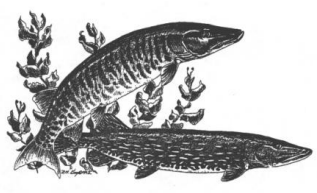


North Central Division American Fisheries Society

Esocid Technical Committee

Chair – Cory Kovacs: MDNR (kovacsc@michigan.gov)
Immediate Past Chair – Dave Kittaka: IDNR (dkittaka@dnr.IN.gov)
Chair Elect – Janice Kerns: UW-Stevens Point (jkerns@uwsp.edu)

July 28, 2016
Summer Business Meeting

The following meeting minutes are from the Esocid Technical Committee (ETC) meeting held in Gretna, Nebraska at the Ak-Sar-Ben Aquarium. The business meeting was held in conjunction with the Joint Technical Committees meeting with Walleye and Centrachid committees.

Meeting Time: July 28th, 9am-12:00pm (Central time)

Attendance
Janice Kerns (UWSP)
Robert Shelly (Utah Dept. Wildlife Resources),
Jon Meerbeek (IADNR)
Keith Koupal (NGPC)
Jeff Hansbarger (WVDNR)
Dave Woods (MDC; minutes)

Agenda (minutes in italics)

- **Call to order**

  In the absence of ETC Chair Cory Kovacs, Dave Woods conducted the 2016 ETC summer business meeting.

- **Approval of Winter Business Meeting minutes (see ETC Webpage)**

  Winter Business meeting minutes were available online and approved by the ETC.

- **Budget (see below)**

  Dave Woods reviewed the budget status with the ETC. In recognition of the diligent efforts of ETC member Keith Koupal to organize the 2016 summer meeting, the WTC voted at their business meeting to give the 2016 joint summer meeting proceeds, totaling approximately $2000, to the ETC. This should bring the balance of the ETC budget to approximately $5,030.

  The group discussed using some of our budget money to provide (soon to be published) copies of the Proceedings of the 2016 Hugh C. Becker International Muskellunge Symposium to ETC members at a reduced cost.

- **Committee Status**
  - Chair Elect 2017-Janice Kerns (UW Stevens Point-fish coop unit)
  - Membership

Janice Kerns will assume responsibilities as the ETC chair at the 2017 ETC Winter Business Meeting in Lincoln, NE. Currently, there are no known changes to the list of voting members on the ETC.

- **ETC By-laws update**
  - History of ETC-last update 2006
  - Include Chairs from each year (term)
  - Update selection for Chair-Elect

While some ETC members had a chance to review the updated ETC by-laws, Dave encouraged all members present to provide comments to Cory soon. The group discussed the need to update the symposium list to include the 2016 Hugh C. Becker International Muskellunge Symposium. Also, the two listed "ongoing projects" in the document can probably be deleted given that there was no knowledge of their status. At the very least, these should be considered "past projects". There was also discussion to include the muskellunge aging project being conducted by Derek Crane (Costal Carolina) as currently ongoing. Cory will follow up with this as he will be editing the documents as comments are received.

- **2017 Winter Business Meeting**

The 2017 Winter Business Meeting will be held at the 2017 Midwest Fish and Wildlife Conference in Lincoln, NE. The exact date and time of the meeting will be forthcoming.

The WTC, ETC and CTC all agreed that the 2017 Joint Summer Meeting will be held at Mille Lacs Lake, Minnesota.

- **State Updates**
  - Complete summary of state reports will be completed and included with the minutes following the meeting

The group discussed the need to write formal written reports for the summer and winter business meetings. The group agreed that while states in attendance will still provide updates at both the summer and winter meetings, there should only need to be one formal report provided for the winter business meeting each year. This will reduce redundancy from having two written state and provincial reports each year.

- **Adjourn**

2016

Esocid	Description	Expenses	Deposits	Balance
01-Jan				$3,020.28
09-Mar	plaque	$25.00		
29-Mar	book sales		$30.00	
		$25.00	$30.00	$3,025.28

State/Provincial Updates (not all updates were shared during business meeting)

Ontario
Prepared by John Paul Leblanc

At this point in time, the information provided for the last Ontario Status Report remains unchanged. There is still ongoing research on muskellunge and northern pike in Georgian Bay, Lake Huron, and with the Lake Simcoe restoration project, but updates will likely be unavailable until late fall.
There has been increased collaboration between Ontario researchers (primarily academic institutions; e.g., McMaster University & Carleton University) and the State University of New York College of Environmental Science and Forestry. Primarily to standardize sampling protocols among regions in the Great Lakes and elucidating habitat selection and habitat requirements for young-of-the year esocids.
These collaborations are still in early-stages and results are preliminary.
Ontario still manages esocid populations by means of natural reproduction, and the majority of research focuses and providing tools and strategies to satisfy fishery management plans.

West Virginia
Prepared by Jeff Hansbarger

1) WVDNR is currently developing a statewide management plan.
2) Hatchery staff experienced some success this past spring using a buffering procedure passed to us by Michigan DNR; we produce approximately 5,000 fingerlings a year. We stock summer released fingerlings (5-7") in rivers, and fall released advanced fingerlings in reservoirs/impoundments (11-14"). Surplus fry supplemental stocking is also done when available.
3) Agency personnel continue to be impressed with the Smith Root Fish Handling gloves used for spawning of both walleye and muskellunge.
4) We have supplied Dr. Derek Crane (CCU) with WV samples for an age and growth project. We also continue to investigate muskellunge age and growth through continued PIT tagging of stocked cohorts in specific WV waterbodies.
5) We are in an evaluation phase of determining natural reproduction in specific rivers, with the plan to possibly expand to other rivers. The goals are to ensure maximum return to all anglers (hatchery production), and to not stock over naturally reproducing populations, except following consecutive years of poor recruitment.
6) A tracking project on the Kanawha River has revealed all transmitter equipped fish were in the vicinity of Kanawha Falls during each spring, a known spawning area. The WVDNR also uses this area to collect broodstock each spring. Information from this project will be used to protect spawning muskellunge that accumulate below Kanawha Falls through potential future regulations.
7) We are working with local taxidermists to gather samples and information from large muskellunge that are kept and mounted.
8) Three additional anglers were given angler recap kits consisting of a PIT tag reader, GPS, bump board, data sheets and pens. These anglers will help document recapture of tagged fish

in numerous waterbodies. Two of the PIT tag readers were donated by the Trooper Eric Workman Foundation (eworkman.org) for the kits. The Foundation has also purchased numerous loads of minnows for the WVDNR, Smith Root Fish Handling Gloves, and purchased over $2500.00 worth of glass ware and equipment for the Palestine State Fish Hatchery.

9) The 4th Trooper Eric Workman Foundation Memorial Tournament was again a huge success, held June 4th and 5th, 2016 statewide on any water. One hundred eighty five anglers from four states caught 52 muskellunge ranging from 30" to 47". There was also a kid's tournament that saw 45 kids participate with a few catching their first muskellunge as well as other fish species.
10) A WV Muskellunge Roundtable Discussion was held April 11, 2016 at Stonewall Jackson Lake. Invited attendees included Bret Preston (Chief of Fisheries), Jim Moore (Muskies Inc. VP for Fisheries & Research, Ch. 9 President), WVDNR staff, and members representing the WV Husky Musky Club, Elk River Muskie Club, Trooper Eric Workman Foundation, Muskies Inc. Ch. 9, and Ch. 63. Discussion points included future regulations, hatchery and project updates, future cooperative projects including anglers and keeping lines of communication open between anglers and the WVDNR.
11) Anglers recorded 182 legal (30") muskellunge in 2015 with the WV Husky Musky Club. This is down from a high of 319 entries in 2010, but the average size registered has steadily risen from 2004 (35") to 2015 (38"). The largest registered in 2015 was a 52 ¾" muskellunge caught and released from the Little Kanawha River that would have been a new state record. Forty-eight percent of the registered muskellunge in 2015 were caught from stocked waters.

<u>Southern Esocid Technical Committee Input/Need for information</u>

1) Since early spring 2016 we (myself and numerous other SE biologists/consultants) have discussed starting a Southern Esocid Technical Committee. Travel issues and a desire to investigate fisheries questions within the southeast, while adding to the parent esocid technical committee are the main goals. Presently we have an 'ad hoc technical committee' within the southern division with the goal to eventually create a formal technical committee. We held a teleconference at the past spring Wheeling Southern Division meeting and plan to continue this at SEAFWA (fall) and SDAFS again in the spring.
2) Suggested needs for information expressed by the 'ad hoc Southern Esocid Technical Committee' participants:
    - Age and growth especially for 'older' muskellunge, non-lethal methods
    - Tiger muskellunge/muskellunge in impoundments
    - 'Hot water (summer) angling' and delayed mortality
    - Natural reproduction assessment/recruitment, what drives success or not
    - Angler exploitation
    - What is the potential of southeast populations (size) compared to Midwest/Canada and how long does it take to get there (i.e. maximum size)
    - Diet analysis
    - Optimal stocking densities as they relate to size limits
    - Stream/reservoir population management, sampling bias
    - Thiamine/Thiaminase issues
    - Economic impact of muskellunge angling
    - Impact to other fisheries, fishes

- Northern pike management (Md DNR), all facets of management, sampling, life history
- Esocid culture

Iowa
Prepared by Jonathan Meerbeek

Muskellunge Stocking, Tagging, and Population Dynamics (Contact: Jonathan Meerbeek jonathan.meerbeek@dnr.iowa.gov) - Thirteen lakes and impoundments are currently being managed as Muskellunge fisheries. In 2016, approximately 3,400 yearling (mean TL = 13.0") Muskellunge were stocked in 2 natural lakes and 8 reservoirs/small impoundments. In lakes where Muskellunge are used as broodstock, populations are monitored via annual spring gillnetting and population metrics are estimated using the Jolly-Seber model. In 2016, 490 broodstock Muskellunge were captured (318 recaptures) ranging from 26.8-52.2 inches in these lakes. Adult (≥ 30 inches) Muskellunge population estimates for 2015 in the Spirit Lake/Okoboji Chain and Clear Lake were 0.06 and 0.13 fish/acre, respectively. Currently, spring-stocked, pellet-started minnow finished yearlings are used in Iowa's Muskellunge culture program. All yearling Muskellunge stocked into Iowa's natural lakes are tagged via PIT tags prior to stocking (since 2011). In 2011 and 2012, yearlings were tagged in the check and tag retention was poor (52%; 118 of 225 tagged) at 2-3 years post-tagging. Since 2013, all yearling Muskellunge were tagged in the dorsal musculature. Retention (2-3 year) of 46 recaptured yearlings was 98% (45 of 46). Short-term PIT tag retention studies conducted by IA DNR and IA State, as well as other published literature, have found high retention rates for PIT tags inserted in this location. Conversely, PIT tag retention for tags (12mm, 23mm, and 32 mm) inserted in the body cavity of fall age-0 Muskellunge has been relatively poor.

Big Creek/Brushy Creek Muskellunge Emigration Study (Principle Investigators: Ben Dodd Ben.Dodd@dnr.iowa.gov, Ben Wallace Ben.Wallace@dnr.iowa.gov, and Michael Weber mjw@iastate.edu) - Iowa State University, the U.S. Army Corps of Engineers and the Iowa DNR are collaborating on a muskellunge emigration study at two central Iowa impoundments, Big Creek Lake (814 ac) and Brushy Creek Lake (690 ac). A horizontal bar barrier was installed at the Big Creek spillway in 2012. Brushy Creek has no barrier but it's similar in size, depth and watershed:lake ratio so it is serving as a reference lake for this study. PIT tag readers and antennas were installed on the spillways of both impoundments to quantify fish escapement and evaluate the efficacy of the barrier. Nighttime boat electrofishing and gill nets were used to collect muskellunge in April, 2016. We collected 16 muskellunge at Big Creek and 30 muskellunge at Brushy Creek Lake and implanted a 32mm HDX PIT tag into the dorsal muscle of each fish. Additionally, approximately 500 age-1 muskellunge were PIT tagged prior to being stocked into each lake. To date, no muskellunge have escaped from Big Creek (barrier) whereas two adult muskellunge (6.6%) have escaped Brushy Creek (no barrier). Escapement of both fish occurred during the spring despite frequent storm events and subsequent outflows later in the summer. No age-1 muskellunge have escaped from either lake to date. The project will be continued through 2020 to evaluate annual variation in escapement.

Known-age Muskellunge Research Project (Principle Investigators: Derek Crane dcrane@coastal.edu and Jonathan Meerbeek jonathan.meerbeek@dnr.iowa.gov) - The Iowa DNR is collaborating on a Muskellunge known-age project that is being led by Dr. Derek Crane a researcher out of Coastal Carolina University. In 2015, we recaptured 132 Muskellunge of

known-age and collected several aging structures on many of those fish. In 2016, we recaptured another 59 fish of known age. Of particular importance, the age structure from known age fish collected from Iowa ranges from age 3-25 and is well distributed amongst the different age classes. The objectives of the study are to: (1) evaluate the accuracy of fin rays as an aging structure, (2) determine if rays from different fins result in the same estimated age, (3) determine if rays from within a fin result in the same estimated age, (4) determine if the location viewed within a ray affects age estimation, and (5) validate cleithra as an aging structure. Known-age structures from Muskellunge managed from several other systems are also being collected. Samples are currently being processed and read.

Yearling Muskellunge Survival Study (Principle Investigators: Jonathan Meerbeek jonathan.meerbeek@dnr.iowa.gov and Michael Weber mjw@iastate.edu) - Muskellunge angling opportunities in Iowa are a direct result of stocking since natural reproduction is extremely limited. Research studies conducted in the 1990s found that spring stocked minnow-finished yearling Muskellunge survived much better than those stocked in fall and, since 2002, the Iowa Department of Natural Resources (DNR) has exclusively used this approach for all Muskellunge stockings. Initially, success of spring-stocked yearling Muskellunge greatly improved population densities in many of Iowa's lakes. However, since this initial surge, adult populations in some lakes have decreased to levels below management objectives, despite increases in stocking rate and frequency. Mark-recapture studies indicate that individual stocked yearling cohort survival to age-4 was highly variable and has been as low as 7% in recent years. Anecdotal observations at stocking suggest that transportation stress and initial predation may be contributing to these observed decreases in survival. For example, in an effort to prevent the spread of zebra mussels, the Iowa DNR treats all water that leaves their hatchery facilities with the Edwards Treatment procedure. This additional treatment in conjunction with a 6 hour transport time may have potential negative effects on survival of stocked yearling Muskellunge. In addition, stocking stressed yearling Muskellunge directly at boat ramps may be contributing to increased predation (avian and/or fish) and hence, reduced cohort survival. Specifically, managers want to know if the reductions are a result of hauling stress, predation, fish condition, or a combination of factors. The objective of this project was to evaluate post-stocking survival of stocked yearling Muskellunge in Spirit Lake, Iowa and to compare cohort survival via three stocking techniques: (1) stocked directly at ramp; (2) transported to holding tanks at Spirit Lake Hatchery for 36 hours (to allow for hauling stress recovery) then stocked at boat ramp; (3) transported off-shore via boat and stocked. Twenty to 21 Muskellunge yearlings (mean TL = 12.9") from each stocking technique were implanted with radio tags (ATS F1440; 18 d prior to stocking) and fish were tracked via a handheld 3-fold yagi antenna. Both cohorts of yearling Muskellunge stocked near shore had a strong affinity to cover (bulrush/cattail) and most remained near stocking site 2 weeks post-stocking. Both nearshore stocking techniques resulted in low Initial mortality (1 of 41; 2.4%). Offshore stocked fish tended to move greater distances shortly after stocking; however, detection probabilities were problematic and initial mortality not estimated. Mortality events appeared to be associated to periods of fish movement from stocking location site (or predators abundances increasing near stocking area) from late May to early June. Known mortality over 66-d was 9%, 25%, and 20% for direct, hatchery holdover, and offshore stocked fish, respectively. Overall, short-term (66-d) mortality was 18% (11 of 61). Two fish were never located during the study. Twenty-eight of the remaining 59 tagged fish went missing soon during the dispersal event in late May/early June. The project will continue through August and be repeated next year. In addition, all stocked fish (N=550) were implanted with PIT tags

and returns from broodstock gillnetting will yield more information regarding survivability of these fish.

Northern Pike Propagation and Stocking (Hatchery Manager: Kim Hawkins kim.hawkins@dnr.iowa.gov - Northern Pike propagation is still an important component to manage these fish in lakes, rivers and impoundments across Iowa. In 2016, 875,955 Northern Pike fry and 152,265 Northern Pike 1.5-3-inch fingerlings were stocked. An additional 13,750 2-inch fingerlings were obtained from Jake Wolf Fish Hatchery in Illinois to fulfill stocking requests.

Michigan
Prepared by Cory Kovacs

Great Lakes Muskellunge Production:

2015- 782,460 eggs taken; hatchery experienced 69.9% eye-up; hatchery has already stocked out 50,000 spring fingerling muskellunge to Lake Macatawa and 30,000 spring fingerlings to Mona Lake; additional surplus spring fingerlings are expected; MI production section targets 40,000 fall fingerlings (8-10"); minnow production at hatchery hopes to offset rearing costs for fall fingerling muskellunge

2016- 368,290 eggs taken; hatchery experienced 78.6% eye-up; 297,755 fry moved to tanks; MI production section targets 40,000 fall fingerlings (8-10"); cooperative agreement beginning this fall with Holland Fish and Game Club to pond finish Muskies, club will purchase fathead minnows for forage; hatchery will supply 4,500 4 inch fingerlings in hopes to harvest 1,275 fall fingerlings, these fish will be used for Lake Macatawa stocking request

Regulations:

- Muskellunge harvest tag still in effect. To date, zero harvest tags for 2016 have been reported to the online system.
- Northern Pike regulations are still being evaluated with ongoing surveys. Protected slot limit (24-34) 2 fish, and no minimum size limit 1 over 24 inches are the special regulations at this time. Some consideration for changing statewide Pike regulation to no MSL and make 24 inch MSL a special regulation. This request is coming from sport angling clubs.

Stocking evaluations:

Broodstock lake evaluation-Thornapple Lake: a total of 4 Great Lakes strain Muskellunge were captured; Thornapple Lake has been stocked annually since 2011; only one spring yearling was caught from the 2012 stocked cohort. Evaluations are ongoing on many stocked lakes investigating the stocking success of the Great Lakes strain fall fingerlings. To date few Great Lakes strain Muskellunge have been captured or observed.

Muskellunge Angler Survey:

MDNR opened online Muskellunge angler survey to collect catch and angler values information. This is a partnership with Michigan Muskie Alliance. First year for online only. As of July 19, a total of 304 responses were received.

Fish Production Upgrades

For Fiscal year 2017, Thompson State Fish Hatchery (Upper Peninsula) has been approved $12.2 million to for upgrades to their facility and construction of 8 new lined ponds. First capital outlay project funded in many years for the Michigan DNR Fisheries Division. Expectations of the improvements will benefit Muskellunge production by adding 15,000 fall fingerlings to the

state system. Expected to be up and running in 2019 or 2020. Project will also improve Walleye production in the state system.

Special Projects

- Northern Pike rearing marsh: Southern Lake Huron Management Unit is operating a rearing marsh for a Pike release. 30 males and 30 females were transferred from an area lake in April of 2016. Fish remained in pond until mid-June (63 days total). Average size of spring fingerlings 4.45 inches. Total fish harvested 5,285.
- Muskellunge telemetry study-St. Clair and Detroit River system: This project represents a collaboration between the DNR (St. Clair Research Station and Lake Erie Management Unit, Ohio DNR, USGS and OMNRF. Tagged 20 Muskellunge this spring that were sampled as part of the Detroit River egg take. 12 males between 10 and 20 lbs, and 8 females between 20-35 lbs were tagged. They have received one hit so far of a male Muskellunge that was detected near the eastern edge of the west-basin of Lake Erie. More data will be available as the stationary receivers are recovered and the data is downloaded by project partners. Finally, this fall OMNRF plans to tag an additional 20 fish in the Thames River, ON, which will bring sample size to 40 individuals.

Dakotas
Prepared by Brian Blackwell

Muskellunge fishing appears to be gaining in popularity in eastern South Dakota. Muskellunge fisheries are currently in good shape and are providing anglers with opportunities to catch muskellunge. Both resident and nonresident anglers have been observed targeting muskellunge. Images of muskellunge caught by anglers fishing South Dakota waters have been common on the internet and in social media.

Spring muskellunge sampling in northeast South Dakota was poor in 2016. Poor catches may have been related to the early ice out followed by cold temperatures.

South Dakota's Blue Dog State Fish Hatchery received 5,000 muskellunge fingerlings in July, 2016 from the Spirit Lake Fish Hatchery in Iowa. The fingerlings were placed in ponds and are being fed fathead minnows. The ponds will be drained in the fall and the muskellunge stocked into select eastern South Dakota waters. A portion of the muskellunge stocked into Lynn Lake will be PIT tagged. The Hugh C. Becker Foundation provided a grant to fund the purchase of PIT tags and readers.

High-quality northern pike populations are currently present in southeast South Dakota. However, due to generally declining water levels, there have been few new year classes recruited to these populations. Angler interest in northern pike fishing remains low in southeast South Dakota, but darkhouse spearing for northern pike is gaining in popularity.

Declining water levels continue to impact northern pike populations in northeast South Dakota. Spring runoff is needed to improve northern pike recruitment.

In recent years, Northern pike have gained access to many waters in South Dakota's Black Hills Fisheries Management Area through unauthorized introductions. Natural reproduction of northern pike was recently documented in several of these waters where northern pike are not desired because of trout management.

New Publication:

Blackwell, B. G., T. M. Kaufman and T. S. Moos. 2016. An Assessment of calcified structures for estimating Northern Pike ages. North American Journal of Fisheries Management 36:964-974.

Abstract - An important component of effective fisheries management is estimating fish ages. Age estimates can be used to estimate recruitment, relative abundance of age-groups, total mortality, and growth. Because of difficulty in estimating Northern Pike Esox lucius ages using scales and whole cleithra, we compared precision and bias of age estimates from whole cleithra, sectioned cleithra, metapterygoid bones, otoliths, and scales. Metapterygoid bones and sectioned cleithra represent two novel structures for estimating ages in North America, and the assessment of otoliths is limited. Complete agreement and consensus agreement rates were greatest for otoliths, sectioned cleithra, and metapterygoid bones. Otoliths provided the most precise age estimates and whole cleithra were the least precise. Consensus age estimates for sectioned cleithra were lower than whole cleithrum estimates. Consensus age estimates from sectioned otoliths were lower than mean age estimates from scales, sectioned cleithra, and whole cleithra, and y-intercepts from the age-bias plots were significantly different than zero. We suggest that otoliths, sectioned cleithra, and metapterygoid bones can be used to estimate Northern Pike ages, but recommend the use of sectioned otoliths because they had the highest precision and otoliths have become a common means of estimating ages for many species.

Wisconsin
Prepared by Jordan Weeks

Muskellunge Standing Team Notes
Schmeeckle Reserve, 2419 North Point Drive, Stevens Point, WI 54481
May 31, 2016, 9 a.m. to 4 p.m.

Attendees – New members - Bob Munson (Musky Clubs Alliance), Mike Vogelsang (Sponsor); Members – Steve Hogler, Dave Rowe, Greg Matzke, Aaron Cole, Tim Parks, Jordan Weeks, Gene Hatzenbeler, Mark Luehring, Joe Weiss, Roger Sabota; and Guests - Chuck Brod (alternate – Musky Clubs Alliance), Larry Slagoski (Musky Clubs Alliance), Dan Isermann (UWSP), Janice Kerns (UWSP), Dan Dembkowski (UWSP), Wes Larson (UWSP).

1) Reviewed Team Structure, Charge and annual work plan. Musky Team Objectives for FY 2017: 1) Transition all 45" minimum length limit waters (and C&R waters) to 50" (by 2018); 2) Transition all the 28" minimum length limit waters to "No minimum" (by 2018); 3) Implement a 50" minimum length limit on 9 new waters (2017 Spring Hearings – see below); 4) Implement the spawning habitat model/generate a GIS layer of "high-probability" spawning grounds; 5) increase the application of the Sensitive Area Designation program; 6)

Initiate research on spawning/rearing habitat enhancement; 7) Begin to examine ways to increase the size of stocked fingerlings, e.g., evaluate stocking densities in ponds/reduced quotas, etc.

2) Fishing Regulation Proposals.
   a) 2017 Fisheries Management Proposals
      i) Allow motor trolling/clarify position fishing. Discussed and recommended a proposal that would allow trolling with 1 "line" (i.e., hook, bait, or lure) per angler (with a maximum of 3 "lines" per boat) in Florence, Iron, Lincoln, Oneida, Sawyer, Sheboygan, Vilas and Waupaca Counties (except that trolling would continue to be allowed with 3 "lines" per angler in 7 Sawyer County lakes) and allow trolling with 3 "lines" per angler in all other waters.
      ii) 50" – High Falls/Cauldron Falls – Approved.
      iii) 50" – Lake Geneva – Luke Roffler – Approved (with revisions).
      iv) Recommended the Simplification of trophy regulations – combine 45", 50", and C&R waters into one category (50") – Lakes Monona, Waubesa, Wingra - Dane; Yellowstone - Lafayette; Chippewa River, Winter dam to Arpin dam - Sawyer; Little St. Germain, Trout - Vilas; Wisconsin River, DuBay dam to Castle Rock dam.
      v) Recommended the Simplification of harvest regulations - Eliminate 28" minimum in favor of "no minimum" – Day, East Twin, English, Mineral, Potter, Spider/Moquah, Spillerburg - Ashland; Owl - Iron; Bearskin, Booth, Julia, Squaw - Oneida; Butternut, Solberg - Price; Black - Sawyer; Upper Gresham – Vilas.
      vi) Eliminate "Total Daily Bag Limits" in favor of "Possession Limits" = 2 muskellunge – O'Brien (LE) – Rejected. We did not see the need for this, from the perspective of the Musky Team.
      vii) Discussion of modeling of proposed slot length limit(s)/50" MLL. We discussed the concept of protected slot length limits for muskellunge but did not advance any specific proposals. We discussed offering this as an experimental option to biologists in the future.
   b) Discussion/Clean-up of current and prior-year resolutions/WCC questions for 2017 Spring Hearings.
      i) Wisconsin River, Castle Rock Tailwaters to Sauk City RR Bridge – 50" - approved.
      ii) Whitefish Lake, Sawyer County – 50"; 2010 WCC Advisory Question - approved.
      iii) Lakes Wissota and Holcombe, Chippewa/Rusk Counties -50" – 2014 Resolutions - approved.
      iv) North & South Twin lakes, Vilas County – 50"; 2015 resolutions/2016 WCC Question - approved.
      v) Kathrine and Willow Flowage, Oneida County – 50"; 2016 resolution - approved.
   c) Discussion of increased protection for our inland Brood Stock lakes. We discussed the idea of either "Catch & Release" only (or possibly 50" minimum) for our brood lakes. We agreed to develop an advisory question that would propose C&R on brood lakes.

3) Propagation/Stocking
   a) Reviewed and approved revisions to the stocking Guidance, FM Handbook, Muskellunge Management Section, to allow exceptions to the 2,500 fish cap on large, Class A1 waters after review and approval by the Musky Team.

b) Had a brief update and discussion of logistics on the project, Evaluation of pellet-started vs. pond reared muskellunge survival – Okauchee Lake was stocked with yearling muskellunge this spring under a private stocking permit, so we may want to drop this lake from the study.
c) Steve Hogler provided a brief update on the GL Spotted Musky program. Last year was a banner year for stocking in the brood stock lakes and Green Bay (as well as the Winnebago System). We expect to have 6,000 yearlings available in August. Pond harvest/stocking will occur on either August 3 or 4 this year. Michigan completed spawning fish from Lake St.. Clair on Friday, 5/27. They didn't meet their initial goal, but it shouldn't impact our arrangement. So, if all goes well in the hatchery, we should be getting all the fish we requested again this fall.
d) Fyke Netting Stress – FYI - A question came up from the public regarding the impacts of netting on muskies. Fish Health staff will be assessing Cortisol, Lactic acid, Glucose, electrolytes, bicarbonate, hematocrit (maybe Blood gases (CO2) and pH). They sampled 10 fish from the Fox River this spring at a cost of about $47.40 per fish.

4) Muskellunge Surveys and Assessments
a) Janice Kerns (UWSP) provided an update on her project, Evaluation of Methods to Estimate Musky Abundance – and also the project looking at variability in abundance estimates through time.
b) Validation of fin-ray aging with known-age fish - No update available, other than data collection is ongoing for the project -– Derek Crane, Mike Rennicke, Kevin Kapuscinski, Dan Isermann, Simonson, Jordan Weeks, Steve Hogler, Tim Parks, Jeff Kampa, and others are participating in this study.
c) We were able to obtain a substantial number of PIT Tags with contingency funds that become available – kudos to Ryan Koenigs for putting the order together – Simonson handed out some of the PIT Tags to District Reps. for selected brood lakes/adult muskies handled in surveys; Simonson still has some PIT Tags that need to be distributed.

5) Habitat Management
a) Janice Kerns provided a brief update on her study, Habitat use and survival of fall stocked fingerlings using radio telemetry. 2 lakes were completed in the ND last year and she plans to sample 2 lakes in the south this year. The FMPT recently approved the funds needed for supplies to complete a second lake. UWSP is still in need of travel funds.

6) Information and Education –
a) Provided a brief recap of the Hugh C. Becker Muskie Symposium/ETC, Minnetonka, MN, held March 2016.

FYI - Upcoming Meetings
a) Joint meeting, ETC/WTC/CTC, Gretna, Nebraska, Ak-Sar-Ben Aquarium, July 25-28, 2016
b) WCC – Warmwater Study Committee – August 20, 2016, Mead Wildlife Area Visitor's Center, Milladore, WI

c) Musky Clubs Alliance, Board of Directors – November 5, 2016 – Moose Family Center, Stevens Point, WI
d) WI Chapter – AFS. January 2017?
e) Milwaukee Muskie Expo, Washington County Fairgrounds, February 10-12, 2017
f) Wisconsin Musky Expo, Central Wisconsin Convention & Expo Center, Wausau, March 3-5, 2017
g) 2017 Musky Team Meeting – We discussed holding the meeting at KEMP station in 2017. The meeting will have to be held in early June to accommodate the rule cycle/review period.

Musky Team Charge

1. Develop/review regulation guidance and proposals;
2. Develop/review stocking guidance and plans;
3. Develop/review habitat management guidance;
4. Develop/review sampling protocol and assessment methods;
5. Review/update musky plan; assess status of the fishery;
6. Identify research needs; coordinate evaluations;
7. Maintain/update musky waters classification system.

Annual Work Plan Objectives for 2015-2016: 1) Transition all the 45" minimum length limit waters to 50" (by 2018); 2) Transition all the 28" minimum length limit waters to "No minimum" (by 2018); 3) implement the spawning habitat model/generate a GIS layer of "high-probability" spawning grounds; 4) increase the application of the Sensitive Area Designation program; 5) Initiate research on spawning/rearing habitat enhancement; 6) Explore removing the 2500 fish cap on large stocked waters/balance requests within management areas (evaluate requests based on performance measures related to density goals); 7) Begin to examine ways to increase the size of stocked fingerlings, e.g., evaluate stocking densities in ponds, etc.; 8) insure that fish stocked with PIT tags are entered into the statewide database; 9) Determine recurring PIT tag needs and coordinate statewide purchases for all species get the best price possible; 10) Evaluate prices for "edible" PIT tags; 11) Update Team charge to include Habitat Protection/Improvement; 12) Have at least 5 WDNR presenters at the 2016 Musky Symposium, with at least 10 WDNR staff in attendance.

*Notes from the Wisconsin Spring Hearings were also provided, but not included in this report due to length. Please contact Jordan Weeks for details on these hearings.

Indiana
Nicholas Haunert - Indiana ETC Representative

David Kittaka,
Indiana DNR, Division of Fish and Wildlife (IDFW)
District 5 Fisheries Biologist
Bloomington Field Office
Bloomington, IN
July 6, 2016

Muskie surveys were conducted at Bass Lake and Duck Lake, two reclaimed coal strip pits in the Greene-Sullivan State Forest in Sullivan County Indiana. Southern Indiana reclaimed and abandoned coal strip mine lakes are some of the larger complexes of water that the IDFW manages for hunting and fishing. Often connected to a river system these pits have an abundant and diverse forage base. Stocking programs for these lakes began as early as 1997 and as recent as 2008. The Duck Lake muskie program began in 2008. This 59 acre pit is the outfall for the 220 acre Bass Lake, which has been stocked with muskie since 1997. Using Michigan style trapnets, effort consisted of 8 lifts per lake. At Duck Lake, a 32.3 inch and a 36.0 inch muskie were collected. Reports of anglers catching and seeing muskie are increasing at Duck Lake. The same effort and gear were used at Bass Lake. A total of 29 muskie was collected for a total weight of 362.25 lbs. The length range was 33.0 to 45.5 inches. Twenty-four of the muskie were at or greater than the 36 inch size limit. Thirteen were 38 inches and greater and of those 6 were 40 inches and greater.

Nicholas Haunert,
Indiana DNR, Division of Fish and Wildlife (IDFW)
District 4 Assistant Fisheries Biologist
Cikana State Fish Hatchery
Martinsville, IN
July 6, 2016

Muskie surveys were conducted at Plover (67 acres) and Sandpiper (17 acres) pits in Driftwood State Fishing Area from March 14-18, 2016. Muskie have been annually stocked at 5 fish per acre in both pits since 1997. The water level during sampling was high enough that at least 3 feet of water connected the two pits at a low spot in the levee. This connection allowed boating and fish passage between both pits. Lake Michigan style trapnets were used in both Plover and Sandpiper pits during sampling. Length, weight, and left pectoral spine for aging was taken on each Muskie. A total of 10 Muskies was collected from 9 trapnet lifts. The Muskie ranged in length from 36.5 to 47.6 inches. Six of the 10 Muskies captured were greater than 40 inches. Two Muskies were recaptured during the survey.

Missouri
Missouri Department of Conservation
Dave Woods, Muskellunge Program Coordinator

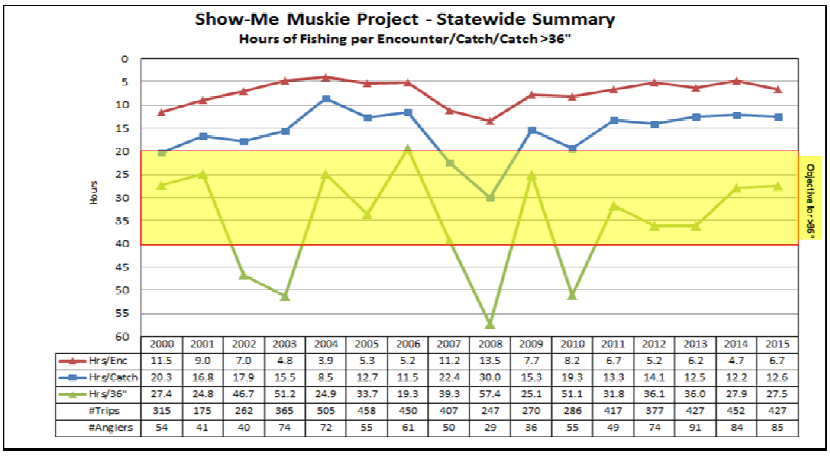
Currently, five lakes in Missouri are managed for muskies: Pomme de Terre Lake (7,820 ac.), Fellows Lake (820 ac.), Hazel Creek Lake (530 ac.), Henry Sever Lake (158 ac.) and Lake 35, Busch Conservation Area (62 ac.). Henry Sever Lake is included in the program as a surplus stocking location only.

2016 Show-Me Muskie Project Results

The Show-Me Muskie Project is a volunteer reporting program in which the Missouri Department of Conservation invites conservation-minded muskie anglers to help evaluate

Missouri's muskellunge management program. Volunteers include a wide cross-section of muskie anglers at all levels of skill and experience. Missouri's Muskellunge Plan sets muskie angler catch-rate objectives, which can be documented most efficiently by anglers themselves. Our cooperators continue to provide a wealth of data, as 85 anglers submitted their trip reports from 2015. This is the second highest number of trip reports received since the program began in 1996. Collectively, anglers made 427 trips and fished a total of 2,449 hours on the five program lakes. There were 364 muskie encounters (6.7 hrs/encounter) and 195 caught (12.6 hrs/catch). Of the 195 muskies caught, 89 were 36 inches or longer (27.5 hrs/catch >36"), which is within the catch rate goal of 20 to 40 hours per catch of a 36" or greater muskie, as identified in the current muskie plan. The following are individual lake results for 2015:

- **Pomme de Terre Lake** – A total of 220 trips were reported by 41 anglers fishing a total of 1,164 hours. There were 224 muskie encounters (5.2 hrs/encounter) and 91 caught (12.8 hrs/catch); of which 56 were 36 inches or longer (20.8 hrs/catch >36"). Once again, this is the lowest number of hours fished to catch a 36 inch muskie since 2006 on Pomme de Terre Lake, indicating great opportunities to catch quality fish on Pomme.
- **Hazel Creek Lake** – A total of 97 trips were reported by 22 anglers fishing a total of 645 hours. This is a record number of anglers reporting on this lake since the project began in 1996. There were 69 muskie encounters (9.3 hrs /encounter) and 46 caught (14.0 hrs/catch); of which 15 were 36 inches or longer (43.0 hrs/catch >36").
- **Fellows Lake** – A total of 27 trips were reported by seven anglers fishing a total of 148 hours. There were 36 muskie encounters (4.1 hrs/encounter) and 12 caught (12.3 hrs/catch); of which 7 were 36 inches or longer (21.1 hrs/catch >36").
- **Henry Sever Lake** – A total of 80 trips were reported by 14 anglers fishing a total of 476 hours. There were 34 muskie encounters (14.0 hrs/encounter) and 44 caught (10.8 hrs/catch); of which three were 36 inches or longer (43.2 hrs/catch >36"). In 2015, the highest number of anglers and trips and the second highest number of fishing hours were reported on Henry Sever Lake since reporting began. In addition, Sever Lake produced its best catch rates reported since inclusion in the Show-Me Muskie Project in 2000.
- **Busch CA Lake 35** – A total of 3 trips were reported by 1 angler fishing a total of 17 hours. There was one muskie encounter (16.8 hrs /encounter) and 2 caught (8.4 hrs/catch); of which none were 36 inches or longer.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hrs/Enc	11.5	9.0	7.0	4.8	3.9	5.3	5.2	11.2	13.5	7.7	8.2	6.7	5.2	6.2	4.7	6.7
Hrs/Catch	20.3	16.8	17.9	15.5	8.5	12.7	11.5	22.4	30.0	15.3	19.3	13.3	14.1	12.5	12.2	12.6
Hrs/36"	27.4	24.8	46.7	51.2	24.9	33.7	19.3	39.3	57.4	25.1	51.1	31.8	36.1	36.0	27.9	27.5
#Trips	315	175	262	365	505	458	450	407	247	270	286	417	377	427	452	427
#Anglers	54	41	40	74	72	55	61	50	29	36	55	49	74	91	84	85

2016 Spring Sampling Results

Standardized fyke net surveys were conducted this spring at Pomme de Terre Lake, Fellows Lake, Hazel Creek Lake and Henry Sever Lake. August A. Busch Conservation Area, Lake 35 was not sampled for muskies in 2016.

- **Pomme de Terre Lake** – Water temperature was 52°F and lake elevation was 840.4 msl (normal pool = 839.0), making for optimal sampling conditions. A total of 101 muskies (56 males and 45 females) were captured in 30 net-days, resulting in a catch rate of 3.4 fish per net-day. Of the muskie captured, 42% were 36 inches or longer and 14% were 40 inches or longer. The largest fish captured was a female that measured 45.0 inches long and weighed 23 lbs, 9 oz. The long-term average catch rate for muskie on Pomme is 6.2 fish per net day. The lower than average catch rate may be reflective of poor timing rather than decreased relative abundance, as the water temperatures were warming quickly and most female muskies were either flowing eggs or already had spawned.

- **Fellows Lake** – Water temperature was 50°F and the lake was 0.5 feet above normal pool. A total of 27 muskies (17 males and 10 females) were captured in 28 net-days, resulting in a catch rate of 1.0 fish per net-day. Of the muskie captured, 39% were 36 inches or longer and 19% were 40 inches or longer. The largest fish captured was 43.0 inches long and weighed 21 lbs, 5 oz. High lake levels caused poor sampling efficiency due to interference from shoreline vegetation. Therefore, the 2016 survey of Fellows Lake muskie may not be an accurate representation of the fishery.

- **Hazel Creek Lake –** Water temperature was in the low 50's. A total of 21 muskies (17 males and 4 females) were captured in 8 net-days, resulting in a catch rate of 2.6 fish per net-day. Of the muskie captured, 14% were 36 inches or longer and no fish 40 inches or above were observed. Due to equipment issues, Hazel Creek Lake was sampled a week later than normal. With water temperatures in the low 50's the week before, and evidence the spawn was over during sampling, the lower than normal catch rates do not seem to be representative of the actual muskie population in that lake.

- **Henry Sever Lake** - Water temperature was 52°F. A total of 24 muskies (12 males, 5 females and 7 unknown) were captured in seven net-days, resulting in a catch rate of 3.4 fish per net-day. Of the muskie captured, 33% were 36 inches or longer and 4% were 40 inches or longer. The largest fish captured was 42.8 inches.

2015 Stocking Summary

In the fall of 2015, four of the five muskie program lakes were stocked with advanced fingerlings averaging approximately 12" in length. On a typical year, three of the five program lakes have an annual stocking commitment of one muskie (12 – 14") per acre: Fellows Lake (820 acres), Hazel Creek Lake (530 acres) and Busch CA Lake 35 (62 acres). Beginning in 2015, muskie stocking rates on Pomme de Terre Lake were adjusted to 5,000 fish annually (0.625 fish per acre). Henry Sever Lake is designated as a surplus stocking lake, meaning when extra muskie

fingerlings are available, Sever will get stocked at a rate of one muskie per acre (158 acres). In October of 2015, Pomme de Terre, Fellows and Hazel Creek lakes received their full stocking commitment. Muskie fingerling numbers were lower than expected, however; and Busch CA Lake 35 only received 50% of its commitment (32 muskies). With an absence of surplus muskie fingerlings, Henry Sever Lake did not get stocked in the fall of 2015.

Nonetheless, designating a lake as a "surplus" fishery does not lessen MDC's commitment to Missouri anglers, and in May of 2016, MDC staff seized the opportunity to stock 115, 15" muskies overwintering in Iowa into Henry Sever Lake. In addition, 119, 15" muskies were also stocked in Busch CA Lake 35 this May to make up for stocking shortages last fall.

Muskies Inc. Partnerships

Lost Valley Hatchery received a monetary donation from the Pomme de Terre Chapter of Muskies Inc. in 2015 in the amount of $500 for construction and installation of habitat structures in their muskie rearing ponds. Hatchery ponds are typically devoid of fish habitat; however the presence of structure is needed to provide cover for young fish. In the past, hatchery staff has used rolls of snow fencing as cover in muskie ponds, but the material was time consuming to deploy and remove. The donation from Muskies Inc. was used to construct and install permanent habitat fixtures in muskie rearing ponds. Pieces of vinyl siding and concrete were used to create 16 artificial habitat structures. Not only did these structures prove useful for muskies, they have also provided spawning habitat in fathead minnow rearing ponds, the main forage source for growing muskies at Lost Valley hatchery.

Habitat Improvement Projects

- **Pomme de Terre Lake** – Over the winter, cedar tree brush piles were placed at 33 locations in the lower part of the lake, all within about a mile of the dam.
- **Busch CA Lake 35** - This February, crews used over 700 Christmas trees to create 8 new brush piles in the lake. In addition, shoreline hardwood trees were hinge-cut to create near shore fish habitat.

All GPS locations for fish attractors can also be found online at: http://mdc.mo.gov/fishing/places-fish/fish-attractors-map. Also, the free ***FIND MO FISH*** application for smartphones shows you a map of Missouri with the locations of public boat ramps to major lakes and streams of Missouri. The map also shows the exact location of underwater fish structures. With the geo-location feature, you can guide your boat right up to your favorite fish attractor and start fishing. The app also includes annual fishing prospects and weekly reports for select bodies of water.