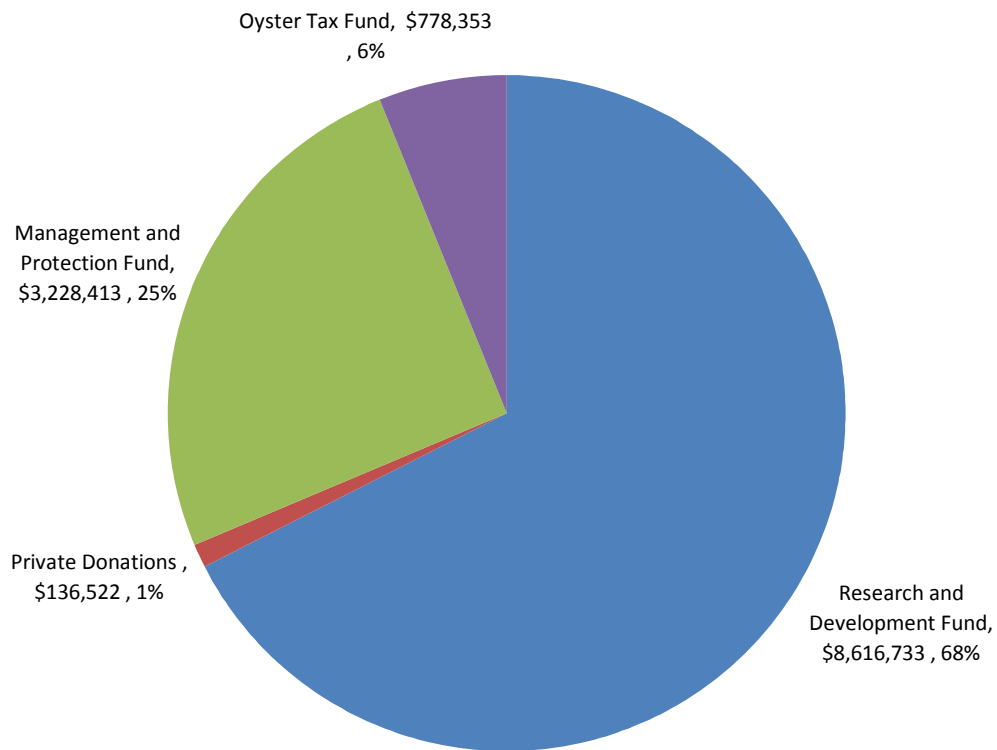
Total FY 2016 fisheries revenues (all fund sources) were \$26,243,516 and are broken down as follows: 49% special fund revenue; 18% federal fund revenue; 25% general fund revenue; and 8% reimbursable fund revenue (Figures 1 and 2). FY 2016 fisheries revenues are \$535,892 higher than FY 2015.



The breakdown of Special Fund revenues into the component sources is shown in Figure 2. Recreational tidal license sale and fee revenues are deposited into the Fisheries Research and Development Fund (FR&D). Non-tidal license sale revenues are deposited into the Fisheries Management and Protection Fund (FM&P), and dedicated oyster fees are deposited into the Oyster Tax Fund.

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Figure 2. FY 2016 Fisheries Special Fund Revenues



Fishing and Boating Services' fisheries-related programs began FY 2016 with a balance of \$1,640,369 and \$493,404 in the FR&D and FM&P funds respectively. Total FY 2016 revenue credited to these funds included \$8,617,140 to FR&D and \$3,228,413 to FM&P (Table 4).

Table 4. Fishing and Boating Services - FR&D and FM&P Funds - FY 2015

	Fisheries Research and Development Fund	Fisheries Management and Protection Fund	Total
Beginning Balance	\$1,640,369	\$493,404	\$ 2,133,773
Revenues	\$8,617,140	\$3,228,413	\$ 11,845,553
Gasoline Sales Surcharge& interest	\$1,845,635	\$2,311	\$ 1,847,946
Total Funds Available	\$12,103,144	\$3,724,128	\$ 15,827,272
Summary of Expenditures			
Fishing and Boating Services	\$6,141,682	\$2,023,103	\$ 8,164,785
Non-Fishing and Boating Services			
NRP - Field Operations	\$2,800,000	\$ 791,661	\$3,591,661
Licensing	\$480,100	\$358,100	\$838,200
Finance & Administrative Service	\$410,000	\$153,600	\$563,600
Information Technology Service	\$416,600	\$156,100	\$572,700
Office of Secretary	\$208,500	\$78,100	\$286,600
Office of Attorney General	\$146,600	\$54,900	\$201,500
Human Resource Service	\$66,000	\$24,700	\$90,700
Office of Communications	\$64,500	24,200	\$88,700
Total Expenditures	\$10,733,982	\$3,664,464	\$ 14,398,446
(Revenue + Surcharge) - Expenditures	\$(271,207)	\$(433,740)	\$ (704,947)
Ending Balance (Total Funds Available – Total Expenditures)	\$1,369,162	\$59,664	\$ 1,428,826

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C. Expenditures

In FY 2016, Fishing and Boating Services expended (all fund sources) a total of \$ 29,656,586 (Figure 3) on its fisheries-related responsibilities. Included in this total is \$6,233,661 of Fishing and Boating Services funds that were provided to other units within the department in support of Fishing and Boating Services' fisheries-related mission (Figure 4), consistent with many of the priorities identified in the 2008 report of the Task Force on Fisheries Management. This includes but is not limited to: enforcement of fisheries management rules (i.e. Natural Resources Police); habitat preservation and restoration (i.e. water quality monitoring, benthic habitat surveys, prioritization of critical habitats, environmental review), legal issues, and licensing services. It is important to note that the Office of the Secretary sector includes several departmental units: the Office of Attorney General; Finance and Administration Service; Human Resources Service; Information Technology Service; and Office of Communication.

The department expended a total of \$10,733,982 and \$3,664,464 of FR&D and FM&P funds, respectively, in FY 2016. FY 2016 expenditures of FR&D and FM&P funds exceeded FY 2016 revenues credited into these funds by \$704,947. The FY 2016 end of year balance of FR&D and FM&P funds is \$1,428,826.

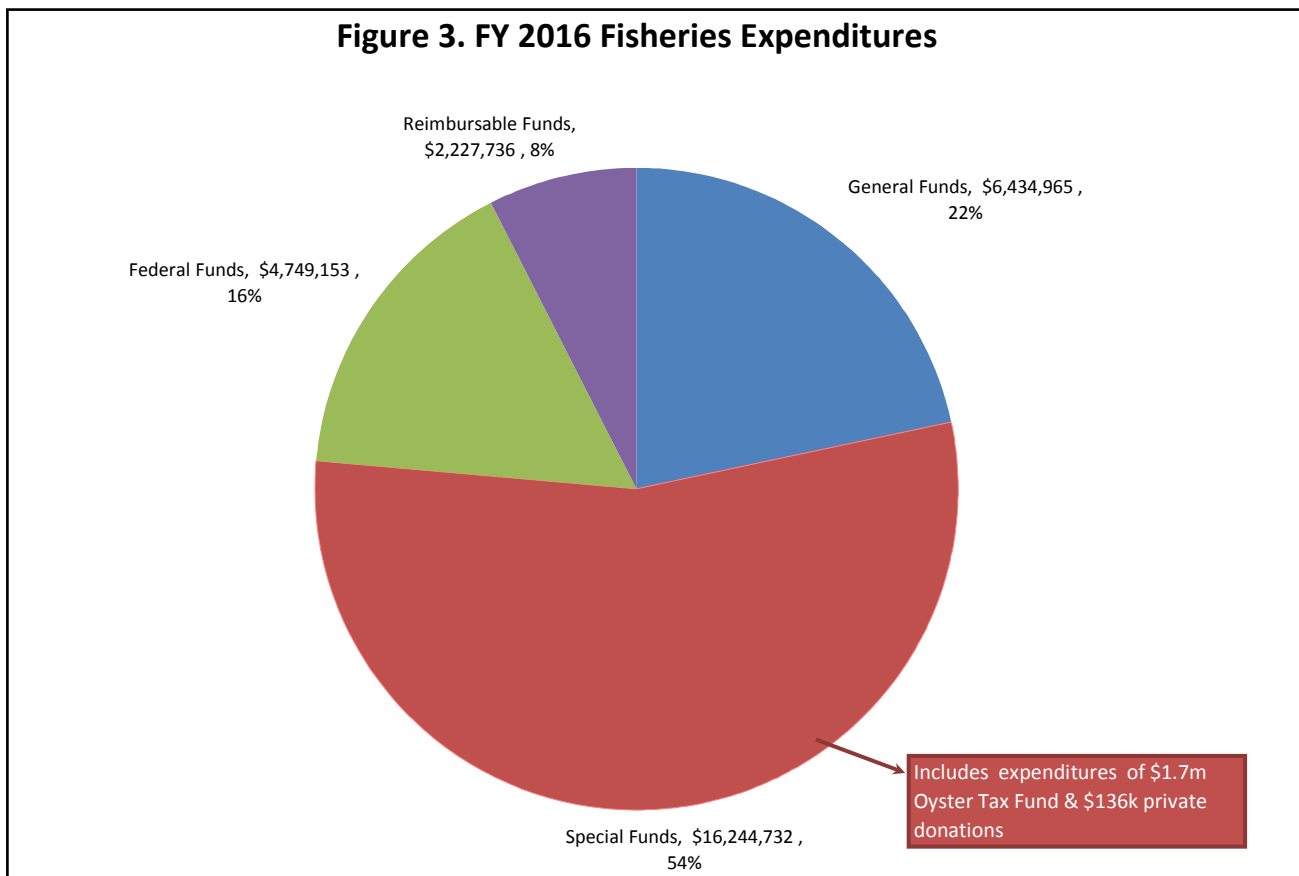
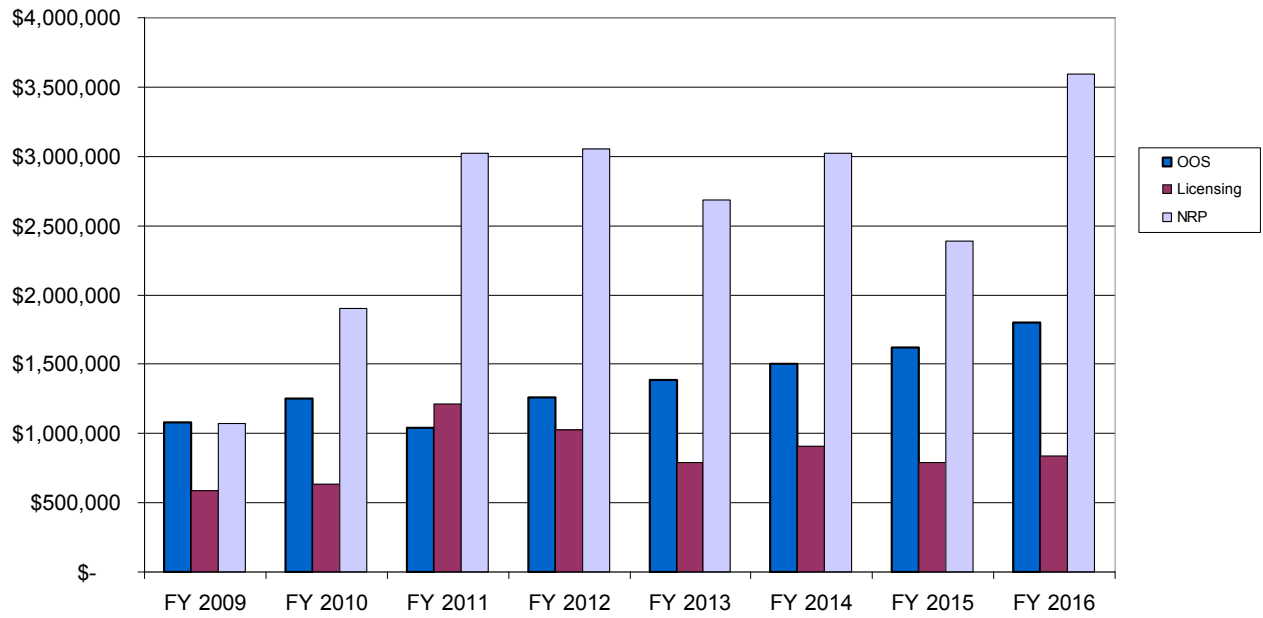


Figure 4. FY 2009 - 2016 Special Fund Transfers to Other DNR Units in Support of Fisheries



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SUMMARY

As this report demonstrates, the department's ability to fund programs to assess, protect, conserve, fairly allocate and promote the sustainable utilization of wild and farm-raised fish resources of the State for balanced ecological and socio-economic benefits is not possible without anglers who support this work by paying for fishing licenses, fees and excise taxes. These revenues pay for an extensive and diverse suite of activities which meet four core fisheries functions of Fishing and Boating Services:

- 1) Protect, conserve and enhance fisheries resources.
- 2) Provide and enhance fishing opportunities, including access.
- 3) Provide sustainable economic opportunities.
- 4) Promote and protect fisheries resources through public outreach and education.

In FY 2016, expenditures of FR&D and FM&P funds exceeded revenues by \$704,947. A portion of the FY 2016 beginning balance of FR&D and FM&P Special Funds were used to cover these expenses. The current level of services the department provides to fulfill the fisheries-related mission of Fishing and Boating Services will only be sustainable if there is an increase in revenue and/or implementation of more cost efficient operations.

With a FY 2017 beginning balance of \$1,428,826 million in FR&D and FM&P funds, the department will have sufficient funds to maintain the current level of fisheries-related services in FY 2017. However, without an increase in revenue, implementation of more cost effective operations and/or reduction in services, there will not be sufficient funds to maintain all of these services by FY 2018.

In FY 2017, Fishing and Boating Services will focus on maintaining the fisheries operations performed in FY 2016 as well as the priorities listed in Appendix 1. Appendix 2 highlights some of the fisheries activities Fishing and Boating Services accomplished during FY 2016.

The next budget report for Fishing and Boating Services is scheduled for October 2017, and will focus on fiscal year 2017 which will close on June 30, 2017.

Fishing and Boating Services is committed to providing a comprehensive annual report on sport fishing revenues and expenditures. We are always interested in hearing from anglers and the general public about issues of concern or new project ideas that you believe we should consider pursuing as we work to ensure Maryland's fisheries resources are sustainably managed for the benefit of those who enjoy them today as well as future generations.

If you have any questions or input regarding this budget report, please contact Karen Knotts, Maryland department of Natural Resources Fishing and Boating Services, Stakeholder Outreach and Services Division Manager at karen.knotts@maryland.gov or 410-260-8294.



SFAC Commissioners

The SFAC advises the department on recreational fishing issues and is comprised of individuals from across the State that represent recreational fishing interests.

Public participation is vital to the department's ability to successfully conserve, manage and restore Maryland's fisheries resources. Members of our advisory bodies serve as your representatives and we invite you to contact them with questions, concerns and/or suggestions about fisheries issues.

Visit <http://www.dnr.maryland.gov/fisheries/fmp/index.asp> for the list of Commissioners who advise the department on your behalf. Simply click on Sport Fisheries Advisory Commission to find contact information and affiliation of each member. You can also keep up with Commission activities with the meeting agendas, materials and summaries which are posted in conjunction with the quarterly SFAC meetings.

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Appendix 1. Fishing and Boating Services

FY 2017 Fisheries Related Priorities

The primary focus of the Unit over the coming year will be on continuing operations. In addition, we will make as much progress on priority issues or activities as resources allow. A list of priorities by Fishing and Boating Services' 4 core fisheries-related functions is included below. These are not the Unit's only priorities, but are the ones that focus on sport or charter fishing in some way.

PROTECT, CONSERVE AND ENHANCE FISHERIES RESOURCES

- a. **Priority Task** – Utilize the completed 5 Year Review Report on oyster restoration and management to inform and guide the Oyster Advisory Commission (OAC) as it develops recommendations to the department on future actions for oyster restoration and management. The Department completed the report on schedule in July 2016 according to the legislative mandate to produce a report that reviews the effectiveness of the locations of sanctuaries, public shellfish fishery areas, and aquaculture areas every 5 years and to propose changes where needed (COMAR 08.02.01). Additionally, utilize the results of the 5 Year Review Report and the OAC recommendations that are ultimately approved by the department to review and update the Oyster Management Plan.

Desired Task Achievement Date – July 2017

Obstacle – Delays as the OAC deliberates and works through complex issues. Staff time to conduct the work.

Solution – Assist the OAC with their needs and timeframes. Defer on any tasks that arise during the fiscal year that may distract staff from this priority project.

- b. **Priority Task** – Continue to support and assist state and federal partners to implement state management of the National Marine Fisheries Service's Marine Recreational Information Program's Access Point Angler Intercept Survey (MRIP/ APAIS). MRIP provides state and federal managers with estimates of recreational catch data for estuarine and marine fisheries. In order to supplement fishery information on Chesapeake Bay striped bass (*Morone saxatilis*), the department also conducts a specific study to characterize the size, age and sex composition of striped bass harvested during the spring recreational trophy season and to develop a time-series of catch per unit effort (CPUE) of the spring trophy fishery. This dockside creel survey also collects information to characterize the recreational angler population. Data collected includes catch and demographic information.

Desired Task Achievement Date – Ongoing

Obstacle – Administrative/hiring hurdles and timeliness of available funds. Delays in data availability.

Solution – Continue to communicate with federal partners and actively participate in program development.

- c. **Priority Task** – Continue to advocate for the development of Chesapeake Bay specific biological reference points (BRPs) for striped bass. The Atlantic States Marine Fisheries Commission (ASMFC) Striped Bass Management Board is expected to review the status of the stock as well as reference points for the Chesapeake Bay proposed by the ASMFC Striped Bass Technical Committee and make recommendations.

Desired Task Achievement Date – Ongoing

Obstacle – Inter-agency coordination and agreement. The ASMFC's Atlantic Striped Bass Technical Committee and Management Board intend to develop Chesapeake Bay specific biological reference points and submit for review at the next benchmark stock assessment scheduled for 2018.

Solutions – Continue working in concert with the ASMFC's Atlantic Striped Bass Technical Committee and Management Board to expedite the development and adoption of new Chesapeake Bay specific reference points which will allow Bay jurisdictions to coordinate management for the Bay resident stock independently of the coastal migrant stock.

- d. **Priority Task** – Streamline fisheries penalty system. In partnership with Natural Resources Police (NRP), integrate enforcement, court and Departmental databases. This will enhance the department's ability to effectively suspend individuals who do not answer to citations for fisheries violations if they fail to appear in court for their scheduled hearing.

Desired Task Achievement Date – Ongoing

Obstacle – District Court and departmental Units including Fishing and Boating, Licensing and Registration and NRP use different systems and databases. The two biggest hurdles are: 1) Getting the e-tickets process up and running through

NRP. 2) Getting the District Court's database downloading appropriate information into databases within the department of Natural Resources.

Solutions – NRP, Information Technology (IT), Wildlife, Licensing and Fishing and Boating are meeting monthly with the Office of Secretary to develop links for all penalty related databasing and systems. The first hurdle of getting the Interstate Wildlife Violators Compact database linked to COMPASS has been resolved. Staff is currently working on linking District Court data, COMPASS, e-tickets and individual unit databases.

- e. **Priority Task** – Finalize and implement July 2014 draft comprehensive Fish Health Management Policy to ensure health of Maryland fish and protect against potential disease introductions from all sources (e.g. bait, pet trade, hatcheries, stocking). Develop and implement baseline fish health survey for Chesapeake Bay and ultimately all state waters to understand current status, provide early warning of potential impacts and inform proactive land use decisions sustaining fishable waters.

Desired Task Achievement Date – Ongoing, dependent on authority

Obstacle – Funds, staffing, constituents, authority

Solution – Phased implementation following stakeholder consultations; spread cost over several years, and as budget allows; seek positions and share duties across existing related positions; review existing authority and seek additional as needed. Some tasks under this priority will be deferred until staffing short falls can be resolved.

- f. **Priority Task** – Continue work towards meeting the Chesapeake Bay Agreement's oyster restoration goal of 10 restored oyster tributaries (5 in MD and 5 in VA) by 2025.

Desired Task Achievement Date – 2025

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Obstacle – Continuing to obtain funding to purchase substrate and to plant oysters.

Solution – Continue working with the department of Budget and Mangement and the legislature to obtain adequate Capital funds.

- g. **Priority Task** – Maintain coordinated baywide sustainable blue crab fishery management program. Future efforts include implementing procedures that increase accountability and accuracy of commercial and recreational harvest.

Desired Task Achievement Date – Ongoing

Obstacle – Currently, Maryland's recreational crabbing license structure does not provide complete information on the number of participants in Maryland's recreational blue crab fishery. This is due to a relatively large amount of harvest that is allowed for unlicensed crabbers as well as the large number of complimentary crabbing licenses that are issued with the Consolidated Bay Sport Fishing license. This lack of accountability in the recreational crab fishery makes it difficult to get an accurate estimate of recreational harvest. Another challenge is the coordination of inter-jurisdictional management and data sharing, and funding.

Solution – Revise the recreational blue crab license structure so that it provides accurate information on how many participants there are in the fishery and provides a solid foundation for reliably estimating recreational crab harvest. Continue to work and participate with Bay partners, and seek potential funding opportunities.

- h. **Priority Task** – Remove high priority fish blockages. Provide for fish passage at dams, and remove stream blockages to restore passage for migratory and resident fish. Restore and enhance river/stream connectivity.

Desired Task Achievement Date – Ongoing. Continue to work towards the fish passage outcome in the 2014 Chesapeake Watershed Agreement. Work with Patapsco River Restoration Project partners to coordinate the removal of Bloede Dam by 2017. Work with The Nature Conservancy and Chesapeake Bay Program partners to update the database for the Chesapeake Fish Passage Prioritization tool.

Obstacle – Progress is slow because many of the blockages are located on private property and landowners do not have the money or incentive to remove the blockage. Finding funding sources for design and monitoring projects is limiting.

Solution – Coordinate and combine forces with Maryland department of Environment programs to remove high priority fish blockages that are in poor condition or have sedimentation concerns. Work with the State Highway Administration and USFWS on culvert assessment and develop a list of priority projects. Continue to apply for grants to fund removal projects.

- i. **Priority Task** – Reduce mortality in catch and release black bass tournaments.

Desired Task Achievement Date – Livewell study work has been mostly completed. Annual summaries of work will

be finished by December 2016 and made available in FY 2017. Recommendations generated from the results will be drafted and submitted to state agencies. This information will be included in outreach material for Maryland's anglers. Infrastructure to deliver material to black bass anglers has been developed and will be utilized in 2016. Conservation videos developed by major bass fishing organizations and the Department will be completed by December 2016 and put on-line. Work to improve infrastructure at existing weigh-in locations will be completed by FY 2018.

Obstacle – A significant percentage of fishing effort for tidal water largemouth bass occurs as tournaments. Even though handling and live wells have improved bass survival over time, the cumulative effective of many tournaments can be high enough to impact populations negatively. Poor water quality and high temperatures can require altering handling techniques to ensure optimum survival. Both innovative mechanisms to deliver information and economic resources are obstacles to the desired tasks.

Solution – Leveraging resources with bass organizations will be done to help offset costs and ensure broader dissemination of outreach materials. A stakeholder, technical group was formed in 2016 and this group will assist in delivering information to a broader constituency. Annual summaries of work will be provided to anglers using the delivery infrastructure to include: 1) emails for tournament directors; 2) emails to an established list of anglers who routinely target black bass in Maryland; 3) social media; and 4) updates to the 2017 Sportfishing Guide. Information from the livewell study will help to refine techniques to improve bass survival.

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- j. **Priority Task** – Implement measures to stabilize and enhance tidal water largemouth bass fishery. Gather public input on catch-and-return angling for black bass. Conduct habitat improvement to help reestablish lost spawning habitat by installing reef balls in Smoots Bay on the Potomac River. Stock bass in impaired areas or areas that lack production sufficient for maintaining quality fisheries. Consider adoption of regulations that limit harvest and/or possession during targeted periods and/or locations.

Desired Task Achievement Date – Survey of angler input - FY 2018. Habitat improvement will be ongoing.

Obstacle – Input from anglers requires contact information or other modes of communication.

Solution – Licensed anglers identified as black bass anglers during the on-line licensing process will be asked for public input regarding regulations. A technical black bass advisory group comprised of stakeholders formed in 2016 will provide feedback on Department actions. Volunteers will be encouraged to assist with installing reef balls and stocking bass. A mark-recapture project instituted on the Potomac River has delivered, in part, a tool for communication between the general public who fishes the recently impaired fishery and the Department that manages it. The general public is an asset in leveraging state effort and resources in meeting this priority task.

- k. **Priority Task** – Expand research efforts to investigate occurrence/extent of fluvial brook trout populations statewide. Efforts will be expanded initially from the Savage River watershed in Garrett County to the Gunpowder Falls in Baltimore and Carroll Counties, and Deer Creek in Harford County.

Desired Task Achievement Date – December 2017

Obstacle – Determining the presence and extent of fluvial brook trout populations statewide will add additional responsibilities/workload to Fisheries staff.

Solution – Develop a partnership with non-governmental organizations (Trout Unlimited) and county government agencies to tackle the workload and share resources. In addition, assistance is being provided by the department's Resource Assessment Service.

Obstacle – Funding for equipment and staffing will need to be accommodated in the annual budget and funds are limited due to current and anticipated budget reductions.

Solution – Procure at least a portion of funds through federal grant programs and from donations from interested user groups (i.e. Trout Unlimited).

- l. **Priority Task** – Initiate restoration projects which will include submitting proposals for funding to reconnect lower Bear Pen Run, Elk Lick and Black Lick to maintain summer flow connectivity with the mainstem Upper Savage River.

Desired Task Achievement Date – December 2017

Obstacle - Staff time to write grant proposals

Solution - Work with interested partners to share the workload for grant writing and management

- m. **Priority Task** - Obtain funding in partnership with Canaan Valley Institute to initiate the Big Run woody debris enhancement and streambank restoration project.

Desired Task Achievement Date – December 2017

Obstacle – Funding needed to develop design plans to meet Maryland department of Environment permitting requirements and then to implement the project

Solution - In partnership with Canaan Valley Institute submit proposals for funding.

- n. **Priority Task** – Continue to focus on water quality and habitat issues negatively affecting important freshwater fisheries.

Desired Task Achievement Date – Ongoing

Obstacle – Major tailwater trout fisheries are threatened by competing water uses and changing water appropriation strategies by the impoundment operators.

Solutions – Use data from continuous and real-time data sondes to negotiate for discharge protocols which maintain acceptable temperatures and flow regimes for trout populations. Continue to participate in the North Branch Advisory Group meetings. This is an ad hoc group consisting of the Army Corp of Engineers, the Upper Potomac River Commission, the Interstate Commission on the Potomac River Basin, Trout Unlimited, the Western MD Guides Association, white water paddling interests and others who negotiate for annual discharge schedules which support their interests. Stay engaged with the Baltimore City Public Works, Carroll County (for Piney Run Reservoir) and Washington Suburban Sanitary Commission to assure similar conditions are maintained for reservoirs in central Maryland. Maintain interaction with state parks for discharges from lakes and reservoirs within state parks to supply quality water for tailwater populations.

Obstacle – Land use changes/patterns are governed mainly by local planning and zoning agencies which do not always consider the impacts of development on water quality or quantity, aquatic habitats and resources.

Solutions – Work closely with other departmental Units (e.g., Resource Assessment Service) to identify quality resources and resources at risk. Use this information to proactively educate communities and local governments on the negative impacts of development on aquatic ecosystems.

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- o. **Priority Task** – Develop Freshwater Temperature and Water Quality Database

Desired Task Achievement Date – Initiated January 2015: data input is ongoing

Obstacle – A tremendous amount of historical stream temperature data exist in individual data files specific to a year and site and in a variety of formats. These must be entered into standardized spreadsheets and uploaded to an MS Access database developed for these data. Some files may need to be converted from old formats (Lotus, .txt, or proprietary software).

Solutions – Conduct data entry of recent data which are in Excel and can be most easily converted to standardized format. Old files are important because they provide the most accurate baseline data for assessing impacts of land use and climate change on stream temperature. Conversion of these files may require assistance from Information Technology.

- p. **Priority Task** – Continue Patapsco River shad and herring restoration project and seek funding to extend the work for five years subsequent to Bloede Dam removal.

Desired Task Achievement Date – No obstacle to continue assessment work through 2017. Dam removal should occur in 2017 and project extension will ideally extend five years post-removal (~2022). Secure funding for additional assessment by summer 2017.

Obstacle – No known funding source currently available.

Solutions – Explore funding extension through Maryland Port Authority mitigation funds or funding related to dam removal habitat restoration. Leverage existing fish production resources and funding programs to continue the stocking component.

- q. **Priority Task** – Support new ASMFC Atlantic sturgeon stock assessment. Findings will determine future conservation strategies. Continue to maintain captive brood population pending stock assessment. Expand and maintain acoustic telemetry arrays in Maryland. Evaluate Marshyhope Creek spawning habitat and assess early life history presence subsequent to discovery of mature brood fish in putative spawning areas.

Desired Task Achievement Date – Ongoing, stock assessment scheduled for 2017 completion, Marshyhope Creek work determined by funding.

Obstacle – None

Solution – Continue to work with the National Marine Fisheries Service (NMFS) to secure research permit. Project was

awarded NMFS funding to conduct habitat and early life history assessment through June 2018.

- r. **Priority Task** – Work with the Atlantic States Marine Fisheries Commission (ASMFC) and the Mid-Atlantic Fisheries Management Council (MAFMC) on the Comprehensive Summer Flounder Amendment. The amendment will involve a comprehensive review of all aspects of the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP) related to summer flounder. Specifically, the Council and Commission will consider whether modifications to the FMP’s goals, objectives, and management strategies for summer flounder are needed.

Desired Task Achievement Date – 2018

Obstacle – Controversial subject matter including commercial and recreational allocations as well as goals and objective of the plan.

Solution – Maintain communication with stakeholders throughout amendment development.

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- s. **Priority Task** – Advise Department leadership and other Maryland representatives on management actions under consideration by ASMFC and the MAFMC. Technical staff will continue ASMFC preparatory meetings before all ASMFC Board meetings to brief Board Representatives regarding potential management actions and technical issues.

Desired Task Achievement Date – Ongoing

Obstacle – None

Solutions – Continue holding ASMFC pre-meetings and maintain communication with department leadership and Maryland representatives.

- t. **Priority Task** – Develop reference points for marine and estuarine forage species, Atlantic menhaden in particular, that reflect their importance for supporting predators that are both gamefish and important food fish.

Desired Task Achievement Date – 2017

Obstacle – Requires an ecological viewpoint that is not well accommodated in single-species management processes of the ASMFC and the Chesapeake Bay Program. These types of reference points represent relatively new concepts that have not been widely implemented elsewhere. Slow progress of the ASMFC Biological and Ecological Reference Points (BERP) working group.

Solutions – Work with the ASMFC’s BERP working group and Menhaden Management Board to select most appropriate modeling tools for ecosystem reference points development. Continue pressing BERP to consider and adopt ecosystem indicators of forage and predator status in addition to the model based reference points.

- u. **Priority Task** – Cooperative tasking with National Ocean Service (NOS) / NOAA Chesapeake Bay Office (NCBO)

Desired Task Achievement Date – ongoing

Obstacle – Funding for specific studies aligned between the different fiscal years; agency priorities between national versus state government agencies

Solutions – Flexible out-year funding commitments; flexible administration for each agency and unit driven to achieve healthy aquatic ecosystems. NOAA designation of the Choptank River as a Habitat Focus Area provides an excellent opportunity to collaborate with federal partners and leverage resources.

- v. **Priority Task** – Deep Creek Lake power plant relicensing. The relicensing process will begin within the next year that will establish the water release schedule, lake levels, and duration of any releases. The process begins roughly three years ahead of the expiration of the existing license to allow stakeholders the time necessary to submit their comments and concerns.

Desired Task Achievement Date – 2019

Obstacle – Conflicts exist between landowners on Deep Creek Lake and the surrounding watershed, anglers, whitewater enthusiasts, state government and industry.

Solutions – Educate stakeholders on the issues. Meet with stakeholders to discuss and develop an approach that will address all of the comments and concerns well ahead of the relicensing.

- w. **Priority Task** – Staff will work with stakeholders and the Garrett County Watershed Coordinator to implement the goals, strategies, and objectives of the Deep Creek Lake Watershed Management Plan (Plan) approved October 2014. Specific strategies currently being discussed include addressing the aquatic vegetation problems and a proposal to dredge select coves to improve navigation and decrease nutrient loading.

Desired Task Achievement Date – Ongoing, deadlines are established for each goal, objective and strategy in the Plan.

Obstacle –Implementation for some parts of the Plan will be expensive and funding will need to be obtained. The dredging is expensive and difficult to achieve and could cause extensive impacts to the aquatic ecosystem. Some of the aquatic vegetation problems have been caused by invasive species and, once established, these can be costly and extremely difficult to control or remove.

Solutions – Secure funding. Identify specific groups to achieve goals, objectives, and strategies and educate stakeholders on needs of the Plan. Implement strategies to eliminate the possibility of the introduction of additional invasive species. Provide education for public stakeholders on the environmental factors that face the lake and surrounding watershed. Meet with the Garrett County watershed coordinator to prioritize the list of stream restoration projects in the Deep Creek Lake watershed.

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- x. **Priority Task** - Determine catch-and-release mortality in the Potomac River from recreational angling of largemouth bass.
Desired Task Achievement Date – December 2018

Obstacle – Recreational anglers can impact a fishery and cause about 10 - 15% of caught black bass to die following angling. This percentage can depend on bait type, season, and angling skill. Despite attention to competitive sportfishing, the percentage of fish that die from recreational angling has not been determined in Maryland and should be used when assessing the possible effectiveness of catch-and-return areas or in other aspects of fisheries management.

Solution – Use a combination of angling and electrofishing to estimate catch-and-release mortality by tagging fish and tracking their capture history using incentive based programs. This project will be used to estimate the size of the population, the relative proportion of caught fish, and the relative proportion of mortality or exploitation.

- y. **Priority Task** - Research northern pike population and angling preferences in Deep Creek Lake to provide information for possible regulation change.

Desired Task Achievement Date – Ongoing

Obstacle – Difficult species to collect and relatively low population abundance combine to reduce sample size, researching and developing appropriate sampling techniques and research methods.

Solution – combine data collection with other surveys, standardize survey sites and seasonal timing of electrofishing collections to maximize catch, collaborate with other Freshwater Fisheries staff to complete task.

Obstacle – gaining public input

Solution – Develop information site on Freshwater Fisheries website.

- z. **Priority Task** – Continue outreach and training on FACTS™ electronic harvest reporting and accountability system that is now available to all commercial fin fisheries and to the blue crab fishery.

Desired Task Achievement Date – Ongoing.

Obstacle – Funding. Hesitancy of commercial watermen to use a new system that requires a hail component. The system does not require that fishermen say where they are fishing but it does require a notification when fishermen begin and end their trip.

Solution – Seek external funding sources. Continue to obtain commercial watermen input on system.

- aa. **Priority Task** – Monitor nuisance cyanobacteria blooms in the upper Potomac River basin and research and document the deleterious effects on aquatic biota and potential risks to human health caused by toxins produced by the blue green algae Planktothrix isoethrix.

Desired Task Achievement Date – Ongoing.

Obstacle – Funding and qualified laboratory for testing.

Solutions - Continue networking with project partners (Hood College and University of Maryland Center for Environmental Studies, Institute for Marine Environmental Technology - UMCES IMET) to seek grant funding sources to quantify/determine total toxin production, toxin accumulations in smallmouth bass and other aquatic organisms, and identify possible genetic abnormalities resulting from exposure. These data will directly relate to ongoing research illustrating immunosuppressants and endocrine disrupting compounds in the nontidal Potomac's smallmouth bass population.

- bb. **Priority Task** – Expand baseline life history data for flathead catfish in the nontidal Potomac River, blue catfish in the tidal waters of the state and northern snakehead where they occur.

Desired Task Achievement Date – Ongoing

Obstacle – Staff time, funding for DNA analysis of stomach contents of invasive species

Solution – Prioritize sampling and reduce frequency of sampling in other water bodies.

PROVIDE AND ENHANCE FISHING OPPORTUNITIES, INCLUDING ACCESS

- a. **Priority Task** – In coordination with state and federal partners, work to maintain and increase the number of publicly accessible areas for sport fishing consistent with the goals of the 2014 Chesapeake Bay Watershed Agreement. Fishing and Boating Services staff lead for public access issues will work cooperatively with the department’s Public Access Matrix Team and partner with MDOT, DBED, DOT, SHA, MHT and NPS in support of state initiatives requiring coordinated and improved statewide public access information from Maryland in order to achieve success and meet their established goals. This includes Executive Order 13508, Chesapeake Bay Watershed Agreement, Chesapeake Bay Watershed Public Access Plan, HB797, and DBED/MDOT Destination Initiative, and SHA / MHT / NPS Initiative prioritizing water access in grant programs.

Desired Task Achievement Date – Ongoing

Obstacle – None

Solution – N/A

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- b. **Priority Task** - Develop coldwater production capacity to levels needed to meet the full trout stocking schedule and eliminate commercial fish purchases. Mettiki Coal LLC hatchery Phase I production is underway and indicates success. Development of Phase II production facility could meet remaining state needs.

Desired Task Achievement Date –Phase II development is ongoing. Initial design plans are being created to estimate necessary funding and provide Mettiki Coal Company with detailed plans to develop an MOU.

Desired Task Achievement Date – Spring 2016 to complete Phase I full production run. Phase II development is ongoing.

Obstacle – None for Phase I culture. Phase II will require additional funding.

Solution – Identify funding sources to construct Phase II facility and leverage Mettiki Coal Resources.

- c. **Priority Task** – Maintain focus on quality and geographic distribution of License Free Fishing Areas (LFFAs). Continue working toward long term goal – that most Maryland residents live within a one hour drive of a site where they have the opportunity to fish recreationally without purchasing a license.

Desired Task Achievement Date – Ongoing

Obstacle – Identifying new areas and assuring that capacity to maintain new sites is in place. Regulation change is required to designate or remove LFFAs.

Solution – Work closely with local jurisdictions and departmental Units, particularly NRP and MD Park Service to monitor performance of current LFFAs and identify new sites.

- d. **Priority Task** - Maintain and update the online Angler Access Map on the department’s Webpage

Desired Task Achievement Date – Ongoing

Obstacle – Status of public access sites change without notice. Important information such as condition of parking lots and roads, fee requirements and fishing regulations must be updated continually to insure accurate information for users of Maryland’s fisheries and waterways.

Solution – Need to keep lines of communications open internally, as well as with other jurisdictions, agencies, and anglers. Staff needs to assess these attributes when utilizing access points and communicate changes to technical staff as part of their ongoing duties.

- e. **Priority Task** – Develop and implement production databases for coldwater and warm water hatcheries. Stocking databases have been developed for coldwater and warmwater hatcheries. Production database has been developed to the template stage but needs to be constructed and implemented.

Desired Task Achievement Date – Spring 2017 for final template

Obstacle – Lack of expertise and staff levels within Hatcheries Division (assigned staff left state service)

Solution – Backfill classified Hatcheries Division position responsible for this work. Seek staff support from Fishing and Boating Services database specialists.

- f. **Priority Task** - Enhance Chesapeake Bay fishing opportunities through development of artificial reefs on permitted fish havens.

Desired Task Achievement Date - Ongoing

Obstacle – None

Solution – N/A

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PROVIDE SUSTAINABLE ECONOMIC OPPORTUNITIES

- a. **Priority Task** - Maintain and update the Charter/Guide map on the department's Webpage and increase awareness of this tool.

Desired Task Achievement Date – Ongoing

Obstacle – Assuring that all those listed have current license or decal.

Solution – Staff must monitor map and perform bi-annual map updates.

Obstacle – Charter boat Captains and licensed Guides must complete and submit application in order to appear on map.

Solution – Create and distribute a message for guides and charters when they purchase their guide/charter license. The message would notify guide/charter of the opportunity to sign up to advertise their services on the Charter/Guide map.

Obstacle – Increase awareness of this tool

Solution – Actively work to identify and utilize opportunities to advertise this tool. Reserve advertisement space in the annual Guide to Maryland Fishing and Crabbing and work with the department of Business & Economic Development and the tourism industry to advertise the tool in their publications. Promote aggressively on social media, such as Facebook.

- b. **Priority Task** – Continue collaboration with Maryland's department of Business & Economic Development and the tourism industry to promote Maryland as a premier destination to fish & hunt.

Desired Task Achievement Date – Ongoing

Obstacle – None

Solution – Continue to work with Tourism at large sport shows such as Harrisburg.

- c. **Priority Task** – Assemble representatives from the American Eel Industry to form a workgroup to identify some management alternative recommendations for when state quota management is implemented through ASMFC. Triggers for state quota management have not yet been hit, but are expected in the near future.

Desired Task Achievement Date – Ongoing

Obstacle – None

Solution – N/A

PROMOTE AND PROTECT FISHERIES RESOURCES THROUGH PUBLIC OUTREACH AND EDUCATION.

- a. **Priority Task** – Work to influence state and local planning to consider negative cumulative watershed impacts from development that diminish fisheries and aquatic resources.

Desired Task Achievement Date – Ongoing

Obstacle – Consideration of cumulative impacts of development on aquatic resources is not required for local governments and planners. Means of communicating the risks of development on fisheries en masse and making it stick are elusive.

Solution – Seek opportunities to communicate with local governments/planners about watershed goals for aquatic resources and provide technical support so they can develop comprehensive plans that consider aquatic habitat important to fisheries.

- b. **Priority Task** – Develop angler preference survey for tidal black bass management to measure angler usage and preferences for black bass fishing opportunities in tidal waters.

Desired Task Achievement Date - The tidal bass survey will be conducted in FY 2017 with results due by June 30, 2018.

Obstacle – One single survey method will not reach all anglers. Mail surveys are expensive and do not always reach the

intended recipient. Some anglers do not use the internet. However the results from mailing surveys depend on memory and do not offer verifiable data, both of which can bias results of catch and harvest. Angler-intercept surveys are conducted on the day of fishing and allow staff to verify results. Both methods are expensive, and angler-intercept surveys are time consuming. There is a lack of funding to implement these surveys.

Solutions – Funding will be requested for FY 2018. Surveys may need to be conducted independently, with the angler-intercept survey conducted in FY 2017 and the mailing survey conducted in FY 2018, which will spread the funding between fiscal years. A portion of the mailing survey will be conducted on-line, which will reduce the amount of money needed to conduct that survey. Additionally, Freshwater Fisheries staff may conduct the survey using methodology established for the FY 2016 brook trout survey, which will reduce the cost of developing a new methodology. The combination of surveys will aid in determining general angler preferences, catches and harvest, as well as expenditures. Results from the survey will be used to improve angler experiences and generate management strategies that benefit the resource and access to the resource. Mail surveys will be conducted by targeting black bass anglers who are licensed. Angler-intercept surveys will be conducted in areas historically surveyed so a comparison of results is possible.



- c. **Priority Task** – Promote recreational fishing opportunities and continue to focus on developing innovative outreach, communication and public engagement tools which reach the broadest possible audience.

Desired Task Achievement Date – Ongoing

Obstacle – None

Solution – Work with Park Service, Natural Resources Police and other departmental Units to develop and implement a Spanish language pilot program of angler education and boating safety outreach events. Pursue grant opportunities for Hispanic outreach, including Recreational Boating and Fishing Foundation.

Solution - Work with Recreational Boating and Fishing Foundation to leverage their marketing and recreational outreach programs (i.e. Fishing License Marketing Program, Take Me Fishing, Vamos A Pescar).

Solution – Work with Park Service to develop and pilot a tackle loaner program at one License Free Fishing Area. Develop and conduct additional youth/family fishing events or programs.

Solution – Expand communications with tackle shops by developing and maintaining a robust communication pathway with tackle shops and local destination marketing offices.

- d. **Priority Task** – Promote nontidal Potomac River recreational fishing opportunities for channel and flathead catfish and improve survivorship of fish during catch and release tournaments. Recreational anglers and tournament anglers have expressed concern that large channel catfish have declined.

Desired Task Achievement Date – Ongoing

Obstacle – flathead catfish have become popular with anglers and many are reluctant to harvest them.

Solution – Develop outreach materials promoting proper fish handling and tournament weigh-in practices that increase survivorship of channel catfish.

Solution – Work with tournament directors and organizations to improve tournament procedures.

- e. **Priority Task** – Retain Cobb Island Bridge as a fishing platform once new bridge is constructed.

Desired Achievement Date – Ongoing

Obstacle – County officials must agree.

Solution – Continue to communicate with county officials to emphasize the value of allowing fishing access in this area; increased fishing would add contribute to the local economy.

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Appendix 2. Fisheries Service FY 2015 Accomplishments

Following is a list of some of the fisheries related activities Fishing and Boating Services accomplished that benefit sport fishermen during FY 2016. These activities may use FR&D and FM&P special funds or other Fishing and Boating Services funding sources.

PROTECT, CONSERVE AND ENHANCE FISHERIES RESOURCES

Oysters – Considered a keystone species of Chesapeake Bay providing numerous benefits to the ecosystem benthic habitat, filtration of algae and silt, ecosystem diversity, etc.), such that benefits of oysters extend beyond just their own population. Oysters are at historically low levels. The amount and quality of oyster habitat is also greatly reduced compared to historic amounts.

- Based upon recommendations from the Environmental Impact Statement (EIS) for oysters and in accordance with the Chesapeake Bay Watershed Agreement to restore 10 (5 in MD and 5 in VA) tributaries by 2025, Maryland has completed major restoration efforts in two tributaries: Harris Creek and the Little Choptank River. The Tred Avon River project is now underway.
- Conducted annual dredge-based surveys of oyster bars. These assessments have provided biologists and managers with information on oyster spatfall intensity, observed mortality, and more recently on parasitic infection status in Maryland’s Chesapeake Bay. The long-term nature of the data set is a unique and valuable aspect of the survey that gives a historical perspective and allows the discernment of trends in the oyster population
- Performed the following GIS and database activities to support the Shellfish and Aquaculture divisions:
 - + Performed quarterly updates to aquaculture lease database
 - + Maintained and updated aquaculture lease database and Aquaculture Siting Tool to include accurate restoration and planting site data.
 - + Created SAV survey maps and assisted with SAV field surveys and conflict mapping exercise
 - + Computed oyster habitat acreage and percentage of seed and shell plantings in oyster sanctuaries
 - + Assisted production of shellfish closure publication
 - + Digitized commercial oyster gear areas
 - + Supported production of “Oyster Management Review: 2010 to 2015”
- Processed and issued 50 new shellfish aquaculture leases on 1,757 acres. Leaseholders plant oyster shell and seed on these leases in compliance with the State’s active use requirements. These activities will serve to expand existing and/or create new marine habitat and augment oyster populations.

Electronic Reporting (Blue Crabs and Striped Bass) - Expanded implementation of the FACTS™

E-Reporting system from a limited blue crab pilot to an expanded blue crab and striped bass pilot to voluntary use for all finfish as of January 1 2016. The FACTS™ system includes a hailing requirement to improve accountability; requires daily reporting when fishing so that harvest information is more accurate; and provides daily harvest totals to allow for timely quota monitoring.

- An electronic reporting coordinator recruits and trains license holders
- Striped Bass check stations are required to use the system when any voluntary participant comes to their facility.
- 5% of finfishers and 6% of crabbers are now signed up to use the system.

Striped Bass – Chesapeake Bay’s marquee sport and charter fisheries. Staff worked in concert with the ASMFC Atlantic Striped Bass Management Board to finalize Addendum IV to Amendment 6 of the Interstate Fishery Management Plan for Atlantic Striped Bass. The new Addendum establishes new fishing mortality (F) reference

points, as recommended by the 2013 benchmark stock assessment, and associated management measures to reduce fishing mortality to a level at or below the proposed target within two years in the Chesapeake Bay and one year along the coast. Management measures were modified to account for these reductions – the first significant management actions in the recreational striped bass fishery in 20 years. Staff completed striped bass stock assessment update in cooperation with the ASMFC technical committee. The assessment results will be delivered to the ASMFC at its annual meeting in late October.

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Staff continued to conduct multiple surveys in order to provide up to date stock assessment information. These assessments have provided managers with information on age structure, length frequency, relative year-class strength and overall striped bass stock status in the Chesapeake Bay.

Brook Trout – The only native trout to Maryland. Considered “canaries in the coal mine” for being among the first aquatic resources to respond to degradation in a stream or watershed. A highly sought after sportfish to Marylanders and tourists, and source of economic importance to western Maryland counties.

- Completed Annual Fishery Management Plan review.
- Continued benthic macroinvertebrate and Brook Trout population monitoring at the Metz property streambank restoration site on the Upper Savage River. Instream work is completed and post-construction monitoring will continue for at least three years.
- Conducted sampling for the third round of the five-year statewide brook trout monitoring plan.
- Initiated work on two State Wildlife Grant funding projects that are focused on water temperature and flow budgets, genetic relationships of fluvial populations, and invasive parasites.
- Completed the survey portion of the statewide Wild Trout Angler Preference Survey that was particularly focused on brook trout. This was a complex undertaking that required a large expenditure of time for program staff.
- Continued intensive population monitoring efforts in the Upper Savage River special brook trout management area to assess the impact of no the no harvest and no bait fishing regulation implemented on January 1, 2007.
- Updated the “Brook Trout homepage” for the department’s website, providing information and updates to the public on brook trout research, management, and angling (<http://dnr2.maryland.gov/fisheries/Pages/brook-trout/index.aspx>).
- Presented information on brook trout resources, management, the Upper Savage River special brook trout management area, and brook trout angling to Mid-Atlantic Council of Trout Unlimited, Nemascolin Chapter of Trout Unlimited, and the Maryland Sport Fisheries Advisory Commission.
- Assisted Central Region staff with the radiotelemetry tagging project of mainstem upper Gunpowder Falls adult brook trout, and assisted in ongoing work efforts of the Upper Gunpowder Falls watershed restoration partnership.
- Fifteen adult brook trout were implanted with radiotelemetry tags in the upper Gunpowder Falls in March 2016. Nine were tagged on Baltimore City watershed property while six were tagged on private property in Carroll County. Initial results indicate that the tagged trout are using over five miles of the main river as spring and summer habitat. This project has allowed Freshwater Fisheries to develop working relationships with private landowners in the watershed and our knowledge of brook trout use of the upper Gunpowder Falls has been greatly enhanced by this project. More brook trout may be tagged in spring 2017.
- Trained approximately 20 volunteers from Maryland Chapter of Trout Unlimited in temperature logger location and deployment. Trout Unlimited purchased temperature loggers and coordinated with Freshwater Fisheries staff to determine locations where additional water temperature data were needed. Seventeen temperature loggers were deployed in the Upper Gunpowder watershed by the volunteers with Freshwater Fisheries guidance.

- Presented and update at the department of Natural Resources in-house Bay Policy meeting on the two year work plan for brook trout as part of the 2014 Chesapeake Bay Agreement. An outcome for restoring brook trout in the bay watershed was included in the agreement, with a goal of increasing the number of streams occupied by brook trout by 8% baywide by 2024.
- Attended the Southern Division American Fisheries Societies' Annual Trout Committee meeting (<http://sdafs.org/trout/annual-meetings-and-minutes>). Several new initiatives were discussed, and a particular area of concern was the issue of invasive fish diseases in wild trout populations and in hatchery systems and the vectors for arrival.
- Co-authored two papers that were published in peer reviewed journals. The papers detailed initial results on research pertaining to angling-related mortality of brook trout.

Black Bass – The most sought after sportfish in Maryland providing significant socio-economic value.

- Completed Fishery Management Plan review and update for tidal largemouth bass.
- Conducted sampling as governed by the standard operating procedure for tidal largemouth bass.
- Stocked thousands of bass in response to stakeholder concerns and ecological need.
- Continued the cooperative agreement to fund a study to improve the survival of largemouth bass held in livewells. An annual summary of work completed by Mississippi State University on livewell work will be completed by December 2016. Current results are being used to refine guidelines in the 2017 Fishing Guide.
- A series of bass conservation videos were created using talents from Bass Anglers Sportsmen Society, Maryland Bass Nation, and National Guide Service, along with the Department.
- A technical advisory group, the Black Bass Advisory Subcommittee, evolved from the black bass roundtable and became a formal group of 13 members to advise the Department on matters of concern for the public in the black bass fishery.
- Worked with numerous tournament directors to provide assistance in organizing and developing tournaments, as well as provide assistance in keeping bass alive aboard release boats.
- The permit for tournament directors was amended with special conditions that require many directors and participants to adhere to recommendations from Keeping Bass Alive and nationally recognized bass best handling strategies.
- A number of indices and spatial layers were developed and made available on-line to help identify essential components for black bass in Maryland, with a goal to protect the stability and integrity of the fisheries.
- Declining catch rates have been verified in the tidal Potomac River, with results presented at the American Fisheries Society Annual Meeting (Portland, OR, August 2015) and are currently in final review with the Journal of Fish and Wildlife Management. The results have also been presented to the SFAC, Potomac River Fisheries Commission, various stakeholders, and prepared as part of on-line reading material.

Yellow Perch –

- Developed a technique for creating biological reference points that take into account the impact of development on sustainable harvest.
- Continued an experimental stocking project at Allens Fresh (Charles County). Approximately 21,000 yellow perch were discretely marked by life stage and stocked to enhance wild populations in this popular fishing area and provide marked hatchery fish that can be used to assess the juvenile population status.
- Developed the draft Amendment 1 to the 2002 Maryland Tidewater Yellow Perch Management plan that revises the management plan objectives, incorporates the status of the stock and presents the current management approach. Incorporate the final draft by reference into Maryland regulations in 2017.

Shad – A historically valuable sport fishery that also serves an important ecological role as a forage fish. A harvest moratorium has been in place since 1980 given its low abundance.

- Continued restoration stocking and assessment project for Patapsco River shad and herring species and documented survival of hatchery-origin larvae and juveniles in putative nursery areas.
- Documented many adult American shad returning to spawn in the Choptank River restoration tributary. Determining the progression of the American Shad restoration program through time has been difficult due to low numbers of returning adult American Shad and the annual variability of wild juvenile abundance estimates. Even though the wild juvenile abundance has been variable, wild juveniles are captured in the summer seine survey suggesting wild recruitment is occurring. In 2015, the department changed the spring adult sampling method and survey area for American Shad. This decision was made because of a successful restocking program for Hickory Shad, as well as historically low adult American Shad catches in comparison to Hickory Shad in the same survey reach on the Choptank River. Anchored gill nets were deployed downstream of current electrofishing areas. In 2015 only three American Shad were captured. The target survey area was moved further downstream in 2016. A total of 46 American Shad were captured during the spring spawning run. Otolith and scale aging analyses will help to determine the contribution of hatchery produced fish to the adult spawning population and estimate the age and frequency of virgin and repeat-spawning.

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Rare, threatened and endangered (RTE) species - Various RTE species are managed under the jurisdiction of the department's Wildlife & Heritage Service (WHS). Hatcheries Division staff collaborated with WHS and Resource Assessment Service (RAS) to produce aquatic organisms to meet management needs. These efforts included "head start" projects (Eastern hellbender), population reintroduction (blackbanded sunfish) and culture research (freshwater mussels).

Invasive Species – The introduction and spread of invasive species such as blue and flathead catfish and Northern snakehead threaten ecologically and socio-economically important native fish species due to their predatory impacts and competition for habitat and food.

- Maintained Invasive Species Component within the MD Fishing Challenge award program, recognizing anglers who 'catch and keep' blue catfish, flathead catfish or Northern snakehead.
- Conducted outreach and education on invasive species including social media, special tournaments/derbies, and public events such as the State Fair.
- Continued research into invasive blue catfish and snakeheads in coordination with the multiagency, Invasive Catfish Task Force.
- Developed an Aquatic Nuisance Species Action Plan that has been internally reviewed by the Department, externally reviewed by the State and general public, presented to the Department's Secretary and is currently under review by the Governor's Office. The adoption of this plan by December 2016 will allow the Department to compete for federal funding and provide a roadmap for addressing invasive species cooperatively with other agencies and the general public.
- Collaborated with the U.S. Fish and Wildlife Service (USFWS) and the National Park Service (NPS) to provide signage, outreach material, and a "Stop the Snakehead" fishing derby on the Chesapeake and Ohio Canal to raise public awareness and encourage angling harvest of Northern snakehead.
- Collected baseline life history data for nontidal Potomac River flathead catfish to include current distribution, relative abundance, size distribution, length-at-age, and stomach contents. Initial survey efforts and angler feedback indicates that the Potomac flathead population is expanding rapidly. Gaining a better understanding of this population will be crucial in determining the potential implications for the ecosystem and popular existing sport fisheries.

- Provided presentations to various groups to highlight invasive catfish population trends and to provide updates on Department activities such as surveys, diet studies and life history data. Provided information to several publications on the status of invasive catfish populations in Maryland.
- Briefed fishery managers and the SFAC on current blue catfish populations and relevant data that led to the rejection of calls from avid anglers who wanted to tighten regulations on trophy blue catfish possession and restricting the transport of live fish across State lines.
- Collected blue catfish for the second time for the Maryland Department of Environment in order to assess the PCB and Mercury levels of fish filets minus the lateral line meat. Results from these samples may pave the way for increasing the monthly meal allowance provided by MDE's fish consumption advisory.
- Initiated a diet study on blue catfish in the tidal Patuxent River. Biological data collected included length, weight, sex, otoliths, maturity and stomach contents. Data will be used as part of the regionwide invasive catfish management plan that is being crafted by the Invasive Catfish Task Force at the request of the Sustainable Fisheries Goal Implementation Team.
- Co Authored two papers regarding blue catfish in the tidal Potomac and Patuxent Rivers: "Gutsy Genetics: Identification of digested piscine prey items in the stomach contents of sympatric native and introduced warmwater catfishes via DNA barcoding" and "Population Size and Survival Rates of Blue Catfish in Chesapeake Bay Tributaries."

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Fish Habitat – Utilization of state of the art tools to integrate the valuation of important fish habitat supports informed decision making at the local, state, and federal levels.

- Developed maps that depict where anadromous fish spawning habitat is located in Maryland and its conservation priority status (high, mid and low) based on relationships of spawning success indicators, salinity, and development (impervious surface).
- Continued annual monitoring on nontidal Potomac River (initiated 2013) to evaluate spatial and seasonal distribution of benthic cyanobacteria, primarily *Planktothrix isothrix* and, in far lesser amounts, *Lyngbya majuscula*, the potential impacts of noxious benthic cyanobacteria blooms on macroinvertebrate communities, water quality and smallmouth bass health. Analyzed and presented data at annual Harmful Algal Bloom Matrix Team conference. Partnered with Hood College and University of Maryland Baltimore Campus (UMBC) Institute of Marine and Environmental Technology (IMET) to identify toxins produced from benthic mats and accumulations of toxins present in aquatic organisms. Additional efforts were made in attempts to quantify dispersion and biomass.
- Collaborated with Hood College, Center for Coastal and Watershed Studies to expand investigation to include estimates of algal coverage and toxin production. Algal toxins have been linked to lowered immune function in some fish and may compound the deleterious effects of other endocrine disrupting compounds.

Fish Health – Understanding fish health in wild stocks, aquaculture, bait fish, the pet industry, and hatchery stocking is the most fundamental need for protection, conservation and wise use to ensure healthy fish stocks.

- Fisheries leadership reviewed the draft Fish Health Management Policy. Implementation process and potential roadblocks were assessed.
- Continued investigation of mycobacteriosis in striped bass. Collaborated with NCBO and environmental consultants to investigate mycobacteriosis in Chesapeake Bay Striped Bass. This work was funded by a Chesapeake Bay Program Goal Implementation Team Sustainable Fisheries grant. The goal was to learn more about disease dynamics and environmental factors that may exacerbate mycobacteriosis, and to recommend a useful fish health indicator for the Bay Program. An effective Chesapeake Bay fish health indicator does not currently exist. Initial work indicated a link between water quality, mycobacterium density, and disease prevalence in Striped Bass. Prevalence of mycobacteriosis in age-1 striped bass could be an appropriate

health indicator for the Bay. This initial work would benefit from additional research and collaboration among all Chesapeake Bay fish health researchers.

- Conducted experimental finfish health survey in a single tributary. This multi-year experimental work will serve to fine-tune the techniques and processes that are needed to fully implement a fish health index for Maryland's Chesapeake Bay waters.

Fish Passage – Targeted removal of stream blockages allows ecologically and socio-economically important fish species to once again utilize historical upstream habitat that serves an important role for spawning, and other life history needs.

- The Patapsco River Restoration partners completed the 90% Design for the Bloede Dam Removal Project and are scheduled to begin the first phase of the project: relocation of the sewer line, beginning in late fall 2016. The removal of the dam structure is scheduled for fall of 2017.
- The Centreville Dam was removed in August/September 2015. With climate change expected to increase the incidence of flooding in the area, the department partnered with American Rivers and the Town of Centreville to improve local flood resiliency by removing the dam and restoring the natural stream channel and surrounding habitat. Removal of the dam allowed access to 3 miles of additional upstream habitat for alewife, river herring, American eel and other native fish.

Regulations and Fishing Penalties - During FY 2016, 137 recreational fishing licenses and 12 commercial fishing licenses were suspended. Additionally, 10 commercial fishing authorizations were revoked. These continued actions to suspend and revoke fishing licenses have provided increased deterrence to illegal activities.

Fisheries Management Plans – Completed the 2015 Fishery Management Annual Report to the Legislative Committees. The report updates the status and management actions of 22 plans that address 32 species. Developed an FMP Focus document for members of the SFAC and TFAC that summarizes the current management for each FMP species and highlights important up-coming management issues.

Atlantic Sturgeon - Deployed and continue to maintain an acoustic receiver array that covers the main stem Chesapeake Bay and major historic Atlantic Sturgeon spawning tributaries such as the Pocomoke, Nanticoke, Choptank, Potomac, and Patuxent rivers. This array is targeted to monitor endangered Atlantic sturgeon populations, but will also detect any similarly tagged animals such as striped bass, sharks, sea turtles and marine mammals. It will effectively monitor tagged blue catfish to assess the migratory behavior and distribution of this invasive species. NOAA funding was obtained to conduct Atlantic sturgeon habitat and early life history research in Marshyhope Creek. This tributary recently indicated the only known Atlantic sturgeon spawning population in Maryland's Chesapeake Bay. It is evident that mature fish occur in putative spawning habitats, but it is unknown whether these animals successfully spawn and produce fertilized eggs, larvae and juvenile sturgeon. Partners from NCBO, the University of Maryland Center for Environmental Science (UMCES) and Delaware Fish & Wildlife (DE DFW) worked to assess spawning habitat and to evaluate whether successful spawning and recruitment occurs. Hard bottom areas were identified by NCBO habitat surveys as potential suitable spawning habitat. Thirteen additional acoustic receivers were deployed to determine tagged sturgeon habitat use.

Forage Fish – Information from existing monitoring programs was integrated into five indicators of forage fish status for resident striped bass in Maryland's portion of Chesapeake Bay. This prototype indicator could be used to meet both ASMFC and Bay Program requirements.

North Branch of the Potomac River watershed – Identified key problems facing the North Branch of the Potomac River and took the following actions:

- Maintained recording temperature monitors to provide temperature data to US Army Corps of Engineers (USACE). The Corps used these data to evaluate impacts of the discharge from Jennings Randolph Reservoir on the Zero Creel for all trout species (catch and return for all trout species with no tackle restrictions) section of the North Branch Potomac River (from the UPRC WWTP discharge downstream to the Route 956 bridge at Pinto). The temperature data were used by the USACE to evaluate the effectiveness of increased flows from Jennings Randolph Lake during excessively hot (> 90 ° F) days. It was determined that increased flow > 250 cfs measured at Luke could maintain river temperatures measured at Keyser at 77° F as the maximum thermal limit for trout species present. The USACE provided increased flows in 2016 during a critically hot spell, and temperatures generally remained at 77° F or less in the North Branch Potomac River measured at Keyser.
- Continued installing fish habitat structures in the Savage River Reservoir to enhance populations in the lake. The reservoir was drained several years ago and habitat was lost. Staff identified key areas where habitat was needed to restore and enhance the recovering fish populations. Activities initially used Christmas tree structures, but activities in 2016 introduced innovative pole timber structures to further enhance habitat.
- Provided additional temperature data regarding the discharge permit renewal for Verso Corporation (papermill in Luke). Staff continued to work with Maryland department of the Environment and the papermill to ensure adequate thermal protection is afforded to the North Branch Potomac River. Staff provides temperature data for an ongoing temperature study as a condition of the cooling water effluent permit.

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Freshwater Temperature and Water Quality Database –

- Imported all 2015 temperature and water quality data collected statewide by Freshwater Fisheries staff into database.
- Converted and imported all temperature and water quality data collected in Central Region from 2003 to 2010.
- Updated a GIS map with descriptive statistics for temperature data.

PROVIDE AND ENHANCE FISHING OPPORTUNITIES, INCLUDING ACCESS

Angler Access Map – Maintained on Fishing and Boating Services website. This interactive map helps anglers find new fishing opportunities and provides information on location, parking, ease of access (including ADA facilities), available fish species, regulations, stocking, managing agency contacts, fees and other.

Hatcheries

- Completed a very successful first full production run at Mettiki Hatchery in spring 2016. More than 19,000 adult fish were stocked in the spring of 2016 and 13,000 adults are still under culture and will be stocked in the fall of 2016.
- Albert Powell Hatchery and Bear Creek Hatchery received an “A” classification for fish health. This rating is granted only after a facility tests pathogen-free for three consecutive years. This is an important milestone for the program, which has committed to strict biosecurity and fish health protocols over the past five years.
- Initiated cutthroat trout culture trials to provide a unique angling opportunity in western Maryland.

GIS

- Updated web-based map indicating License Free Fishing Area information
- Updated spatial data and online map for Maryland’s trout management areas based on revised regulations
- Assisted NOAA partners with with GIS tasks related to an oyster larvae transport model

License Free Fishing Areas – Inspected License Free Fishing Areas and installed new signs where needed.

Artificial Reefs

- Working under MARI/ departmental permits and oversight, the Chesapeake Bay Foundation deployed approximately 150 additional reef balls in spring of 2016 at Memorial Stadium Reef, located between Hart-Miller Island and Tolchester at Gales Lumps. The reef balls were constructed by volunteers from MSSA, Stevenson University, and various school groups. The reef balls were deployed in the new 1.5 acre area that was added to Memorial Stadium Reef Ball site (permit modification) in 2014.



- Completed third year of MARI angler survey; produced summary report with description of species, catch rates and fish size distribution on artificial reefs in Bay and Ocean using data from angler logbooks. During winter/spring 2016, recruited volunteers for fourth year of volunteer logbook study. Fishing period for this survey began May 30, 2016.
- Deployment of 3000 tons (three bargeloads) of concrete at Love Point Reef in spring/summer 2016.
- Worked with the department's power plant division to develop reefing plan with Dominion to accept recycled concrete rubble from the Cove Point facility. Reef plan was finalized in fall of 2014, material was inspected in spring of 2015, and deployment of five barge loads of material were completed by August 31, 2015. Additional material scheduled to be deployed October 2016.
- Planned deployment of reefballs to be completed at Tilghman Artificial Reef Site (Fish Haven).
- Obtained new 10 year Maryland department of Environment state license for artificial reefs (21 original MARI reef sites) and new 10 year Army Corps permit.

PROVIDE SUSTAINABLE ECONOMIC OPPORTUNITIES

Oyster Aquaculture - Growth in this industry should benefit the Bay ecosystem through reduced fishing pressure on the wild fishery, increased oyster biomass, and improved habitat throughout Maryland waters.

- Provided products and services from Piney Point Aquaculture Center to support development of the aquaculture industry in Maryland. Implemented culture trials for triploid oysters to provide a Maryland procurement source for this increasingly scarce product. Increased cultchless culture capabilities for seed production.
- Continued working with MARBIDCO to secure state capital funding that is used to provide financing assistance to existing and prospective shellfish growers.
- Held one on one consultations with prospective growers to help them locate suitable production sites and develop lease and permit application materials required for state and federal project reviews.

GIS

- Assisted colleagues at the Virginia Institute of Marine Sciences -to analyze proximity of oyster-related business relative to active oyster leases
- Updated charter boat data for online web map
- Updated data for the True Blue program to support Maryland's blue crab industry

Charter/Guide Map – Continued to maintain list of Charter boats/Guides included on the Charter/Guide map on the department’s Webpage. Performed comprehensive assessment and update of map. Established process for twice yearly update of map to assure that all those listed have current license or decal.

PROMOTE AND PROTECT FISHERIES RESOURCES THROUGH PUBLIC OUTREACH AND EDUCATION.

Black Bass –

- Held annual Black Bass Roundtable to convey information and to gain feedback from user groups and neighboring states fisheries agencies on tidal water black bass fisheries in Maryland.
- Held several taskforce meetings throughout the year to convey information and to gain feedback from user groups and neighboring states fisheries agencies on tidal water black bass fisheries in Maryland. These meetings included ones with Potomac River Fisheries Commission and the Black Bass Advisory Subcommittee.
- Conducted mark recapture project on Potomac River that fostered communication of hundreds of black bass anglers and the department’s southern region office.
- Developed bass conservation videos with members of the general public to facilitate better handling of black bass.
- Refined black bass website to improve communication with black bass anglers.
- Promoted the fishery using social media and the department’s Anglers Log.
- Worked with media outlets (ABC News, Maryland Public Television) to get coverage of the black bass reef project at National Harbor.
- Continued Volunteer Angler Survey to determine satisfaction with tidal water black bass management. Staff is still assessing the input and survey is ongoing.

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Striped Bass –

- Continued Striped Bass Volunteer Angler Survey. The survey provides the department with supplemental recreational catch data and enables recreational anglers to assist the department and participate directly in fisheries management. This survey is ongoing, staff annually assesses input.

Invasive Species –

- Worked on a department-wide educational campaign to raise awareness about zebra mussels.
- Conducted a fishing derby to raise awareness of northern snakeheads in the C&O Canal; the derby was a cooperative event with the department, National Park Service, U.S. Fish and Wildlife Service, and Senator Lee of the General Assembly in Montgomery County.
- Provided material for display at the Maryland State Fair in Timonium Maryland concerning invasive fish species in Maryland

Marylanders Grow Oysters (MGO) – Expanded this citizen-based stewardship program that engages thousands of Maryland residents and school students to enhance the Bay’s oyster population. MGO is the largest oyster gardening program in the state, active in 30 tributaries, offering a hands-on connection to oysters and the Bay as the participants grow oysters at their piers in cages made by inmates, who are also active as Bay stewards.

Recreational Fishing Promotion

- Completed the 11th annual Maryland Fishing Challenge contest and hosted a finale event. 1,040 Angler Awards were issued in three categories. The first year of the Governor’s Catch and Release Award yielded 20

individuals receiving 24 awards in FY 2016 and five new state record fish were recognized.

- Staff began giving a weekly (Wednesdays) fishing report on radio station WNAV. Reporting started Oct 21, 2015 and a total of 35 reports ran in FY 2016. Additionally, two shows were held on the Outdoorsman Radio Show (including a 2 hour pre-recorded show with Natural Resources Police staff prior to Memorial Day weekend).
- A “16 in ‘16” fishing license discount promotion was developed and rolled out at the Harrisburg Outdoors Show in February. The “16 in ‘16” promotion targets 16 year olds purchasing their first fishing license by giving them a 50% discount on the purchase price. The promotion runs through calendar year 2016. It was also promoted at the Pasadena Fishing Flea market show, online including social media and mentioned during radio interviews. Additionally, two “16 in ‘16” ads were placed in the Coastal Fisherman magazine.
- Staff attended a variety of shows and events in FY 2016 including: Maryland Fishing Challenge Finale (Sept. 2015), Bass Pro Fall Clinic (Sept. 2015), National Fishing and Hunting Day (Sept. 2015), MSSA-Frederick show (Jan. 2016), Harrisburg show (Feb. 2016), Pasadena Fishing Flea Market (Feb. 2016), Boy Scout Troop, Middle River (June 2016), Park Service /MCC “Train the Trainer” (June 2016), MD Dept of Tourism, Maryland Live (June 2016).
- Staff wrote and distributed 43 statewide weekly fishing reports during FY 2016. (The reports take a hiatus during the typically low fishing activity winter period.)
- During FY 2016 2,388 individuals signed up to the Fishing and Boating Services email subscription list, bringing the subscriber total to 26,000. Subscribers can choose to receive emails from up to four separate lists; they include Maryland Youth Fishing Club, Nontidal Recreational Fisheries, Tidal Recreational Fisheries and Commercial Fisheries.
- Staff conducted outreach by personally visiting 43 tackle shops, visits included distributing information on ‘16 in 2016’, the Maryland Fishing Challenge and to talk with shop owners about the upcoming season.
- Created a Freshwater Fisheries Webpage to promote freshwater fishing opportunities, provide relevant news items, and provide anglers with up-to-date resource information.

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Youth Fishing

- Provided support to organized youth fishing events. Stocked trout or hybrid sunfish for rodeo events and provided angling education and guidance (knot tying, casting, habitat, proper tackle selection) at several fishing rodeos and other community events, which included summer day camps and National Hunting and Fishing day.
- Provided 10,000 Rainbow Trout eggs for Trout Unlimited’s “Trout in the Classroom” project to support 91 classroom programs.
- Supported the department’s “Sunfish in Schools” program by providing fish, food, and technical support. This program expanded to more than 155 classrooms for fall 2016.
- Maryland Youth Fishing Club membership reached 2,693 in FY 2016. Continued partnership with Bass Pro Shops to hold quarterly random drawings to select winners from among members of the club who posted entries to the youth angler’s log. Quarterly winners were awarded \$50 Bass Pro Shops gift cards.
- Freshwater Fisheries staff conducted a Youth Brook Trout Fishing event on the Upper Savage River in June. In cooperation with local fishing groups and guides, Bass Pro Shops, Bill’s Outdoor Center, Trout Unlimited and the Bassin’Box, local youth were treated to a fun day of learning how to fish with artificial flies and lures and how to successfully catch and release wild brook trout. Each young person received a fishing rod (choice of fly or spinning rod), a box of lures or flies, empty tackle holder, line cutter and hemostat. Classes during the day showed casting, knot tying, stream bugs, how to safely unhook and release a fish, brook trout life history and how to fish for them. Lunch was provided for young anglers and their parents or guardians. At the end of the day, each had the opportunity to go fishing on Big Run or Savage River Reservoir. Twenty-seven youth participated and the event was deemed a success and will be repeated next year. Cost was kept minimal by generous donations from sponsors.

GIS

- Updated a black bass spatial data layer for the tidal bass fishery. This included layers related to catch surveys, submerged structure, a fish forage index, sanctuaries, catch and return areas, 6-knot speed zones and nursery habitats.
- Updated a web map of black bass release locations for distribution to tournament directors.
- Conducted a series of internal training sessions on proper use of projections, geocoding data and use of GPS to collect field data.

Angler Preference Surveys

- Conducted an angler preference survey of nontidal anglers to determine usage, preferences and understanding of freshwater fishery management strategies. The survey used the database of nontidal anglers and consisted of two options – an online version and a mail-in option for those without access to the internet. Freshwater Fisheries contracted Morgan State University staff to conduct the survey and analyze the resulting data. The Principal Investigator and Fisheries staff collaborated to develop a survey that would evaluate angling experiences, angling preferences and the value of the various fisheries to Maryland anglers. Data are being analyzed and a report is due by the end of 2016.
- A wild trout angler survey was conducted to evaluate trout anglers and their preferences regarding wild trout in general and wild brook trout in specific. The survey investigated usage of special management areas meant to protect wild trout populations. These data will provide insight on how anglers interpret existing protective regulations, on angler's opinions of the regulations, and will help guide future management.

