

Natural Resources & Environmental Science (NRES)
Kansas State University

Final Report

Big Wakes or Big Fish?

Determining public opinion for future recommendations of Marion County Park & Lake

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Abstract

Marion County Park and Lake needs formal guidance in the form of a codified lake management plan, which includes a publicly-approved mission statement. The park has been managed, since its opening in 1940, without a written lake management plan or mission statement. This has led to conflicts between lake managers, nearby homeowners, and lake users. To properly gauge this conflict, we first provide an overview of conflict in natural resource management, and review public survey methodology. We report on the current status, and future goals, of park interpretation, and summarize research on management of eutrophication. To determine the public's opinion on the lake's intended purpose and goals, we created a preliminary survey which was distributed through social media. This survey included demographic information like age and residency; questions on the respondent's frequency, value, and quality of fifteen different activities; and an open-ended question where the respondent gave their version of what the mission of Marion County Park and Lake is. The three most frequent *and* valued activities were 'enjoying natural views', 'fishing from land or docks', and 'hiking/walking'. The highest-rated quality activities were 'enjoying natural views', 'camping', and 'hiking/walking'. Our group synthesized the three most representative, of the many mission statements received, into the following: "The mission of Marion County Park and Lake is to provide recreational opportunity in both natural and park environments while ensuring a healthy, welcoming habitat for plant, animal and human life."

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Introduction

About Marion County Park & Lake

In 1934 the United States federal government designated the state of Kansas to be considered as a drought area. This decision ultimately led to the established counties to obtain funds from the government's natural resources lake and park project plan. Originally the plan sought to serve two important purposes at this time. First, to provide work for the unemployed and second, to serve the government's water conservation initiative. In the following year, the lake site was selected by a group of Kansas engineers and purchased by Marion County. One of the local engineers James Meisner proposed the original plans to convert the once previously 302.5 acres of agricultural land into a brand new park and lake. His personal plans included but were not limited to designs and placements of stone structures, roads, and landscaping recommendations. In 1936, A number of these projects and original recommendations was delegated to be completed by the Civilian Conservation Corps (C.C.C.). Specifically, the members of this federal organization assigned to the area of Marion County Park and Lake were unique because of how they had the rare distinction of being the only black veterans of World War I. In the following years, Earthen Dam, roads, bridges, and even America's favorite pastime diamond was completed. In addition, grass and thousands of trees were scattered across the lake. The long-awaited grand opening and declaration was held on May 26, 1940. Lastly, as of 2002 Marion County Park and Lake was placed on the National Register of Historic Places throughout the United States.



Picture 1. Marion County Park & Lake C.C.C. Worker Statue

Management Status for Marion County Park and Lake

Marion County Park and Lake is struggling in the management department. There is currently no lake management plan, leaving directors with unclear guidelines. The citizens at Marion County Park and Lake seem to have many different opinions on the purpose of the lake, causing the management team difficulties in where to begin. Whether it's the interpretation, recreational activities, lake pollution, boating rules, etc., the lake management plan shall incorporate as many topics as possible. To begin the efforts to form a lake management plan, a public survey shall be released to the citizens of the lake, those owning property, or those who visit Marion Lake. While this report outlines a preliminary process for public participation, this information can be incorporated for further development of the lake's management plan in order to ensure its success.

Importance of Public Participation

Successful societies thrive on participation, agreement, and strong leadership. In order to effectively manage any form of public entity, incorporating public preference into actions or ideas greatly increases the attitudes and participation of those in the community. Public surveys are one of the most common and easiest way to gather opinions and data to find a general consensus, average, or outlier.

For any type of decision making at the management level, the potential of social and ecological performance relies greatly on public participation. In Patricia Perkins' article, "Public participation in watershed management: International practices for inclusiveness," she discusses participatory processes from around the world for decision making, and the importance of public opinion. The theoretical reasons she outlines, show that broad public participation is the foundation of substantial development. More importantly, the way the public participation process is carried out is a crucial key in its success.

Some challenges with involving the public is the cost, the difficulty of analysis, participants being misled and rising people's hopes which can lead to anger, and finding people that have time and energy to participate (Perkins, 2011). With participatory processes related to watershed management, that can also be related to other management types, several factors need to be considered. These factors include the population to be represented, the accountability of such members, and the role of experts. Factors closely relating to lake management surveys would be the scale and

time frame of the survey. These factors have been considered with the process of involving public participation of Marion County Park and Lake, and should be considered in further development of the lake management plan.

Background Research

Conflict in Lakes and Parks

Conflict among park users can look different depending on the type of park, activity, or the convictions of those involved. Given the recreational nature of almost all parks and lakes, most research regarding conflict in these areas is focused on recreational conflict. There are multiple ways park managers can assess conflict, some of which are more complex and thorough than others.

Interpersonal vs. Social Values

The 'interpersonal' vs 'social values' approach to recreation conflict provides a baseline understanding of conflict type. Once they know what type of conflict is occurring at their park, park managers can then take the necessary steps to manage it. Social values conflict is typically observed when two or more visitor groups are using the same area for different, often clashing activities (Vaske, Cline 2007). For example, if jet skiers impose upon a group of kayak fishers on a lake, the fishermen might get upset about the interruption. Interpersonal conflict occurs between smaller groups of visitors and could have a multitude of catalysts such as conflicting personality types, demographics, etc.

Conflict Dimensions

Many researchers have broken down recreation conflict into dimensions such as activity style, resource specificity, lifestyle tolerance, and modes of experience. The 'dimension' approach to conflict enables managers to focus on the root causes of conflict, such as contrasting goals of park use among visitors (Wang C-P, Dawson 2005). For example, a group of elderly visitors might be looking for a quiet and peaceful evening, whereas a group of younger people would be a little bit louder or too rowdy.

Survey Methods

Because public surveys are one of the most common ways to quickly gather data and reach a consensus, there are many different survey methods. This section will cover the basics of three different survey methods that are commonly used for management purposes in lakes, watersheds or wetlands. These survey methods of choice experiments, public risk perception, or key indicators are all viable options to be used for development of the Marion County Park and Lake management plan.

Choice Experiments

Choice experiments, also similar to choice modelling, has respondents choose discrete choices among competing options. Choice experiments are more recently used in recreation and environmental management, rather than their original purpose of determining consumer preference of multiattribute goods. In 2009, a choice experiment was conducted in the Lake Champlain Basin situated between New York, Vermont and Quebec to help their lake management plan (Smyth, Watzin & Manning, 2009). The management plan as of 2003 consisted of 11 goals covering topics such as pollution, fish and wildlife, public outreach, recreation, etc. In order to narrow the efforts in meeting public demands, the authors of this article conducted a choice experiment to assist in decision making within the lake's management.

The authors selected ecosystem characteristics that were both relevant to the public and responsive to management actions. Each attribute represented the existing condition, and two representing possible future conditions that could result from management. The final survey consisted of five important characteristics of Lake Champlain: public beach closures, water clarity, land use change, fish consumption, and the spread of invasive water chestnut. In August of 2002, two thousand questionnaires were sent out, and reminders send out 3 weeks after mailing. Survey results showed that safe fish consumption warranted more management attention than water clarity and algae blooms. The choice experiment proved much more beneficial than a standard questionnaire as it forced respondents to choose one attribute over another.

Public Risk Perception

Another method to seek public data, is surveying in the form of public risk perception. Risk perception relates to the process of information and sense making,

relating to an external threat or situation (Reser, Bradley, Glendon, Ellul & Callaghan, 2012). As far as lake management, it's important to know how the public views threats such as algae blooms, boating accidents, or traffic. Risk perception intelligently results in an answer from respondents while not asking a seemingly easy or straightforward question.

Key Indicators

The process of using key indicators with a scale to then rate the indicators is another common survey method. There can be as many key indicators and sub indicators as necessary, but the purpose is to have each indicator carrying equal weight to the overall goal. This can be seen as a quicker survey method as respondents can read and understand the ranking system, then apply it to all questions or indicators.

A study in the Lake Malawi basin was done in 2014 to assess the participation of the lakes stakeholders in the management of the lake basin. Community involvement of Lake Malawi is a necessary component of the lakes management. The authors conducted in person interviews using semi-structured questionnaires carried out in five of the 15 basin districts. This was to include all the regions of the country. Structured questionnaires interviewed a total of 515 basin dwellers (Chidammodzi & Muhandiki, 2015). The authors used 8 indicators to conduct their survey, each having a scale of 1-5 to rate the level from very low to very high. Each indicator consisted of sub indicators, computation, data sources and limitations. The rankings then show the authors how involved or aware respondents are to such subjects.

Strategic Bias

Strategic bias is a concern during any survey, study or questionnaire. Strategic bias happens when an individual deliberately misrepresented their preferences in order to influence the decision making process. The process of this goes as follows: respondents believe an agency is deciding on a provision decision, respondents choices are used in such decision, and respondents anticipate that true preference revelation will lead to an unfavourable provision outcome (Meginnis, 2018).

An experiment done by Keila Meginnis studies the strategic bias taking place in discrete choice experiments, a survey method previously discussed and used for Lake Champlain. However, in this experiment, they establish the provision outcomes prior to the choice experiment. The respondent will be asked a series of trade off questions involving a number of attributes. Based on the values, they calculate the probability of

preferring each of the possible provision outcomes for the individual. This is set up by an experimental design in a seemingly cause and effect method. Furthermore, the results categorized 27% of the individuals as acting strategically. The research showed that individuals may not respond truthfully if they 1) envision the choice experiment as potentially affecting the provision outcome; 2) have expectations of the outcome; 3) have expectation of outcome being implemented. Although strategic bias cannot be prevented, is important to form survey questions appropriately so that respondents do not feel targeted.

Interpretation

Interpretation is a vast, diverse, and complex topic that stretches far beyond a historical museum, or local state park. It can include everything from an informative sign you glance at, to an elaborate exhibit in a zoological park. Definitions vary ultimately depending on the specific agency or organization. Interpretation can be simply put as the act of bringing meaning to people about the natural and cultural environments that surround them. The man behind the creation of Rocky Mountain National Park Enos Mills became the main figure to first to use the term to describe the work of his natural guides in the area. Although, recently nature guiding has now found a more stable footing in the rise of ecotourism industry. (Bacher et al., 2007) The definition in which I will be using the term “interpretation” has been used by The National Association for Interpretation (NAI). This non-profit professional association has defined the meaning of the word as a “... decision-making process that blends management needs and resource considerations with visitor desire and the ability to pay to determine the most effective way to communicate the message to targeted markets.” (Schimandle, 2013)

Interpretation can be thought of as the delicate balance between using various methods such as providing firsthand experiences and illustrative media compared with the ability to spread a factual message to a group of people. The use of interpretation helps aid in bridging the gap between formal communication and providing people with an engaging, life-changing, learning opportunity.

What is the purpose of interpretation?

As an interpreter fundamental goal is to “seek out to add the essential elements of heightened appreciation, deeper understanding, and new ways of seeing the world.” (Knudson, Beck & Cable, 2018) The goal of interpretation I will be highlighting for this final report will include the developing an unforgettable experience with the desire to establish a sense of place.

The purpose of interpretation is derived from its philosophy in order to help audiences care about park resources so they might support the care for park resources. This in turn, leads to the building of the foundation that establishes the value of

preserving park resources by helping audiences discover the meanings and significance associated with those same resources. When carried out correctly, interpretation takes people from passive appreciation to a sparked sense of excitement of the cultural and natural resources they have become introduce to. “Connections involve moments of intellectual and emotional revelation, perception, insight, or discovery.” (Bacher et al., 2007) When a visitor of your place leaves, he or she should have had a special feeling that relates towards a desire to want to continue to learn more about the place they enjoy going too.

The existing role of interpretation at Marion County Park & Lake

Currently, the role of interpretation at Marion County Park & Lake is minimal at best with an historical museum, numerous brochures, and pamphlets available in the bait shop and a small number of signs scattered throughout the designated area (seen below in picture 2. & 3.).



Picture 2. Marion County Waterfowl Sign



Picture 3. The History of Marion County

While it is better at this stage than nothing at all, there is plenty of room for improvement and future recommendations. It's important to keep in mind that “interpretation goes beyond just a lecture and uses appropriate techniques such as question and answers, old photographs, quotes, audience participation, jokes and even silence,” (Bernstein, 2010). Think of it in terms of you would like the resource you are interpreting to be the one talking, rather than just an individual on behalf of the agency or organization.

Future implementation of interpretation for Marion County Park & Lake

In the future Marion County can implement interpretation throughout their park and lake by focusing their efforts on two major principles. The first of these fundamental concepts is to strive for message unity throughout the area. This means you would want

to plan or design the interpretive program, service, or media, to aid in the support of the collective message. Think of the overall message unity as the stage setting and props for a theatrical presentation for those who choose to come and visit the park and lake for the first time.

In addition, the other interpretive principle Marion County should focus on is how all the interpretation supports one main point or theme. Often characterized as "the big picture." To continue this analogy further the main theme is best illustrated by your answer to the question "if a visitor spends time going to programs, looking at exhibits, etc. while they are visiting my site, by the time they are ready to go back home if they only remember or learned one thing about why our site is so special, that one thing better be _! The answer to this question is "the whole." An example of such a theme might be "We are using state of the art land restoration techniques to improve this site for people and for wildlife."

In conclusion, we have created two questions for Marion County Park & Lake to ask themselves in order to help them plan and design their interpretive program, media or service in the future.

1. Why would the visitor want to know that?

If you cannot answer this question, you are going to have trouble "marketing" the program or service. There is no point in presenting answers to questions no one is asking.

2. How do you want the visitor to use the information you are interpreting to them?

If you don't want visitors to use the information you are interpreting, then why are giving it to them in the first place?

Environmental Management Strategies

Marion County Park and Lake currently has a major issue of algal blooms in the summer, which negatively affect use of the park. Algal blooms stem from environmental management decisions, which are made with the implicit agreement of the users of the park. As such, these decisions should be both scientifically valid and supported by the will of the people who use this natural resource. To support the goal of making scientifically sound decisions following public approval, the following research is presented on the topic of preventing eutrophication through reducing phosphorus levels. This includes both removing phosphorus already in the water column and preventing

phosphorus from entering the lake through overland flow, involving creating riparian buffer zones and encouraging using less phosphorus in lawn fertilizers.

Chemical Management of Eutrophication

First, it should be noted that the main factor causing freshwater eutrophication is excessive phosphorus (Wang, 2009). Efforts to resolve eutrophication and algal blooms should focus on reducing phosphorus, as opposed to nitrogen. Several researchers have focused on fixing eutrophicated lakes by chemical means, including Waajan (2016) and Mehner (2008). In both cases, they used a flocculant to precipitate the phosphorus out of the water solution, and then a follow-up chemical to trap the precipitated phosphorus in lake sediment. This reduction of internal loading of phosphorus is crucial, as reduction of external loads alone rarely causes an immediate shift to meso- or oligotrophic states (Mehner, 2008). In both cases, once internal loading was reduced, the lakes saw immediate and lasting improvements in water clarity, quality, and macrophyte quantity. If logistics allow and public pressure to reduce algal blooms continues, chemical reduction of phosphorus could be a powerful tool for Marion County Park and Lake to combat the eutrophication of the lake.

Riparian Buffer Zones

While internal loading is very important to consider, the source of that phosphorus is external in origin. This is especially true for Marion County Park and Lake, which as an artificial lake has significant sediment inputs from the primarily agricultural land upstream. Reducing phosphorus trapped in sediment being delivered in overland flow is needed to reduce eutrophication. One of the main tools used towards this goal are riparian buffer zones. These buffers provide many benefits, including adding organic material to the stream, reducing water temperatures, and filtering out contaminants from both overland flow and lateral groundwater movement (Correll, 2005). To get these benefits, it is crucial that buffer strips are properly constructed and maintained. Firstly, it is more important to have these buffers along headwater streams, compared to lakeshores, and continuous narrow buffers along the entire length of a stream are superior to wider, intermittent buffers. In creation of a buffer, a three zone approach is recommended. The first zone, closest to the stream, should be about 4.5 meters wide and planted to native trees. The second zone should be about 18 meters wide and planted to native trees and shrubs, while the third zone should be 6 meters of native grass, which serves the primary purpose of trapping suspended sediment. If public pressure to reduce algae concentrations continues to mount, encouraging

upstream landowners to create riparian buffer strips along streams feeding into the lake (perhaps through partnerships with the Natural Resource Conservation Service and the Kansas Forest Service) would be an important step in preserving the lake's integrity.

Reducing Phosphorus from Lawn Fertilizing

Due to the close presence of residential homes to the shoreline, a major concern for Marion County Park and Lake is runoff of lawn fertilizer into the lake. There are several factors going into how much fertilizer enters the lake. The amount of runoff and the type of fertilizer used both impact phosphorus quantities (Gann, 2002). Using fertilizers which do not have phosphorus in them, and ensuring that lawns are properly vegetated to cover the soil, will significantly lower the amount of phosphorus which runs off into the lake. Marion County Park and Lake could consider a strategy of encouraging homeowners to use only fertilizers which do not contain phosphorus, or refrain from fertilizing at all. Public support, determined through surveying, would be crucial in any attempt to begin such a management strategy.

Survey Description

Since the management of Marion County Park and Lake is in the beginning steps of their lake management plan, the opportunities for public participation were seemingly endless. In order to properly conduct a survey, preliminary information was needed first before getting too specific. The survey given does not follow any scientific method like choice experiments or key indicator methods. In hopes to see where the public stands in regards to certain recreational activities, the questions included were based upon their frequency, value and quality of fifteen different activities. It is recommended that the results from this preliminary survey can be used to create a more specific, scientific survey method for the public.

Methods

The approach to this preliminary investigation began with researchers visiting Marion County Park and Lake. After the visit, the researchers compiled survey questions for lake visitors regarding lake use and experience. The questions were formatted on spectrums (low to high) of frequency of use, value, and quality. This survey was composed through K-State Qualtrics, an online application that processes and reports the results. In order to obtain an adequate number of preliminary responses, the park superintendent shared a link to the online survey over the park's Facebook page. The link was shared around 5:00 pm on April 2, 2019. It was available to anyone who followed the link, primarily the park's 1700 facebook followers. At the end of the survey, subjects were asked to provide a mission statement for the park. Entries for this mission statement question were reviewed by the researchers.

Results

The survey resulted in 135 respondents in a two week period. Of these respondents, 63 people gave an answer to the question prompting a mission statement for Marion County Park and Lake. The demographics showed that more respondents are residents of Marion County than not, and a lower percentage of respondents own property within 200 yards of the shoreline than those that do not.

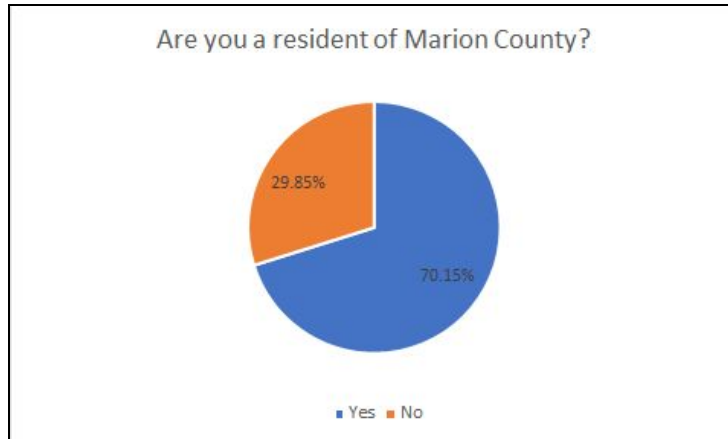


Figure 1. Percentage of respondents that are residents of Marion County

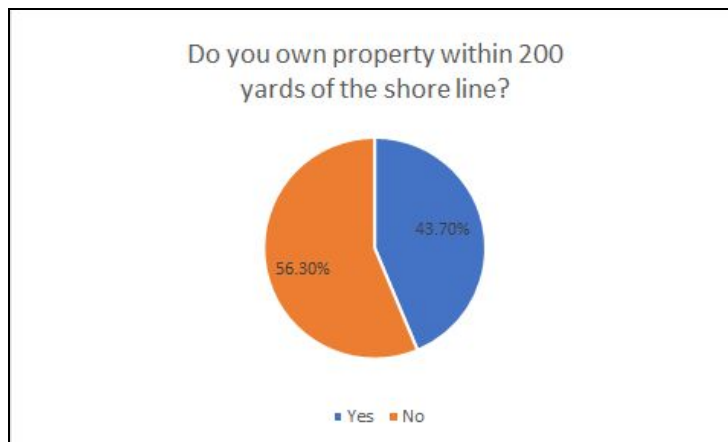


Figure 2. Percentage of respondents that own property within 200 yards of the lake's shore line.

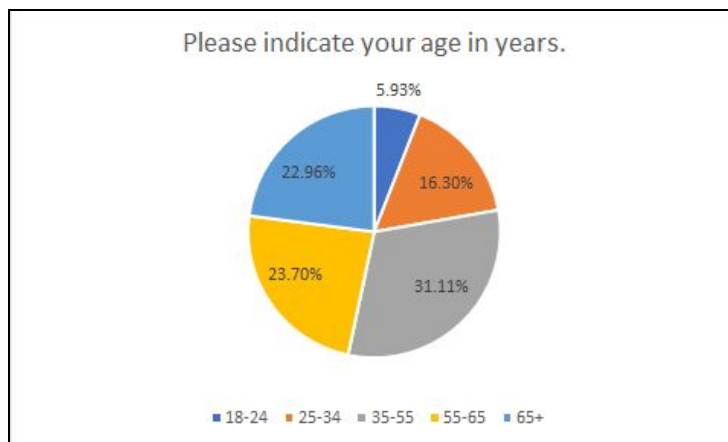


Figure 3. The age range of the 135 survey respondents.

The following graphs are analyzed based on rankings of mean values. The questions were as followed:

1. Please indicate how frequently you engage in the following recreational activities at Marion County Park and Lake.
2. Please indicate how valuable each of the following recreational activities at Marion County Park and Lake are to you personally.
3. Please indicate how satisfied or unsatisfied you are with each of the following recreational activities at Marion County Park and Lake.

Each question has six rankings respondents can choose from. These rankings are given corresponding values of 1-6 which vary slightly for each question. A ranking of 6 means that the recreational activity in question is engaged in greater than 20 times a year, is extremely valuable to the respondent, and is seen as the highest ranking of quality. If there is a mean ranking value of 1, the recreational activity is participated in less than once a year, is viewed as not valuable and is seen as the lowest ranking of quality. The results are broken into the three categories of frequency, value and quality and then further compared after.

Frequency

The results show that the recreational activity most engaged in at Marion County Park and Lake is enjoying natural views with 50.38% of respondents choosing “greater than 20 times per year” and 15.97% choosing “between 10 to 20 times a year”. This results in a mean ranking value of 4.70. The activities engaged in the least frequently are remote control aviation, disc golf, and other water sports at mean values of 1.12, 1.35, and 2.22. Taking the average of the fifteen mean values for each activity, the respondents participate in the questioned activities at a value of 2.85 corresponding closest to a frequency of 3 – 5 times per year.

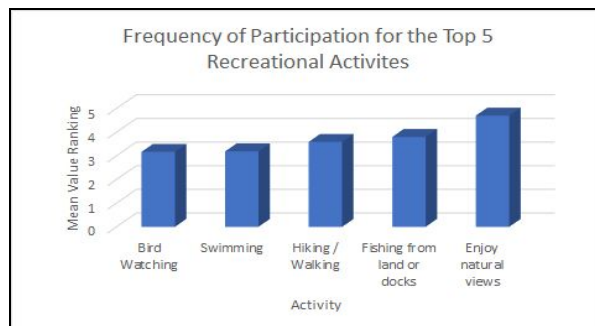


Figure 4. The mean values of the most participated recreational activities with “5” corresponding to 10 – 20 times/year.

Values

Results show that the highest valued activity is enjoying natural views with a mean value of 5.25 rated as “very valuable”. Over 84% of respondents rank this activity as very valuable to extremely value. The lowest valued activities are linearly related to their frequency with remote control aviation, disc golf, and other watersports receiving the lowest mean rankings. Taking the average mean value rankings from all activities, respondents rate their value at a 4.164 corresponding to “slightly valuable”.

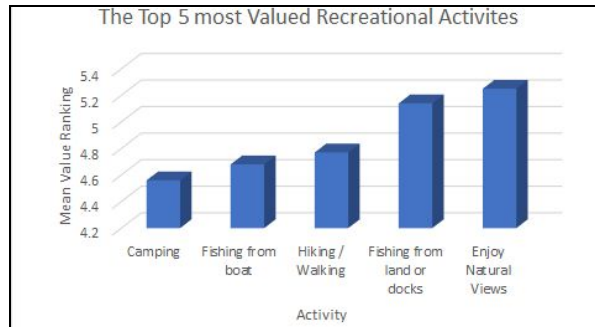


Figure 5. The mean rankings for the top 5 most valued recreational activities with “4” corresponding to slightly valuable and “6” corresponding to extremely valuable.

Quality

Results show that respondents are most satisfied with enjoying natural views with about 80% being “satisfied” to “extremely satisfied” and a mean ranking of 5.06. This marks the highest ranked answer in all three questions. The quality of swimming is placed at 13/15 activities questioned with 28.81% of respondents being less than slightly satisfied. This is notable because swimming is the fourth most participated activity. Taking the average value from all activities, results show an average of 4.558 meaning that respondents are on average slightly satisfied to satisfied with all activities.



Figure 6. The mean rankings for the top five most satisfied activities.

Discussion

When comparing the results from the three questions, it's seen that frequency and value are directly related for most activities meaning that the respondents highly value the activities they participate in most. When placing the mean value rankings from 1 – 15, frequency and value have seven activities that match exactly. The quality, however, differs slightly. Using the results for the top five most frequent activities at Marion County Park in lake, the placement of value and quality is shown below.

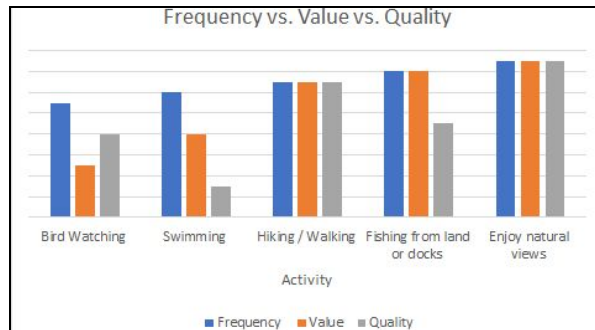


Figure 7. The relationship between the five most participated in activities compared to their value and satisfaction of each.

Final Recommendations

The survey asked respondents to fill in an open ended question finishing the sentence to “The Mission of Marion County Park and Lake is to _”. While not all 135 respondents answered this question, there were many promising mission statements. After comparing these answers to the results from the other questions in the survey, three ideal mission statements stood out. These were chosen based on their inclusion of the highly valued and frequent activities that take place at the park and lake. It’s important for the management plan to be aware of these values, and to hear out the public’s proposed mission statements. In no particular order, the chosen three mission statements from respondents are as followed.

The mission of Marion County Park and Lake is to:

1. Provide a healthy, welcoming habitat for plant, animal and human life as we share this beautiful place.
2. Commit to healthy use of nature, protecting for the future uses and promoting education and preservation while providing opportunities for all.
3. Provide outdoor recreational opportunities in natural and park environments to the citizens and visitors to Marion County.

When considering these chosen mission statements from the public, it is our recommendation that the mission statement of Marion County Park and Lake should be as follows.

“The mission of Marion County Park and Lake is to provide recreational opportunity in both natural and park environments while ensuring a healthy, welcoming habitat for plant, animal and human life.”

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