Clifford Lake

These swans are enjoying a sunny day on Clifford Lake in Montcalm County, Michigan. Clifford Lake is a 202-acre lake with a maximum depth of 46 feet. Fish species found in this all-season lake include bluegill, crappie, walleye, Northern pike, and large-mouth bass. Clifford Lake also features the historic Clifford Lake Inn, which has been welcoming tourists and fishermen to this small, beautiful lake in central Michigan for more than 125 years.

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RIPARIAN (r-'per-EE-n) adj. Relating to or living or located on the bank of a natural watercourse, such as a river, or of a lake or a tidewater.

FEATURE A Look at the Values of A Lake

Revenue, non-tax cash flows, ecosystems and tourism

By Joseph M. Turner
CEO, Michigan Property Consultants

This article is Part II of an article that appeared in the Winter 2009 issue of The Michigan Riparian. This portion will explore new revenue and non-tax cash flows, as well as the value of the ecosystem and tourism.

NEW REVENUE: NON-TAX CASH FLOWS – SECOND HOMES AND TOURISM

Even though the subject and calculations for this article are fictional, where possible, calculations used in the table were taken from realistic sources. They include surveys by property owner associations and academic research. For example, in a study of spending patterns, research by Dr. Daniel J. Stynes of Michigan State University documented non-resident property owners spending between $5,000 and $10,000 annually (1994).

The Walloon Lake Association supported Stynes' with some of the best data I've seen in the state. In both 1991 and 1998, the association conducted a survey of expenditures by its members and published the data in the "Wallooner." Responses to their surveys were very high (56% in 1991 and 41% in 1998). The association reported average spending "times 1,150 members is 14.8 million dollars each year." That spending ($12,870 per member) does not include travel expenditures which could be substantial. In part, travel contributes to a local economy. Sixteen percent of Walloon Lake Association members resided in the area year 'round. Non-resident owners visited about 12 weeks annually.

In *Economic Impacts of Tourism* and other works by Dr. Stynes, methods of approximating the impact of importing new money to a local economy are developed. In some ways, the following discussion is similar to what happens when businesses create new jobs.

For our example, the money "imported" into the local economy is generated from two sources. First, purchases of goods and services comes from tourism and other recreational users. Secondly, money spent in the area by non-resident property owners. A certain portion of the imported money leaks out of the local economy. "Leakage" is part of the new money which is used to acquire goods and services from another economic region. Because "leakage" does not stay within the local economy it has been removed from all calculations of impact.

Remaining money, new to the local economy, isn't spent once; it circulates. Here is how. Assume $100,000 is collectively used by visitors to purchase various goods and services. Some of the visitors may buy a pizza, and locally produced bait for fishing, and magazines to read if things get boring, and gasoline and lunch and maybe even a boat. Of that $100,000 perhaps $30,000 is sent to the companies that made the boat, magazines and other items. The $70,000 remainder is money that has a local fiscal impact. It creates and sustains jobs. It is used to pay wages and buy other goods and services. This economic impact is termed a secondary or "indirect effect." Employee purchases with wages paid from the initial money causes a third or "induced" economic impact.

One method of quantifying initial purchases by tourists and visitors to estimate economic impact is widely used and documented. Known as the "Travel Cost Method," the procedure involves surveying visitors to determine how much and where they spent money. The expenditures are multiplied by the number of parties making such expenditures and by the number of days for which expenditures was made. This, too, is shown in the chart along with a "multiplier" for "circulation."

VALUE OF ECOSYSTEM – VALUING AN EXISTING SYSTEM AND BUILDING A NEW LAKE FROM SCRATCH

Some values associated with the ecosystem of the hypothetical lake are shown in the table for illustrative purposes. The reader is cautioned that the author is not competent to professionally address the topic of computing all of the values shown. Nevertheless, effort has been made to properly research the material presented. There is substantial disagreement between economists over appropriate measures of value as they relate to an ecosystem and how values should be aggregated. Here, values are separated by function. For example, value is calculated for commercial harvesting of wildlife including fish. However, the value of recreational fishing (both catch-and-release and catch-and-keep) is included as part of the overall value of the ecosystem shown under the Contingent Valuation Method. Similarly, periodic flooding causes a quantified amount of annual spring clean up ($25,000). Wetland improvements might eliminate those expenses, so a value of the potential savings is shown but not included as part of the "total value" of the lake. Some economists regard the Travel Cost Method as more reliable than the Contingent Valuation Method. For illustrative purposes, results of both methods are used in the chart. Other procedures to calculate the ecosystem value exist. Market values can be determined for commercial fish harvests but for simplicity, harvest values shown are derived from a Michigan law which declares a value of $10 for game fish and $5 for rough fish and relate to a small commercial fishery. Similarly, this hypothetical ecosystem supports bird hunting and commercial trapping, so values are shown for those harvests. Bird watching and other potential components of ecosystem value not shown but easily recognized, are considered part of the value derived with the contingent value calculation.

We spoke of harvested fish, but what about the continually existing biomass of fish in the water? It is one example of an internal component. When there is prosecution under environmental laws for a fish kill, damage based upon the value

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of the kill is determined. Thus, biomass has value. It is included in the Contingent Valuation calculation. Estimates of fish biomass in Michigan's lakes was hard to come by, but they do exist. For purposes of this illustration, it was assumed that the complete biomass of fish within the lake was 80 pounds per acre and that the division between game and rough fish was 50/50. It was also assumed that natural reproduction rates replaced harvested fish. These component values highlight the idea that just as there are internal and external value influences in private property, public property has internal and external value components.

The value of the wetlands is listed with real estate. Technically, the wetlands are not part of the lake as defined by law. They are created by the lake and an important part of its ecosystem. Fortunately, in the recent past there has been a good deal of research in the area of wetland valuation in Michigan. As stated earlier, the cost of actually producing wetlands can be determined by examining records of developers meeting environmental regulations and from other sources. In addition, some recent, sound studies by economists have provided benchmarks for valuing Michigan's wetlands. For our hypothetical situation, sales and other market indicators of value were judged sufficient that wetland values could be included with the table along with other real property values.

Costs to create a 300-acre lake were examined. Within the recent past, man-made lakes have been built around the country and within this state. Costs to build a new lake varied widely and could not be narrowed down enough to use in calculations for this example. Nevertheless, the range of costs to excavate a lake and let water naturally fill the excavation ran from around $25,000 to $100,000 per acre. Applying that range of cost to the example creates an indicated range of value between $7.5 million and $30 million. Damming a river was a different story. Costs associated with building new dams that could contain a 300-acre lake were available. I found engineering estimates in the state to build a new dam to contain a river and create a lake similar to that depicted in this example. Considering inflation adjustments, the new dam would cost about $5 million to $6 million.

In addition to determining costs of digging out a lake or damming a water flow, economists and experts in natural resource values have developed methods to estimate the value of an existing ecosystem. From among the methods used, I used what is known as a contingent value method. The basic procedure is to survey a population and employing best practices of the profession, determine a population's willingness to pay to maintain a natural resources which exists. From a total population of potential contributors, an estimate is made of how many people would really contribute money and how much money it is that they would contribute. This contingent "value" cannot be extracted from market transactions. Economists King and Mazzotta describe the valuation procedure saying:

"It is not necessary for ecosystem services to be bought and sold in markets in order to measure their value in dollars. What is required is a measure of how much purchasing power (dollars) people are willing to give up to get the service of the ecosystem, or how much people would need to be paid in order to give it up ..."

Examples of people giving money in this way may be found in the state of Michigan's solicitation of contributions for specific purposes. For example, some people voluntarily contribute money when purchasing an automobile license plate to support programs for a bird known as a "loon." The attractiveness of a contingent valuation technique rests in part on the fact that it is clear a natural resource would have value to people who may never use it. People place value on protecting wildlife habitat. They want to preserve natural resources for some future date when they or their children or grandchildren may want to use it. People will contribute money for things they value.

In order to use real market information for this hypothetical example, maps of a geographic area covered by various forms of advertisement from an actual community were used. In addition, records of land ownership and (private and public)

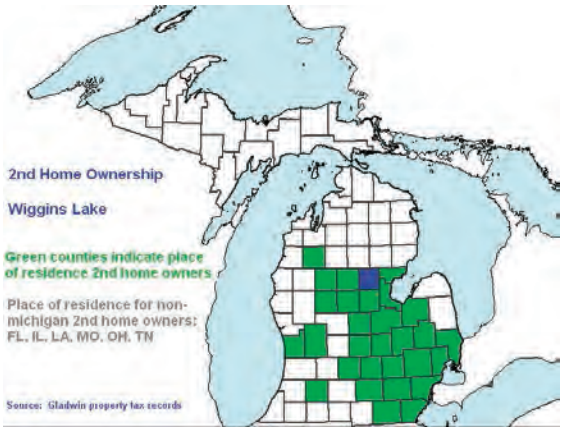

Figure 2: Residence of Second Home Owners

records of the point of origin of visitors to a real lake, were examined. The lake is a good fishing lake with public access and several master angler records. The map above illustrates county of origin for owners of property around a 300-acre lake in Gladwin County (highlighted in dark color). Using that situation for this example, the population base from which citizens would be asked to contribute consisted of approximately 3 million people. Based upon work by economists and personal research, it was hypothesized one out of every 100 people in that population would contribute 10 dollars annually to preserve and maintain this hypothetical lake. Thus, the contingent value survey yielded a current use/non-use value for the lake (less values listed elsewhere) of $300,000.

Jobs sustained or created

Businesses receiving initial direct sale money use it to pay their employees and to pay other businesses from which they've acquired goods and services. One example would be the pizza maker who pays a dry cleaner money to clean aprons and company shirts. Money spent by the visitor to buy a pizza supports wages at the pizzeria and employees at the dry cleaners. If any of those employees use their wages to buy goods or services locally, then another job will be supported. Not every job is supported 100 percent by this money, but according to experts the end result is 25 to 30 jobs supported by every million dollars of applicable cash flow. That rule is applied in this article.

A similar pattern can be found in money new to the local economy from taxes. Non-residents who earned outside of the local economy buy property and pay taxes.

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Day and overnight visitors pay hotel taxes and gasoline taxes and a variety of other taxes. Some non-property taxes such as hotel and gasoline taxes are returned to the local economy to fix roads or pay for tourism projects.

An examination of the data contained in the table illustrates the following full-time job impact of cash flows in this hypothetical study. Tax collections resulting from non-resident property owners amount to a little over a half million dollars per year. That translates into 12 to 15 jobs. Direct expenditures (minus leakage) by non-resident home owners and tourists and visitors create an estimated secondary effect of about $3.3 million. This translates into another 85 to 102 jobs. So, an initial estimate of jobs supported directly by money imported and shown as a specific impact of the lake in this example lies between 97 and 117 full-time jobs. In a job-scarce market, one can see the importance of such facts and data.

It may be useful to examine the concept of flood protection as used in this example. The value estimate was based upon a real situation wherein a local government unit typically expended money in the spring to clean up debris and other material from annual spring flooding. Not shown in this example is the lost value of real estate, individual lives and nature destroyed if a dam were used to create the lake and the dam should break. In circumstances where a lake is created by a dam, such calculations are warranted and the value of the protection will often be very large.

Remember the chart is illustrative and its conclusions are hypothesized. Hopefully it will be thought provoking and the reader will be able to use it as a beginning point for a further inquiry.

Conclusion

The "present value" of all the components shown in the table is over $93 million. This is far more than the cost to dig a lake or construct a dam ($5 million to $30 million). Interestingly, the major portion of that value is not found in enhanced real estate values (e.g. property located close to the lake). Instead, the major value component is the present value of the cash flow created by second homeowners. This is followed by cash flows from taxes and tourism. In this example, the annual "enhanced" value from cash flows to the local economy account for about two of every three dollars of identified value. This pattern should be expected when a desirable natural feature exists for public use. Had this been a private lake, the major component of value could have been second home expenditures and enhanced nearby property values.

Much as investors view bare land and decide which future use would provide the greatest revenue, proper management of our natural resources can yield superlative financial returns. Given the difficult economic times facing our state and the importance of tourism to its economy, it might be time to fully consider how value is generated from a natural feature and explore the contributive value of components. These value relationships are seldom contemplated in analyses for levying special assessments. That void is what drove this research.

Summary

- ❑ Definitions of value may vary, but there is general agreement on the types of value associated with a natural feature such as a lake.
- ❑ Natural features have value internally and affect property values at some distance.
- ❑ Real estate values consist of two parts: the contributory value of internal components and outside influences on value (externalities).
- ❑ Publicly accessible lakes may attract tourists, non-resident property owners and other users.
- ❑ When a lake is open to the public, it usually creates cash flows new to the local economy.
- ❑ Cash flows new to a local economy sustain existing jobs and create new jobs.
- ❑ Non-public lakes may increase real estate values and generate new (higher) tax cash flows from second homes.
- ❑ There now exists a body of research reliably documenting value components external and internal as discussed herein.
- ❑ Value influences from a lake are almost never limited to only adjacent and nearby properties.
- ❑ Methods of valuing an ecosystem are becoming more sophisticated.
- ❑ Natural features, like new businesses, can be economic development engines.
- ❑ For illustrative purposes, the table below assumes commercial harvesting of wildlife and treasts the fiscal value of the harvest as a separate and unique value.
- ❑ There can be significant issues of "double counting" and other errors when valuing an ecosystem – the table is designed to illustrate components of value and does not scrutinize for methodological conflicts.

Illustrative Component Values of a 300 Acre Lake with 75 acres of wetlands and significant use by public

Component	Current Measure	Annual Cash Flow (20yr term; 2% int)	Present Value
Enhanced *Market Value* - Residential	$25,000,000		$25,000,000
Enhanced *Market Value* - Business	$5,000,000		$5,000,000
Mkt Value of Wetlands (75acres@$3000/acre)	$225,000		$225,000
New real estate values because of lake $100,750/acre		**Total**	**$30,225,000**
Enhanced Taxable Value - 22 Mill Levy ($12.5 Million residential + $2.5 Million business)	$15,000,000	$330,000	$5,504,000
Non-Homestead Tax (additional 18Mills)	$8,333,333	$150,000	$2,502,000
Business Taxable Value - 18 mill levy	$2,500,000	$45,000	$750,000
New property taxes because of lake $29,187/acre		**Total**	**$8,756,000**
2nd Home Expenditures (Direct 30%Leakage)	'400*$8000	$3,200,000	$53,371,000
Visitor Expenditures day trips	400 *$35*1.25	$17,500	$292,000
Visitor Overnight trips	100*$95*1.25	$11,875	$198,000
Total present value of new cash flows from lake $179,537/acre		**Total**	**$53,861,000**
Value of commercial rough fish harvest ($5/lb)	200 days @ 5 lbs/day $5,000	$5,000	$81,757
Value of commercial game fish harvested ($10/lb)	200 days @ 5 lbs/day $10,000	$10,000	$163,514
Value of commercially harvested fur bearing animals	$1000	$1,000	$16,351
Value of commercially harvested birds	(150@$10ea) = $1500	$1,500	$24,527
Commercial harvest from lake $954/acre		**Total**	**$286,149**
Statutory value non-harvested Game Fish Biomass remaining in lake (Part of Public Trust Value)	40lbs/acre@$10 $120,000		
Statutory value biomass non-harvested Rough Fish (Part of Public Trust Value)	40lbs/acre@$5 $60,000		
Annual cost to repair spring flooding	$25,000		
Existence Value of Lake (Pop.of Service area is 3 Million) **Contingent Value Method**	$10 per person year (1%contribution rate)		$300,000
Value of public use and services per acre $1,000		**Total Value**	**$300,000**
Value from lake if all factors could be added directly $311,427 per acre			$93,428,149