THE GREAT LAKES FISHERIES LEADERSHIP INSTITUTE: FINAL REPORT – JULY 2004

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In the summer of 2003 through spring of 2004, the Great Lakes Sea Grant Network piloted the Great Lakes Fisheries Leadership Institute (GLFLI), an adult fisheries Extension education program. This initiative represented the coordinated efforts and resources of eight Great Lakes' state Sea Grant programs and partners, with funding support from National Sea Grant. In purpose, the program was to accomplish adult fisheries education programming targeted for Great Lakes fishery stakeholders considered to be future fisheries leaders in each state and covering the five Great Lakes (Lakes Huron, Ontario, Michigan, Erie, and Superior), as well as Lake Champlain.

This report integrates a summary of the formal short-term evaluation of Michigan components of the GLFLI program conducted by Brandon Schroeder for his Master's Thesis. This formal evaluation is based on various levels of intended and actual program outcomes, considering the perspectives of both regional GLFLI program planners and the Michigan participants targeted by this adult fisheries leadership education initiative (Bennett 1978, Robinson 1994).

GLFLI: A Pilot-Model for providing Fisheries Leadership Training

Regionally, the GLFLI was developed around a core curriculum and a format of intensive statewide and lake-wide training sessions. These were designed to increase knowledge of Great Lakes fisheries and fisheries management, as well as to develop networking and leadership skills among future citizen fishery leaders. Specific expected program outcomes were identified and described by Great Lakes Sea Grant program staff after consulting with program partner agencies (Sturtevant et al. 2002). Broadly, a stated vision for the Institute program provides:

> *"We envision a Great Lakes Fisheries Leadership Institute operating on a regional, lake and state level capable of providing emerging citizen fishery leaders with the knowledge and skills to effectively interact with Great Lakes fishery management organizations for the benefit of the fishery and its stakeholders.* (Sturtevant et al. 2002)*"*

As an adult fisheries education program, the GLFLI was designed to encourage greater citizen involvement and action in Great Lakes fisheries issues. The primary desired outcome of the GLFLI is that participants gain the awareness, knowledge and understanding, comfort, skills, and resources by which they can then participate, contribute, or otherwise act in relation to the Great Lakes fisheries (Sturtevant et al. 2002a). Empowerment of people, individually and collectively, to address environmental issues locally and in their communities, is consistent with goals for environmental education programs on statewide, national and international scales (MEECAC 1992, NAAEE 1996, TICEE 1977, Fedler 2001).

Evaluation: Anticipated Learning Outcomes

For a regional Sea Grant planning perspective, Schroeder used program planning and promotional documents to describe program expectations.

- ✓ *Regional GLFLI Anticipated Learning Outcomes:* Regionally developed GLFLI program objectives were numerous, broad ranging, and with inconsistencies across multiple planning documents (Table 1). When categorized into broad topics, anticipated learning outcomes included:
    - Fisheries science (fish and habitats) (10 Learning Outcomes): fisheries management principles and history, fish biology, Great Lakes ecology, habitat, and related issues.
    - Leadership (people aspects of fisheries) (16 Learning Outcomes): networking, institutional arrangements, leadership skills, action/involvement skills, economics, and related issues.

Conclusions and Recommendations Relating to Anticipated Learning Outcomes

- ➢ *We recommend that future fisheries leadership training efforts clarify intended learning objectives, indicating specific standards by which to measure achievement of these objectives.* This will promote consistency in describing program objectives, and clarify intended outcomes against which future programming is measured.

- ➢ *We recommend investment in training and coordinating GLFLI instructors and resources.* This may provide more efficient use of instructors and resources, helping to improve the consistency of program delivery and to generate overlapping instruction and learning experiences in relation to key learning outcomes.

Table 1: Summary of Regional GLFLI Program Goals and Intended Learning Outcomes

Summarized GLFLI Learning Outcome Statements	Source Documents: Funding Proposal[a]	Promotional Brochure[b]	Participant Application[c]
Broad, General Goal Statements:			
1. Minimize frustration of both Great Lakes fisheries management agencies and those citizen leaders and who do not understand the complexities of Great Lakes fishery-related institutional arrangements, history and science.	x		
2. Explanations of the complexities of Great Lakes fishery-related institutional arrangements, history and science to minimize your frustrations.		x	
3. The ecological, economic, political, and socio-cultural environment within which Great Lakes fishery management operates and the fisheries management techniques applied to achieve fishery management objectives.			x
Biology, Ecology, and Fishery Science Related Statements (fish and habitats):			
1. A basic knowledge of the history of Great Lakes fishery and fishery management	x	x	
2. A basic understanding of fish ecology, biology, or science	x	x	x
3. The biological basis for fish production in the natural waters of the Great Lakes			x
4. A basic understanding of Great Lakes food webs – including the effects of lower trophic level changes on fish (physiology and species composition)	x	x	
5. A basic understanding of the effects and potential effects of aquatic nuisance species on Great Lakes fish	x	x	x
6. A basic understanding of the direct and indirect effects of contaminants on Great Lakes fish and sustainable Great Lakes fishery (habitat and reproduction)	x	x	x
7. A basic understanding of Great Lakes fish habitat needs or what composes essential fish habitat	x		x
8. A basic understanding of the impacts of land use on fish habitat	x		
9. Knowledge of Great Lakes fish habitat restoration successes	x		
10. The tools necessary to identify Great lakes fish species	x		
Leadership Related Statements (people aspects of fisheries):			
1. Basic leadership skills	x		x
2. A network of expert contacts (scientists, managers, legislators, etc.) from a variety of backgrounds to call upon to effectively address and/or advocate regional needs.	x	x	
3. Create a network of Great Lakes leaders or peers from the broadest possible variety of backgrounds, organizations, or stakeholder groups who are able to call upon each other to effectively address and/or advocate regional needs	x		
4. Basic understanding of Great Lakes institutional arrangements relevant to the fishery	x		x
5. To understand Great Lakes institutional arrangements and funding authorities,			x
6. Familiarity and basic knowledge with key federal and state fisheries managers and management institutions	x		
7. Develop stakeholders from each Great Lakes state as Great Lakes Fishery Leaders - a cohort of leaders with the knowledge and skills necessary to provide effective leadership on fisheries management issues,	x	x	
8. A basic understanding of the processes which feed into fisheries management decisions	x		
9. Empower these fishery leaders with the ability to influence policy decisions and legislative initiatives	x	x	
10. Exposure to and understanding of current issues and concerns relevant to the Great Lakes fishery	x	x	
11. Expose leadership from one end of the Great Lakes region to the issues and concerns of the other parts of the region.	x		
12. A enhanced ability to see multiple sides of any issue	x		
13. A thorough understanding of fish consumption advisories or how contaminants affect public safety (consumption)	x	x	x
14. Multiply the ability of Great Lakes Sea Grant Extension to reach constituent audiences using a 'teach-the-teacher' model.	x		
15. A basic understanding of needs, opportunities and mechanisms for enhancing public participation in the Great Lakes fisheries	x		x
16. An awareness of the economic importance that Great Lakes fisheries have on regional, statewide and coastal community scales.	x	x	

[a] GLFLI Funding Proposal and Vision Documents (Sturtevant et al. 2002a).
[b] GLFLI Promotional Brochure (Sturtevant et al. 2003).
[c] Cover Letter to GLFLI Applicants (Sturtevant 2003).

GLFLI Participants

GLFLI targeted emerging fisheries leaders at least partially in the hopes that we would maximize the spread of knowledge through the fisheries volunteer community as participants took the knowledge gained through the GLFLI experience back to their organizations. For this reason, we tracked the organizational affiliations of our participants – relying on information provided by our participants themselves. Some participants listed no organizational affiliations prior to their GLFLI experience, many participants listed several affiliations, and some organizations were represented by several GLFLI participants. The 146 unique GLFLI participants claimed affiliations to 114 unique organizations. Recreational fishing clubs (e.g.,) accounted for 24% of the total organizations reached by GLFLI. Educational organizations (high schools, colleges, museums, extracurricular programs, etc.) accounted for 20% of the total organizations reached by GLFLI. Affiliations to decision-making authorities (legislators, agency staff, advisors to agencies) accounted for 15% of the organizations reached by GLFLI. Commercial interests (commercial and tribal fishing organizations or businesses, charters, guides, pro fishermen, outfitters, etc.) combined accounted for 15% of the total organizations reached by GLFLI. Other non-profits (national environmental groups, watershed coalitions, etc) accounted for 16% of the total organizations reached by GLFLI. Media organizations (e.g., papers, writers associations) accounted for 7% of the total organizations reached by GLFLI, and nature centers/parks accounted for the final 4%.

As background for interpreting the formal evaluation of Michigan GLFLI participants for his Master's Thesis, Schroeder compiled additional demographic information on the subset of Michigan participants. This information was drawn from participant application packages, pre- and post-institute participation survey evaluations, and participant writing activities. This is in contrast to other states where information was gathered only through basic applications and sign-in. Michigan GLFLI participants represented a diverse group of adult fishery stakeholders. Diverse Michigan participant stakeholders also held diverse motivations, anticipated learning outcomes, program values and intended applications. Key findings included:

- ✓ *Michigan Participant Diversity:*
  - *Gender*: 86.4% Males : 13.6% Females
  - *Age*: Mean= 44.5 years (Median = 46.5 years)
  - *Ethnicity*: 90.9% White :
    4.5% Hispanic :
    9.1% Native American
  - *Education*: 9% High school degree or less :
    22.7% Vocational/trade school or some college :
    68.2% College graduate (BS, MS, Ph.D, etc.)
  - *Geographic community types:*
    36.3% Rural/farm :
    22.7% Sub-urban/Small town (≤25,000) :
    40.9% Urban/Metropolitan (>25,001)
  - *Occupations*: 18 different occupations represented, including fisheries related professions (e.g., commercial fishing, natural resources professionals, etc.)
  - *Fisheries related organizational affiliations*:
    affiliations with 43 organizations, including: sportfishing, commercial fishing, fish habitat, watershed, natural resources professionals, and outdoor writing

More than 50% of Michigan participants were associated with more than one fisheries-related organization. This is a significant contrast to the regional data, in which participants rarely reported affiliations to more than one organization. We believe this contrast is a result of the contrasting data collection methods, and that the 114 organizational affiliations reported for the regional program may significantly under-represent of the true breadth of fisheries-related affiliations of the GLFLI participants.

In depth evaluation, utilizing multiple data collection instruments, of Michigan GLFLI participants revealed diverse backgrounds, motivations and expectations.

- ✓ *Entry-Level Knowledge and Skills of Participants:* According to pre-Institute surveys, Michigan participants entered into the learning experience with high pre-Institute evaluations of their own knowledge, understanding, comfort and skills related to the Great Lakes fisheries.
- ✓ *Motivations for Participation:* Michigan participant motivations related primarily to (1) participant values (toward carrying out education, advocacy, etc.) and (2)

understanding (gaining knowledge). Secondary program motivations related to social factors (networking).

- ✓ *Anticipated Leadership Actions/Service Project Activities:* Through service project descriptions and leadership exercises participants identified that they were most likely to carry out actions reflecting (1) educational activities, (2) policy or legislative work, and/or (3) fisheries habitat work.
- ✓ *Communities of Work:* Michigan participants related their work primarily to local geographic areas and specific fisheries organizations. Secondarily, participants indicated their leadership work to include state-wide, lake-wide, and Great Lakes basin-wide scopes. Most participants identified multiple levels or scales of "communities" in which they would work.

Conclusions and Recommendations relating to Participant Demographics and Expectations:

- ❖ *Participant Background Experiences:* Participants entered into learning with significant knowledge and experiences related to Great Lakes fisheries. This is consistent with Adult Learning theory that suggests adult education should anticipate diverse and significant participant background knowledge and experiences.

- ❖ *Quality versus Quantity – recruiting diverse stakeholders as a priority over participant numbers:* Total participants completing a full GLFLI experience (70) were less than planned (105) though total participants (including those who attended only a single session (145) exceeded expectations. However, GLFLI recruiting successfully generated a diverse set of participants, representing a significant representation of the targeted diversity of stakeholder groups. Furthermore, stakeholder groups not represented as participants were identified and incorporated as guest instructors. For Michigan participants, learning and networking among a diversity of stakeholders was identified as the most valued outcome of their GLFLI learning experience.

- ❖ *Diverse Stakeholders generate diverse programming needs:* Success in generating a participant group of diverse stakeholders resulted in a participant group of equally diverse motivations, values, needs and expectations. Consistent with adult learning theory, these did not always match GLFLI anticipated learning outcomes (Levine 2000, Robinson 1994). Nonetheless, these are important considerations in developing positive learning experiences among adults. Where participants held expectations similar to those identified by the GLFLI organizers, individual expectations were more specific and less broad ranging than those identified by organizers. As discussed in adult learning theory, learning needs and expectations of participants related to diverse participant values and needs which in turn related to their individually intended leadership actions (as well as communities in which these actions would be carried out).

- ❖ *"Communities" of Work ranged widely, but with Localized Emphasis:* Michigan participants indicated a likelihood of working on multiple levels of community ranging from local geographic communities to lake-wide or Great Lakes basin-wide activity. However, local geographic areas and specific fisheries organizations were more often noted as the community contexts of work indicated by participants. Consistent with

community-based conservation theory, participants were more likely to carry out leadership actions for the benefit of Great Lakes natural resources of specific value or interest to themselves or their community. Regional programming that enhances these community-based conservation efforts can generate significantly greater returns in conservation work, in this case fisheries leadership actions, carried out by program participants (Western and Wright 1994).

- *We recommend allowing for flexible programming designs that take advantage of learning opportunities related to the knowledge bases and learning needs of a diverse stakeholder audience. Sea Grant should* continue and expand the roles and input of local Sea Grant Extension agents, advisory groups, and GLFLI graduates in developing future GLFLI sessions that are flexible to accommodate local participant needs while retaining the regional program intent and values.

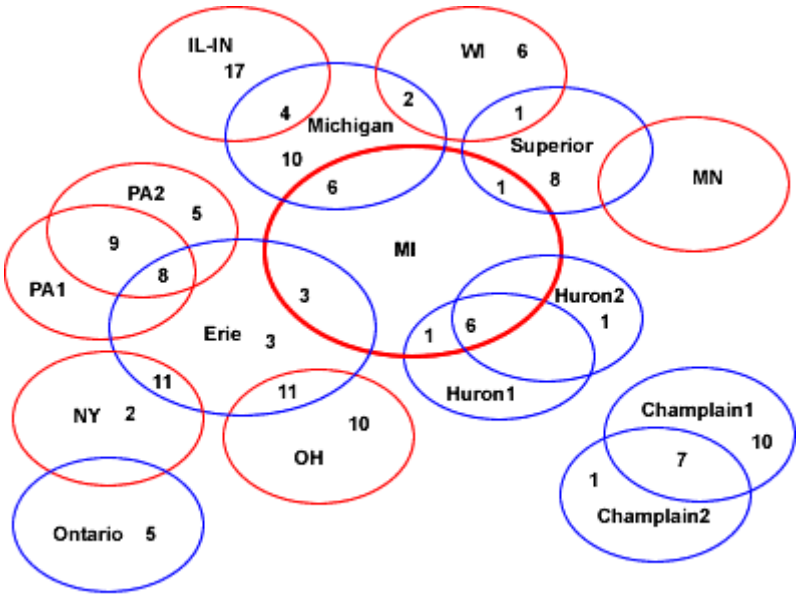
- *We recommend increasing opportunity for learner-relevant learning experiences:* The influence of GLFLI is likely to be greatest where learning is most relevant to the participants. Opportunities for increasing program impacts exist where the GLFLI can serve to guide participants intended actions by providing knowledge, skills, resources and contacts as tools to empower their desired actions. Programming should seek to deliver regional program content in local or participant-oriented contexts, such as creating linkages among participant service projects.

- *We recommend an emphasis on community-based programming.* Such programming should incorporate multiple levels of "community" action. Key to GLFLI programming goals was the opportunity to focus on regional, basin-wide or lake-wide institutional arrangements, networks, and involvement. These were important and valued aspects of programming, and the GLFLI should continue to speak to Great Lakes basin-wide institutional arrangements and decision-making processes. However, to address specific learner needs and enhance program value, programming should consider providing attention to leadership skills or aspects of local involvement that can be utilized at local geographic community levels or within specific fisheries interest organizations.

GLFLI Program Delivery

The regional pilot GLFLI effort was comprised of 8 lake sessions (Superior, 2 Huron, Michigan, Erie, Ontario and 2 Champlain) and 8 state sessions (MN, WI, IL-IN, MI, OH, 2 PA, and NY). All sessions took place between July 2003 and June 2004 except for the Minnesota state session - that has been delayed to coincide with a series of meetings on coaster brook trout in the fall of 2004. Sessions ranged in size from 5 (Lake Ontario) to 33 (Lake Erie) participants. Participants were requested to register for a state and lake session series in order to have the full GLFLI experience. Some states (IL-IN, PA, NY) opted to accept more participants into an otherwise small state session than could be accommodated at the combined lake session. Final numbers also reflect the loss of a few participants

between sessions (largely citing scheduling conflicts) and a few late additions to the program. Thus of the 146 GLFLI participants, less than half (60) were able to attend an entire series.



Each circle indicates a GLFLI session (lake sessions in blue and state sessions in red). Numbers indicate participants attending that subset of sessions.

GLFLI sessions were initially planned with the intention that an entire series would be approximately 40 contact hours. Participants' actual contact hours thus ranged from 3.5 hours (PA#2 only) to 60 hours (Huron1, Huron2 and MI state) with an average for an entire series of 32 hours. This may be somewhat underestimated because it does not include optional follow-up events such as the New York group who participated in the State of the Lake meeting (for Lake Erie) this April.

GLFLI sessions were designed to include elements of seminar-style classroom activities, hands-on experience and networking opportunities in addition to the written curriculum and supplemental materials while covering the eight basic program elements (Aquatic Science; Aquatic Nuisance Species Effects on Sustainability; Fisheries Habitat; Contaminant Issues Relevant to Great Lakes Fisheries; Fisheries Management; Great Lakes Fisheries Agencies, Institutions, Funding and Politics; Public Participation and Leadership). While all sessions were based around these guidelines and used the same core curriculum materials, flexibility to meet the needs of particular groups as well as to take maximum advantage of local expertise and opportunities were given precedence over any attempt to standardize the sessions. A quick perusal of session agendas dazzles the mind with the diversity of programming that resulted, but closer inspection reveals that these common elements were present in each series. Listening to two participants at the Michigan state session exchange stories about their experiences at their respective lake sessions (one electro-fishing in Presque Isle Bay, another visiting a commercial operation unloading fish dockside) reveals an unexpected benefit of such diversity - participants benefiting from the diverse experiences of their peers.

All GLFLI learning outcome areas (objectives) received coverage through GLFLI curriculum. Nearly all learning outcome areas received coverage during Michigan training sessions, with only the contaminants and fish consumption advisories lacking coverage in training sessions (though both were covered in curriculum).

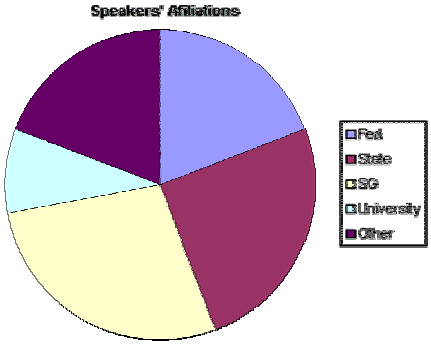
Program content as covered with Michigan participants during training sessions:

- *Both Lake and Statewide Meeting coverage:* networking, institutional arrangements, decision making processes, and fisheries issues
- *Lakewide Meeting(s) coverage only*: Fish biology, Great Lakes ecology, fish production, food webs, aquatic nuisance species, fish habitats, and fish species
- *Statewide Meeting(s) coverage only*: Leadership skills, influencing political/legislative decisions, sharing information, increasing public participation

Regional Program Delivery Elements:

1. *Core curriculum* - consisting of "The Life of the Lakes", eight modules and three project products plus a CD with 5 PowerPoint presentations (available for reuse), was delivered to all participants.
2. *Supplemental materials* – more than 100 products provided by program organizers, partner agencies, presenters and participants were delivered to participants at one or more sessions. These included more than 27 PowerPoint presentations (mostly from the Great Lakes Fishery Commission) that were <u>not</u> delivered as part of the GLFLI.
3. *Training sessions* – 3.5 to 60 contact hours, with an average full program length of 32 hours.
4. *Experiential opportunities* – Experiential opportunities were intended as a cornerstone of the GLFLI. Most participants who took the full GLFLI course had at least one experiential opportunity (at the state or lake level or both) with the Lake Huron-Michigan State participants representing the maximum of 4 experiences with a combined length of 7 hours. Experiences varied broadly in character - from electro-shocking fish on Presque Isle Bay to fish identification at Stone Lab, and fromvisiting a commercial fishery to visiting with the Michigan State legislature.
5. *Discussion* – Most GLFLI sessions included at least one targeted and facilitated group discussion session – with the Lake Huron-Michigan State group again participating in the maximum of 4 discussions for a combined duration of 5 hours.
6. *Networking* – In addition to the formal discussion sessions, GLFLI provided a number and variety of opportunities for participants to network among themselves, with presenters, and with other groups. All sessions included networking opportunities over lunch, most included one or more evening receptions, one (MI state) provided panel discussion opportunities and a resources fair.
7. *Expert presentations* –
    a. 5-10 expert presentations per session
    b. 17 additional core PowerPoint presentations were developed, presented and distributed to participants at one or more sessions.

c. 15 additional PowerPoint presentations were developed by partners specifically for GLFLI use and made available to regional GLFLI staff for reuse
d. 68 individuals were involved in helping to make the pilot GLFLI a reality through presentations, facilitating discussion sessions, teaching curriculum materials, guiding tours and other hands-on activities. Sea Grant staff were directly responsible for less than 30% of the total presentations. State (e.g., DNR, DEQ, Fish and Boat Commission, State Park staff, etc) and federal (e.g., GLFC, USFWS, USGS, GLERL) agency staff delivered the bulk of the presentations (44% combined). Other University staff delivered a variety of presentations (research, leadership, vessel tours) comprising 8% of the programming. A variety of other individuals and institutions were responsible for the remaining 19% - these include commercial, charter and tribal fishermen, charter captains; outdoor writers and editors; leaders of recreational fishing organizations, watershed councils, advocacy groups.



Conclusions and Recommendations for Program Delivery:

- *Program Content Delivery:* Curriculum, program training session formats, and networking among a diverse set of participants and instructional staff were all aspects of the Michigan GLFLI program that were generally carried out as originally intended in regionally developed GLFLI planning documents.

- *Delivery Overlap:* Program objective-related topics that received increased emphasis through multiple overlapping modes of delivery, related to increased participant gains and participant-indicated program values among Michigan participants. These results are consistent with learning theory that describes learning as a multi-step and circular process, understanding that individuals have different styles of learning (Kolb 1984, Hungerford and Volk 1990).

- *We recommend investment of significant programming or contact time.* Such significant investment of contact-time and resources appears necessary to fully achieve multiple and diverse program objectives, particularly objectives that speak to multiple variables and relating to changing learner behavior. Learning and value in the learning experience increased where messages were experienced by the learner in multiple, overlapping settings. Therefore, significant investment of time and

resources should be expected to not only cover, but cover in depth and detail, the large number of expected learning outcomes identified for the GLFLI.

- *We recommend overlap in coverage for program priorities identified as most important.* Particularly those of mutual importance to both Sea Grant and participant program values and expectations, such as networking opportunities or specific types of knowledge or skill sets, through multiple modes of delivery and diverse training formats including curriculum, classroom learning, and experiential opportunities occurring during both lake-wide and statewide training sessions should be considered.

Evaluation: Participant Reactions and Impacts

GLFLI evaluation tools were not standardized across the region. Michigan participants (and a small subset of Lake Michigan and Lake Superior participants from other states) completed the full pre- and post-Institute surveys designed to measure program impacts relative to expected outcomes (expected by program design staff and participants). Other participants completed much shorter formative evaluations designed to assess general satisfaction with the GLFLI experience and highlight areas for improvement and/or follow-up.

- ✓ *Significant Gains in Knowledge and Skills:* In post-Institute surveys, Michigan participants indicated statistically significant increases in knowledge and skills for nearly all learning outcome areas identified as anticipated outcomes by GLFLI planners.

- ✓ *Michigan Participant Reactions to Program:*
  - Learning Expectations:
    - 72.7% agreed they had learned or gained what they *had originally hoped* from their GLFLI experience.
    - 81.8% learned or gained *something new or unanticipated*, beyond what they had originally hoped
  - Programming Expectations:
    - 77.3% agreed curriculum or lessons met their expectations
    - 54.5% agreed experiential opportunities met their expectations
    - 54.5% agreed they had enough opportunities to practice knowledge/skills
  - Overall, 81.8% felt their GLFLI experience to be beneficial.

- ✓ *Key Program Values and Outcomes identified by Michigan Participants:*
  - <u>Primary:</u>
    - Networking (among agencies, institutions, and stakeholder groups)
    - Learning about diverse stakeholders (e.g., sport, charter, commercial, tribal fisheries)
  - <u>Secondary:</u>
    - Knowledge related to fisheries history and biology/ecology, management and policies,

        - Awareness and understanding of Great Lakes issues, and
        - Access to additional resources.

- ✓ *Additional Programming Opportunities identified by Michigan Participants:*
    - Development of specific leadership skill sets (i.e., education skills, habitat improvement skills, etc.), with opportunities to practice skill sets
    - Increased experiential opportunities

- ✓ *Anticipated Leadership Actions/Service Project Activities identified by Michigan participants:* through service project descriptions and leadership exercises participants identified that they were most likely to carry out actions reflecting (1) educational activities, (2) policy or legislative work, and/or (3) fisheries habitat work.

Conclusions and Recommendations Based on Participant Reactions and Impacts:

- ❖ *Significant increases in Participant Knowledge and Understanding:* Based on GLFLI program objectives, participants' self-rated knowledge and understanding increased (statistically significant) in all outcome areas. Participants indicated that increased knowledge and understanding relating to Great Lakes fisheries was one of the most important things gained through their GLFLI experience, second only to their opportunities to network and gain understanding of diverse user groups. Knowledge and understanding are important and necessary precursor variables in fostering environmental stewardship behaviors among learners (Hungerford and Volk 1990)

- ❖ *Resulting Participant Program Values differed from initial Motivations and Program Expectation of participants:* Program values most recognized by participants differed from motivations and original participant expectations. In relation to adult learning theory, the GLFLI served a role in providing a learning experience and resources sought by participants (Levine 2000), and additionally served as an opportunity to introduce participants to new and different learning experiences above and beyond their expectations. Moreover, participants identified some of these "unanticipated" learning opportunities as most valuable or beneficial aspects of their GLFLI experience. Key values identified related to participant motivations and expectations:
    - Primary values included networking and understanding of diverse fishery stakeholders (relates to "social" motivations, a secondary motivation).
    - Secondary values included knowledge related to fisheries history and biology/ecology, management and policies, Great Lakes issues, and access to additional resources (relates to "understanding" motivations, a primary motivation)
    - "Values" related motivations (skills related to carrying out education, advocacy, etc.) – a primary participant motivation -- were not identified by participants as key program outcomes.

- ❖ *Participant Program Values related to Program Delivery and Learning Experience:* The overall GLFLI experience was generally valued as a beneficial experience for participants.

However, the degree to which topic areas were covered and overlapped across modes of delivery (e.g., curriculum, training session agenda items, experiential opportunities, etc.) related to the program values and learning outcomes rated as most important by participants.

- *GLFLI Program may influence, but not significantly change, intended Service Projects/Leadership Actions:* In application of their learning experience, participants indicated a variety of environmental action typologies in describing their intended service projects and leadership activities (Hungerford and Peyton 1980). Consistent with adult learning theory, the Michigan GLFLI participants held individualized motivations for participating and specific intended applications of their learning experiences (Levine 2000, Robinson 1994). The GLFLI may have influenced, but did not result in drastic changes in participants intended actions or participants' sense of the community in which these actions would be carried out.

- *Opportunities for further development of "Empowerment" Variables:* Prior to their GLFLI experience, participants indicated that they placed an importance on gaining action-related skill sets related to education, habitat work, or public/political involvement. While indicating statistically significant increases in these areas, no participants identified these skill sets as important gains from their GLFLI experience. These results may indicate that (1) the GLFLI did not provide enough opportunities to expose participants to these skill sets and opportunities to practice these skill sets; or (2) participants received these skill sets as a part of their training, but in the end felt other aspects of their GLFLI learning experiences (i.e. networking) were more important. Regardless, these skill sets are important empowerment variables necessary in fostering stewardship or fisheries leadership behaviors among learners (Hungerford and Volk 1990).

- *We recommend maintaining successful aspects of programming* that promote (1) networking of diverse stakeholders and (2) understanding of basic knowledge and understanding relating to Great Lakes fisheries. These were key learning outcomes identified both regionally for the GLFLI (do you mean by organizers or by participants beyond MI?), as well as Michigan participants.

- *We recommend added focus on specific "action" or "empowerment" skills.* Opportunities exist for additional programming to increase opportunities for learners to gain and practice specific skills necessary to carry out specific leadership actions. This possibly could be done through advanced trainings, additional contact, supplemental resources, and/or continuing support.

- *We recommend* e*xpanding the roles of local Sea Grant staff and stakeholder advisors.* Program delivery relied on local Sea Grant staff and stakeholder advisory groups. This format increases program value among participants in developing networks, information and resources, and experiences most relevant to participants' communities and local fishery resources.

- *We recommend incorporating participant service projects into the learning process*. Diversify types of knowledge and skill sets provided in trainings to accommodate specific values and needs of GLFLI participant classes.