Increasing Volunteer Engagement Among 16-25 Year Olds

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Unlocking the Severn: Increasing Volunteer Engagement Among 16-25 Year Olds

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Abstract

The goal of this project was to develop recommendations for a marketing campaign for the Severn Rivers Trust to attract volunteers in the 16-25 year old age group. The team gathered data by analyzing existing surveys, administering additional surveys, conducting a focus group, and testing website tools for building an online citizen science platform. The team presented a set of recommendations for developing a marketing campaign to reach young people as well as a set of options for creating an online fish migration monitoring platform utilizing citizen science.

Acknowledgements

The research team would like to express their thanks to the sponsors of this project at the Severn Rivers Trust, Mr. Tim Thorpe and Ms. Alice Fallon, for their continued support throughout the entire project experience. Additionally, the team would like to show their appreciation for their advisor on this project, Professor James Hanlan for his feedback and guidance throughout the project. Finally, we would like to thank our pre-departure course instructor, Professor Courtney Kurlanska for her assistance in developing our project methodology and background.

Executive Summary

Introduction to the Project

The team's goals for this project were to develop recommendations for a targeted marketing campaign to attract 16-25 year olds to volunteer, as well as to create a set of options for designing an online fish migration monitoring platform that utilizes citizen-science. The team worked with the Severn Rivers Trust (SRT) to accomplish these goals for the Unlocking the Severn project. The Unlocking the Severn project goals are to build fish passes in weirs on the river, monitor fish migration in the passes, and increase community knowledge of the heritage of the river and the twaite shad, a protected fish species. There is a focus on the twaite shad because the weirs create an impassable barrier to them, unlike other species, such as the salmon, which can still make it past obstacles by jumping.

The team's focus was on the third goal of the project. By expanding the SRT's volunteer network to a younger audience, knowledge of the twaite shad is being spread. Additionally, the fish migration monitoring system will provide a platform for thousands of people to learn about the Unlocking the Severn project and the twaite shad. In order to accomplish the project goals, the team followed the following four objectives:

1. Explore current Severn Rivers Trust and Canal and River Trust volunteer and non-volunteer perspectives.
2. Evaluate preferences for what kind of volunteering potential participants aged 16 to 25 prefer.
3. Determine effective marketing materials and strategies to reach individuals between the ages of 16 and 25.
4. Analyze options for hosting an online citizen-science platform.

Methodology

In order to evaluate volunteer perspectives effectively, the team analyzed survey data previously gathered by the SRT and conducted interviews with current volunteers. The survey analysis focused on questions about what aspects of the heritage of the Severn River respondents were interested in, as well as social media and volunteering preferences. The data was analyzed by looking at the most popular responses from each age cohort to determine the opinions of respondents between the ages of 16 and 25. In addition, interviews were conducted, over the

phone and via email, with current SRT and Canal and River Trust (CRT) volunteers. The interviews were focused on their experiences with volunteering for the trusts. Their responses were used to understand some of the reasons why people enjoy working with the SRT and CRT and how they became involved with the trusts.

In order to gather preferences of potential volunteers in the 16-25 age group, the team conducted surveys of 16/17 year olds at Worcester Sixth Form College, university age students on campus at the University of Worcester, and 14/15 year olds at the Skills for Tomorrow conference. These surveys asked how likely respondents were to do specific types of volunteering, what social media platforms project updates would be best suited on, what motivations could encourage them to volunteer, and barriers that prevent respondents from volunteering. This data was analyzed by comparing respondents who regularly volunteer and those who do not, as well as comparing the various age cohorts. This provided information on what activities to market to 16-25 year olds.

To determine the most effective marketing materials, the team hosted a focus group of students at the University of Worcester. The team asked participants about marketing materials, branding that the SRT currently uses for the project, as well as if there is a volunteer culture currently on campus. The data gathered was analyzed and provided key information for how to market volunteering to 16-25 year olds.

Finally, to develop a set of options for an online fish migration monitoring platform, the team analyzed website building tools in regards to the functionality and design attributes required by the SRT. This focused on the ability to easily upload high quality videos, display and collect the required data, attract a large audience, have a user database, maintain and have control over website functions, and be cost effective. Each website building tool analyzed was given a grade for each weighted aspect and a final score was calculated to determine the best website for designing the platform.

Findings

Upon the completion of the above objectives, the team analyzed the gathered data. It was determined that young people are interested in the wildlife and plant life along the Severn River. River conservation work, wildlife surveying, and art and photography volunteering were the preferred forms of volunteering among 16 to 25-year olds. Current volunteers at the SRT and the

CRT explained that their motivations for volunteering included meeting new people as well as working outside. Those belonging to the younger age cohort also listed meeting new people and having the opportunity to socialize as potential motivating factors for volunteering. Among university students, the existence of a volunteering record, which can be added to a student's degree, can serve as an incentive for volunteering. To share information about local volunteering opportunities, the Students Union at the University of Worcester has a volunteering email alias, as well as a volunteering Facebook group. Email is the most efficient method to communicate with university students, while Instagram and Facebook are the most popular social media platforms among this age group. The Unlocking the Severn logo was favored amongst University of Worcester students compared to other branding material currently in use. University students prefer that the branding of Unlocking the Severn stay age appropriate and reflect the degree of seriousness of the project by utilizing clean and modern graphics.

From the research we conducted on the different website options, we determined that using Squarespace to build their citizen-science platform would be the best course of action for the SRT. As proven by both the Mystic River Herring website and the tests we completed ourselves, any advanced technical elements of the tool can be set up by an outside contractor. Once these aspects are implemented, the SRT would be able to edit the other parts of their website simply by using Squarespace's design tool instead of having do any web development in a programming language. Building the citizen-science tool through Squarespace would allow the SRT to have control over most aspects of their website without having to employ a long-term web developer.

Recommendations

To assist the SRT in moving forward with this project, the research team developed a set of recommendations for a targeted marketing campaign and a set of recommendations for the online fish migration monitoring platform. The marketing campaign should be multifaceted to account for the different perspectives and opinions between age cohorts. To maintain a uniform brand identity across campaign subsets, the current Unlocking the Severn logo should be used for each campaign subset. This should also involve direct and indirect marketing, indicating communicating through emails is a good start, but expanding to Instagram will help attract more volunteers in the end. The SRT should also market through the University of Worcester Students

Union to showcase how volunteering at the SRT can count toward the students' volunteering records. Specific marketing of art and photography and wildlife and plant life volunteering will attract volunteers at a young age, allowing them to form a connection with the river. This will also allow for volunteers to socialize and meet new people, a popular motivation among survey respondents.

The fish migration monitoring website should showcase the themes present in the Unlocking the Severn logo by utilizing an image that shows the contrast of land and water on the homepage of the website. The website should function by clicking a button every time a shad is spotted, to allow for simplicity and decrease mistakes made in counting hundreds of fish. Additionally, a leaderboard will allow for healthy competition between friends, increasing use of the platform. Finally, it is important for the website to recognize the user's progress. This can be done by having the users earn badges at certain milestones, i.e. when a user counts 100 fish they earn the first in a line of badges. These badges would be presented on the user's profile and a feature to share them to social media should be available to spread knowledge of the website to even more users.

Authorship

This document was equally authored by and edited by all four team members. The following table contains the breakdown of each chapter.

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Chapter 1: Introduction

Public awareness of ecological problems is crucial for the success of conservation efforts. Ensuring the survival and protection of species and their environments are issues that are far too large for a few individuals to solve on their own, so organizations who specialize in the preservation of the history and heritage of environments rely on numerous volunteers to accomplish their goals. The process of recruiting volunteers requires the community to be passionate about the issue, which is not possible if the issue is not well known by community members. Due to the lack of widespread community knowledge of the twaite shad in the Severn River, in Worcester, UK, environmental groups need to build volunteer networks to engage the community and promote and facilitate the migration of the fish. During the British Industrial Revolution, weirs were constructed for trade and transport, without regard for any long-term environmental consequences of these structures. Weirs are a type of barrier that are used to control the flow and elevation of the river to simplify traveling by boat. Many weirs still in place today prevent fish from migrating up the Severn River to spawn new generations.

The Severn Rivers Trust is a non-profit environmental charity that promotes the preservation of the waterways to ensure the health of marine ecosystems. The SRT is currently working with the Canal & River Trust (CRT), the Environment Agency, and Natural England to construct fish passes along the weirs as well as to increase community awareness of the twaite shad. They have received £20,000,000 in funding from the European Union LIFE Nature Programme and Heritage Lottery Fund to complete this project. However, having only twelve staff members, the SRT relies heavily on the assistance of volunteers to complete their projects and monitor the effectiveness of their fish pass solutions. By posting flyers around the Severn River, the SRT was able to recruit eight people walking their dogs by the river, who were willing to donate ten minutes a day to counting fish. Additional marketing will enable the SRT to expand the recruiting process to reach younger members of the community in Worcester, UK. In addition, creating an online migration monitoring system utilizing a citizen-science network could bring attention to the preservation of the shad on a broader scale. This would enable anyone with internet access to contribute to this project by participating in the counting of the shad migration.

Our project team investigated the motivations and preferences of current and potential volunteers at the SRT. This was achieved by analyzing survey data the SRT previously gathered that was administered via project partners emailing lists, social media channels, and list of groups and organizations within the project area. The survey asked about current recreational and personal uses of the Severn River, involvement with local heritage, how people would likely become involved with the Unlocking the Severn project through activities and volunteering opportunities, and how best to communicate the project to people. Because of limited responses in the 16 to 25 age group, we administered an additional survey specifically tailored toward young people. We asked questions regarding social media usage, potential motivations and barriers to volunteering, and what types of volunteering would be the most popular. We utilized information from both surveys to develop marketing materials aiming to recruit younger volunteers for the SRT. The effectiveness of these materials was tested in focus groups of potential volunteers ages 18 to 25. This data help to understand what promotional media would best prompt young people to volunteer at organizations like the SRT.

This report will begin by introducing background knowledge essential to a thorough understanding of the project. We then discuss the methods we used to accomplish our tasks. Next, we discuss results and analysis of the data collected using the outlines methodology. Finally, we present a set of recommendations for the SRT to develop both a marketing campaign and an online citizen-science website.

Chapter 2: Background

The aim of this section is to provide context for the project, Unlocking the Severn, which is sponsored by the Severn Rivers Trust. This section will discuss the historical context of the twaite shad and Severn River, the migration of the shad, an analysis on online hosting options for a citizen-science program, citizen-science and technical programs related to it, marketing for a volunteer network, and brand identity.

2.1 Historical Context

The twaite shad, seen in figure 1, is a small fish that lives along the west coast of Europe. One of four remaining rivers known to provide spawning grounds for the twaite shad in Britain is the Severn River (Maitland, 2003, p. 10). This is also the longest river in the UK, spanning 220 miles from the Welsh Cambrian Mountains to the British Channel. The population of the shad has decreased over the last century, leading to their UK BAP Priority status. This means it is a threatened species requiring conservative action under the UK Biodiversity Action Plan (Maitland, 2003, p. 10). The decline of the species is largely due to the construction of obstacles, such as weirs, which interfere with the migratory pattern of the fish.

Figure 1: Shad pictured in the Severn River

Source: Twaite shad. (2018)

In the seventeenth century, the Severn River was an important waterway for trade (Willan, 1937, 68). During this time, the Severn River was considered a "free river" (Evans, 1988, 384). This meant that locks, weirs, and any other man-made interruptions, as well as tolls for using the river, were illegal (Evans, 1988, 384). In the mid-nineteenth century, Parliament passed several acts allowing the construction of locks and weirs on the Severn, effectively

canalizing the river. (Willan, 1937, 68) The acts were passed primarily to prevent the flooding and erosion of the Severn River Valley. Allowing the construction of these locks and weirs also made it easier for larger ships to navigate up and down the river (Evans, 1988, 386). The construction of these barriers, such as the weir in figure 2, have since made it difficult for fish, like the shad, to migrate up the river.

Figure 2: Diglis Weir on the Severn River

Source: Provided by Research Team

2.2 Migration Help

Weirs, while important for water management, hydropower, and land drainage, are physical barriers that essentially stop the migration of many fish species, specifically the twaite shad. Currently, efforts are being made to counteract the negative effects that these weirs have on the migration patterns of shad. Fish passes, also known as fishways, are structures on or near artificial barriers such as weirs that act to help the migration of species of fish by either passing over or around the obstacle. As of July 18th, 2018, nearly £20 million has been allotted to the construction of fish passes on several weirs along the River Severn and River Teme by the Heritage Lottery Fund and the European Union LIFE program (Severn Rivers Trust, 2017).

In June 2018, at the Powick Weir on the River Teme, The UK Environment Agency began lowering the central sections of the weir to facilitate shad migration upstream. According to the UK government,

> "The existing salmon fish pass will be removed and public safety improved by placing locally sourced rock from the remaining concrete abutment at a gentle slope towards the center of the river, removing the existing height between the

abutment and the water. There will be a naturalized rocky bed with a low flow channel to ensure a section of water is at the right depth and velocity to best assist the twaite shad migration upstream." (Environment Agency, 2018).

However, this method of simply removing weirs is not the only way planned to help the migration of the shad.

The Bevere Weir will have a natural bypass channel installed starting in 2019. According to the Severn Rivers Trust (SRT), three more weirs at Diglis, Holt, and Lincomb will have fish passes put into place by the summer of 2021. A map of all the weirs to be affected by the Unlocking the Severn project can be seen in figure 3. These three are classified as deep vertical slot fish passes. Vertical slot fish passes, as seen in figure 4, are generally sloped channels usually made of concrete that attract migrating shad with slow currents of water. The shad enters the channel through vertical slots, which also create small pools of water for fish to rest. Gradually, the shad pass through more slots and more pools until they eventually pass the weir, thus allowing them to continue their migration (Environment Agency, 2010).

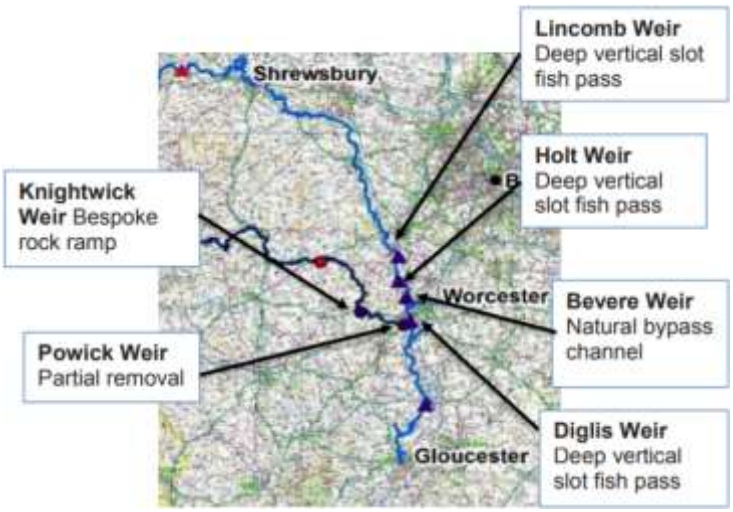

Figure 3: Map of River Severn Weirs

Source: Severn Rivers Trust

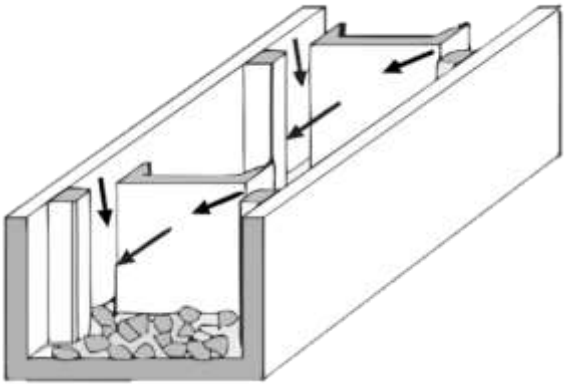

Figure 4: Vertical Slot Pass

Source: Vertical Slot Fishway, 2010

2.3 Migration Monitoring Methods

The problems being faced by shad conservationists along the Severn River are not unique to this region. Across the globe, there are numerous places where organizations monitor the migration of fish along waterways affected by manmade structures. The monitoring of fish, their migration, and their population size is crucial to understanding the ecology of the waterways and maintaining fishing regulations that allow the ecosystem to thrive. Scientists and researchers study the fishes' responses to changes in temperature, and geographic barriers such as dams, and locks. The implementation of fish passageways enables fish to migrate across these barriers. Monitoring the crossing of the fish is important to determine the effectiveness of these passages.

Until recently, methods for tracking fish migration have been extremely time consuming and labor intensive. One technique included collecting fish into large traps and counting the fish by hand, then releasing them onto the other side of the trap. The traps were emptied and counted several times a day (Fisheries and Oceans Canada, 2012). This required manual labor and dedicated workers or volunteers who could handle the traps often. Improved methods include using a hydroacoustic monitoring system, a resistivity counter, or the use of citizen scientists. All of these methods have their pros and cons (Canal & River Trust, et.al, 2017).

One type of hydroacoustic monitoring system is known as the ARIS. The system emits high frequencies that can be used to create an image to detect the presence of fish that swim by the sensor. (Hydroacoustics and Sonar, n.d.) One of the benefits of this system is that it functions

accurately regardless of the water condition and the time of day. This system is also highly portable and can be moved from various sites along the river. Unfortunately, the amount of data collected by the ARIS is extremely large. It is time consuming to analyze the data and there is currently no method to convert the data into a usable format for analysis by citizen-scientists online. This system is also extremely expensive, costing more than £90,000, which means the security of the device also becomes an issue (Canal & River Trust, et.al, 2017).

A resistivity counter, the Logie 2100C fish counter, is another tool that can be used to monitor the migration of fish. This technique uses two electrodes placed in the water that can detect changes in resistance when fish swim in between. Other software that identifies the shape of the signal is used to detect when materials other than fish, like branches or leaves, flow in between the electrodes. The counter can determine the direction of the movement of the fish but has no way of determining the species of fish that swam through without using another technique (Resistivity Fish Counter, n.d.). Using a video camera can help determine the species and size of the fish alongside the resistivity counter itself. When analyzing the results of the counter, correction factors are needed to determine an accurate number of fish that swam through. If water levels rise, the accuracy of the device decreases as fish can swim above the electrodes and the signals can be misinterpreted. In addition, the data compiled utilizing this method is also extremely large and cannot be converted into other formats (Canal & River Trust, et.al, 2017).

A more recent addition to the fish migration monitoring techniques is the use of citizen-scientists. This involves collecting data regarding the number of fish that pass through the weir by volunteers who pass by the weir regularly. Even though this is similar to the original method of counting the fish in traps, the actual counting of the fish is done exclusively by visual inspection of how many fish the volunteers watch swim through the weir. The citizen-scientists are trained on what to look for and how to count fish for a set period of time as often as they pass by the weir, which is limited to daylight hours for visibility reasons. The counts provided by the volunteers are put through a series of calculations with predetermined facts about the fish that is migrating. For example, if a fish is known to migrate only during daylight, no fish need to be accounted for at night. In addition, knowledge of what time of day and year the most fish migrate up the river can be used in calculating the total migration rate as well. In addition, utilizing citizen-science to count the migrating fish can be done remotely if a video camera is set up facing the weir. Citizen-science can prove to be an inexpensive and fairly accurate way to

monitor the fish migration (Canal & River Trust, et.al, 2017). More importantly, the involvement of the community in these environmental protection projects can educate and bring attention to the efforts of local conservation charities.

2.4 Citizen-Science

One effective way that small organizations, like the SRT, can collect large amounts of data is through citizen-science campaigns. Citizen-science has become a buzzword in today's society, with more and more organizations looking to utilize a modernized version to achieve their goals. While the idea of citizen-science is not an entirely new concept, recent technological advances have given the term a new connotation. The general idea is to utilize a large network of people to accomplish tasks that the company or organization would usually have to outsource to a third-party provider (Alsever, 2008). Citizen-science also spreads awareness of the projects people are working on to a broader audience.

One of the earliest forms of citizen-science came in 1714 when the British Government offered a prize to whoever could solve "The Longitude Problem". This was a maritime navigation issue that had perplexed scientists for decades. Instead of hiring a think-tank of scientists to solve the problem, the British Government openly posted a £20,000 prize for any citizen who could develop a working solution. Interestingly, the winning response came from a working-class clockmaker with almost no formal education, John Harrison (Longitude Prize, n.d.). In addition to being considerably cheaper than hiring a team of scientists, the British Government was able to recruit a massive network of people with varied skills and backgrounds to find a unique solution.

A modern example of this form of citizen-science is the Foldit project. One of the largest problems in molecular biology is the inability to predict the shape of a protein. While many researchers have attempted to solve this problem by using recent advances in computer algorithms, this approach lacks the intuition that a human would have in approaching the problems (Marshall, 2012). A team of researchers developed a plan that could be used to try many different methods, as would a computer, while also introducing a human element. The result was a video game called Foldit, where players would compete to "solve" the structures of proteins that had already been identified. The game makes note of each player's methodology for

solving the respective problems, and the most effective methods are used to improve the methods that algorithms use to discover the structures of other proteins (Kleffner, 2017).

As one would expect, not all citizen-science campaigns turn out as well as the examples previously listed. One of the larger failures of this technique was the company Quirky. This start-up's business model was to be an open platform where people could submit new product ideas. The Quirky community would then vote on these products, with the most popular ones moving forward to review by Quirky's executives and then ultimately pushed into production (Fixson, 2016). While this may sound like a good idea, Quirky had many issues that led to its inevitable bankruptcy. The completely open platform led to a huge range of product ideas that were mostly just small alterations of currently available products. One of the biggest problems with Quirky was the lack of constraints that the company put on its contributors. Allowing for any type of product to be submitted led to a mass of poorly designed products that never even made it to production. Allowing the entire design process to be crowdsourced was not a sustainable model, and thus led to Quirky's downfall. In comparison, the successful citizen-science projects utilize the community for one specific part of a project, instead of allowing the entire process to be controlled by the public.

While looking for projects similar to the one the SRT would like that are currently active online, we discovered a project by the Mystic River Watershed Association. Their project is a citizen-science campaign that uses the internet to do the work that would not be feasible given the small size of the organization. The goal of the Mystic River Watershed Association is to track the changes in river herring populations over time, while using citizen-science to accomplish this goal. Volunteers can visit the website to view a video approximately one minute long, input how many fish they saw, and view the data collected by the platform. Figure 5 shows screenshots from the website that display the different aspects of the project. The main portion of the website displays a video between 15-60 seconds and asks the volunteer to input the number of fish seen crossing the view of the camera. In addition, other pages contain more information for the public. A leaderboard can be found which lists the top contributors to the project, which can be seen as an incentive to see your name listed on the board. Another page contains graphs of the information collected that can be used to see how the project is progressing and what trends can be seen.

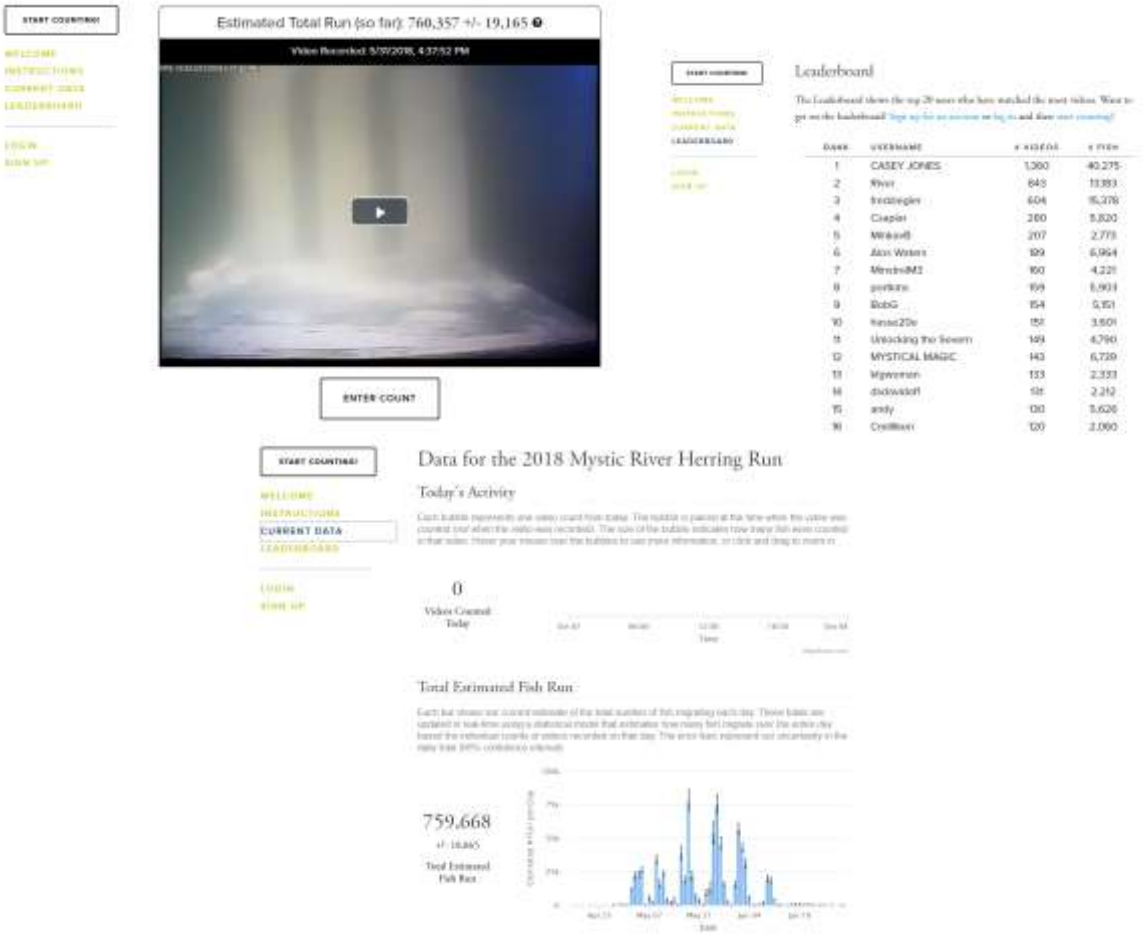

Figure 5: Mystic River Watershed Association Website Screenshots

Source: Mystic River Watershed Website

2.5 Volunteering: Motivations, Benefits, and Challenges

When people sign up to volunteer, they do it because there is something motivating them to take part in the activity. Citizen-science volunteers can have motivations that are highly specific to the type of project they are working on. Researchers who have studied motivations of environmental volunteers have found the most popular motivations include helping the environment, values and esteem, learning, social opportunities, career advancement, and getting outside (Domroese, 2017). These motivations will likely overlap with the motivations of volunteers at the SRT because a majority of SRT volunteering is environmental. Additional motivations will likely be present as citizen-science volunteering is also present. The Great Pollinator Project (GPP) involves a network of citizen-science volunteers to observe bee

pollination in New York City (Great Pollinator Project, 2014). The motivations of citizen-science volunteers for the GPP were very similar to those of environmental volunteers, but in a different order (Domroese, 2017). This is important to consider for the two main aspects of volunteering for the SRT, traditional onsite and online citizen-science volunteering. Bee watchers were highly motivated by the ability to learn more about bees as well as contributing to conservation and science (Domroese, 2017). These motivations can still be achieved through the online citizen-science project the SRT will create, indicating an alignment of benefits and motivations. However, the opportunity to be outside, the more popular motivation among traditional environmental volunteers, cannot be fulfilled by the online fish counting website.

Benefits of and challenges to volunteering are important factors that can affect the motivations or degree of participation of volunteers. In spite of the challenges that are faced when recruiting citizen-science volunteers, there have been a number of well-known successful citizen-science projects. Examples of these include the FoldIt game and The Longitude Problem, more information can be found in section 2.4. When volunteering, people are more likely to be satisfied and volunteer again if they feel the benefits match their motivations (Domroese, 2017). This indicates benefits such as increased knowledge of the topic and an increased appreciation of the science involved are good motivating factors for many people who want to contribute to science. Citizen-science can also indirectly contribute to conservation through increasing participants' awareness of and connection with the topic of study (Ganzevoort et al, 2017). This is important to the historical and heritage goals of the Unlocking the Severn project.

There are numerous reasons why people would be unable to volunteer or continue volunteering. Despite these challenges, there are ways that organizations and charities can combat this by providing the community with more information. One of the most common reasons people claim they cannot volunteer is that they do not have enough time or have very strict schedules (Yotopoulos, A, n.d.). People who are retired, who would appear to have more free time, do not necessarily volunteer more than those who are younger and have to take care of children. This is because those who do not volunteer before retirement, are less likely to volunteer after they retire (Yotopoulos, A, n.d.). Creating opportunities for people to volunteer with children, if they are parents, or enabling people to volunteer from home could increase community involvement. People also claim that volunteering roles are not interesting or they do not have enough information about the volunteering itself (Yotopoulos, A, n.d.). If people do not

understand why their work is important, they would be less likely to continue to volunteer. Ambiguous information about the location and time the volunteering will take place would inhibit people from returning. Organizations who utilize volunteer work need to provide clear information regarding the events that they are hosting to the community. Some claim that they were never asked to volunteer and that was the reason why they never became involved (Yotopoulos, A, n.d.). It is important for organizations who are recruiting people to volunteer to spread information about opportunities to volunteer throughout the community.

There are many citizen science projects that have successfully addressed many of the barriers mentioned here. One such project is the GPP mentioned above. The GPP "assigned" volunteers to locations and bees based on where they live in the city of New York (Great Pollinator Project, 2014). This allowed each volunteer to be able to complete their observations without going completely out of their way, decreasing the time commitment and creating a relaxed schedule. Other projects partner with schools to increase the number of volunteers they have. One of those projects includes Save our Streams (SOS). SOS is a nationwide program in the United States with citizen science programs across the country. The program supplies water quality testing kits to school groups, amongst others, to acquire data across the country (Save our Streams, 2018). An example of one such program can be seen in figure 6 where citizen science volunteers test water quality in a stream. By trading this equipment to schools for educational purposes, they are increasing the number of volunteers they have while integrating the work into people's daily schedules.

Figure 6: A group of volunteers testing water quality in a Virginia, USA stream

Source: VA SOS Quality Assurance Program, 2018

2.6 Marketing for a Volunteer Network

The SRT needs a marketing plan that will attract volunteers. In general, people work because they are paid for their services. Volunteers, however, must have a different motivation. Some people enjoy helping others and are willing to volunteer, but others need an incentive of some variety. If somebody cannot relate to the rationale for volunteering, that person is not likely to volunteer (Randle, 2012). This indicates that a marketing campaign designed to encourage volunteering must take into account the diversity present in the target audience to account for multiple rationales. It is important not to make the campaign too specific or too general. This can be done by having multiple subsets of the campaign to reach different audiences.

An effective marketing plan takes into account people's reactions to stimuli and creates a product that will lead to specific responses. The way a person behaves is based upon three factors; their attitude, the social norm, and how well they believe they can perform the behavior (Randle, 2012). This creates a framework for volunteer recruitment. Marketing based on this framework is the best method for receiving the desired response.

Various marketing strategies focus on a multitude of tasks. One of these strategies is product or service oriented marketing. This strategy focuses on attracting people by focusing on products or services provided in return (Jungbok, 2015, p. 4). This relies on the idea of trading goods or services to attract volunteers. In this case, the services traded are the benefits gained by volunteering. This has been considered too narrow an approach and more attention should be devoted to client needs, known as a "customer", or client, oriented strategy (Jungbok, 2015, p. 2). The strategies both focus one specific aspect of volunteer recruitment, volunteer happiness. According to Jungbok, the customer oriented approach is much more beneficial for nonprofits than initially assumed. It is believed that having this type of mindset will make handling financial aspects of a nonprofit more manageable. Focusing on a customer based plan can result in happy volunteers, which in turn could increase your volunteers via word of mouth.

A particularly well known project that has successfully marketed to volunteers is the Penguin Watch project. This is an online citizen science project that has volunteers count the number of adult penguins, chicks, and eggs in a still image (Penguin Watch, n.d.). An example of one of these still images with penguins marked can be seen in figure 7. This project partners with schools to increase the number of volunteers and additionally spread the message about penguins, their habitat, and other scientific concepts (Penguin Watch, n.d.). By working with

schools, the Penguin Watch team is successfully increasing the number of people actively on their Zooniverse, an online citizen science platform, page. They are also increasing the general knowledge surrounding their project, which in turn is increasing the talk of their project in the community. This has resulted in news articles and media coverage that is expanding their project, making it even more successful.

Figure 7: An example image of penguins being marked in a still image on the Penguin Watch Zooniverse

Source: Penguin Watch, 2018

2.7 Brand Identity

Social media can play an important role in any marketing plan, including one designed to recruit volunteers like the one the SRT will need. A key component to an effective social media campaign is a brand identity (Peck, 2011, p. 2). This identity can be used to help focus an online volunteer recruitment strategy. A brand identity is like a personality, it explains who you are without explaining what you do. It can also be the difference between reaching your target audience and missing them completely. Having a clear identity can help increase visibility of your group and clearly communicate your message (Siegel+Gale, 2015). Social media creates a platform for companies to initiate communication with customers. For non-profits, it provides a place for people to see what the group is accomplishing. An online brand focuses a marketing strategy by creating a common ground for this communication (Peck, 2011, p. 2). When people can see what is being done online, they can follow groups without having to put in significant, sustained effort. By following what nonprofits are doing, people stay involved in the work being done by that group.

The steps identified by marketing experts in developing a brand identity are as follows: make your mission statement clearly available, remain consistent across media platforms, have a continuous message, and be creative in how you deliver your information (Peck, 2011, p. 13). Making information clearly available can increase the number of people who see an organization's message by decreasing the amount of work people have to put in to find it. Remaining coherent and consistent across platforms and having a continuous message helps create a more recognizable brand and allows the entire organization to work in harmony (Siegel+Gale, 2015). Finally, being creative in how you deliver information allows you to reach new audiences and remain interesting in the minds of people reading hundreds of statements online every day. These steps allow for successful communication with your target audience.

One nonprofit that has an exceptional brand identity is the American Red Cross, which has been carefully groomed over their history. In a Red Cross pamphlet specifically about brand identity, the group has broken down these guidelines into four major points: Uplifting, Empowering, Inviting, and Personal (The American Red Cross, 2014). In order to be uplifting, members are instructed to avoid focusing on the devastation or disaster, but rather to bring hope to the people. To spread an empowering message, they strive to grow their network to include more people and help those people contribute to a worthwhile cause. On top of this, the organization is supposed to be as inviting and personal as possible with no intimidation or harsh directives while providing selfless care and treating each person individually with respect. According to John Quelch and Nathalie Laidler-Kylander in their book *The New Global Brands: Managing Non-Government Organizations in the 21st Century.*, one of the biggest issues facing nonprofits is that of public trust (Salls, 2005). The authors warn that, if the public catches wind of any misuse of funds or other scandal, it could be disastrous for the group. As opposed to companies that provide goods and/or services that consumers go out of their way to purchase, nonprofits cannot come back from a scandal by putting a flashy new item on the marketplace.

Chapter 3: Methodology

The goal of this project was to learn the motivations of current volunteers, potential volunteers and non-volunteers, and use that information to successfully market the SRT to a wider audience. To do this, we focused on the following objectives:

1. Objective I: Explore current SRT and Canal and River Trust volunteer and non-volunteer perspectives by analyzing previously collected survey data by the SRT;
2. Objective II: Determine preferences for what kind of volunteering potential participants aged 16 to 25 prefer through surveying young people;
3. Objective III: Determine effective marketing materials through focus groups of current and potential volunteers;
4. Objective IV: Develop a set of options for the SRT to host an online citizen-science fish monitoring system.

3.1 Objective I: Analysis of Local Perspectives

The first objective of this project was to determine the perspectives of the current volunteers for the SRT as well as local people who do not volunteer. The SRT can direct their efforts to recruit volunteers with a deeper understanding of the current community involvement. Assistance from surrounding communities is essential to the success of the Unlocking the Severn project due to limitations in staff size at the SRT. Future decisions regarding publicizing to recruit volunteers will be shaped by the findings to effectively gain maximum community participation. A survey conducted by the SRT gathered data regarding volunteer and local perspectives and we analyzed the findings of the surveys, as well as looked for correlations in responses. In addition to the survey analysis, three interviews with heavily involved volunteers were conducted over the phone and by email to gather more specific information on what the volunteers thought about their jobs with the Severn Rivers Trust and the CRT.

3.1.1 Volunteer Interviews

The Severn Rivers Trust reached out to frequent volunteers for semi-structured interviews. Volunteer responses were anonymous. Using a semi-structured interview format enabled us to have questions to guide the conversation, however; the respondents had the freedom to stray from the provided questions (Berg, 2009). Five volunteers were selected with

the assistance of the SRT. One volunteer was able to take part in a phone interview while two answered the questions over email. The questions were asked in the same order to each interviewee and the response to the phone interview was recorded with an audio recording, with the respondents' permission, which was transcribed, coded, and categorized (Harry, Beth, et.al., 2005). Notes were also taken by hand during the interview. The questions asked discussed what prompted the volunteers' involvements in the project, and why they enjoy volunteering. The interview questions are attached in Appendix B. The phone interview took about ten minutes. Grounded theory analysis was employed again to develop categories and ideas about the data after the information was collected (Glaser, B., & Holton, J., 2007). Patterns in responses that appeared in the coding of the transcripts were noted. These findings were presented to the SRT to help them understand the perspectives and motivations of a few members of their current volunteer network.

3.1.2 Description of the Surveys

Prior to receiving funding for the Unlocking the Severn project, the Severn Rivers Trust hired a consulting agency, Tricolor, to conduct preliminary surveys. A general survey acquired 1084 total responses from the non-visitors of the Severn River, current visitors, families, people with disabilities, older people, younger people, local groups within the community, special interest groups, teachers, and heritage organizations. Surveys were administered through email mailing lists, social media links on Instagram, Facebook, and Twitter, and hard copies distributed during public events. The surveys all contained the same questions in the same order despite the differing forms of distribution (Canal & River Trust, et.al, 2017).

Another survey was conducted with volunteers of the SRT, the CRT, as well as volunteers with other organizations working at the project locations. This survey was sent out via email, receiving 43 responses. The last survey was conducted with non-partner volunteers was also sent by email, receiving 42 responses. This survey was sent to mailing lists of volunteers who are involved with other organizations near the project sites but are not associated with the SRT nor the CRT (Canal & River Trust, et.al, 2017).

Once the results of the surveys were collected, they were compiled into three separate excel spreadsheets, the general survey, the volunteer survey, and the non-volunteer survey, that included each response to every question in the survey. The survey was done anonymously but

each respondent was given a number to be able to match up the answers from various questions and look for correlations between answers. The SRT is hoping to analyze relationships between different categories of respondents and their perspectives on volunteering. Their focus is on the younger age group, ages 16-25, as there is no significant representation of this age group among the volunteers from the SRT for the Unlocking the Severn Project (Canal & River Trust, et.al, 2017).

3.1.3 Analysis of the Surveys

As the SRT continues to focus their efforts on engaging younger audiences, it is important to analyze younger people's volunteer preferences and perspectives. The SRT collected survey data from the general survey as well as four responses from the non-volunteer survey from people among the under 18 to 25 age group. We looked at correlations between several of the survey questions and the responses from the under 18, as well as the 18-25 age cohort. The specific questions that we focused on are questions 8 through 13, which can be found in Appendix C. These questions explore the respondents' perceptions on heritage and its importance, as well as volunteer activities and social media preferences.

Comparing responses from these age groups enables the SRT to determine what activities would most appeal to the younger generations and how to reach them most efficiently. The number of people from each of the age groups matching with a particular answer to the question were calculated using Matlab software (as seen in figure 8).

Figure 8: The Matlab code used to analyze the general survey data

Source: Developed by research team

This code allows us to sort through each question by age group, in this case ages 18 to 25, and determine the number of people in each category who chose a specific answer to the

question. The output is the number of people who answered “yes” and “no” to the options listed in question 11 which can be found in Appendix C. This number can then be entered into an excel spreadsheet in order to calculate the percentage of each age group who selected the options from question 11. This process was repeated for all questions 8 through 13. These percentages were then used to perform statistical chi-squared tests on the frequency of each response compared to the age groups. This determines whether or not the observed results are due to chance alone or if there is a correlation between the responses of a certain age group and a specific answer to the question.

3.2 Objective II: Collect Potential Volunteer Preferences

After analyzing the initial data regarding the opinions of the general population around the river, we aimed to determine what types of volunteering are the most popular and to further investigate the motivations of potential volunteers. To do this, we administered a survey. The main goal of this survey was to determine how potential volunteers, ages 16 to 25, feel about volunteering and what would motivate them to volunteer. We broke up the survey methodology into the following subsections; content of the survey, administering the survey, analyzing the survey results, and dot voting survey.

3.2.1 Content of the Survey

The survey contained questions about what types of volunteering the respondents would most likely partake in at SRT, what motivations would encourage the respondents to volunteer, what prevents the respondents from volunteering, demographic questions, and questions regarding social media usage. Questions regarding specific types of volunteering used a Likert scale, a one to five rank, to determine how much each survey respondent agreed or disagreed with each statement. Each question was asked in the same format, with the scaled answer choices remaining consistent- one being the worst, five the best. This helped focus people’s answers and prevent any unnecessary confusion.

The types of volunteering that were included in the survey are citizen-science, heritage focused, practical conservation, and volunteering to support the project through wider community work. The questions about what could motivate the respondents to volunteer included giving back to the community, meeting new people, and improving their own well-

being. The questions about barriers to volunteering included being too busy, not knowing how to get involved, and never being asked to volunteer. A copy of the survey can be seen in Appendix D. This survey is specifically tailored toward potential volunteers between the ages of 16 and 25.

3.2.2 Administering the Survey

Another important factor in survey methodology is determining how to administer the survey. We utilized both on-site and online methods to administer our survey to as many volunteers as possible. The survey was administered to two groups of individuals, the first being 16 to 17 year old students working with the SRT, and University of Worcester students. The SRT administered the survey to the 16 to 17 year olds who completed the surveys themselves as well as sharing it with their peers as part of their coursework. These methods allowed the respondents' answers to be based on their immediate thoughts in regards to their questions (Davis et al, 2012). It also involved direct interaction between the potential volunteers and the SRT, utilizing a more personal connection. As many people as possible were surveyed using these methods; however, it only accounted for individuals who were present when the survey was given, making it a less effective method overall. Utilizing email surveys as well helped broaden our outreach to the volunteering community, as well as to reach university students. We emailed the survey to a volunteering alias on campus at the University of Worcester to increase the number of potential volunteers who receive the survey. We also posted the survey link online through the University of Worcester Students Union to increase outreach. Although using in person and online surveys resulted in two different ways in which people answered the questions, we feel it is justified by increasing the audience we reached.

3.2.3 Analysis of Results

We focused our data analysis on four main points, which types of volunteering are most popular, which motivations occur most often, which barriers are most common, and how social media is used. The data points were sorted separately based on the responses to the Likert model questions. Responses were quantified by "strongly disagree" being characterized by a one, "disagree" a two, "neutral" a three, "agree" a four, and "strongly agree" a five. The occurrence of each response for each type of volunteering was compared, along with age, to determine which types are the most popular for each age cohort. The same methods were followed to determine

which motivations, barriers, and social media platforms are the most and least effective. In order to account for non-response in our surveys, we simply omitted the unanswered question from the results. It was not feasible to omit the entire survey given the limited time we had to survey the population of potential volunteers.

3.2.4 Dot-Voting Survey

In addition to surveying 16-25 year olds, we provided dot-voting posters for 14 to 15 year olds that were administered at the Skills for Tomorrow Conference at Hereford Academy. This involved posters with images of types of volunteering, social media platforms, and activities that are done by the river, as seen in figure 9. Students were given stamper markers and told to vote for their favorite photo by stamping near the image. Mockups of all of the posters and the instructions we gave the students can be seen in Appendix E. Patterns found in responses were noted and compared. The patterns found could indicate that one type of volunteering or marketing the SRT uses to recruit volunteers is more effective, or that a specific group of people in the community is more interested in a certain project. These findings were presented to the SRT to help them understand the perspectives and motivations of their potential volunteer network.

Figure 9: Dot voting at the Skills for Tomorrow Conference

Source: Research Team

3.3 Objective III: Determine Effective Marketing Materials

The third objective of this project was to determine effective marketing materials for potential volunteers that are between the ages of 18 and 25. The Severn Rivers Trust has very few volunteers in this age category and would like to expand their network to include more. To do this, we hosted a focus group to gather data about the target audience. The purpose of the focus group was to make certain that the marketing tools to be employed by the SRT would have the highest probability of success. With permission, the focus group session was audio recorded and then later transcribed. Anonymity of individual participants was assured.

3.3.1 Hosting a Focus Group

We utilized a focus group to gather data to ensure the success of implementing marketing tools for a network of volunteers aged 18-25. The focus group was open for current University of Worcester students who are members of various societies on campus. These groups included the Biology, Geography, History, and Nature societies. The reasoning behind inviting members of these societies is due to the relation each society's mission has in common with the overall goals of the SRT. As an incentive for university students to attend, pizza and snacks were provided during the event. Using a lecture hall on the University of Worcester campus, we met with these students and discussed various marketing methods, as well as branding techniques, that might appeal to potential volunteers of their age. We also discussed barriers as to why most university aged students might not participate in environmental, or other, volunteering as well as the motives as to why some students do in fact volunteer. The participants were presented with a collection of marketing tools consisting of social media pages, citizen science websites, and current branding in use by the SRT. An example of the current branding in use can be seen in figure 10. We also administered a general volunteering survey, which can be found in Appendix F.

Figure 10: Branding Materials from the Severn Rivers Trust

Source: Severn Rivers Trust

3.3.2 Analysis of Focus Group

Using field notes of the focus group, we were able to arrange individual comments to align with each point of discussion that was brought up. After organizing comments from the students, we were able to identify the main ideas that occur in each of the responses. We then further categorized the ideas of the students into larger themes, some of which could be implemented into a marketing plan for the SRT.

3.4 Objective IV: Determine Options for Citizen-Science Platform

The final objective of our project was to develop a way for volunteers to monitor the shad migration using an online platform. The SRT has multiple cameras set up to record the fish traveling through fish passes along the river. Figure 11 shows a screenshot of one such videos showing two fish (circled in red) passing through the ladder.

Figure 11: Screenshot of SRT video showing shad swimming over fish pass

Source: Severn Rivers Trust

The SRT has thousands of hours of these videos, and that number will continue to increase as more fish passes are installed along the river. Because of the amount of raw data being collected, it would not be feasible for the employees of the SRT to spend their time watching every second of these videos. Instead, the SRT tasked our group with developing a plan for a website that could be used to reach a wide audience and use online volunteering to collect the shad migration data. The SRT plans to make use of citizen-science to help collect a large amount of data that a small organization would not normally be able to accomplish without the use of such tools as now can be provided by citizen-science platforms.

3.4.1 Identifying Hosting Options

Before we began to work on planning the design of the website, we first had to identify the best tool for creating the platform. In order to gather information about different tools available, we researched how previous citizen-science platforms were built. The citizen-science sites we inspected were Penguin Watch, the Mystic River Watershed Association Herring Counter, and the FoldIt project. We also took into account the Seven Rivers Trust's current website when comparing the options. Penguin Watch was made on the platform Zooniverse, a website specifically designed for hosting citizen-science projects, so we contacted the Zooniverse development team to discuss the feasibility of building the project on their website.

The Mystic River project was developed by Walker Environmental Research, LLC, an independent contractor. We contacted this contractor to learn more details about the development of the project. He responded in detail and we learned that the website was built by using the platform Squarespace. Since FoldIt was developed by a collaboration of researchers at different universities, there are multiple public papers written about its development. That was not a feasible option for our group because a group of researchers working for the FoldIt team developed the website. The final consideration we had was the SRT's current website, built with the platform WordPress. The breakdown of all different options, along with a discussion about our final decision can be found in the Analysis portion of this report (Section 5.4).

3.4.2 Analysis of Hosting Options

In order to test each of the options we identified and analyzed the strengths of each by developing a Weighted Decision Matrix. For this matrix, we first identified the aspects of a website that the SRT were interested in, and then the team assigned each of these aspects a priority of high, medium, or low. We discussed these aspects at length with the SRT and worked with them to develop the list of aspects and the priority of each one. A priority of High meant that aspect was crucial for the project and any tool that scored low would be severely penalized. Medium priority aspects would still be implemented in the final website, but it would be acceptable for them to be more complicated to implement. The Low priority aspects are items that the SRT expressed interest in, but are not essential to the project. Figure 12 shows the weighted list we created and used to evaluate each website.

	Aspect	Priority
Video	Able to Upload Videos	High
	Videos High Quality	High
	Storage Space	High
	Video Upload is Simple	Med
	Ability to Alter Set of Videos	High
Data Collection	Save Input to Corresponding Video	High
	Validate Inputs and "Retire" Videos	High
	Display Data on Website	Med
	Export Data for Analysis	Med
Users	Reach a Large Audience	Med
	User Info Database	Med
	Track User Progression	Med
	Ability to Contact Users	Med
	User Rewards/Recognition	Low
Misc	Work with "Lite" Version	Low
	Website Maintenance	Med
	Control over Website Functions	Med
	Cost	Med
	Visual Appeal	Med

Figure 12: Website features required by the SRT and the importance of those features

Source: Developed by Research Team

To be able to compare each site, we signed up for the trial period of all three sites and attempted to implement each aspect individually. For the aspects that the SRT would have to interact with directly, we did this from the perspective of someone with no previous knowledge of website development to stay objective in our findings. After working on each aspect, we assigned it a grade of A, B, C, or F. The grades of A, B, or C described how simple each aspect was to incorporate into the project, while a grade of F showed that the specific aspect was impossible to implement. The findings of our research into the different website options can be found in the Results section 4.4 of this report.

Chapter 4: Results

The following chapter details the data we gathered from pursuing our research methods.

4.1 Objective I: Local Perspectives

Information regarding the viewpoints and thoughts from current SRT volunteers and non-volunteers was collected via survey as well as through semi-structured interviews.

4.1.1 Survey of Volunteers and Non-Volunteers

A Matlab code was utilized to collect information regarding each age cohort and their responses to specific questions given in the survey. The results were entered into an Excel spreadsheet that included the number of responses from each age group as well as the percentages of each age group that chose each answer. A chi-squared test was used to determine whether or not the results of the survey were due to chance alone or if there was an association between answers and age groups. The critical value was chosen as 0.05. The null hypothesis was that the results of the survey and the age group of the respondents had no association. The alternative hypothesis was that there was an association between the responses to the questions and the ages of the people responding. The P-values of the chi-squared tests were entered into the excel spreadsheet. Although the chi-squared test was performed on every age group, because there was only one response from an individual in the Under 18 category, no significant conclusions can be drawn from the test. Excluding the Under 18 category, the null hypothesis can be rejected for every question except for one. In question nine, the p-value calculated from the responses from the 18-25 age cohort regarding industrial heritage was greater than the critical value. This result did not dramatically affect our findings because we were focused on finding the preferences of 18-25 year olds, and industrial heritage had the lowest percentage of interest in this age group.

We focused on the results of the respondents who were between the ages of 18 and 25. The highest percentage of people who answered no opinion/ not sure when asked about whether or not the heritage of the Severn River was important fell into the 18-25 age group (figure 13).

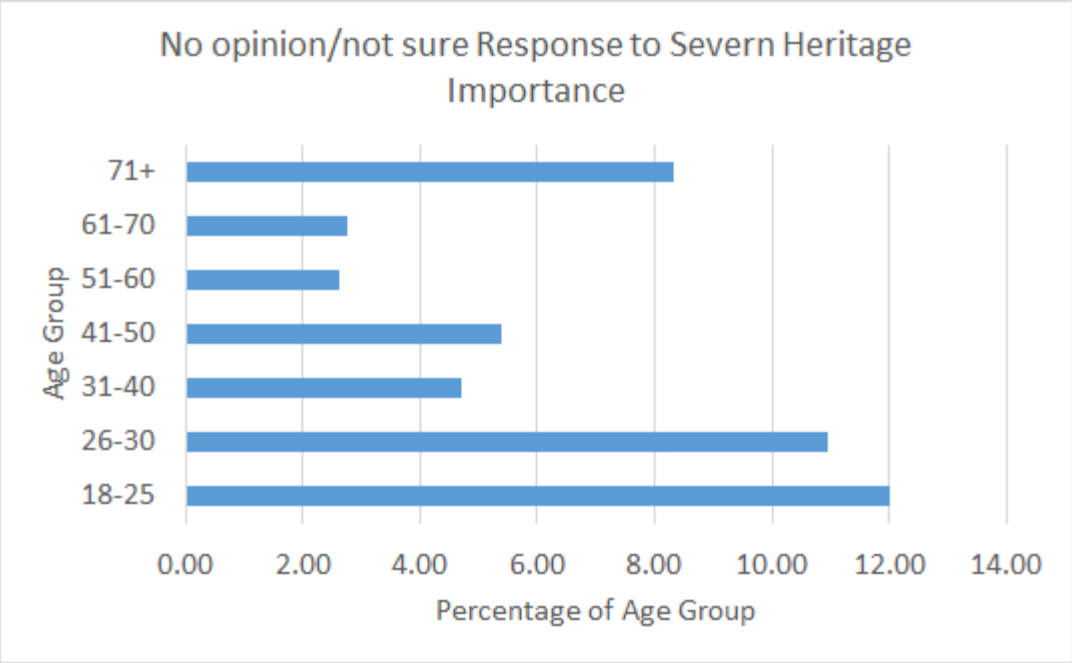

Figure 13: Graphs of responses to question eight

Source: Calculated from Research Team Data

N(71+)=45, N(61-70)=180, N(51-60)=267, N(41-50)=242, N(31-40)=210, N(26-30)=63, N(18-25)=50

Questions 9 and 11 asked about people's interests in various aspects of the Severn's heritage on a scale of 1 to 5, with five being the most interested. People who answered a four or five were considered "interested" in that category. Those who were surveyed between 18 and 25 years old responded with the highest interest in wildlife and plant life as well as the water cycle, as shown in figures 14 and 15.

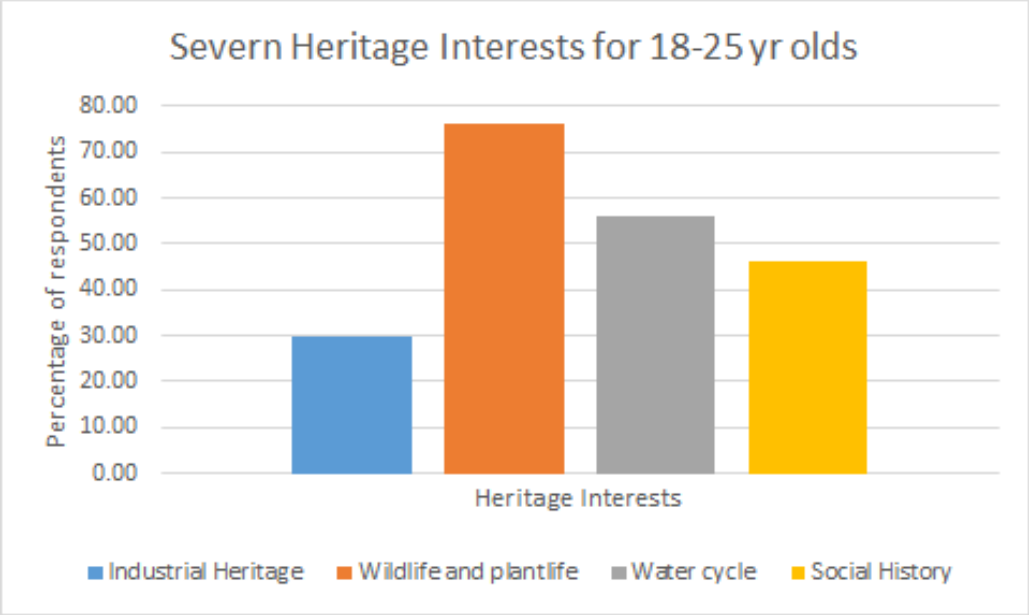

Figure 14: Graph of 18-25 age group responses to question nine.

Source: Calculated from Research Team Data

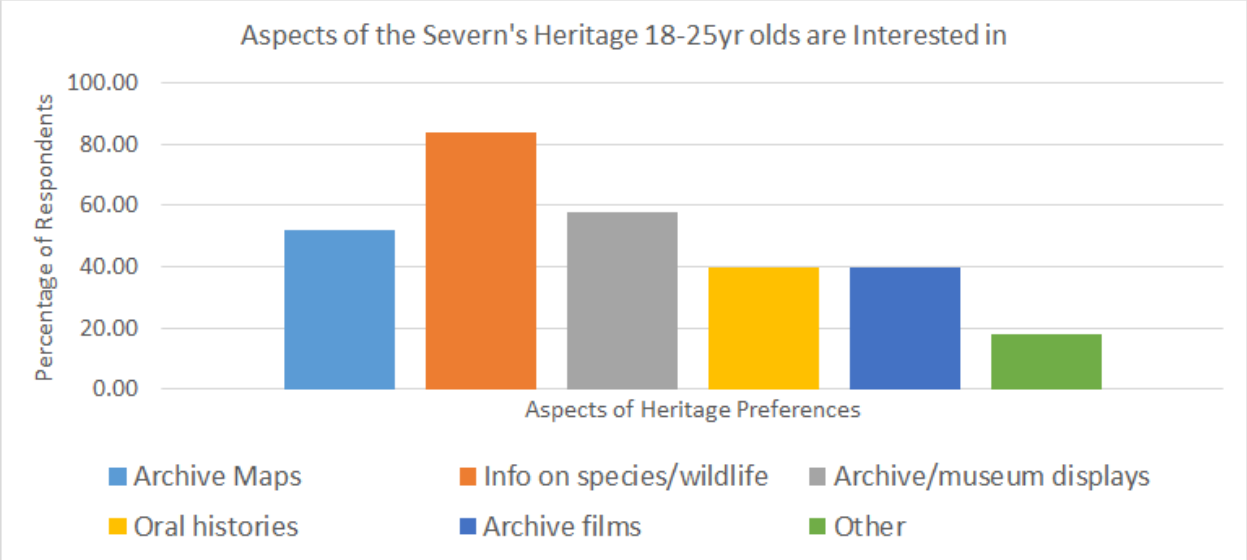

Figure 15: Graph of 18-25 age group responses to question 11.

Source: Calculated from Research Team Data

N=50 (for both graphs above)

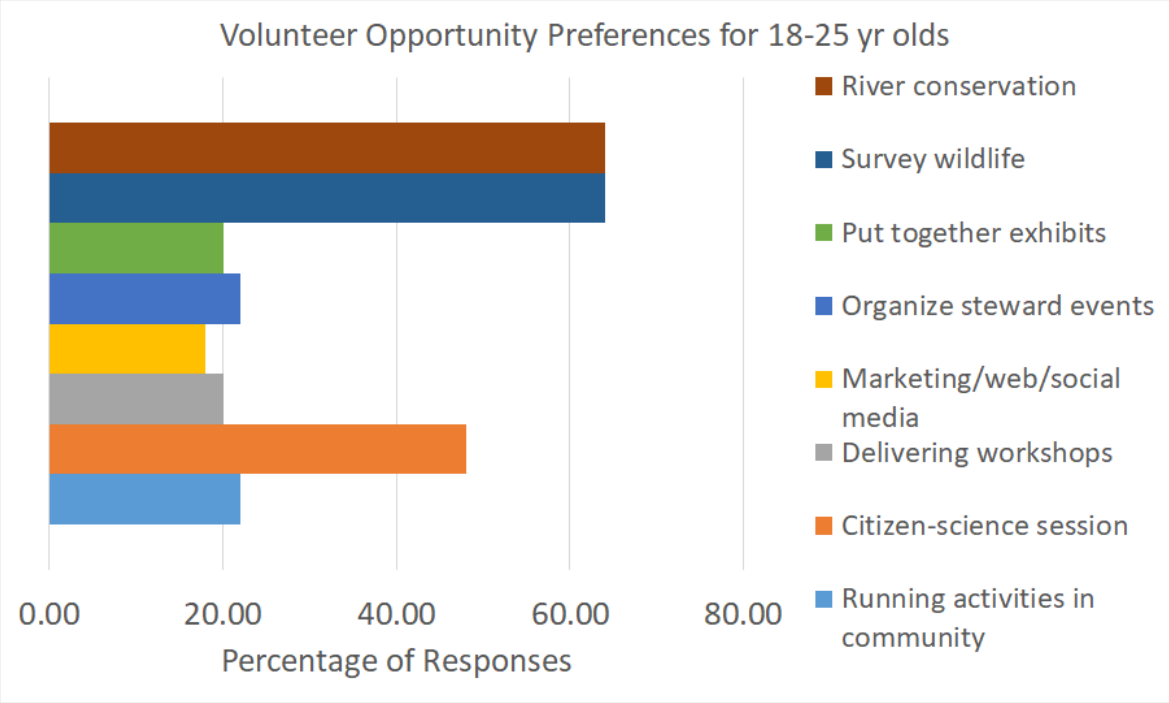

Figure 16: Graph of 18-25 age group responses to question 12

Source: Calculated from Research Team Data

N=50

Question 12, as seen in figure 16, focused on volunteering preferences that the respondents might have. Those in the 18 to 25 age group were most interested in surveying wildlife and river conservation volunteering activities. We also looked at the responses to a question regarding people's preferences on how they would like to have heritage information presented to them. Talks and tours, as well as interactive computer options were the most preferred methods for the younger age cohort, as displayed in figure 18. For the question overall, there was quite a bit of interest in heritage tour information that could be downloaded. The final question we analyzed asked people what communications channels they utilized. Figure 17 demonstrates that Facebook received the most responses from the 18-25 age group.

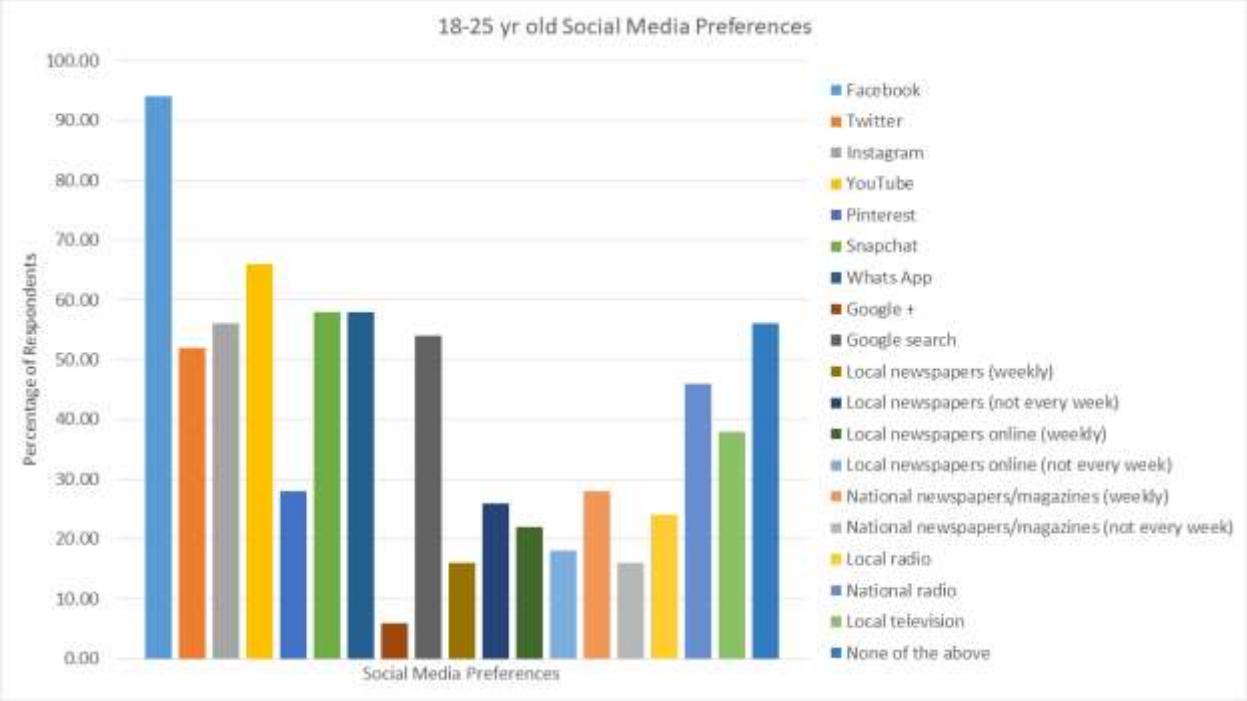

Figure 17: Graph of 18-25 age group responses to question 13.

Source: Calculated from Research Team Data

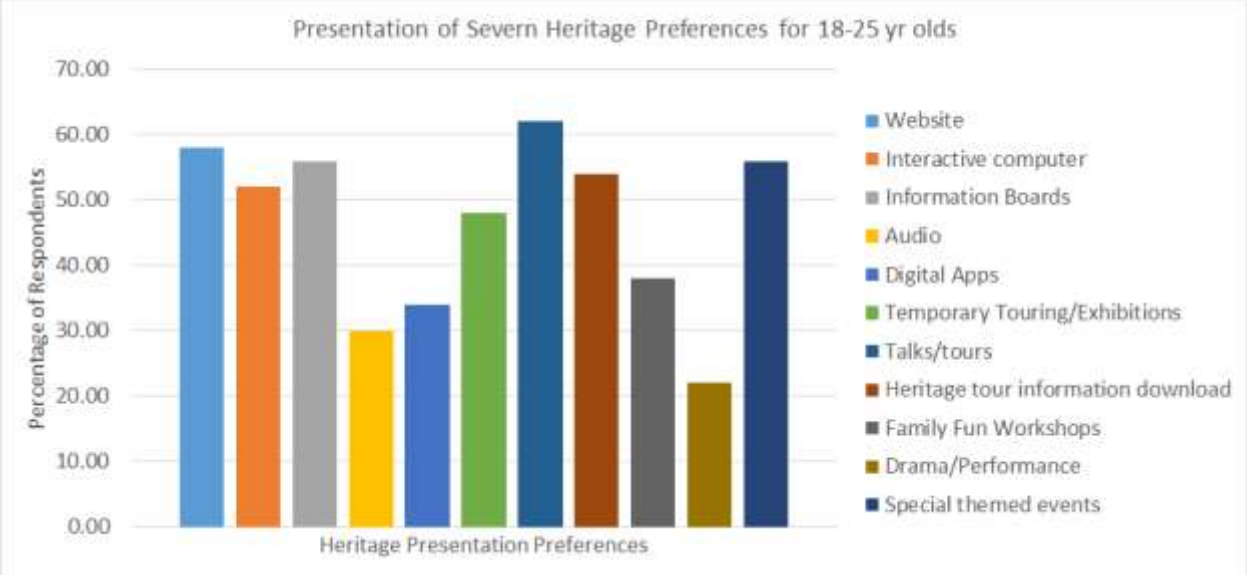

Figure 18: Graph of 18-25 age group responses to question 10

Source: Calculated from Research Team Data

N=50 (for both graphs above)

4.1.2 Interviews of Current Volunteers

With the assistance of the SRT, we were able to contact three active volunteers for the SRT or the CRT. Full transcripts of the phone and email interviews can be found in Appendices G and H. A phone interview was conducted with one volunteer who recently retired from a chair position at another environmental agency and was a geography lecturer in the past. This individual grew up near the Severn River and, even in retirement, wanted to maintain a connection to the river. Assisting in organizing funding bids, as well as being a trained riverfly monitor are just a few of the tasks in which the volunteer is involved. This individual was extremely insightful regarding citizen-science. The volunteer was working with the Shropshire Wildlife Trust to develop an app to allow everyday people to conduct water quality testing. This would expand awareness about the importance of maintaining water quality, as well as providing researchers and conservationists with a large quantity of environmental information. Riverfly monitoring information would also be able to be entered into the app as well. The app itself has been conceptualized and thought through by the wildlife trust and was recently sent to a company for production. When asked about whether or not there was a method to advertise the app, the volunteer explained that there was a catchment based partnership approach that brings together various environmental agencies and trusts to focus on the environment around the catchment. The app is focused on reaching, and helping out, these catchment partnerships. In addition, some current citizen-science groups who are already collecting water quality information will also be asked if they would trial the app.

Another volunteer agreed to answer questions over email. This volunteer was an educational volunteer for the CRT, a partner of the SRT, who taught canal history as well as water safety. This individual used to volunteer once a week before retiring, but now volunteers most days. Involvement with the trust began when the volunteer visited Birmingham Canal with a primary school he used to work at. This individual enjoys being an educational volunteer because of the ability to work outdoors and meet new people. He goes on to explain that allowing children to learn in “real life” is extremely beneficial to them and allows children who might not do well in school to “shine.” When asked about what might prevent this individual from volunteering, he said nothing does but gave some reasons as to why some people might be deterred. Some people might not want the responsibility or to be put near dangerous areas, like

locks. He also mentioned that time constraints can be an issue and facilities during bad weather are extremely limited.

A third volunteer, who was also an educational volunteer for the CRT, answered the questions we sent over email. This individual was a volunteer lock keeper who educates locals that come by the locks as well as working with the CRT Explorers to provide schoolchildren with information on the canal and water safety. The volunteer has been involved in volunteering at a local high school on the chair of governors in addition to his work with the CRT. He believed that expanding children's understandings of the canal and river, history, wildlife, and environmental issues around the river was the most rewarding part about being an educational volunteer. This volunteer explained that he did not have any obstacles that would prevent him from volunteering but that he did not enjoy meetings or anything indoors.

4.2 Objective II: Potential Volunteers Preferences

The following sections detail results gathered from survey distribution to three separate groups. Those groups, in order of data collection, are 16 and 17 year olds, university students, and 14 and 15 year olds at the Skills for Tomorrow Conference.

4.2.1 Survey of 16 and 17 Year Olds

The following results show data collected from the surveys of 34 students ages 16 to 17 from Worcester Sixth Form College. The survey data was organized in an excel spreadsheet and sorted based on the first question asking if the respondent regularly volunteers. Data from these two groups were analyzed separately.

Both groups were asked to define volunteering in their own words. The provided definitions had positive, negative, or neutral connotations. The number of each category of response was compared. Figures 19 and 20 show the responses, indicating a higher percent of positive responses from the group who do currently volunteer regularly.

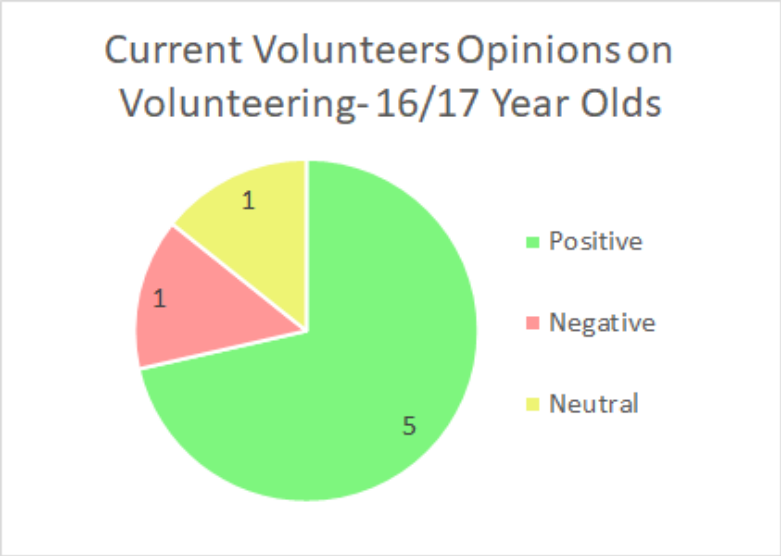

Figure 19: Graph showing the connotation of responses from 16 and 17 year old volunteers when asked to define volunteering.

Source: Calculated from Research Team Data

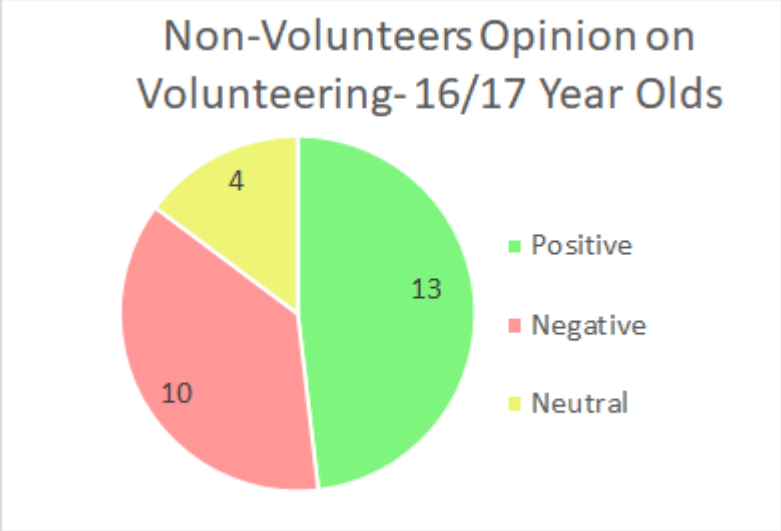

Figure 20: Graph showing the connotation of responses from 16 and 17 year old non-volunteers when asked to define volunteering.

Source: Calculated from Research Team Data

The group of respondents who do currently volunteer were asked about how often they volunteer and the duration of each volunteering occurrence. Figures 21 and 22 show the responses. Sixteen and 17 year olds appeared to be more inclined to volunteer when that volunteering occurred frequently, up to a few times a week, for up to two hours. These were the most common volunteering habits among the 16 and 17 year olds we surveyed.

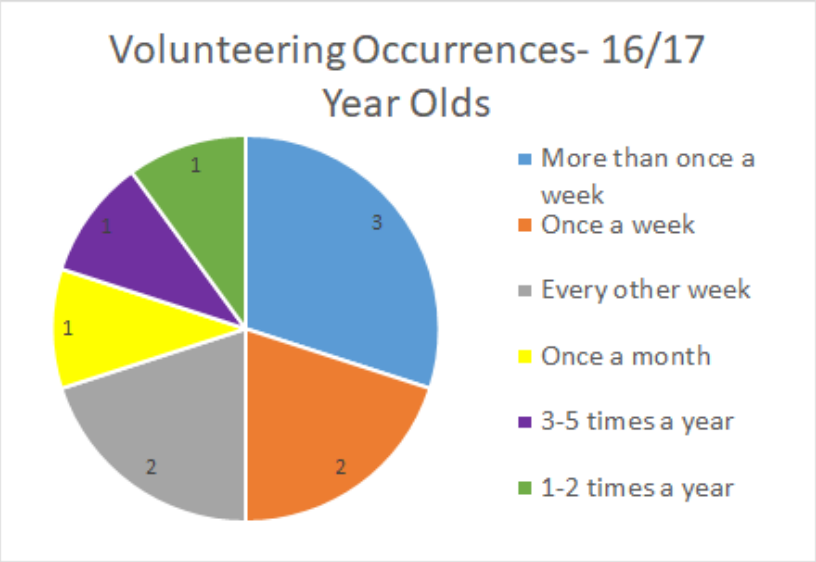

Figure 21: Graph showing the volunteering occurrences of 16 and 17 year olds who currently volunteer regularly.

Source: Calculated from Research Team Data

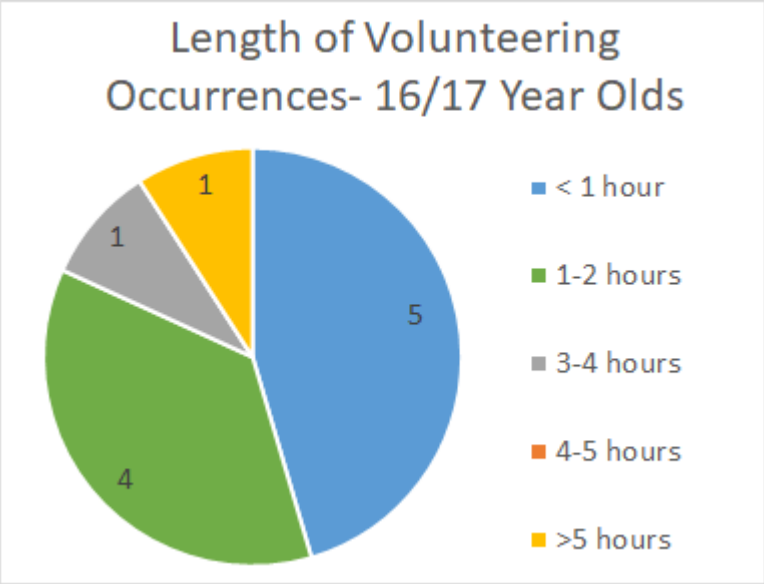

Figure 22: Graph showing the length of volunteering occurrences of 16 and 17 year olds who currently volunteer regularly.

Source: Calculated from Research Team Data

The group of respondents who do not currently volunteer were asked about barriers to volunteering as well as what could potentially motivate them to volunteer. Figures 23 and 24 show the results from these questions. A lack of time was the most common barrier for the 16 and 17 year olds we surveyed. Meeting new people, educational opportunities, and helping the environment were the most popular potential motivations.

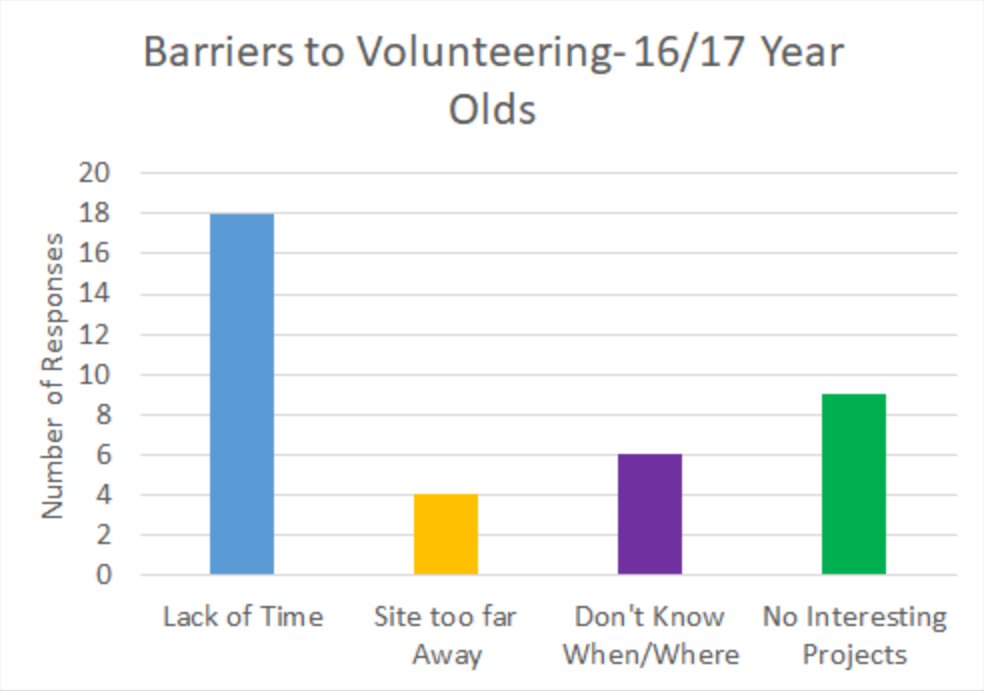

Figure 23: Graph showing the barriers to volunteering amongst 16 and 17 year olds.

Source: Calculated from Research Team Data

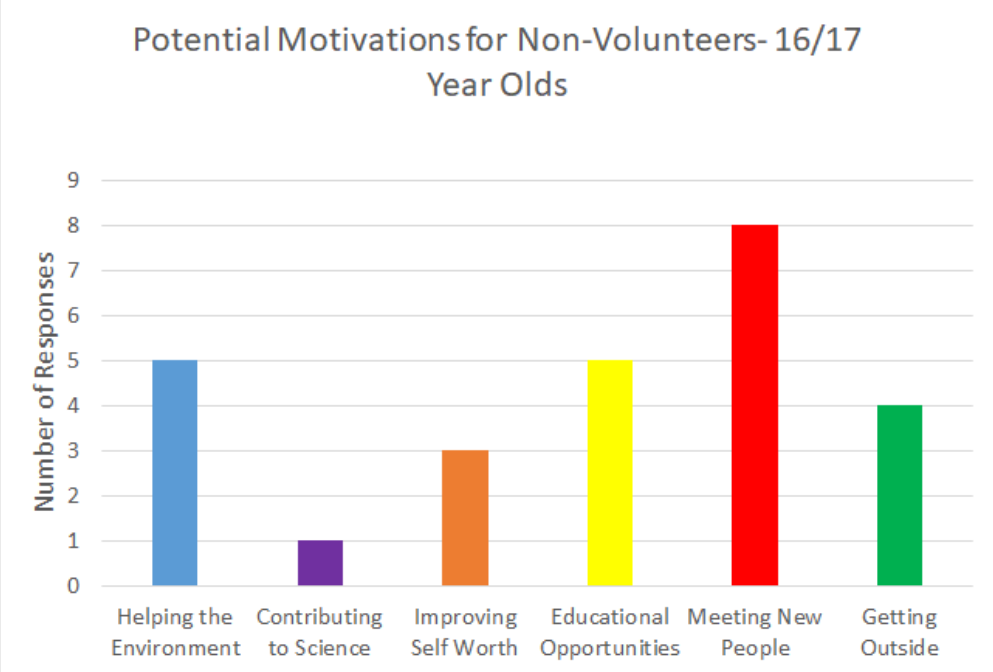

Figure 24: Graph showing the potential motivations for volunteering amongst 16 and 17 year olds.

Source: Calculated from Research Team Data

Both groups of 16 and 17 year olds were asked about specific types of volunteering. The results from this series of questions can be seen in figures 25 and 26. It is clearly shown that a

greater percentage of current volunteers were more open to the different types of volunteering mentioned. Those who do not currently volunteer had more answers in the “extremely unlikely” and “moderately unlikely” categories.

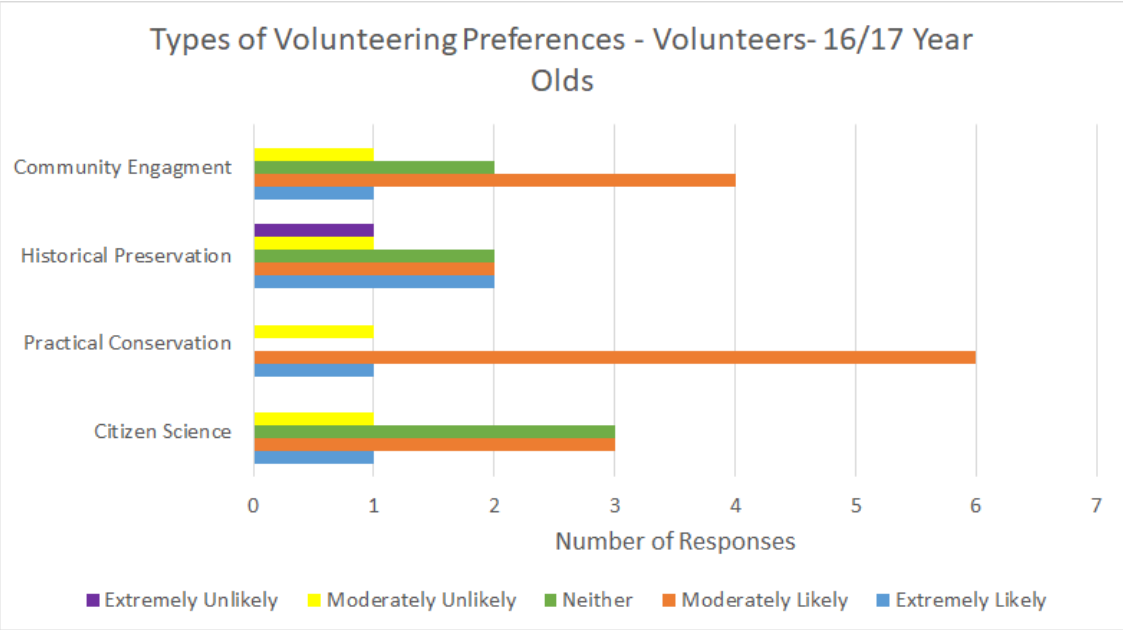

Figure 25: Graph showing the likelihood of 16 and 17 year old current volunteers to engage in SRT volunteering activities.

Source: Calculated from Research Team Data

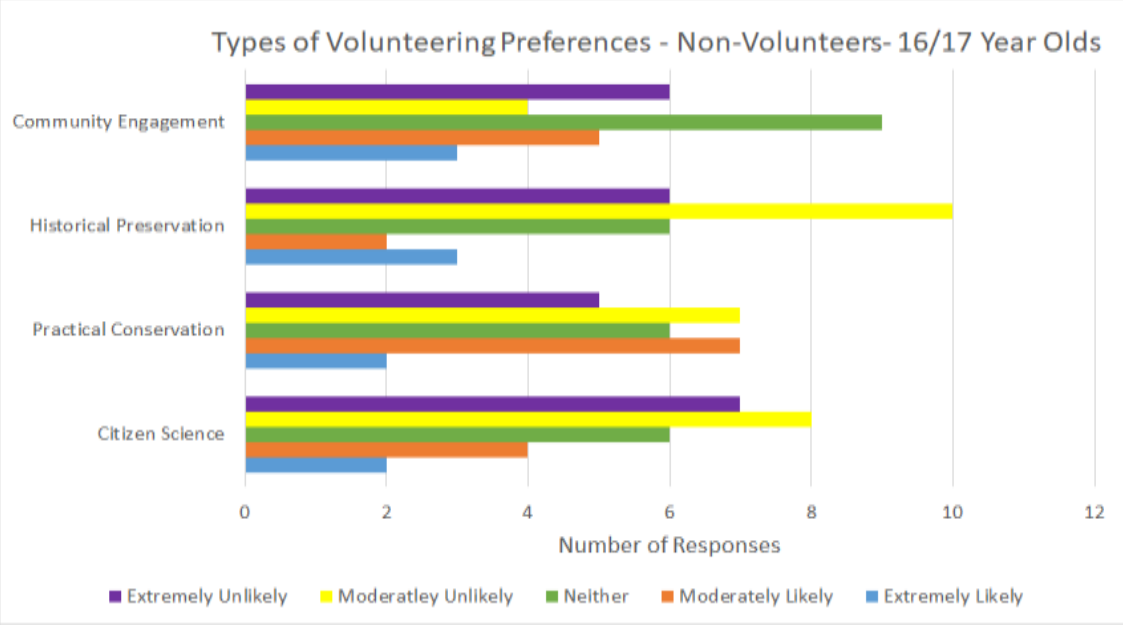

Figure 26: Graph showing the likelihood of 16 and 17 year old current non-volunteers to engage in SRT volunteering activities.

Source: Calculated from Research Team Data

Both groups of 16 and 17 year olds were also asked about their social media preferences in regards to how often they use them, shown in figure 27, and which platforms they would prefer to see SRT project updates on, shown in figure 28. It is clear that Instagram, Snapchat, and YouTube are the three most popular platforms by use. However, Facebook, Instagram, and Snapchat are the three most popular platforms for project updates.

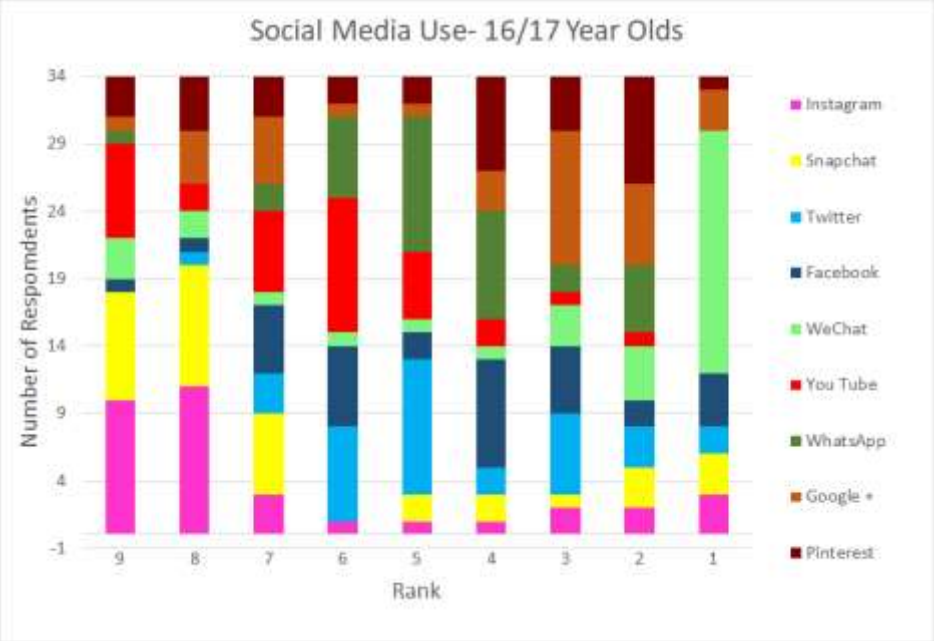

Figure 27: Social media use of 16 and 17 year olds.

Source: Calculated from Research Team Data

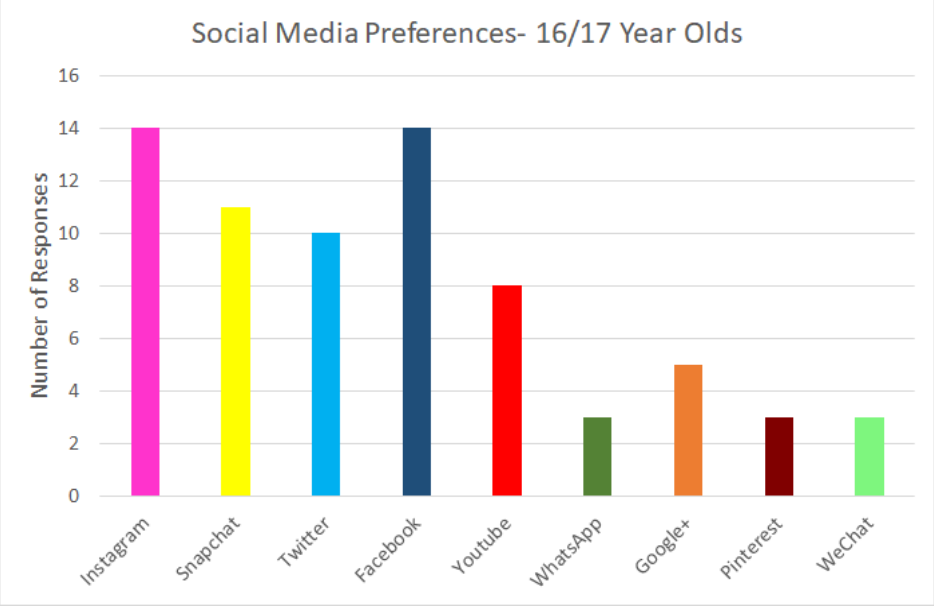

Figure 28: Social media preferences of 16 and 17 year olds.

Source: Calculated from Research Team Data

4.2.2 Survey of University Students

The following data was collected from surveying 30 students at the University of Worcester and the Hive. The data was organized into an Excel spreadsheet and was again sorted based on whether or not the respondent regularly volunteers. Data from the two groups were analyzed separately.

Both groups were asked to define volunteering in their own words. The connotations of the definitions were sorted into three categories: positive, negative, and neutral. The number of responses in each category for both volunteers and non-volunteers are shown in figures 29 and 30 below. As the graphs show, the groups had similar percentages of positive, negative, and neutral responses.

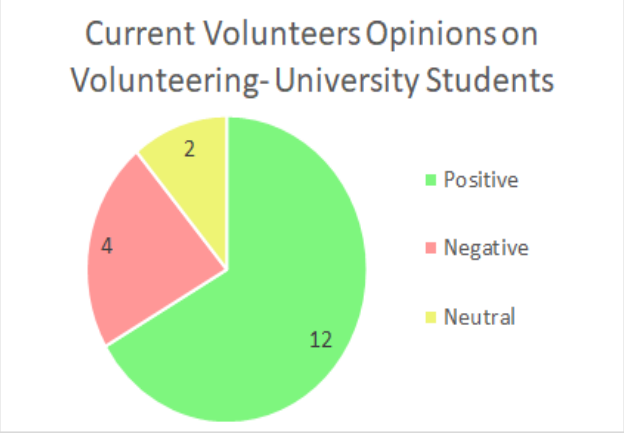

Figure 29: Graph showing the connotation of responses from university student volunteers when asked to define volunteering.

Source: Calculated from Research Team Data

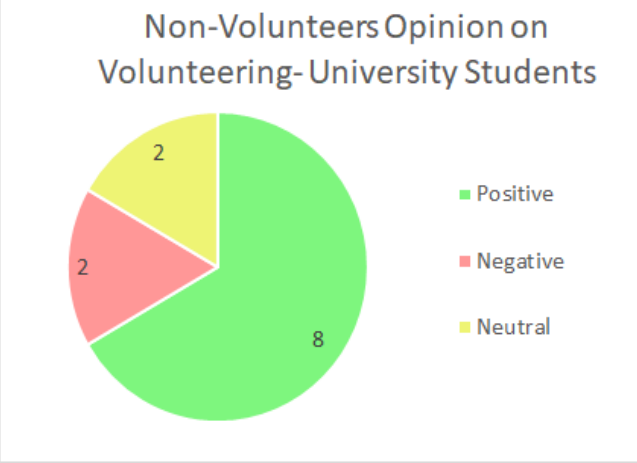

Figure 30: Graph showing the connotation of responses from university student on-volunteers when asked to define volunteering.

Source: Calculated from Research Team Data

The group of respondents who do currently volunteer were asked about how often they volunteer and the duration of each volunteering occurrence. Figures 31 and 32 show the responses. University students appeared to be more inclined to volunteer when that volunteering occurred monthly for longer periods of time, three to five or more hours. These were the most common volunteering habits among the university students we surveyed.

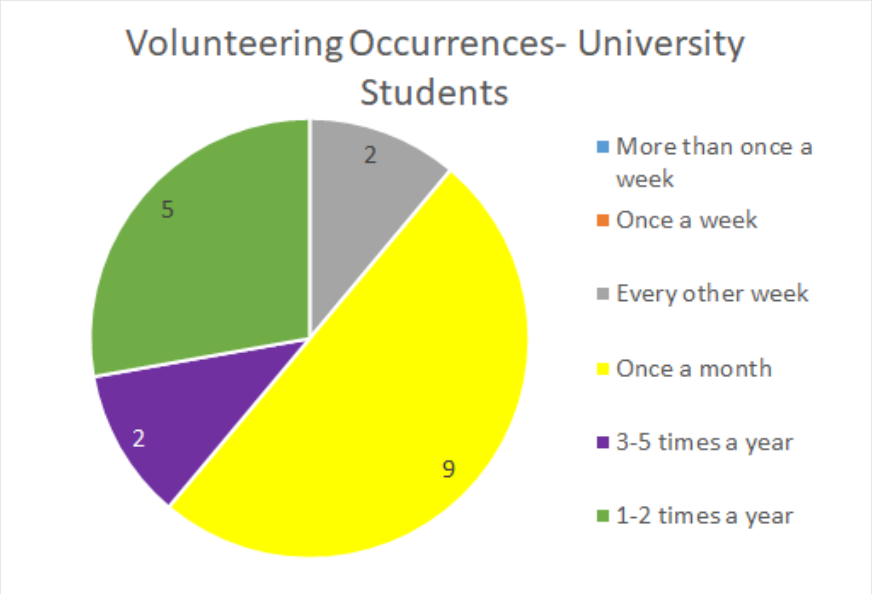

Figure 31: Graph showing the volunteering occurrences of 16 and 17 year olds who currently volunteer regularly.

Source: Calculated from Research Team Data

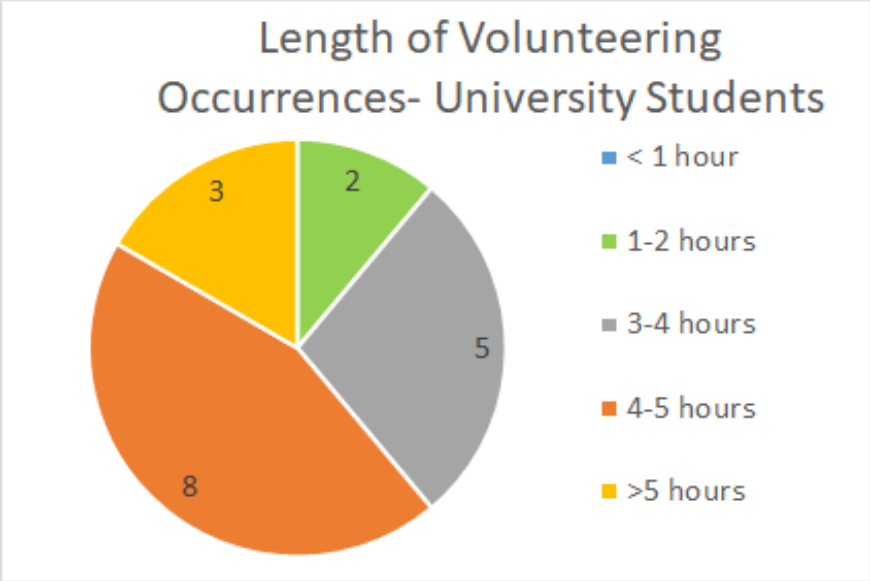

Figure 32: Graph showing the length of volunteering occurrences of 16 and 17 year olds who currently volunteer regularly.

Source: Calculated from Research Team Data

The group of respondents who do not currently volunteer were asked about barriers to volunteering as well as what could potentially motivate them to volunteer. Figures 33 and 34 show the results from these questions. A lack of time was the most common barrier for the university students we surveyed. Meeting new people and contributing to science were the most popular potential motivations.

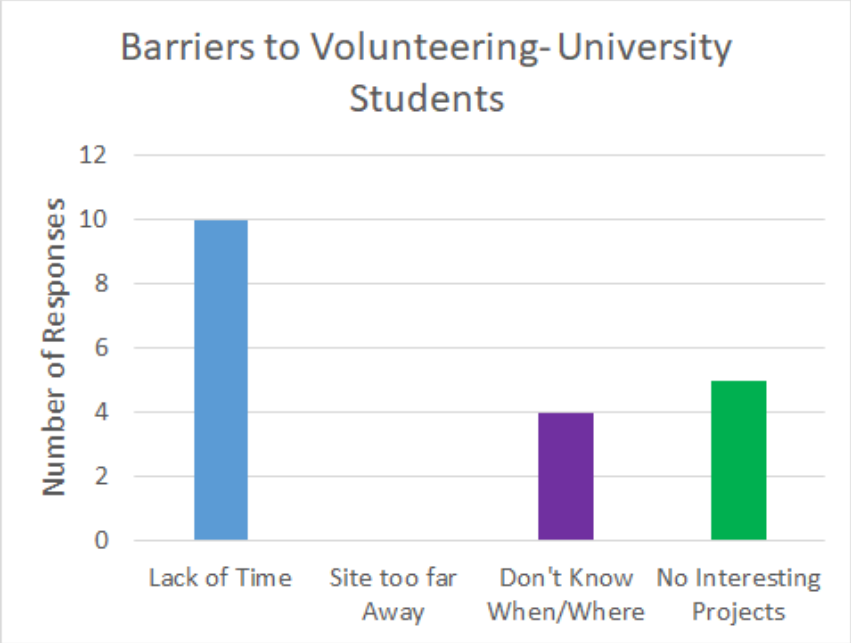

Figure 33: Graph showing the barriers to volunteering amongst 16 and 17 year olds.

Source: Calculated from Research Team Data

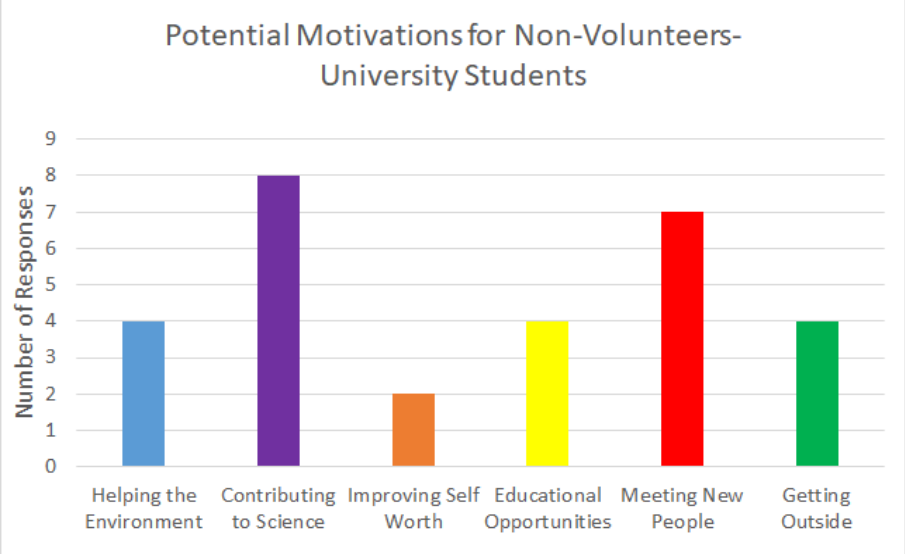

Figure 34: Graph showing the potential motivations for volunteering amongst 16 and 17 year olds.

Source: Calculated from Research Team Data

Both groups of university students were asked about specific types of volunteering. The results from this series of questions can be seen in Figures 35 and 36. It is shown that non-volunteers were more likely to choose the moderate responses. Those who do regularly volunteer had a higher percentage of "extremely likely" responses.

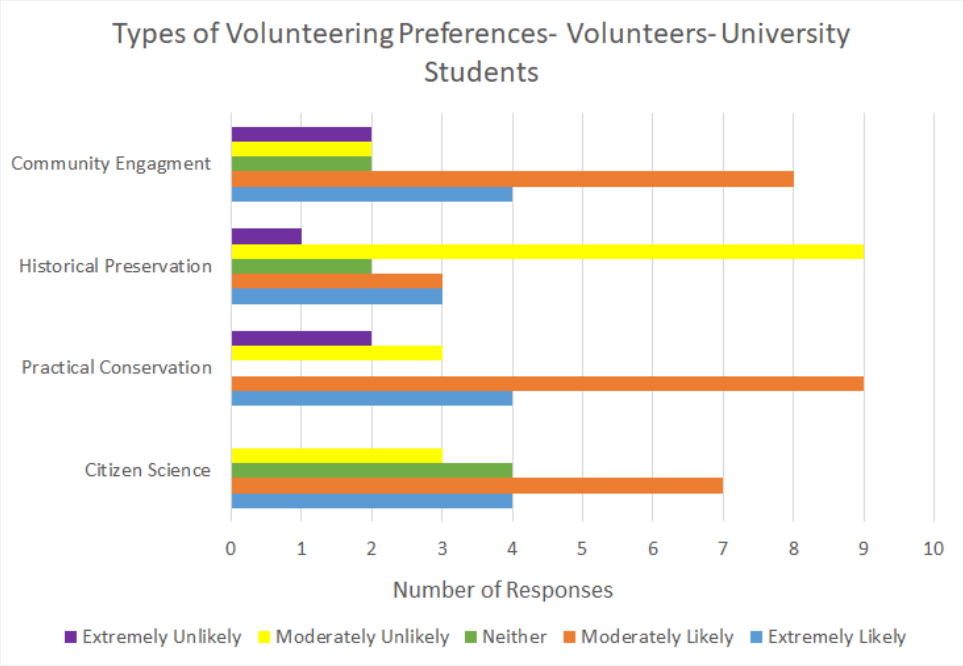

Figure 35: Graph showing the likelihood of university student current volunteers to engage in SRT volunteering activities.

Source: Calculated from Research Team Data

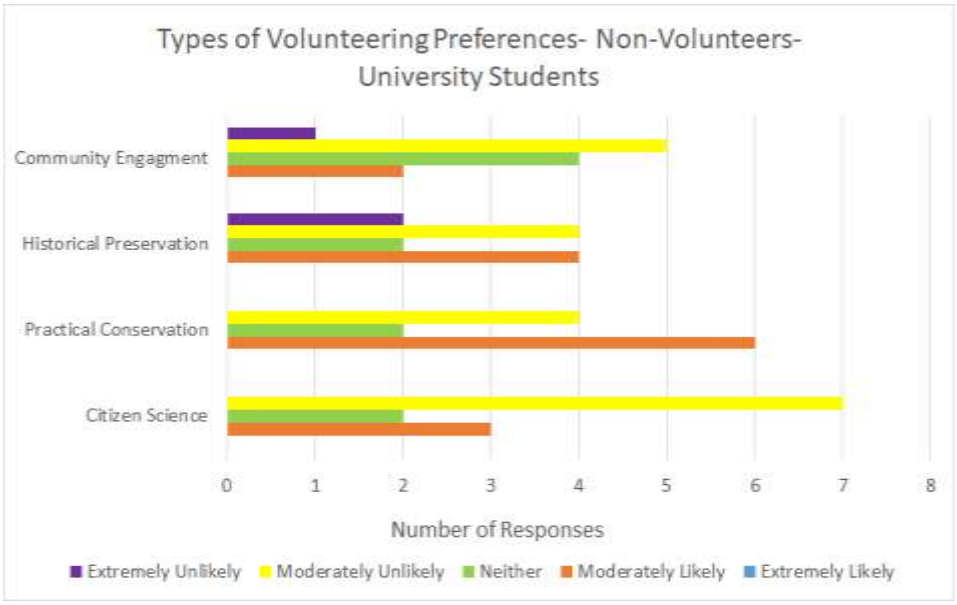

Figure 36: Graph showing the likelihood of university student current non-volunteers to engage in SRT volunteering activities.

Source: Calculated from Research Team Data

Both groups of university students were also asked about their social media preferences in regards to how often they use them, shown in figure 37, and which platforms they would prefer to see SRT project updates on, shown in figure 38. It is clear that Instagram, Snapchat, Twitter, and YouTube are the most popular platforms by use. Facebook, Instagram, and Twitter are the three most popular platforms for project updates.

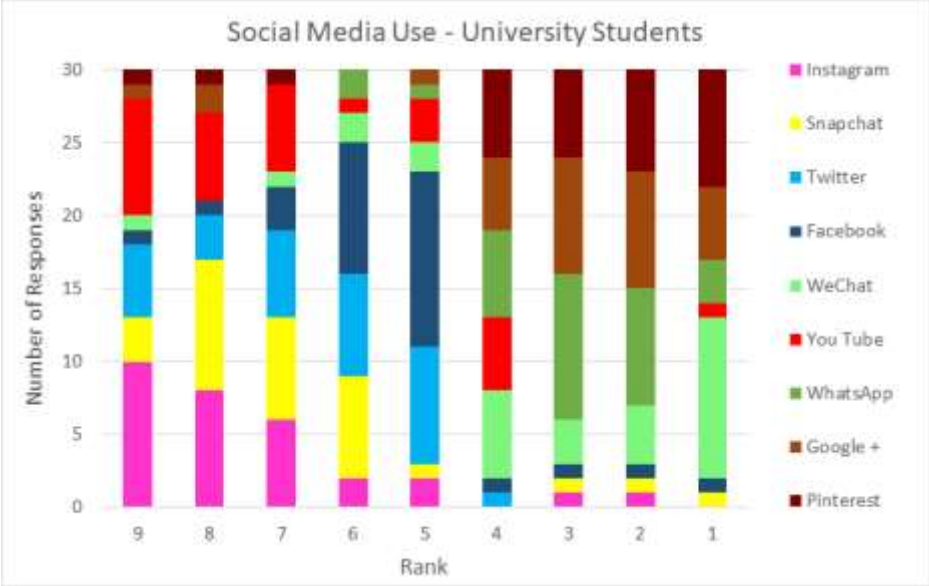

Figure 37: Social media use of university students.

Source: Calculated from Research Team Data

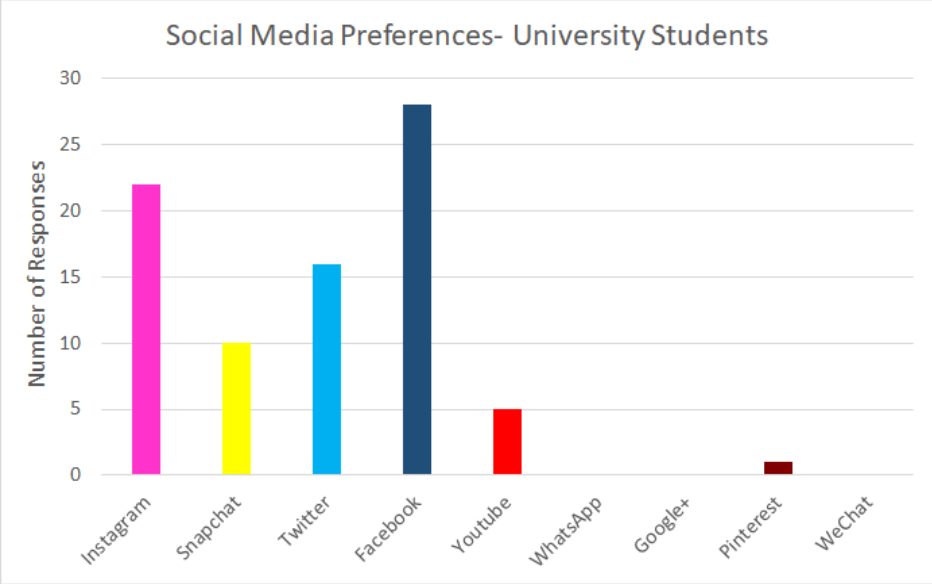

Figure 38: Social media preferences of 16 and 17 year olds.

Source: Calculated from Research Team Data

4.2.3 Dot Voting Survey of 14 and 15 Year Olds

The following data was collected from surveying approximately 35 students at the Skills for Tomorrow Conference. The data was organized into an Excel spreadsheet and graphed according by question.

Figure 39: Heat map showing the popularity of river activities among 14/15 year old secondary school students.

Source: Calculated from Research Team Data

Figure 40: Heat map showing the popularity of social media platforms among 14/15 year old secondary school students.

Source: Calculated from Research Team Data

Figure 41: Heat map showing the popularity of types of volunteering among 14/15 year old secondary school students.

Source: Calculated from Research Team Data

Secondary school students between the ages of 14 and 15 years old were asked to vote for their favorite image on each of the above posters. Figure 39 above shows swimming and dog walking are the most popular river activities for secondary school students between 14 and 15 year olds. Figure 40 shows Instagram, YouTube, and Snapchat are the most popular social media platforms, and Figure 41 shows art and photography is the most popular type of volunteering.

4.3 Objective III: Effective Marketing Materials

A focus group with four participants was hosted for collecting data from University students within the 18-25 age cohort to help determine effective marketing materials for the SRT's Unlocking the Severn project. The results of the focus group with the university students were split into three separate discussion themes; Branding, Marketing, and Volunteering.

The first theme that emerged from the focus group was branding for the Unlocking the Severn project. Students from the University of Worcester were shown the current Branding and Style Guide that is in use by the Unlocking the Severn project. After opening up a discussion regarding color schemes, logos, and general branding, results began to emerge. The participants

unanimously favored the Unlocking the Severn logo as seen as opposed to the Pebble logo. The former being quoted as “outstanding” in comparison to the “out of place” pebble logo and pebble shapes. One main point a participant made that was agreed upon by the rest of the focus group was that the current branding guide appeared to be for young children.

The second theme to emerge from the focus group was marketing methods for university-aged students. When asked what current methods of marketing work for themselves and other university students, the participants unanimously agreed that email is the most effective way to reach this target audience. More specifically, emailing notifications for events works better than any other form of communication, as university students can instantaneously add the events to their electronic calendars. One talking point was social media usage amongst university students. In conjunction with a more serious brand identity, the focus group participants believe a social media campaign would be beneficial for other forms of reminders of events and activities for the Unlocking the Severn project. When asked how to pass 5 minutes of spare time on a smartphone, 3 of the 4 participants stated using Instagram, the other stated YouTube. The participants believed that social media networks such as Instagram and YouTube would impact university students the greatest, as they allow the SRT to visually show the “impact that man made structures have on the river”.

The final theme of results from this focus group was university students and their opinions of volunteering. Of the four participants, only one was actively doing volunteer work while enrolled in university. When discussing the motivations for, and limitations of, university students volunteering, there was one reason that kept emerging for both; interest level. While the three participants who stated they do not currently volunteer initially said they are too busy to volunteer, after some discussion they also stated that they do not volunteer due to their lack of interest. The participant who still volunteers stated he does so because of his interest in the volunteer work itself, even stating he would like a career in the field of his volunteer work. Other data collected was the University of Worcester’s involvement in student volunteering. The Students Union at the University of Worcester holds a Volunteer Record for students where students have the option to log volunteer hours and have their volunteer work certified on their degree transcript.

4.4 Objective IV: Online Fish Monitoring Program

The purpose of this objective was to determine a method for the SRT to begin an online citizen-science campaign in order to monitor fish migration along the Severn River. The SRT does not currently employ any people with the time or resources to construct a website, so we were tasked with developing a proposal for their website before they hire a web developer. In order to analyze the different website options we used the weighted decision matrix discussed in chapter 3.4. We will now go through the matrix to discuss the grades assigned to the websites for each aspect we tested.

4.4.1 Video Aspects

The first set of features we tested related to how well the website handled the upload and display of videos. Most of these aspects were given a priority of "High" because they are essential for the project's success. While excellent for still images, Zooniverse is not yet optimized for projects based on videos. The website offers a downloadable set of software to theoretically make this possible, but it is still being tested. We were in contact with the Zooniverse development team to try to fix these issues but they were unable to figure out a solution. Since the video uploading is not currently available, Zooniverse scored low on many aspects in this section. We gave them higher marks on the Storage Space and Ability to Alter Set of Videos features because if the development team is able to fix the uploading issues, those would be incredibly simple for the SRT. On the contrary, WordPress worked very well with video uploading. The website allows all videos to be uploaded to YouTube and then simply displayed on the WordPress site. Not only does using YouTube solve the storage space issue, but it also maintains a high quality for the videos. Since WordPress was not built as a citizen-science platform like Zooniverse, it is not as simple to alter the set of videos being displayed. Squarespace actually works identically to WordPress with these aspects, as shown in the scores we awarded each. WordPress and Squarespace scored better in this category than Zooniverse overall, as can been seen below in figure 42.

	Aspect	Priority	Zooniverse	WordPress	Squarespace
	Able to Upload Videos	High	F	A	A
	Videos High Quality	High	C	A	A
	Storage Space	High	A	A	A
	Video Upload is Simple	Med	C	C	C
Video	Ability to Alter Set of Videos	High	A	C	C

Figure 42: Video Category of Website Weighted Decision Matrix

Source: Developed by Research Team

4.4.2 Data Collection

The next section of features concerns the ease and feasibility of data collection for the two websites. The ability to link user input to each video and validate these inputs are also essential for the website to function as intended. As a citizen-science platform, Zooniverse excels with these features, while WordPress and Squarespace would require more work and maintenance to set up a similar data collection system. Zooniverse employs a simple user interface capable of handling much of this work, as opposed to the other sites that would require work from a web developer to incorporate a way for the SRT to achieve the same results. Once the data are collected, WordPress and Squarespace move ahead of Zooniverse due to their open design structure. Zooniverse is rigid in its design, so the data can only be exported in one way and cannot be shown anywhere on the website. With the other two allowing for more customization, it is possible to export data in any form requested and easily incorporate a data display on another page of the website. As shown below in figure 43, the Data Collection category is evenly split between the three websites.

	Aspect	Priority	Zooniverse	WordPress	Squarespace
	Save Input to Corresponding Video	High	A	B	B
	Validate Inputs and "Retire" Videos	High	A	C	C
	Display Data on Website	Med	C	B	A
Data Collection	Export Data for Analysis	Med	B	A	A

Figure 43: Data Collection Category of Website Weighted Decision Matrix

Source: Developed by Research Team

4.4.3 Users

The main purpose of this citizen-science tool is to increase community engagement and reach more people than the number usually involved in the SRT's volunteering projects. The next section centers on the ways that the SRT can interact with these users and prove to their funders that they are reaching a larger audience. Using Zooniverse would take advantage of a

well-known website with millions of users who are able to browse for new projects at their leisure, while using WordPress or Squarespace would require the SRT to promote the website themselves. On the other hand, Zooniverse keeps all user information private and allows anyone to contribute to a project without even signing in. This would make it extremely difficult for the SRT to track the number of users their tool achieves, and virtually impossible to get any demographic information at all. If the SRT used the other options to build their website, however, they could include a sign-in page to collect all the pertinent demographic information of the users. Squarespace scored higher in this area than WordPress because the way it organizes different web pages is much more intuitive to the developer and the user. It would be easier to implement User Recognition and Leaderboard pages using Squarespace because it is designed to handle a large number of different pages. It is because of this fact that Squarespace scores higher in this section than WordPress while Zooniverse falls behind both of them, as shown in figure 44 below.

	Aspect	Priority	Zooniverse	WordPress	Squarespace
	Reach a Large Audience	Med	A	B	B
	User Info Database	Med	F	A	A
	Track User Progression	Med	F	B	A
	Ability to Contact Users	Med	F	A	A
Users	User Rewards/Recognition	Low	B	B	A

Figure 44: Users Category of Website Weighted Decision Matrix

Source: Developed by Research Team

4.4.4 Miscellaneous

The final category in the weighted decision matrix is a collection of a few features that did not exactly fit in other categories, but will still be important aspects of the final website. One idea the SRT had was to incorporate a “Lite” version of the citizen-science tool on their own website to increase initial interest. Zooniverse would not interact with this tool at all, but making it on WordPress or Squarespace would completely circumvent the idea, since the SRT would be hosting it on their own website. Having their own website also allows the SRT to have much more control over what is displayed and incorporated into their tool. This includes more flexibility over future aspects of the website as more ideas are brought forward. With this increased control, the work required for maintenance would increase as well as the difficulty of maintenance. The increased maintenance is not equivalent in WordPress or Squarespace, however. To alter parts of the website, such as the data display page, would be much more

difficult on WordPress because that tool requires a knowledge of web development programming languages. Squarespace has an intuitive user interface for the developers to use that requires no prior knowledge. This would allow the SRT to make changes to their website at will without having to hire a developer every time they decided to edit a page on their site. The final aspect of the website is the cost, which is free for Zooniverse, but would require hiring a web developer to build via the other two options. The breakdown of this section is shown below in figure 45.

	Aspect	Priority	Zooniverse	WordPress	Squarespace
	Work with "Lite" Version	Low	C	A	A
	Website Maintenance	Med	A	C	B
	Control over Website Functions	Med	C	B	A
	Cost	Med	A	C	B
Misc	Visual Appeal	Med	A	C	A

Figure 45: Miscellaneous Category of Website Weighted Decision Matrix

Source: Developed by Research Team

Chapter 5: Analysis

This chapter consists of analyses of the results from the previous chapter.

5.1 Analysis of Local Perspectives

Having a deeper understanding of the community's opinions on the Unlocking the Severn project will allow the SRT to move forward with information on how to recruit new volunteers and present their work. The general survey, administered by the consulting agency that was hired by the SRT, collected a large amount of data but was not analyzed with respect to the age of the respondents. The SRT wants to expand their network of younger volunteers and understanding how to reach a younger demographic is important. Even though the current volunteers that were interviewed were not in the age group of interest, because of their active involvement with the SRT, their insight was useful in determining some potential reasons why people would continue to volunteer for the trust.

5.1.1 General Survey Analysis of Age Groups

Expanding the current volunteer network to a younger age group requires an understanding of the opinions of the young people in the community. The survey conducted by the consulting agency collected copious amounts of responses, with fifty responses being from individuals between the ages of 18 and 25. The survey was emailed out to email lists from

various SRT partners as well as being posted on Facebook. Because of this, the survey was slightly biased in that the people it reached were those who followed the SRT on social media and were on the emailing lists of project partners. An analysis can still be completed despite the bias because a panel survey was conducted by Tricolor, the consultation firm. The panel survey was sent out to 202 people using SmartSurvey, which sends surveys to people living within a 60-minute drive of the project hubs. A statistical analysis was completed to determine whether the data collected from the general survey was different from the panel survey. The differences between the results were not statistically significant, indicating that the general survey could be analyzed in spite of the bias (Canal & River Trust, et.al, 2017).

The questions that were chosen to be analyzed provided the SRT with information that would be important for creating a marketing plan in the future. These questions included what types of volunteering would be preferred, how Severn heritage should be presented, and what social media platforms were the most preferable. Understanding the answers 18 to 25-year olds respond with for these questions would enable the SRT to focus their volunteering recruiting strategies on this age group. The first question that was analyzed asked the respondents whether they thought the heritage of the Severn River was important. The highest percentage of an age group to respond with "No opinion/not sure" was the 18 to 25-year age group, followed by the 26-30 age group. This indicates that the younger generations are not necessarily uninterested in the heritage, but that they might not be educated on what heritage is. Fifty-one to sixty year olds had the lowest percentage of responses without an opinion or unsure on the matter. This could be because older age groups have more of an appreciation for the river heritage, having been around the river for potentially a longer period of time, and they may be more aware of the meaning of the term heritage. Older generations more than likely witnessed numerous changes along the river, indicating an understanding of the importance of the history of the river. Surprisingly, those who were over the age of 70 also had a high percentage of responses of "no opinion/not sure." Once again, this could simply be a lack of understanding of the term heritage in the context of the river within this age group.

The aspects of the Severn's heritage that were interesting to people was also asked in the general survey. Respondents in the 18 to 25 age cohort were most interested in the heritage of the wildlife and plant life around the river. This could be because people can interact with and see the plants and animals around the river. With other forms of heritage, such as industrial heritage

and the social history of the river, the visible evidence along the river is not as obvious. Locks and weirs are pieces of industrial heritage but 18 to 25 year olds might not be aware of the history of these structures. When doing activities along the river, people are immediately interacting with the surrounding wildlife, creating a sense of familiarity with the nature around the river. This sense of understanding is what could create an interest in the wildlife and plant life versus a museum display or archive films and maps.

One of the questions we analyzed asked about different volunteering activities in which people would be interested in taking part. The two most popular options among the younger age cohorts were wildlife surveying and river conservation work. This is logical considering most of the respondents in the age group preferred plant life and wildlife heritage. Surveying and river conservation work would involve much of people's time being spent outdoors. In addition, some of the favorite aspects of volunteering for the current volunteers who were interviewed were also getting to be outside.

The final questions we chose to analyze involved the relationship between age and response regarding social media and the presentation of heritage. The question about social media asked about what social media channels with which people engage. Facebook was overwhelmingly popular among the younger age groups. Older age groups also had a high percentage of Facebook users; however, people ages 51 and up had a slightly higher percentage of google search user than Facebook. The popularity of Google searching among older respondents is due to it being simple and not requiring an account to use. The popularity of Facebook is not surprising considering the survey was posted to this social media platform, therefore people who found the survey this way are Facebook users. When asked about how the respondents would like heritage information about the river presented to them, the answer with the highest response from 18 to 25 year olds was through talks and tours, immediately followed by a website. Talks and tours present information without requiring any reading. Without any provided reading material, it can be difficult to ensure that those who are attending the talk are paying attention. In addition, without any reading material, people who go to the talk or tour will not have anything to reference and help them remember what they learned. This problem can be addressed by giving out handouts of QR codes that will direct people to the SRT website that provides written information about the Unlocking the Severn Project. The popularity of technology among younger age groups is a reason why the use of a website to present heritage

information was preferred when 18 to 25-year olds were asked about this topic. Hosting a talk or tour can create an opportunity to go to new places with groups of peers and actively learn. This is different from a traditional learning environment in a classroom where reading material is distributed and students sit for extended periods of time. The contrast could provide a new and enjoyable way to learn.

5.1.2 Interviews with Current Volunteers

Ideally, we would have interviewed some of the volunteers involved with the fish migration aspect of the Unlocking the Severn Project in order to gain more specific insight on what motivated their involvement in the project. Unfortunately, because the Shad migration is in the spring, many of the volunteers who worked with that project are unavailable. The SRT and their partner the CRT have a number of other projects that they are working on as well with numerous active volunteers who were willing to answer questions for us.

Determining whether the active volunteers for the SRT and CRT were involved in other volunteering opportunities around the community could help the SRT in recruiting volunteers from other places. Both CRT educational volunteers had previously volunteered for positions at local schools, either as a lecturer or on the Parent Teachers Association. The volunteer who is a trustee for the SRT used to work for an environmental committee. Having retired from the position, this individual wanted to stay connected to the river, demonstrating that those with an interest in conservation to begin with, could be interested in volunteering for the SRT. Several societies at the University of Worcester, such as the nature, geography, and biology society already have young members who are interested in the outdoors and nature. Members of these societies may be more likely to volunteer for the SRT considering their pre-existing enthusiasm for the subject matter. The two educational volunteers we interacted with became involved with the CRT after having visited the lock or working as a lock keeper. This information is indicative of an interest in the work being done on the Severn after having physically seen or interacted with the lock and weir system on the river. Visuals can help connect potential volunteers with the river itself instead of simply reading about the river and its structures. In the general survey, young people expressed an interest in talks and tours on the heritage of the river. This would give them an opportunity to see and hear about the Severn in person, which could entice them to volunteer for the SRT and the CRT, as was the case with the educational volunteers.

Discerning what people do, or would, enjoy about volunteering for the SRT or CRT could help these trusts advertise for volunteering activities. Highlighting potential benefits of volunteering could persuade people of various age groups to help with the project work for these organizations. The volunteers were also asked about what their favorite part about volunteering for the CRT or the SRT was. The educational volunteers explained that meeting new people and being outside were some of the best parts about volunteering. In the survey we administered to the 16 to 17 year olds, 8 out of 27, about 24%, of respondents said that meeting new people would be a potential motivator for volunteering. Meeting new people was the answer that had the highest percentage of responses for this question. Young people between the ages of 16 and 17 are still in school and are usually eager to meet new people and socialize, which suggests a powerful motivating factor for volunteering among this age group.

Another reason the volunteers claimed to enjoy their work at the SRT and CRT was that it enabled them to be outside and be close to the river. Being that much of the work done by the SRT and the CRT involves being outdoors and along the river, and the people we talked with were very active volunteers, it is logical that they would enjoy the outdoors. In the general survey, the 18 to 25 year age cohort expressed an interest in doing river conservation work and wildlife surveys. These activities involve being outside for the majority of the time. Although motivations for volunteering were not asked in the general survey conducted by the consultation survey, inferring from the positive response to river conservation and wildlife surveys, 18 to 25 year olds would enjoy being outdoors, especially in the better weather.

5.2 Collect Potential Volunteer Preferences

In order to successfully market to a younger audience, it is important to first understand their preferences and attitudes toward volunteering. The target audience of 16-25 year olds covers a variety of preferences, so it is vital to compare how to market to 16-17 year old students versus university students. The following section will analyze the above results by comparing the age groups and identifying potential reasoning for differences in responses.

5.2.1 Preferences among those who regularly volunteer

Among the two age cohorts surveyed, the university age students had the higher percentage of respondents say they regularly volunteer, with 60% volunteering, compared to

21% for the 16-17 year old students. This is likely due to the positive effects volunteering can have on university and employer applications, meaning university age students are more likely to be motivated to volunteer because it will likely have a positive effect on different aspects of their lives. Specifically, University of Worcester students have a volunteering record that the Student Union maintains. This record could be the motivating factor for many of the volunteers. Among those who volunteer, the 16-17 year old students appeared more likely to volunteer frequently- multiple times a week- compared to the more common monthly volunteering among the university age respondents. This indicates the 16-17 year old students could be more attracted to the citizen science volunteering, which can be done multiple times a week for short periods of time. The university students are likely to be more inclined to do practical volunteering that occurs monthly and lasts all day. This is likely because University students typically have classes, homework, society meetings, and work during the week, making it easier to set aside a weekend day to volunteer for a longer stretch of time. While 16-17 year old students have similar schedules, it is likely at a less intense pace. Younger students are also constrained by scheduled weekend, school, and family obligations.

Volunteers in both age cohorts were asked to define volunteering, and their responses were categorized into positive, negative, and neutral responses. The two age groups had similar percentages of the three responses. This is likely because those who regularly volunteer generally have a positive outlook on the work they do. Additionally, both age cohorts were asked what types of volunteering they would be interested in doing for the SRT. The 16-17 year old students clearly preferred practical conservation, followed by citizen science volunteering. The university students preferred all types of volunteering almost equally. This is likely due to the larger group of university volunteers we surveyed. Because more people were represented, more types of volunteering were preferred. However, this could also be due to the experiences university students have that 16-17 year old students do not. Additionally, university students chose "extremely unlikely" more often than the 16-17 year old students when asked to choose how likely they are to do citizen science, practical conservation, archival research, and community engagement volunteering. This is likely due to the older age cohort being more willing to commit to not wanting to do a specific type of volunteering. It could also be due to the younger age cohort not wanting to commit before they really know or just not wanting to offend others who do enjoy that type of volunteering.

5.2.2 Preferences among those who do not regularly volunteer

Non-volunteers were asked to define volunteering in their own words as well. Of those who were surveyed, the 16-17 year old students had a higher percentage of negative opinions about volunteering with 37% for 16-17 year olds compared to 17% for university students. This is due to maturity levels of the respondents. Of the 16-17 year old students, definitions like “free work” and simply “no” were more common. It is possible a lack of knowledge of volunteering led to these definitions, but it is more likely that a lack of motivation for volunteering is the cause. Young people about to enter the workforce feel the need to elevate themselves when compared to their peers (Price, 2002). One way to do exactly that is volunteering, which can be added to one’s resume. This motivation of resume building is not as prevalent in the 16/17 year olds age cohort. Young people are no longer motivated by the simple need to do good (Price, 2002). Without any proper motivation to volunteer, the 16-17 year olds see it as a waste of time and not worth the effort. Among the university students, a large percentage of non-volunteers still had a positive opinion of volunteering, at 67%. This is likely due to young people seeing volunteering as a means to an end, such as resume building (Price, 2002). This indicates it could be easier to market to non-volunteers in university versus non-volunteers in the 16-17 year old cohort because university students are motivated to build their resumes.

Non-volunteers were also asked about barriers they face that might prevent them from volunteering. As expected, both age cohorts agreed that a lack of time was the biggest barrier. This is one of the most common reasons people mentioned when asked why they do not, or cannot, volunteer. As for potential motivations, the 16-17 year old students chose socializing/meeting new people as the best potential motivator closely followed by helping the environment and educational opportunities. University students chose contributing to science as the best potential motivator, closely followed by socializing/meeting new people. In a free response question asking what types of activities non-volunteers might enjoy, multiple respondents said working with friends. This is likely why the socializing/meeting new people response was popular in both age cohorts. People are more willing to volunteer when they can do it on their own terms with friends. It is likely the other motivations are different because university students might be more inclined to volunteer in areas that relate to their field of study, indicating why contributing to science was the most popular potential motivator. Educational

opportunities are similar to contributing to science, but in a more generic sense. This is likely more applicable to the 16-17 year olds curriculum due to its generic nature.

Additionally, both age cohorts were asked how likely they would be to do specific types of volunteering at the SRT. The 16-17 year old students had a similar percentage of "extremely unlikely" responses, with 21%, versus the 25% for university students. However, 27 non-volunteers in the 16-17 year old cohort responded to the survey versus 12 non-volunteers in the university students cohort. This makes it appear as though the 16-17 year old students were much more inclined to choose the unlikely option even though the results have similar distributions. The biggest difference between the cohorts was that the 16-17 year olds selected the "extremely" likely option 37% more frequently than the university students- no university students chose extremely likely for any of the four types of volunteering. This is likely due to the difference in the size of the two samples.

5.2.3 Social Media Preferences of Respondents

Both age cohorts were asked to rank social media platforms in terms of frequency of use. They were also asked to choose the platforms on which they would most like to see volunteering project updates. The most popular platforms by use for both cohorts were Instagram, Snapchat, and YouTube. However, university students chose Instagram and Facebook, closely followed by Twitter, for project updates whereas 16-17 year old students were split between Instagram, Facebook, Snapchat, and Twitter. The only difference here is the inclusion of Snapchat by the younger age cohort. This is likely because university students prefer snapchat for personal use. The fact that the responses to the social media questions were very similar is important to consider for marketing techniques.

The youngest age cohort, consisting of 14 and 15 year olds, were asked to choose their favorite social media platform by dot voting at the Skills for Tomorrow conference. The three most popular apps in this age group were Instagram, Snapchat, and YouTube. This matches very well with the older age cohorts, but there is a distinct difference in the popularity of Twitter and Facebook. These two platforms, which performed well among both the 16-17 year olds and the university students, were among the least favorite platforms of 14-15 year olds. This is likely due to the older age cohorts using Facebook groups for volunteering information, whereas the 14-15 year olds might not have a Facebook account. Twitter is likely less popular among the younger

age cohort because it is becoming more popular among young people's parents. These 14-15 year olds want to go on social media to talk with friends, not their parents.

5.2.4 Dot Voting Analysis

Secondary school students were asked to choose their favorite activity to do by the river and what type of volunteering seemed most interesting to them. Swimming and dog walking are likely the most popular activities in this age group because they do not require much money or equipment unlike rowing, fishing, camping, or surfing. This indicates that activities they can do easily with friends at minimal cost will be the most successful and easily marketed toward 14-15 year olds. If the SRT can portray volunteering as a fun activity, you can do with your friends, 14-15 year olds will likely be more inclined to become involved, especially when they get older and volunteering will benefit them.

The most popular type of volunteering among this age cohort was art and photography. This is not surprising as it plays into the interests of young people who enjoy art. The other types of volunteering are more traditional, but photography might not have been something the students knew they could do while volunteering. This could be useful to the SRT if they wanted to have images of fish migrating or document conditions along the riverbanks. This also plays into the earlier point of volunteering with friends. Students could go out with friends and take pictures of the river for research, but still have fun while volunteering. This is a great way to get younger volunteers involved.

5.3 Analysis of Focus Group

A focus group was conducted in order to obtain qualitative information from University of Worcester students regarding their opinions on branding, marketing, and volunteering. The focus group created an opportunity for an open discussion among students where information and opinions could be shared in depth. We analyzed the data gathered from the focus group to formulate effective marketing strategies for the SRT.

5.3.1 Branding

In order for the SRT to recruit volunteers of various age groups, it is important that their branding material is well suited to the age groups they are trying to reach. From the data gathered regarding branding for Unlocking the Severn, the discussion with the 18 to 25 year age cohort

centered around one main idea. This idea is that branding for Unlocking the Severn should be simple and serious. When shown the current branding for the project, the students reacted negatively to everything except the current logo seen in figure 46, with attached analysis from gathered data. With the university aged students finding the current logo appealing, this will allow the SRT to continue to use the logo regardless of the age cohort of their intended audience. The uniformity of the logo will strengthen the Unlocking the Severn's brand.

Figure 46: Unlocking the Severn Logo and Summary of Findings from Focus Group

Source: Developed by Research Team & Severn Rivers Trust

All other negative reactions to the branding guide from the university students were due to the relationship to the target audience. Pastel colors currently in use as well as pebble shapes were viewed as "childish". This is not negative information, yet instead it confirms that the best ways to reach a target audience is to create different marketing tools for individual age groups, rather than one marketing campaign that is intended for all age groups. The 18-25 year old age cohort prefers branding that is modern and simple, using only a few colors that match the Unlocking the Severn logo.

5.3.2 Marketing

From participants of the focus group, we learned that 18-25 year olds could be marketed towards in a wide variety of ways. Email was said to be the best way to send information to university students. This is most likely due to the importance of email for university course work. With email being the most common form of communication between students and university professionals, students are frequently checking their emails for university updates. While the motivation for checking an email account may be for university reasons, university students still believe it to be the best way to be contacted regardless of the subject.

However, initial contact must be made with the audience being marketed before they can be contacted by email. The initial contact is arguably the hardest part of any marketing

campaign. With the target, age cohort of the Unlocking the Severn project being that of students aged 18-25 years old, this initial contact could be achieved through social media platforms. The results of the focus group state a preference for the application Instagram. The Unlocking the Severn project does not have an Instagram account at present. A quick outlet to create a point of contact with university aged students would be to simply create an account. Utilizing the currently active Unlocking the Severn Twitter account, linking posts on Instagram and Twitter together would be a starting point to establish any overlap in volunteers who use both platforms. While Twitter is not the favored social media platform amongst 18-25 year olds as a whole, it is still widely used throughout the age cohort. Utilizing these social media platforms would allow for visual representation that could attract potential volunteers of a younger age more effectively than a still email or poster. One participant stated that being able to "see the shad and their struggle would be useful" in reference to attracting volunteers. This is most likely due to the sympathy a person would feel watching a video showing struggling shad. The best method to market this visual media to 18-25 year olds is Instagram, in conjunction with the already in place Twitter account for the Unlocking the Severn Project.

5.3.3 Volunteering

The data gathered from the focus group, provided insight into the mindset of university students with respect to volunteering. Of the four participants, only one currently volunteers while studying at university. The main factor regarding whether or not a university student volunteers for an organization is level of interest. One participant even recommended to market strictly to those students who would be interested in the project. This idea of targeted marketing should be a starting point for marketing to university students. Taking advantage of the Volunteer Record put in place by the University of Worcester Students Union, the Unlocking the Severn project has an outlet to reach 18-25 year olds who are currently seeking volunteering opportunities. Other forms of reaching out to university students who may gain interest in the project would be to connect on social media with students in societies that are aligned with the values and goals of that of Unlocking the Severn. These may include the Nature, Geography, Biology, and History societies. From there on, volunteering can be marketed utilizing social media to be more interesting to 18-25 year olds using visual material.

5.4 Analysis of Monitoring Program Options

Many different aspects of the online program need to work together in order for the project to be successful. For the SRT to ensure that it will be an effective use of their time and resources they would like a proposal outlining the pros and cons of different options, as well as a final course of action. To develop this final recommendation we analyzed the different aspects needed and how the websites would be able to accomplish each one. In this section, we will discuss what the different scores on the Weighted Decision Matrix mean in context of the project.

5.4.1 Video Aspects

The most essential aspects of the website concern the ability to upload the SRT's videos for citizen-scientists to analyze. Zooniverse and WordPress/Squarespace scored very differently in this section, due to Zooniverse's limited customization and design options. First, we were unable to prove that uploading videos for the SRT would work with this platform unless the SRT purchased a Mac computer to communicate with the Zooniverse server. Zooniverse is currently testing how they can implement video uploading. Comparatively, we were able to easily prove that this is possible with both WordPress and Squarespace. What became apparent while testing the websites was that WordPress and Squarespace allowed for much more design customization than their counterpart does. However, this flexibility comes at the cost of increased complexity. Zooniverse was built as a platform for people with no experience with computers to be able to easily build their own projects. This contrasts greatly with the other two, which requires designers to have a background in HTML coding and website development to build a functional project. In this section, we almost eliminated Zooniverse from contention because of the video uploading issue, but decided that if the other aspects worked better than WordPress or Squarespace we would re-evaluate at the end.

5.4.2 Data Collection

Another important technical aspect of the website is how simple it would be to collect and display the data gathered from citizen-scientist users. If Zooniverse video uploading becomes a possibility, it would be very simple for the SRT to use the interface to collect data and validate user inputs because the platform would do all the computation automatically. We

developed sample websites that proves this concept is possible using both WordPress and Squarespace; however, it would be more complex to set up and would require someone skilled in website development. It is clear that Zooniverse would be preferable in this situation, dependent on the progress made with video uploading. The rest of this section leans toward Squarespace, due to the ability to add custom pages to a website instead of being forced to use Zooniverse's predetermined format and WordPress's requirement to use web development programming. The SRT would prefer a way to display the data collected to the public instead of keeping it for themselves. Zooniverse does not have a page dedicated for such information, so there would already need to be a separate webpage for data. Displaying graphs is very simple for most websites; Zooniverse is the outlier in this case. If Zooniverse alters to make video uploading possible, its built-in data collection would be simpler than using WordPress or Squarespace, but since this is not the case Squarespace is currently preferable.

5.4.3 Users

The majority of the SRT's funding for the Unlocking the Severn project comes from the Heritage Lottery Fund, and they are required to reach a certain number of people via the project to meet their funding proposal. Reaching a large audience is essential for the Unlocking the Severn project, which is a strength of the Zooniverse platform. Choosing WordPress or Squarespace would require the SRT to market their tool by themselves, instead of relying on the large Zooniverse network to supply their users. Public outreach is of utmost importance to the SRT, so tracking unique users and their progression is a must-have for the website tool. It is here again that Zooniverse falls short of its competitors. The major problem with Zooniverse in this context is that all users report their findings completely anonymously, giving the developer no way to track how many users are actually using the tool. For example, 25 people who each reviewed one video would look identical to one person reviewing 25 videos themselves. This is a significant problem for the SRT, considering how important outreach is to their funders. The SRT would also like the ability to contact people that use their tool, another impossibility in Zooniverse. As with the other sections, the flexibility of WordPress and Squarespace are more complex to utilize than Zooniverse but allow the tool to meet all of the SRT's requirements.

5.4.4 Miscellaneous

The last section of aspects really highlights the differences between the website tools. Essentially these aspects highlight how WordPress and Squarespace allow for more input from the developers to implement their designs, with complete control over each page of their website, but it would be easier for the SRT to make changes with Squarespace. In these parts, WordPress and Squarespace shine over Zooniverse because the latter simply cannot compete with the former's modular design. However, Zooniverse does show promise in the Website Maintenance and Cost aspects. Due to Zooniverse being an open platform maintained by a separate entity funded with grant money, the SRT would not have to worry about having to fix any bugs or other issues that that could arise. An entire team of web developers works for Zooniverse to maintain its infrastructure. In the case of WordPress, the SRT would be reliant on hiring a web developer to do all the development and maintenance of the website. Any issues with the monitoring tool would need professional assistance, but a website made with Squarespace could be edited by the SRT without help. The maintenance would increase costs initially and over the lifetime of the website as well. Zooniverse is completely free, an aspect that cannot be ignored. If the SRT plans to hire a web developer then Squarespace is the clear winner in this section, but if not then Zooniverse would be preferable in this context.

Chapter 6: Conclusions and Recommendations

The overarching goal of the project was to develop a set of recommendations for a marketing plan to increase the involvement of 16-25 year olds at the SRT, as well as to develop a set of options for an online fish migration monitoring platform. The following chapter details the main findings and recommendations the research team has provided for the SRT moving forward.

6.1 Conclusions

The research team has two main conclusions to discuss based on the collected data regarding the marketing campaign and fish migration monitoring website. First, as expected the marketing campaign will need to be multifaceted. This will allow for the marketing materials, which are used to be focused for each age cohort being recruited. This does not mean the development of an entirely new set of marketing materials; however, the SRT will be able to continue using the existing marketing materials to reach families and retired volunteers.

Secondly, it would be best for the fish migration monitoring website to be built and maintained using the Squarespace development platform. We came to this conclusion for a few key reasons. Squarespace allows for a large number of high-quality videos to be displayed by the SRT. The quality of video is important because the fish are very difficult to see in moving water with lower video qualities. This platform has also already been proven to work in a video monitoring program, as shown with the Mystic River Herring Project. In addition to the video aspects, Squarespace would also allow the SRT to create a login page for citizen-scientists before they can analyze any videos. Tracking the number and degree of engagement of users is highly important to the SRT so this feature is significant. The final reason we decided on Squarespace was because its intuitive user interface would allow the SRT to make changes to the pages and information displayed on their website without the need for anyone skilled in website development.

6.2 Recommendations

In this section, the team has summarized the findings from each objective and provided ideas to guide the SRT's decision making regarding the marketing campaign and fish migration monitoring website moving forward.

6.2.1 Marketing Campaign

As shown by the demographics of current volunteers at the SRT, it can be difficult to reach a younger audience when marketing for volunteering efforts. The data collected by the research team has been utilized to develop recommendations for a marketing campaign designed to attract volunteers between the ages of 16 and 25, a category the SRT has labeled "young people." These recommendations for a marketing plan based on data collected from research into this project's first three objectives.

Having a multifaceted marketing campaign will allow for different age groups to be targeted more directly. The current branding material used by the SRT for the Unlocking the Severn project appears to be designed to attract families with young children. This is a good marketing strategy, but will not have the desired effect on young people between the ages of 16 to 25. In order to remain cohesive with the family campaign subset, the young people campaign subset should still use the Unlocking the Severn logo, as it was popular among university students. This will showcase the SRT's uniform brand identity. When advertising towards individuals between the ages of 16 and 25, the SRT should utilize colors that match the Unlocking the Severn logo, instead of the pastel colors used in other branding materials. In addition, marketing materials for this age group should be less whimsical and should highlight the serious nature of the problem on the Severn. Recent college or university graduates are well aware of the problems and issues facing their society and are idealistic and willing to take on serious issues to the best of their ability. University students did not believe that the watercolor fish banner or the pebble shaped logo were effective at reaching an audience within their age group. The branding material aimed at 16 to 25 year olds should be simple in design as well as modern and clean. Utilizing different branding guides will enable the SRT to cater to each individual age cohort, while maintaining the use of the Unlocking the Severn Logo will create a sense of uniformity among the marketing materials.

The best way to directly reach young volunteers is through email. This is the primary marketing tool that should be included in the campaign. During the school year, students are most likely to check their emails and volunteer, indicating an indirect marketing strategy would be beneficial to reach young people outside of the school year. The indirect strategy should utilize Facebook as a majority of respondents surveyed selected Facebook as the best social media platform on which to receive volunteering and project updates. However, it is also necessary to spread to Instagram as the youngest cohort we surveyed, ages 14 and 15, were not keen on the use of Facebook or Twitter at all. Instagram is the best app to reach them because their geography classes already utilize Instagram pages for field trips and project updates. Additionally, Instagram was the second most popular social media platform among the other age cohorts. Utilizing this marketing for volunteering will allow for 14/15 year olds to become involved with the SRT and begin volunteering at a very young age.

The Instagram account should focus on posting pictures and videos that will help people understand the importance of the fish passes for the shad as well as the heritage of the river. An example of this would be to show a shad attempting to swim past a weir without a fish pass compared to a shad swimming past a weir with a fish pass. This will help people understand why the fish passes are so vital to the ecology of the river. Additionally, posts that focus on the construction of the weirs will update potential volunteers on the progress of the project, keeping them involved each step of the way.

In order to attract the greatest number of young people, a focus should be placed on wildlife and plant life volunteering as well as art and photography volunteering. These types of volunteering were chosen as the most interesting among the young people surveyed. Attracting young people to the SRT using these types of volunteering, will get them involved with the project. The active SRT and CRT volunteers explained that they became involved with the trusts after having physically seen the river, either as a volunteer lock keeper or on a trip with a school group. Being involved with a project on the river at a younger age will make people more inclined to volunteer as they get older. This will allow them to branch out to different types of volunteering in the future.

Another focal point of the campaign should place emphasis on the opportunity to socialize and meet new people. This motivation was popular among survey respondents ages 16-25. By marketing volunteering opportunities as fun events, you can take part in with friends,

while also helping the community; larger numbers of volunteers will be recruited. This can be combined with the fact that volunteers will have many educational opportunities and be contributing to science, the other two most popular motivations. If young people can see the benefits of volunteering before actually doing it, they will be more inclined to take part.

In order to specifically tailor the campaign toward university students, the SRT should focus their marketing on the volunteering record at the University of Worcester. A large motivating factor for university students is improving their CV. Marketing through the Students Union Volunteer Record will showcase the opportunity students have to set themselves apart from their peers. This would involve the SRT contacting the University of Worcester Students Union to inquire about including the Unlocking the Severn project in the volunteering opportunities on the website. This is a simple task involving registering an account with the Students Union and uploading volunteering opportunities. The Students Union also has an option for promoting your opportunities and projects. This involves posting A3 or A4 portrait posters in the Students Union building, having a stall space in the Students Union building to promote volunteering opportunities in person, and attending the Freshers' Fair to promote volunteering opportunities to new students. The best times for this subset of the marketing campaign are September through December and January through May as these are the terms students are in school. This promotion, alongside the direct and indirect marketing discussed above, will reach as many students as possible.

6.2.2 Fish Migration Monitoring Website

The SRT has planned to create a website where citizen-scientists can count fish to contribute to the shad migration monitoring. The research done regarding website design, functionality, and use has resulted in a plan of action for designing and maintaining the website based on the information learned from the previous objectives.

One of the most frequent points brought up in the focus group with university students is that the SRT needs to present a website with a tone appropriate for the issues facing the shad, while also making the migration tool engaging and enjoyable. To start, the front page of the website needs to pull people in and establish the themes of the project. During the focus group, some students brought up how the green and blue of the SRT logo highlights the land and water involved in the project. We decided to follow this and make the website emphasize those themes

by showing an image of water surrounded by land and having the green and blue colors prominently displayed, as shown in figure 47.

Figure 47: Example of Website Homepage

Source: Developed by Research Team

The students also had a few complaints about the Mystic River Herring website, and we attempted to address these by introducing a different method of counting the fish. We modeled this method of counting after the effective way that volunteers count fish in person. Instead of counting in their heads and then entering a number at the end of the video, we recommend using a counter that the volunteers click every time they see a fish. This way they are more active during the videos and less likely to get distracted. Shown in figure 48 below is an example of how we recommend the final product could appear.

Figure 48: Example of Shad Counting Tool on Website

Source: Developed by Research Team

In addition to the actual counting tool, the website can also be engaging by supporting a user rewards and leaderboard system. The students we spoke to were keen on the idea of a leaderboard so they could track their progress and compare it to that of their peers. We suggest instituting a leaderboard similar to the one in figure 49 below as one way of allowing volunteers to compete against each other.

Figure 49: Example of Website Leaderboard

Source: Developed by Research Team

Another way of recognizing users' progress on a more personal basis is to include a rewards system where volunteers earn new "badges." This system, employed by many different websites, gives users a sense of accomplishment when they reach a certain milestone. We recommend awarding the volunteers with a new badge once they have reported a certain number of shad, such as 100, 500, and 1,000 shad. These badges would be displayed on the user's profile page, and the user would be able to share their accomplishments on social media when they are awarded a new badge. Figure 50 shows an example of the profile page, while figure 51 shows what could be shown when the user earns a new badge.

Figure 50: Example of User Profile Page

Source: Developed by Research Team

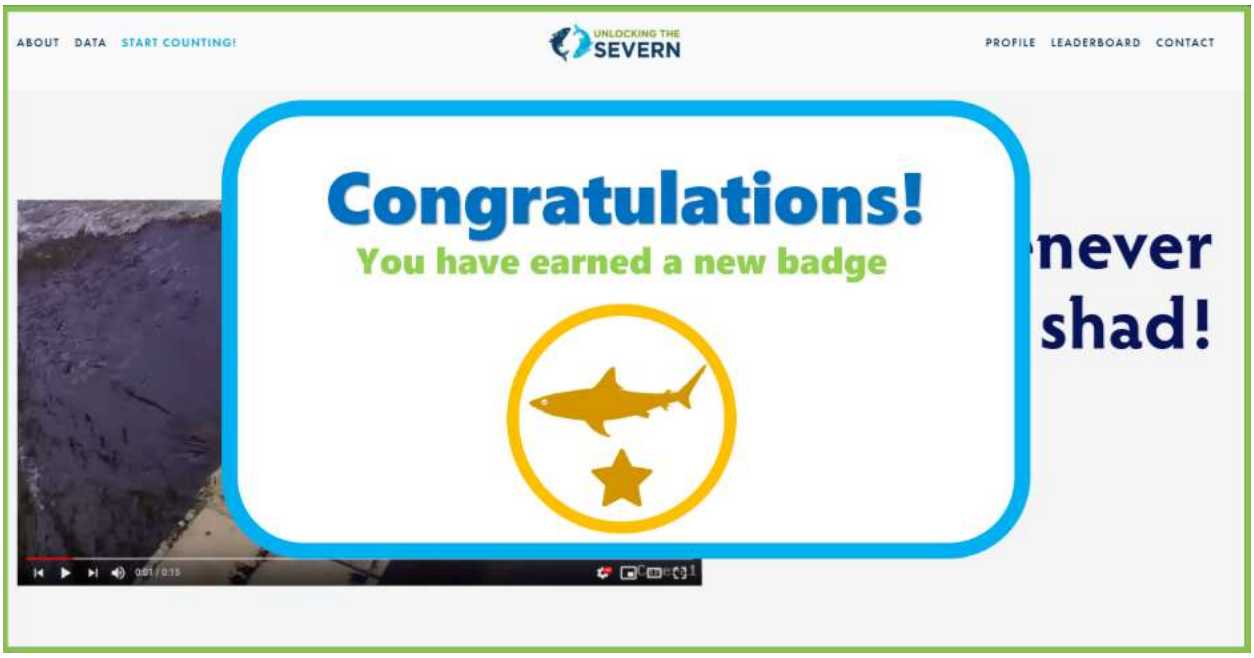

Figure 51: Example of New Badge Earned

Source: Developed by Research Team

A final recommendation we have for the SRT's website is to advertise it using Zooniverse. While exploring the website we saw a few projects that were not actually running on it, but rather hosted on a separate site. This method takes advantage of Zooniverse's free advertising to increase engagement of the project while still having complete control over how the website functions.

References

About the funders. (2014). Retrieved from http://severnriverstrust.com/projects/about-the-funders/

Alsever, J. (2008). What is crowdsourcing? Retrieved from https://www.cbsnews.com/news/what-is-crowdsourcing/

Canal & River Trust, Environment Agency, Natural England, Severn Rivers Trust. (2017). *Fisheries monitoring report 2017 & plans for scientific research*.

Canal & River Trust, Environment Agency, Natural England, Severn Rivers Trust. (2017). *Unlocking the Severn Full Consultation Report*.

Canal & River Trust, Environment Agency, Natural England, Severn Rivers Trust. (2017). *Volunteering Plan*.

Davis, S. K., Thompson, J. L., & Schweizer, S. E. (2012). Innovations in on-site survey administration: Using an iPad interface at national wildlife refuges and national parks. *Human Dimensions of Wildlife, 17*(4), 282-294. doi:10.1080/10871209.2012.673242

Domroese, M. C., & Johnson, E. A. (2017). Why watch bees? motivations of citizen science volunteers in the great pollinator project. *Biological Conservation, 208*, 40. doi:10.1016/j.biocon.2016.08.020

Environment Agency. (2018). Unlocking the river severn: Powick and knightsford. Retrieved from https://www.gov.uk/government/publications/unlocking-the-river-severn-powick-and-knightsford/unlocking-the-river-severn-powick-and-knightsford

Evans, L. (1988). The gift of the sea: Civil logistics and the industrial revolution. *Historical Reflections / Réflexions Historiques, 15*(2), 361-415.

Fixson, S. K., & Marion, T. J. (2016a). A case study of crowdsourcing gone wrong. Retrieved from https://hbr.org/2016/12/a-case-study-of-crowdsourcing-gone-wrong

Ganzevoort, W., Born, R., Halffman, W., & Turnhout, S. (2017). Sharing biodiversity data: Citizen scientists' concerns and motivations. *Biodiversity and Conservation, 26*(12), 2821-2837. doi:10.1007/s10531-017-1391-z

Glaser, B., & Holton, J. (2007). Remodeling Grounded Theory. Historical Social Research / Historische Sozialforschung. Supplement, (19), 47-68. Retrieved from http://www.jstor.org.ezproxy.wpi.edu/stable/40981068

Great pollinator project. (2014). Retrieved from http://greatpollinatorproject.org/

Harry, B., Sturges, K. M., & Klingner, J. K. (2005). Mapping the process: An exemplar of process and challenge in grounded theory analysis.*Educational Researcher, 34*(2), 3-13. Retrieved from http://www.jstor.org.ezproxy.wpi.edu/stable/3700040

Hydroacoustics and Sonar. Retrieved from http://www.fishtrack.co.uk/services/fisheries/hydroacoustics-sonar.html

Jungbok, H. (2015). Marketing strategies for nonprofit organizations. *Advances in Management, 8*(10), 1-5.

Kleffner, R., Flatten, J., Leaver-Fay, A., Baker, D., Siegel, J.,B., Khatib, F., & Cooper, S. (2017). Foldit standalone: A video game-derived protein structure manipulation interface using rosetta. *Bioinformatics (Oxford, England), 33*(17), 2765-2767. doi:10.1093/bioinformatics/btx283 [doi]

Maitland, P. S., & Hatton-Ellis, T. W. (2003). *Ecology of the allis and twaite shad* (Series No. 3 ed.) Life in UK Rivers.

Montella, R., Ruggieri, M., & Kosta, S. (2018). A fast, secure, reliable, and resilient data transfer framework for pervasive IoT applications. Paper presented at the *INFOCOM 2018 - IEEE Conference on Computer Communications Workshops*, 710-715. doi:10.1109/INFCOMW.2018.8406884

Peck, D. (2011). *Think before you engage : 100 questions to ask before starting a social media marketing campaign*. Hoboken: Wiley.

Penguin Watch. (n.d.) What happens to all of those clicks...? Retrieved from https://www.zooniverse.org/projects/penguintom79/penguin-watch/about/results

Price, B. (2002). Social capital and factors affecting civic engagement as reported by leaders of voluntary associations. *The Social Science Journal, 39*(1), 119. doi:10.1016/S0362-3319(01)00169-0

Randle, M., & Dolnicar, S. (2012). Attracting volunteers in highly multicultural societies: A marketing challenge. *Journal of Nonprofit & Public Sector Marketing, 24*(4), 351-369. doi:10.1080/10495142.2012.733668

Resistivity Fish Counter (logie 2100C). Retrieved from http://www.visadvies.nl/resistivity-fish-counter-logie-2100c

Salls, M. (2005). The tricky business of nonprofit brands. Retrieved from https://hbswk.hbs.edu/item/the-tricky-business-of-nonprofit-brands

Save our Streams. (2018). Conservation: Water. Retrieved from https://www.iwla.org/conservation/water

Severn Rivers Trust. (2017). Unlocking the severn. Retrieved from http://severnriverstrust.com/wp-content/uploads/2018/07/Unlocking-the-Severn-Newsletter-September-17.pdf

Siegel+Gale unveils new name and brand identity for tobacco control, non-profit: Truth initiative. (2015). *Health & Medicine Week*, , 4142. Retreived from: http://link.galegroup.com/apps/doc/A430656025/HRCA?u=mlin_c_worpoly&sid=HRCA&xid=f6755a6e

Staff. (2014). Retrieved from http://severnriverstrust.com/about/staff/

The American Red Cross. (2014) Brand identity at a glance. (2014). Retrieved from https://www.redcross.org/content/dam/redcross/atg/PDFs/BrandPoster.pdf

Trustees. (2014). Retrieved from http://severnriverstrust.com/about/trustees/

Twaite shad. (2018). Retrieved from https://canalrivertrust.org.uk/enjoy-the-waterways/fishing/fish-species/rare-and-protected-fish/twaite-shad

VA SOS quality assurance program. (2018). Retrieved from http://www.vasos.org/monitors-page/va-sos-quality-assurance-program/

Vertical Slot Fishway (2010) Retrieved September 7, 2018 from https://www.flickr.com/photos/usfwsnortheast/9444082913/

Willan, T. S. (1937). The river navigation and trade of the severn valley, 1600-1750. *The Economic History Review, 8*(1), 68-79. doi:10.2307/2590360

Yotopoulos, A.Three reasons why people don't volunteer, and what can be done about it. Retrieved from: http://longevity.stanford.edu/three-reasons-why-people-dont-volunteer-and-what-can-be-done-about-it/

Appendices

Appendix A: Sponsor Description

The SRT is an independent environmental not-for-profit charity. Its main goals are to preserve the bodies of water in the Severn catchment and educate the public about water protection and the environment. Currently the SRT is undertaking seven projects, all of which relate to their main goals. The project we will be working on is Unlocking the Severn. Its main focus is creating a pathway through weirs for various fish species, especially the twaite shad, and increase public knowledge of the heritage of the river.

The SRT has nine permanent staff members: an Education Officer, a Volunteer Officer, an Administration Officer, a Catchment Officer, two Project Officers, a Senior Project Officer, a Deputy Director, and a Chief Executive Officer (Staff, 2014). There are also the Chairman of the trustee's and two additional trustees (Trustees, 2014). The SRT partners with many other groups to increase the impact they can have across the Severn Region by increasing the groundwork that is being done. The SRT received funding from the Heritage Lottery Fund and the European Union LIFE Nature Programme for the Unlocking the Severn project (About the Funders, 2014).

Appendix B: Current Volunteer Interview Questions

Informed Consent Information:

We are students from Worcester Polytechnic Institute in Massachusetts and are here completing a project as part of our degree requirements. The research that we conduct will be published in our final report. We are working with the Severn Rivers Trust as our sponsor for this project to understand the motivations and perspectives of the volunteers currently involved in the Unlocking the Severn Project. We are inviting you to take part in this interview. This is entirely voluntary and you may opt out at any time, or skip any questions you do not wish to answer. This interview should take no longer than ten minutes. With permission, an audio recording will be taken during the interview and notes will be taken as well. The recording will be transcribed later and patterns in the responses of interviewees will be identified. Direct quotes from these interviews may be used as well. The identities of all interviewees will be kept anonymous in the final report submitted to the sponsor and submitted to the school. Feel free to ask about anything regarding the type of research we are conducting, the project itself, the questions we will ask in the interview, or anything else you are curious about. You may contact us, our advisor, or our university's IRB office via email at gr-uk-b18-severn@wpi.edu, jphanlan@wpi.edu, or irb@wpi.edu respectively.

Potential Interview Questions:

1. Could you describe your involvement with the Severn Rivers Trust or the Canal and River Trust?
2. Can you tell us about your past experience volunteering in general? For the Canal and River Trust/Severn Rivers Trust?
3. How did you initially get involved with the trust?
4. If applicable: What is the most rewarding part about being an educational volunteer?
5. What are some obstacles that could prevent you from volunteering?
6. What would make volunteering more enjoyable for you?
7. Is there any other type of volunteering that you would enjoy doing for the Canal and River Trust/Severn Rivers Trust?
8. What do you know about citizen-science campaigns?
9. Do you think a citizen-science campaign would spread awareness about projects at the Canal and River Trust and Severn Rivers Trust?What are some of your favorite aspects of volunteering with the SRT or Canal and River Trust?

Appendix C: Unlocking the Severn public consultation survey

The Severn Rivers Trust, in partnership with Canal & River Trust and the Environment Agency are working on a project supported by the Heritage Lottery Fund for the largest river restoration project of its kind in Europe. The project will re-open the mighty River Severn and its major tributary for fish and wildlife whilst reconnecting millions of people and local communities with the lost natural, cultural and industrial heritage of this magical river. For more information on the project: goo.gl/HDFFpu
It is important that our plans reflect the views of a range of community groups and individuals. We'd like to hear what you have to say.

8. Do you think heritage of the Severn is important?

- ❑ Yes
- ❑ No
- ❑ No Opinion/ Not Sure
- ❑ Why?_____

9. What aspect of the Severn's heritage most interests you? Please rate the following options from 1 to 5 (1 being not at all interesting to 5 being really interesting)

Industrial heritage_____
Wildlife and plant life_____
Water cycle_____
Social history_____

10. How would you prefer to have the heritage of the River Severn presented to you? Please rate the following options from 1 to 5 (1 being not at all interesting to 5 being really interesting)

Website/portal about
the Severn and its heritage_____

Interactive/computer
touch screen _____

Information boards_____

Audio (speech/music/sound effects)_____

Digital apps_____

Temporary/ touring
exhibitions on a range of
heritage topics _____

Talks/tours led by experts_____

Heritage tour information
you can download free of charge_____

Family fun workshops/
creative arts sessions_____

Drama/performance activities_____

Special/themed events and festivals_____

11. What aspects of the Severn's heritage would you like to know more about/see and hear?

- ❑ Archive maps
- ❑ Information about the species, wildlife and plantlife that the river supports
- ❑ Archive photos
- ❑ Displays of archive items/museum objects
- ❑ Screening of archive films
- ❑ Other (please specify)

12. There will be a range of exciting volunteer opportunities available as part of the project. Which of these volunteering activities might be of interest to you? (Tick all that apply)

- ❑ Helping with running activities in the community
- ❑ Taking part in 'citizen scientist' sessions-monitoring the project's impact
- ❑ Assisting in delivering workshops and activities as part of a heritage programme to schools or community groups
- ❑ Historical research
- ❑ Marketing, website updates and social media
- ❑ Leading guided tours or heritage walks
- ❑ Recording oral history interviews
- ❑ Helping to organise or steward events
- ❑ Giving talks on relevant topics
- ❑ Helping to put together temporary exhibits and displays
- ❑ Surveying and monitoring wildlife
- ❑ River conservation activities
- ❑ Other (please specify)

13. Tell us more about how you use social media and find out about news and events. Do you engage with any of the following communications channels? (Tick all that apply)

- ❑ Facebook
- ❑ Twitter
- ❑ Instagram
- ❑ YouTube
- ❑ Pinterest
- ❑ Snapchat
- ❑ Whats App
- ❑ Google+
- ❑ Google Search
- ❑ Local newspapers (on a weekly basis)

- ❑ Local newspapers (not every week)
- ❑ Local newspapers online (on a weekly basis)
- ❑ Local newspapers online (not every week)
- ❑ National newspapers/magazines (on a weekly basis)
- ❑ National newspapers/magazines (not every week)
- ❑ Local radio
- ❑ National radio
- ❑ Local television
- ❑ National television
- ❑ None of the above
- ❑ Other (please specify)

16. Please specify your age group

- ❑ Under 18
- ❑ 18-25
- ❑ 26-30
- ❑ 31-40
- ❑ 41-50
- ❑ 51-60
- ❑ 61-70
- ❑ 71+

Appendix D: Potential Volunteers Preferences Survey

Informed Consent Information:

This survey was written by university students working with the Severn Rivers Trust. We are hoping to understand the attitudes of young people towards volunteering so we can make volunteering activities interesting for 16-18 year olds. This survey is entirely anonymous and voluntary and you may opt out at any time, or skip any questions you do not wish to answer. This survey should take no longer than 10 minutes. Feel free to ask about anything regarding the survey. You may contact the university group, their advisor, or their university's IRB office via email at gr-uk-b18-severn@wpi.edu, jphanlan@wpi.edu, or irb@wpi.edu respectively.

Volunteering Questions:

1. Define volunteering in your own words:

2. Do you regularly volunteer?

- ❑ Yes, please answer questions 3-7
- ❑ No, please answer questions 8-10.

3. How often do you volunteer?

- ❑ More than once a week
- ❑ Once a week
- ❑ Every other week
- ❑ Once a month
- ❑ Every other month
- ❑ 3-5 times a year
- ❑ 1-2 a year

4. How long do you volunteer for?

- ❑ < 1 hour
- ❑ 1-2 hours
- ❑ 3-4 hours
- 4-5 hours
- ❑ >5 hours

5. When volunteering in general, do you come with a group of people?

- ❑ Never
- ❑ Occasionally
- ❑ About half the time
- ❑ Most of the time
- ❑ Always

6. What types of volunteering activities do you enjoy?

7. What is your favorite thing about volunteering?

- ❑ Helping the environment
- ❑ Contributing to science
- ❑ Improving self worth
- ❑ Educational opportunities
- ❑ Socializing
- ❑ Getting outside
- ❑ Other, please specify_____

8. Which of the following prevent you from volunteering? ***Check all that apply***

- ❑ Lack of time
- ❑ The site is too far away
- ❑ Not knowing when/where
- ❑ No projects of interest to me
- ❑ Other, please specify_____

9. What activities would you want to do when volunteering?

10. Which of the following would encourage you to volunteer?

- ❑ Helping the environment
- ❑ Contributing to science

- ❑ Improving self worth
- ❑ Educational opportunities
- ❑ Socializing
- ❑ Getting outside
- ❑ Other, please specify_____

Photo Questions: Please answer the following questions based on how much you agree with the given statement.

1. I would like to participate in citizen science volunteering. See photo 1.
- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

2. I would like to participate in practical conservation volunteering. See photo 2.
- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

3. I would like to participate in historical preservation volunteering. See photo 3.
- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

4. I would like to participate in community engagement volunteering. See photo 4.
- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

Social Media questions:

1. Please rank the following social media platforms from 1-9, 9 being the best

__ Instagram
__ Snapchat
__ Twitter
__ Facebook
__ WeChat
__ Youtube
__ WhatsApp
__ Google+
__ Pinterest

2. On which social media platforms would you prefer to see community project updates? ***Check all that apply***
- ❑ Instagram
- ❑ Snapchat
- ❑ Twitter
- ❑ Facebook
- ❑ Youtube
- ❑ WhatsApp
- ❑ Google+
- ❑ Pinterest
- ❑ WeChat
- ❑ Other: _____

3. What draws your attention to a post online?

Demographic Questions: The following questions are optional. They will be used to help us understand our potential audiences and make events as inclusive and accessible as possible.

I identify as:
- ❑ Male
- ❑ Female
- ❑ Non-binary
- ❑ Transgender
- ❑ Prefer not to say

Do you consider yourself to have a disability?

- ❑ Yes, if you would not mind, please specify:
  _____
- ❑ No
- ❑ Prefer not to say

Ethnicity

- ❑ Please Specify:
  _____
- ❑ Prefer not to say

Age

- ❑ Under 16
- ❑ 16-18
- ❑ 19-20
- ❑ 21-22
- ❑ 23-25
- ❑ Over 25

Photo 1: Here you can see volunteers taking part in citizen science.

Photo 2: Here you can see volunteers participating in river cleanup, a type of practical conservation.

Photo 3: Here you can see the type of materials volunteers working on historical preservation through archival research would find.

Photo 4: Here you can see volunteers working on improving community engagement.

Appendix E: Posters for Volunteering Preferences of 14/15 Year Olds

Stamp on the photo of volunteering you are most interested in!

Practical Conservation 	Art and Photography 
Citizen Science 	Archival Research 

Please stamp on your favorite and least favorite social media platform! Green for your favorite and red for your least favorite.

		
		
		

Please stamp by the three activities you do the most by a river.

		
		
		

Appendix F: Marketing Focus Group Volunteering Survey

Informed Consent Information:

This survey was written by university students working with the Severn Rivers Trust. We are hoping to understand the attitudes of young people towards volunteering so we can make volunteering activities interesting for university students. This survey is entirely anonymous and voluntary and you may opt out at any time, or skip any questions you do not wish to answer. This survey should take no longer than 10 minutes. Feel free to ask about anything regarding the survey. You may contact the university group, their advisor, or their university's IRB office via email at gr-uk-b18-severn@wpi.edu, jphanlan@wpi.edu, or irb@wpi.edu respectively.

Volunteering Questions:

Define volunteering in your own words:

Do you regularly volunteer?

- ❑ Yes, please answer questions 1-5
- ❑ No, please answer questions 6-8.

1. How often do you volunteer?

- ❑ More than once a week
- ❑ Once a week
- ❑ Every other week
- ❑ Once a month
- ❑ Every other month
- ❑ Twice a year
- ❑ Once a year

2. How long do you volunteer for?

- ❑ < 1 hour
- ❑ 1-2 hours
- ❑ 2-3 hours
- ❑ 3-4 hours
- ❑ >4 hours

3. When volunteering in general, do you come with a group of people?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Always

4. What types of volunteering activities do you enjoy?

5. What is your favorite thing about volunteering?

- ❑ Helping the environment
- ❑ Contributing to science
- ❑ Improving self worth
- ❑ Educational opportunities
- ❑ Socializing
- ❑ Getting outside
- ❑ Other, please specify_____

6. Which of the following prevent you from volunteering? ***Check all that apply***

- ❑ Lack of time
- ❑ University schedule conflicts
- ❑ The site is too far away
- ❑ Not knowing when/where
- ❑ No projects of interest to me
- ❑ Other, please specify_____

7. What activities would you want to do when volunteering?

8. Which of the following would encourage you to volunteer?

- ❑ Helping the environment
- ❑ Contributing to science
- ❑ Improving self worth
- ❑ Educational opportunities
- ❑ Socializing
- ❑ Getting outside

❑ Other, please specify_____

Photo Questions: Please answer the following questions based on how much you agree with the given statement.

1. I would like to participate in citizen science volunteering. See photo 1.
- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

2. I would like to participate in practical conservation volunteering. See photo 2.
- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

3. I would like to participate in historical preservation volunteering. See photo 3.
- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

4. I would like to participate in community engagement volunteering. See photo 4.
- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

Social Media questions:

1. Please rank the following social media platforms from 1-9, 9 being the best

__ Instagram
__ Snapchat
__ Twitter
__ Facebook
__ WeChat
__ Youtube
__ WhatsApp
__ Google+
__ Pinterest

2. On which social media platforms would you prefer to see community project updates? ***Check all that apply***
- ❑ Instagram
- ❑ Snapchat
- ❑ Twitter
- ❑ Facebook
- ❑ Youtube
- ❑ WhatsApp
- ❑ Google+
- ❑ Pinterest
- ❑ WeChat
- ❑ Other: _____

3. What draws your attention to a post online?

Demographic Questions: The following questions are optional. They will be used to help us understand our potential audiences and make events as inclusive and accessible as possible.

I identify as:
- ❑ Male
- ❑ Female
- ❑ Non-binary
- ❑ Transgender
- ❑ Prefer not to say

Do you consider yourself to have a disability?

- ❑ Yes, if you would not mind, please specify: _____
- ❑ No
- ❑ Prefer not to say

Ethnicity

- ❑ Please Specify: _____
- ❑ Prefer not to say

Age

- ❑ Under 16
- ❑ 16-18
- ❑ 19-20
- ❑ 21-22
- ❑ 23-25
- ❑ Over 25

Appendix G: Transcription of Volunteer Interview

Nicole: We have a few questions about your involvement with the Severn Rivers Trust.

Respondent: Okay

N: So, all of the responses that you give will be anonymous and if you have any questions about the questions that we're asking, feel free to just stop us and ask.

R: Okay

N:We were wondering, what are some of your favorite aspects of volunteering with the Severn Rivers Trust?

R: Okay, well maybe if I just tell you my background and why I'm quite passionate about the Severn really. I used to be the chair of a body that is called the Severn and Wye Regional Flood and Coastal Committee. It's a body that is set up through the Flood and Water Act, a government act and I was the chair of that committee for the region for 6 years. I retired from that role in June and, so I wanted to do something that allowed me to keep my connection with the river and its environment really. I was born very close to the River Severn in Shrewsbury and I used to swim in the river as a young person and so I have a very strong sense of the place that I live in and my connection to the river really and its whole environment. So, this, given that I'm older and have more time with a very- it seemed like a very good fit for me to volunteer with and do things with the Severn Rivers Trust. Does that help?

N: Oh, yes. Thank you. What projects have you helped out with at the Severn Rivers Trust?

R: Well, I've had a connection with the Severn Rivers Trust even when I was working as the chair of the Severn and Wye Regional Flood and Coastal Committee. And, so {name} the chief executive and I used to meet regularly to talk about what plans we had, what work we were going to do through our various roles. And, so I've had quite a long connection however, I'm a very recent volunteer for the Trust, only since the first of October that I became a trustee.

{Name} asked me if I would consider becoming a trustee and I said that I would like to wait a couple of months to make sure it's what I wanted to do after I retired and I went to one of their meetings and decided it's something I very much wanted to do. So, in my role as trustee it's to help consider the governance of the trust, to work with the staff to ensure that we're doing the best we can for the River Severn to help maybe. One of the things I've helped {name} with is putting together funding bids to bid for money to undertake projects on the Severn, nothing quite so big as Unlocking the Severn. That was a very big bid, but other bids we've got on some of the tributaries of the River Severn to enhance the environment and improve water quality. So that's one of the things I do, and I hope to get more involved as time goes on. But the other thing that I do is, I used to be a lecturer in environmental science and geography before- quite a while ago, about 15 years ago. And I used to teach water quality about water quality and how to use aquatic invertebrates to monitor water quality. So, it made sense for me to have the formal training through the Severn Rivers Trust- I don't know if you've met [name] while you've been there who trains people to monitor the river flies in particular sites on the river severn and its tributaries. I've now had formal training so another member of the riverfly monitoring groups and I have chosen a site in Shrewsbury that we are going to monitor once a month. That's quite a long description, is that okay?

N: Oh, yeah. Could you give us an estimate of about how much time you spend helping out the Severn Rivers Trust.

R: Okay, at the moment it's not a great deal. It's probably maybe one or two days a month, but as I've only just begun, I expect that might increase over the next few months and would expect it to maybe be two or three days a month. So, it's not, not a huge amount, but it's how I can help while working with them to do various aspects of supporting the trusts work.

N: Okay
R: So, some of it's practical in terms of going out and actually doing monitoring, some of it's maybe back online looking at documents, checking documents, proofreading things that are less obvious in terms of volunteering.

N: Okay, we have another question, what do you know about citizen science campaigns? It's okay if you don't really know.

R: Citizen science?

N: Yes

R: Quite a lot.

N: Oh, good.

R: In fact, just at the moment with the university center in Shrewsbury and with Shropshire Wildlife Trust we are trying to develop an app for enable groups of just ordinary people who are interested in water quality to be able to do water quality monitoring and record their results more easily. Because, there are lots of groups doing that kind of work but they have to write it down on paper and then maybe scan it or transpose it into an excel file or something like that and then send it off. We are trying to develop an app which would allow them while they're on site to put their results their recordings in, that might be a photograph, it might be some information on if the see a pollution event or oil on water, or it might be if they're doing some water chemistry monitoring how they could put that into information into the app, and also the riverfly monitoring information how they could put that information into the app. And it can go straight to the environment agency or to the cloud so all of the data can be collected in a similar way. In order for that information to be looked at by various groups and it would be open access information. So, really to try and help all that information be recorded in a standard way. So, I'm very much for citizen science because I think it's a fantastic way of getting people interested in their environment but also to get more and more data that we can actually look at, but not at one point. Say they are monitoring every month, then we can look at long term change as well. So looking at changes in the environment, whether some of the things we do help to improve water quality. And if people can get involved in that and I've seen some fantastic citizen science work being done in Telford, in some of the water bodies there and some really great work so I think it's really important and helpful.

N: Yeah, so our project actually has a big portion of it is about trying to create a citizen science network for the shad migration monitoring.

R: Yeah, okay.

N: So how far along is the app for water quality monitoring?

R: It's in the process of being developed. So, we've done a lot of the thinking behind it and the storyboarding of what we're wanting to go into the app and mocking up some ideas of what would go into the app. And it's just gone out to tender- do you understand tendering processes for small companies to bid who actually develop the ideas into reality. So we have it all down on paper, we've thought about what happens when, and if they find a problem how it can go straight to the environment agency to warn them that there is an issue somewhere if someone sees a pollution event for example. So we've done all the thinking about how it will work, now it's actually just gone to a company, a small company in Shropshire to be developed into reality, into the actual app. Then it would obviously have to go to apple and to android to be okay-ed as an app because you have to submit it and it has to be looked at. But at the moment it's still in the development. The thinking has been done, now it's just about actually making it work at the moment.

N: Oh, interesting. So do you have any thoughts on how you're going to spread awareness of that app to the groups that would use it?
R: Yes. Yeah, we do actually. That's part of the reason Shropshire Wildlife Trust is involved at the moment. But, we're also -have you heard of the catchment based partnership approaches and the catchment partnerships while you've been working with the Severn Rivers Trust?

N: No

R: Okay, around England there are things called catchment partnerships that bring all different people together. So, it could be Wildlife Trusts, English Nature, Environment Agency, the rivers

trust, it could be local landowners, farmers to come together to think about the area in which they live and how they can work within the catchment to enhance the environment. And, we're hoping a lot of this app will go to the catchment partnerships and so we'll raise awareness there. But, also very locally in Shropshire, as almost like a trial group, there are already some citizen science groups working on a project called Love your Rivers, Love your Rivers Shropshire, Love you Rivers Telford. We are going to ask those groups, who are already doing some monitoring already and putting it into excel spreadsheets or things like that we're gonna ask them if they would trial the app for us once its produced. We're hoping that will be done by sometime early in the new year, perhaps by April time next year that we might have the app- as long as it's been okay-ed through apple and android, to go, good to go. Then we can take it to these groups as our first trial if you like and to give it a go. The groups are already established and they can give us feedback on it and if we need to change anything and upgrade it and do things to it. And then we hope the catchment partnerships, we can give some feedback and present about it so that they will perhaps encourage others to use it. So we're hoping that it will slowly, we're not in any great rush, we're starting small locally in Shropshire and then maybe with the Rivers Trust with the catchment partnerships to spread and to give to other people who are doing monitoring. So it will be a bit like osmosis, very quietly and it will obviously be free to use and free to interrogate the data all being well. If it works, we have to cross our fingers.

N: Well, those are all the questions that we had. Did you have any questions for us?

R: Because I've come from an academic background, I used to work at the University of Wolverhampton and Aston University which is in Birmingham, I'm just interested how you came to come on placement from Cana- are you in Canada or the US?

N: The US

R: Ah ha, how did you come to come from the US to over to the UK to do some of your studies.

N: So our university has what's called an Interactive Qualifying Project and so we are working on our project abroad, which they have, I think 26 different project sites in various countries. So

we were given the choice of various locations, and we all chose Worcester, England. And then among this location, there were four different projects, and we all chose the Unlocking the Severn Project.

R: Okay, okay. Are you linked to Worcester University or are you just linked to the Severn Rivers Trust?

N: We're living in university housing, but technically we're not students. So, we are just linked to the Severn Rivers Trust.

R: Okay, nice. What are you studying in the US? What sort of subject area?

N: We're all engineering majors

R: Oh, you're engineering, you're not environmental!

N: No

R: Alright, that's quite different then.
N: Yeah

R: So is some of your interest about things like removing the weirs and things like that? So restoration of the river, the engineering side of things?

N: We're really interested in it, but because this is a social science project we don't really get to be involved with that.

R: Okay, so how are you finding it? Is it interesting?

N: It's really interesting. We've learned so much about just the construction of the weirs and the history. We've learned a lot about fish .

R: Right! That's good, that's good, because that's what the project is about. And how many of you are there? Is there a few of you here?

N: There are four of us in the Unlocking the Severn group, but then there's actually 16 of us from Worcester, MA that are here.

R: Okay, are you having a good time? That's the main thing.

N: yeah, I'd say so. It's really different.

R: How long are you here for?

N: We're here until the 15th of December.

R: Okay, oh a little while yet then, but you'll be home for Christmas so that's a good thing.

N: Yes

R: Really, I was just interested in what you're doing. I'm glad to hear about it and I'm glad you're having fun. If you think of any other questions, do feel free to drop me an email. If you need anything clarified that I've talked about or haven't got a clue what I was talking about do feel free to drop me an email or give me another call or something.

N: Okay, thank you very much!

R: You're very welcome and I hope it's helpful.

N: Thank you

R: Thank you Nicole, Bye.

Appendix H: Educational Volunteer Responses

Educational Volunteer 1

1. **Could you describe your involvement with the Canal and Rivers Trust?**

Education volunteer, teaching canal history, water safety and life of canal folks both in school and by canal/riverside.

2. **Can you tell us about your past experience volunteering in general? For the Canal and Rivers Trust?**

I've done voluntary language teaching in schools, primary and secondary for many years; 1 day a week before I retired, now most days. I've been doing CRT for about 5 years in Birmingham, Hatton and Worcester.

3. **How did you initially get involved with the trust?**

On a school visit to Birmingham canal with the primary school in Somerset where I work.

4. **What is the most rewarding part about being an educational volunteer?**

This is huge! Personally I find it wonderful working outdoors meeting new people - adults and children alike - and sharing my interest. I think greatest value is that children are learning in a fresh 'real life' environment from adults they have never met before. I think this has a number of benefits. They are learning in context. They are learning from people who are effectively strangers from a wide spectrum of backgrounds, who in most cases are older than their teachers. I'm pretty sure that often, children who shine on these visits are not necessarily the ones who shine in school. I think it offers the children fresh opportunities for learning.

5. **What are some obstacles that could prevent you from volunteering?**

For me none. Some people might be put off by the responsibility, especially working in potentially dangerous areas like locks. We certainly have to take this very seriously.

6. **What would make volunteering more enjoyable for you?**

Time constraints are sometimes against us and some locations lack facilities for bad weather.

7. **Is there any other type of volunteering that you would enjoy doing for the Canal and Rivers Trust?**

Possibly canal restoration.

8. **What do you know about citizen-science campaigns?**

Nothing I'm afraid.

9. **Do you think a citizen-science campaign would spread awareness about projects at the Canal and Rivers Trust?**

I guess so but I don't know what's involved. Sounds interesting.

Educational Volunteer 2

1. Could you describe your involvement with the Canal and Rivers Trust?

I am a volunteer lock keeper which involves helping boaters through the locks at Diglis on the Worcester & Birmingham Canal down on to the River Severn. I also give them local information about moorings, local facilities, shops etc. I talk to pedestrians and visitors to the locks about the history, wildlife and purpose of the canal. Also I tell them about the work of the CRT. I work with CRT Explorers on the canal & riverside giving school children information about the Canal, the River, water safety, the local wildlife and the industrial history of the area

2. Can you tell us about your past experience volunteering in general? For the Canal and Rivers Trust?
I was a Samaritan for about 10 years, listening to the suicidal, bereaved and depressed. I was on the primary school Parent Teachers Association and Governors. A governor and Chair of Governors at my daughter's High School. For the Canal and Rivers Trust? Lock keeper and Explorer.

3. How did you initially get involved with the trust?
As a lock keeper

4. What is the most rewarding part about being an educational volunteer?
Helping children understand how the canal and river work, the history, wildlife and the future and green issues around the waterways.

5. What are some obstacles that could prevent you from volunteering?
There are no obstacles.

6. What would make volunteering more enjoyable for you?
Avoiding meetings and anything indoors.

7. Is there any other type of volunteering that you would enjoy doing for the Canal and Rivers Trust?
Quite happy with my role.

8. What do you know about citizen-science campaigns?
I have never hear of them.

9. Do you think a citizen-science campaign would spread awareness about projects at the Canal and Rivers Trust?
Probably.