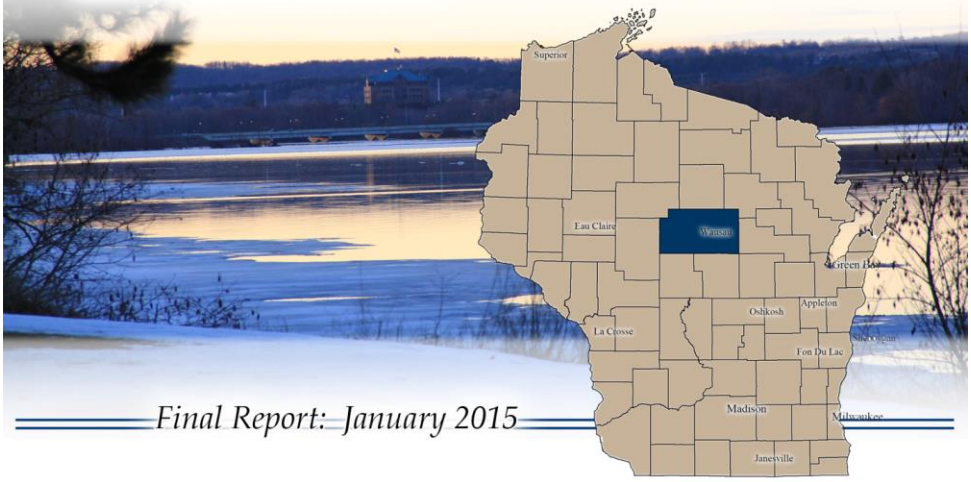
University of Wisconsin-Stevens Point
College of Natural Resources

Lake Wausau:
Socio-Economic Assessment



Final Report: January 2015

As a resident of one of the communities that surround Lake Wausau you have been randomly selected to receive a survey concerning efforts to improve the community resource of Lake Wausau. This survey is being conducted by faculty in the College of Natural Resources at the University of Wisconsin--Stevens Point in partnership with the Lake Wausau Association and sponsoring local governments. Survey results will help these groups understand how residents in the Wausau area interact with and value Lake Wausau and the Wisconsin River. Results will inform ongoing research and activities to improve water quality in Lake Wausau. All results will be kept confidential and if you have any concerns about the treatment of research participants please contact the UWSP Institutional Review Board that can be reached at (715) 346-4598.

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Social-Economic Assessment for Lake Wausau

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I would also like to thank several team members who were also involved in the development and analysis of the Lake Wausau Community Survey. Specifically, Jared Wehner who managed the data collection process as part of his LTE role with the Center for Land Use Education at UW-Stevens Point and Jacob Hernandez who provided data entry and analysis that contributed to the completion of this report.

Finally, this work would not have been possible without the support of members of the greater Wausau community and specific input from members of the Lake Wausau Association.

Suggested Citation

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Outputs

- Thompson, Aaron., Hernandez, J., Wehner, J. June 2013 – September 2013. Development, data collection, and analysis of the Northern Wisconsin Landowner Survey. Survey contacted 836 respondents from 4 Central Wisconsin communities (Wausau, Schofield, Rothschild, & Rib Mountain) with a 44.3 percent response rate.

- Zangl, M., Thompson, Aaron. 2014. Defining Areas of Improvement for the Lake Wausau Community: *PPGIS Methods for Analyzing Spatial Survey Data*. University of Wisconsin – Stevens Point.

Table of Contents

Introduction

Social and economic data is being collected to provide a foundation for successful planning to address water quality, recreational, and land management challenges associated with Lake Wausau (in Marathon County, WI). Understanding community commitment to this resource, the perceived role it plays in the future of the region, and areas of potential management conflict is an important foundational step in developing a plan for future action to improve Lake Wausau. The proposal described here includes all steps to be undertaken as part of Phase I of this research.

Literature Review

Expansion of opportunities for individuals with different attitudes and priorities to take an active role in deciding how shared resources are managed within their community is one of the biggest changes occurring today in natural resource management. This change is not simply occurring at the national level, but is becoming more common at the local level as government and citizens are seeking planning solutions that combine the knowledge and interests of multiple stakeholders to effectively make decisions about community challenges, such as watershed management (Koontz, 2005). Gray (1989) describes the rise in popularity of this type of collaborative planning as a response to traditional approaches to resolving complex problems that fail to produce solutions because decision makers become polarized in an adversarial process that limits the identification of common problems and solutions.

Collaboration is a process that seeks instead to limit these adversarial interactions by emphasizing a collective search for information amongst a diverse group of stakeholders (Gray, 1989). Through the development of a common understanding of the problem and exploration of divergent attitudes and priorities held by stakeholders this search for information can assist communities in developing a shared vision for managing their natural resources. The emphasis on clearly articulating a vision for the future is essential for successful planning as outlined in the Rational Comprehensive Planning model developed by Friedman (1987). The RCP model proposes that successful planning is based on a detailed assessment of current conditions that inform the development of a shared vision to guide the selection of goals, alternatives, and implementation strategies. The collaborative approach builds on the RCP process by placing additional emphasis on clearly identifying and recruiting a broad base of community stakeholders into the planning process. This emphasis makes incorporation of a social analysis as critical to the current conditions inventory as the ecological analysis. This is not to say that collaboration leads to a process without conflict; however, the emphasis on mutual input into the formative stages of the decision making process facilitates relationship building that can increase individual participant's willingness to listen, learn, and develop mutual goals with other stakeholders (Schuett, 2001).

While the decision to proceed with a collaborative approach to developing a plan for managing Lake Wausau is still in the future, at this stage in the process there are several important lessons from the collaboration literature collaboration that can assist in the development of these efforts. These lessons include:

- Community context can shape the success of future planning efforts (Koontz, 2005).
- Importance of working toward a broadly shared vision requires recognizing the diversity of stakeholders and their attitudes toward the resource (Conley & Moote, 2003).

Objectives

The following objectives were developed in response to these collaborative management lessons to provide the foundation for future decision making concerning Lake Wausau.

Identify the different attitudes (social and economic) held by the general public toward Lake Wausau

The formative stages of a collaborative process to effectively plan for the future of a common resource, such as Lake Wausau, require developing an understanding of the diversity of perspectives that exist within a community that are relevant to the resource. In practice what this means is that there is a need to understand current community members' attitudes toward Lake Wausau are and how these perspectives have evolved over time. Strauss (2002) emphasizes the importance of understanding the breadth of attitudes that exist in relation to the resource, indicating that "it's important to remember that a stakeholder can do more damage to a process by being left out than by being involved."

In addition, we will explore the importance of economic variables among survey respondents. Economic value of public goods, such as Lake Wausau, is often assessed with several methods, depending on the nature of the services provided by the good. In the case of a public good, such as Lake Wausau, there are values associated with direct production value, e.g. energy production, use values associated with recreation, and non-use (amenity) values associated with proximity and other services provided by the lake that are not associated with direct use.

Methods

A mail survey questionnaire was sent to a random sample of 850 mailing addresses in the Wausau area – including 160 individuals from each of the 4 communities and a separate sample of 210 additional individuals living within near-lake neighborhoods. This sample was developed from tax parcel records to identify and randomly select residential homeowners within each of the communities (for a step-by-step process refer to Appendix A). Using Dillman's (2000) tailored design method we conducted a five wave survey that resulted 44.3 percent response rate. We collected data on attitudes toward Lake Wausau, economic priorities, and demographic information from respondents in order to test for potential response bias of these methods. The

data from the survey has been analyzed to identify shared perspectives, or belief systems, related to Lake Wausau that can be used to ensure adequate representation of different stakeholder groups in the process.

	Sample	N	Response Rate
Wausau	156	56	35.90%
Schofield	156	62	39.74%
Rothschild	158	68	43.31%
Rib Mountain	159	83	52.20%
Near Lake Neighborhoods	207	99	47.83%
Overall	**836**	**358**	**44.31%**

Survey Variables:

1. Lake Wausau Association (LWA) awareness and knowledge
2. Environmental Knowledge
3. Governance Policy
4. Community perspective of Lake Wausau as a resource
5. Economic valuation of Lake Wausau's resource attributes
6. Demographic information of Lake Wausau Residents.

Project Timetable Including Specific Deliverables

Supports		Year 1	Year 2	Year 3
Obj. 2	Survey Development	x	x	
Obj. 2	Survey Implementation		x	
Obj. 2	Survey analysis		x	x

Survey Findings: Lake Wausau Community Survey

Lake Wausau Community Survey

University of Wisconsin-Stevens Point
College of Natural Resources

As a resident of one of the communities that surround Lake Wausau you have been randomly selected to receive a survey concerning efforts to improve the community resource of Lake Wausau. This survey is being conducted by faculty in the College of Natural Resources at the University of Wisconsin--Stevens Point in partnership with the Lake Wausau Association and sponsoring local governments. Survey results will help these groups understand how residents in the Wausau area interact with and value Lake Wausau and the Wisconsin River. Results will inform ongoing research and activities to improve water quality in Lake Wausau. **All results will be kept confidential** and if you have any concerns about the treatment of research participants please contact the UWSP Institutional Review Board that can be reached at (715) 346-4598.

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PLEASE READ BEFORE BEGINNING THIS SURVEY:

The survey must be completed by an adult member of your household 18 years of age or older.

Please mark all answers clearly, in pen or pencil, as indicated below.

Example "A" ☐ ☐ ☒ Example "B" ☐ ☐ ☑

Social Data

One of the primary goals of the Lake Wausau Community Survey was to assist those attempting to develop management plans for enhancing the lake in understanding community views and priorities for the future of this resource. The following sections outline the key findings related to both social and economic data provided by the 378 survey respondents.

Lake Wausau Association Awareness and Knowledge

This variable was used to measure awareness and knowledge respondents hold in regards to the Lake Wausau Association and their mission. This variable was also used to measure if respondents generally agreed or disagreed with LWA's priorities put forth in their mission statement. Data from this variable will be used to better asses LWA's awareness and make sure their mission is consistent with the needs of residents in the greater Wausau community.

Survey items:

1. Have you heard of the Lake Wausau Association?
2. Do you agree with the priorities that the Lake Wausau association has put forth in their mission statement?

Results:

These survey items were measured using a 7 point Likert scale from -3 to +3 (strongly disagree to strongly agree). Question 1 had a mean response of 1.75 Question 2 had a mean response of 2.0. This means respondents generally agreed with both questions.

In regards to question 1 (n=359) 41% of respondents had never heard of the Lake Wausau Association. 43% had heard of LWA, but did not know what their purpose was. Only 16% of the respondents had heard of LWA and knew what LWA's purpose was.

In regards to question 2 (n=346) 82% agreed (Somewhat agree, agree, strongly agree) with LWA's priorities put forth in their mission statement. 3% of respondents disagreed (somewhat disagree, disagree, strongly disagree) with LWA's mission statement). 15% of respondents remained neutral to the question.

Discussion

Results indicate that the majority of respondents heard of the Lake Wausau Association and knew what their purpose was. Therefore, LWA is doing a good job of promoting the organization. However, there remains, 41% of residents who do understand who LWA is and what they are trying to do. The Lake Wausau Association should continue to promote the organization as a conservation group affiliated with the preservation of Lake Wausau. This will increase awareness and knowledge of the organization to residents of the greater Wausau Community.

Community Perspective of Lake Wausau as a Resource

Survey respondents were asked to rank their agreement with statements about Lake Wausau, ranging in content from perceptions of the current condition of the water, assigning responsibility for current conditions, to the reasons why it's a priority to protect and revitalize the lake. Each of these items is shown below in Table 1. In addition, the mean results overall and for each community are provided in Table 1 that provides an indication of overall positive and negative evaluations of the conditions of Lake Wausau.

***Table 1**: Views of Lake Wausau Items*

Items 1-5:

1. Lake Wausau vastly adds to the beauty of the community and its surroundings.
2. It is important for community members to take an active role in determining the future of Lake Wausau.
3. I choose to spend my time elsewhere because of the lack of recreation facilities on the lake.
4. Providing better habitat for fish and wildlife motivates me to support efforts to improve Lake Wausau.
5. Competition for areas to recreate (such as fishing, boating, jet skiing, biking, etc.) makes it difficult to enjoy recreating on Lake Wausau.

Items 6-10:

6. I feel unsafe when walking or spending time in the parks along the lake.
7. The scenic and natural beauty of Lake Wausau contributes to our community's ability to attract new residents and employers.
8. Local funding to revitalize the lake is a great investment in our future.
9. I like outdoor activities, but I don't recreate on Lake Wausau.
10. Proposed improvements to Lake Wausau and the riverfront will help revitalize neighborhoods and attract people back to downtown.

Items 11-15:

11. Lake Wausau has some of the best fishing in the area.
12. When recreating on the lake my enjoyment is frequently disrupted by other users.
13. The lake is too big of a mess to fix without federal money.
14. The lake is dirty and seems to be getting worse.
15. Lake Wausau is a good place for doing the types of activities I enjoy most.

***Table 1**: Views of Lake Wausau Items (cont.)*

Items 16-20:

16. The condition of the lake has gotten so bad that I only feel safe looking at the water.
17. Water quality in Lake Wausau continues to improve, allowing for increased opportunities for recreation.
18. The parks on the lake remain some of the most beautiful spots in the county.
19. The condition of the lake shows that local government is not taking responsibility.
20. More restrictive regulation of activities on the lake is necessary to protect the enjoyment for all users.

Items 21-25:

21. Lake Wausau has meaning to me, because it gives our community a sense of place.
22. I find it very difficult to get to the lake or surrounding parks.
23. Spending time on Lake Wausau is a tradition that keeps me coming back.
24. Providing better opportunities for recreation motivates me to support efforts to improve Lake Wausau.
25. The Wisconsin Department of Natural Resources is an important partner in the management of Lake Wausau.

Items 26-30:

26. The water has a smell to it that makes me not want to spend time on the lake.
27. Lake Wausau builds community by creating a bond between people living on the lake and those that recreate there.
28. There are too many regulations on Lake Wausau for me to enjoy recreating there.
29. I don't feel safe eating fish from the lake.
30. The lake is important because it supports manufacturing in our community.

***Table 2**: Views of Lake Wausau Results*

Statement	Overall	Wausau	Schofield	Rib Mountain	Rothschild
1	1.5979	1.6694	1.6026	1.6354	1.5224
2	1.4011	1.3920	1.3333	1.4896	1.4179
3	-.2784	-.2358	-.4805	-.3158	-.1940
4	.8472	.7760	.8831	.9072	.8333
5	-.0243	-.0081	-.1667	.0426	-.0597
6	-.7177	-.7016	-.7662	-.7188	-.7313
7	.9919	1.0902	.9351	1.0000	.9104
8	1.0538	1.0081	1.1429	1.0729	1.0000
9	.1283	.2339	-.1026	.0206	.2687
10	.8552	.9360	.9351	.6701	.8955
11	.0405	-.0328	.1579	-.0103	.1940
12	-.1263	-.1360	-.2338	-.0313	-.1515
13	-.2107	-.2400	-.1795	-.2371	-.2985
14	-.1555	-.1371	-.1948	-.0515	-.3731
15	.1941	.0480	.3974	.2316	.2769
16	-.5401	-.5323	-.5769	-.5773	-.5970
17	.3102	.2320	.4231	.2813	.4030
18	.5376	.5323	.5128	.6186	.4923
19	-.0214	-.0080	.1169	-.0938	-.1343
20	-.1497	-.1048	.0385	-.3814	-.1493
21	.7984	.8115	.8831	.7551	.8209
22	-.8633	-.7724	-.9870	-1.0816	-.6418
23	.1351	.1157	.2987	.1753	.0000
24	.5108	.5041	.5789	.5408	.4030
25	.7769	.6694	.9221	.7292	.9104
26	-.3110	-.2764	-.3117	-.4286	-.2836
27	.1989	.1463	.3506	.2577	.0896
28	-.4309	-.2927	-.5405	-.4898	-.4478
29	.2749	.3577	.1818	.3163	.1231
30	.1348	.1138	.1184	.1237	.2388

Results: What we learned about 'Views of Lake Wausau'

In order to begin to decipher the areas of agreement and disagreement that create unique belief systems or view of the lake further analysis is required. The goal of this analysis is to assign survey respondents into groups with like-minded people based on how each individual responded to the 30 items. The analytical technique used for this process is call Inverted-R analysis, which is well suited for grouping together numerical patterns associated with strongly agree to strongly disagree survey responses (Thompson et al., 2010). This factor analysis technique supports identifying the number of unique groups, or distinct belief systems, that exist within a set of data. The analysis revealed four unique belief systems exist within the responses to the Lake Wausau Survey, which will be described in detail below.

Commonalities & Differences

One of the advantages of the inverted-R analysis is that it helps us understand both the differences and similarities between the groups of people who hold to each of the identified views of Lake Wausau. First, focusing on the commonalities that crossed all four groups the results of the Inverted-R analysis showed that all groups:

1. Strongly agree that Lake Wausau adds to the beauty of the community (Item #1).
2. Strongly agree that community members must take an active role in the future of Lake Wausau (Item #2).
3. Agree that Lake Wausau contributes to the community's ability to attract new residents and employers (Item #7).
4. Agree that local funding to revitalize Lake Wausau is a good investment in the future (Item #8).
5. Agree that Lake Wausau contributes to the community's sense of place (Item #21).
6. Disagree that it is difficult to access the lake and surrounding parks (Item #22).
7. Agree (although the support levels vary across groups) that the Wisconsin Department of Natural Resources is an important partner in the management of Lake Wausau.

The list above provides an indication of the strong support that exists for the stewardship of Lake Wausau as a community asset that significantly contributes to quality of life in the surrounding communities. Across all four groups with distinct views of the resource this favorable opinion of Lake Wausau and the need for both individual citizens and communities to invest in its future demonstrate the strong support that exists in the general population for efforts to enhance and revitalize the lake.

Future efforts to enhance Lake Wausau also need to acknowledge the differences that exist within the community. The Inverted-R analysis revealed four distinctly different belief systems, suggesting that once past the commonalities listed above community members have significant differences of opinion about issues including the condition of the lake, what motivates them to

support efforts to address problems, who is responsible, and more. Below you will find a description of each group – representing one of the unique view points toward Lake Wausau:

Group 01: At home on Lake Wausau

Residents who hold this view enjoy spending time on Lake Wausau, seeing plentiful outdoor recreation options and good fishing as some of the high points of their time spent here. For many, they view recreating at Lake Wausau as part of a tradition that keeps them coming back over and over again. They disagree with others who think the lake is dirty and getting worse; most hold the opposite opinion that the water is safe for recreating and they are willing to eat fish caught there. These individuals believe that the parks on Lake Wausau represent some of the most beautiful places in the county and disagree that there is an unpleasant odor that prevents them from recreating here. When it comes to who is responsible, this group sees that both the DNR and local government have appropriately responding to the conditions on Lake Wausau.

Group 02: Hard working Lake Wausau

There are a couple of similarities between residents who hold this view and Group 1 as both believe that Lake Wausau has plentiful outdoor recreation opportunities and that the parks along the lake are some of the most beautiful places in the county. Outside of these areas individuals in group 2 are less motivated by providing fish and wildlife habitat than other groups and instead believe that the lake is important because of the role it plays in supporting manufacturing within the community. They enjoy outdoor recreation, but don't choose to spend their time on the lake. However, this slight to recreating here doesn't seem to be linked to concerns over smell or water quality issues. They are also the least likely to support stronger regulations of activities to protect the enjoyment of the lake for all users and are the least supportive of the involvement of DNR in lake management. When it comes to local funding this group agrees with the investment for the future, but support is lower than for any of the other groups.

Group 03: When recreating, it's not on Lake Wausau

Negative experiences and perceptions of the recreational aspects of Lake Wausau dominate the views of members of this group. In particular, they view the lake as lacking recreational facilities and feel that there is too much competition (or crowding) that makes it difficult to enjoy what is here. They view the parks as being less safe than members of other groups, which in combination with the other factors may explain why this group that does enjoy outdoor recreation chooses to spend their time elsewhere. Put simply they don't see the lake as a good place for doing the things they enjoy most, citing poor fishing opportunities and frequent disruption from other users as reasons they go to other lakes. This group seems less connected to the lake as they disagree that spending time here is a tradition or that the lake plays a role in building community between those that live and recreate here. They do support efforts to improve the lake especially by focusing on enhancing fish and wildlife habitat, but they also feel

that the condition of the lake is a reflection of local government not taking responsibility to manage the problems.

Group 04: It's dirty and the time has come to fix Lake Wausau

The defining feature of those who hold this view is a strong belief that Lake Wausau is dirty and seems to be getting worse. They are the only group who to disagree that water quality is improving and are the most likely to believe that the condition of the lake is so bad that it is now only safe to look at the water. This view is supported by their perception of the lake having a strong odor and are the least likely to feel safe eating fish from the lake. Similar to group 3, members of this group see a lack of recreational facilities on the lake, but are largely motivated by the need to enhance fish and wildlife habitat. They are also the most critical of local government's response to the condition of the lake, but among the most supportive of DNR's involvement in managing these issues.

Discussion: Who Lives in Your Community?

The survey used a sampling design that allows us to examine differences between individuals who live in each of the four communities surrounding Lake Wausau. In addition, we also included a special group of residents who live in 'Near-Lake' neighborhoods surrounding the lake. In order to understand the diversity within each of these communities we were able to link group membership showing the four belief systems described above with where these residents live within the Lake Wausau area. The results shown in Table 3 provide a snapshot of the views of Lake Wausau held by residents of these different areas. Group 1, 2, 3, and 4 correspond to the descriptions above, while group 0 is reserved for those individuals who weren't strongly associated with any of the dominant belief systems (they are included here to show the overall percentage of those who completed the Views of Lake Wausau portion of the study.

***Table 3**: Group Distribution in Community Samples*

	Wausau	Schofield	Rib Mountain	Rothschild	**Total**
Group 0	4.9%	6.1%	9.8%	6.8%	**6.8%**
Group 1	46.1%	54.5%	47.6%	52.5%	**49.5%**
Group 2	18.6%	13.6%	18.3%	16.9%	**17.2%**
Group 3	16.7%	12.1%	9.8%	16.9%	**13.9%**
Group 4	13.7%	13.6%	14.6%	6.8%	**12.6%**

The results indicate some significant variation across the communities in the region, especially with regard to the percentage of residents who hold views associated with groups 1 and 2. The communities of Schofield, Rothschild, and those living in near-lake neighborhoods have a significantly higher percentage of those who belong to Group 01, or those that 'feel at home on Lake Wausau'. We see a higher percentage of membership in Group 02 who hold a

'hard working Lake Wausau' perspective among residents of Wausau and Rib Mountain. Efforts to work with local governments and residents of surrounding communities will need to take into account both the commonalities that were identified across groups, as well as the differences that exist between groups in order to develop an effective outreach strategy.

Public Participation Mapping

Public participation mapping allows for priority areas to be located by local knowledge. By obtaining this local knowledge limited resources can be allocated to best fit the wants and needs of those who use the lake. The interactions between humans and their biophysical environment can help guide the decision making process in regards to optimal use of the built and natural landscape they inhabit (Ndubisi, 2002). This data can aid in setting targets for future preservation of Lake Wausau.

Survey items

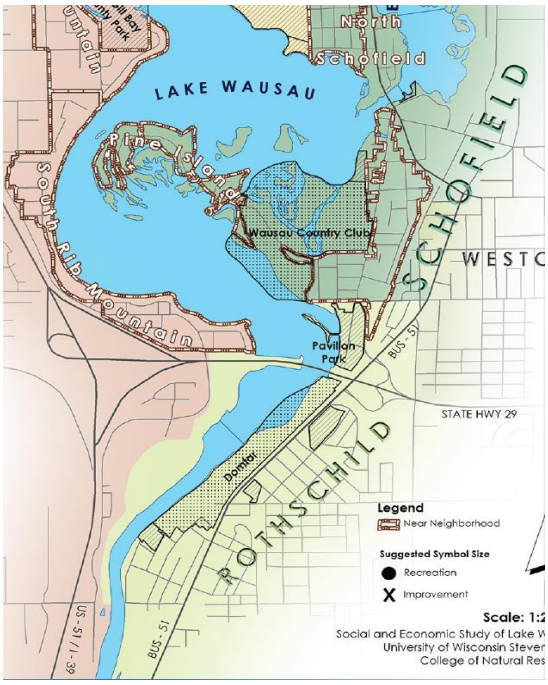
A1. Indicate on the map where you prefer to recreate on Lake Wausau (using a dot)

A2. What types of activities do you do there?

B1.Indicate on the map where you have seen areas of most improvement on Lake Wausau (circle the location)

B2. What Sort of Improvements have you seen there?

Figure 1*: Map used in the survey for respondents to indicate answers from A1 and B1*



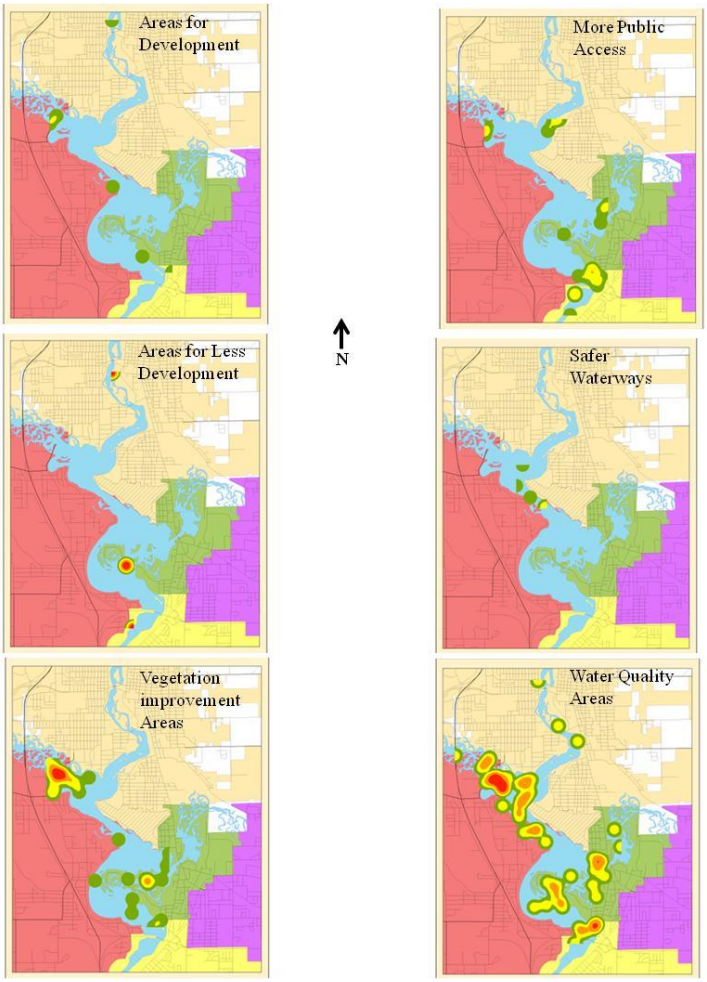
Methods

Reoccurring and common themes were selected from the data provided by respondents. These themes were then used in their own individual density analyses in order to locate highest priority areas. These were then overlaid into one priority map.

Results

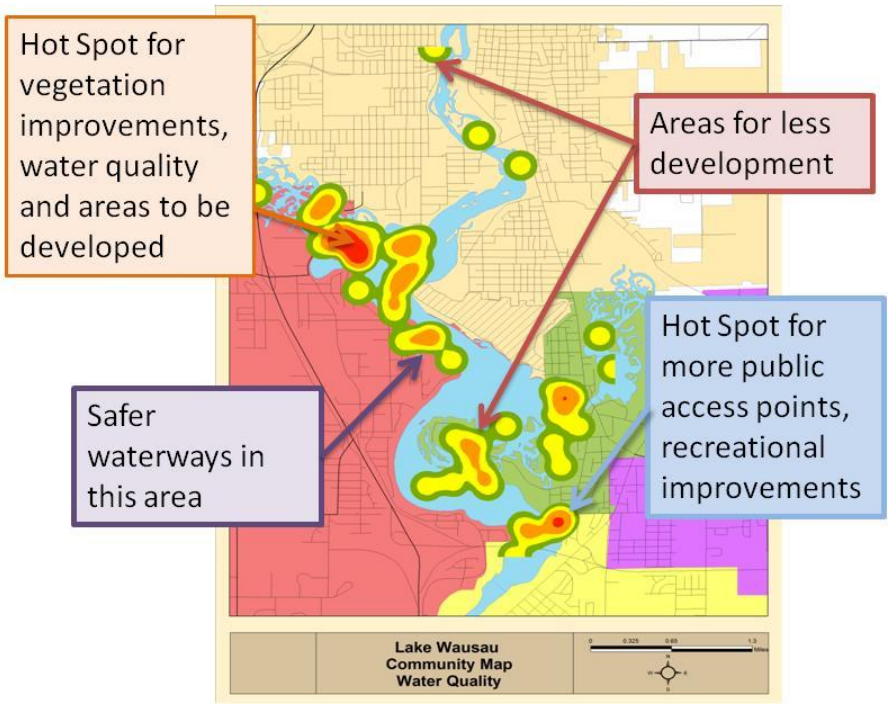
Figure 2 is the result of each density analysis run. Thus, there were six common themes that were revealed from the data provided by respondents.

Figure 2: *Six density analysis maps from respondent data*



Final overlay map identifies all of these priority areas on one map. Their spatial interaction is important in the planning process. Figure 3 represents a strong planning tool that can be used to locate priority areas and allocate limited resources.

***Figure 3**: Final Density analysis map with all priority areas for Lake Wausau improvement located.*



Discussion

The data provided from this variable is important in the planning process. Future work by the Lake Wausau Association should stem from these results. With limited resources it is important that the area's most important to users of lake be target first. Data was provided by local experts who use the lake often. These results provide two key answers. The first is "where does Lake Wausau need improvement?" Second "what types of improvement does Lake Wausau need?"

Demographics

This variable is used to show who responded to the survey. The targeted audience of this survey was homeowners in the greater Wausau community. Thus, it is important to note, that the demographics reported here may not be representative of the broader population. Personal characteristics included: age, gender, education, political orientation, occupation, ethnicity and income. Data here is used simply to understand who responded to the survey and to gauge success of a targeted audience.

Survey items:

1. Gender
2. Age
3. Born in Wausau (Y/N)
4. Education level
5. Political orientation
6. Length of residency in greater Wausau area
7. Community
8. Ethnicity
9. Occupation
10. Approximate annual income.

Results:

The following sections provide an overview of the respondent characteristics based on the results from demographic data (survey items above) provided by the survey.

General Demographics

Of the total 378 respondents 56% indicated they were born in the Wausau area while 44% indicated they were not. 96% of respondents indicated they were white.

Gender:

Of the total 378 respondents, the overwhelming majority gender was male. 71.5% of respondents indicated they were male, while only 28.5% indicated they were female

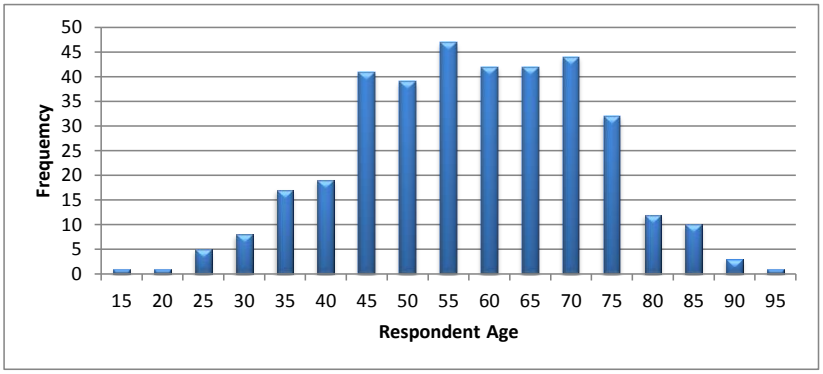
Ethnicity:

An overwhelming majority of respondents were white at 96.9%. This is slightly higher than U.S Census (2012) indicates for the city of Wausau which is 87%.

Age:

The median age of respondents was 55. As indicated in figure 4 the majority of respondent were between the ages of 45 and 70.

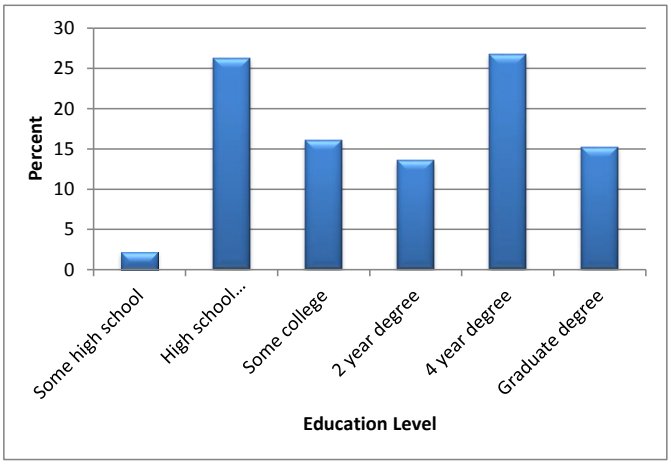
Figure 4: *Age break down of respondents*



Education level:

Figure 5 below, represents the highest level of education respondents have. There was a pretty even distribution of education levels; however, 57% of respondents indicated some form of post-secondary education. 26% of respondents indicated have only a high school level education. This is lower than the U.S Census (2012) which indicated 87% of the Wausau community has a bachelors or higher education level.

Figure 5: *Education level of respondents*



Political Orientation:

Table 4 indicates the political orientation of the respondents. 32% respondents' indicated that they did not affiliate their political views as either liberal or conservative. 45% of respondents affiliated their political views as conservative, while 23% of respondents affiliated their political views as being more liberal.

Table 4*: Political orientation of respondents*

	Frequency	Percent
Strongly liberal	26	7.6
Somewhat liberal	50	14.7
Neither	110	32.3
Somewhat conservative	87	25.5
Strongly conservative	68	19.9
Total	341	100.0

Income Range:

As shown in table 5 a total of 316 individuals responded to this question. The majority of respondents fell in the $25,000-$100,000 range at 72%. This is similar to the U.S Census Report (2012) which indicates Wausau has a median income of $42,000 annual income.

Table 5*: Approximate income of respondents*

	Frequency	Percent
Less than $25,000	51	16.1

$25,000 to $50,000	105	33.2
$50,001 to $100,000	122	38.6
$100,001 to $150,000	21	6.6
$150,001 to $250,000	11	3.5
Over $250,000	6	1.9
Total	316	100.0

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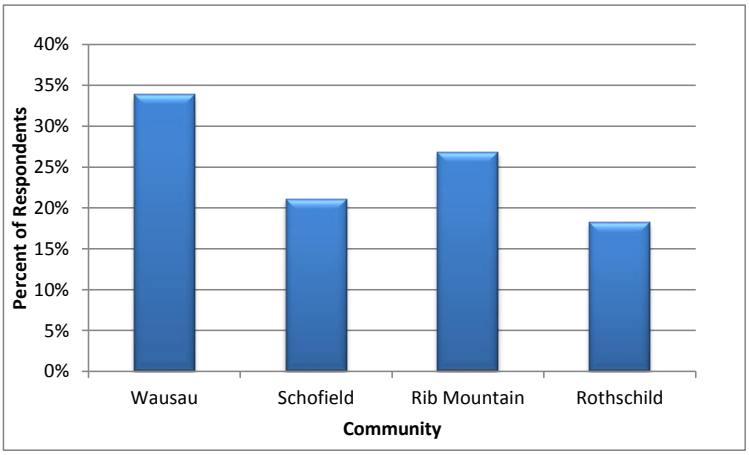
Community of Residence:

34% of respondents reside in the city of Wausau as indicated by figure 6. 665 of respondents reside outside of the city of Wausau.

***Figure 6**: Community of Residence*



Discussion

Though the sample may not be representative of the entire greater Wausau community, it does provide a strong indication of the demographics of the target audience, homeowners in the greater Wausau community. This data can be used to tailor outreach methods to the target audience. It also provides insight on the respondents of this survey.

Economics

This section was used to measure the economic importance of Lake Wausau to the greater Wausau community. The variables within this section were also used to understand respondents' use of Lake Wausau in comparison to other lakes. Data from this section can be used to assess the need to continue investing resources in Lake Wausau as a cherished resource to the greater Wausau community. Data form this section can also be used in conjunction with the information provided by respondents in the public participation mapping to indicate where limited resources should be allocated for improvements tailored to the users of the lake.

Methods

The economic portion of the study was also incorporated into the survey using the methods described in this section. In order to assess the effect that water quality has on the benefits derived from provision of these services, economic valuation were assessed by determining:

1) What services are valuable and potential means implementing a value mechanism (e.g. increased water rate, recreation fee, taxes, etc.)
2) A reasonable estimation of value for variations of those services, e.g. if wildlife habitat is a valued service assessment assign reasonable dollar values for the provision of habitat provided at different levels of water quality (e.g. good, fair, bad) (3) whether these valuations differ amongst stakeholder groups depending on preferences and expectations. The determination of services that are valuable and potential means of implementing value mechanisms will be accomplished in Phase I of the study. With an identified subset of valued services and mechanism for payments, a reasonable dollar value for the provision of these services could be determined for the most appropriate mechanism (e.g., wildlife habitat may be provided by an increase in fees for recreational consumption).
3) An assessment of importance of lake characteristics through a ranking using 100 importance points amongst seven different lake characteristics

Survey Items:

1. Canoeing, Kayaking, and Sailing: Do you participate in this activity?
2. Motor boating: Do you participate in this activity?
3. Fishing (Spring through Fall): Do you participate in this activity?
4. Ice Fishing: Do you participate in this activity?
5. Golfing: Do you participate in this activity?
6. Wildlife Viewing: Do you participate in this activity?
7. Biking/Walking: Do you participate in this activity?

   IF yes (for each above question 1-7);
   a. How much did you spend on this activity last year?
   b. How many days did you do this activity last year?
   c. What is the quality of this activity on Lake Wausau compared to other Lakes?

d. What percentage of time does poor water quality in Lake Wausau stop you from doing this activity?

8. Importance value (out of 100) for seven different lake characteristics.

Results:

Respondents were asked to indicate the economic importance of Lake Wausau by answering the previously mentioned 7 yes/no quantitative questions followed by a series of 4 more qualitative questions if they answered yes. This was, as mentioned, to measure the overall economic importance of Lake Wausau as well as understand how respondents use the lake as compared to other lakes.

***Table 6**: Number of respondents who answered yes to participating in one of the 7 recreational activities listed on Lake Wausau Last Year*

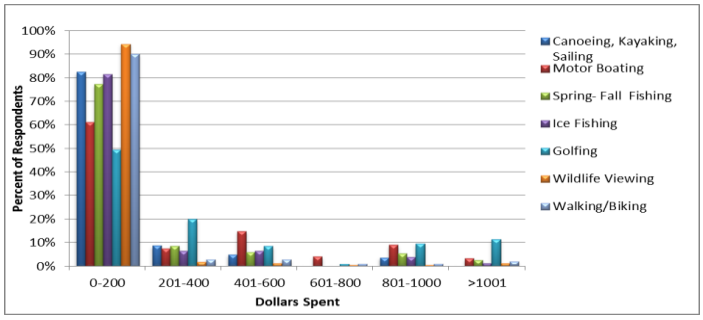
Activity	N=
Canoeing, Kayaking, Sailing	96
Motor Boating	142
Spring - Fall Fishing	173
Ice Fishing	89
Golfing	119
Wildlife Viewing	200
Biking / Walking	241

Table 6 indicates the sample size of each activity used to measure the economic value of Lake Wausau. As shown in the table of the 378 survey respondents biking and walking was the most popular recreational activity provided by Lake Wausau with 53% (n=200) of respondents indicating they partake in this recreational activity. Ice fishing was the least popular with 24% (n=89) of respondents partaking in this recreational activity.

How much did you spent on this activity last year. (A)

As indicated by figure 7, at least 50% of respondents for each recreational activity indicated that they spent between $0.00 and $200.00 on a single recreational activity last year. Golfing and motor boating had 20% and 15% accordingly of their respondents indicated that they spent between $201.00 and $400.00.

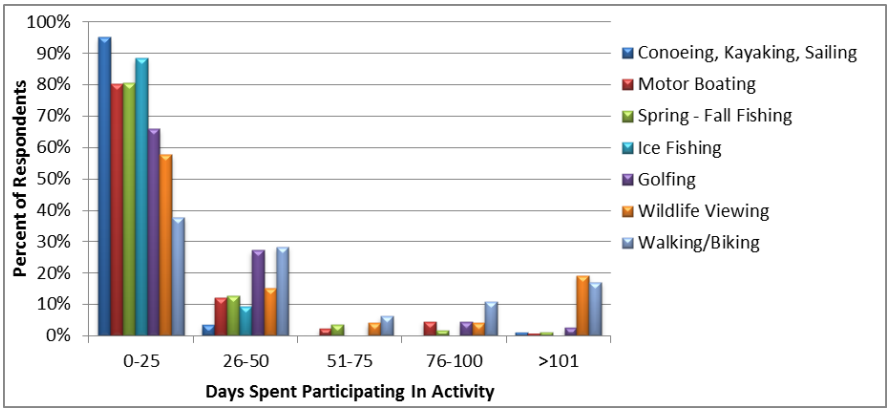
***Figure 7**: Amount of money respondents spent on each recreational activity last year in 200 dollar class intervals.*



How many days did you do this activity last year? (B)

An overwhelming majority of respondents spent between 0 and 25 days last year participating in at least one of the seven recreational activities. Canoeing, kayaking, and sailing was the most popular with 95% of respondents participating between 0-25 days.

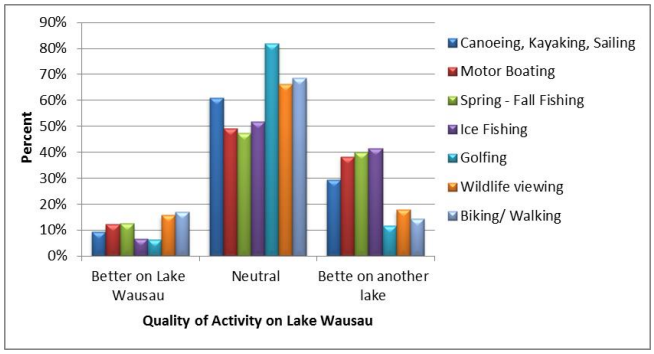
***Figure 8:** Percent of respondents and the days they spent recreating on the lake*



What is the quality of this activity on Lake Wausau compared to other Lakes? (C)

An overwhelming majority of respondents ranked the seven recreational activities as neutral on Lake Wausau. However, 10% - 40% of respondents indicated that these recreational activities are better on other lakes.

***Figure 9**: Percent of respondents ranking each recreational activity on Lake Wausau*



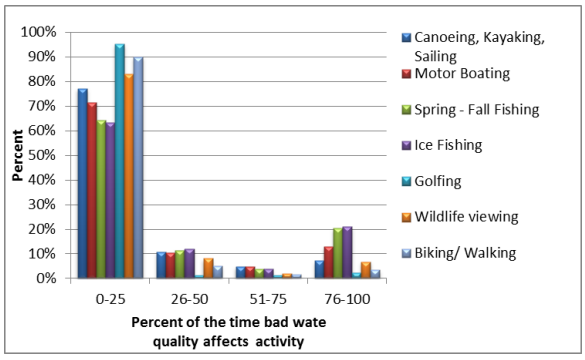
What percentage of time does poor water quality in Lake Wausau stop you from doing this activity? (D)

The vast majority of respondents indicated that water quality only negatively impacts their recreational actives 0-25% of the time. However, as much as about 20% of respondents indicated that poor water quality effects fishing and ice fishing 76-700% of the time.

Commented [TN1]: 100%?

***Figure 10**: Percent of the time bad water quality affects recreational activity*

Commented [TN2]: X axis need repair.



What lake characteristics are most important to respondents?

Overall, 336 respondents assigned the 100 importance points among the seven lake characteristics, which included: safety from bacteria contamination, health advisories (free from contamination advisories), water clarity, lack of water odor, hard, clean and sandy lake bottom in swimming area (swimming area bottom quality), diversity of wildlife seen at Lake Wausau (diversity of WLV), diversity of fish species/habitat, and quantity of fish caught. The mean and standard deviation of the importance point allocations of respondents across the top seven lake characteristics are displayed in Table 7.

Table 7: *Descriptive statistics of lake characteristic importance variables from Lake Wausau survey performed in 2012 (n=336).*

Lake Characteristic	Mean	Standard Deviation
Free from contamination advisories	29.6	20.1
Water clarity	17.5	14.4
Lack of water odor	15.3	11.3
Swimming area bottom quality	10.2	11.3
Diversity of WLV	10.2	11.4
Diversity of fish	9.6	10.8
Quantity of fish caught	7.6	10.2

These results are similar to results found by Azevedo et. al (2003) for a survey that analyzed the value placed on water quality in lakes by residents in the state of Iowa, with same order averages of 19, 12, 14, 8, 9, 10, and 27, respectively.

Commented [TN3]: What?

Do residents of neighborhoods near Lake Wausau have different importance rankings for the seven lake characteristics than respondents that reside further from the lake?

Importance values assigned for the seven lake characteristics are not significantly different when examining responses from residents of neighborhoods near Lake Wausau (near neighbors, n=154) and the population of survey respondents indicating they did not reside near the lake (n=152) for six of the seven lake characteristics (T-test, p=0.02). There was a significant difference in the importance assigned to water clarity between near neighbors and those that did not reside in near neighborhoods with greater importance placed on water clarity by residents living nearer the lake (respective means: 19.3 and 15.5).

Do members of the different belief system groups derived from the Lake Wausau study have different importance values for the seven lake characteristics?

Using a Kruskal-Wallis test of independent groups, where belief system groups were used to rank the importance values, the "Quantity of fish caught" variable was significantly different (at *p=0.063*) and further exploration found that while the mean value for this variable was lower than 10 for all groups, yet higher for groups 1 and 2 ("at home on" mean = 9.1 and "hardworking

Lake Wausau" mean = 6.8) than for groups 3 and 4 ("when recreating, it is not on Lake Wausau" mean = 5.3 and "perceive Lake Wausau as dirty and believing the time has come to address it" mean = 4.86).

Do members of the different communities surrounding Lake Wausau have different importance values for the seven lake characteristics?

Using a Kruskal-Wallis test of independent groups, where the community variable (Wausau, Schofield, Rib Mountain, Rothschild) was used to rank the importance values, found no significant difference in values assigned to the seven lake characteristics amongst community members.

Discussion

Results indicated that Lake Wausau is a cherished resource among the residents of the greater Wausau community. Data from these variables can be used to assess the economic value of Lake Wausau and the quality of recreation on the lake. While each of these variables is important independent of others, when combined, they can be even more revealing of the importance of the lake to the greater Wausau community. This information is important in order to focus efforts towards improvement of recreational activities. Similarly, the data allowed us to see that importance values for lake characteristics are similar to those in other places, such as Iowa. Differences in importance values assigned to the lake characteristics existed with water clarity; the value assigned to water clarity amongst those residing in near neighborhoods was greater than respondents residing further from Lake Wausau. One would expect that proximity to the water body and an increased importance for water clarity would go hand in hand, as residents nearer the lake most likely experience water clarity issues on a more frequent basis. The second difference was the importance value amongst belief groups for quantity of fish caught, here were found those who seems to be more in tune to Lake Wausau, groups "At home on Lake Wausau" and "Hardworking on Lake Wausau" were more likely to assign higher values than those that recreated elsewhere or perceived that it was dirty.

Commented [TN4]: ?

Governance Policy

This variable was used to understand respondents' understanding of governance policies implemented to protect water quality. It is part of the Lake Wausau Association's mission to protect the water quality of Lake Wausau. Data collected from this variable will aid in Lake Wausau assessing future needs of disseminating information in regards to these governing policies.

Survey Items:

1. NR 115 - also known as Wisconsin Shore land Zoning
2. NR 151 - also known as the Phosphorus Rule.
3. NR 40 - also known as the Invasive Species Rule.
4. U.S. Clean Water Act.

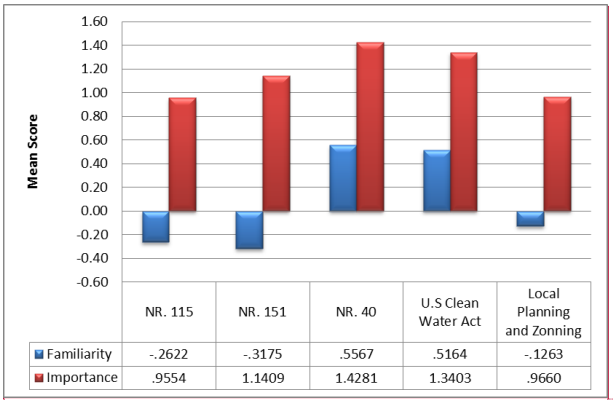
5. Your Community Planning and Zoning Regulations.

Results:

Respondents were asked to rate their familiarity with 5 water quality governmental policies through the use of a 5 point scale ranging from -2 (very unfamiliar) to +2 (very familiar). Respondents were then asked to rate these same 5 policies in regards to importance using a similar 5 point scale.

Figure 11 shows the mean scores of respondents in regards to their familiarity to the water quality policy and how important they thought it was. NR. 40, also known as the invasive species rule, prohibit the possession and transportation of invasive species. This was the highest ranked water policy for familiarity and importance. The U.S clean water act was close to follow. The mean scores do not include respondents who responded "don't know" about a particular policy.

***Figure 11**: Mean scores of respondent familiarity and importance of five water quality-oriented governmental policies.*



Commented [TN5]: Sig figs

Tables 8 and 9 show what percent of respondents were familiar with the policies and how important they thought they were. These breakdowns also include the respondents who did not know what the rule was or how important it was to them for restoration efforts. This is an important consideration as all of the policies had at least a 20% response rate of respondents who didn't know what the rule was or its importance to them, which indicates the need for more information to landowners.

As indicated by table 7 a large portion of respondents were either unfamilar with, familar with or didn't know about the policies. Only between 5%-15% of respondents were very unfamiliar with any one policy. Between 10%-25% respondents indicated they were unfamilar with anyone policy.

As indicated by table 8 the majority of respondents' believed these rules are important, very important or didn't know. A very low percentage of respondents believed anyone of these rules were unimportant.

Results indicate that while respondents are familiar with and believe these polices are important. The Lake Wausau Association could do more to disseminate information about the rules and why they exist.

Table 7: *Percent of respondent's familiarity with governance policy rules*

	Familiarity					
Policy	Very Unfamiliar	Unfamiliar	Neutral	Familiar	Very Familiar	Don't Know
NR 115 - also known as Wisconsin Shoreland Zoning.	15.0%	20.4%	8.6%	23.6%	4.0%	28.4%
NR 151 - also known as the Phosphorus Rule.	14.5%	24.1%	9.9%	20.2%	4.8%	26.5%
NR 40 - also known as the Invasive Species Rule.	5.9%	12.1%	9.1%	38.2%	15.3%	19.4%
U.S. Clean Water Act.	5.5%	10.1%	15.6%	39.9%	12.0%	16.9%
Your Community Planning and Zoning Regulations.	10.8%	20.5%	18.3%	22.1%	5.1%	23.2%

Table 8: Percent of respondent's belief of importance of governance policy rules

	Importance					
Policy	Very Unimportant	Unimportant	Nuetral	Important	Very Important	Don't Know
NR 115 - also known as Wisconsin Shoreland Zoning.	2.2%	1.9%	9.5%	30.2%	17.1%	39.1%
NR 151 - also known as the Phosphorus Rule.	2.2%	1.0%	7.5%	23.9%	24.5%	40.9%
NR 40 - also known as the Invasive Species Rule.	1.6%	5.0%	3.8%	27.0%	42.1%	20.5%
U.S. Clean Water Act.	1.4%	1.1%	8.4%	26.0%	41.1%	22.0%
Your Community Planning and Zoning Regulations.	1.6%	3.0%	11.6%	27.0%	20.3%	36.5%

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Appendix A: Sample Development Method

Creating the Address Sample for the Lake Wausau Community Survey

1) Selected "Town" addresses and created a layer from selected features. (i.e. select Wausau address that have a mailing address in Wausau).
2) Remove "City of…" parcels from the list.
3) Confirm mailing address 1
4) Create a "PHYS_ADDR" column
5) Merge "HOUSE_NUM1", "ST_DR1" and "STREET1" by highlighting the address with a street direction and right clicking "PHYS_ADDR" and selecting FIELD CALCULATOR. Use this formula: [HOUSE_NUM1] & " " & [ST_DR1] & " " & [STREET1] for ONLY those addresses that have a street direction (i.e. N 1st St).
6) For the remaining address use the field calculator [HOUSE_NUM1] & " " & [STREET1]
7) Dissolve by "MAIL_ADDR1", "MAIL_NAME1" and "PHYS_ADDR"
8) Turn off the unnecessary fields and export Dissolved table into Excel as a .dbf. (Leaving MAIL_NAME1, MAIL_ADDR1, CITY, ZIP5 and PHYS_ADDR)
9) Create a "MATCH" column with the equation (MATCH = MAIL_NUM1 = PHYS_ADDR), this will produce a "TRUE" or "FALSE" answer.
10) Verify that there are no false positive addresses.
11) Remove all the FALSE results from the mailing list as well as any address that are CO, INC, LLC, etc. Also remove addresses that are for Living Estates Trusts, because they don't have a name to address.
12) Create a FID for each address. (Wausau = 0 - 1XXXX; Schofield = 2XXXX; Rothschild = 3XXXX; Rib Mountain 4XXXX; Near Neighborhood Oversample = 6XXXX)
13) Randomly select 200 "Community" addresses using Excel's random number generator. (=RANDBETWEEN 1,X)
14) Create a column "IN_SAMPLE" and place and "X" in that column if that address has been randomly selected.
15) Verify the names at those addresses using the reverse address look up feature on http://www.whitepages.com. Remove names from the sample that cannot be verified.
16) Trim the list at random (or add to as needed) so that each community has 160 addresses. (DO NOT DELETE ANY ENTRIES THAT ARE NOT ON THE MAILING LIST)
17) In ArcGIS, add the address table for each community and join it to the respected community's parcel shapefile and selected "Keep only matching records."
18) Open the attribute table and right click on the "IN_SAMPLE" column and select sort ascending. Select all the address entries that do not have an "X."
19) With the data entries selected, use the CLIP tool and use the "Near_Neighborhood" shapefile to clip the parcel data.
20) Open the newly created shapefile's attribute table turn off the unnecessary columns and export the .dbf to Excel.
21) Repeat steps 11 through 14 for each of the municipalities.

22) Merge these excel documents into one spreadsheet retaining all of their attributes.
23) Randomly select 250 “Near-neighborhood” addresses using Excel’s random number generator. (=RANDBETWEEN 1,X)
24) Verify the names at those addresses using the reverse address look up feature on http://www.whitepages.com. Remove names from the sample that cannot be verified.
25) Trim the list at random (or add to at random as needed) so that it has 210 addresses.

Appendix B: Warm-up / Introduction Questions

Environmental Knowledge

This variable was primarily used as a warm up question for respondents to familiarize themselves with the layout of the survey. However, this variable does measure environmental knowledge of conservation practices along stream banks for lake front owners. Data from this variable can aid in asses the need to disseminate sustainable practice for lake front land owners.

Survey items:

1. Vegetation along stream banks helps improve water quality
2. Paint, solvents, or used motor oil may be disposed of safely into a storm sewer.
3. Grass clippings, garden trimmings and fallen leaves can be a source of water pollution.
4. All fertilizers/chemicals applied to lawns stay within the yard.
5. Areas of grass, trees, and wetlands around streams can absorb flood waters and reduce flooding damage.

Results:

Questions 1-5 (above) were measured using a True (1) False (0) Don't Know (9) Scale. Questions 1, 3, and 5 were overwhelmingly true with mean answers of .89, .93, and .91 accordingly. Questions 2 and 4 were overwhelmingly false with mean answers of .01 and .02. This is expected as questions 1, 3, 5 were positively worded questions while 2 and 4 were negatively.

Discussion

Results indicate that respondents are generally familiar with sustainable practices in regards to lake front property. This is a positive quality and can be used by the Lake Wausau Association to continue providing information.

Appendix C: Lake Wausau Capacity Study

PI: Dr. Kristin Floress
Center for Land Use Education, UW-Stevens Point

Contents

Introduction

This report is part of a larger watershed planning process to protect and improve Lake Wausau, a vital community and recreational resource in Central Wisconsin. The Lake Wausau Association, City of Wausau, towns of Rib Mountain and Wausau, the Wisconsin Department of Natural Resources, the University of Wisconsin – Stevens Point Center for Watershed Science and Education and Center for Land Use Education partnered to assist in developing an information base to provide direction for management decisions in the watershed.

To develop effective management structures for Lake Wausau it is necessary to understand the physical system, stakeholders, existing organizations involved in managing the lake and how they are related, policies impacting the lake, and how well strategies for protecting and improving Lake Wausau and other water resources are working. This report will provide insight about the organizations, policies, and stakeholder perceptions of how Lake Wausau and water in general are managed in Wisconsin. Five questions addressing principles of water governance (developed by the Citizens League in Minnesota, 2009) are answered in this report.

1. *Transparency* – Who is in charge of developing and implementing the policies governing actions that could impact Lake Wausau, and is the system of water governance understandable?
2. *Effectiveness* – How well are policies and programs achieving their intended purpose, and can they be adapted to new science and circumstances?
3. *Equity* – Are all stakeholders (individuals, entities, sectors) sharing the responsibility for ensuring equitable access to safe water?
4. *Accountability* – Are water users held accountable for their impacts on water, and is it clear which agencies are responsible for outcomes? Measurable goals, funding, staff, and resources should match policy goals.
5. *Appropriate Scale* – Are programs and policies flexible enough to accommodate local conditions, and are they based on watershed rather than political boundaries?

Water governance is complex, and the Lake Wausau watershed consists of nested and overlapping governmental boundaries that are comprised of the laws, rules, people, and organizations involved in managing the lake. The state of Wisconsin, Marathon County, city of Wausau, Schofield, Rib Mountain, Rothschild, and town of Wausau all have policies impacting the lake. The data for this report come from: interviews conducted with those knowledgeable about Lake Wausau, water quality, and land management; a content analysis of policies and plans impacting Lake Wausau; a mail survey of Lake Wausau residents; and a web survey of individuals knowledgeable about organizations involved in watershed management in Wisconsin.

Methods

Content Analysis

To examine transparency, equity, accountability, and scale, a content analysis of plans and policies impacting Lake Wausau was conducted. The analysis identified the actors/entities (e.g. lakeshore

owners, producers, municipalities) and actions (e.g. activities that can potential harm the lake's resources) addressed, who is accountable for meeting the policy's goals, and at what scale the policy applies. Plans and policies were identified through interviews with those responsible for managing land and water resources in Marathon County and through web searches for ordinances, plans, and policies in Wisconsin and each of the cities, towns, and villages in the watershed that pertain to nonpoint source pollution.

Interviews

A series of interviews were conducted with individuals involved in water/watershed management, local government agencies and non-governmental organizations, lake association members, and others who were identified as potentially having meaningful knowledge that would be useful for understanding the management of Lake Wausau. The interviews were designed to elicit feedback about interaction among those responsible for developing or implementing policy (transparency), perceptions of policies, programs, and resources available (effectiveness, equity) and perceptions of stakeholders (accountability). The questions can be found in Table 1.

Table 1. Interview Questions
Q1. Tell me a little about your organization.
Q2. How long have you been involved with this organization?
Q3. Are you involved in any other organizations that might also impact or be impacted by (water policies in Wisconsin/the Lake Wausau management plan)?
Q4. What is the primary role your organization plays, and how is that related to (water policies in Wisconsin/the Lake Wausau management plan)?
Q5. What role do you play in your organization?
Q6. What policies or plans that shape the role you and your organization play in (water management in Wisconsin/for Lake Wausau)?
Q7. What policies or plans help or hinder successful watershed management in (Wisconsin/Lake Wausau)?
Q8. To whom or what do you see your organization as most accountable?
Q9. What types of resources (financial, technical, and others) do you and your organization use to help achieve your goals?
Q10. Which do you rely upon most often?
Q11. How frequently do you work directly with other organizations – either governmental or not - in (Wisconsin/ the Lake Wausau watershed), and how would you characterize that work? (Probes – is there cooperation? Conflict?)
Q12. What is unique to the local population in the Lake Wausau watershed that affects your ability achieve your goals?
Q13. What unique natural resource features in the area simplify or complicate your ability to achieve your goals?
Q14. What is unique about your position that can enhance Lake Wausau management?
Q15. What unique resources (programs, funding, technical, etc…) do you know of that are available to you to work on Lake Wausau issues?
Q16. Please describe how well you think our agencies, policies and programs are working to protect (water quality in Wisconsin/ Lake Wausau).
Q17. Which do you think are the *most* effective at improving or protecting (water quality in Wisconsin/ Lake Wausau)?
Q18. Which do you think are the *least* effective at improving or protecting (water quality in Wisconsin/ Lake Wausau)?
Q19. Are there stakeholders (people, agencies, groups, etc…) who you see as having too *much* influence on attempts to protect (water quality in Wisconsin/ Lake Wausau)?

Q20. Are there stakeholders (people, agencies, groups, etc…) who you see as having too *little* influence on attempts to protect (water quality in Wisconsin/ Lake Wausau)?
Q21. What changes would you make to the resources you currently have available to improve your ability to protect (water quality in Wisconsin/ Lake Wausau)?
Q22. What trends – environmentally, politically, technologically, and so forth – do you see as having the most impact on your ability to protect (water quality in Wisconsin/ Lake Wausau)?
Q23. Is there anything you'd like to add?
Q24. Is there anyone you think I should interview to help us understand the capacity to improve (water quality in Wisconsin/ Lake Wausau)?

The interviews were digitally recorded and transcribed for analysis.

Mail Survey

A mail survey of Lake Wausau residents was conducted in 2013. The methods and results from that survey were previously reported and can be found within that survey report. Several questions were included on the survey addressing governance, and those results are reported herein.

Web Survey

After analysis of interview transcripts, the researcher developed a series of questions (based on Smith, 2002) about specific agencies and organizations that had been mentioned by interviewees in order to garner additional information about transparency, effectiveness, accountability, and scale. The sample for the web survey was not random. Instead, interview participants and several others involved in watershed management in Lake Wausau and Wisconsin were emailed the survey and asked if they would complete it. They were also encouraged to forward the survey to anyone in their organization whom they felt could provide useful feedback.

The survey collected information about 11 agencies/organizations: US Environmental Protection Agency; Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade, and Consumer Protection; local cities/towns/villages; County Department of Conservation, Planning, and Zoning; Natural Resources Conservation Service; River Alliance of Wisconsin; Lake Wausau Association; North Central Stormwater Coalition; Wisconsin Association of Lakes (Wisconsin Lakes); and UW-Extension. The same set of questions was asked for each agency, and assessed people's perceptions of the scale, power, support for, and effectiveness of each organization with regard to nonpoint source pollution. The survey questions are found in Table 2.

Table 2. Web Survey Questions

1. **Are you familiar with [organization]? *(yes, no)***
2. **How would you characterize [organization] in terms of its functional scale? Functional scale means the variety of issues the organization addresses. *(narrow, medium, broad)***
3. **How would you characterize the [organization] in terms of its spatial scale? Spatial scale means the geographic area to which the organization's policies apply. *(narrow, medium, broad)***
4. **How would you characterize the authority the organization has over decisions impacting water quality? *(weak, moderate, strong)***

5. **How would you characterize the power the organization has to change people's behavior to improve water quality? *(weak, moderate, strong)***
6. **How would you characterize the ideological support, or public and political support for actions, the organization has to achieve water quality goals? *(minimal, fair, optimal)***
7. **How would you characterize the financial support, or willingness for the public to invest in actions to improve water quality, for the organization? *(minimal, fair, optimal)***
8. **In general, how effective do you think the organization's programs and policies are for improving water quality? *(very effective, somewhat effective, neither, somewhat ineffective, very ineffective)***

Results

Policies and Plans Impacting Lake Wausau

The ability for Lake Wausau to act as an exceptional recreational and community resource is impacted by a variety of other activities that take place in the watershed. In general, plans and policies in the watershed are implemented to protect surface, ground, and drinking water quality; wetlands and shorelands, floodplains, aquatic life and habitat, and to reduce soil loss. In addition, many of the plans and policies mentioned enhancing natural beauty and aesthetics as benefits to protecting other resources.

There were 33 documents analyzed, and categorized according to their policy level (Federal=1, State=16, County=7, and City/village/town=9). At the county level, three documents were general plans (groundwater protection guide, land and water plan, comprehensive plan) and the remainder were county ordinances. At the City/village/town level, five were comprehensive plans and the remainder were ordinances. Tables 3-5 provide information for each policy about the resources protected, stakeholders impacted, actions that are addressed, parties responsible for implementing and enforcing, and the number of interviewees who mentioned the policy as being part of their responsibilities.

The language of the plans and policies differed greatly in the degree to which certain actions were required, encouraged, or forbidden. Local and county comprehensive plan language is largely voluntary in nature, and consists of statements such as "strive for", "attempt", and "encourage". Because comprehensive plans are not regulatory documents, state administrative rule and local/county ordinance language was much stronger, and included statements such as "must", "must not", "is/are required", and "will".

Adopting a comprehensive plan does not ensure that the actions detailed within the plan will be carried out or that resources that are identified by the plan as important will be protected. Local ordinances need to be developed to achieve the goals of the comprehensive plans, and ordinances enacted or amended after 1/1/2010 and addressing general zoning, official mapping, subdivision, and shorelands/wetlands need to be consistent with the comprehensive plan. An additional layer of complexity was introduced by 2013 Wisconsin Act 80, which repealed the requirement that county shoreland zoning ordinances apply to shorelands annexed to or incorporated as part of cities or villages. Effectively, this means that a city or village ordinance can be less restrictive than the county ordinance that applied prior to Act 80.

Most of the policies and plans identified by the research team were not mentioned by the people interviewed for the study, and instead were found within the text of those that were mentioned or were deemed by the research team to potentially impact Lake Wausau quality. However, there were several policies that were mentioned by at least one interviewee, and those are: NR 151, NR 216, NR 243, ATCP 50, and Marathon County Chapters 11 and 13. Each of these will be explained below. The remainder of the policies are found in tables 3 and 4, and detail which resources are protected by the plan or policy, what stakeholder groups need to carry out actions to protect the resources, the types of actions they are required or encouraged to take, and the agency responsible for ensuring goals are attained. This information is helpful is assessing the transparency, equity, and accountability of the system of water governance for Lake Wausau.

State Administrative Rules

Several state administrative rules were mentioned by interviewees as important to their positions. Administrative rules are the means by which the DNR implements statutes enacted by the Legislature. Some rules provide performance or technical standards. A performance standard provides expectations for water quality, but does not dictate how the standard must be met. Technical standards detail the methods for achieving the performance standard. Administrative rules impacting natural resources are prefaced with the letters "NR", representing the Department of Natural Resources. While 14 NR rules were identified by the research team for analysis, only three were mentioned by interviewees.

NR 151

This rule is intended to establish performance standards for nonpoint source pollution and guidance for developing technical standards for implementation. It impacts agriculture, construction, transportation, municipalities, and those with more than 5 acres of turf/garden. In the Lake Wausau watershed, NR 151 was mentioned with regard to agricultural producers (crops, livestock, dairy) rather than the non-agricultural intended audiences.

NR 216

This rule details the requirements for what stormwater discharges require Wisconsin Pollution Discharge and Elimination System (WPDES) permits and criteria for meeting the performance standards of NR 151. This rule applies to stormwater running off from industrial facilities, construction sites, and municipal separate storm sewer systems (MS4). Municipal separate storm sewer systems are systems of sewers, ditches, pipes, and so forth that collect stormwater and discharge it to surface waters. Marathon County, Rib Mountain, Rothschild, Schofield, and the city of Wausau each have an MS4 and stormwater permits from the DNR. Each also participate in the North Central Wisconsin Stormwater Coalition with several other entities.

NR 243

This rule applies to animal feeding operations which either discharge waste to surface waters or meet criteria that determine whether they are a concentrated animal feeding operation (CAFO). The rule

provides technical standards for meeting the goals of NR 151. Concentrated animal feeding operations are required to have WPDES permits and must have nutrient management plans. There are currently nine CAFOs permitted in Marathon County.

Table 3. State Policies

Policy	Resources Protected	Stakeholders Impacted	Actions (suggested or required)	Accountable
ATCP 50 – Soil and Water Resource Management	Soil, water quality	Farmers	Nutrient management plans	CPZ, DATCP, DNR
ATCP 51- Livestock Facility Siting	Water quality, odor	Local governments, livestock operators	Procedures for new or expanded facility siting	DATCP, Livestock Facility Siting Review Board
NR 102 – Water Quality Standards for Wisconsin Surface Waters	Overarching water quality, public health, water supplies, aquatic life, recreation, animals	Everyone in Wisconsin	Establishes standards for surface waters	DNR
NR 109 – Aquatic Plants: Introduction, Manual Removal, and Mechanical Control	Native populations of aquatic plants, water quality, habitat, aquatic life	Individuals, lake organizations LOUs	Removal or introduction of aquatic plants	DNR
NR 115 – Shoreland Protection	Water quality	Property owners, counties	Shoreland development (impervious surfaces)	CPZ, DNR
NR 116 – Floodplain Management	People, property, economic value	Communities with floodplains mapped by FEMA	Floodplain development – communities must develop ordinances to be eligible for NFIP	Communities, DNR
NR 117 – City and Village Shoreland – Wetland Protection Program		Cities, villages	Required to have zoning ordinances meeting minimum state standards	
NR 151 – Runoff Management	Water quality	Crop, livestock, dairy producers; municipalities	Performance standards for phosphorus, erosion, livestock/manure, construction, urban stormwater, transportation	Municipalities, DNR, DATCP (through related programs)

NR 153 – Targeted Runoff Management	Water quality	Grants for urban and agricultural runoff	Strategy for achieving NR 151 through supporting BMPs and planning	DNR
NR 154 – Best Management Practices and Cost Share Conditions	Water quality	Recipients of NR 153 and 155 funds	Acceptable BMPs, standards, and funding conditions	DNR, DATCP
NR 155 – Urban Nonpoint Source Pollution Abatement and Storm Water Management Grant Program	Water quality, floodplains, groundwater	Grants for local governments, UW System	Strategy for achieving NR 151 through supporting non-agricultural BMPs, planning, and administration	DNR
NR 190 – Lake Management Planning Grants	Lake resources	Cities, towns villages, tribes, lake associations, local governments, school districts	Provides funds for lake planning, information and education	
NR 198 – Aquatic Invasive Species Prevention and Control Grants	Control invasives, restore natives	Counties, cities, towns, villages, tribes, lake protection districts, local governments, schools, nonprofits, agencies	Cost-sharing for preventing and controlling AIS	DNR
NR 216 – Storm Water Discharge Permits	Water quality	Municipalities, industries, construction sites	Permitting system to achieve water quality standards	DNR
NR 217 – Effluent Standards and Limitations for Phosphorus	Water quality			
NR 243 – Animal Feeding Operations	Water quality	CAFO operators	Design standards, management practices, and permit requirements for CAFOs	CPZ, DNR

Table 4. County Policies

County Policy/Plan	**Resources Protected**	**Stakeholders Impacted**	**Actions (suggested or required)**	**Accountable**
Chapter 11 – Animal Waste Storage and Nutrient Management	Aquatic life, groundwater, water quality	Waste storage operators	Nutrient management plans, permits required	CPZ
Chapter 13 – Livestock Facilities Licensing	Public health and safety	Livestock facility operators	Licensing for new and expanded livestock facilities (ATCP 51)	CPZ, ATCP
Chapter 17 – Zoning Code	Shorelands, aquatic life, floodplains, natural beauty, natural resources, water quality, wetlands	Cities, villages, towns, county, developers, builders, property owners, livestock facilities, shoreland owners	Development, building, forestry practices, livestock practices	CPZ
Chapter 21 – Nonmetallic Mining Reclamation	Ground and surface water quality, wetlands	Mining site operators	Mining site reclamation standards	DNR, CPZ
Comprehensive Plan (natural resources section)	Groundwater, surface water, wetlands, shorelands	All in Marathon County	Guidance for protecting natural resources	County, towns, villages, cities
Groundwater Protection Guide				
Land and Water Resource Plan	Groundwater quality and quantity, forestry, invasives, soil erosion, lakes, surface water quality, wellheads, wetlands	Everyone, farmers, livestock operators, property owners, waste storage operators	Goals and objectives for implementing NR 151 strategies in addition to a variety of other actions to protect resources identified in plan	CPZ, DNR

Table 5. City/Village/Town Policies

City/Village/Town Policy/Plan	**Resources Protected**	**Stakeholders impacted**	**Actions (suggested or required)**	**Accountable**
Rib Mountain, Schofield Stormwater Code	Aquatic life, natural beauty, water quality	Developers, builders, everyone	Prevent erosion from construction sites, prevent illicit discharge and connection; comply with MS4 permit (WPDES)	Rib Mountain, DNR
Rib Mountain Chapter 17 – Zoning Ordinance	Floodplains, groundwater quality and quantity, natural beauty, shorelands, surface waters, wetlands	Developers, builders, everyone, property owners	Codifies where/what type of development can occur	Rib Mountain, Marathon County
Rib Mountain Comprehensive Plan	Shorelands, water quality, wetlands, protection from invasives, woodlands	Developers, builders, property owners, Big Rib River riparian owners, woodland owners	Rib Mountain will work with Marathon County and DNR to enforce regulations, provide information to residents	Rib Mountain, DNR, Marathon County
Rib Mountain Wellhead Recharge Ordinance	Groundwater quality	Anyone engaging in actions potentially contaminating groundwater that is a source for municipal wells	Codifies forbidden activities in the wellhead recharge zone.	Rib Mountain
Rothschild 535-16 – Wastewater Discharge	Water quality, health and safety	Everyone	Discharges into sanitary sewers, wastewater discharges (types and amounts of pollutants)	Rothschild
Rothschild Comprehensive Plan	Wetlands, floodplain, natural character, threatened and endangered species	Developers, builders, Rothschild residents	Work with Marathon County and DNR to enforce regulations, provide information to property owners	Rothschild, Marathon County, DNR
Schofield Chapter 45 – Shoreland – Wetland Zoning	Water quality, wildlife habitat,	Developers, builders, property owners	Establishes wetland district that codifies the conditions	Schofield

	natural beauty, wetlands		under which new, modified, and replaced structures can be built in a wetland district	
Schofield Comprehensive Plan	Floodplains, wetlands, shorelands	Developers, builders, property owners	Work with Marathon County and DNR to protect wetlands and shorelines; update floodplain maps, provide information to residents, work with Marathon County and DNR to enforce regulations and protect wetlands from development, distribute information about wetland protection	Schofield, WDNR, Marathon County
Town of Wausau Comprehensive Plan	Water quantity, wetlands, shorelands, well water safety, surface water, woodlands, wildlife, farmland protection,	Farmers, property owners, shoreland owners, residents	Work with Marathon County and DNR to protect wetlands, provide information to residents, serve as liaison among parties for MFL/woodland programs, amend zoning ordinances to protect surface water and control soil erosion, help farmers develop markets, consider purchase of development rights program	Town of Wausau, Marathon County, DNR

Interviews

Eleven people participated in interviews. This section reports interviewee perceptions of the effectiveness of policies and programs to control nonpoint source pollution, to whom or what the interviewee sees themselves as accountable, factors negatively or positively impacting water quality, the types of resources, those responsible for implementing policies and programs need and use, and an assessment of stakeholder power.

Effectiveness of Policies and Programs

The agricultural performance standards (NR 151) were noted as having the potential to positively impact Lake Wausau water quality, but, as one individual stated, they don't, "…go far enough to protect water quality", due to producers not needing to change practices unless cost-share funding is available.

The municipal separate storm sewer system (MS4) program was also seen as having positive impact on water quality. In addition, the North Central Wisconsin Stormwater Coalition was seen by several participants as being positive asset and driver of change in the Lake Wausau watershed.

One individual discussed the Water Resources Act and Comprehensive Planning law as impacting water quality. S/he said that, "If your goal is water quality protection, both of them are insufficient. They take steps in the right direction, but they certainly aren't strong enough because they're a political compromise. So they're not strong enough to protect water quality."

Cooperation and Institutional Change

Cooperation among state agencies was noted by several interviewees as being necessary for improving Lake Wausau. One participant noted that a disconnect exists between the Department of Natural Resources – which is charged with improving water quality - and the Department of Agriculture, Trade, and Consumer Protection - which also oversees many landscape level production activities that impact water quality. The participant noted, "So you've got the DNR here trying to enforce this and make the water quality better. And you've got the Department of Agriculture over here saying, 'well, I don't think so because that's going to put a burden on our guys [farmers]." Another individual noted that:

> *…the Department of Ag has their hand in the environmental regulation, which seems to me that that should really be the Department of Natural Resources that regulates that industry. It used to be that the DNR had the funding and that was eventually taken away from the DNR and given to the Department of Ag, so that's where this requirement to provide cost sharing before you can make anybody do something comes into play for farmers. I don't' understand why someone in the U.S. should have to pay for poor management or because they did not take the steps needed to look to the future, for example, to put in a manure storage facility to get them through the winter months without spreading it on snow-covered ground. So I think just put the DNR back in charge of regulating or protecting water quality.*

Resources

Having the resources necessary to develop, implement, and enforce policies and plans was described as important by all participants. Having appropriate staff and funding for implementation and monitoring were noted as being barriers to protecting water quality. One individual noted an issue with the MS4

permits is that, “Yeah, it’s a great idea. But to turn around and put the burden on the incorporated entities and not everyone that may have an impact on the river, I don’t think it’s fair.”

One person noted with regard to monitoring that, “They’re talking about making the treatment plants reduce their phosphorus…and it’s supposed to cost millions of dollars. And we haven’t even hardly touched on some of the agricultural runoff things so I think the monitoring is important.”

Funding for municipal and agricultural practices - in addition to activities such as weed removal - to improve water quality was repeatedly mentioned as being vital and currently insufficient. One person noted, “The DNR, they set the standards that we have to follow and other than quantity, we are typically not more restrictive. We are not because it boils down to money. It costs a lot of money to be in compliance with DNR rules and regulations, so we do our best to be in compliance.”

Stakeholder Power

Interviewees were asked to assess the level of power stakeholders had with regard to water quality in Lake Wausau. “The people who enjoy the lake”, were noted as not being involved in decision making. Wastewater dischargers (specifically the Municipal Environmental Group) was seen as having some degree of power to make policy changes that could impact Lake Wausau water quality. One person said that “tree huggers” have unfairly influenced policy by attending meetings and being a vocal minority with regard to stormwater and runoff. Agribusiness, CAFOs, and farmers were repeatedly mentioned as having too much power and influence over actions that impact water quality. One person noted, “The involvement of big ag in this area, they are structured in a way that can prevent a lot of water quality improvement.” Another said, “Farmers have, as I understand it, much more impact on the waters of the state than municipalities, and more control. But the farmers are untouchable, as I understand it.” Several participants noted it isn’t the individual farmers, but the agricultural lobby “down in Madison” and “whoever is representing the farmer at the state level” that have the power and influence. Another said, “I think the farming organizations have too much lobbying power down in Madison and at the national level...Dairy Business Association, Wisconsin Corn Growers, and all those different organizations, I think they have too much power.”

Factors Facilitating or Posing Barriers to Improved Water Quality

Aside from what is perceived as unfair practices with regard to agricultural operations, other barriers to improving Lake Wausau ranged from the ecological ramifications of changing weather patterns to the disconnection among the various users of the Wisconsin River. One person noted that, “the biggest problem is that we people in Lake Wausau tend to look at the weeds and the algae growth in terms of, ‘here’s our local problem,’” instead of seeing the various land uses in the Wisconsin River watershed as impacting the Lake.

Factors noted as positively impacting water quality included education, the positive economic impact that recreational events can have on Lake Wausau and the surrounding communities, pride in the City of Wausau, and the support of County Board members. The technical skills that those have been working in the area long-term were seen as a having the potential to help improve water quality, as was the increase in monitoring as a result of the Wisconsin River TMDL. Several participants noted that grazing,

organic farming, “minimalist agriculture,” and innovative practices on smaller farms were also improving water quality.

One person noted that:

> *Well you've got a fragmented approach. You've got different regulations in different municipalities and you've got different thought processes relative to the value and the role of that governmental unit in protecting quality and I think that the hope of the lake association was there would be some opportunities to approach it holistically with all the governmental units.*

This comment speaks to the theme that ran through many of the interviews regarding the opportunity that additional cooperation among the various stakeholders of Lake Wausau could provide for improving it as a community resource, but that disconnection among stakeholders and governance hinders this opportunity.

Mail Survey

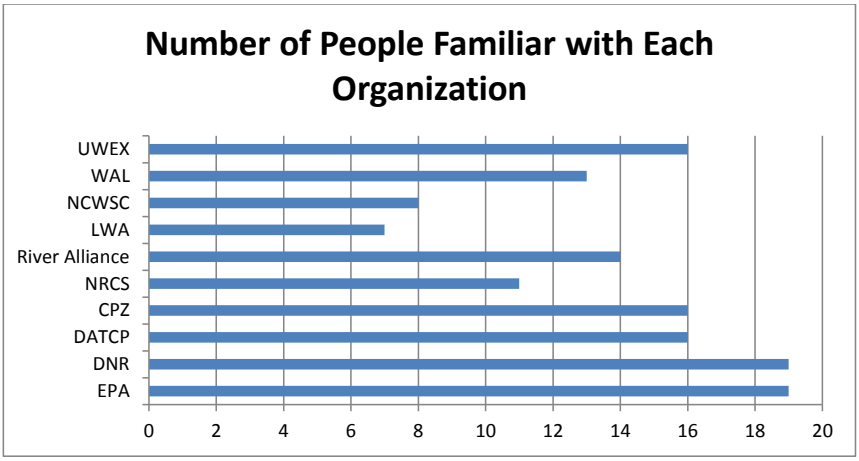
Respondents were asked how important and how familiar they were with five policies important to Lake Wausau – NR 40, NR 115, NR 151, Community Planning and Zoning Regulations, and the Clean Water Act. The number of respondents to each question ranged from 368 to 373. Most people indicated that they were not very familiar with the policies, but they perceived the policies as being important or very important for improving water quality (Table 6.).

Table 6.

	Very Unfamiliar	Very Unimportant	Unfamiliar	Unimportant	Neutral (familiarity)	Neutral (importance)	Familiar	Important	Very Familiar	Very Important	Don't know (familiarity)	Don't know (importance)
NR 115 - a.k.a. Shoreland Zoning	15%	2.20%	20.40%	1.90%	8.60%	9.50%	23.60%	30.20%	4%	17.10%	28.40%	39.10%
NR 151 a.k.a.Phosphorus Rule	14.50%	2.20%	24.10%	1.10%	9.90%	7.50%	20.10%	22.90%	4.80%	24.50%	26.50%	40.90%
NR 40 a.k.a. Invasive Species Rule	5.90%	1.60%	12.10%	0.50%	9.10%	3.80%	38.20%	27.50%	15.30%	42.10%	19.40%	24.50%
U.S. Clean Water Act	5.50%	1.40%	10.11%	1.10%	15.60%	8.40%	39.90%	26.00%	12.00%	41.20%	16.90%	22%
Your Community Planning and Zoning Regulations	16.80%	1.60%	20.50%	3.00%	18.30%	11.60%	22.10%	27.00%	5.10%	20.30%	23.20%	36.50%

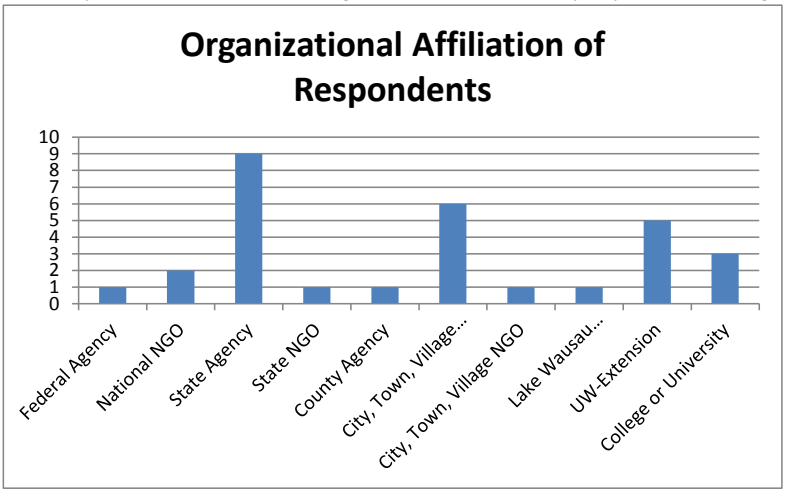
Survey

Nineteen individuals responded to the web survey. For each organization, respondents were initially asked if they were familiar with the organization. If they answered no, they were piped to the next organization. Thus, the total number of individuals answering any given question may not always add up to 19.



The results will be presented so that comparisons can be made across agencies/organizations for each question, rather than all of the questions about a specific organization at once.

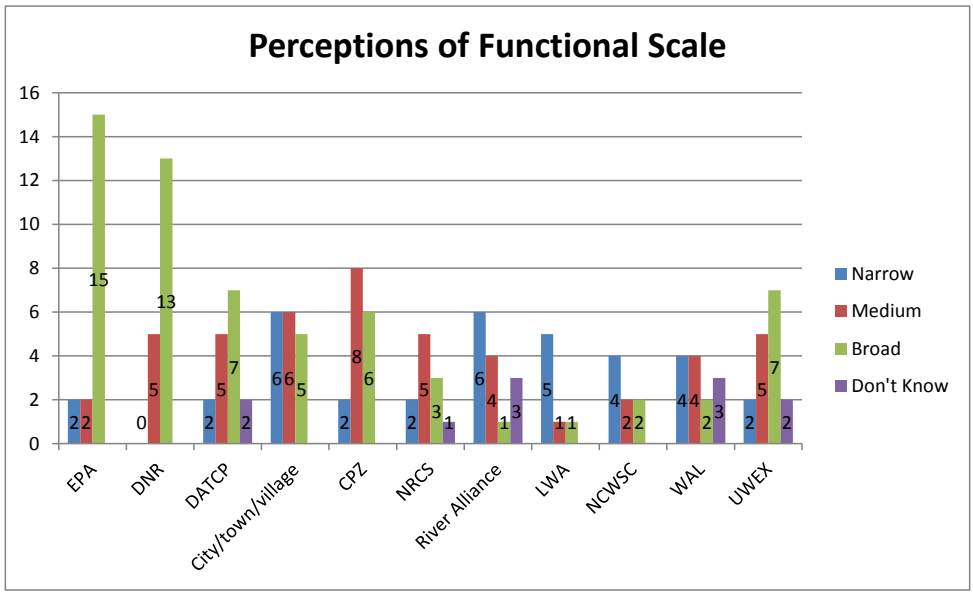
Most respondents were from state agencies (n=9), followed by City, Town, or Village government (n=6).



Functional Scale of Organizations

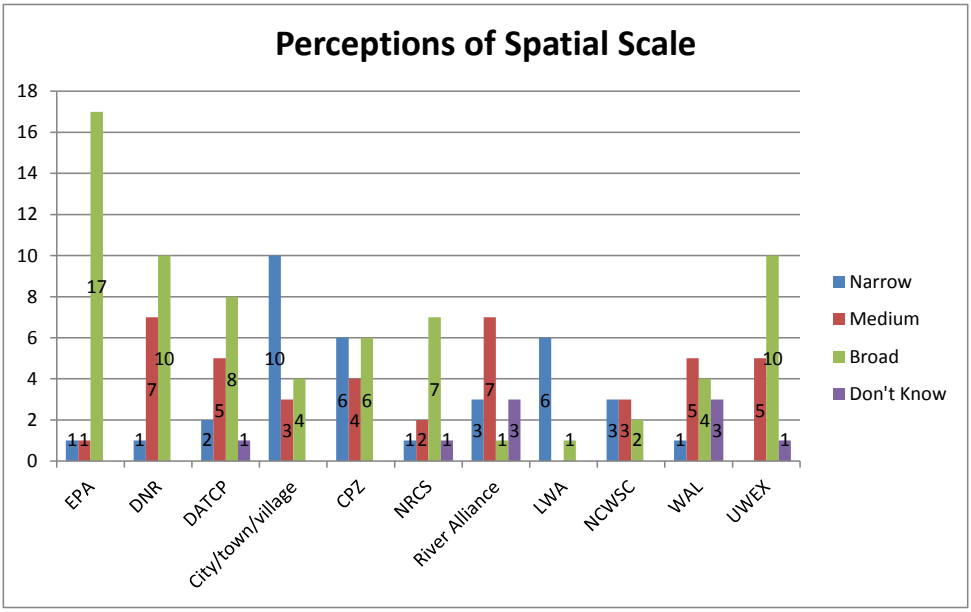
Respondents perceived organizations differently in terms of the variety of issues the organization addresses. Clearly, most people felt that the EPA and DNR had broad functional scales (n=15, n=13, respectively). Opinions were mixed with regard to DATCP, where two people felt they had narrow, five medium, and seven broad functional scales, and two didn't know. Similarly, with regard to city/town/village functional scale, both narrow and medium scale received six responses, and broad five. People most often perceived CPZ as having medium or broad scale, the NRCS as having medium scale, and the River Alliance as narrow. Of the seven people indicating they are familiar with the LWA, five perceived they had narrow functional scale. Four people indicated the NCWSC had narrow scale, two medium, and two broad. The WAL were rated as having narrow (n=4), medium (n=4), and broad (n=2) scale, and 3 people didn't know. University of Wisconsin Extension was rated by five people as having medium and seven people broad functional scale, while two people each responded broad scale and don't know.

These are important results, as it may be that people are not clear with regard to the functions of several of the organizations, most notably DATCP, WAL, NCWSC, and UWEX.



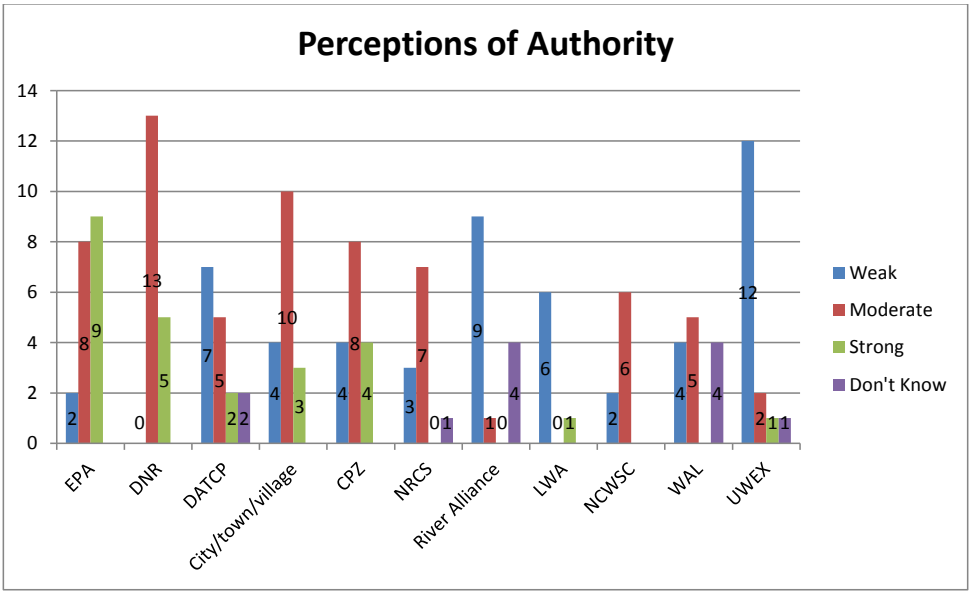
Spatial Scale

Respondents seemed somewhat more familiar with the spatial scales addressed by the organizations. Again, EPA was ranked as having broad scale (n=17) by most respondents to the question, but DNR was ranked as having both medium (n=7) and broad (n=10) spatial scale. This, however, may be due to interpretation of spatial scale: if people were thinking national as broad spatial scale, then they may have seen state level as medium. This possibility should be kept in mind when drawing conclusions from this set of responses. Clearly, city/town/village was seen as having narrow scale by most respondents to the question (n=10), while CPZ had mixed results with six people responding they had narrow, four medium, and six broad spatial scales. Seven of the 14 respondents indicated River Alliance has medium scale, with three people answering narrow and don't know each. The LWA was ranked by six of the seven people responding that it has narrow spatial scale, and one person perceived they had broad scale. The NCWSC also had an interesting dispersion, with three each answering narrow and medium, and two broad. The WAL was rated as having narrow (n=1), medium (n=5) and broad (n=4) spatial scales, with three people indicating don't know. Ten people answered UWEX has broad scale, followed by medium (n=5) and don't know (n=1).



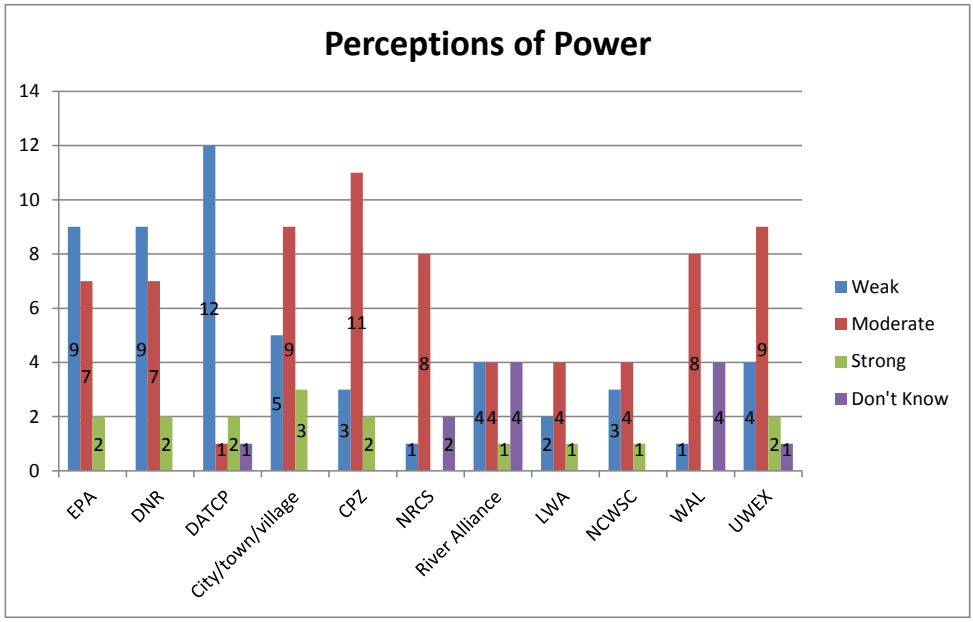
Perceptions of Authority

For most organizations, there was no one clear answer given by respondents with regard to the authority organizations have to make decisions impacting water quality, though there are several notable exceptions. Extension, the LWA, and River Alliance were ranked by most as having weak authority. The Department of Natural Resources, CPZ, city/town/village, WAL, NRCS, and NCWSC were ranked most often as having moderate authority. Nine people ranked the EPA as having strong authority (seven ranked them as moderate). Seven people ranked DATCP as having weak, four moderate, and two strong authority.



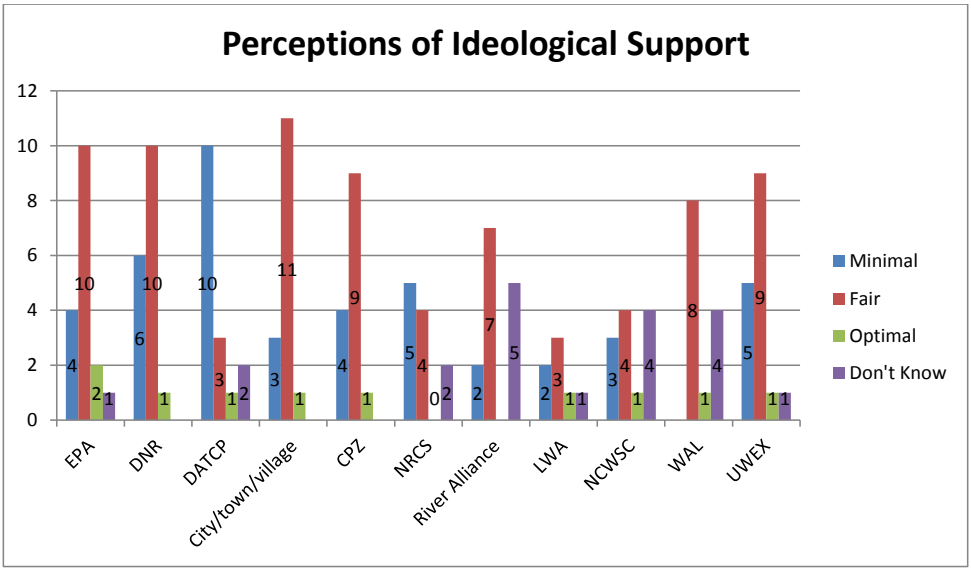
Perceptions of Power to Change Behavior

When asked the power each organization had to change people's behavior to improve water quality, the results indicate that no organization is overwhelmingly viewed as having this power. Most were ranked as having weak or moderate power, though DATCP was ranked by 12 of the 15 people responding as having weak power to change behavior. The organizations with more people perceiving them as having moderate power than weak power were CPZ (n=11, NRCS (n=8), River Alliance (n=4), city/town/village (n=9), LWA (n=4), NCWSC (n=4) WAL (n=8) and UWEX (n=9).



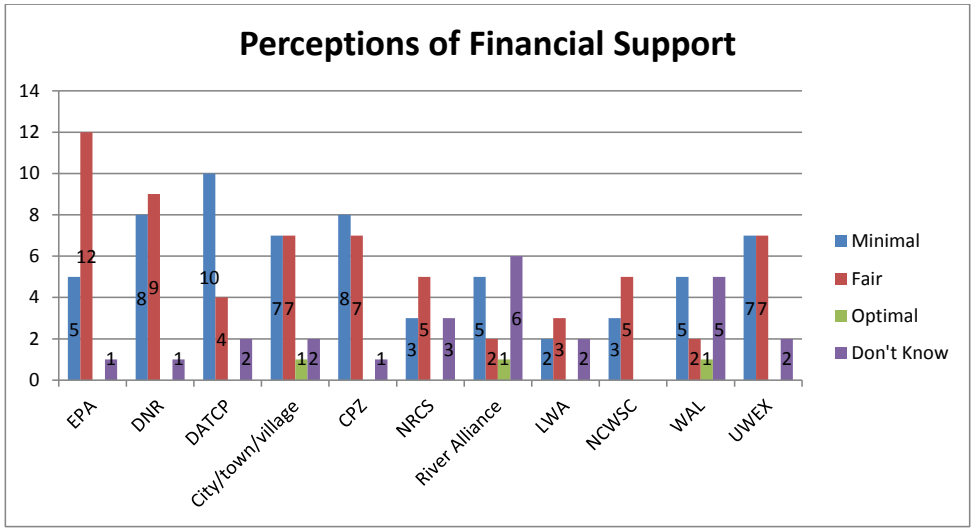
Perceptions of Ideological Support

None of the organizations was most often rated as having optimal ideological support. Only one organization, DATCP, was rated most often as having minimal ideological support (n=10). This is very interesting, given the power DATCP was perceived to hold by those participating in interviews. Most organizations were perceived as having fair ideological support, though the proportion of fair to minimal support varied with each organization. The NCWSC and WAL also had several people indicate they did not know the status of ideological support.



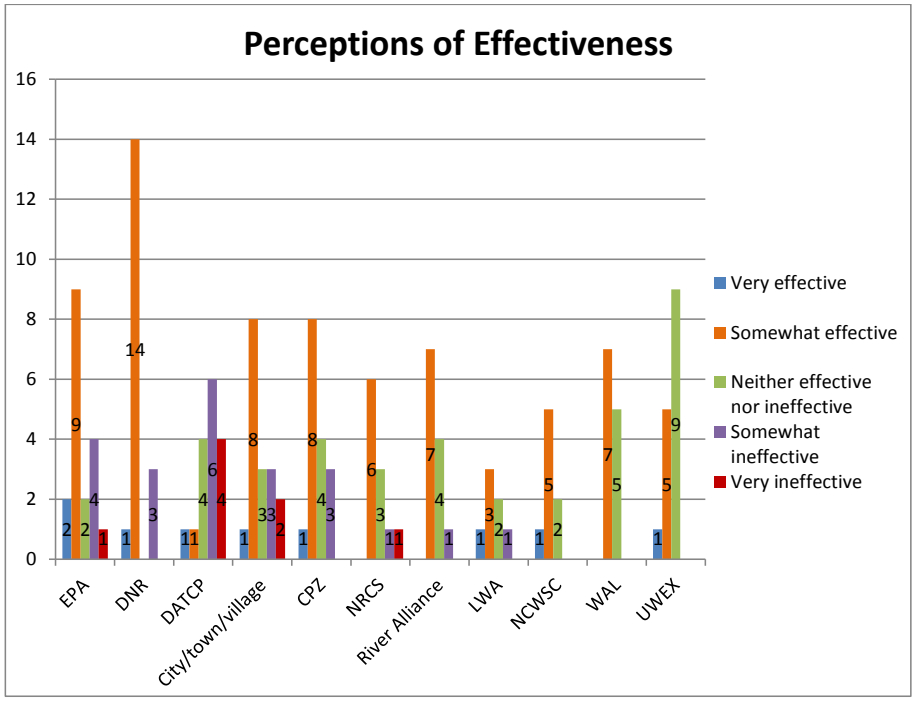
Perceptions of Financial Support

Respondents overwhelmingly avoided answering that any organization had optimal financial support. Again, only DATCP was ranked as having minimal support most often (n=10), while CPZ was ranked as both minimal (n=8) and fair (n=7). All other organizations were rated as having fair financial support, though for most, minimal was rated only slightly lower. Most people responding to the question did not know the financial support associated with River Alliance and WAL.



Perceptions of Effectiveness

When asked how effective each organization is with regard to improving water quality, most organizations were ranked most often as being somewhat effective, though UWEX was ranked as being neither effective nor ineffective, and DATCP was most often ranked as being somewhat ineffective followed closely by very ineffective.



Synthesis and Recommendations

Transparency

Water governance for Lake Wausau (and in general) is not very transparent. There are a variety of administrative rules, local and county ordinances, and plans that potentially impact Lake Wausau. Very few of these plans and policies were mentioned by interviewees as being important to their work. While those who are responsible for the implementation of specific programs and policies may know the goals of a policy and to whom it applies, it is difficult to understand who is ultimately responsible for achieving outcomes and how policies are inter-related. In addition, there is some disagreement about the functional and spatial scales of the agencies and organizations forming and implementing policies impacting water quality. Of the policies included on the mail survey of residents, people did not consider themselves knowledgeable about the policies, but perceived them as important, once again indicating that water governance is not very transparent. It is hoped that this document provides some insight as to the state, county, and local policies and plans that play a role in the governance of Lake Wausau.

Effectiveness

In general, policies and programs of the agencies and organizations impacting Lake Wausau were not seen as being very effective at improving water quality, though many were seen as being somewhat effective. The Department of Agriculture, Trade, and Consumer Protection was only viewed by two respondents (n=16) as effective at all. These results indicate that, of people responsible for developing or implementing policies impacting water quality in Wisconsin who participated in this non-representative survey, there is some disagreement about whether our policies and programs, regardless of what agency is responsible for them, are positively impacting water quality. Taken with the perceptions individuals had about the agencies' ability to impact behavior regarding water quality, the institutional structure for water governance is seen, at most, as only mildly effective.

Two policies were mentioned as being effective by interviewees – the MS4 permitting program (NR 216) and agricultural performance standards (NR 151, ATCP 50). One participant noted that the performance standard "doesn't go far enough to protect water quality… it gets us a little bit closer, but not quite where we need to be." With regard to MS4 permits, an interview stated that a goal was to educate people about stormwater discharging directly to the river, and that, "a lot of people for some reason don't think that happened." Both statements indicate that even policies viewed as effective have issues with implementation and outcome achievement.

Equity

Unreasonable burdens are perceived by several interviewees as being placed on municipalities to reduce phosphorus contributions rather than other land uses that are negatively impacting water quality, most notably agriculture. In addition, some stakeholders (the "average joe" as one participant put it) are not being involved in the decision making processes around water quality. It is likely that many people do

not understand these processes or are even aware they occur, once again speaking to the lack of transparency in water governance in general.

Accountability

Individuals involved in implementing state and local policies saw themselves as accountable both to agencies hierarchically above them (like DNR) and to local citizens. One person said that, "I am most accountable to the residents of the county. They tell their representatives what they would like to see, issues they have, and that's passed down to me. If I'm not doing my job they go to their representatives and I find out about it." In terms of who is being held accountable for nonpoint source pollution that can impact Lake Wausau, the policies and plans are mostly aimed toward agriculture and development. Residents who are not agricultural producers are largely not addressed in regulatory policy. Even the MS4 permits, regulating municipal stormwater runoff are issued to the local government, who are then responsible for ensuring that individuals are not discharging to the system. In spite of this, agri-business and those who represent them ("big ag", lobbyists, Dairy Business Association) were viewed as having too much influence and power with regard to water policy. One interviewee stated that the DNR needs to be "back in charge of regulating or protecting water quality" instead of DATCP. Interestingly, DATCAP, more than any other organization, was viewed as having minimal support financially or ideologically and weak authority to make decisions and impact behavior regarding water quality. Again, this speaks to the lack of transparency and understandability of the policy making process and organizations involved.

Another component of accountability is that those who are responsible for meeting goals have the resources necessary to do so. Several interviewees noted that this is not the case. Staff shortages, lack of resource commitment for implementation and monitoring, and funding being removed from programs (DNR programs) and funneled toward others were all mentioned.

Scale

Scale was the most difficult principle to assess, as scale fluctuates depending on the resource in question. It was noted that some people see the issue as weeds in Lake Wausau, which indicates that the scale at which people view impacts on the lake may not be appropriate. In addition, the greatest number of regulations that require action and enforcement are at the state, rather than local, level. While a great number of policies and plans exist at the local level, they are mainly voluntary in nature. Ideally, the state policies are both specific and broad enough to protect water quality and be applied locally, respectively. However, perceptions of interview participants did not see most of the policies as being effective.

Recommendations

Institutional Design

Currently, polluted runoff from urbanized and agricultural areas have separate systems of administrative rules, county and local ordinances and plans, and entities responsible for attaining water quality goals. Effective institutional design is one of the most important tools we have to improve water quality.

Approaches to managing stormwater in nearby areas have included creating a stormwater utility fee to engage in management actions that reduce nutrient and other pollutant loading from stormwater. It would be useful for the Lake Wausau project partners to investigate the potential of creating a watershed utility fee or fees that would contribute toward supporting changes in land management practices. As funding was seen as one of the main barriers to successfully improving water quality in Lake Wausau, a steady source of money with institutional support would be significant. A watershed utility fee that uses a land parcel size and use metric for determining each property owner's fee could be developed and be an equitable means of funding the protection of water quality.

Partners and Cooperation

Clearly, the Lake Wausau management strategies will be more successful if ties are formed with all of the stakeholder groups that impact the lake, including the farmers who may not be able to enjoy the resource at all or to the extent to which other residents in the watershed are able.

Many farmers do not have the time to enjoy the Lake's resources during the summer months, when farming takes up the majority of their time. As many of those interviewed perceived production activities as negatively impacting water quality in Lake Wausau, inviting farmers to have a role in managing the lake and enjoying its benefits could provide opportunities for all lake stakeholders to meet and interact with each other, thereby increasing the probability of cooperation. The Lake Wausau Association and other current project partners could host a Farmer Appreciation Dinner or other event held at a Lake Wausau park or restaurant. Expanding planning activities beyond the current partners to other organizations, including agricultural organizations, would also be useful.

The North Central Wisconsin Stormwater Coalition was mentioned several times as being an effective organization for reducing runoff from urban sources. Marathon County, Rib Mountain, Rothschild, Schofield, and the city of Wausau each have municipal separate storm sewer systems (MS4) and stormwater permits from the DNR. The NCWSC is a partnership among these and other local governments to collaboratively fulfill the education and outreach requirements of their permits.

Of the eleven agencies and organizations identified in interviews and examined through the web survey, many were seen as being somewhat effective in improving water quality and fair ideological support. It would be useful to understand which organizations Lake Wausau residents view as most effective and which they support. However, a good starting point would be to include representatives from some of the organizations in planning meetings in order for relationships to be built among stakeholder groups. The Department of Agriculture, Trade, and Consumer Protection was not viewed positively in this small web survey, but it is possible that they are viewed positively by agricultural producers. Conversations with farmers by current project partners can aid in understanding the best channels for building support in the farming community.

Local Policies and Plans

Most local plans were voluntary in nature, and did not require the actions they prescribed. With the exceptions of ordinances and county code, this was true across plans. In the absence of regulatory structures governing individual behaviors, improvement in water quality will be based on voluntary changes in behavior. Through the interviews and content analysis, it is clear that the tool being relied upon most often in the Lake Wausau watershed for changing behavior is education, including methods such as newsletters, brochures, utility bill inserts, and websites. Unfortunately, these methods are largely unsuccessful in changing behaviors, and thus the Lake Wausau management plan will be most successful if trusted information sources and messages that resonate with the populations most impacting water quality are used. Research in Eastern Marathon County revealed that neighbors and peers were the most trusted source of information, and that result is supported by much of the research conducted in Wisconsin. Plans should focus on building these networks, using social marketing strategies such as norm building and commitment, and extending influence through social networks to change behavior.