

# PRESENTATION NARRATIVE

IAAO 79<sup>TH</sup> INTERNATIONAL CONFERENCE  
ON ASSESSMENT ADMINISTRATION

THE GEOGRAPHIC DISTRIBUTION OF  
VALUES FROM A LAKE

by Joseph M. Turner, MAAO

August 26, 2013

Lakes create value in affected properties and lakes have value themselves. It is a widely accepted concept that the presence of a body of water generally enhances value in land near the water. Nilsson and others (2005) report that “dam-impacted catchments experience” ... “about 25 times more economic activity per unit of water than do unaffected catchments.” It is also well known, that in some circumstances the presence of a body of water can enhance the local economy through the importation of money from outside sources. The delivery system for outside revenue may commonly be traced to owners of “second homes,” visitors and tourists visiting for recreational or other purposes and business to business sales. Natural resource economists refer to three forms of expenditures from outside sources as: “direct,” “indirect” and “induced.” Economic development officials view the flow of cash as a stimulant to an economy and one method of creating or sustaining jobs.<sup>4</sup>

This paper and the accompanying presentation (at the 2013 International Association of Assessing Officers 79<sup>th</sup> International Conference on Assessment Administration) address methods of discovering and quantifying the geographic distribution of such values. Much of the information is drawn from research and testimony associated with a 300 acre lake and given before Michigan’s 55<sup>th</sup> Circuit Court. The hearing regarded the Chappel Dam, public improvement that enlarged Wiggins Lake, which is located in Gladwin County, Michigan. The subscripts<sub>(1)</sub> at the end of any paragraph in the “Written Narrative” accompanying this presentation indicate which slide is being referenced. Where there is no subscript, the last subscript referenced slide is still under discussion.

An analytical technique taught in some law schools was used in the presentation format. It is known by the acronym IRAC, which stands for: Issue, Rule, Analysis and Conclusion. If one reads decisions of various courts, it will be evident they frequently employ a similar format.<sup>5</sup>

Because testimony before the courts and tax tribunals must be fact based, a list of accepted rules and facts are part of the presentation. Matters of fact are classified as legal, economic and scientific facts. An acronym (LES) is taught in Michigan’s special assessment administration classes to emphasize these three categories.

## ISSUE

The “issue” being explored for this report may be stated as: “What values, expressed in cash or cash equivalents may be reasonably determined to be a result of the presence of a body of water?” The term “reasonably” implies the use of commonly accepted valuation methodologies or other valuation techniques that can pass the scrutiny of the courts. Value is expressed as present or current value in terms of U.S. currency.<sup>6</sup>

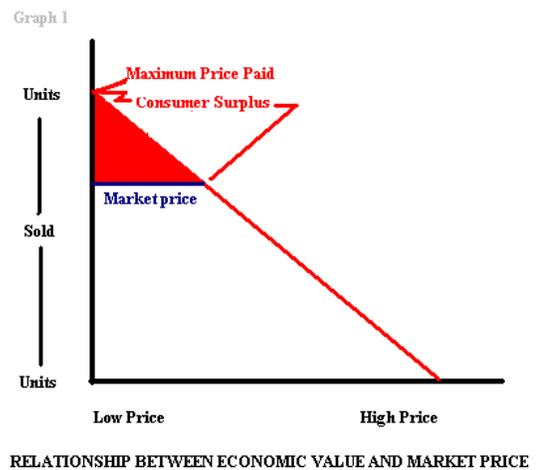
There are three principle categories of value influence: the impact on real estate, the creation of new cash flows and what natural resource economists consider as “services” valued in cash equivalent terms by humans. Each of these categories exerts an independent fiscal influence over a unique and distinct geographic area. This paper describes such influences and illustrates computations and a summation of values derived from the illustrations. It also shows

how the geographic influence differs by classes of property. For example, the impact on residential properties is generally limited to a smaller geographic area than the area containing affected business properties. Cash flows generated by expenditures of visitor, tourists and 2<sup>nd</sup> home owners affects a smaller area than the distribution of property and other tax collections.<sup>7</sup>

Since methods of estimating values associated with a natural resource may utilize fair market value derived from the price of transactions within the market by real estate appraisers, or from methods used by natural resource economists to determine value, it is important to distinguish between fundamental concepts of value. There are two important distinctions. Most people understand value to be the price of something or a value derived directly from transaction prices within a market. Real estate appraisers and the courts rely upon market transactions as the basis for value. Economists on the other hand, premise the concept of value on the principle that a transaction price merely represents the lowest level of value.

Economists work on the concept that “value” is equal to a term known as “consumer surplus.” Consumer surplus is the sum of all transactions lying between market price and the highest price people are willing to pay for a good or service.<sup>(8)</sup>

While the value of a good or service is frequently thought of as “market price” or the “transaction price” under specific conditions (e.g. knowledgeable buyers and sellers, adequate time to market and a lack of extraordinary pressures on the buyer or seller that might force a sale), **the willingness to pay concept defines market price as the minimum value.**



There are eight dollar based ecosystem value measures used by natural resource economist according to the educational information posted on *ecosystemvaluation.org*. They are: Market Price Method; Productivity Method; Hedonic Pricing Method; Travel Cost Method, Damage Cost Avoided, Replacement Cost and Substitute Cost Methods; Contingent Valuation Method; Contingent Choice Method; and Benefit Transfer Method. This presentation considers the Travel Cost Method and uses Contingent Valuation for illustrative purposes.

## RULES

Now, let’s begin looking at various rules which must be used in a proper determination and quantification of values associated with a lake. Because several methodologies are used to determine value, rules will be stated which relate to real estate appraisal techniques, techniques used to value cash flows, rules related to “job generation” and rules related to the Contingent Value and Travel Cost Methods employed by economists.<sup>(9)</sup>

The analysis of real property for values associated with a lake will incorporate all three approaches to value (market, income and cost). The analysis will ensure that all affected classes of property are examined. At a minimum that will be residential, recreational, commercial and industrial. Of course, the analyses will meet applicable professional standards for appraising.<sup>(10)</sup>

For purposes of analyzing cash flows, parameters must be established and revealed. In this presentation the cash flow analysis must utilize a 20 year period (remaining life of dam), 2 percent interest rate (reasonable during this time period) and findings are to be made as an estimate of the present value of the cash flow. Cash flows to be analyzed must consist of money new to the local economy. New money means money coming from outside the “local economy”.

(11)

There are four identifiable sources of new money from the natural feature (lake): elevated property tax collections; money from visitors and tourists; expenditures by non-resident property owners and money generated from the harvest of wildlife or other natural resources. Each form of cash flow is associated with a unique economic effect.<sup>(12)</sup>

For example, expenditures by 2<sup>nd</sup> home owners (non-resident real estate owners) and visitor/tourist expenditures. The sum of expenditures derived from “outside” the local economy will usually have some portion which does not stay local, but in fact “leaks away” immediately. Perhaps there is a vending machine where the vendor removes the money and takes it to his home in another county or other distant place; or perhaps a local business buys supplies from an out-of-the-area firm so that following a direct sale, a portion of the direct money leaves the local economy. For this presentation, the rule is thirty percent of “direct” expenditures leak from the local economy.<sup>(12)</sup>

Whatever the impact of cash flows, the analysis is restricted to only cash flows that are measurable and received by government units, businesses or institutions within the local economy. Institutions may be things such as a school district. An example of a cash flow recognized but not counted, can be found by examining tax collections which flow to the state. Property tax, sales tax and other tax payments flowing to the state will be documented and recognized, but not counted as part of the impact on the local community. Money flowing to the government jurisdictions located within the local economy will be used to determine value.

Where there is an identifiable cash flow to a jurisdiction, but it is deemed to be so small that it does not materially affect the local economy, the sum will not be considered in the analysis. For example, a sales tax or cigarette tax or some other tax where it can be determined that there is a definite collection, but a miniscule (de minimus) benefit to the local economy.

Cash flows within an economy create or sustain jobs. While job generation is not a measure of value that property tax assessors normally concern themselves with, it is a very important issue for economic development specialists and elected and appointed government officials.

There are potentially many professionals and employees who rely upon the cash flow from visitors, tourists and second home owners to make a living. It turns out that new jobs may be computed based upon a determination of final demand. Direct expenditures create or sustain jobs in the businesses serving the needs of the visitors, tourists and second home owners. This could be fishing gear or food or beverages. It may be the real estate firms providing the second homes, the title companies and attorneys used during the purchase or sale process. It may mean the electrician, carpenter, roofer or others who provide services to the second home owners.

Economists use the direct, indirect and induced expenditures in a formula to create a ratio which describes the total impact within an economy created by these expenditures. The basic ratio formula is: Direct expenditures divided into the total of direct, indirect and induced expenditures equals a ratio. The ratio can be used to illustrate the total impact of a dollar of new money to the local economy. It can be used with a known cost per employee in a particular industry in a particular economy to create a "job multiplier." A job multiplier illustrates how many jobs can be expected to be created or sustained at a certain expenditure level.

An example of calculating job generation effects is provided by the New York State department of labor using the formula: (direct effects plus indirect effects plus induced effects) divided by direct effects. In the example, the department of labor determined that the number of jobs created by direct effects is 2.09; that jobs created by indirect effects is 2.56 and induced effects create 4.04 jobs. Using the formula, the job multiplier becomes 4.16. Thus, for every one new job created by \$1 million dollars of final demand in the local economy, a total of 4.16 jobs in total are created (1 times 4.16).<sup>(13)</sup>

Valuing an environmental service represents a very challenging proposition. Four valuation methods are considered. They are: a legislated value (value set by law), various methods used by natural resource economists that are approved by the federal government, judicial decisions and costs to return environmental damage to pre-damage state.<sup>(14)</sup>

Consider the value of fish from the perspective of these four approaches. The legislative value is determined by a statute which sets the value of game fish at ten dollars per pound and the value of a rough fish at five dollars per pound. However, the economist may consider the economic value as an "existence use value" derived from a "contingent value" survey and based upon the concept of "willingness to pay." The economist may also consider the value of the service provided by recreational fishing, or by the commercial harvest of fish. A court of law may "find" specific values related to environmental damages of a fish "kill" as the cost of restoring a natural resource to its original condition.

The value of fish may also be considered from the perspective of a "biomass" and the law. Michigan's lakes are deemed to have "rough" fish and "game" fish. Biologists refer to these as the biomass of a lake. There have been measurements of the percentage of rough fish and game fish existing per acre within several inland lakes. Consequently, it is possible to estimate the

value of that biomass of fish, by utilizing a value per fish which is legislated. In Michigan, the legislative value of a rough fish is \$5.00 per pound and the value of a game fish is \$10.00 per pound. Using this data, if there exists a 50/50 ratio of game fish to rough fish with a biomass of 80 pounds per acre and we have a 300 acre lake; then the value of the fish biomass would be \$400 per acre for game fish (40 pounds per acre x \$10 per pound) and \$200 per acre for rough fish (40 pounds per acre x \$5 per pound). Consequently, on the 300 acre lake we are considering, the value of the fish biomass is \$180,000. This is an example of using a statutorily mandated value. This report illustrates the commercial harvest of a small number of game fish using the statutory value.

Among the methods used by natural resource economists, two have been selected for illustration in this presentation.

One, the "Travel Cost Method" is incorporated within the total costs attributed to the lake. This method relies upon a determination of the expenditures of visitors, tourists and second home owners. The travel Costs Method consists of surveying users of natural resources to determine how much money they spend to achieve that use. Their spending represents money "imported" into the local economy from a distant place. Because the cash flow is identifiable, measurable and arises from sources outside the local economy, it is used as a measure of value in this presentation. The Contingent Valuation Method is used to determine the value of the lake from the perspective of "existence use." The value will be estimated by surveying people in a defined geographic area, determining how much that population would spend to keep the lake and what amount they would spend. Some states provide a real life measure from the entire population of income tax payers or those securing fishing or hunting licenses when the state asks for a voluntary donation to support a particular species of wildlife.

For purposes of estimating value, any source of cash flow into the local economy from a distant economy is divided into two components: money which stays in the local economy and money that "leaks" to firms and persons located outside the local economy. The money staying in the local economy is utilized in the calculation of "value." This money also stimulates the local economy (creates growth). The expression of this growth is determined from three distinct cash flows: direct expenditures, "indirect expenditures" and "induced expenditures." A direct expenditure is the money spent by the visitors, tourists and second home owners at local businesses. Indirect expenditures are that portion of direct expenditures spent by the firms to resupply for future sales, to pay employees and for other purposes which permit the business to operate. Induced expenditures is that money received by employees of the firms which is spent in the local economy.

The concept of "willingness to pay" as **a method of determining value**, is quite different. It does not result from measurable and direct expenditures in the local economy. Instead it is a speculative process. It requires the identification of a specific population living within a defined geographic area or a population identified from a particular characteristic or

characteristic which has a willingness to pay to sustain a natural resource. The willingness to pay is quantified using survey techniques. The researcher ascertains the percentage of that population that may be expected to contribute money to preserve the resource for future generations, or for their own future use or for other reasons. The researcher estimates the amount of money the percentage of the identified population is “willing to pay” annually. Using the number of persons expected to contribute money and an estimate of the dollar amount they’ll pay, the researcher multiplies the two to generate an estimate of the “value” of the natural resource. Since the technique does not rely upon actual expenditures that can be reasonably identified, it will be illustrated, but the value is not included in the value table created for this presentation.

It is not uncommon to find a court decision which mandates a restoration of a damaged environment. Two examples are costs associated with restoring a natural resource following a petroleum product spill or a restoration order where individuals have driven recreational vehicles in prohibited areas or in other ways that damaged a natural resource. In such cases, a court may order a restoration process from which it is possible to determine specific monetary values of the resource. While “value” can be derived for a resource in these ways, the technique is not employed herein as an indicator of value to be summed with other cash or cash equivalent values. Instead, it is shown for illustrative purposes.

There are four harvests associated with the lake. Of them, three are examined with the travel cost method and one consists of a commercial harvest. The three are: fishing – catch and release; fishing – catch and keep and expenditures by hunters of water fowl. The other harvest consists of a small commercial fishery.<sup>(15)</sup>

Rules regarding money circulating within the “local economy” demonstrate that geographic areas are a critical part of the value determination process. One example of importance is that related to the flow of water. The first component of water flow is the area from which water flows, the second is the land surrounding the lake and the third is the area in which flooding occurs. Of these areas, flood damage has been recorded. It occurred in two forms: As catastrophic flooding from a failure of the dam and as periodic damage from annual spring flooding downstream from the dam. The cost of maintaining the integrity of the dam to prevent catastrophic flooding is not included within the example. However, the rule for this report is, the annual cost (\$25,000) of repairing flood damage. is considered an income. This is because the dam eliminates an annual cost and makes those expenditures available for other uses.<sup>(16)</sup>

In order to value the annual cash flows generated by new tax revenue, one needs to identify the jurisdictions to which property taxes, sale taxes, gasoline taxes or other taxes which exceed the de minimus level flow. It is also important to identify the geographic area which encompasses the “local economy.” Knowing this, the researcher can quantify the expenditures remaining in the local economy and those leaking. Furthermore, the research can then identify the area in which job generation or sustainment can be attributed to and the appropriate job multipliers for the area. The researcher must also determine the area from which revenue in the

form of expenditures arises. This can be used in calculations of contingent use values, the “existing use” value of the resource and travel cost estimates. Tracking the flow of new expenditures from tourists, visitors and non-resident property owners (areas impacted by non-resident expenditures) helps define the local economy and helps the researcher identify travel routes and other areas affected which are not near the natural resource.(17)

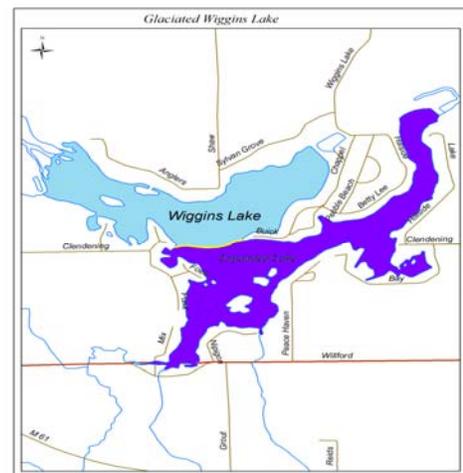
## ANALYSIS

In order to complete a proper analysis the research must look to facts, both known and ascertainable. That is facts, easy to find and facts available if one devotes the effort to look for them. Once a reasonably comprehensive set of facts have been identified, rules can be utilized with those facts to create a competent analysis of values associated with a particular natural resource.(18)

In this presentation, we first visually examine the dam which creates the lake. It is an earthen dam that approximately doubled the size of a lake created 8,000 to 10,000 years ago by glaciation. The dam structure contains an abandoned power house previously used to generate electricity. The power company that owned the dam sold it to Gladwin County, Michigan in the 1960s because siltation within the lake made power generation inefficient. The County wanted to maintain the lake for recreational and other uses that enhanced the county’s tax base.(19)

In fact, a series of public documents and hearings identified a number of reasons why this dam is important. Its primary purpose now, is to stimulate the economy through tourism and recreation. Another purpose is safety, to limit minor flooding and to prevent catastrophic flooding. In a debate over keeping the lake at its present condition or draining the lake and returning to a run-of-the-river condition, Michigan’s Department of Environmental Quality recommended keeping the dam and the 55<sup>th</sup> Circuit Court ordered the “lake level” to be maintained. This meant the county had to maintain the dam in so that it remains safe and the lake waters were maintained at court established levels.(20)

Light blue areas are areas created by glaciation. In the 1910s the original river was blocked and a new dam built in an adjacent wetland. The expanded lake created by the dam is shown in dark blue. Due to siltation, the lake has an average depth of about 6 ft and a maximum depth of 25 feet. The lake is discussed in magazines catering to fishermen and women and department of natural resource records indicate record size fish have been caught in the lake’s waters. At least one annual fishing contests draws up to a 100 people from southeastern Michigan’s metropolitan areas.(21)



The dam has broken twice (1912 and 1929), killing once. The breaks created extensive property damage downstream including the destruction of a smaller dam downstream.<sup>(22)</sup> Chappel Dam was recently repaired at a cost of \$2,000,000. However, those costs included the expenses of litigation and engineering a potential replacement dam. Costs for repairs was less than one million dollars. In part, the repairs were ordered because current estimates of damage from a catastrophic failure project the loss of six lives and eleven million dollars in property damage. <sup>(22)</sup>

Scientific facts help determine the geographic area from which water flows into the lake. The area constitutes land within three counties and the drainage area (watershed) is 235 times as large as this 300 acre lake.<sup>(23)</sup> Using factual data describing the watershed, we can begin creating a map of counties that are connected to the lake by legal, economic and scientific facts. By aggregating several maps which illustrate such connections, the researcher can create a consolidated illustration that can be used to determine value based upon cash flows, the local economy, leakage and tax flows.<sup>(24)</sup> Once the watershed and the lake are identified, one can examine the flood plain downstream of the lake. <sup>(25)</sup>

The geographic area connected financially to the lake can be further refined by creating maps illustrating the primary residences of non-resident property owners. This means illustrating where cottage and other 2<sup>nd</sup> home owners live. Cash flows into the county can be illustrated by mapping the geographic areas targeted by business owners. Such maps can be created by using maps of coverage areas for radio and TV stations carrying advertisements. A similar process can be used to identify circulation areas for print media carrying advertisements or otherwise targeting recreational visitors and tourists. Commonly used visitor surveys may also be used to create maps that illustrate connections to the lake.<sup>(26)(27)(28)(29)</sup>

To summarize relevant data: the county is ranked as among the highest in the state with regard to non-resident owners of local property; media reports, surveys and interviews with business owners and professionals such as real estate agents, attorneys and other identify expenditure patterns, travel routes and destinations along which tourists, visitors and 2<sup>nd</sup> home owners buy goods and services. For example, surveys by lake associations and surveys of 2<sup>nd</sup> home owners by Wiggins Lake indicate that 2<sup>nd</sup> home owners typically spend between \$7,500 and \$12,000 annually in the local economy surrounding Wiggins Lake. Recreation surveys reveal that fishermen and women, hunters and other recreational users attracted to the lake spend about \$35 per day per person for day trips and \$95 per day per person for overnight trips.<sup>(30)</sup>

Identifiable and measurable annual cash flows from a tax base elevated by the presence of water (the lake) can similarly be mapped. The elevated tax revenue flows throughout Gladwin County, to an intermediate school district serving both Gladwin and Clare counties, to the state of Michigan and to a community college serving students living in the local economy. Of these jurisdictions, the cash flow to the state of Michigan will be removed from calculations because

that flow of money “leaks” from the local economy.<sup>(31)</sup> Local jurisdictions include Sage and Grout Townships, the township within which Wiggins Lake is located.<sup>(32)</sup>

Through the examination of facts, both known and ascertainable, and of research both existing research and undertaken to assist in area identification, several maps which reveal cash flows have been created. Among those maps are: the geographic origin of persons spending money in the local economy to enjoy fishing; a map created from tax records which illustrates the county of origin for those persons owning cottages or 2<sup>nd</sup> homes within on or within the area of elevated property tax base created by the lake; and maps of broadcast coverage areas for TV and radio stations known to carry advertising encouraging visitors to Wiggins Lake or nearby businesses. The outcome of this body of research demonstrates that money is imported as direct expenditures from thirty-one counties in central and southeastern Michigan. The analyses includes a geographic definition of the local economy. The local economy is defined as that geographic area lying within 30 miles of Wiggins Lake. <sup>(33)</sup>

Michigan’s 55<sup>th</sup> Circuit Court augmented the research when, after a three day hearing on the benefits of keeping the lake or returning it to a run-of-the-stream operation “found” certain geographically benefitting areas, persons and entities. They include: “properties on the lake, “those with a view of the lake” and “those who have access to the lake.” The court “found” that Michigan’s Department of Environmental Quality” is a benefitting entity as is the legislative government of Gladwin County. It also found that “properties downstream” of the lake and “all taxpayers of Gladwin County” benefit from the lake.<sup>(34)</sup>

Legal, economic and scientific facts, when consolidated, enable the development of a map that illustrates specific areas that benefit from tourism and visitors as well as those recreational and residential properties situated on land whose value is enhanced by proximity to the lake. Included are highways and local roads where businesses benefit from cash flows related to the lake, the business district of the city of Gladwin and the business located near the lake.<sup>(35)</sup>

From all the individual maps created through research, a single map illustrating the principle geographic area from which money flows into the local economy can be created. Using a standard map of the state of Michigan which illustrates boundaries for each county, thirty-one counties located in the central and southeastern portion of the state are identified.<sup>(36)</sup>

## CONCLUSION

Now that facts, both known and ascertainable, have been gathered, the researcher can arrive at relevant conclusions of values associated with Wiggins Lake in a way that illustrate a more complete picture of how the lake contributes to the local economy.

Research has shown fiscal connections exist between the lake and the entire state of Michigan. The economic influence from the lake on property value extends about 2000 ft from the water’s edge. The influence diminishes with distance and consists of three components: land

touching the lake, land with deeded access to the lake and land with a view or easy access to the lake. Fact based data and the opinion of respected natural resource economists, lead to the conclusion that the definition of the “local economy” should be the area lying within a thirty mile radius of Wiggins Lake.<sup>(37)</sup>

In order to illustrate the influence of the lake on nearby property values, a graphic has been developed which plots changes in value premised upon academic research. Most land influenced in this situation is property adjacent to the body of water. There are a few parcels with a view of the lake or easy access to the lake. Parcels on the body of water enjoy a doubling from the value of similar property that is not so influenced. Parcels with a view of the lake enjoy a seventy-five percent increase in value and those with easy access (including deeded access) enjoy a value increase of fifty percent. Because of the dominance of parcels on the water relative to those that are not, the overall increase in value for all parcels approximates a one hundred percent increase in value. <sup>(38)</sup>

County Equalization records show that from a property tax perspective, increases in residential property values will generate the greatest tax revenue on a percentage basis. This is because undeveloped residential land sells for about three times the value of agricultural land per acre and residential values of undeveloped land are a little more than double the value per acre of industrial and commercial land. <sup>(39)</sup>

Based upon published research, visitor bureau surveys and information from local surveys, it has been concluded that expenditures per day per person for day trips generate \$35 in the local economy and overnight trips generate direct expenditures of \$95. These numbers have been used in cash flow calculation for recreational activities including fishing and hunting. The value of animal trapping from the natural resource generates a small annual cash flow and is based upon the identified market value of the furs. <sup>(40)</sup>

As a quick review of the valuation methods employed to arrive at conclusions for this presentation the following summary is offered.

- **Market approach used to evaluate real estate**
  - Hedonic valuation (Multiple Regression)
  - Paired associates
- **Determine market area: Visitors & 2<sup>nd</sup> Home expenditures**
- **Income capitalization used for cash flows**
  - Of tax revenue
  - Of 2<sup>nd</sup> home ownership expenditures

- Of tourism/visitor revenue
- **Natural resource economic survey method (Contingent Value – existence use)**
  - Determine market area
  - Determine population's willingness to pay (amount) and percent of population's willingness to pay
  - Travel Cost Method for visitors and Tourists <sup>(41)</sup>

As is true in all research, it is important to provide the sources for opinions and facts utilized in arriving at a value. The following listing of sources for data used in this presentation is offered:

- **CONCLUSION: Summary of sources of information**
- **Expenditure survey: 2nd home owners, tourists and visitors**
- **Survey: business owners; review tourism studies, check fishing or other guides and books for reference to lake**
- **Sworn testimony: court hearings, divorces, tax appeal information**
- **Tax records (rent schedules, income statements)**
- **Academic studies**
- **Interviews CPA, brokers, appraisers and other professionals**
- **Census and other federal records**
- **Insurance Rates (Mfg firm w/o sprinklers received lower fire rates due to water frontage)**
- **Media reports and coverage areas** <sup>(42)</sup>

Finally, every effort was made to estimate values that are confined to the local economy as defined; values that are measurable and accessible to other researchers and facts and relevant data that can be easily found by other researchers or found even though requiring time and effort.<sup>(43)</sup>

Financial conclusions follow in several tables:

**Property Taxes influenced by the presence of the natural resource**

<b>Illustrative Component Values of a 300 Acre Lake with 75 acres of wetlands and significant use by public</b>			
<b>Component</b>	<b>Current Measure</b>	<b>Annual Cash Flow (20yr term; 2% int)</b>	<b>Present Value</b>
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
<b>New property taxes because of lake \$29,187/acre</b>		<b>Total</b>	<b>\$8,756,000</b>

(44)

### **Real Estate Values**

<b>Illustrative Component Values of a 300 Acre Lake with 75 acres of wetlands and significant use by public</b>			
<b>Component</b>	<b>Current Measure</b>	<b>Annual Cash Flow (20yr term; 2% int)</b>	<b>Present Value</b>
Enhanced <i>Market Value</i> - Residential	\$25,000,000		\$25,000,000
Enhanced <i>Market Value</i> - Business	\$5,000,000		\$5,000,000
<i>Mkt Value</i> of Wetlands (75 acres@\$3000/acre)	\$225,000		\$225,000
<b>New real estate values because of lake \$100,750/acre</b>		<b>Total</b>	<b>\$30,225,000</b>

(45)

## Identifiable and Measurable Cash Flows

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
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
<b>Total present value of new cash flows from lake \$179,537/acre</b>		<b>Total</b>	<b>\$53,861,000</b>

(46)

## Values related to the Natural Resource itself (use values)

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
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
<b>Commercial harvest from lake \$954/acre</b>		<b>Total</b>	<b>\$286,149</b>

(47)

## SUMMARY OF ANNUAL CASH FLOWS

- Enhanced Taxable Value \$ 525,000
- 2nd home and visitor expenditures \$3,229,375
- Commercial Harvests \$ 17,500

**TOTAL AMOUNT OF ANNUAL CASH FLOWS \$3,771,875**



Direct Expenditures	\$3,229,375	
	Direct Expenditures minus leakage	\$2,260,563
Harvests from natural resource		\$ 17,500
Total		\$2,803,063

Economic facts and the opinion of natural resource economists were utilized to conclude that twenty-five to thirty local jobs would be supported by every one million dollars of new revenue to the local economy. It was concluded that a job multiplier of 1.30 best suited this market. Another way of stating the multiplier is that for every three jobs created, an addition job is created within the local economy. (50)

Using the estimate of 25 to 30 new jobs being created for every one million dollars of new cash flowing through the local economy, the conclusion job generation is that between 93 and 112 new jobs will be created from cash flows arising from elevated tax revenue, direct expenditures minus leakage and commercial harvests of the natural resource. Those 93 to 112 new jobs will create a secondary flow of money within the local economy. That secondary flow will create or sustain 31 to 37 new jobs. Thus, a defensible estimate of the total number of new jobs lies between 124 and 149 new jobs. (51)

As an addendum, consideration was given to the cost of creating a 300 acre lake. The first approach was to look for construction costs to build a new dam. Engineering costs were available to build a new dam on the river which forms this impoundment. They ranged from \$3 to \$5 Million depending on exact location. Some costs to excavate a lake of 300 acres were obtained. They ranged from about \$20,000 per acre to over \$100,000 per acre; or between \$6 Million and \$30 Million. Obviously, true requests for proposals would refine the cost range. Nevertheless, subject to actual excavation costs, the similarity of costs for constructing a new dam and for excavating a lake are similar in the range of about \$5 Million to \$6 Million suggest a reasonable first approximation of the cost to create the lake.

## REFERENCES:

Crompton, J. L. (2001a) The impact of parks on property values: a review of the empirical evidence, *Journal of Leisure Research* 33(1), pp. 1–31, [http://www.actrees.org/files/Research/parks\\_on\\_property\\_values.pdf](http://www.actrees.org/files/Research/parks_on_property_values.pdf) accessed July 21, 2013

Crompton, J. L. (2004) *The Proximate Principle: The Impact of Parks, Open Space and Water Features on Residential Property Values and the Property Tax Base* (Ashburn, VA: National Recreation and Park Association)

Dynesies, Mats, Nilsson, Christer, Reidy, Catherine A., Revenga, Carmen (2005), Fragmentation and flow of the worlds large river systems, *Science*, Vol. 308 no. 5720 pp. 405-408, <http://www.sciencemag.org/content/308/5720/405.short> accessed August 1, 2013

King, Dennis, PhD and Mazzotta, Marisa, PhD, (2000) *Essentials of Ecosystem Valuation, Essentials Section 1, Basic Concepts of Economic Value*, Website sponsored by U.S. Department of Agriculture Conservation Service and National Oceanographic and Atmospheric Administration, <http://ecosystemvaluation.org/1-01.htm> accessed July 21, 2013

Nicholls, S. and Crompton, J.L. (2005) The Impact of Greenways on Property Values: evidence from Austin, Texas, *Journal of Leisure Research* 37(3), pp. 321-341, [http://agrilife.org/cromptonrpts/files/2011/06/4\\_2\\_7.pdf](http://agrilife.org/cromptonrpts/files/2011/06/4_2_7.pdf) accessed July 21, 2013

New York State Department of Labor., (2005) How jobs create new jobs...understanding the multiplier effect, *Employment in New York State*, Albany, New York, April Issue, pp. 1-3, accessed July 27, 2013, <http://www.labor.ny.gov/stats/PDFs/enys0405.pdf>

Stynes, Daniel J. PhD, Economic Impacts of Tourism, portions of Michigan State University class materials ( Course PRR 840), <http://www.msu.edu/course/prr/840/econimpact/pdf/ecimpvol1.pdf>, accessed July 20, 2013

Stynes, Daniel J. PhD, Michigan Tourism and Economic Income Model (MITEIM), excel program available for download on web at: [http://35.8.125.11/mgm2\\_new/econ/MITEIM2010.xls](http://35.8.125.11/mgm2_new/econ/MITEIM2010.xls) accessed July 30, 2013

Turner, J. M. (2009), A Look at the values of a lake, Everything From Tourism To Natural Resources, *The Michigan Riparian*, Part 1, Vol. 44, No. 4, Winter, pp 12 – 15, [http://miparian.org/archive/2009/winter\\_09.pdf](http://miparian.org/archive/2009/winter_09.pdf) accessed July 21, 2013

Turner, J.M. (2010), A Look at the values of a lake, Everything From Tourism To Natural Resources, *The Michigan Riparian*, Part 2, Vol. 45, No. 1, Spring, pp 8 – 10, <http://www.michiganpropertytax.com/articles/2010%20Riparian%20Part%202.pdf> , accessed July 21, 2013