

# **Outdoor Adventure Center Great Lakes Fisheries Learning Program**

## **Planning Grant Report**

Over the course of several months Natalie Cypher and Emily De Long contacted education facilities in the Great Lakes region to determine what Aquatic Stewardship and Fishing Education programs are already offered regionally. Facilities that were contacted include: Belle Isle Aquarium, Grand Valley State University Aquatic Research Facility, the National Museum of the Great Lakes, Sea Grant Summer Discovery Cruises, and University of Michigan Dearborn Environmental Interpretive Center, among others. See Appendix D for a complete list of facilities and education program information.

It was discovered that elementary students have the most opportunities for field trips that include aquatic education, which typically take the form of pond study and water quality education. Of the organizations that responded to the information request, only four regularly offered programs to middle and high school students. These programs were also focused on water quality education, not fishing or fisheries management.

Furthermore, despite the creation of programs specific to middle and high school students, in 18 months of operation the Outdoor Adventure Center (OAC) has taught only 26 middle school classes and 6 high school classes. This is compared to approximately 550 elementary school classes in the same time period (this includes the school year only - not summer day camps or similar groups).

As a result of these findings, new programming will include a three phase school program geared towards area middle and high school students, with a focus on Fish and Fisheries Management in Michigan. These phases are outlined below. The program is comprised of an initial outreach visit to the school by OAC staff, to introduce the concept of Michigan Fish and Fisheries. During phase two teachers will choose between two programs, which will take place during a field trip to the OAC. These options are: an invasive species program featuring a live Sea Lamprey, or a Lake Sturgeon management program featuring live Lake Sturgeon. The final phase of the program will take students out of the classroom to experience fishing at a nearby State Park.

Public program offerings at the OAC will be enhanced, including an extension to the current summer Free Fishing weekend festival, an additional Ice Fishing Festival during the winter Free Fishing weekend, additional weekend fishing programs throughout the summer, and Sturgeon Management and/or Invasive Species programming adapted for the general public and families. Two teacher professional development opportunities are included, and will be hosted by the OAC.

**School Program:** For development of specific content of Phase 1 and 2 programs, OAC Staff will work with the Detroit Public School Community District Office of Science to ensure that content aligns with the New Michigan Science Standards. This will provide maximum benefits for students and teachers, and ensure school administrator support of this program.

### **Phase 1 – Outreach program at partner school**

*Will take place between October and the first week of November*

**Program Goal:** Introduce the Great Lakes ecosystem and fisheries. Discuss important fish species in Michigan, highlight challenges facing our Great Lakes ecosystems, and describe how agencies like MDNR are managing those challenges. Include the importance of Great Lake health in the lives of all citizens within the watershed.

#### **Expected Outcomes:**

- Students will learn the importance of fisheries management in the Great Lakes and their connection to this ecosystem
- Students will identify common Great Lakes fish species
- Students will understand challenges facing Great Lakes ecosystems, actions taken by the DNR and other agencies to overcome these challenges, and how they as Great Lakes citizens can contribute

#### **Program Objectives:**

- Overview of life in the Great Lakes
  - What are the Great Lakes? – Discuss the geographic area and the Great Lakes watershed.
  - Fisheries in the Great Lakes--share statistics on fishable lakes and rivers, number of anglers active in the state, and the economic impact of fisheries
  - Species info
    - Components of a Great Lakes ecosystem food web, and the importance of each component
      - Identify typical species within each level of the food web including producers; and primary, secondary and tertiary consumers
      - Include a discussion on the negative impact of invasive species to this ecosystem
- Resource management
  - Overview of DNR Fisheries career positions and how staff conduct field work and research related to the above management issues
  - Discuss outcomes of DNR management activities related to the above issues. Explain DNR work with partner agencies on resource management.
- Great Lakes in Your Backyard
  - Where do you live in the Great Lakes watershed?
  - How does the health of the Great Lakes impact you and your family?
- Hands-on activity: Fish External Anatomy and Species ID
  - Learn fish external anatomy and the characteristics used for fish species ID
  - Students will use dichotomous keys to students to identify photos of the following species
    - Steelhead Trout
    - Chinook Salmon
    - Walleye
    - Bluegill
    - Northern Pike
    - Muskellunge
    - Largemouth Bass
    - Smallmouth Bass

- Follow-up Activity: facilitated by classroom teacher
  - Students review current articles for of sturgeon habitat creation, lamprey management, or related topics. Worksheets will test student understanding and ability to analyze the text.
  - Selected articles will prepare students for Phase 2 programming at the OAC
  - Teachers will receive one of the following posters for future classroom use:
    - Michigan Watersheds map
    - Great Lakes Basin map
    - Fins, Tails, Scales poster

Evaluation for Phase 1:

- Pre-tests and post-tests will be proctored by teachers and returned to OAC staff. Tests will be scored to gauge effectiveness and student growth.

## **Phase 2 – Field trip to the OAC, including one classroom program:**

*Will take place between January and March*

**Program Goal:** Investigate current fisheries management issues to gain a deeper understanding of fisheries management, and how management goals are achieved. Students will analyze factors that have caused species composition and habitats to change over time; and actions taken to restore species and habitats. Students will work collaboratively to solve a real-world fisheries management problem.

### **Teachers choose one of two options for Phase 2:**

#### ***Option 1: Story of the Sturgeon: A Living Dinosaur***

##### **Expected Outcomes:**

- Students will learn the characteristics and importance of the Lake Sturgeon
- Students will understand the factors that have historically negatively impacted Lake Sturgeon
- Students will understand the importance of the Lake Sturgeon and how its populations are being restored in the Great Lakes
- Students will gain an appreciation for the Lake Sturgeon and the overall health of the Great Lakes ecosystem
- Students will understand how Great Lakes health and the health of its species are important to our communities and the Great Lakes Fishing industry

##### **Program Objectives:**

- Introduce the Lake Sturgeon, including the following:
  - Habitat and geographic range
  - Biology and life history
  - History of Sturgeon in the Great Lakes, including the specie's near extinction due to overfishing, habitat loss, construction of dams, and pollution
- Live Lake Sturgeon will allow observation and description of physical characteristics. A model will demonstrate the size of a fully grown sturgeon.
- Recognition of the Lake Sturgeon as an important aspect of our Great Lakes heritage, ecosystem, and fishing industry
  - Current management efforts:
    - Laws and regulations in place that protect Sturgeon, and events leading to their creation
    - Sturgeon spawning habitat restoration efforts in the St. Clair and Detroit Rivers
      - Physical aspects and geographic locations of spawning reefs, and requirements for Sturgeon reproductive success
      - Agencies involved in management efforts
      - Determination of appropriate spawning reef locations, and equipment and technology used in field work
      - Results of these efforts, including current Sturgeon population estimates and other species that benefit from these spawning reefs
- Hands-on, problem-solving activity:
  - Use 3-D model and 2D canvas model of the Detroit River to determine appropriate sturgeon spawning reef locations based on known information regarding sturgeon habitat requirements and life history. Students will work collaboratively in groups. Students will be provided information such as:
    - Detroit River depth and strength of current in different locations
    - preferred substrate type for productive spawning reefs

## **Option 2: Alien Invasion of the Great Lakes: Story of the Sea Lamprey**

### Expected Outcomes:

- Students will understand how invasive species are introduced and how they negatively impact our Great Lakes ecosystem and economy
- Students will understand the biology and life cycle of the Sea Lamprey, and its negative impacts upon the Great Lakes ecosystem and economy
- Students will understand the habitat requirements for Sea Lamprey spawning
- Students will understand management efforts to control Sea Lamprey and other invasive species

### Program Objectives:

- Introduce concepts of invasive species
  - Compare and contrast native, non-native, and invasive species
  - Discuss the introduction and spread of invasive species
  - Shared characteristics of invasive species
  - Negative impact of invasive species upon ecosystems
- Introduce the Sea Lamprey
  - Biology and life history
  - Native and introduced range
  - How it was introduced to the Great Lakes
  - Negative impact on the Great Lakes - both ecologically and economically
  - Include live Sea Lamprey specimen for observation and physical characteristics description
- Sea Lamprey reduction and management efforts
  - Identification of target areas for Sea Lamprey control
    - Determining which Great Lakes tributaries are used for Sea Lamprey spawning and contain larval lamprey
    - Mapping exercise to identify spawning streams
  - Control methods used
    - Lampricides, barriers, traps
    - Equipment, technology, and skills required
- Hands-on, problem-solving activity:
  - Use a large map of one of the Great Lakes and its major tributaries to identify locations that should be targeted for lamprey control. Students will work collaboratively in groups. Students will be provided information such as:
    - Preferred habitat for Lamprey spawning
    - Physical characteristics of tributaries that may be suitable for Lamprey spawning, and therefore should be targeted for control
- Evaluation for Phase 2: Pre-tests and post-tests will be proctored by teachers and returned to OAC staff. Tests will be scored to gauge effectiveness and student growth.

### **Phase 3 – Fishing Event at State Park**

*Will take place between May and the first week of June*

**Program Goal:** Provide a hands-on fishing experience for students at a State Park. This area will have good quality, accessible fishing, and will be stocked to ensure a successful, enjoyable experience. Students will be inspired to continue fishing with their families.

#### **Expected Outcomes:**

- Students will have an enjoyable fishing experience with their peers
- Students will interact with DNR fisheries biologists and staff of other agencies
- Stations will review information learned in Phases 1 and 2
- This experience will inspire students to appreciate and support fishing, and continue fishing with their families in the future

#### **Program Objectives:**

- Host a single-day fishing event for all participating schools
- “Get out and do it” aspect to program, reflecting the theme of exhibits at the OAC
- Location – a nearby state park with accessible, stocked fishing
  - Potential: Island Lake State Recreation Area
- Fish-related activities and stations
  - Fishing Derby
  - Casting instruction and practice - “Backyard Bass” activity
  - Stations run by OAC / DNR staff and participating partner agencies. Topics for stations may include:
    - Invasive species
    - Fish ID and common fish species in the area
    - Equipment and gear necessary for fishing
    - Art component
  - Fishing Derby Prizes
    - Fishing rods and tackle boxes as prizes
    - Fishing excursion with Lake St. Clair Walleye Association as a grand prize.
- Provide food such as hot dogs and chips, water or soda

Interested partner agencies include:

- US Fish and Wildlife Service - Detroit River International Wildlife Refuge
- US Fish and Wildlife Service - Waterford Substation
- Lake St. Clair Walleye Association
- Michigan Sea Grant
- Project FISH

**Evaluation for Phase 3:** Student feedback forms will be disbursed and returned the day of the event. Questions will be reactionary, not content focused.

- Ex: Did you enjoy the events today? Are there other activities you would have liked to do? Was this a new experience for you? How likely are you to go fishing or participate in other outdoor activities after today? Do you feel you have a better understanding of the Great Lakes/fishing/etc. after this program?

**\*400 - 800 students can be reached through the three phase School Program, dependent on demand and resources**

## **Public Events:**

- **Fishing Fest**—Expand the current one-day Free Fishing Weekend in June to a full weekend event.
  - Add guest speakers
    - Walleye Association: habitat restoration efforts
    - Michigan Sea Grant: sturgeon spawning reef
    - Include a program by OAC staff
  - Expected Outcomes:
    - Families will learn the basic equipment that is needed for fishing
    - Families will have an introductory fishing experience with many fishing and aquatic professionals nearby to help
    - Families will learn the importance of habitat management in aquatic ecosystems, and how their participation in fishing and purchase of a fishing license helps those efforts
  
- **Public Sturgeon / Lamprey Program**
  - Modify the middle/high school program for family audience: “Come see a living dinosaur and an alien at the OAC!”
  - Offer regularly, for example the first Sunday of each month
  - Expected Outcomes:
    - Families will learn to identify fish species of the Great Lakes
    - Families will learn the impacts of habitat destruction and invasive species in the Great Lakes
    - Families will gain an appreciation for the habitat management and invasive species management conducted by agencies such as MDNR and USFWS
    - Families will learn how to prevent the spread of invasive species
    - Families will gain an appreciation for the fascinating history of the Lake Sturgeon, and how they can contribute to its continuing recovery
  
- **Expand Current Public Fishing Programming**
  - Offer two weekends per month, for example, every 1st and 3rd Sunday of the month
  - Include the “Backyard Bass” casting practice game
  - Include “Pin the Parts on the Fish” fish anatomy game
  - Expected Outcomes:
    - Participants will learn basic casting techniques
    - Participants will learn basic fish external anatomy to help with Fish ID
    - Participants will learn the basic equipment needed for fishing, have a hands-on experience, and be encouraged to continue the sport
  
- **Ice Fishing Weekend Event**
  - Host during the winter Free Fishing Weekend in February
  - Offer expert instruction in ice-fishing gear and technique
  - Ice fishing in harbor at Milliken State Park
  - Provide a bonfire and hot chocolate for guests
  - Expected Outcomes:
    - Participants will learn basic equipment and safety guidelines for ice fishing
    - Participants will have a chance to try their luck and be encouraged to continue the sport

- Live Sturgeon and Lamprey provide many opportunities for outreach and education at the OAC. Informal “table talks” can be offered at any time to guests.

**\* 1,000 individuals can be reached through expanded public fishing / aquatic education programming**

**Additional Opportunities:**

- Annual OAC participation in Sturgeon Day - Partner with U.S. Fish and Wildlife Service and U.S. Geological Survey on this annual spring event at Milliken State Park
- Mark Stephens of Project Fish will train OAC staff and area teachers in Project Fish curriculum



## Appendix A:

Item	Quantity Needed	Cost per unit	Total Cost	Source
Lamprey and Accessories	1 unit	\$1,500	\$1,500	Kevin Frailey - Michigan DNR
Sturgeon and Accessories	1 unit	\$1,952	\$1,952	Preuss Pet Store (Lansing, MI)
Michigan Watersheds map poster	*14/28	\$10.00	*\$140.00/ \$280.00	Michigan Sea Grant
Great Lakes Basin map poster	*14/28	\$10.00	*\$140.00/ \$280.00	Michigan Sea Grant
Fins, Tails, and Scales poster	*14/28	\$8.50	*\$119.00/ \$238.00	Michigan Sea Grant
Portable Fish Anatomy diagram	2	\$70.00	\$140.00	Engineering Graphics, Inc.
Sturgeon model	1	\$310.00	\$310.00	Engineering Graphics, Inc.
Fish dissection model	1	\$164.00	\$164.00	Carolina Biological Supply
Bus Transportation	*14/28	\$240 (x2 trips)	*\$6720.00/ \$13,440.00	Trinity Transportation
3-D model of Detroit River	1	\$750.00	\$750.00	University of Michigan School of Engineering
Lunch (Phase 3 Outreach)	700 people	\$2.05	\$1,437.94	Gordon Food Service (see Appendix C)
Fishing poles for Derby prize giveaway (Phase 3 outreach)	10	\$14.99	\$149.90	Dick's Sporting Goods
Tackle boxes for derby prize giveaway (Phase 3 outreach)	10	\$12.96	\$129.60	Wal-Mart
Fishing rods (phase 3 outreach)	60	\$14.99	\$899.40	Dick's Sporting Goods
Tackle boxes (phase 3 outreach)	3	\$12.96	\$38.88	Wal-Mart
Live fishing bait for phase 3 outreach and public programs	100	\$2.50	\$250.00	
Project Fish training workshop for 10 staff			\$3,345.20	Mark Stephens - Project Fish
Staff cost			*\$11,411.92 / \$13,875.76	(see Appendix B)
	*Cost for 14 schools / 28 schools			
		<b>14 outreach classes</b>	<b>28 outreach classes</b>	
	<b>Total Budget:</b>	<b>\$29,597.84</b>	<b>\$39,180.68</b>	

## Appendix B:

### Staff budget for Fisheries Programming

<b>Project</b>	<b>Hours Required per Person</b>	<b>Staff Hourly Rate</b>	<b>Number of Staff</b>	<b>Total Staff Cost</b>
<i>Lesson Plan Research &amp; Creation</i>	100	\$16.21	2	\$3,242.00
<i>14 School Visits*</i>	56	\$16.21	1	\$907.76
<i>28 School Visits*</i>	112	\$16.21	1	\$1,815.52
<i>3 Fishing Outreach Events</i>	24	\$16.21	6	\$2,334.32
<i>5 Fishing Outreach Events</i>	40	\$16.21	6	\$3,890.40
<i>Fishing Fest</i>	16	\$16.21	4	\$1,037.44
<i>12 Weekend Family Program</i>	3	\$16.21	1	\$583.56
<i>14 Weekend Fishing Events</i>	5	\$16.21	2	\$2,269.40
<i>Ice Fishing Fest</i>	16	\$16.21	4	\$1,037.44

**Staff Total Cost for 14 Visits:** \$11,411.92

**Staff Total Cost for 28 Visits:** \$13,875.76

\*School visits-- 4 hours total staff time: 2 hours at school per visit, plus 1 hour preparation, 1 hour commute

## Appendix C

Food Item	Pieces/unit	Price/unit	Cost for 700	Units/case	Price/case	Cost for 700
Hot Dogs	40/bag	\$8.99	\$161.82	2 bags/case	\$17.99	\$161.91
Hot Dog Buns	16/bag	\$2.49	\$109.56	n/a	n/a	n/a
Black Bean Veggie Burgers	12/box	\$19.99	Only ordering 8 boxes -- \$159.92	n/a	n/a	n/a
Hamburger Buns	12/bag	\$1.99	\$117.41	n/a	n/a	n/a
Ketchup Packets	1,000/case	\$24.99	\$49.98	n/a	n/a	n/a
Mustard Packets	500/case	\$10.99	\$43.96	n/a	n/a	n/a
Chips-variety pack	50/box	\$12.79	\$179.06	3 boxes/case	\$38.37	\$191.85
Cookies	40/box	\$12.99	\$233.82	6 boxes/case	\$77.94	\$233.82
Water-16.9 oz	35/pack	\$5.99	\$119.80	5+ packs	\$4.99	\$99.80
Pop	12/pack	\$4.79	\$282.61	n/a	n/a	n/a

Best price options are highlighted. Total cost for 700 participants=

\$1,437.94

Cost per participant=

\$2.05

Organization	Organization Representative	Audience	Peak Season	Frequency of Programs
Belle Isle Aquarium		DPSCD 3rd graders at Conservatory; DPSCD 4th graders at Aquarium	January - May	Tuesdays & Wednesday 10-12, sometimes Thursdays
Cranbrook		5/6th grade for <u>How We Use Water</u> programs, 7/8th grade for <u>I Live in a Watershed</u> program		
DTE Energy	Matthew T Shackelford, Principal Engineer	Participate at local River Festivals, aimed at school age children & presented by Ecological Field Services team. Partnering with the St. Clair Detroit River System Initiative (SCDRS) for many years- includes funding for the fish spawning reefs constructed in the system over the years & offering in-kind services to the partnership when needed. Recently conducted native mussel surveys for the fish spawning reef team at the end of last year. This work is rewarding for the DTE team involved & shows commitment to the communities including wildlife.	For river/water festivals it is the spring or fall when these events occur at the beginning or end of the school year.	Follow the water festival schedules

Content Focus	Limiting Factors in Programming
<p>Conservatory: plant structure &amp; function, adaptation &amp; classification. Aquarium: requirements for life, adaptations, fossils as evidence of the geological past &amp; living fossils</p>	<p>No lunch room so they have to use the conservatory show room, buildings are small &amp; the classroom fits only 15. Programs only occur when closed to the public due to space. Solely reliant on volunteers.</p>
<p>Water quality, water as a resource, &amp; watershed education.</p>	
<p>Education on invasive species with a focus on zebra and quagga mussels (Dreissenids), the importance of wetlands and T&amp;E species, a display of scuba equipment, &amp; a hands-on demonstration of remotely operated underwater vehicle (ROV). This presentation touches on the importance of stewardship but also career opportunities in the field of ecology/biology.</p>	<p>Time. DTE also does field work for the business groups within DTE such as wetland delineations, T&amp;E surveys, environmental sampling etc.</p>

Organization	Organization Representative	Audience	Peak Season	Frequency of Programs
Explorer Guides	Karen Gourley	<p>EG programs - general public and campers at nearby campgrounds.</p> <p>Anyone can join-free for kids under 17 since they don't need a fishing license. Locations include Milliken, Proud Lake, Maybury, Sterling State Parks, Island Lake, Pinckney, Holly. Most participants are families.</p>	<p>Summer. Potential - February free fishing weekend in winter for events. Valerie at Bay City does a big winter fishing festival during this weekend. Would be a good source of ideas related to this.</p>	<p>Weekly - <u>Hook, Line, and Sinker</u>. "Fishing derby" type programs - one-two per season</p>
Friends of the Detroit River	Matthew T Shackelford, Principal Engineer	<p>The general public, DTE membership &amp; school age children. The Friends of the Detroit River (FDR) hosts the Detroit River Water Festival.</p>	<p>The FDR regularly sets up a display at different venues (outdoor shows, street fairs, world wetlands day, etc.) &amp; this is all year long</p>	<p>Offer programs and presentation whenever possible. The Detroit River Water Keeper (Robert Burns) is housed within the FDR &amp; gives presentations to a wide audience. Main programs: Detroit River Clean-up, Detroit River Water Festival, &amp; Shiver on the River.</p>

<b>Content Focus</b>	<b>Limiting Factors in Programming</b>
<p>Fishing technique, fish ID, fish anatomy. Some "fishing derby" style programs - Fishing Fest at Milliken and Maybury - give away small prizes. Also casting techniques - Backyard Bass. Have recently pushed Invasive species education--Invasive Species Education week in August has been successful.</p>	<p>Previously have had trouble making invasive species an attractive topic for public programming, but recently have been doing better - a good source of info for how to market invasive species programs</p>
<p>Stewardship and promoting the Detroit River. Showing the public and stakeholders the numerous habitat improvement and restoration projects FDR has completed on the River.</p>	<p>Grant dollars &amp; time.</p>

Organization	Organization Representative	Audience	Peak Season	Frequency of Programs
Friends of the Rouge		K-12 teachers & their classrooms. Most participants are 4th-12th grade classes	Spring and fall	Two large scale monitoring events - one in May and one in October
GVSU Aquatic Research	Dr Janet Vail	Outreach program is all ages, serving 6,000 students annually from Kent, Ottawa, & Muskegon Co. on 2.5 hour cruises. Education station in Muskegon has 2,000 students.	Mid April to Mid June; Mid Sept to Mid October. Some summer programs, including sailing to Indiana for festivals	
Huron River Watershed	Jason Frenzel Volunteer Coordinator	School groups, residents within watershed area, college students. Most of the volunteers are retirees, they are working to expand this. They try to reach all age groups, and will change programming every few years if gaps are identified.	Benthic studies in the spring and fall with school groups, INE work in summer.	Of 5-6 separate projects, each goes out once or twice a week. All told, programs are almost daily in their peak seasons.



Content Focus	Limiting Factors in Programming
<p>Water quality monitoring - chemical testing &amp; macro-invertebrate ID</p>	<p>Teachers are overworked &amp; challenged by a lack of funding for programs like these. Teachers are trained in conducting this monitoring day with students &amp; are provided materials but getting quality data can be difficult. Teachers are not always experts with macroinvertebrate ID.</p>
<p>Water quality education. Chemical &amp; macroinvertebrate testing.</p>	<p>The station is in association with GVSU, &amp; more focused on academic research than outreach/education. Currently serving as many students as they are interested in serving.</p>
<p>Focused on homes in the Huron River basin, teaching students who to perform benthic invertebrate and chemical studies. Also working to develop a snorkeling program for water quality tests, and seine netting with students. Calendars sent to residents with tips to improve water quality. Public message through table talks and media is "what you can do at home to improve water quality". Working with municipalities on regional planning.</p>	<p>Despite a million dollar budget &amp; 13 staff, there is always a lack of time. More could always be done with more staff/volunteers to spread the word about water quality. They work in a very wide geographic area, &amp; have difficulty reaching all their residents/finding a cohesive message that resonates with the wide variety of social/economic perspectives.</p>

Organization	Organization Representative	Audience	Peak Season	Frequency of Programs
Indian Spring Metropark	Bridget	Preschool-college aged, but typically elementary students	May	1 school per day, 4 classes of 30 students
Lake Erie Metropark		Few public fishing programs. Occasional fishing programs for kids ages 6-10, also very few. Planning summer "water festival" for public audience. 4th grade participants in GLEP water studies - occasional middle-high school participants.	Water Festival - summer. GLEP programming may-early June and late Sept - October.	Fishing - less than one per year. GLEP with 4th graders - maximum 5 days per week through season - students spend half of day on Boat with Sea Grant, other half with LEMP staff doing macroinvertebrate water investigations. Full day experience, one time.
Lake St Clair Walleye Association	Jerry Comfort	All ages, many kids fishing outings. Regular meetings for members, & events for guests.	Year round activities.	
National Museum of the Great Lakes	Ellen Kennedy	Families, school groups typically 4-6th grade	May to October the museum receives 70% of its visitors. School groups mainly in May, September, and October	Usually 1 school per day.

<b>Content Focus</b>	<b>Limiting Factors in Programming</b>
Water quality, pond dipping, & biodiversity index.	Weather is the main limiting factor.
Macroinvertebrates related to water quality, marsh ecosystems. Future water festival will include some Great Lakes fisheries, value of our Great Lakes for natural resources & recreation (fly-fishing, fly-tying with Huron River Fisherman's Association)	
Fishing trips; walleye habitat restoration efforts	
Mission is Great Lakes History, and advancement of the boating technology over the years. STEM education through weather, geology, invasive species, navigation, and study of motion activities. Tried a fishing program summer 2016--didn't work.	Only catfish in the Maumee River, & students didn't have the patience to fish for them. New facility, still developing lesson plans/outreach.

Organization	Organization Representative	Audience	Peak Season	Frequency of Programs
Project Fish	Mark Stephens	<p>Adults, teachers &amp; volunteers to run program. Fish education &amp; recreational boating program targets PE teachers for use in classroom.</p> <p>Work with all ages: homeschool, fishing clubs, families etc. 4-H students, science teachers</p>	Spring and summer, with some ice-fishing programs in winter. Few programs are offered year round.	First three weekends of May have a program targeting 50 students & parents, at a 2:1 ratio with volunteers--these students are invited back 3 times in the summer to enhance their skills.
SeaGrant - Summer Discovery Cruises	Steve Stewart Great Lakes Education Program Director	Mostly families. Some opportunities for teachers as a professional development type cruise for teaching about the Great Lakes. Some cruises for kids.	Lake St Clair cruises - July . Lake Erie cruises - month of August	2-3 cruises per day Wednesday-Sunday
Stepping Stones / GLEP / Fishing Derby at Palmer Park	Gary Williams	<p>Stepping Stones - ages 9 and up - mostly from parks and rec departments, church groups, day camps - so variety of ages. GLEP - 4th grade students with their school, some high schools to fill in gaps. Palmer Park Derby - wide range of ages. Some family groups attend. Up to 500 kids.</p>	<p>Stepping Stones - summer only - 8 weeks. GLEP - May/June and September / October only. Palmer Park derby - always the Saturday before Memorial Day weekend.</p>	Stepping Stones - 80 programs. GLEP - 5 days per week during season is goal, but May-June is usually fuller because fall is not as popular a time for field trips. Palmer Park Derby - one per year
UMD Environmental Interpretive Center		<p>Water Festival in May for 5th grade students. Pond studies - range from K-high school; mostly upper elem..</p> <p>Watershed education - upper elem. / middle</p>	Spring and fall, occasionally in summer	Pond studies - near daily in May/June, weekly in Sept / Oct.

<p>USFWS / Detroit River International Wildlife Refuge</p>	<p>Justin Chiotte / Jennie Braatz</p>	<p>Schools and public audiences in general, also home-school</p>	<p>N/A - visitor center is not open yet, school visit has started only this year. They are in very beginning phases</p>	<p>With partner school program, they will visit the school once in fall as introduction, once in winter time and once in spring. School will visit in winter/spring.</p>
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Content Focus	Limiting Factors in Programming
<p>Working with Stepping Stones; Project Fish hosts occasional fishing derbies. General goal is to have multiple contact lessons to build students' skills.</p>	<p>Lack of funding.</p>
<p>Very broad content - includes wildlife, history, lake ecology, weather, one Lake St Clair cruise focuses on fisheries</p>	<p>Registration has been down , cruises occassionally cancelled due to lack of registration. There is a fee per person, &amp; Sea Grant must meet minimum costs. They try to keep fees as low as possible.</p>
<p>Stepping Stones - water studies. Fishing - fish as water health indicators, fish anatomy, fishing/casting technique (backyard bass), actual fishing. GLEP - water quality - plankton and benthic sample observation, water testing, boat knot tying, other "boating" stuff. Some invasive species</p>	<p>Transportation costs are the biggest challenge-Gary has seen this challenge with GLEP more than Stepping Stones. Challenges for fishing programs on Belle Isle-access and safety are a problem for Kids Intro-to-Fishing programs. Belle Isle is currently not conducive to that type of programming-the lagoons have too much aquatic vegetation &amp; stagnant water. The Model Yacht Basin is ideal, but there are not enough fish in it to make fishing an enjoyable activity for kids.</p>
<p>Watershed stewardship education, macroinvertebrate sampling &amp; water quality, pond ecology.</p>	

Water quality and macroinvertebrate ID. No focus on fisheries management with this program, but may consider in future. Once visitor center opens, there will be public opportunities for fishing - possibly schools as well.

Program is just now beginning, but transportation costs for schools is a big challenge - currently IWRA pays for transportation to the refuge