ASSESSING POTENTIAL ECONOMIC AND ECOLOGICAL IMPACTS OF REMOVING THE INDIANFORD DAM

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Assessing potential economic and ecological impacts of removing the Indianford Dam

Collaborative and applied research sponsored by Rock and Jefferson Counties

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Executive Summary

A nine-month study was undertaken to estimate impacts of changes in the Lake Koshkonong watercourse on local tourism, property values, and environmental characteristics. The study, with three specific purposes, was requested jointly by Rock and Jefferson Counties. In this study, we have assessed a series of likely impacts that could occur if the Indianford Dam were to be removed and the lake and river system were allowed to return to their “native” course. Our economic assessment was limited to use value impacts of reducing water levels on the lake by three feet. These took the form of change occurring to property values of residential parcels located within ½ mile of Lake Koshkonong and local businesses reliant on lake-based recreation.

Both primary and secondary data were used to assess residential parcel values and local tourism business activity. Specifically, this analysis relied on property tax assessments and equalized values specific to the towns of Albion, Milton, Sumner, and Koshkonong. Focus group interviews and related research found elsewhere were used to estimate property value impacts associated with changes in the Lake Koshkonong watercourse. Local tourism sensitive businesses were assessed using available secondary data sources combined with focus groups interviews and windshield surveys of the region. Again, research results available elsewhere were applied to differentiate local demands from tourism demands.

Characteristics of the Lake — Key Findings:

- Removal of the dam will cause water levels on the current Lake Koshkonong to decline by approximately 3 feet during a normal, summer flow condition.

- While the statutory ordinary high water mark would remain roughly the same as it is today, water levels are anticipated to fluctuate more widely than they do currently as a result of dam removal.

- Dam removal would likely create new wetland areas consisting of diverse vegetation including grasses, sedges, rushes, cattails, wild rice and other marsh plants.

- The type of resulting wetland could be characterized as an “emergent vegetation” wetland type, and would include seasonally flooded basins or flats, inland fresh meadows, and inland fresh marshes.

Potential Local Real Estate Market Value Changes — Key Findings:

- A 3-foot decline in the water level on Lake Koshkonong is estimated to negatively impact local property values by roughly $23 million. The distribution of this value decline is estimated as follows:
  - Town of Sumner (Jefferson County); 65 percent of total decline; roughly $15.1 million.
  - Town of Koshkonong (Jefferson County); 19 percent of total decline; roughly $4.5 million.
  - Town of Milton (Rock County); 11 percent of total decline; roughly $2.6 million.
  - Town of Albion (Dane County); 5 percent of total decline; roughly $1 million.

- Results suggest that local units of government could initially lose about $470,000 in annual property tax revenues, roughly allocated following the percentages above.
Local Tourism Impacts — Key Findings:

- A decline of three feet on the lake would translate into a loss of business for those firms catering to motor boating and other businesses that rely, at least partially, on the lake for their customer base such as restaurants, taverns, and campgrounds.

- The assessment assumed that tourism-sensitive retail and service sector businesses in close proximity to the lake that rely on water-based recreation as a primary customer base would shut down.

- Those retail and service businesses that are less reliant on water-based recreation would adapt and change, but remain in business.

- Tourism-sensitive retail accounts for roughly $45 million in gross sales. These sales support almost 1,000 total jobs (not FTE's). Tourism-sensitive real estate and service sector sales amount to almost $12 million supporting a total of just under 200 total jobs.

- The impact of dam removal on local retail businesses would amount to an estimated annual loss of $5.25 million in gross retail sales that support roughly 200 total jobs.

- The impact of dam removal on real estate and service sector businesses would amount to a decline of roughly $9 million in gross sales that support an estimated 150 total jobs.

Conclusions:

Results of this study suggest that both residential property values and local tourism sensitive businesses would experience declines in use value in the short-term. Furthermore, changes in water levels on Lake Koshkonong could be expected to affect local tourism incidence.

This report focuses on tangible impacts of dam removal to local interest groups in the short-term. Intangible values associated with potential ecological benefits could be significant and affect a broader set of stakeholders. Our assessment did not address the broader societal benefits of environmental change. These benefits could include the value of streambed rehabilitation, water quality improvement, fishery habitat improvement, and the importance society places on the presence of more native landscapes. Finally, our assessment was limited to the short-term. We made no attempt to characterize the long-term impacts of dam removal on either property values or tourism. Incorporating change in the type of local tourism or alternative motivations for owning adjacent properties were beyond the scope of this assessment and could imply alternative policy recommendations.

Certainly, changes in the quality and quantity of environmental resources available in a local area have impacts on the economic structure of nearby communities. Public policies that address environmental issues have consequences to local, regional, and larger scale constituents. Again, our assessment of local use value impacts only begins to address these important policy questions and consequences.
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Assessing potential economic and ecological impacts of removing the Indianford Dam

Chapter 1. Introduction and Research Overview

Water and wetland resources provide important natural amenities that draw people into a region for recreational purposes and create premiums for adjoining residential properties. In addition to providing societal benefits such as ecosystem function and aesthetic landscapes, these resources create recreational opportunities and natural amenities that lead to market-based economic benefits that accrue to the local economy. Changes in wetland characteristics affect these economic benefits. Thus, examining the economic impacts of alternatives represents an increasingly important component of public policy development.

Lake Koshkonong as outlined in Figure 1 is a 10,400 acre lake located in Southeastern Wisconsin. Combined with the connecting Rock River, this water system is one example of an important water resource that has a significant economic importance to surrounding communities. Rock County owns the Indianford Dam which, in large part, maintains Lake Koshkonong at its present levels. The dam is in a state of structural decline. The Wisconsin Department of Natural Resources has mandated the county to either repair the dam or remove it altogether. The Rock County Board of Supervisors must select one of these options and then find the money to implement the solution they support. Making needed repairs to the existing dam would maintain the current water levels of the lake and continue to support current levels of water-based recreational use. Removing the dam would return the land to a more original state that some claim would result in water quality and ecosystem function benefits. Some claim that dam removal would reduce the lake's ability to support water-based recreational uses.

This report outlines a nine month applied research project initiated and funded by the county governments of Rock and Jefferson counties through local University of Wisconsin - Extension contacts. It is organized into four additional sections that clearly outline (1) purpose and scope of the research, (2) methods employed, (3) results, and (4) caveats, policy implications, and further research needs.
Figure 1.1. Political/administrative map of Lake Koshkonong and surrounding region (adapted from Microsoft Expedia Streets 98).
Purpose

This applied study attempts to more clearly identify the economic consequences of the two alternatives relevant to the Lake Koshkonong situation. Specifically, our research interests can be summarized into three basic purposes as specified by Rock and Jefferson County officials:

1. Estimating the economic value of tourism from retaining the Indianford Dam, and from having the dam removed.

2. Estimating the potential market value change of property fronting Lake Koshkonong if the dam is removed.

3. Determining what the Lake Koshkonong ecosystem would look like if the dam were removed. The focus of this assessment includes both physical and environmental aspects.

Statement of Scope

This applied study combined secondary data on business activity and real estate values with three focus group interviews and numerous personal interviews.

The first two purposes require the documentation of the current situation. We used secondary data confirmed through windshield surveys and one-on-one interviews with local business owners in estimating the extent of local business activity attributable to water-based recreational use. We then looked at a current assessment of residential property values using property tax records and transactions data, confirmed using a focus group process of property tax assessors and real estate professionals. In assessing the physical effect of dam removal, analysis and conclusions for this third purpose were based on results of the focus group process related to physical and environmental change.

Given a general lack of primary data, we limit our tourism and real estate assessment of dam removal impacts to a ranking of specific sites in the area with respect to anticipated changes in use. Residential property value changes were adjusted based on results of recent comparable research conducted in Minnesota. This research
measured changes in property value to correspond with distance of the home from alternative types of wetland. A focus group interview conducted with local real estate professionals was also important in estimating property value impacts resulting from dam removal.

Brief Literature Review

During the past 10 years, there has been a growing movement to remove aging dams throughout the United States and return watercourses to more "original," or "natural," conditions. A good overview of this movement that provides the rational for removing dams as a strategy for restoring river systems can be found in Pyle (1995). In addition to dam maintenance costs, the primary impetus for these efforts focus on benefits to biotic diversity and ecosystem function. There is a growing amount of evidence to suggest that dam removal can have a dramatic impact on wetland habitat, water quality, fisheries potential, and biotic integrity (Kanehl, Lyons, and Nelson 1997; Raibley et al 1997). As a matter of fact, because of these benefits, many small dams throughout Wisconsin have been, or are in the process of being, removed. Wisconsin is looked at as a national leader in small dam removals (Born et al 1998).

The socioeconomic aspects of dam removals have not had as much attention paid to them in the literature (ibid). In part, this is due to the nature of economic benefits derived from environmental change. Much of what people value about environmental change is not represented by typical economic assessments. This is due to the simple notion that many environmental goods and services are not traded in the marketplace. These so-called "nonmarket" benefits present difficulties to the empirical study of socioeconomic implications associated with dam removals. Also, the lack of literature can also be explained by the relative "newness" of (1) the debate, (2) methodological advances in resource economics and (3) the difficulties associated with valuing nonmarket benefits.

Direct use value impacts of environmental change on tourism and residential real estate are the specific interests of this study. There is a growing literature that helps us understand these effects. For instance, work on the value of lakes to residential property values have been forwarded using statistical modeling by Lansford and Jones (1995; 1996) and others. These so called "hedonic" models attempt to explain property values as they relate to distance of homes from lakes. Specifically, the impact of alternative wetland types on residential property values has been studied in Minnesota.
by Doss and Taff (1996). This latter study provides usable relative impacts that can be applied to the Lake Koshkonong situation.

To our knowledge, the specific issue associated with dam removal and impact on tourism has not been addressed in the literature. Tourism impact assessment that focuses on business activity, however, has been addressed in the literature. Johnson and Thomas (1990) outline two methods of tracking employment and output levels associated with tourism. The first of these is the expenditure method that identifies ratios used to derive employment figures from expenditure data. This method provides the closest approximation of employment directly attributable to tourists since base data are tourist expenditures. Limitations to this approach include the need for data that represents tourism demand.

A second employment tracking technique is the employment count method that identifies employment in tourism-related industries as identified by specific SIC categories and relies upon count data from firms. The benefits of this method are that counts agree with standard reporting sources. Limitations of this method include the inability to separate sales that are resident driven from those driven by tourists. This limitation is alleviated, somewhat, by identification, or assignment, of tourism-sensitive business sectors. Others have studied employment in tourism using this employment count method (Brown and Connelly 1986; Johnson and Moore 1993) and identified benefits from using data that is regularly published by stable sources. These benefits speak toward the ability to track tourism employment over time, particularly throughout the various seasons of the year. Furthermore, regularly published secondary data allows researchers to track tourism-sensitive sectors over time.

Given budgetary considerations and scale of analysis, the approach of looking at tourism employment and sales information for "tourism-sensitive" business sectors will be used in our study of the Lake Koshkonong tourism sector. More detail on the specific research methods is found in the next chapter.
Chapter 2. Research Methods

Data Sources

Our conclusions are based on the collection and analysis of both primary and secondary data. The primary data was collected through a series of focus group interviews. These were conducted between March and August of 1999 with natural resource professionals, real estate interests, and local business owners. Also, a series of drive throughs and one-on-one interviews was conducted during July and August of 1999. Secondary data on relevant local business activity included 1998 American Business Institute (ABI) datasets on retail and service sector activity cross-referenced with U.S. Department of Commerce data (ES-202). Local property values were identified using 1998 property tax assessments from Rock, Jefferson, and Dane Counties and adjusted to market values using 1996, 1997, and 1998 equalization data from the State of Wisconsin, Bureau of Equalization.

Primary Data:

Focus Groups. A "focus group" is a carefully planned, informal, small group discussion. It is designed to collect information by getting participants to talk about their ideas and perceptions of a specific topic or issue. Three separate focus groups were conducted to collect information specific to the Indianford Dam/Lake Koshkonong situation. The intent of these focus groups was to (1) obtain a broad contextual basis upon which to assess the validity of secondary data and (2) obtain insights into the effects of dam removal from knowledgeable sources. Our approach in developing, conducting, and analyzing this contextual data relied heavily on the focus group approach as outlined in Stewart and Shamdasani (1990), Krueger (1994), Morgan (1988) and Templeton (1987).

The first focus group involved natural resource professionals familiar with the Lake Koshkonong and Indianford Dam situation. This focus group involved eight locally-based land and water managers including four from the Wisconsin Department of Natural Resources, one from the U.S. Geological Survey, two from county parks departments, and a private individual familiar with lake depths. Our intent with selection of participants was to have a range of resource disciplines involved in the discussion. Our subject interests ranged from aquatic vegetation and fisheries
management to hydrogeologic and limnological issues. Our primary questions to these people involved their knowledge of the lake system and their estimation of specific changes in the Lake Koshkonong system that could be expected were the Indianford Dam to be removed. Specifically, we were interested in water levels, the types of vegetation that would evolve on the newly created landforms, and the affect of changing water levels on wildlife and fishery populations. Furthermore, we had a brief discussion about the potential change in recreational use given declining lake levels.

The second focus group was conducted with people involved in the local real estate market including both assessors and realtors. In addition to the University researchers, there were three people involved. These included a real estate appraiser with offices in Janesville who works with lakefront properties, a realtor from Edgerton with 20 years of experience, and a real estate appraiser from Fort Atkinson with 20 years of experience in the Lake Koshkonong region. The questions raised in this focus group provided insight into the disparities between assessed values and transaction values of lakefront properties, components of lakefront property value, current values of lakefront property, trends in lakefront real estate, and their perception of change in real estate value that would be anticipated were changes to occur in water levels. Our intent in choosing individuals for this focus group was not necessarily to generate unbiased information about dam removal ... we realize that Realtors and, to some extent, residential property appraisers, have monetary self-interests at stake. With this focus group, we were interested in pursuing contextual information that could assess the current market structure for local residential lakefront properties and provide some ability to compare and use secondary data and inferences from appropriate statistical models.

The third focus group looked at the local retail and service business situation and included nine owners or managers of specific firms involved in the restaurant, hotels/overnight accommodations, marina, gift shop, gas/convenience stores, and grocery retail sectors. The questions raised in this focus group dealt with the level and characteristics of customer demand, importance of the lake as a primary motivating presence for people in the region, and the perceptions regarding impact of fluctuating water levels on business activity. Once again, we realized the obvious financial self-

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1 It should be noted that there were eight people originally invited to the meeting. Even though only three local stakeholders were involved, we believe the discussion was sufficiently detailed and addressed each of our questions in a satisfactory fashion.
interest of individuals representing this group and sought to direct discussion to participant’s perceptions of the local tourism phenomenon and the structure of their business activities.

An analysis of focus group interviews was conducted based on responses to previously identified questions, statements, and probes. Specifically, all focus group interviews were transcribed and content analysis was performed on responses to each question posed during the focus group. Where useful, specific quotations were pulled from the transcript to substantiate focus group points. An agenda and an outline of the content analysis for each focus group is found in Appendix A (natural resource professionals, Appendix B (local real estate professionals), and Appendix C (local business owners).

Personal Interviews. A series of personal interviews was conducted during July and August of 1999 to confirm secondary data used in the analysis of retail and service sector business activity. As discussed in the next section, the analysis of business activity relies on data purchased from the American Business Institute (ABI). Key business attributes obtained from this source included (1) presence of retail and service sector businesses including street address, (2) specific Standard Industrial Classification (SIC) within which primary business activity occurs, (3) gross sales volume of specific business, and (4) number of total employees. The personal interviews were done to verify, in a gross sense, the data obtained from ABI.

Several retail and service sector businesses located within one-mile of Lake Koshkonong were identified during drive-throughs of the study area. These were businesses located primarily on the eastern and western side of the lake. With the exception of three firms, the drive-throughs located businesses that were identified in the ABI dataset. Of the businesses visited fewer than half had an owner or manager present who could be of assistance. When a manager or owner was present, they often gave “best guesses” about the employment and sales figures for their businesses. With few exceptions, results of these personal interviews generally confirmed both presence of the firm and overall size of business activity.

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2 The three businesses that were found on-the-ground but NOT found in the ABI dataset were included in the analysis. Estimates of gross sales and employment for these firms were made using information provided by personal interviews. It should be noted that there does exist a possibility that other firms could have been missed by the ABI dataset. But given the verification of the vast majority of businesses, we were satisfied that this possibility is minimal.
Secondary Data:

The secondary data assessment specific to the Lake Koshkonong region took two different forms. First, assessed values and parcel characteristics of real estate surrounding the lake were identified and analyzed. Second, firm-level data on sales and employment for retail and service sector businesses surrounding Lake Koshkonong were used to assess tourism business activity. Both of these are now discussed below.

**Residential Parcel Values.** Data on residential real estate values was obtained from Dane, Rock and Jefferson County property tax offices. This data is specific to the parcel level for private properties in which individual property taxes are assessed. During the past few years, assessed values used for tax purposes have typically lagged behind market values. In certain areas experiencing significant growth, these ratios have lagged behind market values by more than 50 percent. The analysis of waterfront property value done for this study corrected base assessed values by applying the local assessed value to transactions value ratio for the past three years. This is a process similar to the State’s equalization of value process. Given larger sample sizes, off-lake properties used only 1998 equalization ratios. These ratios are found in Table 2.1.

**Data on Tourism.** An important objective of this study was to examine what is commonly referred to as the tourism “industry.” It should be noted that tourism itself is a rather ill-defined entity. What constitutes the tourism “industry” is a matter of considerable debate for those who analyze tourism. For purposes of this study, we focused attention on retail and service sector businesses generally thought to classify themselves as tourism sensitive. These specific retail, real estate, and service sectors are identified in Table 2.2.

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3 Discrepancies between assessments and market values are common throughout Wisconsin. Indeed, local governmental units and the State of Wisconsin have an interest in maintaining the assessments at as close to market value as possible. A common measure of this discrepancy is the assessed value : transactions value ratio, which, according to state rules, should be at least .85.

4 There are other sectors that could have been included in this ad hoc assignment of what comprises the tourism industry. Examples of these sectors include residential construction, remodeling, passenger travel, and travel arrangements. Given the nature of tourism in Southern Wisconsin, however, we chose to define the tourism industry as being limited to specific retail and service sectors.
Table 2.1  Equalization ratios for residential property in proximity to Lake Koshkonong (assessed value : sales price)

<table>
<thead>
<tr>
<th>Town (County)</th>
<th>Year</th>
<th>Average assessment : sales price (ratio in %)</th>
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<tr>
<td></td>
<td></td>
<td>On-lake</td>
</tr>
<tr>
<td>Milton (Rock)</td>
<td>1998</td>
<td>84.5</td>
</tr>
<tr>
<td></td>
<td>1997</td>
<td>95.7</td>
</tr>
<tr>
<td></td>
<td>1996</td>
<td>na</td>
</tr>
<tr>
<td>Albion (Dane)</td>
<td>1998</td>
<td>na</td>
</tr>
<tr>
<td></td>
<td>1997</td>
<td>53.8</td>
</tr>
<tr>
<td></td>
<td>1996</td>
<td>95.3</td>
</tr>
<tr>
<td>Sumner (Jefferson)</td>
<td>1998</td>
<td>na</td>
</tr>
<tr>
<td>Koshkonong (Jefferson)</td>
<td>1998</td>
<td>na</td>
</tr>
<tr>
<td></td>
<td>1997</td>
<td>80.8</td>
</tr>
<tr>
<td></td>
<td>1996</td>
<td>na</td>
</tr>
</tbody>
</table>

Source: State of Wisconsin, Bureau of Equalization

Table 2.2  Assignment of business sectors included within the local tourism industry.

<table>
<thead>
<tr>
<th>Business Sector</th>
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<tbody>
<tr>
<td>Retail</td>
</tr>
<tr>
<td>Building materials</td>
</tr>
<tr>
<td>General merchandise</td>
</tr>
<tr>
<td>Food stores</td>
</tr>
<tr>
<td>Eating and drinking establishments</td>
</tr>
<tr>
<td>Gift and craft stores</td>
</tr>
<tr>
<td>Real Estate</td>
</tr>
<tr>
<td>Appraisers, managers, and developers</td>
</tr>
<tr>
<td>Real estate</td>
</tr>
<tr>
<td>Service</td>
</tr>
<tr>
<td>Lodging places and campgrounds</td>
</tr>
<tr>
<td>Amusements and recreation</td>
</tr>
</tbody>
</table>

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The distribution of regional tourism firms by distance from the lake was done using a geographic information system (GIS) database manager. Firm locations were geocoded and identified as being located within four lake distance zones. These zones included distances of ½ mile, 1 mile, 5 miles, and 10 miles away from Lake Koshkonong and the Rock River (between the city of Jefferson and Indianford dam).

Assessing the Impact of Lower Lake Koshkonong Water Levels

Real Estate:

In our assessment of real estate value, we assumed that if we controlled for lot size and type of house, residential property values experienced a premium for being adjacent to both open water and emergent vegetation wetland. In other words, all else equal, residential property values experience a decline as one moves further from the lake or wetland. This phenomenon of amenity value is supported by a growing number of studies (Lansford and Jones 1995; 1996; Doss and Taff 1996). Ultimately, the impact values of lower Lake Koshkonong water levels rely on an estimate of the difference in premiums between parcels located on open water and those located adjacent to an emergent vegetation wetland. The base value of back lot properties (those behind the first and second ring of houses directly adjoining the water body or wetland) approaches the values of surrounding regional residential properties unaffected by the lake.

A combination of methods was used to identify the impact of receding water levels and conversion of shallow waters to wetlands on residential property values. After compilation, geo-coding, and cleaning of parcel-level data, we separated “lakefront” property (parcels that include lake frontage) from off-lake parcels. These off-lake parcels were further separated into “second-tier” (those parcels immediately behind lakefront parcels) and “third tier and beyond” parcels (those parcels immediately behind second-tier parcels extending out to a rough distance of ½ mile from the lake.)

Residential developments surrounding the lake were associated with a viewshed rating. From previous research (Doss and Taff 1996), the dominant amenity attribute was a view of open water. Our viewshed rating for developments around Lake Koshkonong was based on the distance from current shorelines to anticipated year-round open water shorelines estimated to result from a 3 foot lowering of water levels. The average rough distance of approximately 300 yards and beyond was used to
indicate "full" view blocking. Roughly 100 - 300 yards, on average, was used to identify "medium" view blocking, and zero to 100 yards was used to identify "minimal" view blocking.\(^5\) It was assumed that these areas of fluctuating water levels would revert to an emergent vegetation wetland state.

Previous research conducted in Ramsey County, Minnesota assessed the effect of alternative wetland types on residential property values (Doss and Taff 1996). This research developed a hedonic regression model (a specific type of statistical model) that controlled for parcel characteristics and isolated the effect of distance to four wetland types on property values. Results of this Minnesota research allowed us to benchmark our estimates of value reduction resulting from water level decline and wetland creation. An effort was made to sample parcels surrounding Lake Koshkonong for a parcel centroid distance metric and use the Doss and Taff hedonic regression to identify causal elements that help explain property values relative to the expected lake/wetland ecosystem. This effort combined with the content analysis of the real estate focus group discussion (see Appendix B) provided confidence that the estimates used to allocate residual values were reasonable.

Once value change was estimated, fiscal impacts were identified using mill rates provided by the State of Wisconsin Department of Revenue for the towns of Albion, Milton, Sumner, and Koshkonong. These mill rates were applied to residential property value declines to generate total property tax revenue changes by town that could be expected to result from declining water levels of Lake Koshkonong.

Tourism:

Given budget constraints, we were not able to directly assess changes in tourism demand resulting from dam removal (the effect of lowering water levels on demand for water-based recreation.) Our assessment was limited to looking at local retail and service sector business activity, which represents the supply-side of tourism.

In determining the effect tourism has on regional economic activity, it should be realized that retail and service sector businesses are supported by a mixture of demands

\(^5\) There are many amenity attributes that explain property value. These include water quality, the characteristics of the lake for recreational use, presence of native vegetation, and other important aspects of the specific water body. We focus on "view of open water" in this study because of its dominance in the Ramsey County, Minnesota study done by Doss and Taff (1996). Given budget constraints, we were not able to estimate a specific hedonic regression model to explain the unique amenities provided by Lake Koshkonong.
that make up their customer base. Needless to say, an important aspect of retail and service sector business originates locally, or from within the community. In impact assessment, this locally originating customer base is NOT defined as tourism, particularly given the nature of economic impact analysis that relies on the export-base as a driver of economic growth. For this reason, our assessment of regional tourism business separated local demand from that which originates from OUTSIDE of the region. This outside-of-region demand thus served as a proxy for tourism. It was identified as a percentage of retail and service sector business attributable to tourist demand. For purposes of this analysis, we used previous research (Leatherman and Marcouiller 1996) that identified Rock and Jefferson County percentages of sectoral activity attributable to out-of-region demands.

In the absence of a survey-based recreational demand assessment, we have applied a simple reduction assumption to local tourism business activity. Based on best professional judgement combined with contextual results of the local business owner focus group (see Appendix C), we assumed that all on-lake (within 1/2 mile) retail, real estate, and service sector businesses would be completely affected and that off-lake business could adapt and remain in operation at current levels. To state the obvious, this approach provides only an educated guess at tourism impacts but is benchmarked by an upper bound of tourism-sensitive business activity within set geographical regions around Lake Koshkonong.

Assumptions and Caveats to the Approach

This study is limited in both scope and assumption. Perhaps the most obvious caveat associated with our value measures is that we limited our assessment to market-based uses accruing to local interests operating within the surrounding regional economic structure. Certainly, one could argue that there are significant benefits associated with dam removal that accrue to society as-a-whole. These typically non-local and non-market benefits are not assessed in this study.\textsuperscript{6} The analysis is limited to

\textsuperscript{6} Total economic value can be thought of as comprising both use and non-use values. This study focused solely on use values. Important examples of non-use values that were not assessed in this study include ecosystem function values, option value, existence value, and bequest value. Interested readers are referred to a set of UWEX factsheets that deal with the economic value of water (see UWEX publications G3698-1, G3698-2, G3698-3).
an assessment of market-based use benefits associated with local real estate and tourism businesses.

Another limitation of this study is that we focused solely on residential properties. In focusing solely on residential property, we didn’t provide an assessment of commercial real estate values. Commercial properties would also likely be affected by declines in both residential property values and tourism incidence. Furthermore, the scope of this study did not include an assessment of residential property values in surrounding communities; many of which could also experience some property value change.

Finally, there are many environmental, water quality, and other recreation issues associated with dams and considerations for removal of dams. However, this study is limited to the three purposes identified by the clients for the work — Jefferson and Rock Counties. In a nutshell, the analysis contained in this report focuses on tangible impacts of dam removal to local interest groups in the short-term given readily available secondary data sources. Intangible values associated with potential ecological benefits could be significant and affect a broader set of stakeholders. Our assessment did not address the broader societal benefits of environmental change. These benefits could include the value of streambed rehabilitation, water quality improvement, fishery habitat improvement, alternative recreational benefits, and the importance society places on the presence of more native landscapes. Given the study’s narrow focus, no attempt was made to characterize the long-term impacts of dam removal on either property values or tourism. Incorporating change in the type of local tourism or alternative motivations for owning adjacent properties were beyond the scope of this assessment and could imply alternative policy recommendations.
Influence of the Dam on Lake Configuration.

Lake Koshkonong is currently a 10,400 acre impoundment of the Rock River with a maximum depth of roughly 7 feet. Originally, water levels fluctuated and the region was a large wetland along a smaller area of open water and river channel. The Indianford Dam was originally constructed in 1851 to serve as a power source for a sawmill and has progressed through numerous physical changes over the past 150 years. Currently owned by Rock County, the dam maintains water levels above roughly 770 feet in elevation on upstream portions of the Rock River. A schematic that represents the elevational changes in the Rock River between the dam and the beginning of Lake Koshkonong is found in Appendix D.

It should be noted that removal of the Indianford Dam will not eliminate Lake Koshkonong. The lake is maintained at the 771 foot level by two geologic bedrock tables. The first exists roughly 4 1/2 miles upstream from the dam and is located close to the Chicago, Milwaukee, St. Paul, and Pacific Railroad Bridge. The second is found just before the lake begins a short distance upstream from the I-90 bridge (roughly 6 miles upstream from the dam).

Removal of the dam, however, will cause water levels on the current Lake Koshkonong to decline by roughly 3 feet during a normal, summer flow condition. Furthermore, water levels are anticipated to fluctuate more widely than they do currently as a result of dam removal. One measure commonly applied to lakeshores is referred to as the ordinary high water mark (OHWM). The experts that were involved in the natural resource professionals focus group generally agreed that this ordinary

**KEY FINDINGS**

- Removal of the dam will cause water levels on the current Lake Koshkonong to decline by approximately 3 feet during a normal, summer flow condition.

- While the statutory ordinary high water mark would remain roughly the same as it is today, water levels are anticipated to fluctuate more widely that they do currently as a result of dam removal.

- Dam removal would likely create new wetland areas consisting of diverse vegetation including grasses, sedges, rushes, cattails, wild rice and other marsh plants.

- The type of resulting wetland would also be characterized as an “emergent vegetation” type, and would include seasonally flooded basins or flats, inland fresh meadows, and inland fresh marshes.
high water mark would remain roughly the same as it is today. As one of our focus group participants noted:

“I don’t really think you’d see a change in the statutory ordinary high water mark at all. You would still see just as big of floods as we always have. Where I think we would see fluctuations is in that number that we would call our ordinary summer normal flow. That would vary from year to year based on whether we’re in a hydrologically wet or dry year.”

Removal of the Indianford dam would likely cause a reduction in the overall water levels of the lake during dryer months (typically during the summer). Again, according to the focus group participants, this lower water level was identified as a reduction in roughly three feet from the current normal water mark. As one of our resource professionals noted:

“In looking ... for what the lake would be like if it was ... lower, I guess I would have to throw my vote in for the (alternative map) that looks three foot lower as being ... what we could expect as more the open water situation out there.

Using recent maps of lake depth, an estimation can be made of a rough approximation of lake configuration that would result from dam removal. This new lake configuration is found in Figure 3.1.

**Impact of dam removal on lake and wetland ecology**

This reduction in water levels would have a dramatic effect on the lake and subsequent wetland ecology. In general, there was agreement among our resource professional focus group participants that changes in vegetation would occur and result in increased diversity of plant species on the newly created wetland areas. As one of the participants noted:

“... a basin that has a watershed so significantly larger that the basin (itself), (experiences) very diverse flows from very dry to very wet. Those types of wetland basins are probably the most diverse because they go through such a wide range (of water levels.) ... its when you have a dam that keeps relatively
Figure 3.1 Likely effect of removing Indianford Dam on Lake Koskonnong water levels
constant water levels that you get ... the takeover of things like cattails or more of a monotypic stand ... because we have such a wide, varying flow situation, ... the watershed that we probably would have (is) a very diverse system."

There was also general agreement among resource professional that the type of wetland that would result from dam removal would be of the "emergent vegetation" type. These wetland type include seasonally flooded basins or flats, inland fresh meadows, and inland fresh marshes. They are typically fairly open, but most of the vegetation is about the same height. They vary from being well drained during much of the growing season to having up to three feet of water. The vegetation might include grasses, sedges, rushes, and other marsh plants such as cattails and wild rice. One of the resource professionals noted:

"I don't see the tree line really expanding out into the existing wetlands much farther than what it is right now."

Another added:

"... expect to see ... emergent vegetation extend out to what we currently see as about a three foot contour."

Finally, another summed up the simple notion that we shouldn't expect the wetland to return to pre-settlement conditions:

"I think a lot of us would hope that, you know, in a best situation, the wetland would go back to some of those pre-settlement conditions, but the reality is that most of the wetlands in Jefferson County were all intact at that time. With the invention of the dragline and a few other things, virtually everything that can be drained in Jefferson County has been drained. Consequently, it's made some big changes in our annual water budget where we see most of our water com(ing) into this lake as snowmelt, and then the rest of the year, we're just begging for a little drink of water to keep things at a higher level, instead of having that continual flow like we may have seen. Consequently, I don't know if we would ever see the conditions that were referred to in some of the pre-settlement documents, where Koshkonong was described as a meadow of wild rice ... we
still have the problems of the high amounts of nutrients coming down the Rock River, various levels of unknown amounts of pesticides, herbicides, and the like, that are definitely going to throw a wrench into anything we try to do, or possibly complicate it at least, in terms of trying to establish vegetation out there."

Actual ecological impacts of dam removal and subsequent water level declines cannot be forecast without error because nobody can be sure of real change until it occurs. Also, specific restoration procedures and projects that could be implemented following dam removal have not, to the authors' knowledge, been discussed. There does exist some amount of ecological manipulation that could occur that would have a dramatic effect on ecological succession and the state of the future lake. Examples of this include riverbank and shoreline stabilization efforts, dredging, and other river/lake restoration efforts. Our assessment on the impact of dam removal to the lake and river ecosystem is limited to the likely forces of natural succession.
Chapter 4 Assessment of the Local Real Estate Market

The lake as an amenity

Lake Koshkonong provides significant additional value to adjacent properties. In addition to providing a view of water, the lake represents open space, recreational opportunities, and the perception of closeness to "nature." There is ample evidence to support this notion of amenity premiums associated with the lake. Certainly, recent empirical studies draw out these premiums (Lansford and Jones 1995; 1996 and others) which are substantiated for the local situation by participants of the focus group with real estate professionals. This anecdotal evidence is summed up nicely with the following statement made by a local realtor:

"Water, just the word ... is magic."

<table>
<thead>
<tr>
<th>KEY FINDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A 3-foot decline in the water level on Lake Koshkonong is estimated to negatively impact local property values by roughly $23 million. The distribution of this value decline is estimated as follows:</td>
</tr>
<tr>
<td>- Town of Sumner (Jefferson County); 65 percent of total decline; roughly $15.1 million.</td>
</tr>
<tr>
<td>- Town of Koshkonong (Jefferson County); 19 percent of total decline; roughly $4.5 million.</td>
</tr>
<tr>
<td>- Town of Milton (Rock County); 11 percent of total decline; roughly $2.6 million.</td>
</tr>
<tr>
<td>- Town of Albion (Dane County); 5 percent of total decline; roughly $1 million.</td>
</tr>
<tr>
<td>- Results suggest that local units of government could initially lose about $470,000 in annual property tax revenues, roughly allocated following the percentages above.</td>
</tr>
<tr>
<td>- The estimated tax revenue declines may be high for towns because of the differential between assessed value and equalized (or full) value, and the declines may be initial until the market adjusts or stabilizes to meet new market demands.</td>
</tr>
</tbody>
</table>

Identifying the determinants of residential property values around the lake is complex. Property values are comprised of much more than proximity to the lake. In an effort to identify the premium associated with the lake, it is important to control for other aspects that explain residential property value. Basic factors that contribute to residential property value include characteristics of the lot, type and size of home, presence of contributing public services (schools, roads, police, fire, etc.), proximity to workplaces, local land use regulations, and other aspects of local quality-of-life.

The premiums associated with land in proximity to the lake provide the focus for this chapter. There is strong evidence to support the claim that Lake Koshkonong
residential properties right on the water are more valuable than off-water properties. From an anecdotal perspective, a local real estate assessor stated:

"... if you had the same house ... located on-the-lake or off-the-lake, there’s a difference of about 50 percent in value."

A local realtor confirmed this and added:

"... they want to be on the water ... you gravitate outward from there and the property values decrease."

These statements generally mimic the findings from research elsewhere. Our problem, however, is not whether the lake provides a premium, rather the difference in premiums associated with property values in proximity to open water versus an emergent vegetation wetland. Our basic problem is one of identifying property value impacts when change in wetland type occurs. In an effort to put context around the available statistical models, the focus group participants, in general, confirmed previous research findings. During the interview, we probed our local real estate professionals for this difference. An assessor noted:

"... (being adjacent to a wetland) is not the same as being right on the lake but somewhere maybe a little bit above being off-the-lake."

This was confirmed and elaborated on by a local realtor:

"There’s a pretty strong market for people who do want wetlands, but it has to have a building site with it."

An exact specification of difference in premiums placed on open water or emergent vegetation wetlands is elusive. The study done in Ramsey County, Minnesota (Doss and Taff 1996), looked specifically at the differences in value between four alternative wetland types from open water to forested wetland. Overall, their study showed that view of a lake dominated the various amenity characteristics and that wetlands of any type were preferable to no wetlands due to their characteristic provision of open-space. Furthermore, scrub-shrub and open water wetlands were most highly valued while
forested and emergent vegetation wetlands were valued slightly lower. Thus, it would seem reasonable that our bounds for premium differences lie between 50 percent (off-lake) and 100 percent (no-change) of on-lake property values. Our attention now turns to secondary data on residential parcels specific to Lake Koshkonong.

**Property within ½ mile of Lake Koshkonong**

Land that is located within ½ mile of Lake Koshkonong is predominantly used for either residential purposes or open space (hunting clubs and agricultural uses). For purposes of this assessment, we focus attention on the residential uses of land. There are approximately 2,800 residential parcels that exist within ½ mile of Lake Koshkonong. These residential parcels are clustered within development locations around the lake. There are 14 identifiable residential developments surrounding the lake, most of which fall within the newly created Lake Koshkonong Lake District. These residential developments are outlined in one of the maps found in Appendix E.

Parcel-level data was separated into “lakefront” property (parcels that include lake frontage) and off-lake properties. These off-lake parcels were further separated into “second-tier” (those parcels immediately behind lakefront parcels) and “third tier and beyond” parcels (those parcels immediately behind second-tier parcels extending out to a rough distance of ½ mile from the lake). To differentiate properties that would experience major viewshed change (slight topographical gradients) from those that would have minimal impact (those with steeper topographical gradients), a rating system was applied. Major real estate developments surrounding the lake were associated with this viewshed rating. This viewshed rating for development around Lake Koshkonong was based on the distance from current shorelines to anticipated year-round open water shorelines estimated to result from a 3 foot lowering of water levels. The average rough distance of approximately 300 yards and beyond was used to indicate “full” view blocking. Roughly 100 - 300 yards, on average, was used to identify “medium” view blocking, and zero to 100 yards was used to identify “minimal” view blocking. It was assumed that these areas of fluctuating water levels would revert to an emergent vegetation wetland state. A summary of residential parcels located within ½ mile of Lake Koshkonong is found in Table 4.1.

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7 In general, there is rough overlap between the identified parcels within ½ mile and this newly created lake district. Given our ½ mile designation, however, the boundaries do not match exactly.
### Table 4.1 Residential property values with respect to distance and view of Lake Koshkonong

<table>
<thead>
<tr>
<th>View Effect</th>
<th>Lakefront</th>
<th></th>
<th></th>
<th>Second-tier</th>
<th></th>
<th></th>
<th>Third-tier &amp; beyond</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full</td>
<td>Medium</td>
<td>Minimal</td>
<td>Full</td>
<td>Medium</td>
<td>Minimal</td>
<td>Minimal</td>
<td>TOTAL</td>
</tr>
<tr>
<td>Number of Valued Parcels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Albion</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>475</td>
<td>527</td>
</tr>
<tr>
<td>- Milton</td>
<td>0</td>
<td>35</td>
<td>85</td>
<td>0</td>
<td>18</td>
<td>83</td>
<td>540</td>
<td>761</td>
</tr>
<tr>
<td>- Sumner</td>
<td>114</td>
<td>175</td>
<td>0</td>
<td>102</td>
<td>92</td>
<td>0</td>
<td>164</td>
<td>647</td>
</tr>
<tr>
<td>- Koshkonong</td>
<td>16</td>
<td>127</td>
<td>3</td>
<td>0</td>
<td>99</td>
<td>0</td>
<td>37</td>
<td>282</td>
</tr>
<tr>
<td>TOTAL</td>
<td>151</td>
<td>337</td>
<td>88</td>
<td>133</td>
<td>209</td>
<td>83</td>
<td>1216</td>
<td>2217</td>
</tr>
<tr>
<td>Average Parcel Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Albion</td>
<td>$65,236</td>
<td>na</td>
<td>na</td>
<td>$47,566</td>
<td>na</td>
<td>na</td>
<td>$33,904</td>
<td></td>
</tr>
<tr>
<td>- Milton</td>
<td>na</td>
<td>$84,317</td>
<td>$119,527</td>
<td>na</td>
<td>$49,051</td>
<td>$80,848</td>
<td>$66,544</td>
<td></td>
</tr>
<tr>
<td>- Sumner</td>
<td>$150,729</td>
<td>$116,855</td>
<td>na</td>
<td>$76,604</td>
<td>$39,262</td>
<td>na</td>
<td>$34,235</td>
<td></td>
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<tr>
<td>- Koshkonong</td>
<td>$162,350</td>
<td>$78,344</td>
<td>$96,450</td>
<td>na</td>
<td>$46,815</td>
<td>na</td>
<td>$27,606</td>
<td></td>
</tr>
<tr>
<td>Total Parcel Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>- Albion</td>
<td>$1,369,966</td>
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<td>na</td>
<td>$1,474,547</td>
<td>na</td>
<td>na</td>
<td>$16,104,430</td>
<td>$18,948,943</td>
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<tr>
<td>- Milton</td>
<td>na</td>
<td>$2,951,111</td>
<td>$10,159,778</td>
<td>na</td>
<td>$882,924</td>
<td>$6,710,409</td>
<td>$35,933,684</td>
<td>$56,637,906</td>
</tr>
<tr>
<td>- Sumner</td>
<td>$17,183,092</td>
<td>$20,449,641</td>
<td>na</td>
<td>$7,813,573</td>
<td>$3,612,139</td>
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<td>$5,614,474</td>
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<tr>
<td>- Koshkonong</td>
<td>$2,597,603</td>
<td>$9,949,716</td>
<td>$289,350</td>
<td>na</td>
<td>$4,634,690</td>
<td>na</td>
<td>$1,021,439</td>
<td>$18,492,798</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$21,150,661</td>
<td>$33,350,468</td>
<td>$10,449,128</td>
<td>$9,288,120</td>
<td>$9,129,753</td>
<td>$6,710,409</td>
<td>$58,674,027</td>
<td>$148,752,566</td>
</tr>
<tr>
<td>Number of Zero Value Parcels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Albion</td>
<td>17</td>
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<td>0</td>
<td>29</td>
<td>0</td>
<td>0</td>
<td>476</td>
<td>522</td>
</tr>
<tr>
<td>- Milton</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>- Sumner</td>
<td>1</td>
<td>17</td>
<td>0</td>
<td>5</td>
<td>2</td>
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<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>18</td>
<td>19</td>
<td>3</td>
<td>34</td>
<td>5</td>
<td>2</td>
<td>490</td>
<td>571</td>
</tr>
</tbody>
</table>

Source: Assessed values: Rock, Jefferson, and Dane Counties; Equalized value ratios: WDOR, Bureau of Equalization

Total number of parcels: 2788
Around the lake, there were approximately 2,200 parcels that had assessed values for land and/or improvements as tracked by Jefferson, Rock, and Dane Counties. After correcting for equalization ratios (see Table 2.1), these parcels had a market value of roughly $149 million in 1998 dollars. This total value was not evenly distributed around the lake. Note from the table that roughly 48 percent of the residential property value around Lake Koshkonong is found in Jefferson County (the Towns of Sumner - 36% and Koshkonong - 12%). Roughly 38 percent is found in the Town of Milton (Rock County), and 13 percent was found to lie in the Town of Albion (Dane County). Further examination showed that a larger proportion of property in both Milton and Albion is found off-the-lake (in the third tier and beyond) when compared to both Sumner and Koshkonong. Finally, note from this table that of the almost 2,800 total residential parcels, roughly 600 were identified from the assessments to have zero value. Furthermore, note that most of these (522) are found in the Town of Albion (see footnote). In addition to the reporting anomaly, we speculate that some of these parcels are either publicly owned or owned by certain not-for-profit organizations (churches) and are thus not part of the local taxation system.

The summary of viewshed ratings also showed differences by sub-lake region. Since these ratings reflect general topographical gradients and likely distances to open water resulting from lowering lake levels, shallower regions of the lake have higher impacts on lake view. Residential properties found in both Milton and Koshkonong were more apt to have “medium” and “minimal” viewshed effect ratings given their relatively steeper topographical gradients when compared to residential properties found in the Town of Albion. A notable exception to this are properties located in the Blackhawk Island development located in the Town of Sumner.

These results translated into property value impacts as outlined in Table 4.2. Values on this table represent the residual values after application of the proportional

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8 There was an anomaly in the way assessed values were reported in the Town of Albion that could lead to some bias in total values reported in Table 4.1. In conversations with the town treasurer of Albion and the previous assessor, it became apparent that some parcel assessments for properties owned by the same person were combined in the assessed value dataset from Albion used for this study. Thus, there is an under-reporting bias in the total reported residential property value for parcels located within ½ mile of the lake and in the Town of Albion. The extent of this under-reporting bias depends on the relative location of affected parcels. It appears that the most common situation was that the parcel with combined reported values was, most often, directly adjacent to the parcel that had zero reported value. Parcels that had zero values that are adjacent to the parcels with combined assessment reporting are more likely to be included in the totals found in Table 4.1 thus minimizing the potential bias.
Table 4.2 Likely impact of lower water levels (with dam removed) on residential property values around Lake Koshkonong

<table>
<thead>
<tr>
<th>View Effect</th>
<th>Lakefront</th>
<th>Second-tier</th>
<th>Third-tier &amp; beyond</th>
<th>TOTAL value of property by town</th>
<th>TOTAL Loss of property value by town</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage residual value(^1)</td>
<td>60%</td>
<td>75%</td>
<td>90%</td>
<td>70%</td>
<td>80%</td>
</tr>
</tbody>
</table>

| Estimated parcel value result | Full             | Medium            | Minimal            | Full             | Medium            | Minimal            | Minimal            |                   |                   |                   |                   |                   |                   |
|--------------------------------|------------------|------------------|--------------------|------------------|------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|                   |
| - Albion                      | $821,980         | $0               | $0                 | $1,032,183       | $0               | $0                 | $0                 | $16,104,430       | $17,958,593       | ($990,351)        |                   |                   |                   |                   |
| - Milton                       | $0               | $2,213,333       | $9,143,800         | $0               | $706,339         | $6,039,368         | $35,933,684        | $54,036,525       | ($2,601,381)      |                   |                   |                   |                   |                   |
| - Sumner                       | $10,309,855      | $15,337,231      | $0                 | $5,469,501       | $2,889,711       | $0                 | $5,614,474         | $39,620,772       | ($15,052,147)     |                   |                   |                   |                   |                   |
| - Koshkonong                   | $1,558,562       | $7,462,287       | $260,415           | $0               | $3,707,752       | $0                 | $1,021,439         | $14,010,455       | ($4,482,343)      |                   |                   |                   |                   |                   |
| TOTAL                          | $12,690,397      | $25,012,851      | $9,404,215         | $6,501,684       | $7,303,802       | $6,039,368         | $58,674,027        | $125,626,344      |                   |                   |                   |                   |                   |                   |

Current Lake Koshkonong Property Value: $148,752,566

NET IMPACT OF LOWER WATER LEVELS: ($23,126,222)

Source: Assessed values: Rock, Jefferson, and Dane Counties; Equalized value ratios: WDOR, Bureau of Equalization

1. Represents remainder after impact of lowering water levels and derived as estimates when combining procedures outlined in Doss & Taff (1996) with focus group results.
premium associated with being proximate to an emergent vegetation wetland. These proportions were estimated based on the Doss and Taff (1996) statistical models (hedonic regressions) placed into a local context by the focus group interviews with real estate professionals. To reiterate, these estimates provide a basis to differentiate parcel values based on their relative proximity, or distance, to open water and emergent vegetation wetlands. An improvement in these rough proportions could be obtained by replicating the Doss and Taff approach that isolates the effect of alternative wetland types on property values. Given the uncertain nature of ecosystem change, however, we are generally satisfied that these results represent realistic expectations of change given lowering water levels on Lake Koshkonong.

Note from Table 4.2 that a three foot decline in the water level on Lake Koshkonong is estimated to negatively impact local property values by roughly $23 million dollars. Again, this value decline is not found evenly distributed around the lake. Given the relative distribution of residential parcels, the Town of Sumner would be expected to experience the largest decline in property values. Roughly 65 percent of the decline ($15.1 million of $23.1 million) is estimated to occur in the Town of Sumner. This is compared to 19 percent ($4.5 million) for Koshkonong, 11 percent (2.6 million) for Milton, and 5 percent ($1 million) for the Town of Albion.

Fiscal impacts associated with change were estimated from the base data on residential property value declines. Using mill rates provided by the State of Wisconsin Department of Revenue for the affected towns, an estimate of total annual property tax revenue decline was identified. This represents lost local government revenue that could be expected to result every year after water levels of Lake Koshkonong decline. A summary of local fiscal impacts is found in Table 4.3.

Given the structure of mill rates and the relative property value impacts, it becomes apparent that the potential for annual local government revenue loss is significant. To arrive at fiscal impact measures, we used equalized (or full) property values. Declines in local government revenue may be slightly overstated due to the simple fact that all three towns have property assessment values that are lower than equalized (or full) value. This is evident from both Wisconsin Department of Revenue records and the focus group discussion with local real estate professionals (see Table 2.1). In addition, we did not assess the changes in permit/fee revenue or changes that would result in state-aids, nor do we examine changes in demands for government services. Finally, these declines in value and revenue are estimated as initial decreases. Focus group participants did recognize that housing markets do adjust and stabilize as
Table 4.3 Fiscal impacts resulting from declining water levels on Lake Koshkonong

<table>
<thead>
<tr>
<th>County</th>
<th>Albion (Dane)</th>
<th>Milton (Rock)</th>
<th>Sumner (Jefferson)</th>
<th>Koshkononong (Jefferson)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential Property Value Decline:</td>
<td>$990,351</td>
<td>$2,601,381</td>
<td>$15,052,147</td>
<td>$4,482,343</td>
</tr>
</tbody>
</table>

Property Tax Mill Rates:

- Technical Colleges
  - County
  - Local
  - Other
  - K-12 Schools

<table>
<thead>
<tr>
<th></th>
<th>Albion</th>
<th>Milton</th>
<th>Sumner</th>
<th>Koshkononong</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.00148</td>
<td>0.00148</td>
<td>0.0015</td>
<td>0.00148</td>
</tr>
<tr>
<td></td>
<td>0.00390</td>
<td>0.00636</td>
<td>0.0033</td>
<td>0.00429</td>
</tr>
<tr>
<td></td>
<td>0.00214</td>
<td>0.00101</td>
<td>0.0038</td>
<td>0.00083</td>
</tr>
<tr>
<td></td>
<td>0.00046</td>
<td>0.00061</td>
<td>0.0002</td>
<td>0.00020</td>
</tr>
<tr>
<td></td>
<td>0.01081</td>
<td>0.00989</td>
<td>0.0121</td>
<td>0.01235</td>
</tr>
</tbody>
</table>

Total: 0.018785 0.01935 0.0209 0.01914

Lost Property Tax Revenues by Jurisdiction

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Albion</th>
<th>Milton</th>
<th>Sumner</th>
<th>Koshkononong</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Colleges</td>
<td>$1,465.72</td>
<td>$3,850.04</td>
<td>$22,578.22</td>
<td>$6,634</td>
<td>$34,528</td>
</tr>
<tr>
<td>County</td>
<td>$3,862.37</td>
<td>$16,544.78</td>
<td>$49,672.09</td>
<td>$19,220</td>
<td>$89,300</td>
</tr>
<tr>
<td>Local</td>
<td>$2,114.40</td>
<td>$2,627.39</td>
<td>$57,198.16</td>
<td>$3,698</td>
<td>$65,638</td>
</tr>
<tr>
<td>Other</td>
<td>$455.56</td>
<td>$1,586.84</td>
<td>$3,010.43</td>
<td>$896</td>
<td>$5,949</td>
</tr>
<tr>
<td>K-12 Schools</td>
<td>$10,705.69</td>
<td>$25,727.66</td>
<td>$182,130.98</td>
<td>$55,343</td>
<td>$273,908</td>
</tr>
</tbody>
</table>

Total: $18,603.74 $50,336.72 $314,589.87 $85,792.05

Aggregate Total Impact: $469,322

Source: Towns, Villages, and City Taxes - 1998, Wisconsin Department of Revenue, Division of State and Local Finance, Madison, WI.

Note: Analysis is based on equalized (or full) value whereas towns apply mill rate to assessed value. Thus, estimates for town revenues are slightly overstated (by roughly 10 to 40 percent).
demands for new environmental conditions change.

Our estimates suggest that local units of government could initially lose roughly $470,000 in annual property tax revenues. Given the specific county mill rates and potential property value decline, the Town of Sumner and Jefferson County revenue would be most heavily impacted. Our data and analysis suggest that Jefferson County could experience an almost $400,000 annual reduction in property tax revenues. This represents roughly 85 percent of the total revenue loss with another 11 percent of total loss accruing to Rock County and 4 percent to Dane County.
Water-based recreation represents an important motivating factor associated with local tourism in the vicinity of Lake Koshkonong. This local tourism provides an important source of business receipts for firms involved in selling goods and services used by recreationists and second homeowners. Identifying the current extent of local tourism and making an estimate of likely change resulting from water level declines provides the focus for this chapter.

There is a modest amount of retail, real estate, and service sector business tied to recreational use of Lake Koshkonong. Examples of these types of business include restaurants, campgrounds, marinas, and real estate sales. The extent of retail and service sector business activity varies in location relative to Lake Koshkonong.

It should be noted that the current configuration of Lake Koshkonong maintains a shallow lake with maximum depths that do not exceed 7 feet. There is a significant amount of current boating use that relies on this water depth for safe operation. A decline of three feet on the lake would likely have dramatic effects for boating enthusiasts. Ample evidence suggests that this would translate into a loss of business for those firms catering to motorboating enthusiasts. As noted by a focus group participant:

**KEY FINDINGS**

- A decline of three feet on the lake would likely translate into a loss of business for those firms catering to motor boating and other businesses that rely, at least partially, on the lake for their customer base such as restaurants, taverns, and campgrounds.

- The assessment assumed that tourism-sensitive retail and service sector businesses in close proximity to the lake that rely on water-based recreation as a primary customer base would shut down.

- Those retail and service businesses that are less reliant on water-based recreation would adapt and change, but remain in business.

- Tourism-sensitive retail accounts for roughly $45 million in gross sales supporting almost 1,000 total jobs (not FTE's). Tourism-sensitive real estate and service sector sales amount to almost $12 million supporting just under 200 total jobs.

- The impact of dam removal on local retail businesses would amount to an estimated annual loss of $5.25 million in gross retail sales that support roughly 200 total jobs.

- The impact of dam removal on real estate and service sector businesses would amount to a decline of roughly $9 million in gross sales that support an estimated 150 total jobs.
"... it would be devastating to the marina business ... when the water gets real low, people aren’t doing the boating just because of the destruction that it does to their boats."

Furthermore, impacts would extend throughout other business sectors that rely, at least partially, on the lake user for their customer base. A campground owner confirmed this and noted:

"... Lake Koshkonong ... is the second largest concentration of camping [sites] in the state. There’s something over 3,000 campsites around Lake Koshkonong. If you take the lake away ... you can cut that to less than half."

The local restaurant scene, particularly those close to the water, are heavily reliant on the lake and its recreational user. A local restauranteur noted:

"... on any given night, the [supper club] can be full and I don’t know half the people visiting. You know, Milton and Edgerton and the local townsfolk — they support us a lot, but the majority of the visitors are people I’ve never seen before. I’d say 60 percent of our business is the weekend people."

Other retail and service sectors, such as local grocery or hardware stores, off-lake restaurants, hotels, and community-based recreational businesses are more diverse in their demand structure and rely on more of a mixture of local and regional residents with tourists adding a bonus to their overall customer base. Our attention now turns to the secondary data on local business activity.

The local tourism industry

Local businesses that are sensitive to tourism demands were identified for the local region surrounding Lake Koshkonong (see Table 2.2). This local region included varying distances from the lake and river system between Indianford Dam and the city of Jefferson. Specific firms were located, geo-coded, and verified. Additional firms not included within the ABI dataset were included and respective characteristics (gross sales and employment) were estimated from personal interviews. The extent of off-lake
retail, real estate, and service firms that was attributable to tourism was then estimated using previous research specific to tourism characteristics of Rock and Jefferson Counties (Leatherman and Marcouiller 1996). The following provides detail on local tourism-sensitive business activity.

Retail:

The tourism-sensitive retail sectors assessed in this study included building materials (hardware), general merchandise, food stores, restaurants, taverns, and gift/craft stores. Business activity in these categories located within 1 mile of the lake and river system are summarized in Table 5.1. In this presentation, two sets of data on retail activity are included; (1) for those businesses found within one mile of the lake itself and (2) for those businesses found within one mile of the river system (off-lake) from Indianford Dam to the city of Jefferson excluding any that are in first category.

Note from the Table that tourism-sensitive retail businesses in the region account for roughly $45 million in gross sales and support, in total, almost 1,000 local jobs. The bulk of this activity occurs in eating and drinking establishments which experience roughly $16 million in gross tourism sensitive sales. Slightly more than $5 million dollars of this is found on-the-lake with the rest being found off-lake, primarily in the surrounding communities of Fort Atkinson and Jefferson (again, this includes only those businesses located within 1 mile of the river).

Real Estate and Service:

A similar assessment was done for those local businesses classified as operating in the real estate and service sectors. Specific businesses included within this grouping include real estate management/sales, lodging places/campgrounds, and

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9 This previous research was specific to Wisconsin counties and relied on peer-groupings based on common tourism types. These peers were then used to identify the export-base portion of retail and service sector employment using a minimum requirements approach, a variant of the location quotient. Interested readers can obtain copies of this article from the lead author.

10 In this assessment of retail and service sector employment, employment estimates are counted in total. The available secondary data measures total jobs, not full-time equivalents. All job types, including part-time and seasonal employment, are included within this number of total jobs. To be sure, there is ample evidence to suggest that jobs tied to tourism tend to be seasonal, part-time, and relatively low-wage as compared to jobs found in other non-tourism sensitive sectors. Further research is required to convert total jobs to an estimate of full-time equivalent jobs.
Table 5.1 Retail Business Affected by Lake Koshkonong Tourism

<table>
<thead>
<tr>
<th>Retail Sector</th>
<th>Retail business activity within 1 mile of lake and river system$^1$</th>
<th>Lake tourism impact$^5$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On-lake$^2$</td>
<td>Off-lake$^3$</td>
</tr>
<tr>
<td>Building Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Percentage of demand from tourists$^4$</td>
<td>100%</td>
<td>28%</td>
</tr>
<tr>
<td>- Number of Firms</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>- Gross Sales</td>
<td>$250,000</td>
<td>$30,750,000</td>
</tr>
<tr>
<td>- Number of Employees (total jobs)</td>
<td>3</td>
<td>282</td>
</tr>
<tr>
<td>General Merchandise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Percentage of demand from tourists$^4$</td>
<td>100%</td>
<td>28%</td>
</tr>
<tr>
<td>- Number of Firms</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>- Gross Sales</td>
<td>na</td>
<td>$14,000,000</td>
</tr>
<tr>
<td>- Number of Employees (total jobs)</td>
<td>na</td>
<td>428</td>
</tr>
<tr>
<td>Food Stores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Percentage of demand from tourists$^4$</td>
<td>100%</td>
<td>20%</td>
</tr>
<tr>
<td>- Number of Firms</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>- Gross Sales</td>
<td>na</td>
<td>$50,000,000</td>
</tr>
<tr>
<td>- Number of Employees (total jobs)</td>
<td>na</td>
<td>879</td>
</tr>
<tr>
<td>Eating and Drinking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Percentage of demand from tourists$^4$</td>
<td>100%</td>
<td>28%</td>
</tr>
<tr>
<td>- Number of Firms</td>
<td>14</td>
<td>77</td>
</tr>
<tr>
<td>- Gross Sales</td>
<td>$5,000,000</td>
<td>$39,750,000</td>
</tr>
<tr>
<td>- Number of Employees (total jobs)</td>
<td>202</td>
<td>1048</td>
</tr>
<tr>
<td>Gift and Craft Shops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Percentage of demand from tourists$^4$</td>
<td>100%</td>
<td>69%</td>
</tr>
<tr>
<td>- Number of Firms</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>- Gross Sales</td>
<td>na</td>
<td>$9,250,000</td>
</tr>
<tr>
<td>- Number of Employees (total jobs)</td>
<td>na</td>
<td>135</td>
</tr>
</tbody>
</table>

Total Impact of Lake Tourism on Retail Activity

$^1$ Source: American Business Institute data for towns of Albion, Milton, and Koshkonong
$^2$ Geocoded based on distance from Lake Koshkonong (excluding Rock River)
$^3$ Geocoded based on distance to Rock River between Jefferson and Indianford Dam (excluding Lake Koshkonong)
$^4$ From "Estimating tourism's share of local income from secondary data source" Table 4, Cluster #3, in Leatherman and Marcouiller (1996)
$^5$ Calculated based on 100 percent of "On-lake" business activity and tourism share of "Off-lake" business activity

Total Impact of Lake Tourism on Retail Activity

- $44,942,300 gross sales
- 960 total jobs
amusements/recreation (including marinas). A summary of the real estate and service business activity is found in Table 5.2. Note from this table that tourism-sensitive real estate and service sector sales amount to almost $12 million that supports a total of just less than 200 total jobs. The bulk of this activity (roughly half) is found in the lodging places and campgrounds sector. An interesting aspect of real estate and service sector businesses is the predominance of on-lake activity relative to that found in surrounding communities. Almost three quarters (73 percent) of gross sales are found on-lake. This compares with only 12 percent of retail businesses being categorized as located on-lake.

**Change in tourism-sensitive business activity resulting from lower lake levels**

Given the general lack of data on recreational motivations and current water-based recreational use, our assessment of change in tourism that would result from lowering lake levels is, at best, a gross estimate. There was some agreement, though, in the focus group interviews that the level of business, particularly that which is tied closely to the lake, would decline dramatically as a result of lower Lake Koshkonong water levels. Many of the lake front business owners identified the notion that lowering lake levels by 3 feet would put them out of business. As a lakefront supper club owner noted:

"... we're 6 or 7 miles out in the middle of nowhere ... (what) would be the draw to bring someone out 6 miles for dinner (without the lake)? My guess is that we would lose a lot of (our customer base.) Twenty percent — maybe thirty percent of our business, you know. But that might be the only edge. That's one of the main edges that we have over our competition ... (its) that resource right outside the door."

Other business owners that relied heavily on the water-based customer concurred and elaborated:

"I think I would close. I seriously do. I think it would just be a matter of time. I think I would hang on for awhile and watch the sales decrease, and probably end up just locking it up."
Table 5.2 Real Estate and Service Businesses Affected by Lake Koshkonong Tourism

<table>
<thead>
<tr>
<th>Real Estate and Service Sector</th>
<th>Real estate and service business activity within 1 mile of lake and river system$^1$</th>
<th>Lake tourism impact$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On-lake$^2$</td>
<td>Off-lake$^3$</td>
</tr>
<tr>
<td>Real Estate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Percentage of demand from tourists$^4$</td>
<td>100%</td>
<td>53%</td>
</tr>
<tr>
<td>- Number of Firms</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- Gross Sales</td>
<td>na</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>- Number of Employees (total jobs)</td>
<td>na</td>
<td>23</td>
</tr>
<tr>
<td>Lodging Places and Campgrounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Percentage of demand from tourists$^4$</td>
<td>100%</td>
<td>87%</td>
</tr>
<tr>
<td>- Number of Firms</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>- Gross Sales</td>
<td>$4,500,000</td>
<td>$1,750,000</td>
</tr>
<tr>
<td>- Number of Employees (total jobs)</td>
<td>85</td>
<td>27</td>
</tr>
<tr>
<td>Amusement and Recreation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Percentage of demand from tourists$^4$</td>
<td>100%</td>
<td>71%</td>
</tr>
<tr>
<td>- Number of Firms</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>- Gross Sales</td>
<td>$4,250,000</td>
<td>$1,250,000</td>
</tr>
<tr>
<td>- Number of Employees (total jobs)</td>
<td>65</td>
<td>19</td>
</tr>
</tbody>
</table>

Total Impact of Lake Tourism on Real Estate & Service Activity

$11,956,250 gross sales
199 total jobs

1. Source: American Business Institute data for towns of Albion, Milton, and Koshkonong
2. Geocoded based on distance from Lake Koshkonong (excluding Rock River)
3. Geocoded based on distance to Rock River between Jefferson and Indianford Dam (excluding Lake Koshkonong)
4. From "Estimating tourism's share of local income from secondary data source" Table 4, Cluster #3, in Leatherman and Marcouiller (1996)
5. Calculated based on 100 percent of "On-lake" business activity and tourism share of "Off-lake" business activity
"It would probably ruin us, in the long run — it would probably take five or six years, but over the long haul, what we count on is building up enough in the summer to get you through the winter."

Other business owners, less tied to water-based recreationists, were more sanguine. Depending on type of business, local residents provide a large customer base and would continue to frequent local business. For instance, one local grocer noted:

"It wouldn't put me out of business (grocery store) by any means. I think I would drop more than the ten or fifteen percent I raise up in the summer though because of the change in ownership around the lake — of the houses."

Thus, our assessment of change resulting from water level decline is left to an assumption. Namely, that those retail and service businesses in close proximity to the lake and who rely on water-based recreation as a primary customer base would shut down. Those who are less reliant on tourism and are found off-the-lake would adapt and change, but remain in business. If we can accept this assumption, then the impact on local retail businesses from Tables 5.1 would amount to an annual loss of $5.25 million in gross retail sales with a corresponding loss of roughly 200 total jobs. This type of a decline in tourism would likewise affect real estate and service sector businesses. Note from Table 5.2 that this would amount to roughly $9 million in gross service sales that support roughly 150 total jobs.

This assessment of recreation-reliant businesses provides perspective on the extent and characteristics that make up the local tourism phenomenon. Certainly, successful entrepreneurs will seek opportunities and remain flexible in adapting to market changes. Change, however, is rarely painless and often comes at a certain price to local resiliency. Three final focus group comments sum this point up well:

"It's taken so long for the lake to get the reputation that it has ... if the configuration changed ... it would take so long to come back up and define itself ... it'd be very, very difficult for the people around the lake to stay in business that long."

35
"I would see a definite change in use ... it's taken such a long time to build up the tourism idea in our community with our festivals and other things ... (the character of our visitors) would change."

"We're just finally starting to get heard. It would be very, very discouraging to us if this happened, because we're prophets now and people are realizing that it is the lake that brings people here ... (if the water levels dropped), we'd have to go and reinvent ourselves again ... change is not easy for anybody ..."

These estimates of economic impact resulting from tourism declines represent short-term effects. Throughout Wisconsin, the tourism phenomenon has shown itself to be dynamic and flexible in response to changing customer demands. Previous research on the economic effects of forest-based outdoor recreation in rural Wisconsin suggests that simple assessments of tourism tend to gloss over important user characteristics (Marcouiller and Mace 1999). For instance, tourism development that targets more quiet (or passive) recreational users (such as the type of tourism provided by a changed watercourse around Lake Koshkonong) is likely to draw from a larger population when compared to motorized use. Although expenditures of quiet users tend to be lower than motorized users, this has been shown to be more than offset by higher participation rates. Again, without specific research on the unique attributes of Lake Koshkonong recreational use, we are limited in direct applications of previous work. Needless to say, a change in the Lake Koshkonong system would likely cause the type of tourism found in the local area to change. Our assessment does not reflect or take account for changing tourism types.
Chapter 6 Summary, Conclusions, and Further Research Needs

A nine-month study was undertaken to estimate impacts of changes in the Lake Koshkonong watercourse on local tourism, property values, and environmental characteristics. In this study, we have assessed a series of likely impacts that could occur if the Indianford Dam were to be removed and the lake and river system were allowed to return to their "native" course. Our economic assessment was limited to use value impacts to residential property and tourism sales of reducing water levels on the lake by three feet. These took the form of change occurring to property values of residential parcels located within ½ mile of Lake Koshkonong and local businesses reliant on lake-based recreation.

Both primary and secondary data were used to assess residential parcel values and local tourism business activity. Specifically, this analysis relied on property tax assessments and equalized values specific to the towns of Albion, Koshkonong, Sumner, and Milton. Focus group interviews and related research found elsewhere were used to estimate property value impacts associated with changes in the Lake Koshkonong watercourse. Local tourism sensitive businesses were assessed using available secondary data sources combined with focus groups interviews and windshield surveys of the region. Again, research results from related studies were applied to differentiate local demands from tourism demands.

Results of this study suggest that both residential property values and local tourism sensitive businesses would experience declines in use value. Overall, results of the analysis suggest that property values located within ½ mile of the lake will decline by roughly $23 million which would lead to an annual fiscal impact of almost $470,000 in lost local government property tax revenue. Furthermore, changes in water levels on Lake Koshkonong could be expected to affect local tourism incidence. Results of our analysis suggest that local retail activity could expect to lose $5.25 million in gross retail sales with a corresponding loss of roughly 200 total jobs. This type of a decline in tourism would likewise affect real estate and service sector businesses to the tune of roughly $9 million in gross real estate and service sector sales that support roughly 150 total jobs.

Further research could more closely specify and elaborate on the complex nature of economic impacts resulting from dam removal. The research outlined in this report only scratches the surface of economic values associated with Lake Koshkonong. A more comprehensive study of total economic value that extends beyond local
community impacts is possible and remains for future work. Such a study could assess the societal costs and benefits derived from the lake and river system.\footnote{This societal perspective could incorporate more that simple use values associated with local business and real estate interests. A logical question to drive future research might ask whether benefits accruing to society as a whole that result from dam removal and restoration of native habitat exceed costs involved with use value declines to local stakeholder groups. Furthermore, there is a need to delve into the nature and context of community development impacts that identify distributional consequences of change. Are tourism-type jobs and the benefits that accrue to business owners really satisfying the needs of the local community? How do these activities compare to other economic development alternatives when it comes to sustaining local household incomes and providing for local quality-of-life measures? Our assessment provides only a starting point with which to proceed in answering these critical questions that relate environmental resources to economic development.}

Other research that has been proposed involves a thorough examination of water-based recreational demands on Lake Koshkonong. This research could uncover basic data on type of recreational uses, motivations for travel, expenditure patterns, baseline demographics, and origin of recreational enthusiasts. This information would provide a clearer picture of the importance of the lake in meeting recreational and tourism demands. Again, this additional research remains for future work.

The work contained in this report focuses on \textit{tangible} impacts of dam removal to \textit{local} interest groups in the short-term. Intangible values associated with potential ecological benefits could be significant and affect a broader set of stakeholders. Our assessment did not address the broader societal benefits of environmental change. These benefits could include the value of streambed rehabilitation, water quality improvement, fishery habitat improvement, and the importance society places on the presence of more native landscapes. Finally, our assessment was limited to the short-term. We made no attempt to characterize the long-term impacts of dam removal on either property values or tourism. Incorporating change in the type of local tourism or alternative motivations for owning adjacent properties were beyond the scope of this assessment and could imply alternative policy recommendations.

Certainly, changes in quality and quantity of environmental resources available in a local area have impacts on the economic structure of surrounding communities. Public policies that address environmental issues have consequences to local, regional, and larger scale constituents. Again, our assessment of local use value impacts only begins to address these important policy questions and consequences.
References


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Appendix A.
Focus Group of Resource Professionals: Interview Agenda and Analysis

The first focus group involved natural resource professionals familiar with the Lake Koshkonong and Indianford Dam situation. This focus group involved eight locally-based land and water managers including four from the Wisconsin Department of Natural Resources, one from the U.S. Geological Survey, two from county parks departments, and a private individual familiar with lake depths. Our intent with selection of participants was to have a range of resource disciplines involved in the discussion. Our subject interests ranged from aquatic vegetation and fisheries management to hydrogeologic and limnological issues. Our primary questions to these people involved their knowledge of the lake system and their estimation of specific changes in the Lake Koshkonong system that could be expected were the Indianford Dam to be removed. Specifically, we were interested in water levels, the types of vegetation that would evolve on the newly created landforms, and the affect of changing water levels on wildlife and fishery populations. An interactive mapping exercise was carried forth using the following procedures:

Procedure for Interactive Mapping
1. project base map of lake and vicinity on large paper (map to have lake bed contours and set at a predetermined scale)
2. draw outline of existing shoreline to “register” alternative
3. review and confirm outline of projected ordinary high water mark of lake without dam
4. review and confirm outline of 1971 map of lake without dam
5. have participants discuss and draw alternatives

Furthermore, we had a brief discussion about the potential change in recreational use given declining lake levels. An agenda for this focus group is found in Table A1.

The following describes major findings from the first focus group session. The basis for analyzing each of the focus group interviews was developed from main themes identified using personal notes, typed transcripts and reviews of each audio tape. This focus group attempted to capture the knowledge base of local lake experts on critical physical considerations from removing the Indianford Dam.

In summing up the importance of the situation:

“... that’s one of the big concerns of everybody ... what would it look like if the lake was down and how much would be left ... they anguish over a half of a tenth or a tenth of a foot, let alone what might be (a drop) of about three or four feet.”
### Table A1. Focus Group Outline: Resource Professionals
Conducted on March 26, 1999 at the Rock County Courthouse

<table>
<thead>
<tr>
<th>Purpose:</th>
<th>To confirm previous studies on lake configuration change, and to characterize change in the Lake Koshkonong ecosystem if this dam were to be removed.</th>
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<tbody>
<tr>
<td>1.</td>
<td>What is your name and the organization you represent?</td>
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<td>2.</td>
<td>What has been your experience with either the Indianford Dam or Lake Koshkonong matters?</td>
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<td>3.</td>
<td>What do you see as critical physical considerations and impacts from removing the Indianford Dam?</td>
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<td>6.</td>
<td>Where would you anticipate the new ordinary high water mark of the lake to be if the dam was removed (i.e., how accurate is the 1971 map?).</td>
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<td>7.</td>
<td>- discussion and interactive mapping</td>
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<tr>
<td>7.</td>
<td>What kind of emergent vegetation would you expect with lower lake levels?</td>
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<tr>
<td>8.</td>
<td>Where would the various new wetland classifications be generally located?</td>
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<tr>
<td>8.</td>
<td>- discussion and interactive mapping (participants draw alternatives)</td>
</tr>
<tr>
<td>9.</td>
<td>In what ways will a smaller lake configuration affect the environment, wildlife, and fish populations?</td>
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<tr>
<td>9.</td>
<td>- discussion and map any observations that have geographic implications.</td>
</tr>
<tr>
<td>10.</td>
<td>How could the reduced lake size impact various recreational uses and users (current users and possible new future users)?</td>
</tr>
<tr>
<td>11.</td>
<td>Of all the impacts discussed, which one is the most important to you?</td>
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</table>
Estimate of the ordinary high water mark given dam removal.

"The ordinary high water mark is a very easy question to answer actually. I don’t think you’re going to see as much of a change in the ordinary high water mark of that lake ... it’s the summer water level (that fluctuates)."

"I don’t really think you’d see a change in the statutory ordinary high water mark at all. You would still see just as big of floods as we always have. Where I think we would see fluctuations is in that number that we would call our ordinary summer normal flow. That would vary from year to year based on whether we’re in a hydrologically wet or dry year."

"We might see two and a half feet or so drop out of Lake Koshkonong. That’s my guess."

"I think four (feet of drop in lake levels) ..."

"I tend to be more in the three to two and a half feet (range) ... because of that bench you’re talking about on the river system."

On ownership of newly create land resulting from dam removal:

"The ordinary (high) water mark is the lake, so the ownership of that (new land) still would reside with the state."

"... the significance of the ordinary high water mark is that it’s the demarcation mark between the private lands and what’s in the public trust. In lake areas, the (lake) bed is owned by the State of Wisconsin."

On accuracy of the maps:

"In looking ... for what the lake would be like if it was ... lower, I guess I would have to throw my vote in for the (alternative) that looks three foot lower as being ... what we could almost expect as being more the open water situation out there. I did quite a bit of netting back in some of the bays this year, and it appears that the map is fairly accurate."

On the types of vegetation evolving on the newly created landforms:

"We may see an increase in ... submerged vegetation, as well as the encroachment of the (emergent vegetation) type. Just a very small amount
though, of the scrub, shrub stuff.

"... a basin that has a watershed so significantly larger that the basin (itself), (experiences) very diverse flows from very dry to very wet. Those types of wetland basins are probably the most diverse because they go through such a wide range (of water levels.) ... its when you have a dam that keeps relatively constant water levels that you get ... the takeover of things like cattails or more of a monotypic stand ... because we have such a wide, varying flow situation, ... the watershed that we probably would have (is) a very diverse system."

"... if you’re out there right now, there’s absolutely no question what’s open water and what’s cattails. I mean, it’s just like you cut it with a knife. But, in the case that this would (be allowed) to fluctuate naturally, then we would probably see just sort of the blurring where you’d be into some submerged vegetation creeping up to cattail ...

"I don’t see the tree line really expanding out into the existing wetlands much farther than what it is right now."

"... expect to see ... emergent vegetation extend out to what we currently see as about a three foot contour."

"... I’m suspecting that we’ll see bullrushes in the lake growing out to about a two foot depth."

"Yeah, I would guess that we’d see a dramatic increase in those near shore areas of submerged vegetation, and that would, primarily, be Saggle pond weed ... there we might also see other plants such as vidans and smartweed in the lake that would be a beneficial wildlife food ...

"I would expect to see an increase in (purple loosestrife), but I don’t think it’s going to totally dominate, like maybe was our fear fifteen, twenty years ago.

Effect of new lake boundaries on wildlife, fisheries, and general environment

"Water quality, 99% of the time, goes up significantly when a dam is removed because you don’t have the slowing down of the water. Flowing water has a higher water quality, and that doesn’t have a whole lot to do with the configuration of the lake, but just that it’s a flowing system."

Oxygen levels:
"I think in most of the popular opinions about the lake, that's one of their fears, is that if the lake was drawn down by a foot or two, that we would see extensive, massive fish kills due to less oxygen in the lake. I guess I would argue with that a little bit, but it will take a little bit of analysis to actually calculate how many days supply of oxygen we have in the lake based on the projected volumes ..."

"But the scary thing is that there's huge fluctuations in these things (oxygen levels) ... In extremely hard winters, especially if we were at low flows, I do have a fear that we would have significant fish kills in Lake Koshkonong."

Refuted by others:

"With the more open flowing condition, and especially if there were no dam, we may see a better exchange of oxygen in the river up above."

On fish diversity:

"... we would have an additional tremendous increase in spawning habitat for norther pike as well as walleye. We would see better vegetation. Submergent and emergent vegetation provide better habitat for crappies, bluegills, largemouth bass."

"... we would see a total decrease in the numbers of fish, but the number of fish per acre would probably stay relatively the same, because that tends to correlate more with water quality parameters such as nitrogen, phosphorous, eutropic levels than it does with the volume of the lake. So as we would see less lake, we would see less numbers of fish, but the numbers of fish per acre would stay relatively constant."

On wildlife:

"I think you're going to see a major increase over the amount of turkeys now."

"I think a lot of us would hope that, you know, in a best situation, would go back to some of those pre-settlement conditions, but the reality is that most of the wetlands in Jefferson County were all intact at that time. With the invention of the dragline and a few other things, virtually everything that can be drained in Jefferson County has been drained. Consequently, it's made some big changes in our annual water budget where we see most of our water comes into this lake as snowmelt, and then the rest of the year, we're just begging for a little drink of water to keep things at a higher level, instead of having that continual flow like
we may have seen. Consequently, I don’t know if we would ever see the conditions that were referred to in some of the pre-settlement documents, where Koshkonong was described as a meadow of wild rice... we still have the problems of the high amounts of nutrients coming down the Rock River, various levels of unknown amounts of pesticides, herbicides, and the like, that are definitely going to throw a wrench into anything we try to do, or possibly complicate it at least, in terms of trying to establish vegetation out there.”

Effect of new lake levels on recreational uses

“The (boat launches) on the lake, probably wouldn’t be usable unless they had significant dredging. They’re not great as they are, though. Most of the boats that get launched are going in on the river. Charlie Bluff... it’s probably the most popular public access sit on the lake.”

“I’d say (the region would have) more duck... and better duck hunting... more and better birding...”

“Less motorized recreation, more quiet recreation.”

“Smaller boats in general.”

“I would think people are still going to recreate out there, there’s just going to be less boatable water. The skiers are only going to have a portion of the lake to deal with...”

“There will still be adequate... areas for water skiing, if you’re going to be out in the middle of this thing. But you won’t be able to water ski in some of the bays where they are (waterskiing) now.”

“... the main summer recreation is just putting around in a pontoon boat, and a lot of those pontoon boats that are currently moored up on shore are going to be in a situation where they’re going to have to put a lift in, maybe... two to three hundred feet off of shore where they are now.”

“I’m going to guess that (deep water draft boats) are not going to be very practical, and so... they’re not going to have a lot of boatable water unless it’s the river channel or staying in the middle of the lake. On the other hand, if fishing is better, hunting is better, we may see a dramatic increase in the number of jon boats, flat-bottom boats... boats with shallow water drafts.”
“The number one way that people fish on Lake Koshkonong in the summer months is trolling. If we see an increase in the amount of vegetation in the lake, it’s going to have a dramatic effect in your ability to fish in that way, or to motor-troll in that fashion. People will probably still do it. It’s going to be more of a headache. That may help reduce harvest on game fish.”
Appendix B.  
Focus Group of Real Estate Professionals: Interview Agenda and Analysis

The second focus group was conducted with people involved in the local real estate market including both assessors and realtors. In addition to the University researchers, there were three people involved. These included a real estate appraiser with offices in Janesville who works with lakefront properties, a realtor from Edgerton with 20 years of experience, and a real estate appraiser from Fort Atkinson with 20 years of experience in the Lake Koshkonong region. The questions raised in this focus group provided insight into the disparities between assessed values and transaction values of lakefront properties, components of lakefront property value, current values of lakefront property, trends in lakefront real estate, and their perception of change in real estate value that would be anticipated were changes to occur in water levels. A complete agenda for this focus group can be found in Table B1.

The following provides a general content analysis of the second focus group session. The basis for analyzing each of the focus group interviews was developed from main themes identified using personal notes, typed transcripts and reviews of each audio tape. This focus group attempted to capture the knowledge base of local real estate professionals on property values and the impact of removing the Indianford Dam.

On the components that determine property value:

"... I think the biggest thing is land value ... from there, you would look at the type of house."

"... a lot of the cottages are tear-downs where they tear the cottages down and build a new house on the parcels."

"... the value in any of the properties close to the lake (is dependent) on the nearness of the parcel to the water."

"... the biggest (component of) value for anything around the lake, as far as I’m concerned, is waterfront or close access (to water)."

"The water, just the word ... is magic."

"... the attraction of waterfront property ... certainly (would need to account for) proximity to major urban locations."
Table B1.  Focus Group Outline: Area realtors and appraisers  
Conducted on May 14, 1999 in the Jefferson County Courthouse

Purpose: To provide context for determination of residential property values along Lake Koshkonong

1. What is your name and the organization you represent.

2. What has been your experience of valuing properties in the near vicinity of Lake Koshkonong?

3. What are some of the components that determine property value (e.g. size of home, # of bedrooms, etc.)?

4. Describe how you view the differences between assessed values and market values in lakeside residential property?

5. What are some of the typical values that you're seeing for different types of housing?  
   - small cottage - 2 bedrooms  
   - medium house - 2/3 bedrooms  
   - larger homes

6. Describe the differences between residential property on open water and on wetlands (e.g. cost of purchase, taxes, market value of existing homes)?

7. How would you describe changes and trends over the last ten years regarding:  
   - how property is used (year round, seasonal)  
   - types of homes being built  
   - origination of new homeowners (Chicago area, Milwaukee, local area)  
   - amenities that attract newer homeowners (e.g. water, proximity to I-90)  
   - demographic profile of new homeowners

8. Based on discussion on property values so far, to what extent would property values change if Lake Koshkonong were to recede?  
   - 1 foot, 2 feet, 3 feet, 4 feet

9. Have you any other related important matters that you would like to comment on?
On the differences between assessed values and market values in lakeside residential property:

"... three years ago, the Town of Koshkonong went through a re-evaluation (of property values) ... we had determined that the assessed values approximately represented about 80% of market value at that time."

"... a lot of the properties ... have been remodeled and the people have bought them for "x" dollars and gone in and done a lot of remodeling ... a lot of the assessed values haven't caught up."

"... in Edgerton, they more or less made it a law almost that every three years, everything is reassessed."

"... the Town of Koshkonong was reassessed about 3 years ago and currently they are at 81% of pure market value."

On the variation in residential real estate prices around the lake:

"I've got a two bedroom, just listed, needs some love, great view, wonderful view, $43,000."

"I've got a house for $325,000 which I'd tell you right now is overpriced on a 50 foot lot in the floodplain ... the most beautiful house you ever saw, but it's only on a 50 foot lot."

"... people are doing remodeling because they have confidence in property value based on the original attributes. I think people still believe that there is nothing that is going to happen and that's why they continue to buy."

"I would be pretty hard pressed to find anything that is in decent shape for less than $50,000."

On the relationships between residential property values and proximity to open water:

"... I think $50 to $60 K is a reasonable amount for a small two bedroom, on that is in reasonable shape. Upwards if you have something that is fixed up. If you get on the lake, I can tell you that roughly values are gonna double."
"... if you had the same house ... located on the lake or off the lake, there’s a difference of about 50% in value."

"... you’d be real hard pressed to find anything on the lake for less than $100,000 that has actual waterfront."

"... large home ... off the lake ... probably $200 K. You get up on the lake (and the same house) would go for $350 - $450 K. The highest priced residential resale ever occurred on Lake Koshkonong is $425,000."

"... you’ll see non-waterfront homes that sell for half what the waterfront property sells for."

"... they want to be on the water ... you gravitate outward from there and the property values decrease."

On the differences between residential property values on parcels adjacent to open water and parcels adjacent to wetlands:

"... (being adjacent to a wetland) is not the same as being right on the lake but somewhere maybe a little bit above being off the lake."

"There’s a pretty strong market for people who do want wetlands, but it has to have a building site with it."

"I guess if the lake would revert back to wetland, the only people that would want to buy land out here would be the hunting clubs and hunters."

Refuted later in the focus group but responses seemed questionable because tone was more defensive:

"There would be absolutely zero premium put on wetland."

"Because there would be so many of them, they’d be worth diddly."

On the changes and trends in lakefront properties:

"I’ve seen a trend toward more year-round use. People are moving up here from other areas because they see the quality of life, the proximity to the Chicago area, commuting distances. I mean there are a lot of people who live here now and commute back and forth to work everyday."
"I think (people) are buying (these houses) as second homes, but in the back of their mind, they (have plans) to eventually make it the home ... they are buying seasonal cottages and putting in furnaces and air conditioners and making them year-round homes."

On the estimated impact of lower water levels on property values around the lake:

"... Lake Koshkonong ... is still an affordable place for people with recreational aspects (to buy.) ... if you take away the recreational aspects ... by removal of the lake or reducing the water level, you'd be left with (value only) for the hunting clubs."

"I think, as a guess, that we would see a (property value decline of) at least 10% for six inches (of water level decline), 20% for a foot, and all the way up to 60% for 3 feet."

"I would agree with a 50% (decline in property values) on the 3 to 4 foot level (of decline)."

"You'd have a flood of stuff (homes) for sale ... everybody would have their house for sale and nothing would sell."

"Its gonna have an impact on housing (values) ... maybe as far south as Janesville, as far north as Cambridge ... and Fort Atkinson."
Appendix C.
Focus Group of Local Business Owners: Interview Agenda and Analysis

The third focus group looked at the local retail and service business situation and provided perspective into the impact of tourism on the communities surrounding Lake Koshkonong. In addition to the project staff, there were nine local business owners participating in the focus group held during late August of 1999. These local business owners represented specific firms operating as restaurant/supper clubs, taverns, campgrounds/overnight accommodations, marinas/watercraft rentals, gift shops, grocery stores, and gas/convenience stores. The issues discussed during this focus group revolved around the characteristics and extend of tourism demands. In addition, we had the participants discuss likely effects of lowering water levels of Lake Koshkonong on both recreational use and resulting business activity.

The following describes major findings from the third focus group session. The basis for analyzing each of the focus group interviews was developed from main themes identified using personal notes, typed transcripts and reviews of each audio tape. This focus group attempted to capture the knowledge base of local retail and service sector business owners on the possible impacts of lowering water levels on Lake Koshkonong.

Characteristics of current business demand

“My business (hardware retail) is predominantly local people, but I do get a lot of weekend Illinois people ... a lot of cottage owners.”

“I think we get people from all over ... lots of times, my [gift shop] customers are the spouses of those that are doing the hunting and fishing.”

“In the summer, we probably do three times the amount of business [gas and convenience store sales] that we do in the winter.”

“I run ... a grocery store. We’re atypical in that most grocery stores drop in business in the summer — our business rises by ten to fifteen percent. This [place] is a destination ... the lake is good for my business. It’s no question that the lake is the reason that we rise up in the summer.”

“... it would be devastating to the marina business ... when the water gets real low, people aren’t doing the boating just because of the destruction that it does to their boats.”

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Table C1  Focus Group Outline: Area Businesses
Conducted on August 26, 1999, 7:00 – 9:30 p.m. at the Fort Atkinson
Chamber of Commerce, Board Room

Purpose: To provide the context for and the financial impact to business from
possible changes in the physical configuration of Lake Koshkonong.

1. What are your names and the businesses with which you are involved?

2. How would you describe, in general, your business and types of customers?

3. How would you categorize the amount of business you receive from people
outside the area?

4. How many year-round and seasonal employees do you have?

5. How would you describe where your customer base is coming from? (Where are
their permanent homes?)

6. What changes might we see in recreational users of Lake Koshkonong if the dam
was removed and the lake had lower water levels?

7. What would be the financial implications to your business if Lake Koshkonong’s
dam were removed?

8. What would you do to respond to the business/financial implications (if there
are changes) of a different customer base?

9. Are there any other important business considerations related to removing the
dam that you would like to comment on?
“... Lake Koshkonong ... is the second largest concentration of camping [sites] in the state. There’s something over 3,000 campsites around Lake Koshkonong. If you take the lake away ... you can cut that to less than half.”

“... on any given night, the [supper club] can be full and I don’t know half the people visiting. You know, Milton and Edgerton and the local townsfolk — they support us a lot, but the majority of the visitors are people I’ve never seen before. I’d say 60 percent of our business is the weekend people.”

Extent of outside demand for locally available goods and services

“... 60 percent of the people that come through our doors come from out-of-town.”

“... 40 to 50 percent of my business — maybe as high as fifty or more come from outside the area.”

“... boat sales to people that lived farther than twenty miles from the marina were just over 80 percent (of my business).”

“... forty percent in the summer and maybe twenty five percent in the fall and winter months.”

“... I’d say about 10 percent (of the hardware business).”

Changes in recreational use that would be likely to occur as a result of lower water levels:

“... recreational use as far as skiing, tubing, jet skis — would be gone. It would be impossible.”

“... all those big pleasure boats — those people have families, they have property on the water, they have money ... this business would be lost.”

“I think about runabout type boating ... that’d be gone — I know it would be gone. We’re getting bigger boaters out on the lake — they’re gonna be gone. We may have a few pontoon boats out there — a few diehards, but its going to be the fishermen, the duck hunters — we’re going to lose our family-type boaters.”

“...Its taken so long for the lake to get the reputation that it has ... if the configuration changed ... it would take so long to come back up and define itself
... it'd be very, very difficult for the people around the lake to stay in business that long."

"The duck hunters would probably (like it), but that's only seasonal — real seasonal ... they're not going to spend a lot of money if they grab a few items and go out into the duck blinds."

"I would see a definite change in use ... it's taken such a long time to build up the tourism idea in our community with our festivals and other things ... (the character of our visitors) would change."

"... I've noticed a change over the last few years, where we're getting a lot more of the personal watercraft ... you never saw any of those around Lake Koshkonong until about three or four years ago ... none of those would be anywhere near us (if the water level dropped.) It would be a duck hunter's lake and a sightseer's lake."

Financial implications of lower lake levels

"I think I would close. I seriously do. I think it would just be a matter of time. I think I would hang on for awhile and watch the sales decrease, and probably end up just locking it up."

"I'd lose 25 to 30 percent of my summer business."

"It would probably ruin us, in the long run — it would probably take five or six years, but over the long haul, what we count on is building up enough in the summer to get you through the winter. If you didn't have the summer to build up on, (you'd have to count on only the locals.)"

"... we're 6 or 7 miles out in the middle of nowhere ... would it be the draw to bring someone out 6 miles for dinner (without the lake?) My guess is that we would lose a lot of (our customer base.) Twenty percent — maybe thirty percent of our business, you know. But that might be the only edge. That's one of the main edges that we have over our competition ... (its) that resource right outside the door."

"... it's nothing to have one of the Illinois guys come in and drop a hundred bucks on the bar and say, let me know when it's gone ... they come up with five hundred dollars and they're gonna spend it. They're not going home (until its gone) ... the change you give them goes for tollbooths on the way back."
Response to changing demands

“IT probably wouldn’t hurt us (the hardware store) very much ... as far as our fishing dollars are concerned ... that’s such a nominal thing we can pick that up in other areas.”

“The culture around the lake would change dramatically. A lot of those houses that people have purchased on the lake were bought because there was a lake there.”

“It wouldn’t put me out of business (grocery store) by any means. I think I would drop more than the ten or fifteen percent I raise up in the summer though because of the change in ownership around the lake — of the houses.”

“We’re just finally starting to get heard. It would be very, very discouraging to us if this happened, because we’re prophets now and people are realizing that it is the lake that brings people here ... (if the water levels dropped), we’d have to go and reinvent ourselves again ... change is not easy for anybody ...”

“... there are a lot of communities out there that would love to have this situation here ... to me this is a gem. If the (lake) went down, we would have to retool everything because we’re in a very competitive business, and our edge is that river.”

“I think I’d have to look to see who was still coming and find out what their interests and desires were and try to adjust to that, and try to find a way to get them to help me connect with other people with their types of interests ...”

“I think you’re looking at changing your product - the quality of your product to ... where they’ll come and see you. You’d surely have to take a different stance in promoting ... we’d all deal with a much different customer base than we deal with now.”

“I know what I have now. And I know what my business is now. And it would be totally changing what I sell, what I buy. ... that would be — not starting from square one, but it certainly disrupt my business sense. I don’t think I’d like to see it. And, I would hate to see what would happen to the surrounding businesses around me, and especially the people that had to really start over from scratch.”
Appendix D
Elevations of Relevant Channel Points

Schematic of Rock River
(Indianford Dam to Beginning of Lake)

Landmarks: Indianford Dam, Table (Railroad Bridge), Beginning of Lake

River Flow:

Figure D.1 Side view schematic of Lake Koshkonong and Indianford Dam.
## Appendix E
Various Maps of the Local Real Estate Situation

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<tbody>
<tr>
<td>Lake Koshkonong - Total Land Value</td>
<td>59</td>
</tr>
<tr>
<td>Lake Koshkonong - Square Foot Land Value</td>
<td>60</td>
</tr>
<tr>
<td>North Lake Koshkonong - Total Land Value</td>
<td>61</td>
</tr>
<tr>
<td>North Lake Koshkonong - Square Foot Value</td>
<td>62</td>
</tr>
<tr>
<td>South Lake Koshkonong - Total Land Value</td>
<td>63</td>
</tr>
<tr>
<td>South Lake Koshkonong - Square Foot Value</td>
<td>64</td>
</tr>
<tr>
<td>South Lake Koshkonong - Total Land Value</td>
<td>65</td>
</tr>
<tr>
<td>Southwest Lake Koshkonong - Square Foot Value</td>
<td>66</td>
</tr>
<tr>
<td>West Lake Koshkonong - Square Foot Land Value</td>
<td>67</td>
</tr>
<tr>
<td>Major Real Estate Developments Around Lake Koshkonong</td>
<td>68</td>
</tr>
</tbody>
</table>
Major Real Estate Developments
Around Lake Koshkonong
West Lake Koshkonong:
Square Foot Land Value
Southwest Lake Koshkonong:
Total Land Value
South Lake Koshkonong:
Total Land Value
North Lake Koshkonong:
Square Foot Land Value
North Lake Koshkonong:
Total Land Value