

ECONOMIC IMPACT

OF EAGLE LAKE COMMUNITY on the town of Dover and Racine County

EXECUTIVE SUMMARY

This report is a summary of the larger Town of Dover/Eagle Lake Community Survey and Economic Impact Study. The larger study is available through the Town of Dover. Much of the technical analysis is further developed in that larger volume.

This report is comprised of three distinct sections. The first section is the Town of Dover Community Survey. This survey seeks to gather information from property owners in the Township. The information sought would help guide future growth and development in the area. The major findings of the survey include:

- a. *51 percent of the respondents live directly on Eagle Lake.*
- b. *Of those that do not live directly on Eagle Lake, (49 percent of respondents) have lived or owned land in the Town of Dover over 10 years.*
- c. *61 percent regularly use a boat or watercraft on Eagle Lake.*
- d. *Use of the property was bi-modal: 40 percent used the property year round, while 40 percent used the property less than 40 days per year.*

- e. *For those that were not already full time 62 percent reported to not be intending on becoming a full time resident ever.*
- f. *Most of the property (62 percent) has been bought in the last 18 years.*
- g. *The majority of respondents (73 percent) felt that property appreciation met or exceeded their expectations.*
- h. *While 59 percent of respondents believe the area has changed since they purchased their home, only 23 percent of respondents like it less now than before.*
- i. *When respondents were asked to account for their time use of the lake, 68 percent was accounted for in relaxation or leisure.*
- j. *When surveyed regarding development, preservation, and water quality issues, responses were very consistent that they felt Residential Development is not needed in the area, The watershed should be protected, Reduction of water quality of lake and groundwater is a serious concern*
- k. *A majority of respondents believe that there is adequate availability of single family housing and condominiums.*
- l. *However, few residents are willing to pay more in property taxes to purchase of development rights to prevent further development.*

The second section is a hedonic analysis of the value of real estate on Eagle Lake and it's evolution over the past 20 years. By collecting sales price and assessment data on a sample of properties, this report isolates the value of lakefront property in current dollars and its change in valuation over the past 20 years. The major findings of this analysis include:

- a. *We estimate that the mil rate for the Town of Dover property owner is \$0.12 higher due to the real and perceived decline in water quality and its impact on the demand for Eagle Lake real estate.*
- b. *This \$0.12 increase in taxes generates a tax increase of \$24 on a \$200,000 home.*
- c. *The presence of the lake produces a positive tax impact on the overall community. Without the lake, in order to offer similar services, the community would need to increase property taxes by 10 percent.*

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The third section is an input-output analysis. In this section we use IMPLAN to estimate the economic impact and contribution of the part time residents on Eagle Lake. Prior research has shown that projections of declining water quality leads part time lake property owners to indicate that they will use their property less in the future. As a result, the marginal and incremental dollars they inject into the local economy will diminish. The IMPLAN study in this report estimates both the current economic input these residents offer the regional economy and the projected losses due to continued degradation of the water. The major findings of this analysis include:

- a. *The economic contribution of part time residents on Eagle Lake creates over 56 jobs.*
- b. *The economic contribution of the part time residents on Eagle Lake injects \$3,680,819 into the Racine County economy.*
- c. *The economic contribution of the part time residents on Eagle Lake injects \$1,874,490 in labor income into the Racine County economy.*

This report seeks to address several of the many complex contributions that Eagle Lake provides to the economy of Racine County and the Town of Dover. It clearly understates the positive contributions. It does not take into account the economic impact full time residents have on the economy throughout the year. It also does not address the spending patterns of individuals and groups who visit the community to fish and recreate. Prior research has determined a positive economic impact from these groups.

This report also attributes some of the loss in appreciation to the changing quality of Eagle Lake. It is critical to recognize that other factors, such as shopping and economic development opportunities, may also contribute to appreciation. However, the economic literature has shown mixed impacts (both positive and negative) of urbanization on lakefront property values. There is, however, no mixed impact of waterfront and water quality degradation on lakefront property values¹. This degradation has a negative impact on value.

As a result of this recognition, when developing a strategy to “polish the apple,” a reasonable strategy should include programs that have one direction impact on property values and a program that can be controlled by the community. Given these parameters, the promotion of a clean and healthy lake should be considered as a strategy to improve the economic contribution of the lake to the Town of Dover and improve Dover and improve the tax base of the Town of Dover.

I. PUBLIC POLICY SURVEY AND LIFE IN THE TOWN OF DOVER

In 2007, the Fiscal and Economic Research Center (the FERC), located in the University of Wisconsin Whitewater’s College of Business and Economics, and affiliated with the University of Wisconsin-Extension, conducted a survey of lakeshore residents around Eagle Lake in the Town of Dover. Approximately 33 percent of

¹ There are also questions of endogeneity on real estate appreciation due to urbanization. The significance and sign of the _____ is difficult to predict. However, the impact of environmental degradation is historically negative.

TABLE I: TOWN OF DOVER ECONOMIC AND DEMOGRAPHIC DATA, 2000

	Town of Dover	Wisconsin
Area (sq. miles)	35.4	54,310
Population	2796	5,556,506
Percent Change in Population (2000-2006)	0.79%	3.59%
Median Household Income (2005)	\$51,949	47,105
Median Value of Owner Occupied Housing (2005 Value)	\$203,662	\$152,600
Median Resident Age	36.1%	36.0%

the 779 distributed surveys were completed and returned. Survey sponsors were interested in the homeowner's responses regarding development issues and lake utilization. Understanding residents' views of development and utilization is considered critical for planning future outreach efforts that support improved water quality in Eagle Lake.

The result of the public policy survey was that a wealthier and older cohort responded than the population in general. This may be due to the financial dynamics required by Eagle Lake. Due to their concern over the future of the lake, these residents may have been more motivated to respond. This, coupled with the financial requirements that discourage young buyers of these expensive lake properties, tilted the response rate towards this cohort.

The survey instrument was developed by the FERC with input provided by the Township's elected leaders and the Lake Association. The township generated a list of property owners on Eagle Lake along with all other citizens of Dover that live in the Sewer District. A survey packet containing the survey, a cover letter, and a stamped and addressed return envelope were sent to 800 households. A second survey packet was sent to

lakefront residents that had not responded to the initial survey mailing. All correspondence was signed by the Chairman of the Town of Dover.

Several key points were found upon studying the survey. Respondents with property on the lake had some differences in their answers compared to the respondents with property off of the lake. Some differences included respondents with property on the lake believed more strongly than those off the lake that:

- a. *Something important to them when they first moved to the area had changed.*
- b. *The area was more likeable now than it was when they first bought the property.*
- c. *Reduction in water quality would impact them.*
- d. *Reduction in water quality was a very serious concern.*
- e. *Purchase of development rights could be a good thing.*
- f. *Those on and off the lake agreed that:*
 - g. *No continued residential development is necessary.*
 - h. *The watershed should be protected, even if it slows development.*
 - i. *Groundwater quality is something that will impact their health.*

We asked how much time respondents spent at home to get an idea of how much their property was used by the immediate family. We found that about 40 percent reported that their immediate family lived their year round, while another 40 percent had immediate family there less than 40 days per season². While the properties were used near the same each season, during winter properties seemed to be used a little less than other seasons.

For those that were not already full time residents we asked if they planned to become full time residents and if so when. 62 percent reported to not be intending on becoming a full time resident ever. Of the respondents that did plan to become full time residents about two thirds of them said it wouldn't be for at least 6 years.

Respondents who have owned their property for over 30 years were very happy with the way their property has appreciated. They report the appreciation has exceeded what they were expecting. However, most respondents who owned a property 30 years or less reported their appreciation has just met or been below what they were expecting. This could mean that either in the last 30 years appreciation in the area has been lower, or that owners expectations of appreciation in the last 30 years have been higher.

II. EAGLE LAKE: THE IMPACT OF DIMINISHING WATER QUALITY ON VALUE

Introduction

On the border of Wisconsin and Illinois, near the border of Racine and Kenosha County is Eagle Lake. Eagle Lake, a drainage lake, is a 500 acre lake that has approximately 200 homes located directly on it. It attracts homeowners, boaters and fishers from Milwaukee (about 30 miles to the north) and Chicago (about 50 miles to the south). A major challenge presented to both lake management and community leaders is the perception that both lake levels and water quality have diminished in recent years. In consideration of this issue, it is the goal of this analysis to determine whether the value of water frontage has kept pace with competing lakes within the same market. As a result, this analysis will look at the changes in lakefront property on Eagle Lake, Paddock Lake and Hooker Lake.

While consistent data regarding long term changes in water depth is limited, the maximum depth determined by the Wisconsin Department of Natural Resources is 32 feet for Paddock Lake, 27 feet for Hooker Lake and 12 feet for Eagle Lake. It is the anecdotal argument of many on Eagle Lake that this depth has diminished over the past 20 years. It is argued that this diminished depth has adversely impacted the marketability of the lake due to limitations on boating opportunities. This limitation may be one of the contributors to the activities offered by the survey respondents.

² This is a critical issue that will be further explored in the IMPLAN analysis. It is feasible that, by improving the lake quality and/or increasing social opportunities, these families who are using their lake homes less than 40 days may frequent the community more often. This could heighten the economic impact of Eagle Lake.

As is addressed more fully in the larger Town of Dover/Eagle Lake Community Survey and Economic Impact Study, there is a large and rich academic literature regarding the impact water depth and water quality has on lakefront property values. This literature also continues in the area of the impact negative environmental perceptions have on valuation. It is in reflection of this literature that it is hypothesized that the current shallow nature of the lake would result in lower prices for lake property on Eagle Lake, relative to competing lake properties.

These price differences may have also resulted in widening differences in valuation over time as Eagle Lake's water level diminished.

This outcome is caused by several issues that have been well documented in the academic literature surrounding waterfront real estate. The impacts include: (a) Potential loss of functionality of piers and ability to use the piers for boating, swimming and other water activities for all or portions of the period between May and October; (b) Loss or diminishment of the ability to access the shoreline with watercraft; (c) Degradation of the appearance of the shoreline and exposure of "mud flats" under low water level conditions; (d) Reduction of the areas of navigability by larger motorized craft; (e) Exposure of rocks and other obstacles that can damage watercraft.

This report tests the hypothesis that the perceived reduction in water level caused a diminution in property value along the lake relative to what would be expected in the absence of reduction in water levels and quality. This paper recognizes that, while the water reduction is measurable, the concurrent adverse publicity is not. As a result, it is these inseparable issues that may have had an adverse impact.

THE MODEL

This paper argues that the available data indicates a change in the demand for real property on Eagle Lake has created an adverse affect on property values. This adverse affect is attributed to the management issues related to silt accumulation and top-soil run-off. This report uses longitudinal data provided by the Racine and Kenosha County Recorder of Deeds. This review divides the sales periods of the homes into two periods. The first period (the Early Epoch) lasted from 1984 to 1997. The second period (the Later Epoch) lasted from 1998 to 2007. Based on the review of this data, it appears that there has been an adverse change in the demand for lake frontage.

In recognition of the fact that most (if not all) lakefront property has appreciated over time, comparable regional lakes are included in the analysis. Since locations on lakefront are limited, there is a unique and desirable attribute associated with this type of property. These attributes, based on leisure and lifestyle, are so attractive that lakefront properties have witnessed dramatic appreciation in recent years. As a result, this analysis also includes information regarding single family home sales from 1984 to 2007 at Hooker Lake and Paddock Lake, lakes located in similar proximity to Eagle Lake. This analysis also uses assessment data from 2007 for all three lakes. The hypothesis of these tests is that the appreciation of property on Eagle Lake has not kept up with the appreciation of property on the alternative lakes.

This model uses hedonic analysis to determine the change in property values due to lake quality relative to properties on other lakes in the region. The hedonic approach is based on the idea that an asset is composed of a bundle of individual components, each of which has an implicit price.

The market price of the asset dwelling is the sum of the prices of the individual components. The hedonic analysis in this study is based on several assumptions. First, the value of residential property is assumed to be a function of specific measurable housing and other attributes. Second, general attributes such as rural amenities on the urban fringe in southeastern Wisconsin are present for all of the properties included in our analysis. Third, we assert that one identifiable difference between the valuation of lakefront properties on Eagle Lake versus other nearby lakes between 1984 and 2007 is Eagle Lake's continuing negative change in water quality and accompanying reputation effect.

The development of the model recognizes the internal and locational attributes of lakefront real estate. Internal attributes include such characteristics as bathrooms, bedrooms, square feet, etc. The individual lake provides a key locational characteristic. Changes in the demand for any of these attributes can affect the overall demand for the given housing unit. And sometimes increases in the demand for some attributes can mask decreases in the demand for other attributes. For example, if the demand for a particular locational attribute, such as proximity to Eagle Lake, decreases, but the demands for all other attributes happen to increase, the sum of the increased demand outweighs the decrease in demand for the single attribute. Thus, neither a change in the demand for a particular attribute, nor the magnitude of that change, can be determined by analyzing the demand for a housing unit as a whole. However, this does not mean that the decreased demand for the single attribute, in this case proximity to Eagle Lake, was not real and significant. Had demand for that single attribute held steady or even

increased, the demand for the entire unit would have experienced an even greater increase.

For the purposes of determining whether a change in the character of an environmental amenity results in a change in demand for housing units for which proximity to that amenity is an attribute, it is necessary to isolate the particular characteristic of the housing unit that is most closely related to the environmental amenity. In this case the measurable characteristic of housing units around Eagle Lake which is most closely related to the character of the environmental amenity is shoreline frontage. In other words, changes in demand for proximity to Eagle Lake are indicated by changes in demand for Eagle Lake's shoreline frontage. By isolating the demand for shoreline frontage at housing units along Eagle Lake, and changes thereto, from the demand for other attributes of housing units, such as demand for the interior attributes of houses around the lake indicates whether changes in the character of Eagle Lake have an effect on demand for housing units.

MODEL RESULTS

Sales price information comes from the Recorder of Deeds offices in Racine and Kenosha Counties.

Register of Deeds Data

A static analysis would appear to contradict the hypothesis that the properties on Eagle Lake have been harmed by a real or perceived decline in lake level. A simple evaluation of prices of properties on the three lakes could be interpreted such that properties on Eagle Lake are more valuable. However, the first question addressed the question of whether lake front frontage was priced

differently on the three lakes. This question was answered in the affirmative. The second question confronted in this report is whether property on Eagle Lake has suffered in value relative to other lake property in the region.

Once again, a hedonic equation was developed using similar variables to that in the Assessor's equation. However, this equation used data obtained from the register of deeds regarding the actual sales prices. These prices were then normalized, by eliminating inflation by using the 1984 price level as the base year. Using 60 feet of frontage as a guide, it was determined that Eagle Lake's lake frontage value exceeded both Hooker and Paddock Lakes. However, over time, this price advantage has diminished considerably. In regards to this question, using the point estimates created

by the regression, it is clear that the properties on Paddock Lake have appreciated by 527 percent between the two epochs (controlled for inflation). During this same time frame, lakefront property on Hooker Lake (once again using 60 feet of frontage as a guide) has risen by 1,034 percent. However, properties on Eagle Lake have only risen by 388 percent.

The impact of this result is that while Eagle Lake continues to have higher lakefront valuations, Paddock and Hooker Lakes are making great strides in catching up. The failure of the properties at Eagle Lake to appreciate to the same degree as their counterparts at Paddock and Hooker Lakes results in a significant adverse economic impact to the Eagle Lake region.

FIGURE 1: LAKEFRONT VALUE APPRECIATION

Early Epoch: 1985-1996 Late Epoch: 1997-2007

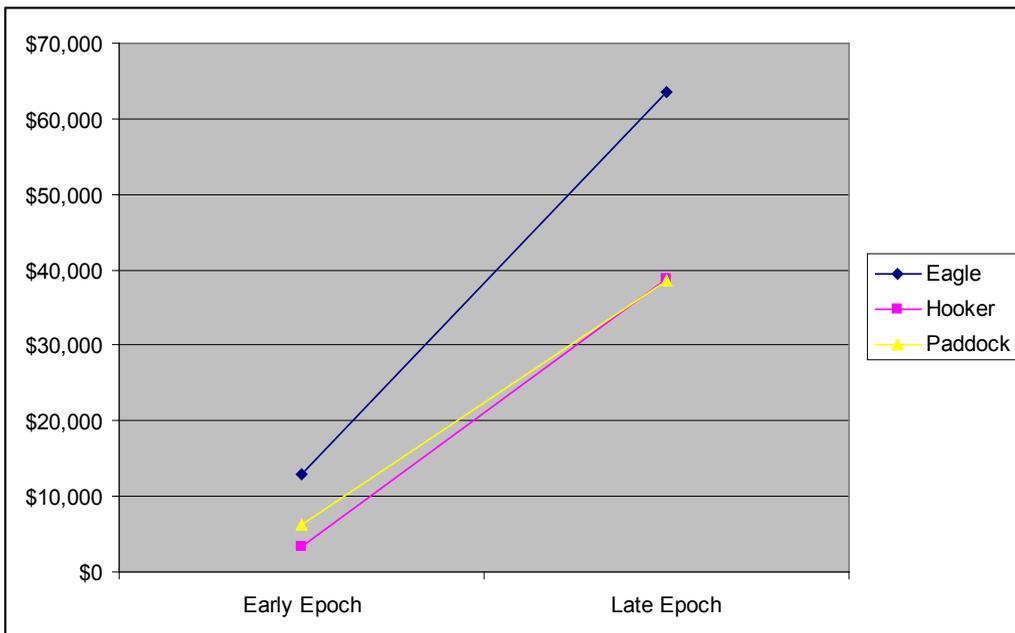
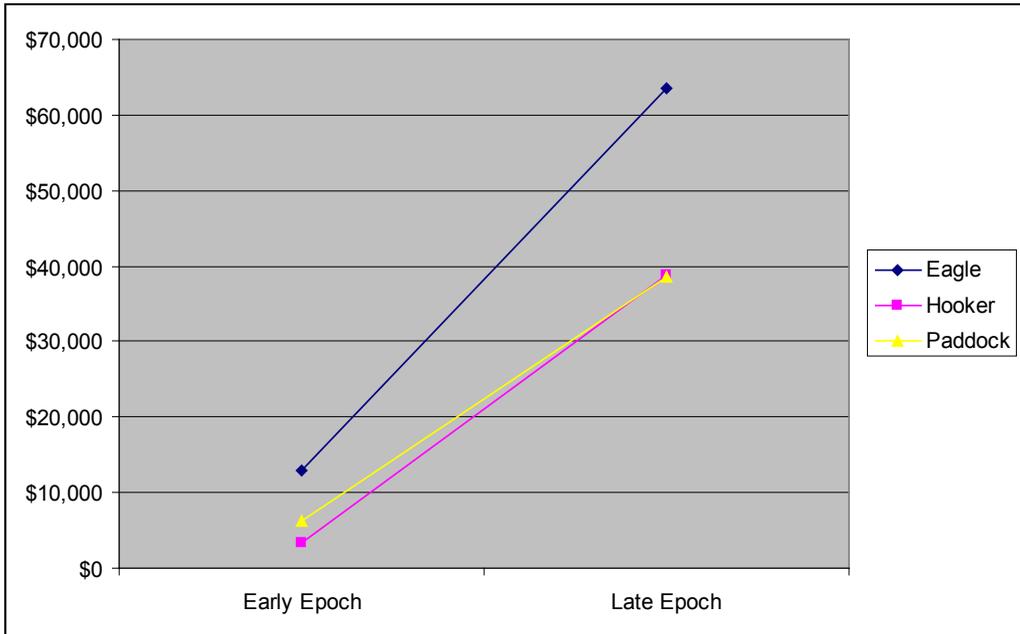


FIGURE 2: LAKEFRONT VALUE APPRECIATION

Early Epoch: 1985-1996 Late Epoch: 1997-2007



Had the properties on Eagle Lake kept pace with their counterparts, they would have witnessed an additional average inflation adjusted appreciation of \$37,937. (or \$73,635 in current dollars). Considering that there are 208 residences on Eagle Lake, this translates into a current aggregate loss of wealth to the community from homes that have associated lake frontage of almost \$15.316 million in 2007 dollars.

CONCLUSIONS TO HEDONIC ANALYSIS

This research uses hedonic analysis to evaluate the effect of the perceived and real environmental degradation has had on property values on Eagle Lake. The analysis shows that this event resulted in financial harm to the homeowners and the community that is dependent on their wealth as a tax base. The research also confirms that the below market returns on Eagle Lake are attributable to this objective event and the subjective public knowledge. As with any

³ Eagle high represents projected value at the end of late epoch had Eagle Lake lakefront access and frontlake appreciated at the same rate as Hooker Lake property.

⁴ Eagle low represents projected value had Eagle Lake property appreciated at the same rate as Paddock Lake.

empirical analysis, hedonic studies are vulnerable to the omitted variable bias. It is important to reflect on the idea that, due to Paddock Lakes initial lower prices and value, prices are converging. However, this paper builds upon the recognized theoretical link between property values and the changes in water level.

This analysis suggests that, in the absence of the water level and quality decline, market forces would have lead to a higher appreciation of real property values on Eagle Lake. By and large, the coefficients of the hedonic regression have the expected signs and magnitudes. The coefficients on the housing characteristic variables all have the anticipated sign: basement size, living space, number of bathrooms, and size of an attached garage are all positive and significant. In addition, the time indicator variables evolve from negative to positive due to the overall inflationary pressures on home values, thus indicating the general appreciation of property over time. Finally, the conclusion is robust in that it continues to hold after controlling for unmeasured, underlying factors that vary, such as unique market conditions.

As explained in the literature review, there is a theoretical link between property values and changing environmental amenities generally, and lake levels in particular. Together, the theory and empirical evidence support the hypothesis that changing lake water levels influence shoreline values on Eagle Lake. In this study, the decline in water levels at Eagle Lake and the public's knowledge of this situation caused a substantial change in demand that contributed to a significant decrease in shoreline property values.

Implications of Hedonic Analysis

This research uses hedonic analysis to evaluate the effect of the perceived or real degradation of Eagle Lake on property values. We show that this has produced financial damages to the homeowners with lake frontage. Our analysis demonstrates that the below market returns on Eagle Lake properties is attributable to lake quality degradation and the corresponding reputation effect.

In 2007, there were 208 developed properties with shoreline on Eagle Lake. This translates into an aggregate loss in valuation of over \$15.316 million. This is a reduction of the real wealth of Racine County, Wisconsin, and it is important to note that this also results in a redistribution of property tax burden within the community. In 2007, the equalized value of all property in the Town of Dover was \$436 million, which generated \$1,304,116 in Township property tax revenues⁵. Assuming that the Township operates efficiently and there are no areas in which to trim the budget, had the lake properties appreciated the projected \$15.316 million, property tax rates could have been lower than they are. In aggregate, we estimate that the mil rate for the Town of Dover property owner would have been \$0.12 lower had the degradation not occurred, which generates a tax increase on a \$200,000 property of \$24. Of course, this effect repeats itself at the county and school district levels. This analysis also excludes any reduction in the State of Wisconsin and the Vocation Technical College portion of the property tax, but we note that if portions were to be included, the tax savings estimate would be slightly higher.

⁵ Note that due to the Use Value Taxation of Farmland, this number is slightly different from the Town's Budget. However, the results that evolve from this calculation are similar.

One final consideration in regards to tax revenues and Eagle Lake is the lake property owners contribution to the Town's budget. One of the features lake properties offer semi-rural communities, such as Dover, is an area of dense development. Although the lake itself is undeveloped, the land around it is valuable and the development is dense. In the case of the Town of Dover, the lake itself encompasses about 500 acres. Given the density of the properties surrounding the lake, it is reasonable to estimate that the area of the lake and the houses surrounding the lake does not exceed 1.5 square mile (960 acres). If we consider that Dover is a township of 35.4 square mile, this leaves about 34 miles for all other development.

This new model assumes two features. First, without the lake, the 1.5 square miles would develop similar to the rest of the town. Second, this area would develop into residential real estate, rather than commercial or industrial. While commercial and industrial would assess at a higher rate, the marginal gain would be small.

By removing the lake properties from the tax roll, we find that the aggregate assessed value of all remaining residential real estate falls from \$183,400 to \$175,400. In addition, density falls in this new 1.5 square mile region, such that the density of the remainder of town becomes 50 residences per square mile. Currently 208 residences occupy the 1.5 acres surrounding and including the lake.

Given this new regime, the aggregate assessed value of this area (75 houses on 1.5 square mile with an average value of \$175,400) will be \$13,156,338 rather than the \$49,237,500 produced through the properties association with the lake. This reduction of Equalized value for the

community of over \$36 million would reduce the aggregate equalized value of the Town by a full 10 percent. This would require the town to either change the level or quality of services offered or increase the mil rate for the town in general.

III. EAGLE LAKE: THE IMPACT OF PART TIME RESIDENTS ON THE RACINE COUNTY ECONOMY

Expenditure Patterns of Eagle Lake Property Owners

One of the features of the public policy survey explored the spending patterns of part time residents. The survey asked all respondents to report "the amount your family spends in the Racine area (as opposed to other counties) on the items listed below over the course of the average year." This question was followed by a list of eleven separate expenditure categories. Ultimately, through the use of IMPLAN, these questions offer insight into the economic impact of the casual or part time visitor to the region.

The initial results from this survey question, by expenditure category, are shown in Table 3.1. The largest mean expenditure is for the category "Construction and remodeling." The average respondent stated that they spent \$11,997 over the course of an average year. The part time lake residents exceeded this average by spending \$13,024 over the course of the average year. These large mean values may be somewhat surprising at first glance, but it indicates the relative importance of this type of spending by Town of Dover Lake residents. Out of 944 respondents, 649 (68.75 percent) responded that they had incurred some expenses on remodeling/construction in the Racine County area.

TABLE 2: AVERAGE EXPENDITURE BY ALL RESPONDENTS (PART-TIME LAKE RESIDENTS) PER YEAR ON:

Construction/remodeling	\$11,997	(\$13,024)
Bait/tackle	74	(59)
Launch Fees	42	(20)
Dining Out	1,060	(1,186)
Entertainment	490	(541)
Groceries/Liquor	2,812	(2,314)
Gas	2,145	(1,265)
Shopping-General	1,492	(1,087)
Shopping-Tourism	245	(275)
Licenses	170	(147)
Medicare	1,007	(272)
Live Theater	18	(17)
Other	551	(374)

The second largest expenditure category was “Groceries and liquor” (mean = \$2,811 yr). Following that in order of importance were “Dining out” (mean = \$1,543), “Shopping – general” (mean = \$1,060), and “Gas/oil for vehicles/boats” (\$2,145). The mean expenditure data included in Table 4.1 represent our best estimates of the annual average direct expenditures per family among Town of Dover property owners. Direct expenditure numbers are only the starting point, however, for estimating the total economic impact from Town of Dover resident spending.

Due to the fact that all communities have residents who spend money at the grocery store, the gas station and the hardware store, this study focuses on the marginal dollars brought in by the part time property owner on Eagle Lake.

This money differentiates the community from the more traditional urban fringe township in southeastern Wisconsin. By looking specifically at their spending patterns, we can see the impact created by the monies they move from their primary community to their week-end or part-time community. Our IMPLAN analysis (an input-output analysis) does not simply look at the effect created by these parties, but extends into the indirect and induced impacts of this spending. This is because a portion of these direct expenditures generates income for Racine County area businesses, and in turn a portion of this income is spent on labor and other inputs in the Racine County area.

This spending provides the owners of resources (individuals who supply time and labor; land owners; etc.) with additional income, a portion of which is spent on further goods and services in the Racine County area in a second round of spending. This continuing chain of spending and income, which must be modeled in order to estimate total economic impact of the part time resident, is described in greater detail in Section 5. While this study does not reach back to the original spending data, we assume that all full time residents will spend money and are the basis of the primary economy, it is possible to further explore economic impact by adding the primary impact of the full time residents to the total economic impact of the part time resident.

Input/Output Analysis

The impact of receipts and expenditures of the part time resident attracted to Eagle Lake is felt throughout the entire local economy. Mortgage payments, grocery bills, and new cars are all affected by expenditures made by property owners as well as lake visitors. As a result, the revenue of banks, supermarkets, car dealers, etc...

are affected by these expenditures. The linkages between sectors within the regional economy can be measured using multipliers. While we use three types of multipliers in this analysis, we present a brief explanation of one (the expenditure multiplier) to illustrate this concept. Multipliers are composed of direct, indirect, and induced effects. The direct effect occurs in the first round through the direct expenditures of households and visitors. The indirect and induced effects focus on how the direct expenditures cause a ripple effect, which lead to additional spending in other sectors of the economy.

The induced multiplier effect is generated from the proportion of total expenditures spent by property owners and visitors in Racine County. On the other hand, any expenditures incurred outside Racine County is a leakage. Leakages are defined as a flow of dollars leaving the community as residents spend money in other communities. Analysts use the multiplier to describe and quantify the relationships, or linkages, between a region's various economic entities within. Multipliers describe these relationships using several different economic indicators such as industry output, personal income, and employment. This study uses the three indicators most commonly used in economic impact analysis: total expenditure, employment, and personal income.

Total expenditures provide a measure of total economic activity that is occurring within a specific sector as well as how it relates to total economic activity in the region. Similarly, employment estimates provide an evaluation of the number of jobs in a sector or specified sub-sector of the economy. Finally, personal income, defined as the wages, profits and other types of earned income, provides an indication of employee earnings attributable to a particular sector of the economy.

Economic Impact Analysis

One key objective of this report is to quantify the importance of the presence of Eagle Lake to the local economy. Due to the interrelationships between different sectors of an economy we must consider how the tourism sector (the part time resident) is linked to the rest of the economy. Importantly, we must quantify not only the direct economic impact of Eagle Lake part time resident, but also the indirect and induced effects. However, not all household spending occurs in the defined region. We must take into consideration a leakage such as this. When a portion of these expenditures is made in the region a multiplier effect occurs: Household spending part time residents stimulate additional spending in the local economy. Input output analysis enables us to capture the linkages between the tourism sector and the rest of the local economy. It does so by using regional data to generate multipliers, which are used to quantify the relationships between firms and households. In this context, we will use the multipliers to estimate the total economic impact of households and visitors coming to the region because of Eagle Lake.

The software used to conduct the input-output analysis is IMPLANPro. Appendix D provides a more detailed description of IMPLANPro and input-output analysis. While other software packages can be used to conduct this type of analysis, IMPLANPro was chosen because of its flexibility, modeling capability, ease of data management and interpreting impact analysis results. IMPLANPro utilizes secondary county-level (for Racine County) data such as economic output, employment, and personal income for the year 2006 obtained from published sources such as the Bureau of Census, the Bureau of Labor Statistics, and Regional Economic Information Systems (REIS).

Results

As shown in Table 3, Eagle Lake is an important component of the local economy. The presence and economic activity of the part time residents is an important contributor to the overall economy of Racine County⁶. It is critical to recognize that Eagle Lake is a small lake; yet it is a positive force in the economy. In total, economic activity associated with property owner spending results in about 56 jobs and \$1.84 million in labor income.

The economic impact provides insight and an opportunity to the community. In the Community Survey, it was determined that 40 percent of the lake residents used their homes fewer than 40 days per year. While this may be a reflection of the busy lifestyle and demands on time these families have, it is not unreasonable for the community to strive for greater participation by this under utilized group. Since the IMPLAN numbers only evaluate these part time residents, increasing the time they spend in the Town of Dover could offer some economic stimulus to Racine County.

Prior research has shown that improving water quality is a cause for part time lake owners to use their property more. In the publication “What Is the Value of a Clean and Healthy Lake to a Local Community?”, the Fiscal and Economic Research it was determined that in response to the control of Eurasian watermilfoil part time residents on Delavan Lake would increase their use of their lake property by 5.12 percent. This would result in an increase in labor income by over ninety five thousand dollars and an additional 2.9 jobs. In contrast, this study also found that a decline in water quality would result in a decline in usage by 2.17 percent.

Conclusion

The preceding analysis demonstrates that Eagle Lake plays a vital role in the regional economy. Importantly, it also links economic activity with lake water quality and water level. The analysis indicates that both the demand for property and spending patterns by suffer in response to these negative factors.

TABLE 3: ECONOMIC IMPACT OF EAGLE LAKE ON LOCAL ECONOMY
Input-Output Table 8
Part Time Lake Property Owners Spending

	Direct	Indirect	Induced	Total Impact
Expenditures	\$2,524,371	\$336,804	\$819,347	\$3,680,819
Labor Income	\$1,483,826	\$127,160	\$263,505	\$1,874,490
Employment	44.0	3.8	8.5	56.3

⁶ Once again, this analysis is limited to part time residents. If we add the full time residents, lake visitors (people who visit the lake to fish or boat), and visitors to the County Park the impact is greater.

Major findings of this study include the following:

- *Part Time Residents within the Eagle Lake Sewer District spend significant amounts of money in Racine County. The property owner survey implemented under this study shows that the average household spends about \$21,000 per year in the Dover area in the 12 Annual aggregate spending classifications by all the part time households is estimated to be approximately \$2.5 million.*
- *The sum of direct, indirect, and induced spending as a result of the existence of Part Time Resident on Eagle Lake is estimated to be in the range of \$3.7 million per year. In total, direct spending as a result of the presence of Eagle Lake is about \$2.5 million annually. Using input-output analysis we find that this direct spending results in an additional \$1.2 million of indirect/induced spending, for a total of \$3.7 million. We also estimate that 56 jobs are generated from these expenditures.*
- *A decline in water quality (increased algae, reduced water clarity and reduced depth) has had an impact on the demand for Eagle Lake real estate relative to competing lakes. After controlling for other factors that influence changes in property values over time, actual and perceived lake degradation has had a negative financial impact on lake property owners. While Eagle Lake property owners have witnessed an inflation adjusted return of over 380 percent, this is significantly lower than the point estimates of the returns on Hooker (which saw an increase of over 1000 percent) and Paddock Lakes (which had an increase of 550 percent). This translates into an aggregate loss in potential valuation of over \$15 million.*

The findings of this study support the conclusion that Eagle Lake is a crucial component to the financial, physical, environmental, and social fabric of the region. Eagle Lake affects not only the quality of life for local residents, but also has regional economic implications. Based on our analysis, we conclude that lake management policies can and do have important economic and public finance implications. In particular, results of the hedonic study show that an Eagle Lake restoration project can generate substantial increases in lakefront property values. Further, we demonstrate that this increase not only benefits lake property owners, but the community as a whole via reduced tax burdens on non-lakefront properties. The input-output analysis also illustrates the link between Eagle Lake and lake water quality and the local economy.

Eagle Lake and the Town of Dover are currently at crossroads. It should be recognized that effective management of this valuable natural resource must continue to include the participation of multiple levels of government. A coordinated and informed consortium of governmental units could implement effective policies to guide development in the areas surrounding the lake and the drainage basin, which could yield high returns in terms of maintaining and improving lake quality. This study shows clearly the connection between lake quality, the property tax base, and local economic activity. We hope that this research serves as a catalyst for renewed interest in intergovernmental cooperation and a review (and if necessary the augmentation) of the watershed management plan for the mutual benefit of all stakeholders in the region.

