

**SCIENCE AND INFORMATION SUBCOMMITTEE
OF THE GREAT LAKES ADVISORY BOARD**

**RECOMMENDATIONS for INCORPORATING DURATION/LONGEVITY
INTO GLRI PROJECT SELECTION**

November 15, 2016

Executive Summary

The Science and Information Subcommittee (SIS) of the Great Lakes Advisory Board (GLAB) has been asked for its advice on how to incorporate duration/longevity considerations into GLRI proposal selection. The SIS appreciates the importance of the Measures of Progress (MOPs) in the GLRI action plans as these track actions taken towards specific objectives and help satisfy accountability requirements imposed by Congress and the Office of Management and Budget. MOPs that measure program outputs have a critical role in demonstrating the tangible results of the GLRI investments, which is necessary to sustain support for the program over time. Making the linkage from MOPs that measure outputs to ecological benefits (outcomes), ideally at a large scale and over a long timeframe, is extremely challenging. The SIS applauds efforts by GLRI-funded agencies to find ways to identify and fund projects that may have long-term benefits not easily captured in annual MOP reporting.

This report is intended as guidance from the GLAB to the Interagency Task Force (IATF) as GLRI-funded agencies search for ways to ensure that GLRI investments have the greatest possible long-term benefit to the Great Lakes. The report includes specific recommendations that we believe will assist the agencies as they consider long-term ecological benefits in project selection, and hopefully will help achieve those benefits in the long run.

The report and recommendations are based on discussions within the SIS and reviewed by the GLAB, informed by charge questions presented by the agencies. The SIS formed subcommittees around each of the charge questions and reviewed select proposals/projects, and provided an examination of whether and how “longevity/duration” considerations have been incorporated into a select group of past projects.

The charge questions ask for input on how “longevity and duration” considerations can be incorporated into the GLRI program. For purposes of this report, we propose that “duration” refer to the length of the project (essentially the project period) and “longevity” refer to when the benefits will be achieved and how long the benefits will last. For instance, a fish barrier may take 3 years to build (duration), and its benefit may be achieved immediately upon completion and last 30 years (longevity).

Summary of recommendations

- A forum should be established to identify new MOPs that measure long-term ecosystem outcomes and the long-term ecosystem benefits to be achieved by the GLRI program investments and to complement the current MOPs. (Recommendation 1.1)
- Establish consistent language for GLRI program documentation that includes direct measures or surrogates that track overall progress toward long-term ecological benefits. (Recommendation 1.2)

- Where feasible, incorporate duration and/or longevity considerations when interpreting existing MOPs in Action Plan II, and incorporate explicit duration and longevity considerations into the new MOPs in Action Plan III (2020-2024). (Recommendations 1.3 and 2.1)
- Require GLRI grant applicants to describe how they will or could demonstrate by pre- and post-project monitoring or otherwise that a proposed project will contribute toward the achievement of project outcomes. (Recommendations 1.4, 3.2)
- Identify specific project evaluation criteria that characterize the long-term benefits to be achieved by the GLRI program, and create a scoring rubric or “check list” to use in identifying projects that deserve extra consideration on the basis of duration and longevity. (Recommendation 3.1)
- Require applicants to estimate when project outcomes are expected to materialize, how long they are expected to last, and how they pertain to the long-term Great Lakes ecosystem restoration goals and MOPs in the Action Plan. Guidance should be developed to ensure some consistency. (Recommendation 4.3)

Charge Question 1: What are the most significant kinds of challenges that can impede the duration or longevity of ecosystem benefits from GLRI-funded actions, and how should they be addressed in GLRI processes?

GLRI-funded projects as discrete grants are typically short-term in nature, rarely going beyond a three-year period. By contrast, restoration expenditures (whether made through GLRI or some other program) generally are intended to achieve beneficial, long-term ecological outcomes. The SIS believes that the central challenge in addressing the duration or longevity success of GLRI-funded projects lies in defining and measuring the long-term ecological benefits that are achieved individually or collectively by GLRI-funded projects.

The SIS strongly supports what we understand to be the main premise underlying the charge questions: although valuable as a reporting tool, most of the MOPs in Action Plan II do not quantify actual ecological benefits. Virtually all of the current MOPs measure program outputs¹ because they track progress toward an interim objective (e.g., acres of habitat protected), not the ultimate desired program outcome (i.e., improvement of the Great Lakes ecosystem). Most of the MOPs are “process measures” that measure either project parameters or progress toward a focus area objective,² and not “outcome measures,” which measure progress toward a desired ecological goal.

To address these challenges, there is a need to identify and define the long-term ecosystem benefits to be achieved by the GLRI program, and to establish new metrics that measure the extent to which GLRI investments achieve, or are expected to achieve, those long-term ecological outcomes. Defining new metrics—new MOPs—to measure progress toward long-term

¹ The term “output” means an environmental activity, effort, and associated work products related to an environmental goal or objective, that will be produced or provided over a period of time or by a specified date. The term “outcome” means the result, effect or consequence that will occur from carrying out an environmental program or activity that is related to an environmental or programmatic goal or objective.

² For purposes of this document, “focus area objectives” are the objectives listed for each focus area on page 4 of GLRI Action Plan II.

ecosystem benefits is a complex and important goal, but will require more effort and data on the MOPs in the current program. Thus SIS was unable at this time to articulate the new MOPs. Recognizing that new MOPs would create better linkages between the long-term ecosystem benefits to be achieved and the projects funded under the GLRI, the SIS recommendations include:

Recommendation 1-1: The IATF should convene a forum of IATF personnel who participate in GLRI funding decision-making to identify and define new MOPs that can be used to measure progress toward long-term ecosystem benefits, to the extent feasible. These new MOPs should be outcome-oriented, with specific endpoints that can be used as surrogates to directly track progress toward long-term ecosystem goals. The new MOPs could specifically reference the long-term goals established for the Great Lakes ecosystem (e.g., “fish safe to eat,” “water safe for recreation,” “safe source of drinking water”).³

Recommendation 1-2: Forum participants might develop high-level guidance for all GLRI funding programs that describes what is expected of individual applicants in their proposals and reporting. Consistent language for GLRI program documentation is needed across GLRI funding programs that enables the IATF to better track overall progress toward long-term ecological benefits. Specific recommendations regarding the content of GLRI program documentation are included in response to Charge Question 4.

Recommendation 1-3: New MOPs that explicitly incorporate duration and longevity considerations should be incorporated into GLRI Action Plan III (2020-2024). We acknowledge the difficulty of tracking progress toward long-term goals within the 5-year planning cycle, but ideally the MOPs in Action Plan III will include those that are directly related to ecosystem benefits in addition to MOPs focused on process.

Lack of GLRI funding for monitoring is an over-arching issue, as it may take decades (beyond the grant period) to demonstrate that ecosystem benefits have been realized. The availability of funding for monitoring pre-implementation baseline conditions, post-implementation adaptive management, and (in some instances) longer-term post-project conditions should be considered for projects implemented under GLRI.⁴ In addition, project proposals should be required to identify whether an existing federal, state, or local monitoring or assessment program is being used to track restoration progress.

Recommendation 1-4: A brief monitoring plan for demonstrating progress toward and achievement of project outcomes should be included in all project proposals. This monitoring may not necessarily be done as an explicit part of the project (in fact the duration of the project likely will not allow it), but the monitoring approach should be articulated by the applicant. The plan should include standardized metadata: what is being monitored, how frequently, where monitoring should occur, how long into the future it will continue, who will do it, and to whom data and other results will be

³ The long-term goals were carried over from the first GLRI action plan and incorporated into Action Plan II on page 3.

⁴ See, for example, 2016 Sustain Our Great Lakes Request for Proposals Evaluation Criteria: “Evaluation and Maintenance - Monitoring: Project includes a plan for monitoring progress during and after the proposed project period to track project success and address new challenges and opportunities. Long-term sustainability: Project will be maintained to ensure benefits are achieved and sustained over time; plans described in the proposal include how future funding will be secured to implement necessary long-term monitoring and maintenance activities.”

reported. Wherever possible, GLRI funding programs should include funding request language and scoring criteria that encourages applicants to consider incorporating or piggybacking onto existing federal, state, and local monitoring efforts.

The SIS recognized that success of future monitoring is contingent upon support for this activity until the outcome is achieved. The monitoring should be realistic, coordinated, and attainable especially for small groups who are experts in this work but most likely have financial and staff resource constraints around long term monitoring and assessments. The SIS is particularly concerned that implementation of a monitoring program may pose an unreasonable burden on smaller organizations and projects. In developing guidance on monitoring expectations (Recommendation 1-2), care should be taken to ensure that worthwhile projects that are small in scope are not unduly disadvantaged. Support for existing data collection and sharing repositories, e.g. the Great Lakes Observing System (GLOS), is essential for those projects which have monitoring that is amenable to data archiving in GLOS. Without support for data archives that are readily accessible by all Great Lakes residents, the ability to effectively communicate outcomes for such projects would be highly constrained.

The SIS identified additional challenges that can impede the longevity of ecosystem benefits. The Laurentian Great Lakes are a system undergoing change from population growth, land use change, species invasions to climate change and other stressors. Any number of challenges exist, each with a set of specific factors playing a role in the changes seen in the Great Lakes system. The nature of each problem affects how long the problem may persist but may be multi-faceted.

Take phosphorus (P) for example: in some cases, the rates of P change may be rapid such as with dreissenid mussels, which profoundly changed biogeochemical processing of P in the Great Lakes. By contrast, P export by rivers may decline more slowly than expected in certain watersheds due to legacy storage.

Of all the additional challenges that may impede the longevity of ecosystem benefits, *climate change* may be the most challenging, with potential long term impacts on the ecosystem that may even negate any ecosystem benefits achieved by GLRI investments. For example, the warming of Lake Erie could create the situation where warmer hypolimnetic waters hold less oxygen, oxygen consumption rates are increased, and prolonged mixing in spring prior to thermal stratification creates a shallower hypolimnion. All these factors would contribute to more hypoxia, even if primary productivity in the lake was reduced through successful GLRI-funded P reduction efforts.

Multiple stressors may impede system recovery when only one stressor is ameliorated. Management actions may decline in effectiveness over time, for example, if an invasive plant adapts to control measures. Climate change, land-use change and population pressures may degrade management actions. These challenges may vary by focus area and objective.

These challenges and multiple stressors are indicative of the Great Lakes ecosystem's complexity; hence, it is imperative that long-term monitoring plans be developed (and funded) to ensure ecosystem benefits are being realized, and if not, use the monitoring information to make the appropriate course corrections.

Charge Question 2: *For which of the GLRI measures of progress is the duration or longevity of ecosystem benefits from a GLRI-funded action most critical?*

Within each focus area in the Action Plan II (page 4), there will be some MOPs that will be important for tracking the objectives associated with the duration or longevity of ecosystem

benefits to be achieved from a GLRI-funded action. It is important that new MOPs track progress toward the achievement of these longer term objectives and not just project parameters. For example, one of the MOPs for the Nonpoint Source Pollution focus area tracks the “measured nutrient and sediment reductions from monitored GLRI-funded projects in targeted watersheds.” This MOP does not help demonstrate the ultimate goals that the water is safe to drink or for recreation (the overall long-term ecosystem objectives), but it helps to demonstrate that nutrient loads from agricultural watersheds have been reduced, which is the focus area objective. Duration and longevity with respect to projects that contribute toward the achievement of a modified MOP that adds a greater time element to monitoring these reductions is important to ensure that nutrient reductions are long-term, not temporary. Only long-term nutrient reductions will achieve the focus area objective and the desired ecosystem outcome.

Duration and longevity are less important with respect to MOPs that merely track project parameters. For example, duration/longevity are difficult to consider with respect to the nonpoint source pollution MOP that tracks “the number of GLRI-funded nutrient and sediment projects in targeted watersheds.” This MOP does not demonstrate progress toward a focus area objective (reducing nutrient loads from agricultural watersheds) because it tracks only the number of projects, not whether the projects are effective in reducing nutrient loading. Metrics that track methodologies and field methods may be helpful, but they are not related directly to a longer term goal or objective. Thus, duration and longevity are less critical respect to these measures.

It may not be necessary to imply a project longevity standard to all of the current MOPs. The MOP that tracks the removal of Beneficial Use Impairments (BUI) or the de-listing of Areas of Concern (AOC), for example, essentially tracks progress toward a final long-term outcome because all benefits are achieved for the foreseeable future once BUI removal or de-listing has occurred.

Recommendation 2-1: The IATF should strive to include duration and/or longevity considerations when using or interpreting the MOPs in Action Plan II that track progress toward the achievement of focus area objectives. In addition, the IATF should incorporate (where feasible) duration/longevity requirements into the new MOPs that track progress toward the achievement of long-term ecological outcomes. It is less important to incorporate duration/longevity into MOPs that only track project parameters (outputs).

Charge Question 3: *How should the duration or longevity of ecosystem benefits be considered when comparing various proposals for GLRI funding?*

The SIS has very limited information about the current project selection process, making it difficult to specify how to add on scoring criteria for duration/longevity. We recognize that EPA provides scoring criteria in their requests for funding. However, other GLRI-funded agencies may not. A consistent scoring rubric that is used across GLRI funding programs could be helpful.

Recommendation 3-1: In conjunction with the Recommendation 1-1, a group of agency personnel tasked with better defining long-term ecological benefits associated with new MOPs should identify a few specific project evaluation criteria that characterize projects that articulate long-term benefits. This could allow construction of a scoring rubric or “check list” that helps identify projects deserving of extra consideration on the duration/longevity basis.

The total cost to achieve, monitor, and maintain an ecosystem benefit will often extend well beyond the timeframe of an individual GLRI-funded project. Many projects will require continuous, meaningful maintenance expenditures (e.g., incentives to maintain farming practices, repeated treatment of invasive species). Others may require little maintenance (e.g., dam removal to reconnect a tributary). Project proposals should include cost estimates for achieving project outcomes over a long-term timeframe and how they will be addressed beyond the grant period.

Recommendation 3-2: To satisfy concerns over monitoring and maintenance issues, applicants should be asked, at a minimum, to address the following questions in project proposals: (a) Will the completed project be self-sustaining or require on-going maintenance (and if the latter, for how long, at what cost effort, by whom, etc.)? (b) What is the anticipated response time following project completion for the identified ecosystem benefits to be realized? Responses should be clearly explained in detail and be well-defended.

Charge Question 4: *What level and type of documentation on the duration or longevity of ecosystem benefits should accompany GLRI funding proposals?*

Applicants may not be able to provide precise, detailed answers regarding longevity/duration in project proposals and final reports, but a requirement to address the longevity/duration issue would be useful. Efforts to acknowledge uncertainties and risks should be viewed as a positive. Definitions of longevity and duration as part of the funding agency guidance recommended above will be needed.

Recommendation 4-1: GLRI project proposals should be required to define project success in terms of both outputs and outcomes, and specifically state the long-term Great Lakes ecosystem restoration goal(s), focus area, and MOP being targeted. The applicant should not be required to perform an evaluation of project success, but should articulate in the proposal what success means for the individual project and the achievement of GLRI Action Plan MOP.

Recommendation 4-2: If feasible, applicants should be required to define project success in terms of short, medium and long-term project outcomes. We define short term as occurring within the project funding cycle (1-2 years); medium term as occurring within the Action Plan funding cycle (≤ 5 years); and long term as occurring over a longer time period than a single Action Plan (> 5 years). This information could be used as assessment criteria during the GLRI proposal review process.

Recommendation 4-3: GLRI project proposals should be required to estimate when project outcomes are expected to materialize and how long they are expected to last. They should include a rationale for their estimates. Requiring applicants to include a description of what long-term ecological success looks like in their project proposal (e.g., by asking them to estimate how long invasive species will be controlled after the proposed project is completed) would make it easier for the agencies to compare project proposals in terms of duration and longevity.

Recommendation 4-4: Applicants for GLRI funding should be required to follow a standard format when preparing proposals and final reports to ensure consistency of reporting. Relevant data could then be accessed across all GLRI projects for each GLRI focus area or MOP. Final reports should include an explicit statement describing how

duration/longevity will be evaluated beyond the grant period, or a statement explaining why this expectation does not apply.

Recommendation 4-5: Grantees should be required to develop a fact sheet for each GLRI funded project. (The fact sheet could be developed at the beginning of the project and updated at the end of the project). The fact sheets could identify project outputs and outcomes, target focus areas and MOPs, and expected and (at the end of the project) realized ecosystem benefits, as well as funding sources, partners, etc. The fact sheet and the final report could be posted on appropriate agency websites and linked in the reporting database that EPA may be maintaining.

Charge Question 5: Are there any models or other tools that the GLAB would recommend for estimating the duration or longevity of ecosystem benefits from GLRI-funded actions?

Depending on the type of project, models may be helpful. Established long-term monitoring programs may be another approach (e.g., National Coastal Wetland Assessment Program; federal, state or local established long-term monitoring programs). Likewise, new tools can be incorporated into project reporting to document ecosystem benefits. Examples include development and use of an improved GIS data base into which data and photos can be entered from the field. The purchase and use of a Drone could further document project outcomes with photographic evidence.

Recommendation 5-1: If technically feasible and reasonable under the Eagles Reporting System, the GLRI tracking system should include a coding field that provides information related to duration and longevity reporting and approaches used by applicants and/or GLRI funding agencies, thereby building a library of useful approaches.

Recommendation 5-2: Ecosystem benefits should be valued, and the long-term value of these benefits should be considered when prioritizing projects and making funding decisions. There are a variety of tools to assess the relative value of ecosystem benefits; such benefit assessments should be included in project proposals and the proposal review process. Cost-benefit analysis, nonmarket valuation techniques (e.g., contingent valuation, travel cost), and other methods are potential and acceptable approaches. To facilitate consistency and comparability, the IATF should identify the approach they see as most useful for projects in each focus area.

It should be recognized that cost-benefit analysis is most useful when comparing two or more alternatives for achieving the same goal. For example, which strategy, A, B, or C, is the most cost-effective way of reducing inputs of P into a water body? One could appropriately use metrics such as P-removed/\$ to compare such projects. If one's goal is to restore as much coastline habitat as possible, the metric acres-restored/\$ might also be useful. Cost-benefit analysis is less useful when comparing projects with different goals. The more different the goals are, the more difficult it is to use the tool. For example, is it better to use GLRI funds to implement a P-reduction project or a restoration project? Quantifying that decision becomes much more difficult.