

MinnAqua—Minnesota's Angling and Aquatic Education Program Launches *Fishing: Get in the Habitat!* in schools

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Abstract.—The MinnAqua Program, the angling and aquatic education program of the Minnesota Department of Natural Resources, was established in 1989. Its purpose was to introduce urban youth in the Twin Cities of Minneapolis and St. Paul to fishing. MinnAqua has since grown notably, expanding into a successful statewide program reaching over 40,000 people a year, still with a focus on angler recruitment and retention. In addition, the MinnAqua Program also recognizes that fishing provides a powerful context for environmental education, which gets kids outdoors and can serve to foster the development of systems-based awareness, environmental knowledge, skills, and attitudes, and can consequently lay a foundation for active stewardship of Minnesota's aquatic resources. Through 2000, programming occurred in both formal (schools) and nonformal education settings; however, MinnAqua had been especially effective in reaching out to youth in nonformal settings. In 2001, the decision was made to update the Leader's Guide to create a tool to aid in strengthening and expanding the program's outreach in all areas, especially in the formal setting. The new *Fishing: Get in the Habitat!* MinnAqua Program Leader's Guide was created and published in June of 2007. This innovative and comprehensive angling and aquatic education curriculum guide is being delivered throughout Minnesota to classroom teachers. To date, over 500 Minnesota educators have received this new guide; most received these guides by attending a MinnAqua facilitated training workshop.

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Introduction

Here in the Land of 10,000 Lakes, Minnesotans have a unique opportunity to be outdoors enjoying aquatic habitats. Minnesota has over 5,400 game fish lakes, as well as over 15,000 mi of fishable streams and rivers. With these wonderful water resources within close proximity, fishing is considered Minnesota's pastime. The MinnAqua Program staff believes that fishing is a life-long activity that connects participants to their local environment and encourages wise stewardship of natural resources.

In 1989, the Minnesota Department of Natural Resources (DNR) Division of Fish and Wildlife partnered with the University of Minnesota Extension Service-Center for 4-H Youth Development to create "a comprehensive aquatic resources education program based on an assessment of the long term goals of the Division of Fish and Wildlife and the needs of its constituents" (Bilitz 1989). The purpose of this assessment, or survey, was to determine if there was a genuine need to provide Minnesota's citizens with angling and aquatic education programming and opportunities in a growing, more urbanized society. The results of the survey affirmed the necessity for such a program, one providing angling education programs for Twin Cities (Minneapolis and St. Paul) urban youth. The eventual outcome was the MinnAqua Program, which was piloted from June 1990 to October 1992 (Erickson-Eastwood 1992).

Soon after its implementation, the DNR recognized that the MinnAqua Program was neither adequately aligning with the Minnesota statute describing Minnesota's State Goals for Environmental Literacy (Waste Management Act, Minnesota §115A.073 1989) nor with the

original 1989 needs assessment, because MinnAqua activities were not effectively connecting new anglers and angling to a larger environmental context (Erickson-Eastwood 1992). For this reason, MinnAqua expanded its program, developing and emphasizing appreciation for and connection to fisheries, aquatic habitats, and ecosystems. Up to this time, the program had only been teaching basic fishing skills through the process of introducing and engaging new participants in the activity of fishing. With program expansion, MinnAqua was no longer just a fishing program, but rather a program offering fishing as the context in which multiple topics might be taught, such as aquatic ecology, fisheries management and regulations, and aquatic stewardship with a systems-based approach.

A Systems-Based Approach to Angling and Aquatic Education

The DNR is charged with working with the citizens of Minnesota to manage and conserve the state's natural resources, providing outdoor recreation opportunities, and providing for commercial uses of natural resources to create a sustainable quality of life. To successfully meet these challenges, the citizens with whom the DNR partners must be informed enough to make wise decisions in the 21st century, doing so by effectively (1) applying informed decision-making processes to maintain a sustainable lifestyle and (2) by possessing a minimal degree of environmental literacy. In sum, the citizens must possess both sufficient knowledge of the processes for making wise environmental decisions and of the essential understandings and skills needed to effectively use those processes.

Since 1989, Minnesota has had a statute outlining state goals for environmen-

tal literacy. The statute states that pupils and citizens should be able to apply informed decision-making processes to maintain a sustainable lifestyle. To do so, citizens should be able to: 1) understand ecological systems; 2) understand the cause and effect relationship between human attitudes and behaviors and the environment; 3) evaluate alternative responses to environmental issues before deciding on alternative courses of action; and 4) understand the effects of multiple uses of the environment (Waste Management Act, Minnesota §115A.073 1989).

An environmentally literate citizenry not only understands ecological systems, it has an awareness that due to the relationships within those systems something is happening over time that maintains those systems. An environmentally literate citizenry also perceives themselves as “connected” with, or as being an integral, interdependent part of those systems. A number of current patterns and trends, however, have been moving us in a contrary direction to achieving the positive understandings and perceptions of an individual's connection to, and within, the natural world. Restrictive patterns of sprawl and congestion, endless suburban development, and over-scheduling across America are taking their toll, resulting in a marked decrease in the amount of time adults and children are spending outdoors (Kelly 2006a; 2006b). This is occurring, interestingly, even as globalization has served to make the world a smaller, and in many respects, far more interconnected place.

Evidence of how spending less time outdoors is impacting children's mental and physical health and development can be found in a growing number of studies that are also indicating that humans have an inborn need for contact with nature (Taylor and Kuo 2006). Childhood obe-

sity, inattentiveness, diminished creativity and depression are just a few of the problems linked to what author Richard Louv has dubbed “nature deficit disorder” in his recent bestselling book *Last Child in the Woods*. It seems that our busy, modern western lifestyle is reinforcing a faulty perception that there is a human-nature gap and people are separate from, or somehow outside, the workings of the natural world (Louv 2005).

What does this mean for the DNR Section of Fisheries and the MinnAqua Program? There may be a relationship between a recent decline in angling participation in Minnesota (Southwick 2005; Kelly and Sushak 2006), which coincides with an even more notable pattern of a nationwide decline in angling participation (Responsive Management 2003), and the underlying negative symptom of this larger trend of people not being “connected” to the natural world. People may not perceive a sense of connection or *relevancy* to their own lives for spending time outdoors and for going fishing.

The way that many individuals define “environment” may also be partly to blame for these trends. For many individuals, at the same time that the word “environment” has an abstract *inclusive* meaning, referring to many things at once, such as trees, birds, fish, bugs, cattails, bears, and soil, it also has an *exclusive* meaning—that these various “natural” things stand distinctly separate and apart from humankind. However, the truer definition of the term “environment” is that it generally describes the interdependent relationships of systems—natural systems, social systems, and manmade or built systems—which surround, interconnect and interact with, and support us where we live.

According to *The Second Minnesota Report Card on Environmental Literacy*,

which was a survey of adult environmental knowledge, attitudes, and behavior conducted in August 2004, while 60% of Minnesota adults believe that they are knowledgeable about environmental issues and problems, in fact, only 47% of the state's adults have an above average knowledge about the environment (Murphy 2004).

To conduct wise stewardship, and consequently maintain a sustainable lifestyle, Minnesota's citizenry must not only be environmentally literate, but must also have a world view that is systems-based and be actively employing the processes of *systems-thinking*, or critical systems inquiry. Systems theory is an interdisciplinary field of science involving the study of the nature of complex systems in the natural world, in society, and in science. *Systems-thinking* embodies a world view that includes an awareness or mindset for understanding how the universe works. It is a perspective for going beyond immediate events, to looking for patterns of behavior, to seeking underlying systemic interrelationships which are responsible for the patterns of behavior and the events. It is a world view which implies that the foundation for understanding lies in interpreting interrelationships within systems—interrelationships, which are responsible for the manner in which systems operate, and interrelationships which result in the patterns of behavior and events we perceive (Bellinger 2004).

Addressing today's increasingly complex environmental issues and problems requires being able to identify, address, effectively solve, and anticipate and prevent existing and future environmental problems and challenges with an understanding that we are ourselves interdependently connected to all the components of environmental systems

(natural, social, and built systems), and therefore, our decisions and actions impact those systems and can create positive as well as negative changes in those systems. A central piece of the idea of environmental literacy is an understanding of systems-connections from the personal level, to the local level, to the global level. With such an understanding, people can move forward into the future with a clear vision, better prepared to more purposefully and mindfully live within the systems that envelop and support them.

Unfortunately, the modern view of people's separateness, or disconnection, from the natural world serves to blind humankind to its very "nature," or its true essence of interconnection. Without a self view of being connected and interdependent with the natural world, it is likely that individuals will not be motivated to act with a fully systemic approach, develop a better understanding of real-life problems with a broader perspective including wiser, more holistic ways of thinking with which to evaluate choices, make informed decisions, and follow through with responsible actions and wise stewardship.

Developing environmental literacy is created through both direct and indirect means. For example, angling education programs can *directly* create environmental literacy by purposefully incorporating teaching people about natural systems and systems-thinking, in tandem with fishing skills. Angling education programs can *indirectly* help to develop environmental literacy by creating the necessary conditions that enable people to expand their awareness of the natural world, by "getting them in the habitat" with a fishing rod in hand, thereby experiencing and embracing an activity that involves an *interconnected relationship* with natural systems.

The angling and aquatic education programs created and provided by MinnAqua are rooted in the core belief that the activity of fishing not only gets people outdoors and engages them in a healthy life-long activity, but that fishing also *connects* people to the natural world. Fishing can provide a conduit to environmental literacy. Because fishing is fun, it provides the motivation or “hook” to get participants outside to a lake, river, pond or stream. Although an individual’s initial reason for continuing to fish regularly may be to become a better angler to catch more fish more often, fishing also provides a relevant, meaningful context for learning more about the habits and habitats of fish. As a person spends more time fishing, directly experiencing the natural world and learning more about natural systems by discovering when and what fish eat, where a particular species of fish finds cover, what habitat conditions support a particular species of fish, and so on, the individual also begins understanding and valuing more deeply the broader ecological systems that support the activity of fishing. In turn, the individual’s internal sense of the connections between good fishing, healthy habitats, and wise stewardship for natural resources can begin to grow and the journey down the path to environmental literacy is underway.

MinnAqua Program Activity Guides

After the MinnAqua Program’s inception, and as the program grew, so did a need for program materials and education resources. The origin of the first MinnAqua Program Activities Guide began in 1991, when MinnAqua collaborated in a study that was conducted to look at students’ knowledge, attitudes, and experi-

ences with aquatic resources and environments. The study also included a look at teachers’ implementation of aquatic education activities in their classroom. This information would help to guide the development of additional MinnAqua activities and materials (Drewes 1991). The results of the survey identified sufficient student interest in learning about aquatic resources to support the creation of materials about aquatic resources. The survey also found that educator feedback provided good guidance on which aquatic education topics these student materials should cover.

As a result of this survey, a youth activity booklet was created in 1991, entitled *Fishing: Get in the Habitat!* to aid angling and aquatic education instruction. A year later, MinnAqua created a publication, *Fishing: Get in the Habitat! Leaders’ Guide*. This was the original MinnAqua Program Leaders’ Guide. It included 20 activities divided into six themed chapters: 1) Habitats and Ecosystems, 2) Minnesota Fish, 3) Water Stewardship, 4) Managing Our Resources, 5) Fishing Equipment and Techniques, and 6) The Fishing Trip. Within each of these chapters, the activities were broken down by the level of fishing experience and by the level of aquatic ecology knowledge of the learners, resulting in activities that ranged from beginner, to intermediate, to advanced levels. The intended use of the first MinnAqua Program Leader’s Guide was to support the MinnAqua staff and a network of volunteer instructors as they led fishing clinics and aquatic education programs throughout the state.

Launching into Schools

By 2000, MinnAqua had grown and evolved to the degree that it was recognized as a successful angling and aquat-

ic education program. At this stage of its development, MinnAqua began recognizing that its outreach and impact throughout Minnesota was spreading. The program was especially effective in working with groups in nonformal educational settings, including, among others, community recreation centers, nature centers, park and recreation departments, and scouting organizations. Although it was also providing numerous programs in schools, MinnAqua did not have sufficient staff to go into every classroom throughout the school year. It was not reaching as large an audience in schools as it was with its summer intern staff and youth group programming. The program was looking to increase its effectiveness and outreach in all settings.

In 2000, the program's influence was spreading, as well. Jenifer Matthees, the MinnAqua Program Coordinator at that time, participated as a reviewer with the Recreational Boating and Fishing Foundation (RBFF), assisting with evaluating RBFF's newly developed *Best Practices in Fishing, Boating, and Aquatic Stewardship Education Workbook*. The RBFF Best Practices were specifically "designed to help educators build, enhance, and evaluate their programs based on research and practices shown to be effective" (Seng and Rushton 2003). With the RBFF Best Practices, MinnAqua now had new research-based principles upon which to continue improving the effectiveness of its angling and aquatic education programming efforts.

According to the RBFF Best Practices, an angling and aquatic education program is more effective if it succeeds in reaching its audience from multiple settings. Since MinnAqua had already established a successful base, but was especially successful in reaching youth in

nonformal settings, the MinnAqua Program decided to further improve its effectiveness by now expanding the effectiveness of its outreach in all areas, while paying special attention to the formal education setting, schools.

Expanding MinnAqua's outreach into the realm of formal education was also supported by additional survey information. A 2001 Environmental Education Survey administered by the Minnesota DNR and Minnesota Department of Education (MDE) found strong interest among formal educators in using aquatic education materials, as well as in using local lakes, ponds, rivers and wetland areas as extensions of their classrooms (Minnesota DNR and Minnesota Department of Education 2001).

To more easily facilitate working effectively with the thousands of teachers throughout Minnesota, without also needing to dramatically increase the size of the MinnAqua Program staff, MinnAqua decided to rewrite and expand the original *Fishing: Get in the Habitat! MinnAqua Program Leaders' Guide*. The goal was to create a useful set of classroom-appropriate lessons and activities for classroom teachers, while also creating a resource that would also increase its success in meeting the needs of its nonformal efforts. These lessons and activities were to specifically focus on the needs of classroom teachers, youth program leaders, as well as their students, ranging from pre-kindergarten through fifth grade. This target group was within the pre-kindergarten through 12th grade range which was identified as a key group in the DNR 2000 *Cornerstones Report* (MN DNR 2000), as well as in the state's *A GreenPrint for Minnesota: State Plan for Environmental Education* (Minnesota Environmental Education Advisory Board 2000).

To narrow the scope of the project, as well as to address the targeted age range of youth that most often participated in nonformal programs, the new *Fishing: Get in the Habitat! Leaders' Guide* focused on 3rd–5th grade teachers and their students. Focusing on a narrow range of specific grades was intended to ensure that concepts in the lessons and activities were appropriate for the developmental levels of the students, thereby remaining within RBFF Best Practices, which state that effective programs are those that are developmentally appropriate for participants (Seng and Rushton 2003).

To ensure that the concepts presented in the lessons and activities were developmentally appropriate for grades 3, 4 and 5, MinnAqua undertook an extensive review process, which included reviewing the National Research Council's *National Science Education Standards*, the North American Association for Environmental Education's *Excellence in Environmental Education: Guidelines for Learning (K-12)* and *Environmental Education Materials: Guidelines for Excellence*, (North American Association for Environmental Education 1998). The American Association for the Advancement of Science's *Benchmarks for Science Literacy* (American Association for the Advancement of Science 1994), and the *Environmental Literacy Scope and Sequence* (Minnesota Environmental Education Advisory Board 2002) were also reviewed. It is important to highlight here that *The Environmental Literacy Scope and Sequence* was developed in Minnesota and provides progressive benchmarks for a *systems-based* approach to environmental education. Further, the MinnAqua staff also reviewed the Minnesota Academic Standards for all content areas, because another key RBFF Best Practice is to align educational products

with national and state academic standards (Seng and Rushton 2003).

In keeping with MinnAqua's intention to clearly understand what qualities characterized an effective educational product, and since the RBFF Best Practices also emphasize using educational research in product development (Seng and Rushton 2003), MinnAqua conducted an extensive review not only of educational research, but also of the content of educational publications, thereby becoming familiar with learning theory, and with developmentally-appropriate concepts and skills for grades 3, 4, and 5.

In addition, the MinnAqua staff not only interviewed educational professionals at the Minnesota Department of Education (MDE), but also attended state education conferences, thereby gaining valuable insights into which specific features would be most necessary and most helpful for teachers in formal education settings if included in the new *Fishing: Get in the Habitat! Leaders' Guide*.

As a result of the review process, criteria were established for a high quality educational product that would be useful not only for classroom teachers, but also across a broad spectrum of nonformal educational settings. From these criteria a set of guidelines was developed for rewriting the original Leaders' Guide. These guidelines included:

- increased background information for each lesson
- defined steps and procedures for lesson implementation
- alignment with the 2004 Minnesota Academic Standards and Minnesota's *Environmental Literacy Scope and Sequence*
- measurable objectives
- authentic assessment ideas
- developmentally appropriate concepts and activities

- accommodation of multiple learning styles in lesson activities
 - K–2 options
 - concepts, environmental issues and problems are addressed with accuracy and fairness
 - content specific to Minnesota culture, natural resources, and fisheries management
 - connections to students' everyday lives (relevance)
 - additional indoor classroom activities
 - self-directed, student-centered learning opportunities
 - individual and group activities
 - interdisciplinary, hands-on, and inquiry-based lessons
 - service-learning connections
 - lessons to stand alone or be used as part of a unit
 - improved appearance of graphics and copy pages
 - a glossary of terms used in lessons
 - age-appropriate reading lists related to content for students

These guidelines provided the broad conceptual framework for the overall project, serving as the conceptual guidance that moved the project towards completion.

Formative Evaluation

The RBFF Best Practices also emphasize the importance of evaluation during educational product development (Seng and Rushton 2003). Moreover, carrying out a formative evaluation of education materials as they are being developed can significantly improve the learning effectiveness of these educational products, especially when compared with educational materials that have not undergone any type of formative evaluation. So, a formative evaluation of the new Minn-

Aqua Leaders' Guide was initiated after the first draft of the curriculum guide was completed. The goal of this formative evaluation was to stimulate and maintain continual improvement during the development of the new Leaders' Guide, ensuring that the rewrite guidelines were being addressed and that the needs of the intended users were being met (Nelson and Matthees 2007).

To help guide the evaluation process, MinnAqua again turned to national and state academic standards, to highly qualified educators, and to partnering organizations. In addition, MinnAqua also sought the assistance of a graduate research student, not only to incorporate state-of-the-art education evaluation methods, but to also include in the process other significant stakeholder groups, such as people within other parts of the DNR, other outreach partners and, of course, the intended users. This extensive formative evaluation process also included both nonformal and formal educators to pilot test the lessons and activities in real settings.

In sum, during its entire development, *Fishing: Get in the Habitat!* was continually reviewed by a cadre of people possessing a wide array of expertise including: experts in instructional design, DNR fisheries biologists, experts in academic standards, in assessment and in environmental education guidelines, and in service-learning and by practitioners involved in working in a variety of educational settings with a wide spectrum of youth—including educators experienced with providing educational programming for scout groups, 4-H groups, accessibility for people with physical disabilities, and with grades K–2.

The formative evaluation of the new MinnAqua Leaders' Guide has value outside of the MinnAqua program, too. Pro-

professionals can review the Leaders' Guide formative evaluation, along with evaluations of similar educational products cited in the Literature Review, to gather ideas of what methods may or may not be appropriate for their evaluation design, based on the goals of their evaluation, the characteristics of their product, and the time and budget available for the evaluation (Nelson 2006).

The New MinnAqua Leaders' Guide

The educational purpose for the new MinnAqua Leaders Guide is rooted in the two key publications that provide direction for the outreach activities of the DNR: *Minnesota Department of Natural Resources 2000 Cornerstones Report: Building a Framework for Education* (MN DNR 2000) and *A Strategic Conservation Agenda 2003–2007: Measuring Progress Toward Mission* (MN DNR 2005). These documents state that efforts in developing natural resources stewardship are a cornerstone for achieving the DNR mission for natural lands, fisheries and wildlife, waters and watersheds, forests, and outdoor recreation. Natural resources stewardship education itself is complex, employing a dynamic process that involves systems-thinking, as well as developing in the citizenry the essential awareness, knowledge, skills, and motivation needed to anticipate, identify, solve and prevent pressing natural resource problems, while also meeting the natural resources management goals that lead to informed participation and action.

The much anticipated, new *Fishing: Get in the Habitat! Leaders' Guide for Grades 3–5* was published in June 2008. In its final form, it still consists of six themed chapters, similar to the earlier 1989 Leaders' Guide; however, the chapter titles were

revised to better reflect the enhanced scope of the concepts and focus of the new lessons. The six chapter titles are: 1) Aquatic Habitats, 2) Minnesota Fish, 3) Water Stewardship, 4) Fisheries Management, 5) Fishing Equipment and Skills, and 6) Safety and The Fishing Trip.

While the original MinnAqua Leaders' Guide had 20 lessons, the new Leaders' Guide has 39 lessons and 22 helpful appendices. Further, it is aligned with both the Minnesota Academic Standards for grades 3–5, and the systems-based Environmental Literacy Scope and Sequence. The new MinnAqua *Fishing: Get in the Habitat!* curriculum guide is beautifully illustrated with a rich array of original scientific illustrations that are all electronically accessible. There are many more improved features, but, the key attribute, of course, is that the new *Fishing: Get in the Habitat!* enables Minnesota teachers to introduce kids to fishing, and to engage kids with learning that is place-based (focusing on Minnesota species and places), relevant, systems-based, interdisciplinary, challenging, and, inspiringly fun!

To date, over 500 Minnesota educators have received this new angling and aquatic education curriculum guide; most received these guides by attending a MinnAqua facilitated training workshop. The new MinnAqua Leaders' Guide has also been incorporated into the St. Paul Public School District's (Minnesota's second largest school district) new science and academic standards curriculum framework.

The DNR is looking towards a future in which natural resources education is a part of every student's school experience, in addition to being available outside of the school setting. The training of teachers and youth program leaders to use the new *Fishing: Get in the Habitat!*

MinnAqua Program Leaders' Guide is one way of fostering effective collaborative partnerships with other educators—public and private, formal and nonformal, thereby leveraging MinnAqua's efforts to efficiently and effectively deliver quality natural resources education programs throughout the state.

Next Steps

MinnAqua staff envision that the new *Fishing: Get in the Habitat! MinnAqua Program Leaders' Guide* will be used by Minnesota educators for addressing academic standards within a context of fishing and aquatic ecology, and in many other ways, such as: (a) for teaching about Minnesota fish, aquatic resources, and resource management; (b) for leading students to the outdoors and guiding them in initiating and maintaining various self-sustaining programs, for example, volunteer stream monitoring, shoreline restoration, and other service-learning projects; (c) for connecting students to their local aquatic resources through the life-long recreational activity of fishing; and (d) for promoting systems-thinking, environmental literacy and lasting stewardship of Minnesota's aquatic resources.

MinnAqua staff will continue developing new strategies and pathways that provide for wider distribution of the *Fishing: Get in the Habitat! MinnAqua Program Leaders' Guide* to teachers, youth program leaders and other nonformal educators. At the same time, MinnAqua will continue with its current practice of providing *Fishing: Get in the Habitat!* training workshops to teachers and to youth program leaders. Further, MinnAqua will also be developing plans for supporting those educators who have already participated in a training workshop and are actively using the new Leader's Guide both in-

side and outside of their classrooms. Conveniently, *Fishing: Get in the Habitat!* is available in its entirety on CD. Soon, it will also be available for download directly from the DNR website.

As the MinnAqua Program staff continues conducting workshops throughout the state for Minnesota teachers, the staff is finding that in addition to an enthusiastic reception from elementary school teachers, more and more middle school and high school teachers are becoming enthusiastic about using this new curriculum guide in their classrooms. By expanding and enhancing its distribution efforts to positively address the opportunity for engaging participation from middle and high school teachers, MinnAqua will be achieving an even broader positive presence within the formal education setting. This positive influence can be further expanded and enhanced by aligning the current guide's lessons and activities to middle school and high school academic standards, and creating additional lessons for the high school level.

In collaboration with an environmental education program evaluation consultant and the University of Minnesota-Duluth, MinnAqua is currently embarking on a year-long summative evaluation of the new *Fishing: Get in the Habitat!* guide's efficacy in distribution and implementation, including how well the lessons are reaching students and to what degree the intended learner outcomes are being effectively achieved, in the short-term, as well as in the medium-term, and the long-term (Nelson 2006).

Conclusions

Throughout the extended process of developing, distributing, and supporting the comprehensive *Fishing: Get in the Habi-*

tat! MinnAqua Program Leaders' Guide, the MinnAqua staff has remained aware that increasing the effectiveness of angling and aquatic education efforts in Minnesota is, to a great extent, directly dependent upon its effectively reaching outward, into all the settings in which angling and aquatic education can occur, and expanding our efforts in the important realm of formal education.

The MinnAqua staff has been effectively leveraging its efforts with a curriculum guide that enables teachers to “do what we do,” free of requiring the physical presence of a MinnAqua staff person in every Minnesota classroom. This positive leverage is also expected to continue reinforcing and strengthening the effectiveness of the MinnAqua Program in reaching students in 3rd, 4th, and 5th grades, while further complementing MinnAqua's nonformal programming efforts to get “kids in the habitat” and introduce them to fishing, and to grow environmental literacy and natural resources stewardship in Minnesota within a context of fishing and aquatic education.

By partnering with teachers and schools, MinnAqua is able to enhance its outreach efforts in other important ways, including accessing youth who, for multiple reasons, may not otherwise participate in nonformal angling and aquatic opportunities, or pick up a fishing rod, or even explore the outdoors. Partnering with schools also enables MinnAqua to more effectively meet its broader goals of reaching youth, reaching culturally diverse audiences, and reaching new immigrant populations. As MinnAqua embarks on this new and exciting chapter in the evolution of Minnesota's aquatic education efforts, it looks forward to both continuing its learning from others in the aquatic education field and also to sharing its own learnings, experiences and resources with others.

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MinnAqua™ Minnesota's Angling and Aquatic Education Program Launches Fishing: Get in the Habitat! in Michelle M Kelly, Roland E Sigurdson. The MinnAqua Program, the angling and aquatic education program of the Minnesota Department of Natural Resources, was established in 1989. Its purpose was to introduce urban youth in the Twin Cities of Minneapolis and St. Paul to fishing. MinnAqua has since grown notably, expanding into a successful statewide program reaching over 40,000 people a year, still with a focus on angler recruitment [Show full abstract] and retention. MinnAqua™ Minnesota's Angling and Aquatic Education Program Launches Fishing: Get in the Habitat! in Schools (Michelle M. Kelly and Roland E. Sigurdson). Fisheries Management and Aquatic Education in the Long Island/New York City Area: Lessons Learned Over the Past 30 Years (Edward F. Woltmann, Gregory Kozlowski, and Charles A. Guthrie). I FISH NY: Outreach and Education in New York City and on Long Island (Melissa K. Cohen, Nim Lee, Sarah Bruner, Malynda Nichol, and Chart Guthrie). Adult Aquatic/Angler Education Program Delivery in Alaska™s Second-Largest City (Shann Paul Jones). Summer Fishin... The continuing education of users remains a priority for the Minnesota DNR. The MinnAqua Program offers basic instruction in lake and stream ecology, fish population dynamics, water quality, and sport fishing skills, connecting participants to Minnesota™s aquatic resources through the lifelong activity of fishing. Participants understand the vital roles that clean water, healthy watersheds, aquatic habitat, and quality fisheries play in their lives, and how their own decisions and activities impact water quality, local watersheds and fisheries. Minnesota™s rich angling heritage also builds bridges to new and culturally diverse communities, which have their own strong fishing traditions and a similar appreciation and enthusiasm for the fisheries resource. MinnAqua Leader's Guide" is a curriculum created by the Minnesota Department of Natural Resources for educators working primarily with children in grades three through five in formal and nonformal education settings. Like many agency-developed supplemental educational resources, the Leader's Guide is available through workshops and by mail. Athman Ernst, Julie. Applied Environmental Education and Communication , v9 n2 p104-121 2010. The "Fishing: Get in the Habitat! MinnAqua Leader's Guide" is a curriculum created by the Minnesota Department of Natural Resources for educators working primarily with children in grades three through five in formal and nonformal education settings.