

# Connecting the Teachers of Victoria with Wildlife Conservation Partners

An Interactive Qualifying Project Report  
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## **Abstract**

We created a hi-fidelity prototype of a web application that will connect teachers with local conservation groups and provide them with real-world learning opportunities in collaboration with Zoos Victoria. Through conducting questionnaires and feedback forms with teachers, we determined what users desired most in this application while also ensuring simplicity and creativity. Our application, which we designed to integrate into the Statewide Integrated Flora and Fauna Teams (SWIFFT) website, will address the need for a platform that can both aggregate wildlife conservation classroom resources and meet the needs of busy teachers.

# Executive Summary

Australia is one of the most biologically diverse nations on Earth with over one million species of plants and animals, many of which do not exist anywhere else in the world. Due to Australia's rich and unique biodiversity, wildlife conservation organizations stress the need to minimize any threats to biodiversity by promoting conservation initiatives. To aid them, one solution is to foster wildlife conservation education in the classroom. Wildlife conservation education is necessary to teach people about the best practices to protect wild species and their habitats in order to prevent them from going extinct. In fact, several studies suggest that there is a significant correlation between the level of environmental knowledge and the degree of pro-environment and conservation behavior. Thus, learning about wildlife conservation at an early age has the potential to inspire students to become further involved with conservation efforts later in life.

Our sponsor, Zoos Victoria, is a not-for-profit wildlife conservation organization that works to fight animal extinction both locally and globally. In addition, Zoos Victoria aims to be part of every Victorian child's education and stresses the importance of utilizing real-world learning to teach students about wildlife conservation efforts. Teachers struggle with developing relevant and engaging conservation lessons for their students because of the effort and time commitment it requires. There is a need to support these teachers in this process of finding resources to increase wildlife conservation discussions in the classroom. The goal of this project is to support Zoos Victoria's initiative to provide real-world learning opportunities to students and to raise awareness for wildlife conservation in the state of Victoria. Our team accomplished this by developing a **web application** that connects school teachers with local conservation groups and provides them with educational activities. Our sponsor identified a potential host for our application within the existing website of one of their partners, the Statewide Integrated Flora and Fauna Teams (SWIFFT), which is managed by the Centre of e-Research and Digital Innovation (CeRDI). The SWIFFT website has extensive wildlife conservation resources, but is mainly designed for scientists. We propose implementing our web application into the existing SWIFFT website, which allows us to utilize the extensive conservation resources already available on the SWIFFT website while also making the site more accessible to teachers.

## Project Development Process

Figure 1 illustrates the overall project development process we followed to complete our project of making a web application that integrates with the SWIFFT website through a Teacher Tab. First, we assessed the needs of teachers to create a list of initial specifications for the application. Next, we developed a mockup of the application following these initial specifications. We then assessed the design and feasibility of the application and made changes in response to this feedback. Lastly, we developed plans to aid the future development of our application.

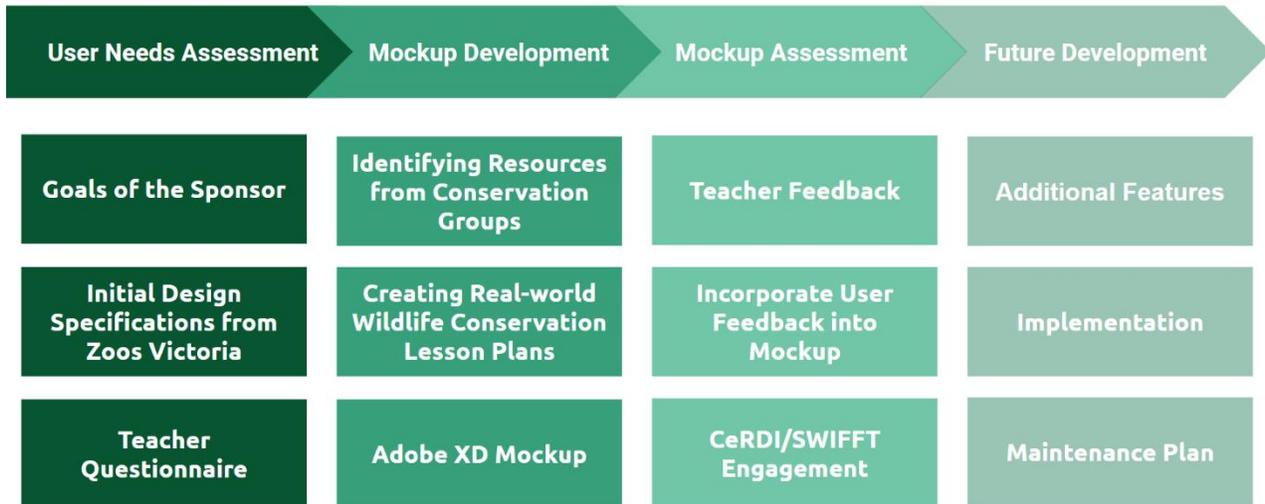


Figure 1. Project Development Process

### User Needs Assessment

We synthesized a list of features that teachers desire in the application from qualitative data in the form of initial specifications presented by Zoos Victoria and our American school teacher questionnaire. From this list, we identified a total of six essential requirements for our application:

1. Categorise the needs of school teachers
2. Provide quick and easy access to conservation information
3. Create relationships within the community
4. Identify local organizations that offer programs to engage students
5. Share information and advice with other teachers
6. Provide information about their local natural environment and projects

We considered these requirements in the application design process in order to build a platform that appeals to the future users: school teachers.

### Mockup Development

The final design of the application that meets the needs expressed by teachers consists of three main components, as seen in Figure 2:

- Explore Resources
- My Workspace
- Community

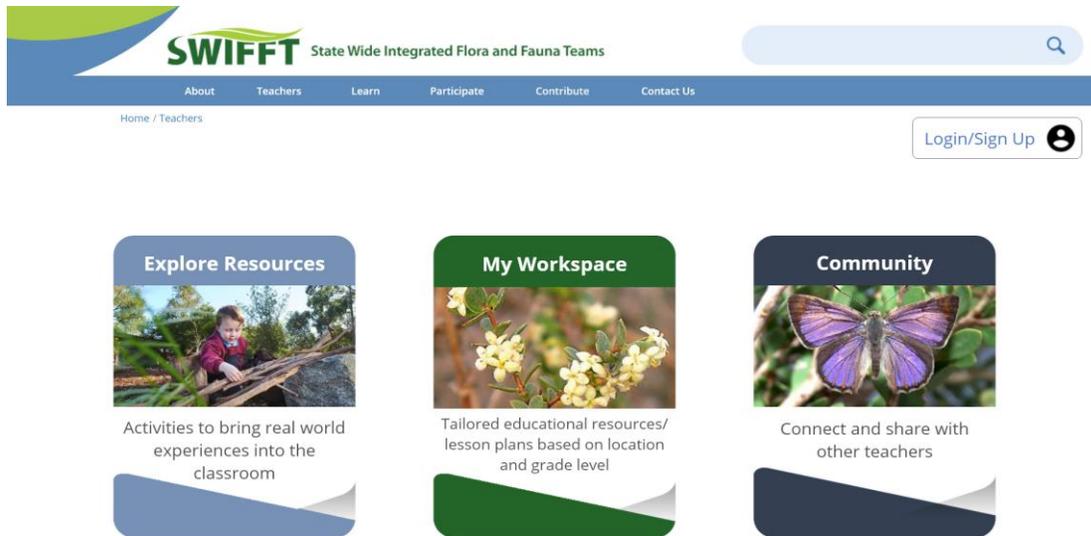


Figure 2. Homescreen of Proposed Teacher Section

The **Explore Resources** page, as shown in Figure 3, is the most prominent of our proposed features and the one that teachers will utilize the most. This page serves as an area for teachers to easily search for resources of many different categories:

- Real-world Learning Opportunities
- Lesson Plans
- Classroom Activities
- Citizen Science Initiatives
- Threatened Species Information

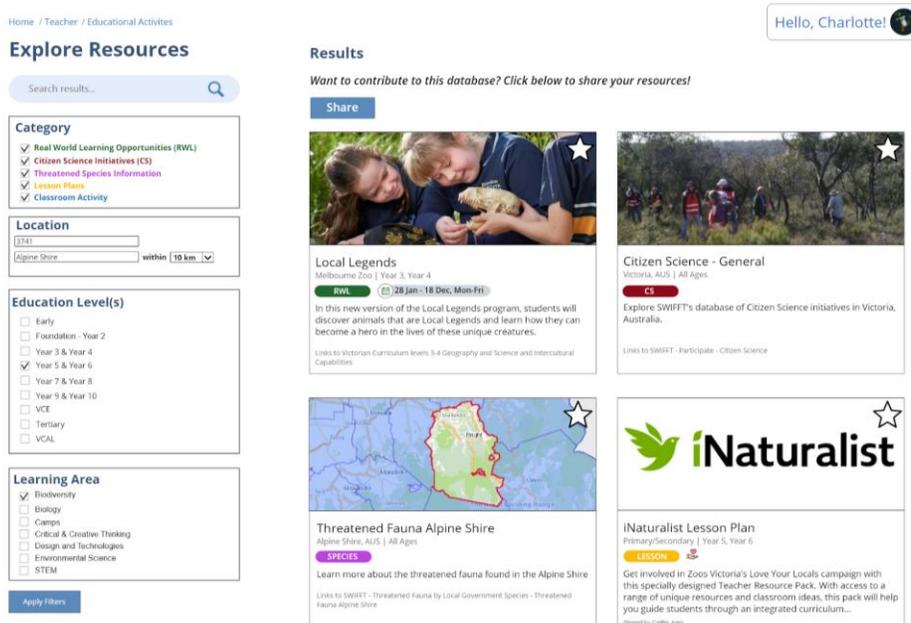


Figure 3. Explore Resources Page

Teachers can filter the list of resources displayed on the right side of their screen by using the extensive filter options presented on the left side. They can filter resources by category, location, education level, and learning area. Additionally, there is a search bar above the filter options that allows teachers to enter custom criteria to help them find the exact type of resource they are searching for. Each resource displays its name, description, category, and educational level. Teachers can click on each resource’s picture to navigate to that resource’s page containing more extensive information about it as well as additional related resources. We identified resources from conservation groups and created several lesson plans for the web application to serve as examples for teachers who want to upload their own. Teachers can add new resources to this page by clicking the share button located above the list of resources. In addition to sharing resources, teachers can also save resources to their My Workspace page by pressing the star button located in the top right corner of each resource preview.

The **My Workspace** Page, as seen in Figure 4, allows teachers to view and organize their favorite resources that they discovered from the Explore Resource page. The page organizes resources by category inside one of four collapsible sections. Teachers can further organize their favorite resources by creating new folders on the left side of the screen. Teachers can move resources into these folders by pressing the folder icon to the right of a resource and then selecting the folder they wish to move the resource into. Additionally, teachers can download resources from this page by pressing the download icon associated with it or they can remove it from their workspace by pressing the gold star icon.



Figure 4. My Workspace Page

The **Community** page, as seen in Figure 5, is a place where teachers and other community members can communicate to exchange their ideas and experiences regarding incorporating conservation issues in the classroom. Teachers can sort the results of this page by selecting categories on the left-hand side of the screen and pressing the “Apply Filter” button. Teachers can make new posts by clicking the “Create Post” button located above the list of forum posts to

communicate directly with other teachers and conservation organizations. Teachers can then respond to the post by typing their response in the comment text box below and pressing the “Comment” button. All comments appear directly below the post for others to respond to. Teachers can also save Community posts to the My Workspace page by pressing the “Save” icon below the body of the post.

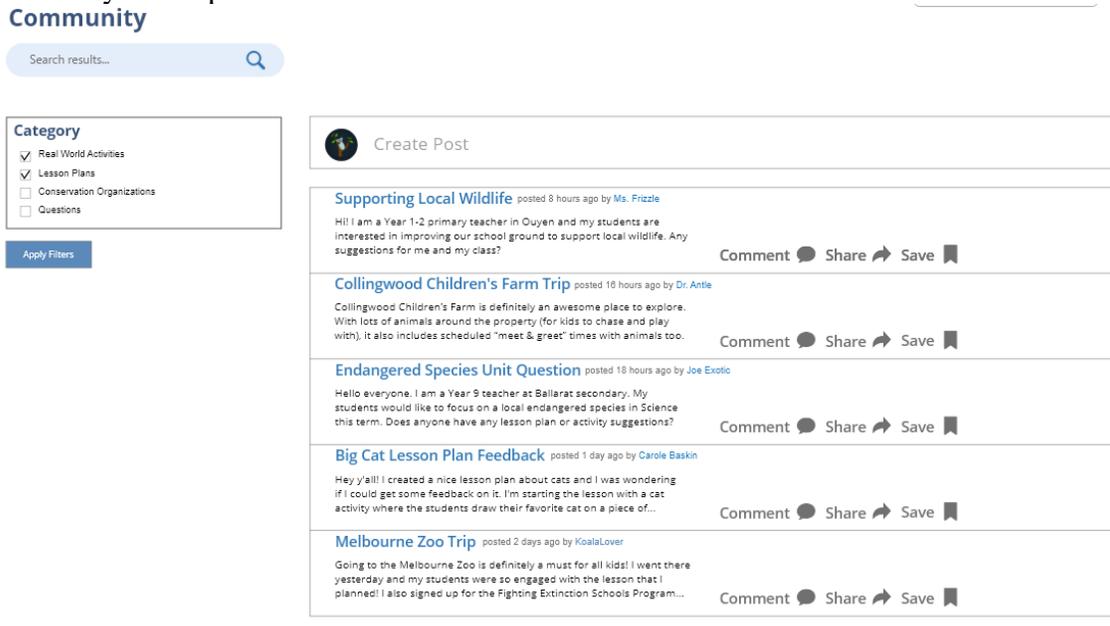


Figure 5. Community Page

## Mockup Assessment

To test and gather **feedback** on our hi-fidelity prototype, we sent a virtual feedback form to teachers and received nine responses. The feedback form consisted of tasks that allowed the users to explore the mockup and give suggestions about the design and practicality of each page. Overall, the teachers believed that the mockup was simple and creative. We incorporated this feedback into our mockup by making appropriate changes to better fit the needs of the teachers. After this, we presented our mockup to members of the CeRDI development team at SWIFFT to gain more feedback and inquire about the feasibility of integrating our web application into the current SWIFFT website.

## Future Development

To provide guidance to the future development team regarding **additional features** and maintenance recommendations for our application, we recommend the following improvements that could enhance our mockup:

1. Creating a space for video resources that will allow teachers to share appropriate videos for use in the classroom.
2. The ability to view other teachers’ profile pages, which would foster deeper connections between teachers.
3. Adding more images to the website to increase the visual appeal of the site.
4. Granting student access so students can ask their own questions, view resources, and ask for feedback from conservation members on the work they are doing.

We created an **implementation** plan to roll out our project in stages to the SWIFFT website. The Explore Resources page would be the first page to roll out, but it would not feature the ability to favorite resources and store them on your account. At this point, it would just be a tool that teachers can use to find classroom resources. By doing this, we will be able to gauge interest in this page before adding the My Workspace page, which allows for further customization of the teacher resources and teacher logins. Lastly, the need for a Community page and forum will then be re-evaluated based on teacher feedback.

Regarding suggestions on the **maintenance** of the site, we recommend that CeRDI use WordPress for its content management system (CMS) due to its extreme popularity, flexible and simple interface, commitment to open-source software, and the ability to be self-hosted with the SWIFFT website for no extra cost. Moreover, the CeRDI development team has expressed interest in moving away from their existing search engine, SWISH-E, and to one that is more efficient and provides more relevant results. We recommend Algolia for this purpose as the leading search API used among software engineers and is capable of delivering real-time results based on less user input.

## **Conclusion**

Our application addresses the need for a platform that can both aggregate wildlife conservation classroom resources and meet the needs of busy teachers who want to teach wildlife conservation through the use of real-world learning opportunities. The three components of our application enable teachers to easily find relevant resources, foster the creation of lesson plans for the classroom, and allow the teachers to communicate with similar-minded individuals. Using this web application will aid teachers in educating their students through hands-on experiences that are memorable and incite a deeper interest in the subject of wildlife conservation. Providing students with the opportunity to apply learned skills in a real-world context helps them transform working memory to long-term memory. We hope our application is a first step to incorporating wildlife conservation in the classroom through real-world learning opportunities.

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# Authorship

**Caitlin Jung** was responsible for researching, writing and editing the Key Features of Wildlife Conservation section (excluding the Map of Life location-based feature) of the Background (2.3), the Designing a Mockup of the Application in Adobe XD section (3.2.3), the Human-centered design section in the Methodology (3.2.4), the Testing the Mockup of the Application section (3.3), the Feedback on the Mockup section (4.3), and the Additional Features section (5.1), and the creation of Appendix F.

**Sarah Tarantino** was responsible for researching, writing and editing the Zoos Victoria sections of the Background (2.1), the Discovering what Features Teachers Desire in the Application sections (3.1), Identifying Resources from Conservation Groups section (3.2.1), Creating Lesson Plans Inspired by Conservation Group Resources section (3.2.2), the Features Teachers Desire in the *SWIFFT for Teachers* Application sections (4.1) and the creation of Appendix A.

**Hunter Trautz** was responsible for researching, writing, and editing the introduction paragraph regarding Victorian wildlife conservation laws, the Victorian Wildlife Education section of the Background (2.2), the Victorian Wildlife Education section (2.3), the Agile Scrum section of the Methodology (3.2.5), the Features of Web Application section (4.2), the Implementation section of Future Development (5.2), as well as the Maintenance section of Future Development (5.3).

**Jacob Tutlis** was responsible for researching, writing, and editing the Map of Life part of the Location-based Features section of Background (2.3.3), and the creation of the Proposed Design and Mockup Manual sections of Appendix G

All team members were responsible for researching, writing, and editing all other sections.

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# 1.0 Introduction

Australia is one of the most biologically diverse nations on Earth with over one million species of plants and animals, many of which cannot be found anywhere else in the world (Australian Government, 2020). There are more than 378 species of mammals (approximately half are marsupials), 828 species of birds, 300 species of lizards, 140 species of snakes, and two species of crocodiles that live in Australia (Australian Government, 2020). Due to Australia's rich and unique biodiversity, wildlife conservation organizations stress the importance of minimizing any threats to biodiversity by promoting conservation initiatives. To aid the efforts of these conservation organizations, one solution is to foster wildlife conservation education in the classroom.

Wildlife conservation education is necessary to teach people about the best practices to protect wild species and their habitats in order to prevent them from going extinct. From traditional classroom learning to hands-on activities, fostering strong connections to nature prompts people to reconsider their role in environmental problems and conservation action and see themselves as part of the solution (Association of Zoos and Aquariums, 2020). In fact, several studies (Ajaps & McLellan, 2015; Zheng et al., 2017) suggest that there is a significant correlation between the level of environmental knowledge and the degree of pro-environment and conservation behavior. Essentially, the more people know, the more likely they are to actively practice conservation measures in their everyday lives. Thus, learning about wildlife conservation at an early age has the potential to inspire students to become further involved with conservation efforts later in life.

Zoos Victoria is a not-for-profit wildlife conservation organization that works to fight animal extinction both locally and globally. Part of Zoos Victoria's mission is to deliver profound zoo-based experiences that connect people with wildlife and provide meaningful conservation messages. The Connect-Understand-Act framework is a powerful tool that Zoos Victoria uses in their wildlife conservation programs to effectively accomplish this mission. This framework focuses on applying conservation concepts to real-world scenarios to increase the effectiveness of students' learning.

Along with its dedication to conservation education, Zoos Victoria also aims to be a part of every Victorian child's education. To accomplish this goal, the organization created a program in 2014 to become directly involved with schools in the Victorian area, known as the Fighting Extinction Schools Program, which now involves 500 schools in the state of Victoria, which represent 20% of the total. Once part of the program, schools act as wildlife conservation centers in their community to initiate and inspire conservation among community members. Not only does this partnership bring wildlife conservation education into the classroom, but it also increases overall action by encouraging students to become leaders in their communities. However, Zoos Victoria has expressed concern that the impressive amount of participation in The Fighting Extinction Schools Program alone is not enough to solve the lack of conservation education in the classroom. Teachers struggle with developing relevant and engaging conservation lessons for their students because of the effort and time commitment it requires. There is a need to support these teachers in this process of finding resources in order to increase wildlife conservation discussions in the classroom.

The goal of this project is to support Zoos Victoria's initiative to provide real-world learning opportunities to students and to raise awareness for wildlife conservation in the state of Victoria. This was accomplished by developing a hi-fidelity prototype of a web application that connects school teachers with local conservation groups and provides them with educational activities. Our sponsor identified an existing website of one of their partners, the Statewide Integrated Flora and Fauna Teams (SWIFFT), where we could add an area targeted towards teachers. SWIFFT is an organization that connects people with events, information, and others interested in threatened species and biodiversity conservation. Their website, developed by the Centre for eResearch and Digital Innovation (CeRDI) at Federation University Australia, contains a plethora of conservation resources specifically intended for scientists. We propose implementing our web application, *SWIFFT for Teachers*, into the existing SWIFFT website, which allows us to utilize the extensive conservation resources already available on the SWIFFT website while also making the site more accessible to teachers.

## **2.0 Background**

In the wake of the 2020 bushfires that have burned through about 5.8m hectares of bush, wildlife conservation has become more important than ever before due to the loss of endangered species' habitats. The responsibility of educating the next generation about these issues falls to zoos and other conservation organizations like the Statewide Integrated Flora and Fauna Teams (SWIFFT). These organizations can best engage the younger generation through collaborating with teachers to achieve a more environmentally conscious community. Zoos Victoria has played a major part in this by launching the Fighting Extinction Schools program. The creation of a teacher section on the SWIFFT website supports this initiative by providing teachers with the resources needed to bring real-world learning opportunities to their students and facilitating connections within the community.

This section presents information concerning Zoos Victoria's collaborations with schools in Victoria, Australia, and the current status of animal conservation issues taught in Victorian schools. Additionally, it explores features implemented in other applications that can aid in this project.

### **2.1 Zoos Victoria's Community Outreach**

The role of zoos has changed drastically over the past couple of decades to become more of a conservation-based organization rather than a menagerie for pure entertainment. Zoos have a unique opportunity for public conservation education due to the number of recreational visitors they draw annually (Tribe & Booth, 2003). Zoos Victoria encapsulates this change and works hard to incorporate community members into its work with its outreach campaigns that focus on animal extinction. Multiple factors contribute to animal extinction, including the effects of climate change and the loss of habitats of endangered species. A lesser-known, but still serious, threat to the survival of these endangered species is the public's unawareness of such species. A majority of the public is also unaware of any preventative measures that people can undertake to aid in their survival. Zoos Victoria focuses on this threat through its high level of engagement within the community and schools of Victoria (Zoos Victoria [ZV], 2020b).

In 2019, Zoos Victoria developed a five-year conservation master plan per the Victorian State Government's Protecting Victoria's Environment – Biodiversity 2037 plan. The master plan outlines the steps and actions that the zoo will take to recover the 27 threatened native species of south-east Australia, called the Fighting Extinction 27 (FE27). These species could disappear within the next decade without intervention (ZV, 2020d). The plan also stresses the importance of integrating biological and social science interventions to change the grim future of the FE27 (Fighting Extinction 27, 2020; see Appendix A). Throughout the plan, Zoos Victoria explains its role of exciting and educating communities in order to inspire wildlife conservation advocates of future generations. The success of the plan is contingent on the public's participation in the proposed projects and campaigns (ZV, 2019a).

#### **2.1.1 Zoos Victoria Education Programs**

As part of its master plan, Zoos Victoria works directly with schools to connect young students with wildlife through meaningful learning programs. There are 78 excursion programs

offered between the three zoo locations, which tailor to the participating students' ages and the objective learning outcomes of the curriculum. These programs span all levels of education from early childhood to Year 12 and support the Victorian curriculum and Victorian Early Years Learning and Development Framework (VEYLDF). Many of the programs cover vast areas of learning, including science, design, technology, mathematics, critical and creative thinking, ethics, and more (ZV, 2020a). The project-based learning aspect of these programs engages the students with wildlife in an impactful way. Project-based learning often involves completing a tangible task which gives the experience a deeper meaning (Ramey-Gassert, 1997). Oppositely, traditional classroom learning is more abstract and has little to no connection with the real world. By utilizing project-based instead of traditional classroom learning, the student experience is more memorable. These experiences are invaluable because they will spark further interest and curiosity among the participating students.

Zoos Victoria also provides resources for Victorian teachers to help them incorporate wildlife conservation into their classrooms. The ultimate goal is to assist schools and teachers in creating memorable wildlife conservation learning programs. Teachers who have connections with their local wildlife conservation organizations can offer more real-world learning opportunities to their students. Zoos Victoria works to support teachers through professional development and networking events designed to educate them on the best practices for inspiring students about wildlife. Teachers can obtain a teacher membership, which offers exclusive access to hands-on conferences and workshops. Free web conferences, which also focus on incorporating wildlife conservation into the Victorian school curriculum, are also available for non-members. Zoos Victoria designs these programs to follow the Australian Professional Standards for Teachers, and each participant receives a certificate at the conclusion of the event (ZV, 2020e).

Along with teacher events and programs, Zoos Victoria also offers unique weekend and holiday programs. The youth leadership program for school years 9-11 is a project-based learning experience that provides an opportunity for student leadership and collaboration. Through five modules, students work to solve a real-world conservation issue while improving their teamwork, communication, innovation, and management skills (ZV, 2020f). Additionally, Zoos Victoria offers work experience programs to inspire the next generation youth to work with wildlife, or join the Zoos Victoria workforce. Both offerings are immersive programs that bring awareness to conservation issues. Other programs include "Keeper for a Day" at the Werribee Open Range Zoo, the STEM Design Challenge, Youth at the Zoo program (YATZ) and participation in local community campaigns (ZV, 2020a).

### **2.1.2 Fighting Extinction Schools Program**

The Fighting Extinction Schools program brings conservation issues directly into the classroom with project work. Students engage with wildlife conservation by investigating and coordinating one of the Zoos Victoria campaigns into their community. Also, students can create their own campaigns or initiatives to inspire their community. Zoos Victoria has established collaborations with 500 schools as shown in Figure 2.1. The collaborating schools represent only 20% of all Victorian schools, but the organization hopes to involve 70% by the end of 2024 as specified in the 2019-2024 Conservation Master Plan. One of the critical steps to achieve this goal is to mobilize the Victorian school community through online initiatives. Another crucial step is to provide resources and support for schools in order for teachers to activate and incorporate

conservation projects in the classroom, school, and community (ZV, 2020c). Creating a web application is an example of providing a resource that encompasses both of these critical steps.

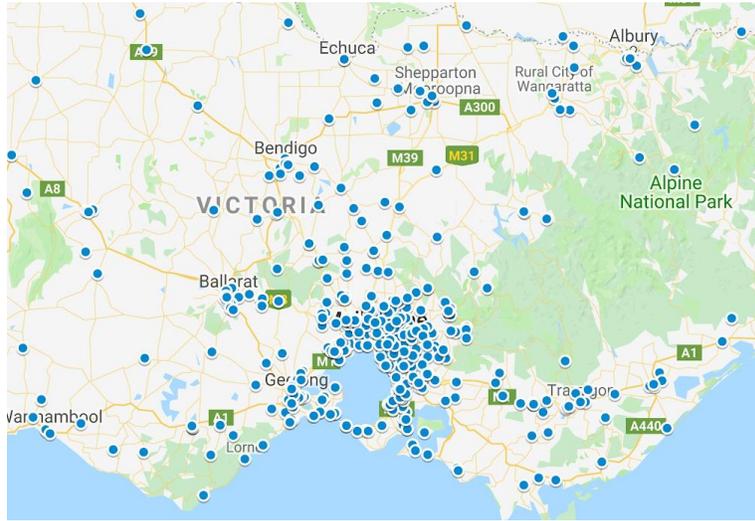


Figure 2.1. Fighting Extinction Schools Map (ZV, 2019b)

## 2.2 The Statewide Integrated Flora and Fauna Teams (SWIFFT)

As a partner organization of Zoos Victoria, the Statewide Integrated Flora and Fauna Teams (SWIFFT) is an independent network dedicated to providing free resources related to threatened species and biodiversity conservation. The SWIFFT website features information about flora and fauna in the state of Victoria as well as opportunities to get involved with wildlife conservation. SWIFFT highlights citizen science initiatives by emphasizing community and collaboration from its wide range of partner organizations and others who have an interest in wildlife conservation. In addition to Zoos Victoria, SWIFFT's partner organizations include the Helen Macpherson Smith Trust, the Department of Environment, Land, Water and Planning, and CeRDI at Federation University Australia. Their wide range of partners and pre-existing website infrastructure, as seen in Figure 2.2, make them an excellent candidate for an application that connects teachers with independent conservation organizations and real-world learning opportunities. This application will fill the gap of a lack of real-world learning opportunities and wildlife conservation topics within the Victorian science curriculum.

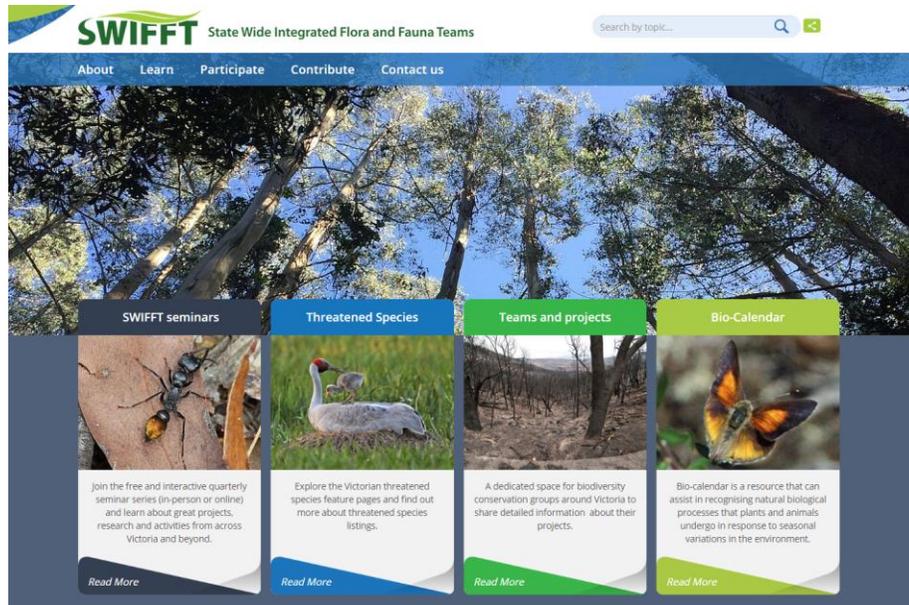


Figure 2.2. SWIFFT Home Screen (SWIFFT, 2020)

## 2.3 Victorian Wildlife Education

The Australian Curriculum Assessment and Reporting Authority (ACARA) develops and approves the class curriculums used in schools throughout Australia. The curriculum that is in place now is called “Foundation – Year 10” or F-10 and it provides a set of guidelines for states to follow and objectives for them to incorporate into their own curriculum. The Victorian Curriculum and Assessment Authority (VCAA) uses its own version of F-10 that reflects Victorian priorities and standards. However, neither curriculum covers the topic of environmental science or animal conservation issues. In doing so, the VCAA loses an important opportunity to utilize the impact that teachers have on their students to make them passionate about wildlife conservation.

### 2.3.1 Victorian Science Curriculum

The VCAA mandates all primary schools to use the F-10 curriculum, which outlines eight different learning areas and three cross-curriculum priorities. Cross-curriculum priorities are topics embedded in all areas of the curriculum in order to instill in students a more holistic and global world view. Sustainability was originally incorporated as one of these principles in 2008 in an attempt to make the curriculum consistent with the “Melbourne Declaration on Educational Goals for Young Australians” (Gough, 2011). As a result of sustainability being a cross-curriculum priority, environmental science is not included as part of the F-10 science curriculum. The science curriculum instead focuses on helping students become scientifically literate and building a strong foundation in the biological, chemical, physical, earth, and space sciences (VCAA, 2020). In fact, environmental science is not offered as a separate subject until senior secondary school, which consists of grades eleven and twelve, and it has the lowest enrollment of all the science subjects (ACARA, 2020). The lack of formal environmental science education in Victorian primary schools emphasizes the vital role that independent organizations must take in teaching young people about conservation issues.

### 2.3.2 Impact of Teachers on their Students

Teachers are the key to inspiring interest and concern in wildlife conservation issues among students. A study was conducted at a high school in rural Western Australia where researchers asked students about the impact that their teachers had on their learning, the good and bad qualities of teachers, and the teaching curriculums used in their classes (Strikwerda-Brown et al., 2008). The researchers' findings suggest that the students' success and overall interest in classes directly linked to the quality of the teachers. Students claimed that when they had a "good" teacher, someone who was passionate and well informed about the subject, they would receive better grades. The students performed better in these classes because their teachers inspired them to have an increased interest in the topic and were actively seeking to understand and learn the material. On the other hand, many of the students claimed they would not try in classes that had "bad" teachers. One student spoke about how having a poor math teacher ruined his interest in the subject permanently (Strikwerda-Brown et al., 2008). Thus, having unfavorable experiences learning about a topic negatively influences peoples' feelings towards it permanently. By connecting good quality teachers with conservation partners, we hope to create more interest in wildlife conservation issues among students.

## 2.4 Key Features of Wildlife Conservation Applications

As teachers are the key to inspiring action among the younger generation, one way to inform teachers about wildlife conservation issues is to support teachers with an application that provides them with a wide range of conservation resources. There are several applications that focus on wildlife conservation in terms of connecting, informing, and teaching people. Determining and evaluating applications that are similar to the one developed in this project is essential for establishing the project application initial framework. This section details the features of applications that are relevant to the project:

- Informational Features
- Location-based Features
- Classroom Resource Features

### 2.4.1 Examples of Informational Features in Conservation Applications

Informational features, which consist of facts and figures, provide additional knowledge to the user about the intended purpose of the application. Many applications convey these in an engaging and visually appealing manner to retain the interest of the users.

**WWF Together** is an iOS application that provides an interactive experience that brings the user closer to 16 endangered species (World Wildlife Fund [WWF], 2013a). By doing this, WWF hopes to help protect animals in danger of extinction and raise global awareness about the brevity of life. The app features high-definition videos and image galleries and allows the user to immerse him/herself into the life of these species from the perspective of the animal as seen in Figure 2.3 (WWF, 2013b). Each species has several fascinating and unique facts and information that the users can view through animations. The application also includes a 3D interactive globe, which allows the users to see the locations of the animals. Users can even create animated video origami of each animal and share them through social media (WWF, 2013b). The features of WWF Together stand out from other information applications by conveying the story of each animal in such a captivating and unique way. The user-centered design of the application elevates

the experience and emotions of the user when learning about these animals, inspiring them to step up and make a change to protect the animals.



Figure 2.3. WWF Together Application (WWF, 2020)

**iNaturalist** is a crowdsourcing application that helps users identify surrounding plants and animals. In the application, users can record encounters with organisms, connect with experts who can identify organisms, learn about nature, log population data, view data from around the world, and help monitor data for scientists (iNaturalist, 2019). Additionally, users can put their images under the Creative Commons license so others can use them for research work (Parab, 2018). Essentially, this application provides an educational experience to users while also offering the opportunity to connect with other wildlife enthusiasts. In fact, Parab (2018) claims, "iNaturalist is exactly the kind of app that'll turn casual observers into hardcore wildlife enthusiasts," which speaks to the effectiveness, ease-of-use, and satisfaction of the users of the application. The dual focus on public education and networking makes this application extremely relevant to this project.

#### 2.4.2 Examples of Location-based Features in Conservation Applications

Location-based features provide users with a unique experience of being able to view personalized content based on their locale. They also give users the ability to view any area they want, letting them gain different perspectives of the world. Location-based features can vary as some might be interactive maps, while others might just be finding local news.

**Map of Life** (MOL) is a website that helps users visualize biodiversity by providing interactive maps that display both local and global species. The goal of MOL is to aid worldwide biodiversity education and research by integrating large and diverse datasets of species range data. MOL uses the Google Earth Engine and CARTO mapping services to handle most of its mapping queries (Map of Life, 2019). This website provides a great example of professional wildlife range mapping, a feature that is crucial to this project, this can be seen in Figure 2.4.

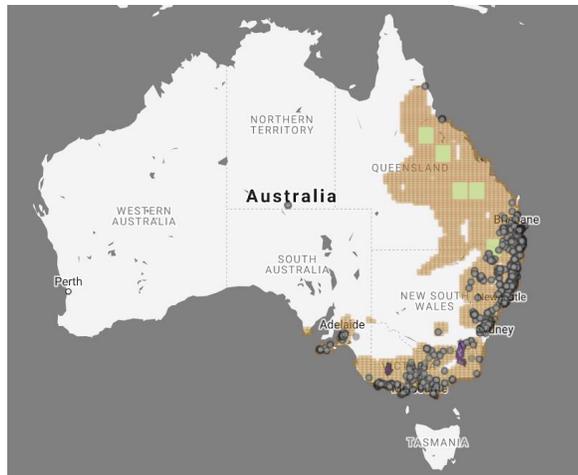


Figure 2.4. MOL - Koala Species Map (Map of Life, 2020)

The **African Wildlife Foundation** (AWF) features a stunning location-based, interactive map on their website to display the critical landscapes in Africa where they work. When users hover over one of the locations, a pop-up appears with a picture and a brief statement about the country. Users also can click on each country to see even more information regarding the habitat and wildlife in that area, which includes primary ecosystems and key landmarks, such as National Parks. Additionally, this page details the challenges that the area faces and solutions that AWF will take to protect the country's unique biodiversity (African Wildlife Foundation, n.d.). Another feature of this page is the inclusion of a map icon that follows the user as he/she scrolls through the page, allowing easy access to explore other countries in Africa. The impressive user interface and design elements of this website in conjunction with the rich information and facts outlines the appeal that location-based websites should have to retain user visits. With this, teachers can educate their students on important wildlife locations and topics in a fun way.

### 2.4.3 Examples of Classroom Resource Features in Conservation Applications

Classroom resource features supply teachers with access to lesson plans and activities that will enhance the learning experience of their students. **Conserv-AR** is a mobile application game that uses augmented reality (AR) to increase awareness and knowledge about environmental conservation in Western Australia (Phipps et al., 2016). The developers of this app chose AR technology because of the numerous benefits in classrooms. One advantage is that AR education methods facilitate unity among all students, as these methods reduce the negative effects of learning disabilities. Additionally, AR allows the users to immerse themselves inside of the app, creating a real-world simulation that forces them to interact and follow storylines. The user chooses an animal and topic they wish to learn about and then the application takes them on a field trip using GPS coordinates (Phipps et al., 2016). While on a field trip, the user must look for target locations, answer storyline questions, read and collect information, and take quizzes to track learning objectives as seen in Figure 2.5. By generating a balance between education and entertainment, students are more likely to engage with the material and make a meaningful impact on the world. Even though the developers have not tested the effectiveness of Conserv-AR as a teaching tool, the initial implementation and concept is promising for future use in the classroom.



*Figure 2.5. Conserv-AR Application (Phipps et al., 2016)*

**Ranger Vision** is a mobile application for photographing and classifying plants and animals in Australia. The application provides an interactive platform to connect students with local wildlife and features a variety of indoor and outdoor experiences, rich and flexible lessons, and contributions to scientific databases (Ranger vision, n.d.). Students can take pictures of, classify, and upload recorded sightings of plants and animals to the Atlas of Living Australia, a database of Australia's plants and animals (Ranger vision, n.d.). Teachers are also able to track the progress of their students and see the pictures they have taken. This focus on student interaction is valuable for classroom learning because hands-on experience allows students to obtain a deeper understanding of the topic and allows them to see the impact that they can have in the real-world.

### 3.0 Methodology

The goal of this project was to assist Zoos Victoria in raising awareness for wildlife in the state of Victoria by developing a web application that connects teachers with local conservation groups and provides them with real-world learning opportunities. Our web application, *SWIFFT for Teachers*, is designed specifically for integration into the SWIFFT website. Once our design is incorporated into the SWIFFT website, it will support Zoos Victoria’s initiative to provide real-world learning experiences to students in hopes of inspiring future leaders to support wildlife conservation efforts, including Zoos Victoria’s Fighting Extinction program. To accomplish our goals, we created the following objectives:

1. Discovering what features teachers desire in the application
2. Developing the mockup of the application
3. Testing the mockup of the application
4. Creating a future development plan for the application

Due to the COVID-19 pandemic that began in early 2020, international travel was restricted and the project had to be completed remotely. To complete the objectives listed above, we followed the development process in Figure 3.1.

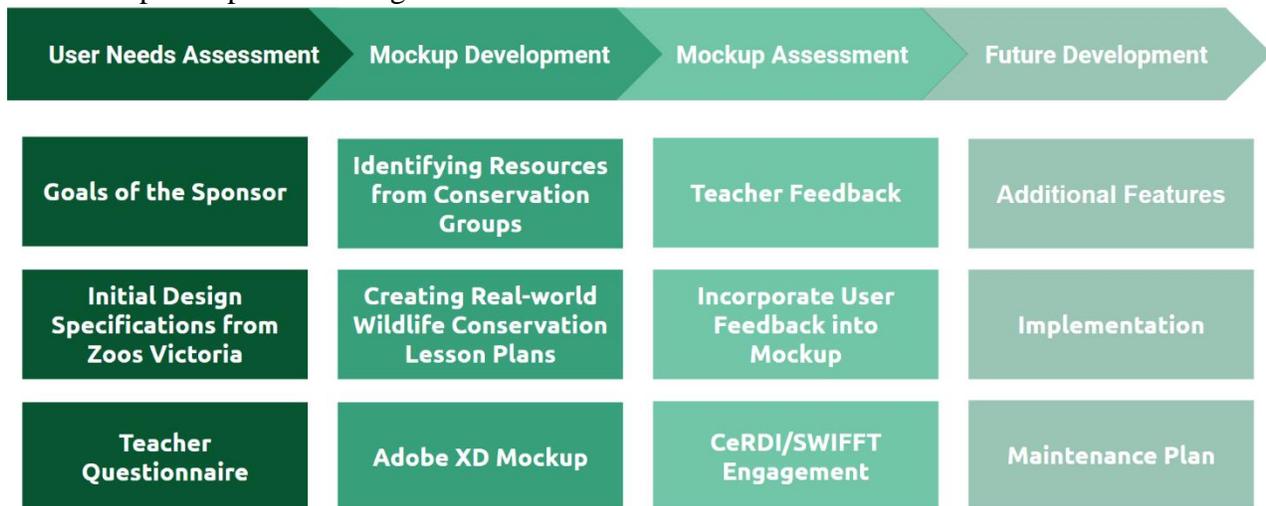


Figure 3.1. Project Development Process Diagram

First, we assessed the needs of teachers to create a list of initial specifications for the application. Next, we developed a mockup of the application following these initial specifications. We then assessed the design and feasibility of the application and made changes in response to teacher feedback. Lastly, we developed plans to aid the future development of our application.

### **3.1 Discovering what Features Teachers Desire in the Application**

This objective focused on gathering information and inspiration from school teachers to design a web application that appeals to them, the potential users. Developers should design their apps to best fit the needs of their users to ensure high user retention rates and satisfaction. We designed our web application by incorporating as many suggestions from teachers as possible. Teachers will devote more time into using and sharing the web application if they believe that their opinions and views contributed to its design. For this reason, the project team obtained their perspectives from:

- A list of initial design specifications developed by the Education Strategic Team of Zoos Victoria
- A teacher questionnaire

#### **3.1.1 Initial Design Specifications Provided by Zoos Victoria**

In order to complete the first objective, we needed to do some information gathering from members of the community who specialize in working with teachers. The Education Strategic Team of Zoos Victoria developed and provided us with a list of initial design specifications based on their research and expertise of working with school teachers. The Education Strategic Team first identified the opportunities and challenges of teacher access to real-world learning opportunities by focusing on two main questions:

- What enables teachers to work with people outside of school gates?
- What obstacles/blockers do teachers face?

A document of possible answers to these questions and proposed design specifications for the web application served as qualitative data for analysis. From this document, we extracted major themes and organized them by their potential to become a feature. After identifying these actionable ideas, we incorporated them into our design process. We evaluated each idea based on the pros and cons to pinpoint those that best fit the needs of the intended users.

#### **3.1.2 Virtual Teacher Questionnaire**

We created a virtual questionnaire to receive input from teachers in the United States in order to supplement the list of initial design specifications provided by the Education Strategic Team of Zoos Victoria (Virtual Questionnaire with Teachers, 2020; see Appendix B). We identified teachers with personal relationships to team members as possible participants because it was more likely for them to dedicate time to the questionnaire during the COVID-19 pandemic. To create the questionnaire, we utilized the Qualtrics Survey Software and focused on teachers' opinions on applications that they personally use to create lesson plans. Some sample questions in the questionnaire were:

- Do you currently use any applications to assist you in creating your curriculum?
- In general, what do you like about these applications?
- In general, what do you dislike about these applications?
- Do you currently incorporate wildlife conservation topics in the classroom?
- Would you use an application to aid you in this process?

Recorded reports from the questionnaire served as qualitative data for analysis. From these reports, we extracted major themes and organized them by their potential to become a feature. An example of one of these ideas was an aspect of an application that most teachers reported that they like when creating lesson plans. After identifying these actionable ideas, we incorporated them into our design process. We evaluated each idea based on the pros and cons to pinpoint those that best fit the needs of the intended users.

## **3.2 Developing the Mockup of the Application**

This objective was twofold. The first part focused on identifying and collecting resources, such as general information, opportunities to get involved, and educational activities, from key supporting conservation partners of SWIFFT to include in our mockup of the application. We did this to increase the number of resources provided in the application instead of just simply relying on SWIFFT's website. Using these resources, we created seven lesson plans that served as examples in the mockup of the application.

The second part details how we developed a prototype for our project. By following the steps listed in these processes, we ensured that our application adhered to the needs and capabilities of the users. The HCD process focuses solely on solving a specific problem while keeping the user in mind during all stages of development. Moreover, Agile Project Management and Scrum were essential for creating an application and continually building upon previous designs to ensure that the prototype will be suitable for investors and stakeholders. Both processes are valuable tools for developers to utilize during all software development projects.

### **3.2.1 Identifying Resources from Conservation Groups**

Due to the global COVID-19 pandemic, it was difficult for the team to contact conservation organizations to inquire about their educational resources on wildlife conservation. Instead, the team extensively researched the conservation partners of SWIFFT to gather information about current projects that they support as well as any learning material, such as activities or recommendations, available on their respective websites (Real-world Learning Opportunities from Partners of SWIFFT, 2020; see Appendix D & Zoos Victoria School Programs, 2020; see Appendix F). We incorporated these resources into the mockup of the application and compiled them as a deliverable. It should be noted that SWIFFT has a plethora of partners with valuable educational resources. The conservation partners chosen for research are only a small portion of SWIFFT's partners due to the time limitations of the project.

### **3.2.2 Creating Lesson Plans Inspired by Conservation Group Resources**

We created seven real-world lesson plans inspired and influenced by the educational resources from conservation organizations (Real-world Learning Lesson Plans Inspired by SWIFFT Resources, 2020; see Appendix E). Each lesson plan has the same structure to provide continuity of examples posted on the application. The general structure for each lesson plan is as follows:

1. **Learning Objectives:** defined at the beginning of each lesson plan to clarify, organize, and prioritize intended learning outcomes
2. **Introduction Activity:** intends to pique the students' interests and prepare them for the main content of the lesson
3. **Lecture:** details how the teacher plans to educate their students on the specified topic
4. **Activity:** presents the real-world learning opportunity that will bring the students out of the traditional classroom setting so they can apply the knowledge from the teacher lecture into the real world
5. **Discussion and Assessment:** details how the teacher can determine whether the students have met the intended learning outcomes
6. **Wrap Up:** sums up the main takeaways from the lesson
7. **Other variations (optional):** describes other ways that teachers can either continue the lesson in future classes or provide adjustments to the proposed lesson plan

These lesson plans are featured on the *SWIFFT for Teachers* mockup application and will be part of our deliverables. The seven real-world learning lesson plans act as example templates for future users to follow when making lesson plans from the educational resources provided on the *SWIFFT for Teachers* application. Our hope is that teachers will share their created lesson plans on the application to create a database of real-world learning lesson plans inspired by conservation organizations.

### 3.2.3 Designing a Mockup of the Application in Adobe XD

To develop a mockup web application for our project, we used Adobe XD. Due to the varying degrees of technical and programming knowledge across our team, we wanted to choose a prototyping tool that adhered to the following criteria:

1. The tool must be able to create hi-fidelity prototypes.
2. The tool must be easy to use and understand.
3. The tool must allow for collaboration among at least four people.
4. The tool must be cost-efficient.

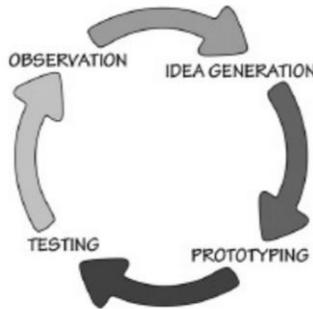
Adobe XD met these criteria as it is a collaborative, vector-based design tool for web and mobile applications that requires no prior knowledge of coding or technical skills. The software provides an easy-to-use interface for designing both low-fi and hi-fi prototypes and is free for students. Our team explored all of the features of Adobe XD, such as components and animations, and incorporated them into our mockup. Furthermore, our team utilized the UI kits provided by Adobe XD to easily create design elements, such as checkboxes and bullet points. Over the course of the project, we continually made revisions to the mockup per the Human Centered Design (HCD), Agile Project Management and the Scrum Methodology.

### 3.2.4 Following the Human Centered Design (HCD)

The HCD process is an iterative process that focuses on ascertaining the right problem and the right solution. Finding the appropriate solution entails meeting people's needs through the

development of an enjoyable and effective product design that satisfies constraints such as reliability, efficiency, and cost (Norman, 2013). Each iteration aims to yield more insights into the current problem and move towards finding the desired solution. Within each iteration, there are four activities as seen in Figure 3.2:

- Observation
- Ideation
- Prototyping
- Testing



*Figure 3.2.* The Iterative Cycle of the HCD process (Norman, 2013)

The project team acted as the product designers and used the HCD process iteratively to guarantee that the final product satisfied the needs of the potential users. In the first step of the HCD process, we analyzed results from a list of initial design specifications developed by the Education Strategic Team of Zoos Victoria and sent a questionnaire to teachers to find out what features they find helpful and useful to this web application. After gathering information from teachers and conservation partners, we brainstormed possible solutions for figuring out how to best incorporate their feedback and suggestions into the application.

For the prototyping step, we developed several mock-ups of the application using Adobe XD. Additionally, we used the Agile Project Management and Scrum Methodology in this step to ensure the improvement of our product during development. Finally, for the last step of the HCD process, we tested the functionality and user interface on potential users with a feedback form to determine how to improve our web application web application for ease-of-use, simplicity, and appeal.

### **3.2.5 Utilizing the Agile Project Management & Scrum Methodology**

Agile project management is an iterative approach to managing software development projects that focuses on continuous product releases and incorporating customer feedback with every iteration (Atlassian, 2020). Scrum is a framework for Agile that software and technology industries utilize due to its structure of roles, meetings, and rules (Cprime, 2020). Teams usually consist of about seven people, and the goal of the team is to deliver a releasable product at the end of each “**sprint**,” the name given to the fixed-length iterations (Scrum Reference Card, 2014). As shown in Figure 3.3, each team uses a product backlog to manage the tasks they have to complete. The backlog consists of user stories, which represent features that are important to the product’s user base and appear in the prototype. At the beginning of each sprint, the team chooses a

reasonable amount of achievable and pertinent user stories to complete by the end of the sprint and moves these to the sprint backlog.

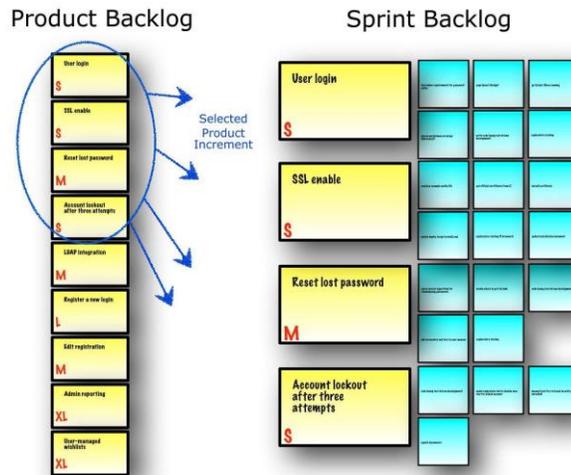


Figure 3.3. Agile Scrum Product and Sprint Backlogs (Scrum Reference Card, 2014)

Each member of the team has one of three roles:

- developer,
- product owner
- scrum master

The **product owner** considers the interests of stakeholders by creating and constantly re-prioritizing the product backlog. The **scrum master** is in charge of leading the team’s daily meetings, or “daily scrums.” At this meeting, each member must take turns speaking about what tasks they completed the previous day, what tasks they will complete today, and any issues that they are currently experiencing. The rest of the team members are primarily **developers** and focus on collaborating together in order to finish the user stories for that sprint. At the end of each sprint, the team presents and demonstrates their product to the stakeholders in the scrum review meeting to receive crucial feedback that the team will implement in the next sprint as seen in Figure 3.4.

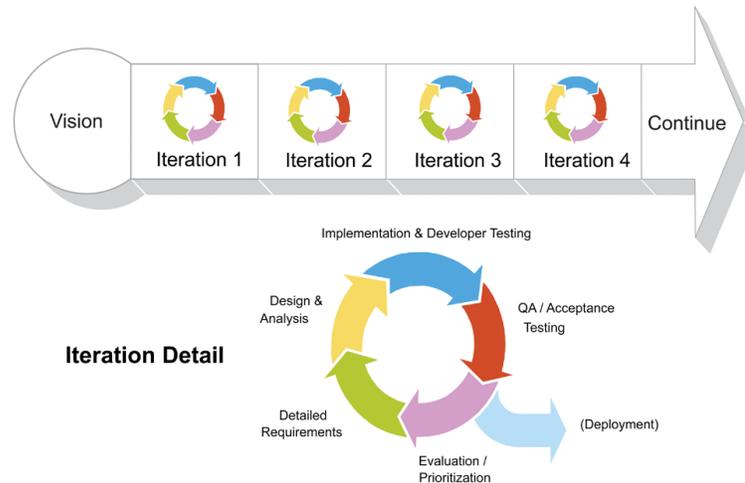


Figure 3.4. Agile Scrum Iteration Map (Scrum Reference Card, 2014)

The project team utilized the Agile Scrum methodology to ensure the creation of a prototype that meets the needs of both our sponsor and the platform’s user base. Agile was the best choice for this project because it incorporates the needs of the stakeholders and the users at every step of the iteration process.

### 3.3 Testing the Mockup of the Application

To test our mockup with potential users, we sent out a feedback form to teachers in the United States (Virtual Mockup Feedback Form with Teachers, 2020; see Appendix C). Due to the constraints of the global COVID-19 pandemic, feedback forms were necessary to solicit teacher assessment of our mockup because of their dynamic ability to help improve products and/or services by capturing feedback and satisfaction. We identified teachers with personal relationships to team members as possible participants because it was more likely for them to dedicate time to the form during this time. To create the feedback form, we utilized the Qualtrics Survey Software and included a consent form for permission to transcribe and incorporate the responses for data analysis in this project. The beginning of the form gathered information about the teachers, such as the grades and topics that they teach in schools, with about half of the respondents saying that they teach science topics in the classroom. The rest of the questions on the form asked questions about specific tasks that the participants were instructed to do. The tasks were:

1. Create an account
2. Navigate through the Explore Resources page
3. Navigate through the My Workspace page
4. Navigate through the Community page

We guided the users through these tasks and asked for feedback on the following aspects of the mockup:

- User interface/design aspects of the pages
- Ease-of-use
- Comprehension of the wording and icons, and
- Any improvements or suggestions

Recorded responses from the feedback form served as qualitative data for analysis. From these responses, we extracted major themes and ideas and organized them by their potential for inclusion in the mockup. Then, we assessed the pros and cons of incorporating these themes and ideas into the mockup and made appropriate changes.

### **3.4 Creating a Future Development Plan for the Application**

The future development plan for the application was developed by working closely with the Centre for eResearch and Digital Innovation (CeRDI), the group who is currently responsible for the design and upkeep of the SWIFFT website (Future Development Plan, 2020; see Appendix G). The plan for this application consisted of three sections:

- Additional Features
- Implementation
- Maintenance

For the implementation and maintenance sections, we had a conversation with the CeRDI development team. In this conversation, we discussed the following topics:

- Who would manage the site?
- What would be the technical integration process into SWIFFT?
- What are the storage requirements?
- Who would manage accounts?
- How would resources be kept up to date and how would they be stored?

We organized a transcript containing all the information gathered from this meeting into the topics listed above and incorporated it into the corresponding maintenance sections in the future development plan.

## 4.0 Web Application: *SWIFFT for Teachers*

This section discusses the results from executing the methodology described in the previous section. The first part of this section synthesizes the results that we obtained from the design specifications of our sponsor and a teacher questionnaire and presents an analysis of the features that teachers desire in this web application. The second part of this section details the design and features of the proposed mockup and demonstrates how the SWIFFT website influenced and contributed to this project. The last part presents the teacher responses from the feedback form and how their opinions influenced the development of the mockup.

### 4.1 Features Teachers Desire in the *SWIFFT for Teachers* Application

We collected qualitative data in the form of initial design specifications from our sponsor, Zoos Victoria, and as comments from teachers through a Qualtrics questionnaire. Then, we assessed this data into actionable ideas that had the potential to become features in the application. Finally, we reassessed these ideas for feasibility and created six features that teachers desire in the *SWIFFT for Teachers* application.

#### 4.1.1 User Needs Assessment

As part of the Agile and Scrum Methodology, we generated user stories and assigned story points to each based on the priority and feasibility for implementation into the application. We rated the user stories using the first five numbers of the Fibonacci sequence, 1, 2, 3, 5, 8, with one meaning that the user story's feature will take the least amount of time to implement and eight meaning that the user story's feature will take the most amount of time to implement. The ranking is as follows:

- As a science teacher, I want to teach more about local endangered species in my science class but I don't know where to start looking for that information (1)
- As a science teacher, I want to find local community opportunities and projects that will support student learning (2)
- As a science teacher, I know about my local conservation organizations but I don't know anything about their current efforts or events for my students (2)
- As a science teacher, I want to find local organizations that offer programs to engage my students through real-world learning opportunities. (3)
- As a science teacher, I want to share advice with other teachers about wildlife conservation lesson plans. (3)
- As a science teacher, I want to create relationships within my community so that I can provide better learning opportunities for my students. (5)

We assessed and consolidated teacher comments from the questionnaire into actionable ideas that have potential to be incorporated into the application as features. The following is a list of the resulting actionable ideas:

- An application that is clear and concise with extensive resources and information
- An application that is easy to use and not overwhelming
- An application where content can be personally tailored

- Continuity of lesson plan structure throughout the application
- An application that offers hands-on activities for students

We also considered other non-actionable, but helpful ideas when creating the overall list of features teachers desire such as website creativity and aesthetics.

#### **4.1.2 List of Features Teachers Desire in the Application**

We assessed all of the opportunities, challenges, initial specifications and teacher comments listed above were assessed for feasibility for becoming a feature in the application. We sorted these ideas by similarity to each other and then into distinct categories. From the categories, we identified a total of six features that teachers desire:

1. Categorise the needs of school teachers
2. Quick and easy access to conservation information
3. Creating relationships within the community
4. Identify local organizations that offer programs to engage students
5. Sharing information and advice with other teachers
6. Information about their local natural environment and projects

We implemented these features in the application design process in order to build an application that appeals to the future users, school teachers.

## **4.2 Features of Our Web Application**

Our proposed solution for the SWIFFT website is the addition of a “Teachers” tab on the home screen of the web application as seen in Figure 4.1. This tab consists of three major features which we identified as crucial to our userbase as seen in Figure 4.2:

1. The **Explore Resource** page
2. The **My Workspace** page
3. The **Community** page

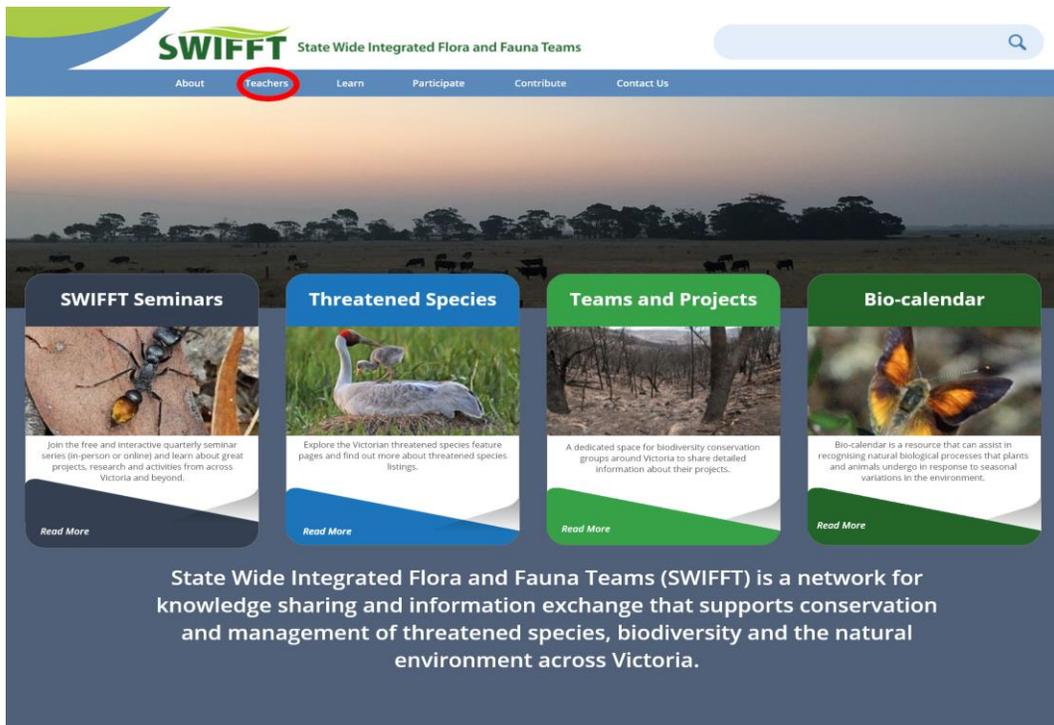


Figure 4.1. SWIFFT for Teachers - Home Screen

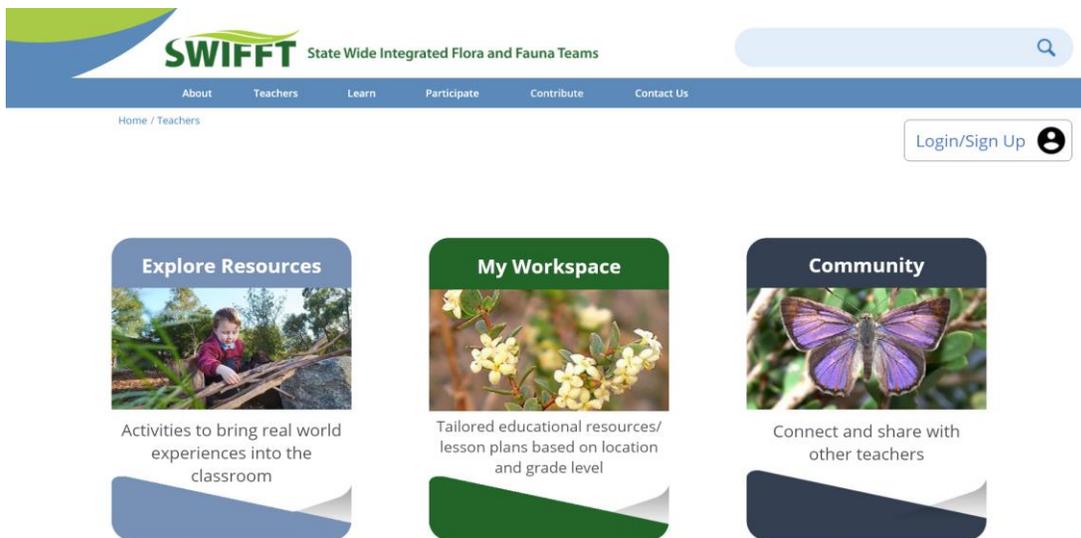


Figure 4.2. SWIFFT for Teachers - Teacher Home Screen

## 4.2.1 Explore Resources

The Explore Resources page, as shown in Figure 4.3, is the most prominent of our proposed features and the one that teachers will likely utilize the most. This page serves as an area for teachers to easily search for resources of many different categories such as:

- Real-world Learning Opportunities
- Lesson Plans
- Classroom Activities
- Citizen Science Initiatives
- Threatened Species Information

The screenshot shows the SWIFFT website's 'Explore Resources' page. At the top, there is a navigation bar with links for 'About', 'Teachers', 'Learn', 'Participate', 'Contribute', and 'Contact Us'. A search bar is positioned on the right side of the header. Below the navigation bar, the page title 'Explore Resources' is displayed, along with a breadcrumb trail 'Home / Teacher / Educational Activities' and a personalized greeting 'Hello, Charlotte!' with a profile icon. The main content area is split into two columns. The left column contains a search bar and four filter panels: 'Category' (with checkboxes for Real World Learning Opportunities (RWL), Citizen Science Initiatives (CS), Threatened Species Information, Lesson Plans, and Classroom Activity), 'Location' (with a text input '3741' and a dropdown for 'Alpine Shire' and a 'within 10 km' range), 'Education Level(s)' (with checkboxes for Early, Foundation-Year 2, Year 3 & Year 4, Year 5 & Year 6, Year 7 & Year 8, Year 9 & Year 10, VCE, Tertiary, and VCAL), and 'Learning Area' (with checkboxes for Biodiversity, Biology, Camps, Critical & Creative Thinking, Design and Technologies, Environmental Science, and STEM). An 'Apply Filters' button is located at the bottom of the filter panels. The right column is titled 'Results' and includes a 'Share' button. Below this, there are four resource cards, each with a star icon in the top right corner. The first card is 'Local Legends' from Melbourne Zoo, for Year 3 and Year 4, categorized as 'RWL' and available from 28 Jan to 18 Dec, Mon-Fri. The second card is 'Citizen Science - General' for Victoria, AUS, for all ages, categorized as 'CS'. The third card is 'Threatened Fauna Alpine Shire' for the Alpine Shire, AUS, for all ages, categorized as 'SPECIES'. The fourth card is an 'iNaturalist Lesson Plan' for Primary/Secondary, Year 5 and Year 6, categorized as 'LESSON'. Each card includes a brief description and a link to the resource.

Figure 4.3. SWIFFT for Teachers - Explore Resources Page

Teachers can filter the list of resources displayed on the right side of their screen by using the extensive filter options presented on the left side. They can filter resources by category, location, education level, and learning area. Additionally, there is a search bar above the filter

options that allows teachers to enter custom criteria to help them find the exact type of resource they are searching for.

Each resource displays its name, description, category, and educational level. Teachers can click on each resource's picture to navigate to that resource's page containing more extensive information about it as well as additional resources that may be attached as seen in Figure 4.4.

**SWIFFT** State Wide Integrated Flora and Fauna Teams

About Teachers Learn Participate Contribute Contact Us

< Back to Explore Resources

## iNaturalist Lesson Plan

**Objectives:**  
Students will be able to identify local species and efforts to conserve them.

*Vocabulary: Species, Habitat, Conservation, Endangered, Endangerment levels*

**Introduction Activity:**  
Students will write all of the local species that they know about on sticky notes and then post them on the board/wall. Then, the students will group these species by the type (i.e. mammals, reptiles, etc.).

**Lecture:**  
Edit the attached slideshow to customize for your school area. Use the slideshow to inform the students about local species, some fun facts about them, and methods taken to conserve these species.

Activity	Duration

**YEAR LEVELS**  
Year 5, Year 6

**MATERIALS**  
Sticky notes  
Access to mobile devices  
Paper  
Coloring supplies

**COST**  
\$3-5

**DOCUMENTS INCLUDED**  
Sample Powerpoint

**THEMES**  
Australian Animals,  
Ecosystems / Habitats,  
Endangered Species,  
Conservation, Citizen Science

Figure 4.4. SWIFFT for Teachers - iNaturalist Lesson Plan Page



Figure 4.5. SWIFFT for Teachers - Share Page

By pressing the “Share” button at the top of the Explore Resources page, teachers will see the Share page as shown in Figure 4.5. Teachers can then press the share button associated with the type of resource (lesson plans and activities, events, or other) that they are attempting to upload. After they select one of the share buttons, the web application will prompt them to fill out a brief form, as seen in Figure 4.6.

### Share a Lesson Plan or Activity

Got an exciting and engaging wildlife conservation lesson plan or activity that you would like to share with other teachers? Please fill out the form below to contribute to our database!



The required fields are denoted by an asterisk \*

\* Name of Lesson Plan/Activity:

\* Type of Resource:

\* Grade Level:

\* Topic:

- Biology
- Camps
- Civics & Citizenship
- Critical & Creative Thinking
- Design and Technologies
- Geography
- Science
- STEM

Web Link (if applicable):

\* File:    N/A

Description of Lesson Plan/Activity:

Figure 4.6. SWIFFT for Teachers - Share Lesson Plan/Activity Page

In addition to sharing resources, teachers can also favorite resources by pressing the star button located in the top right corner of each resource preview. Each resource that is favorited will now have a gold star to indicate that it has been favorited and saved to that user's My Workspace page.

#### 4.2.2 My Workspace

The My Workspace Page, as seen in Figure 4.7, allows teachers to view and organize their favorite resources that they discovered from the Explore Resource page. The page organizes resources by category inside one of four collapsible sections. Teachers can further organize their favorite resources by creating new folders on the left side of the screen.

SWIFFT State Wide Integrated Flora and Fauna Teams

Home / Teachers / My Workspace

Hello, Charlotte!

## My Workspace

**My Folders**

Add New

### Real World Learning Opportunities

**Caring for Animals | Terms 1 and 2 2020**  
Equip your students with new STEM skills and knowledge whilst designing solutions for Zoo animals.

---

**Saving Endangered Species | Terms 1 and 2 2020**  
Explore Healesville Sanctuary, meeting our unique, endangered wildlife and learn what you can do to help fight extinction. Are you up for the challenge?

---

**Eat or be Eaten**  
In the wild it's a case of eat, or be eaten. Animals are specially adapted to digest their favourite food and avoid being eaten themselves.

---

**Local Legends**  
In this new version of the Local Legends program, students will discover animals that are Local Legends and learn how they can become a hero in the lives of these unique creatures.

**Lesson Plans**

**Citizen Science Websites**

**Community Forum Posts**

Figure 4.7. SWIFFT for Teachers - My Workspace Page

Teachers can then move resources into these folders by pressing the folder icon to the right of a resource and then selecting the folder they wish to move the resource into as seen in Figure 4.8. Additionally, teachers can download resources from this page by pressing the download icon associated with it or they can remove it from their workspace by pressing the gold star icon.

The screenshot shows the SWIFFT website's 'My Workspace' page. At the top, there is a navigation menu with links for 'About', 'Teachers', 'Learn', 'Participate', 'Contribute', and 'Contact Us'. A search bar is positioned in the top right corner. Below the navigation, the user is greeted with 'Hello, Charlotte!' and a globe icon. The main content area is titled 'My Workspace' and features a 'My Folders' sidebar on the left with options: 'Add New', 'Biodiversity Unit', 'Local Species Unit', 'Outdoor Activities', and 'Potential Class Activities'. The central focus is the 'Local Species Unit' section, which lists several units: 'Local Legends', 'They're Calling on You', 'Wipe For Wildlife', 'Love Your Locals', and 'Zoos: For People Or Animals?'. Each unit entry includes a brief description, a download icon, a folder icon, and a star icon.

Figure 4.8. SWIFFT for Teachers - My Workspace Folder Example

### 4.2.3 Community

The Community page, as seen in Figure 4.9, is a place where teachers and other community members can communicate to exchange their ideas and experiences regarding incorporating conservation issues in the classroom. This page displays all forum posts on the right hand side of the screen and sorts them from newest to oldest by default. Teachers can further sort the results of this page by selecting categories on the left hand side of the screen and pressing the “Apply Filter” button. Teachers can also make a new post by clicking the “Create Post” button located above the list of forum posts.

SWIFFT State Wide Integrated Flora and Fauna Teams

Home / Teacher / Community

Hello, Charlotte!

Community

Search results...

**Category**

- Real World Activities
- Lesson Plans
- Conservation Organizations
- Questions

Apply Filters

Create Post

**Supporting Local Wildlife** posted 8 hours ago by Ms. Frizzle  
Hi! I am a Year 1-2 primary teacher in Ouyen and my students are interested in improving our school ground to support local wildlife. Any suggestions for me and my class?

Comment Share Save

**Collingwood Children's Farm Trip** posted 16 hours ago by Dr. Antle  
Collingwood Children's Farm is definitely an awesome place to explore. With lots of animals around the property (for kids to chase and play with), it also includes scheduled "meet & greet" times with animals too.

Comment Share Save

**Endangered Species Unit Question** posted 18 hours ago by Joe Exotic  
Hello everyone. I am a Year 9 teacher at Ballarat secondary. My students would like to focus on a local endangered species in Science this term. Does anyone have any lesson plan or activity suggestions?

Comment Share Save

**Big Cat Lesson Plan Feedback** posted 1 day ago by Carole Baskin  
Hey y'all! I created a nice lesson plan about cats and I was wondering if I could get some feedback on it. I'm starting the lesson with a cat activity where the students draw their favorite cat on a piece of...

Comment Share Save

**Melbourne Zoo Trip** posted 2 days ago by KoalaLover  
Going to the Melbourne Zoo is definitely a must for all kids! I went there yesterday and my students were so engaged with the lesson that I planned! I also signed up for the Fighting Extinction Schools Program...

Comment Share Save

Figure 4.9. SWIFFT for Teachers - Community Page

On the “Create Post” page, as seen in Figure 4.10, teachers can give their post a title, description, and assign multiple categories to it in order to encourage other teachers or community members to respond to their post. After creating a post, a screen containing that post’s page appears, as seen in Figure 4.11.

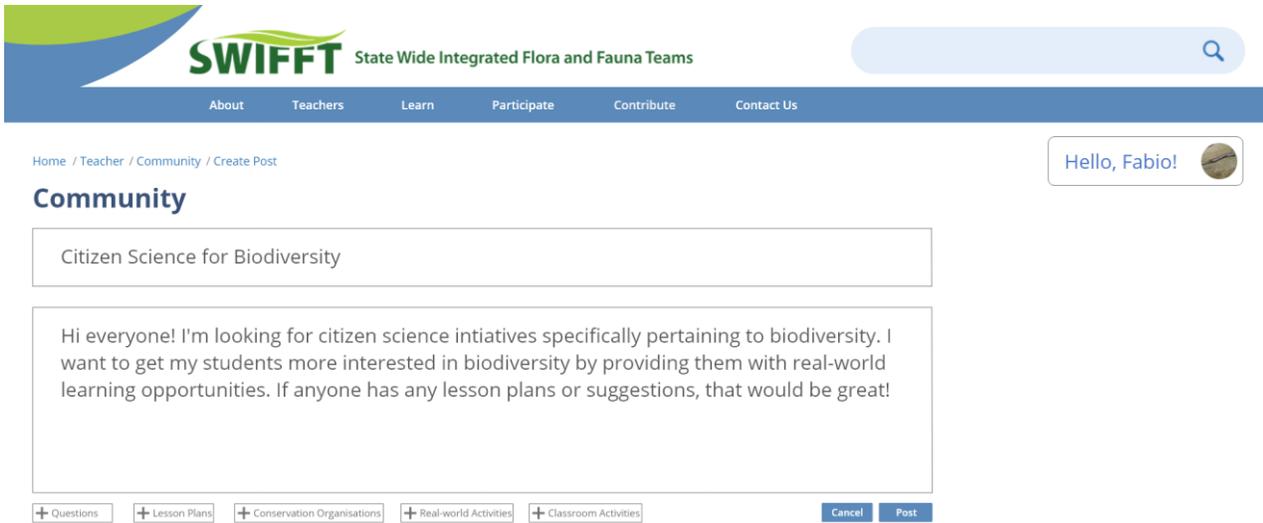


Figure 4.10. SWIFFT for Teachers - Create Post Page

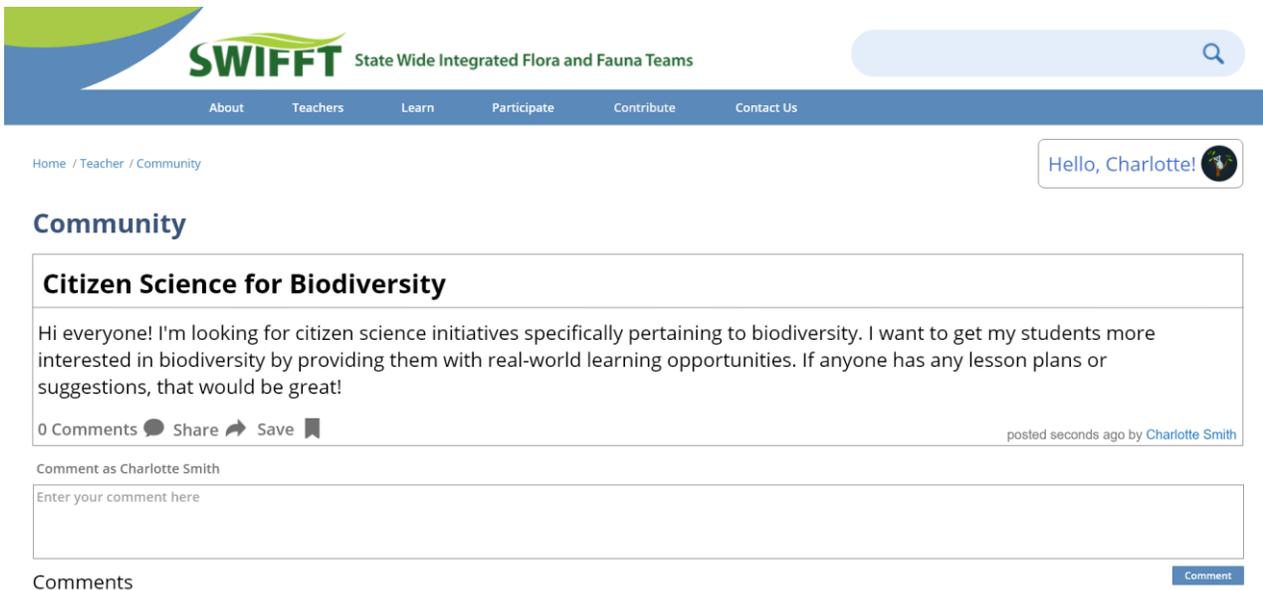


Figure 4.11. SWIFFT for Teachers - Create Post Page

Teachers can then respond to the post by typing their response in the comment text box and then pressing the “Comment” button. All comments appear directly below the post for others to respond to. Teachers can also save community posts to the My Workspace Page by pressing the “Save” button below the body of the post.

## 4.3 Feedback on the Mockup

Gathering feedback about our mockup from teachers in the United States was completed after creating a hi-fi prototype of the mockup as part of the testing phase of the **HCD process**. The results from the feedback form were analyzed and incorporated into the final design of our mockup.

### 4.3.1 Results from the Feedback Form

#### Task 1: Create and Account

When asked to navigate to the login/sign up screen of the mockup, a majority of the participants noted that the design of the login and sign up screens were clean, straightforward, easy to navigate, and easy to understand. They provided suggestions on how to improve the profile pages by adding grade levels that the teachers teach, age groups of the students, and types of school (i.e. public, private, etc.).

#### Task 2: Navigate through the Explore Resources Page

In general, the participants believed that this page had a user-friendly interface and was easy-to-navigate. Many noted that the design of the page was standard and familiar to them, which allows the user to feel comfortable while using the application. Regarding the filters on this page, three users commented that there should be more learning areas for students in elementary schools, as these learning areas applied more to students in higher grades. Another teacher commented that the learning areas were too broad. One suggestion from this page was to allow teachers to post the links from this page to one of the services that teachers already use for lesson plans, such as Google Classroom / Site or a Learning Management System (LMS).

#### Task 3: Navigate through the My Workspace Page

One teacher suggested that the home screen of this page should be organized by content/unit rather than by type of resource as she teaches material in units. Some major problems among the teachers on this page included the font size and the visual appeal. The font was too small for many of the teachers, which made the text difficult to read. Additionally, two teachers found that this page was not visually appealing and suggested that there should be more colors and images.

#### Task 4: Navigate through the Community Page

In general, almost all of the teachers described this page as easy to navigate and simple. Since the design of this page is similar to the My Workspace page, similar comments regarding font size, color scheme, and images appeared from the teachers. When asked to create a post, one teacher suggested the ability to link specific modules and lesson plans so other users can directly access the document on which the question was asked. One teacher commented about the lack of consistency of the icons on this page; icons for “share” and “save” were used in the Explore Resources page, but were different icons on the Community page.

Overall, the nine teachers in this feedback form believed that the mockup was **simple and creative**. On a scale from one to ten, when asked about the **simplicity** of the mockup, the average rating from the teachers was an 8.44, with a low of 7 and a high of 10, as shown in Figure 4.12. The teachers who rated the mockup on the lower end of the scale (rating of 7 or 8) reasoned that

the “confusing wording” and “small font” detracted from the simplicity and ease-of-use of the mockup. On the other hand, the teachers who rated the mockup on the higher end of the scale (rating of 9 or 10) believed that the design was intuitive, familiar, and easy to navigate.

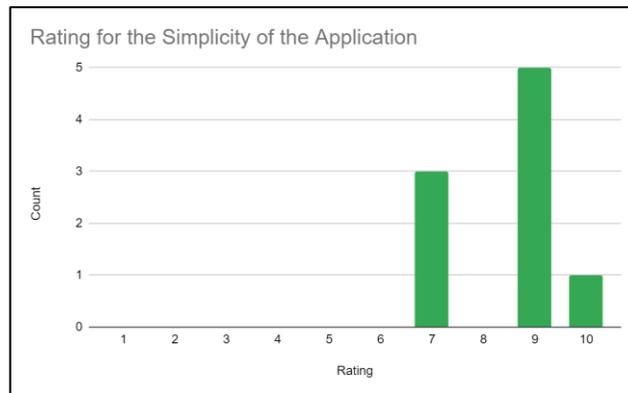


Figure 4.12. Feedback Form Results about the Simplicity of the Application.

Using the same scale from one to ten, when asked about the **creative design** of the mockup, the average rating from the teachers was an 8.56, with a low of 7 and a high of 10, as shown in Figure 4.13. People who rated the creative design on the lower end of the scale (rating of 7 or 8) reasoned that there should be more color and images in the design. Oppositely, those who rated the creative design on the higher end of the scale (rating of 9 or 10) believed that the theme was consistent, creative, and appealing and that the design uses images to engage the teachers and capture their attention.

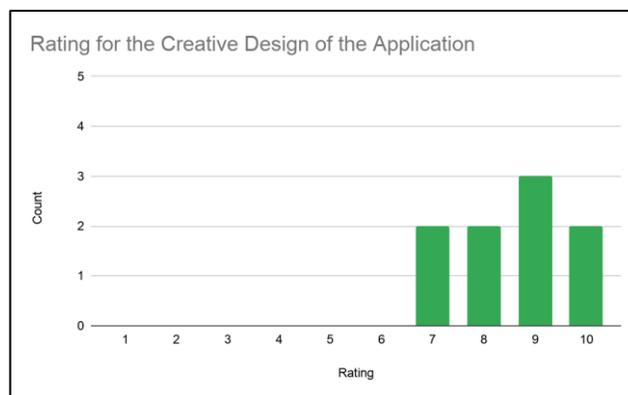
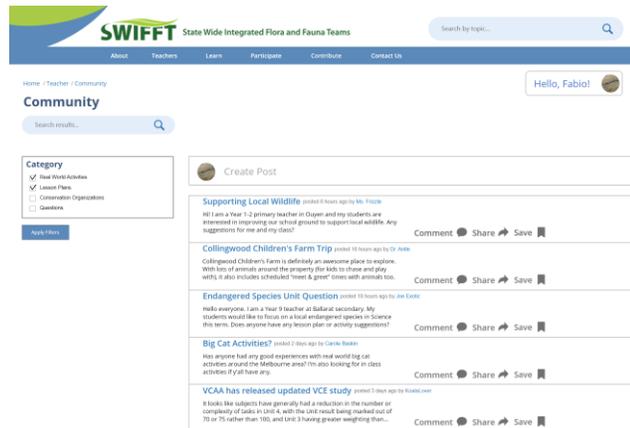
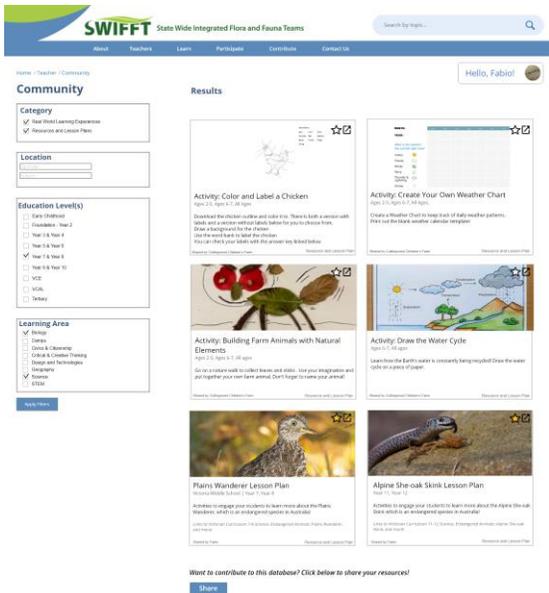


Figure 4.13. Feedback Form Results about the Creative Design of the Application.

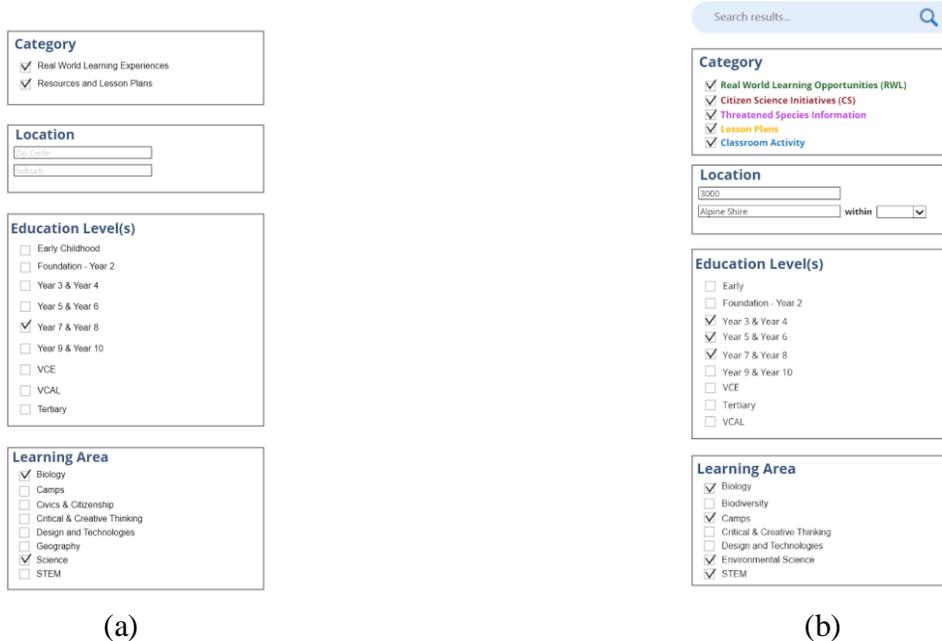
### 4.3.2 Changes to the Mockup

In response to the design specifications from our sponsor and the feedback form, we made appropriate changes to the mockup to better fit the desires of the teachers. One change to the mockup was the Community page, as seen in Figure 4.14. Originally, this page solely contained teacher-created resources, meaning that there were two places on the mockup that had resources. Since organizing the resources in this way was inefficient and repetitive, we combined the teacher-created content with the organization-created content in the Explore Resources page and used Community to host a forum.



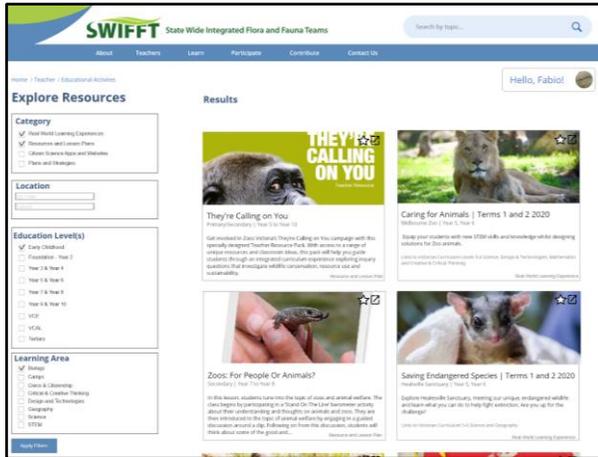
(a) (b)  
 Figure 4.14. Before (a) and After (b) of the Changes to the Community Page.

Another change to the mockup was the with the filter options in the Explore Resources page, as seen in Figure 4.15. We gave the users more control over the search results by incorporating a search bar for more advanced results and provided more categories for resources. Furthermore, we replaced any “vague” or broad learning areas, such as science, with more specific ones, such as biodiversity and environmental science.

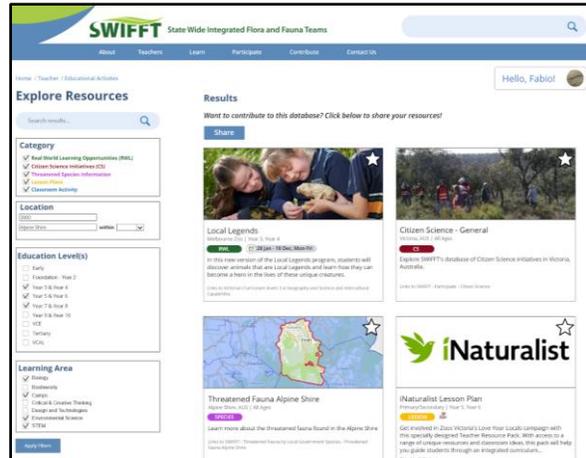


(a) (b)  
 Figure 4.15. Before (a) and After (b) of the Changes to the Filters on the Explore Resources Page.

The format of the resulting resources on the Explore Resources page also changed to clearly categorize the types of resources featured on this page, as seen in Figure 4.16. We used color-coded categories and added markers of each category to the resulting resource boxes. Also, we added dates to the real-world learning opportunities because these have specific dates and times and sorted them from most recent to oldest to allow teachers to find eligible resources easier.



(a)



(b)

Figure 4.16. Before (a) and After (b) of the Changes to the Explore Resources Page.

## **5.0 Future Development**

The purpose of this section is to provide a brief overview of additional feature recommendations to our mockup and our implementation and maintenance plans, which can all be found in Appendix G. The implementation plan is a guide to anyone that will continue the development of our project by providing a manual that contains our proposed design and a maintenance plan that describes how to deploy our project to the SWIFFT website.

### **5.1 Additional Features**

Based on the results from the feedback form, there are several future improvements that could be made to our mockup. One is creating a space for video resources. One of our teachers in the feedback form noted that “Children love videos and they are a great learning tool!”. Our sponsor also expressed an interest in incorporating videos through SafeShareTV, which is a platform similar to YouTube, that will allow for teachers to find appropriate videos for use in the classroom. We would also like to add the functionality for viewing other teachers’ profile pages, which would foster deeper connections between teachers. Another improvement is adding more images to the website to increase the visual appeal. As previously seen, a couple of our pages have a lot of text and boxes so adding more videos and colors will add to the visual appeal of the site. The final future improvement is adding student access so students can ask their own questions, view resources, and ask for feedback from conservation members on the work they are doing.

### **5.2 Implementation**

After presenting our mock-up to the developer team, we established a plan to slowly roll out our proposed changes to SWIFFT in order to receive further feedback from users. The Explore Resources page will be the first page to be implemented, although it will not yet feature the ability to favorite resources and store them on user accounts. From this initial test, CeRDI will be able to gauge the interest of its users in this page before adding the My Workspace page, which allows for further customization of the resources contained in the Explore Resource page in addition to teacher accounts. Lastly, the need for a Community page and forum will then be re-evaluated based on the success of the other two pages. This is due to the difficulty of motivating teachers to speak openly on an online public forum, a problem our sponsor has encountered in the past with their own Facebook page for Victorian teachers.

### **5.3 Maintenance Plan**

In order to develop a maintenance plan for our proposed additions to the SWIFFT website, we worked closely with the developers from CeRDI. The maintenance of the SWIFFT site will be greatly facilitated by CeRDI’s own in-house content management system (CMS) called Content Builder. A CMS is a powerful tool that allows for people with little to no programming experience to maintain and update their website. We are recommending that CeRDI should continue using Content Builder, as the volunteer who is currently maintaining the site is comfortable with it. The web application will utilize the CMS to add new teacher resources, keep existing ones up to date with new information, and to remove old real-world learning opportunities whose scheduled dates have already come and gone.

The Explore Resources page, which is the main proposed addition to the site, will require little to no additional storage. This is because we plan to utilize existing resources from the SWIFFT page as well as brand new ones that have been aggregated from conservation organizations. This will entail re-categorizing the existing resources to meet the criteria of the new teacher resources. Furthermore, the pre-existing Resource Library page on SWIFFT will provide a solid structure for this new page. Lastly, the My Workspace page may also require a separate database in order to store user data, which CeRDI has previous experience with from their other websites. Both CeRDI and our sponsor have expressed interest in allowing teachers to login via their school emails in order to encourage more teachers to use the site by removing the hassle of having to create an account. The user data used on the My Workspace page will consist solely of each teacher's organizational folders and favorite resources so that they may access them without having to browse Explore Resources to find them again.

As previously mentioned, CeRDI uses Content Builder as the CMS for the SWIFFT website. However, if there is interest in transitioning away from Content Builder in the future, we recommend that CeRDI use WordPress for their new CMS due to its extreme popularity, flexible and simple interface, and ability to be self-hosted with the SWIFFT website for no extra cost. Another advantage of WordPress is that it meets CeRDI's commitment to open-source software.

Moreover, the CeRDI development team has expressed interest in moving away from their existing search engine, SWISH-E, and to one that is more efficient and provides more relevant results. We recommend Algolia for this purpose as it is the leading search API used among software engineers and is capable of delivering real-time results based on less user input.

## **6.0 Conclusion**

The goal of this project was to assist Zoos Victoria in raising awareness for wildlife in the state of Victoria by developing a web application that connects teachers with local conservation groups and provides them with real-world learning opportunities. Our application addresses the need for a platform that can both aggregate wildlife conservation classroom resources and meet the needs of busy teachers who want to teach wildlife conservation through the use of real-world learning. The three components of our application enable teachers to easily find relevant resources, foster the creation of lesson plans for the classroom, and allow the teachers to communicate with similar-minded individuals. Despite the limitations to this project imposed by the COVID-19 pandemic of 2020, there is potential to build upon our deliverable of a hi-fidelity prototype of a web application to construct this necessary platform. We designed the prototype specifically for integration into the SWIFFT website. It features the same color scheme and structure as the current SWIFFT site and it uses resources that are already available on the site or included in CeRDI's repertoire of prebuilt resources from other sites. Furthermore, conversations with the SWIFFT/CeRDI development team suggested that our design is achievable and is likely to be developed in the future. All in all, using this web application will aid teachers in educating their students through hands-on experiences that are memorable and incite a deeper interest in the subject of wildlife conservation. Providing students with the opportunity to apply learned skills in a real-world context helps them transform working memory to long-term memory. We hope our application is a first step to incorporating wildlife conservation in the classroom through real-world learning opportunities in hopes of inspiring future leaders to support wildlife conservation efforts

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## Appendix A: Fighting Extinction 27 Matrix

Fighting Extinction 27		
Species	Endangerment Level	Photograph
Mammals		
Brush Tailed Rock Wallaby (southern population)	Critically endangered  Fewer than forty individuals in the southern population	
Eastern Barred Bandicoot (mainland population)	Extinct in wild  Three reintroduced populations on the mainland, and a fourth on Churchill Island	
Lowland Leadbeater's Possum (Lowland population)	Critically endangered  Fewer than forty individuals in the Lowland population	
Mountain Pygmy-possum	Critically endangered  Fewer than 2,000 individuals in the wild	
New Holland Mouse	Vulnerable  Fewer than 10,000 individuals in the wild	

Smoky Mouse	Endangered Fewer than 2,500 individuals in the wild	
Southern Bent-wing Bat	Endangered Fewer than 41,000 individuals in the wild	
Tasmanian Devil	Endangered Fewer than 15,000 individuals in the wild	
Birds		
Helmeted Honeyeater	Critically endangered Fewer than 200 individuals in the wild	
Mallee Emu-wren	Endangered Estimated 7,500 - 35,500 individuals in the wild	
Orange-bellied Parrot	Critically endangered Fewer than fifty individuals left in the wild	

Plains-wanderer	Critically endangered  Estimated 250-1,000 individuals in the wild	
Regent Honeyeater	Endangered  Fewer than 2,000 individuals in the wild	
Swift Parrot	Critically endangered  Unknown number left in the wild	
Amphibians		
Baw Baw Frog	Critically endangered  Less than 1,000 individuals in the wild	
Giant Burrowing Frog	Vulnerable  Unknown number left in the wild	

Large Brown Tree Frog	Endangered Unknown number left in the wild	
Northern Corroboree Frog	Endangered Fewer than 2,000 individuals in the wild	
Southern Corroboree Frog	Critically endangered Fewer than fifty individuals in the wild	
Spotted Tree Frog	Endangered Fewer than 12,000 individuals in the wild	
Stuttering Barred Frog	Endangered Not seen in Victoria since 1983	
Reptiles		
Alpine She-oak Skink	Endangered Four populations left in Victoria	

Grassland Earless Dragon	<p>Critically Endangered</p> <p>Not seen in Victoria since 1969</p>	
Guthega Skink	<p>Endangered</p> <p>Unknown number left in the wild. Only found on the Bogong High Plains.</p>	
Invertebrates		
Golden-rayed Blue Butterfly	<p>Critically endangered</p> <p>Unknown number left in the wild</p>	
Key's Matchstick Grasshopper	<p>Endangered</p> <p>Unknown number left in the wild</p>	
Lord Howe Island Stick Insect	<p>Critically endangered</p> <p>Estimated twenty to thirty-five individuals in the wild</p>	

# Appendix B: Virtual Questionnaire with Teachers

## Preamble:

We are a group of students from the United States studying at Worcester Polytechnic Institute (WPI). We are completing a project with the help of our sponsor Zoos Victoria and with advising from WPI faculty. The goal of this project is to support Zoos Victoria's initiative to provide real-world learning opportunities to students and to raise awareness for wildlife conservation in the state of Victoria. This is going to be accomplished by developing a website that connects school teachers with local conservation groups and providing them with educational activities. The creation of a website will help achieve this goal while also incorporating the needs of busy teachers and increasing engagement in real world learning opportunities at schools. This questionnaire should last approximately 10 minutes. Please be aware that you are not required to answer any questions that you do not want to and you can exit the form at any time.

May we use your responses in our final report? (Y/N)

All of your responses will be kept anonymous if you would like. (Y/N)

## Outline:

We would like to gather suggestions and information about what teachers would like to see in a webpage that will connect teachers to real world learning opportunities created by wildlife conservation partners.

## Questionnaire:

1. What is your name?
2. What is your email?
3. At what school do you currently teach?
4. What grade level do you currently teach?
5. Do you teach science topics in your classroom?
  - If not, what subject do you teach?
6. Do you currently use any applications to assist you in creating your curriculum?
  - Which applications do you use?
  - In general, what do you like about these applications?
  - In general, what do you dislike about these applications?
7. If you are a science teacher, do you currently incorporate wildlife conservation topics in the classroom? Leave this section blank or respond N/A if not.
  - Do you already use an application to aid you in this process?
    - If not, would you use an application to aid you in this process?
  - Do you have or follow any lesson plans relating to wildlife conservation?
    - If so, please describe and/or elaborate.
      - May we include them in our webpage?

# Appendix C: Virtual Mockup Feedback Form with Teachers

## Preamble:

We are a group of students from the United States studying at Worcester Polytechnic Institute (WPI). We are completing a project with the help of our sponsor Zoos Victoria and with advising from WPI faculty. The goal of this project is to support Zoos Victoria's initiative to provide real-world learning opportunities to students and to raise awareness for wildlife conservation in the state of Victoria. This is going to be accomplished by developing a website that connects school teachers with local conservation groups and providing them with educational activities. The creation of a website will help achieve this goal while also incorporating the needs of busy teachers and increasing engagement in real world learning opportunities at schools. This feedback form should last approximately 20 minutes. Please be aware that you are not required to answer any questions that you do not want to and you can exit the form at any time.

May we use your responses in our final report? (Y/N)

All of your responses will be kept anonymous if you would like. (Y/N)

## Outline:

We would like to test the usability of a webpage that will connect teachers to real world learning opportunities created by wildlife conservation partners and also gather any suggestions or new ideas you may have regarding this subject.

## Opening Questions:

1. What is your name?
2. What is your email?
3. At what school do you currently teach?
4. What grade level do you currently teach?
5. Do you teach science topics in your classroom?
  - a. If not, what subject do you teach?

## Tasks:

We have four tasks that we would like you to complete using a website mock-up we have developed. We ask that you answer questions and give feedback for each task. This mockup contains pre-set information, meaning that you cannot customize the website nor can you type anything in any of the boxes. You can only navigate through it by clicking on buttons, icons, and pictures.

Begin by clicking on the "Teachers" tab on the navigation bar. You are now on the teacher home screen.

Task 1: Click Login/Sign up.

Questions:

1. What are your thoughts on the login/sign up screen? Do you have any suggestions or improvements?
2. Click sign-up. Click sign-up on the next page as well. You should now be at a page where you can create your profile. Are there any other criteria that you think should be added to this page? Are there any that you think should not be part of this page?
3. Click save. You should now be on a profile page, which will act as the teacher home page when you are logged in. What are your thoughts on the design of this page?
4. Any other thoughts/comments/suggestions/improvements?
5. Click on Educational Resources.

Task 2: Go to Educational Resources.

Questions:

1. What are your initial thoughts on the design of this page?
2. Look at the filters on the left-hand side of the screen.
  - a. What filters, if any, should be added to this page? Why?
  - b. What filters, if any, should be removed from this page? Why?
3. Scroll down the page to “Local Legends”. Favorite this. Scroll back down to “Local Legends” to make sure that you have favorited it.
4. Were the icons on this page easy to figure out/identify? (if no, then prompt for a response)
5. Click on the “share” button. What are your thoughts on the design of the page?
6. Click on the “Fill out form” button underneath “Lesson Plans & Activities”
7. What are your thoughts on the design of this page?
8. Click “submit”
9. Any other thoughts/comments/suggestions/improvements?
10. Go back to the teacher home page and Click on My Workspace.

Task 3: Go to My Workspace.

Questions:

1. What are your thoughts on the design of this page?
2. How would you download a resource?
3. How would you move a resource into a folder?
4. Click on “Local Species Unit” on the left-hand side.
5. What are your thoughts on the design of this page?
6. Any other thoughts/comments/suggestions/improvements?
7. Go back to the teacher home page and click on Community.

Task 4: Go to Community

Questions:

1. What are your thoughts on the design of this page?
2. Make a post on the community forum (keep in mind that you cannot enter text).
3. What are your thoughts on the design of this?
4. Either press “cancel” or “post” to go back to the community page.
5. Click on the post titled “Supporting Local Wildlife”.
6. What are your thoughts on the design of this page?
7. Any other thoughts/comments/suggestions/improvements?
8. Go back to the teacher home page.

**Feedback Questions:**

1. On a scale from one to ten, with one being the worst and ten being the best, how would you rate the simplicity of the application? Why?
2. On a scale from one to ten, with one being the worst and ten being the best, how would you rate the creative design of the application? Why?
3. What features would you want to see in this application that are not present?
4. What could be improved about the application?
5. Do you know of any other teachers that may be interested in giving insight for this webpage?
6. Any suggestions or last thoughts about anything in the application?

**Wrap up:**

Thank you so much for your cooperation and participation! This feedback will be extremely helpful to us when designing our webpage. Would you be willing to participate in a potential follow-up feedback survey or interview? (Y/N)

## Appendix D: Real-world Learning Opportunities from Partners of SWIFFT

Name	Description	Web	Mobile
Atlas of Living Australia	The Atlas of Living Australia is a collaborative, national project that aggregates biodiversity data from multiple sources and makes it freely available and usable online. Includes species information profiles, downloadable occurrence data, spatial tools, sightings upload tools and citizen science platforms	X	
Aussie Bird Count	Birdlife Australia citizen science event. Australia wide bird count surveys.	X	X
Australian BioBlitz hub	National list of BioBlitz projects.	X	
Australian Citizen Science Association	The Australian Citizen Science Association (ACSA) was formed to advance citizen science through the sharing of knowledge, collaboration, capacity building and advocacy. ACSA is a member-based community that supports, informs and develops citizen science. ACSA membership is open to citizen science project managers, volunteers or anyone with an interest in citizen science	X	
Birdata	A Birdlife Australia platform. Record, contribute and view bird sightings and survey data.	X	X
BowerBird	Managed by the Museum of Victoria and the Atlas of Living Australia, Bowerbird is a socially networked, web-based, community, biodiversity workspace for Australia. Submit biological sightings and images for identification, discussion and sharing to conservation networks and recognised databases	X	
Climate Watch	Contribute species data relating to climate change.	X	X
eBird	International bird observation and checklist citizen science program.	X	X
Echidna CSI	EchidnaCSI is a citizen science project aimed at understanding more about Echidnas through the public's help.		X

Eremaea Birdlines	Eremaea Birdlines is a service provided by Birdlife Australia for recording unusual and interesting observations of wild birds in Australia.	X	
EstuaryWatch	EstuaryWatch is a citizen science program for monitoring estuary health.	X	
FeralScan	Map feral animal sightings, impacts and control actions. Includes RabbitScan, WildDogScan, FeralCatScan, FoxScan, FeralPigScan, ToadScan, MynaScan, MouseAlert, CamelScan, FeralGoatScan, FeralFishScan, StarlingScan, DeerScan (coming)	X	X
Frog Census	Melbourne Water community frog monitoring program. Recording of frog calls.		X
FrogID	Discover which frogs live around you and help count Australia's frogs.	X	X
Fungimap	Putting Australian fungi on the map.	X	
iNaturalist	International biodiversity observation and citizen science platform.	X	X
iSpy Catchment Creatures	Goulburn Broken Catchment Management Authority bird, fish, reptile and frog observation program.	X	
National Waterbug Blitz	National citizen science event to collect waterbug monitoring data from waterways and wetlands	X	X
NatureBlitz	The North Central CMA's NatureBlitz app is a citizen science monitoring tool that allows the community to collect important information about our region's biodiversity.	X	X
NatureShare	Citizen science database for individuals and groups to document and share information about their local environment.	X	
NatureWatch	A Victorian National Parks Association program. Started in 2007, NatureWatch trains community volunteers to collect important information about Victoria's animals and plants. Projects include Communities Listening for Nature, Caught on Camera, GrassTree Monitoring and Grassland Threatened Species.		
ParkConnect	The ParkConnect web site has lists of available volunteer activities across Victoria. Parks Victoria volunteers help to protect, maintain and restore	X	

	Victoria's unique and special places.		
PlatypusSPOT	Report Platypus sightings.	X	
Redmap	Redmap (Range Extension Database & Mapping project) invites the Australian community to spot, log and map marine species that are uncommon in Australia, or along particular parts of our coast.		
ReefWatch	A Victorian National Parks Association program. Marine citizen science program that trains people to collect important information about fish, invertebrates and algae at dive locations across Victoria. Projects include Great Victorian Fish Count, Adopt a Sponge, PlateWatch, OysterWatch, Sea Slug Census and ReefCam		
TurtleSAT	Contribute to mapping the location of freshwater turtles.	X	
VBA Go	Mobile recording tool for the Victorian Biodiversity Atlas.	X	
WaterWatch	Waterwatch is a citizen science program for monitoring waterway health.	X	
Wildlife Spotter	Become a citizen scientist and assist researchers by looking for animals in wilderness photos taken by automated cameras around Australia.		
WomSAT	WomSAT is a new resource for communities to record sightings of wombats across the country.	X	
xeno-canto	xeno-canto is a website dedicated to sharing bird sounds from all over the world.	X	
ZoaTrack	Platform for storing, analysing, visualising, synthesising and sharing animal presence and movement information.	X	

# Appendix E: Real-world Learning Lesson Plans Inspired by SWIFFT Resources

## iNaturalist Plan

*Learning Objectives:* SWBAT... identify local species and efforts to conserve them.

**Vocabulary:** wildlife conservation, endangered species

**Grade:** 4-5

**Materials:**

- Sticky notes
- Mobile devices or tablets
- Paper
- Pencil
- Coloring supplies

*Introduction Activity:* (approximately 10-15 minutes)

- Hand out a stack of sticky notes to each student/group.
- Instruct the students to write all of the local species that they know about on the sticky notes for 3 minutes.
- After 3 minutes, have all the students post the sticky notes on the board/wall.
- If the students are arranged in groups, then...
  - Have one person from each group come up to the board/wall.
  - Instruct the students to group the species on the sticky notes in a certain way. Allow the students to do this for 2-3 minutes. Such groupings can include by type (i.e. mammals, reptiles, etc.), size, noise the species makes, food the species eats, etc.
  - Have the group of students briefly explain (~1 min) what each group represents and say some of the species in the groupings out loud to the rest of the class.
  - Repeat this 2-3 more times.
- If the students are not arranged in groups, then...
  - Randomly choose 3-5 students or ask for 3-5 volunteers to come up to the board/wall.
  - Instruct the students to group the species on the sticky notes in a certain way. Allow the students to do this for 2-3 minutes. Such groupings can include by type (i.e. mammals, reptiles, etc.), size, noise the species makes, food the species eats, etc.
  - Have the group of students briefly explain (~1 min) what each group represents and say some of the species in the groupings out loud to the rest of the class.
  - Repeat this 2-3 more times.

*Lecture:* (approximately 10-20 minutes)

- Edit [this slideshow](#) to customize for your school area. Use the slideshow to inform the students about local species, some fun facts about them, and methods taken to conserve these species.

*Activity:* (approximately 1-2 hours)

**\*\* Prior to the lesson, identify safe places around the school grounds where you can take your students to look at local species. \*\***

- Distribute school-owned tablets to the students or, if tablets are not available, instruct them to take out their mobile devices. If the students are using school-owned tablets, ensure that the iNaturalist mobile application is downloaded on the device. If the students are using their mobile devices, then inform them that they must download the iNaturalist mobile application.
- Take the students outside to the areas that you have previously identified.
- Inform the students about the following safety precautions:
  - Do not venture out of this area that we are currently standing in.
  - Do not get too close to the species.
  - Do not touch the species.
  - Do not fool around with your other classmates.
  - Do not use any other application on the tablet or mobile device other than the iNaturalist mobile application.
- Instruct the students to open the iNaturalist mobile application and explain that the purpose of this application is to take pictures of and record sightings of species in the application. Quickly demonstrate the different features of the application to the students. Tell the students to store their sightings to their local databases.
- Monitor the students as they venture around the area to find species to capture on the iNaturalist mobile application.

*Discussion and Assessment:* (approximately 15-20 minutes)

- When back in the classroom, instruct the students to look at their personal databases.
- Give the students 10 minutes to discuss one or more species that they have seen that day in groups of 3-5. This discussion should include the name of the species, habitat, potential ways to conserve the species, and fun facts. Most of this information can be found in the iNaturalist mobile application.
- After the discussion, have the students select one of the species in their local database. Hand out one piece of paper to each student and distribute the coloring supplies. The students will write the name of the species, a description, and draw a picture of the species on a piece of paper.

- Each student will show his/her work to the class and the entire class will have a discussion about the best ways to conserve the species.

*Wrap Up:*

- Main idea: There are millions of species all around you, some that you may not even know about, but all are important and you should take active measures to conserve them.
- Did you like our activity for today?

*Other variations:*

- If you would like for this to occur for more than one day, give the students a homework assignment of using the iNaturalist app at home and take pictures of species near their homes. Then, they can bring in some of the species that they have seen the day before and discuss them with the class.

## iBird Plan

*Learning Objectives:* SWBAT... identify local bird species and efforts to conserve them.

**Vocabulary:** birds, conservation

**Grade:** 4-5

### **Materials:**

- Mobile devices or tablets
- Paper
- Pencil
- Coloring Supplies
- For the bird food:
  - Birdseed
  - Pine cones
  - String
  - Peanut butter (need to think of alternatives if students have allergies. For example, an alternative is sunflower seed butter)
  - Plastic knives
  - Paper bowls
  - Paper towels
  - Latex-free gloves

### *Introduction Activity:*

- None

### *Lecture:* (approximately 15-20 minutes)

- Create a fun powerpoint that has a bunch of bird facts or use [this powerpoint](#). Use the powerpoint to inform the students about birds, some fun facts about them, and methods taken to conserve them.
- Set up [this quiz](#) on a monitor. (**Note:** The quiz is based on the powerpoint mentioned above. Also, you must select “Quiz” on the right-hand side of the site.) All questions are multiple choice to make it easier for the students to answer.
- Split the class into groups of 3-5. Each team must select a team name and a buzzer noise that imitates a bird noise.
- If there is a tie for the quiz, then have each team complete [this label diagram quiz](#) and whoever does it the fastest with the most accuracy wins.

### *Activity:* (approximately 1-2 hours)

**\*\* Prior to the lesson, identify safe places around the school grounds where you can take your students to look at local bird species. Additionally, tie strings to the top of pine cones for the pine cone bird feeder because this step can get sticky and messy. \*\***

- Students will make a pine cone bird feeder, which is from [this website](#). Follow the instructions listed below:
  - Give one pine cone with a string attached, one bowl filled with birdseed, one pair of latex-free gloves, and one plastic knife to each student. Put jars of peanut butter (or a nut-free alternative) in specified locations around the room.
  - Instruct the students to put on their gloves and go to the specified peanut butter (or a nut-free alternative) locations around the room (in an orderly fashion!). Have them spread the peanut butter all over the surface of the pine cone.
  - Then, the students will go back to their seats and roll the pine cone through the bowl of birdseed.
  - The students will place their pine cone bird feeder on a paper towel when finished. They will also remove their latex-free gloves and wash their hands.
- Distribute school-owned tablets to the students or, if tablets are not available, instruct them to take out their mobile devices. If the students are using school-owned tablets, ensure that the iNaturalist mobile application is downloaded on the device. If the students are using their mobile devices, then inform them that they must download the iBird Pro Guide to Birds mobile application.
- Take the students outside to the areas that you have previously identified.
- Inform the students about the following safety precautions:
  - Do not venture out of this area that we are currently standing in.
  - Do not get too close to the species.
  - Do not touch the species.
  - Do not fool around with your other classmates.
  - Do not use any other application on the tablet or mobile device other than the iBird Pro Guide to Birds mobile application.
- Instruct the students to open the iBird Pro Guide to Birds mobile application and explain that the purpose of this application is to take pictures of and record sightings of species in the application. Quickly demonstrate the different features of the application to the students. Tell the students to store their sightings to their local databases.
- Monitor the students as they venture around the area to find species to capture on the iBird Pro Guide to Birds mobile application.

*Discussion and Assessment:* (approximately 15-20 minutes)

- When back in the classroom, instruct the students to look at their personal databases.
- Give the students 10 minutes to discuss one or more species that they have seen that day in groups of 3-5. This discussion should include the name of the species, habitat, potential ways to conserve the species, and fun facts. Most of this information can be found in the iBird Pro Guide to Birds mobile application.
- After the discussion, have the students select one of the species in their local database. Hand out one piece of paper to each student and distribute the coloring supplies. The

students will write the name of the species, a description, and draw a picture of the species on a piece of paper.

- Each student will show his/her work to the class and the entire class will have a discussion about the best ways to conserve the species.

*Wrap Up:*

- Main idea: Birds are an important part of our ecosystem and we must conserve them so we can continue seeing these amazing creatures everyday.
- Play [this video](#) for the students.
- Did you like our activity for today?

*Other variations:*

- None

## Port Phillip Bay Reef Cam

**Learning Objectives:** Demonstrate to students how estuaries and bays play a vital role in supporting healthy fish populations, preventing shorelines from eroding and improving coastal water quality.

### **Introduction Activity:**

Along the southern coast of Australia lie hundreds of bays and estuaries that contain important temperate habitats, including rocky reefs, seagrass meadows, mangrove forests and saltmarshes. These habitats are home to many unique and iconic species such as handfish, seadragons and giant cuttlefish and play a vital role in supporting healthy fish populations, preventing shorelines from eroding and improving coastal water quality. Yet sadly, the health of our bays and estuaries is in decline and largescale action is needed to repair coastal habitats and the critical services they provide for the benefit of both people and nature.

- Port Phillip Bay is an example of an estuary, all bays are estuaries as well. The species that live there are known as temperate marine life. The health of Australia's estuaries have been in decline due to decades of commercial dredging, pollution and overfishing.
- Port Phillip Bay contains a wide range of marine habitats like leafy seagrass meadows, hard temperate coral outcrops, colourful sponge gardens and vast underwater sandy plains. A hundred years ago it was also home to extensive oyster and mussel reefs that supported a huge range of other sea life including fish, crabs, sea squirts, snails and sponges. Sadly, after many years of over exploitation, pollution, introduced species and disease, these shellfish reefs disappeared. Shellfish are crucial to the ecosystem because they are excellent natural water filters, with one adult oyster filtering up to a bathtub of water a day.
- Shellfish reefs provide many benefits to people and communities, including:
  - 850 direct jobs will be created in maritime construction, science, fisheries and associated service sectors with half of these in regional areas.
  - 7,000 m<sup>3</sup> of shell waste will be diverted from landfill, to be recycled into new reefs.
  - New community volunteering and education opportunities.
- **Open the [Port Phillip Bay Reef Cam](#), which was created by The Nature Conservancy Australia, and leave it open on your classroom projector for the students to watch.**
- See if the students can identify any of the fish on their own for a few minutes and have them write down any that they are able to. Explain to students that most people do not know about these species and their value, because they are often overshadowed by the issues with the tropical Great Barrier Reef.

### **Materials:**

- [Great Fish Count Worksheet](#)
- A computer with internet connection

### **Lecture:**

- Here is the link to a presentation that covers the information listed above:

- [https://docs.google.com/presentation/d/1vbWVFQ9jeUhVColwd66tvTZtQ2yYQ4dS9nEbTu9drR0/edit#slide=id.g35f391192\\_09](https://docs.google.com/presentation/d/1vbWVFQ9jeUhVColwd66tvTZtQ2yYQ4dS9nEbTu9drR0/edit#slide=id.g35f391192_09)

***Activity:***

- Display the [Port Phillip Bay Reef Cam](#) on the classroom projector again.
- Have students fill out their [Great Fish Count Worksheet](#) while watching the livestream

***Discussion:***

- After students have watched the live stream for about 30 minutes and have tallied a sufficient number of fish species, go through the worksheet as a class and compare their total counts. Go through the rest of the presentation and see if any of those species are ones that you saw on the reef cam. Go over the basic information provided on the slides for each species that your students may have seen.

***Ending:***

- The fish species local to Southern Australian estuaries are crucial to the environment and should be protected similar to those in The Great Barrier Reef

## Birdlife Australia - Build a bird nesting box

*Objective:* To understand the different nesting patterns of local bird species and how humans negatively impact these natural habitats.

### *Lecture:*

- Discuss the importance of importance of shelter for birds
- What are the differences between a traditional bird's nest and a tree cavity nest?
  - What local species prefer tree cavity nests over open nests?
- Discuss how humans have negatively impacted the tree cavity nesting bird populations
  - Have students brainstorm solutions to these issues
- Discuss the benefits of creating nesting boxes for these bird species

### *Activity:*

#### Materials:

- Paper
- Coloring supplies
- In groups of four, have students research a local tree cavity nesting bird species and develop a team plan to create a bird box tailored to the species (ie. what special considerations must be made)
  - Here is a guide to 13 different species and recommended nesting boxes:  
<http://www.birdsinbackyards.net/Nest-Box-Plans>
- Have teams draw up their designs and propose how they would build their design.

### *Discussion:*

- Come together as a class and discuss the different plans each group developed
- Did each group come up with the same idea? Do nesting boxes differ between different bird species? What considerations did each group account for in their design?
- Nesting boxes are only part of the solution, what else can we do to conserve these bird species?
  - Ex. Bird friendly gardens, dense shrubbery, bird baths

### *Ending:*

- Human activities have a huge impact on the wildlife around us. It is important to be conscious of our actions and to support local wildlife by understanding their habitats and what we can do to help.

### *Other variations:*

- If accessible, proposed nesting boxes may actually be built and placed appropriately around the school yard.
  - It is important to follow guidelines to make sure the nesting boxes do not interfere with other local wildlife:  
[https://www.birdsinbackyards.net/sites/www.birdsinbackyards.net/files/page/attachments/doc\\_19\\_guidelines\\_schools\\_0.pdf](https://www.birdsinbackyards.net/sites/www.birdsinbackyards.net/files/page/attachments/doc_19_guidelines_schools_0.pdf)

- Students may monitor the implemented bird boxes and collect data on breeding success or failure and predatory behavior by other birds. This valuable data can be submitted to your local bird club or Birds Australia for their records.

## Royal Botanic Gardens Foundation - Build your own bottle ecosystem

*Objective:* To understand the interconnectivity of lifeforms involved in an ecosystem and the importance of conserving each member in the ecosystem.

### *Lecture:*

- Start by allowing students to brainstorm the plants and animals they see everyday. Discuss what each animal eats and how that animal is connected to other plants, animals and even humans.
- Discuss the term “ecosystem”. Show examples of different ecosystems around the world and discuss how they compare to your own.

### *Activity:*

#### Materials:

- Paper
  - Coloring supplies
- 
- In teams of four, have students choose which kind of biome to create and research what plants thrive in that biome, along with what type of soil and what nutrients those plants need.
  - Have teams draw up their designs and propose how they would build their design.

### *Discussion:*

- Have teams come back together as a class and discuss their planned ecosystems. How are they similar? How do they differ?

*Hands-On Activity:* (done in teams or by teacher for class) <https://sciencing.com/make-ecosystem-bottle-5164713.html>

#### Materials:

- Clean plastic 2L bottle (clear)
- Box cutter
- Potting soil
- 4-6 bean seeds
- Grass seed
- Tape

#### Protocol:

1. First peel the sticker off of the clean plastic 2L bottle if you have not already done so. Using the box cutter, cut off the top portion of the bottle (right where it tapers off to the neck).
2. Place 8-10 cm of potting soil into the bottom of the 2L bottle. Gently tap the bottle to allow the soil to settle, but be careful not to pack it in.
3. Plant 4-6 bean seeds in the soil by pushing them about 2-3 cm below the surface of the soil.
4. Sprinkle two pinches of grass seed on top of the soil and then lightly cover them with dirt.
5. Sprinkle water onto the soil until it is damp through the bottom, but not soaking wet.

6. Screw the cap onto the cut-off top of the bottle. Place it upside down into the opening and seal the edges with clear tape.
7. Place in a warm, partly sunny spot. The ecosystem will not require watering again.

*Wrap-up Discussion:*

- Why don't we have to water the plants in our ecosystem for them to grow?
- What is each member of this bottle ecosystem contributing to the others?
- How could we add on to this ecosystem to make it more complex?

*Ending:*

- All members of an ecosystem are co-dependent and vital to the overall success of the ecosystem. It is important to be conscious of our actions and to understand what we can do to conserve members of local ecosystems.
- Have students check on your ecosystem each day and watch your bean plants grow!

*Other variations:*

- Bring students for a "field trip" on the school grounds to help them brainstorm the plants and animals they see everyday.
- Have students keep a nature journal where they document the different plants and animals they interact with everyday. Ask them to choose a plant or animal they saw that day and write a mini report on it.
- Add a snail or worm to your bottle ecosystem and see how it affects plant survival.
- Create a complex bottle ecosystem by using aquatic life, such as fish or snails, plants and algae. Instructions for these may be found online. Note: some require feeding incorporated fish, meaning the bottle is not a true ecosystem.

## Victorian Landcare

*Learning Objectives:* Increase students awareness of the importance of a healthy environment and biodiversity

### Introduction Activity:

- Watch a video about the organisms that are decomposers and introduce the class to the energy cycle in our natural environment.

### Lecture:

- Create a PowerPoint that explains
  - The process of composting and what organisms are involved
  - Why it is important to our natural environment
  - How everyone can do it.
- Talk about the school's current recycling program and how composting is nature's way of recycling.

### Activity:

- Over the timeline of a few weeks have students collect plant-based food scraps from their lunches and store them in a bucket outside.
- Every week have students bury the week's worth of food scraps in some locations around the school grounds.
- Eventually, plant something in the soil.

### Discussion:

- Talk to students about how they could be doing this at their own homes and ask students to explain their family's system of composting if they do it.
- Have a discussion on how the class made the school's soil healthier.

### Ending:

- Talk to students about Victorian Landcare and possible events that they could do with their families. Send information home with the students to encourage their families to participate. Victorian Landcare is actively trying to grow community participation.

### Other variations:

- Victorian Landcare provides grants to schools that want to do projects based on the landcare and biodiversity. It would be possible to do this project on a larger scale within the school with funding.
  - <https://www.environment.vic.gov.au/landcare/victorian-junior-landcare-and-biodiversity-grants>

## Appendix F: Zoos Victoria School Programs

Zoos Victoria School Programs			
Program	School Years	Activities	Online Resources
Term 1			
Endangered Animals: Orang-utans	3 - 6	<ul style="list-style-type: none"> <li>Hear personal stories from Zoos Victoria Keepers about the needs of Orang-utan and the threats in the wild</li> <li>Learn how STEM skills are used to address real-world conservation challenges</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Sumatran Orang-utan</a></li> <li><a href="#">Don't Palm Us Off</a></li> </ul>
Thinking Global: Geography, Gorillas and Us	5 - 10	<ul style="list-style-type: none"> <li>Meet zoo experts who can help explain the complex relationships of the environment and human influences on gorillas</li> <li>Learn about gorillas, the threats they face in the wild, and the actions that can help save them</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Western Lowland Gorillas</a></li> <li><a href="#">They're Calling On You</a></li> </ul>
Term 2			
Program	School Years	Activities	Online Resources
STEM at the Zoo - Animals and Ethics	5 - 6	<ul style="list-style-type: none"> <li>Explore ethics through the lens of a contemporary zoo</li> <li>Learn how STEM skills are used by Zoo experts to address real-world conservation challenges</li> <li>Hear from Zoos Victoria's marine mammal expert about protecting seals from distress in the wild</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Primary school ethical capabilities teaching resources</a></li> <li><a href="#">Secondary school ethical capabilities teaching resources</a></li> </ul> Community Conservation Campaigns: <ul style="list-style-type: none"> <li><a href="#">Love Your Locals</a></li> <li><a href="#">Seal the Loop</a></li> </ul>

			<ul style="list-style-type: none"> <li>• <a href="#">When Balloons Fly, Seabirds Die</a></li> </ul>
Endangered Animals: Plains Wanderer	5 - 8	<ul style="list-style-type: none"> <li>• Hear about the Plains Wanderer, why it's under threat in the wild, and all the strategies and opportunities to save it from extinction</li> <li>• Learn about Victoria's most endangered ecosystem and what has caused the change over time</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Plains Wanderer</a></li> </ul>
Endangered Animals: Australian Native Mice	7 - 8	<ul style="list-style-type: none"> <li>• Hear from Zoos Victoria's experts about the work being done to help the Australian Native Mouse</li> <li>• Discover how STEM skills can be used to address real-world conservation challenges</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">New Holland Mouse</a></li> <li>• <a href="#">Smoky Mouse</a></li> </ul>
Term 3			
Program	School Years	Activities	Online Resources
Endangered Mammals: Tasmanian Devil	1 - 4	<ul style="list-style-type: none"> <li>• Hear first-hand experiences from Zoos Victoria's experts to learn more about the Tasmanian Devil and what can be done to protect it and other endangered species</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Tasmanian Devil</a></li> </ul>
Wildlife and Waste: Sustainability	5 - 8	<ul style="list-style-type: none"> <li>• Hear from Zoos Victoria's sustainability experts about how they address complex, real-world, sustainability challenges at the zoo</li> <li>• Learn how to apply STEM skills to address real-world conservation challenges</li> </ul>	Community Conservation Campaigns <ul style="list-style-type: none"> <li>• <a href="#">Wipe for Wildlife</a></li> <li>• <a href="#">They're Calling On You</a></li> <li>• <a href="#">Love Your Locals</a></li> <li>• <a href="#">Seal the Loop</a></li> <li>• <a href="#">When Balloons Fly, Seabirds Die</a></li> </ul>

Endangered Animals: Good News Stories on Threatened Species Day	5 - 8	<ul style="list-style-type: none"> <li>● Hear from experts in species recovery about the work they do to save animals from extinction</li> <li>● Learn how STEM skills are used to address real-world conservation challenges</li> </ul>	
*Women in STEM: Deep Blue	7 - 10	<ul style="list-style-type: none"> <li>● Connect with female STEM role models who are caring for our oceans</li> <li>● Discover real-world case studies of women working in STEM</li> <li>● Explore the role of STEM in the future of work</li> <li>● Reflect on how personal interests and skills can be translated to STEM study and careers</li> </ul>	Sponsor: <ul style="list-style-type: none"> <li>● <a href="#">girdedworld</a></li> </ul>
STEM in action - Careers at Werribee Zoo	9 - 12	<ul style="list-style-type: none"> <li>● Learn about the variety of careers at Werribee Zoo</li> <li>● Learn about how STEM is used daily to help fight extinction of wildlife</li> </ul>	
*VCE Biology Unit 2: Conservation through Reproductive Biology	Typically years 11 - 12	<ul style="list-style-type: none"> <li>● Meet real-world experts in reproductive Biology</li> <li>● Explore fundamental concepts in reproduction biology and how they can be applied to a real-world conservation issue</li> <li>● Discover why an understanding of sexual reproduction, growth and development, and inheriting genotypes and phenotypes are crucial in fighting extinction</li> <li>● Learn about the science-based techniques for captive breeding of critically endangered animals</li> </ul>	This program links to VCE Biology: Unit 2; Area of Study 1, 2 and 3. Information about this can be found <a href="#">here</a> .

Term 4			
Program	School Years	Activities	Online Resources
Endangered Birds: Helmeted Honeyeater	3 - 6	<ul style="list-style-type: none"> <li>● Hear from a Zoos Victoria expert to learn more about the Helmeted Honeyeater and the efforts to protect this species from extinction</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Helmeted Honeyeater</a></li> </ul>
Love Your Locals: Victorian Grasslands, OBPs and EBBs	5 - 8	<ul style="list-style-type: none"> <li>● Connect with experts to learn about critically endangered species</li> <li>● Learn about Victoria's most endangered grassland ecosystem and what has caused change over time</li> <li>● Learn about two critically endangered Victorian species- the Eastern Barred Bandicoot and the Orange bellied parrot and what the zoo is doing to help</li> <li>● Learn about what you can do to help to fight extinction of local Victorian species</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Orange-bellied Parrot</a></li> <li>● <a href="#">Eastern Barred Bandicoot</a></li> </ul>

\* This program takes place at the Melbourne Zoo and costs \$19 AUD per student and is free for accompanying teachers.

\*\*All are online and free unless otherwise noted.

# Appendix G: Future Development Plan

**Proposed Design (Screenshots of all the pages that we created, comments on design, link to mockup and images of all the pages)**

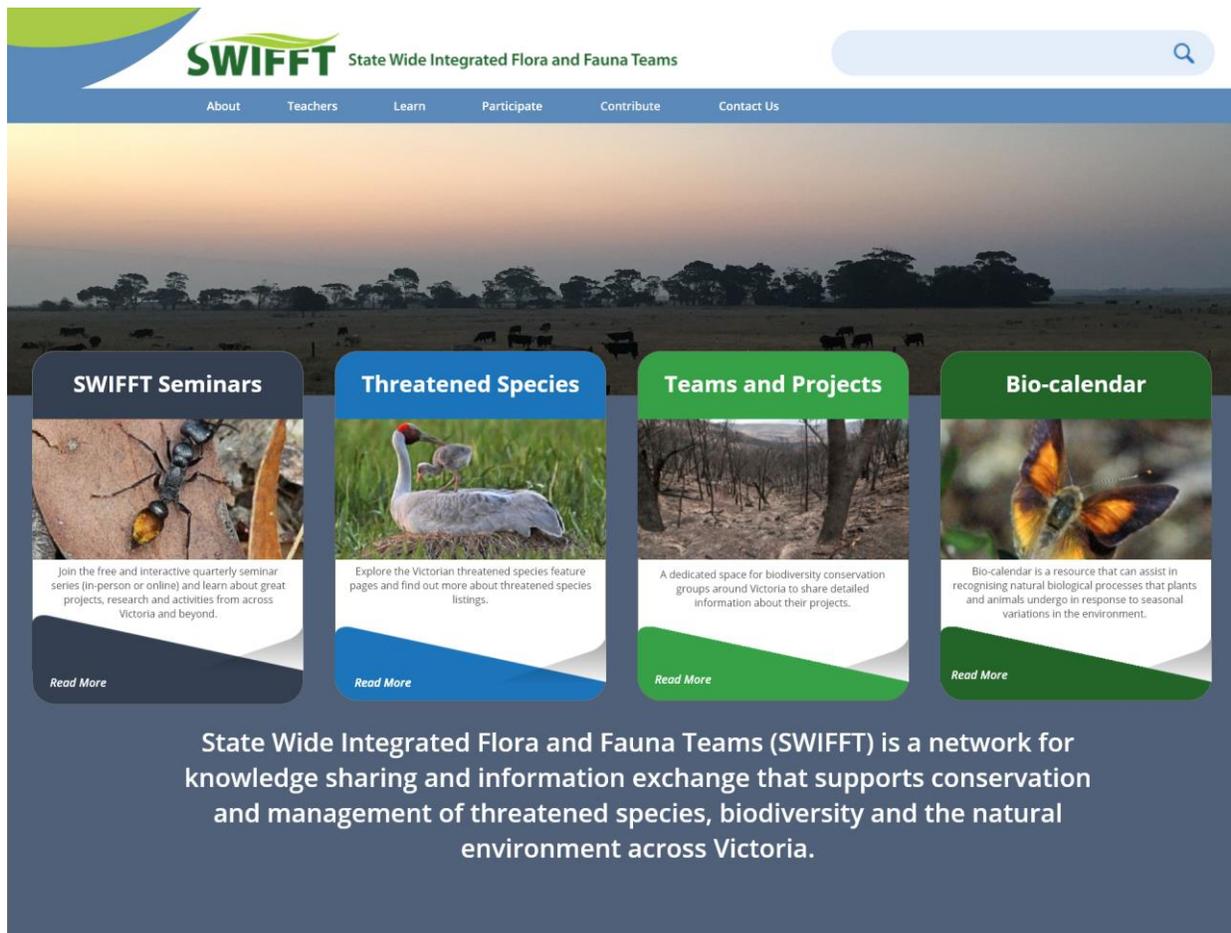
## LINKS

- Web mockup (<https://xd.adobe.com/view/46c8437b-8be4-422a-6678-94e1aff8d21d-30f9/>)
- Mockup files (<https://drive.google.com/open?id=1NgnlP0f7H6ngW6ekpcNRTSJZyP3XG-MV>)
- Mockup screenshots ([https://drive.google.com/open?id=1FRRw08eEmnQakbwwmno\\_kcE30IBeza8i](https://drive.google.com/open?id=1FRRw08eEmnQakbwwmno_kcE30IBeza8i))

## Sitemap

- SWIFFT Homepage
  - Teacher Main Screen
    - Explore Resources
      - Real World Learning (Local Legends )
      - Citizen Science (Citizen Science - General)
      - Threatened Species Information (Threatened Fauna Alpine Shire)
      - Lesson Plans (iNaturalist Lesson Plan)
      - Classroom Activity (Build Farm Animals with Natural Elements)
    - My Workspace (Dropdowns expanded and contracted)
      - Local Species Unit Folder
    - Community
      - Create Post
      - Post example (Supporting Local Wildlife)
  - User Accounts
    - Login page
    - Signup page
    - Create profile page
    - User profile page
  - Share page
    - Share a Lesson Plan or Activity

# Proposed Design



*SWIFFT Homepage*

**Explore Resources**



Activities to bring real world experiences into the classroom

**My Workspace**



Tailored educational resources/ lesson plans based on location and grade level

**Community**



Connect and share with other teachers

*SWIFFT for Teachers Home Screen*

Home / Teacher / Educational Activities

Hello, Fabio! 

## Explore Resources

Search results...

**Category**

- Real World Learning Opportunities (RWL)
- Citizen Science Initiatives (CSI)
- Threatened Species Information
- Lesson Plans
- Classroom Activity

**Location**

State:  within

**Education Level(s)**

- Early
- Foundation - Year 2
- Year 3 & Year 4
- Year 5 & Year 6
- Year 7 & Year 8
- Year 9 & Year 10
- VCE
- Tertiary
- VCAL

**Learning Area**

- Biology
- Biodiversity
- Camps
- Critical & Creative Thinking
- Design and Technologies
- Environmental Science
- STEM

## Results

Want to contribute to this database? Click below to share your resources!

**Share**



**Local Legends**  
Melbourne Zoo | Year 3, Year 4

**RWL** 28 Jan - 18 Dec Mon-Fri

In this new version of the Local Legends program, students will discover animals that are Local Legends and learn how they can become a hero in the lives of these unique creatures.

Links to Victorian Curriculum levels: 3-4 Geography and Science and Inter-cultural Capabilities



**Citizen Science - General**  
Melbourne Zoo | All Ages

**CSI**

Explore SWIFFT's database of Citizen Science initiatives in Victoria, Australia.

Links to SWIFFT: Participate: Citizen Science



**Threatened Fauna Alpine Shire**  
Alpine Shire, VIC | All Ages

**Lesson**

Learn more about the threatened fauna found in the Alpine Shire.

Links to SWIFFT: Threatened Fauna by Local Government Species - Threatened Fauna Alpine Shire



**iNaturalist Lesson Plan**  
Primary/Secondary | Year 5, Year 6

**Lesson**

Get involved in Zoos Victoria's Love Your Locals campaign with this specially designed Teacher Resource Pack. With access to a range of unique resources and classroom ideas, this pack will help you guide students through an integrated curriculum.

Shared by Cathi Jung



**Zoos: For People Or Animals?**  
Secondary | Year 7 to Year 8

**Lesson**

In this lesson, students tune into the topic of zoos and animal welfare. The class begins by participating in a 'Stand On The Line' barometer activity about their understanding and thoughts on animals and zoos. They are then introduced to the topic of animal welfare by engaging in a guided discussion around a clip.



**They're Calling on You**  
Primary/Secondary | Year 9 to Year 10

**Activity**

Get involved in Zoos Victoria's They're Calling on You campaign with this specially designed Teacher Resource Pack. With access to a range of unique resources and classroom ideas, this pack will help you guide students through an integrated curriculum experience exploring inquiry questions that investigate wildlife.



**Activity: Building Farm Animals with Natural Elements**  
Primary | Early

**Lesson**

Go on a nature walk to collect leaves and sticks. Use your imagination and put together your own farm animal. Don't forget to name your animal!



**Activity: Draw the Water Cycle**  
Primary | Early

**Activity**

Learn how the Earth's water is constantly being recycled! Draw the water cycle on a piece of paper.

Shared by Colleenwood Oldham's Farm

*Explore Resources*

◀ Back to Explore Resources

## Local Legends ☆ 📖

In this new version of the Local Legends program, students will discover animals that are Local Legends and learn how they can become a hero in the lives of these unique creatures.

### Program Description

In this new and updated version of the Local Legends program, students will learn what makes our Local legends unique and why they need us to be their heroes.

By gathering information and sharing ideas, students will learn how to be a responsible custodian to Australian animals and their habitats through the tradition of storytelling.

Students will have the opportunity to observe Australian species in their habitat, learn what features they have to help them to survive and what they can do to protect animals, native vegetation and wild environments.

By reflecting on what they have learnt, students will be encouraged to do their own story-telling, sharing what makes their Local Legend unique and how they can change their behaviour and influence others to become a hero for their own Local Legend.

Local Legends will:

- Understand the value and importance of storytelling for conservation in the past and present
- Witness the unique features of Australian animals, take part in interactive experiences in the workshop, attend Daily Talks, observe animals interacting with their habitats, and explore the Zoo
- Learn how to use storytelling to empower people to take care of the fragile connections between animals and their homes
- Be inspired to take greater responsibility in saving our native species

Activity	Duration
Welcome and introduction to your day (arrivals between 9.40 - 10am)	10 minutes
Workshop with Melbourne Zoo teacher	40 minutes
Explore the Zoo - meet the local legend animals, visit other animal exhibits, attend educational keeper talks	1 - 4 hours

## Melbourne Zoo

**YEAR LEVELS**  
Year 3, Year 4

**COST**  
\$19 per student

**AVAILABILITY**  
Monday to Friday (during the school term)

**STUDENT RATIO**  
1 adult for every 10 students

**THEMES**  
Aboriginal Culture, Adaptations, Australian Animals, Ecosystems / Habitats, Endangered Species, Life cycles, Sustainability

## *Real World Learning (Local Legends )*

[Back to Explore Resources](#)

## Citizen Science Initiatives

There are many facets to citizen science but in general terms it is about the public engaging with and sharing science in relation to the natural world. This could be through random observations and reporting, organised surveys, monitoring project progress and outcomes, recording methodologies and sharing knowledge to improve recovery of species and their habitats.



This page is set up to help groups and individuals undertaking or planning native flora and fauna projects in Victoria to connect with other sites and resources for information relating to citizen science.

### Further information:

- [Biodiversity on-ground actions](#) - \$25.66 million to support biodiversity and threatened species through community action grants, support programs and regional partnership approaches.
- [Recommended references](#)
- [SWIFFT video conference notes - Citizen Science](#)
- [SWIFFT video conference notes - Online biodiversity resources](#)
- [Land for Wildlife](#)
- [Conservation Management Networks](#)

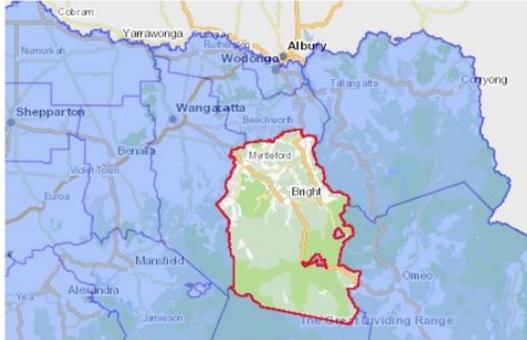
## Citizen science and data collection apps and websites

<p><b>Atlas of Living Australia</b></p> <p>The Atlas of Living Australia is a collaborative, national project that aggregates biodiversity data from multiple sources and makes it freely available and usable online. Includes species information profiles, downloadable occurrence data, spatial tools, sightings upload tools and citizen science platforms.</p>	<a href="#">Weblink</a>	
<p><b>Natural Newstead</b></p> <p>Web app, Android app, iOS app</p> <p>Birdlife Australia citizen science event. Australia wide bird count surveys.</p>	<a href="#">Weblink</a>	
<p><b>Australian Citizen Science</b></p> <p>This website explores ways to keep our natural ecology healthy and thriving for future generations, Authored by Stephen Murphy.</p>	<a href="#">Weblink</a>	
<p><b>iNaturalist</b></p> <p>Web app, Android app, iOS app</p> <p>International biodiversity observation and citizen science platform.</p>	<a href="#">Weblink</a>	
<p><b>Aussie Bird Count</b></p> <p>Web app, Android app, iOS app</p> <p>Birdlife Australia citizen science event. Australia wide bird count surveys.</p>	<a href="#">Weblink</a>	
<p><b>Frog ID</b></p> <p>Web app, Android app, iOS app</p> <p>Discover which frogs live around you and help count Australia's frogs.</p>	<a href="#">Weblink</a>	

### *Citizen Science (Citizen Science - General)*

[Back to Explore Resources](#)

## Threatened Fauna Alpine Shire ☆ 🔗



Alpine Shire is a local government area located in the northwest part of Victoria in the Hume region.

Click the buttons below to see the threatened species in this region!

<b>Birds (54)</b>	<b>Reptiles (8)</b>
<b>Mammals (11)</b>	<b>Amphibians (5)</b>
<b>Fish (8)</b>	<b>Invertebrates (5)</b>

Note: This page is intended to provide an overview of all known (including historic) records of fauna in the Alpine Shire, which are considered threatened, poorly known, near threatened, or extinct in Victoria.

Conservation Status Key	
<b>EW</b>	Extinct in Wild
<b>RX</b>	Regionally Extinct
<b>CR</b>	Critically Endangered
<b>EN</b>	Endangered
<b>VU</b>	Vulnerable
<b>NT</b>	Near Threatened
<b>DD</b>	Data Deficient

### *Threatened Species Information (Threatened Fauna Alpine Shire)*

< Back to Explore Resources

## iNaturalist Lesson Plan

### Objectives:

Students will be able to identify local species and efforts to conserve them.

*Vocabulary: Species, Habitat, Conservation, Endangered, Endangerment levels*

### Introduction Activity:

Students will write all of the local species that they know about on sticky notes and then post them on the board/wall. Then, the students will group these species by the type (i.e. mammals, reptiles, etc.).

### Lecture:

Edit the attached slideshow to customize for your school area. Use the slideshow to inform the students about local species, some fun facts about them, and methods taken to conserve these species.

Activity	Duration
Using the iNaturalist mobile application, students will go outside and take pictures of species close to the school grounds and store their sightings in their local databases	1-3 hours

### Discussion:

When back in the classroom, the students will look at their personal databases and discuss 1+ species that they have seen that day within groups of 4. After a brief discussion, have the students write the name of the species, a description and draw a picture of the species on a piece of paper. Each student will show his/her work to the class and have a discussion about the best ways to conserve the species.

### Ending:

There are millions of species all around you, some that you may not even know about, but all are important and you should take active measures to conserve them.

### Other Variations:

If you would like for this to occur for more than one day, give the students a homework assignment of using the iNaturalist app at home and take pictures of species near their homes. Then, they can bring in some of the species that they have seen the day before and discuss them

#### YEAR LEVELS

Year 5, Year 6

#### MATERIALS

Sticky notes  
Access to mobile devices  
Paper  
Coloring supplies

#### COST

\$3-5

#### DOCUMENTS INCLUDED

Sample Powerpoint

#### THEMES

Australian Animals,  
Ecosystems / Habitats,  
Endangered Species,  
Conservation, Citizen Science

#### IMPORTANT LINKS

[Online Quiz](#)  
[More Bird Information](#)

#### FILES

[victorian\\_species.pptx](#)

## *Lesson Plans (iNaturalist Lesson Plan)*

◀ Back to Explore Resources

## Building Farm Animals ☆ 🔗 with Natural Elements

### Objectives:

Students will be able to design their own farm animal using natural materials.

*Vocabulary: Species, Habitat*

### Steps:

1. Look around for a fallen leaf. Don't take leaves off living plants, because that can hurt them! You can find big leaves under trees, and little leaves under bushes or flowers.
2. Leaves come in all kinds of shapes! Animals do too. Glue your leaf to the center of a piece of paper to give yourself lots of room to add the other pieces.
3. Glue the other pieces you found to the paper and the leaf. Maybe the rocks are eyes, and the wood chips are eyebrows. Sticks can be legs, horns, or maybe a smile! Have fun with it!
4. Some shapes can be hard to find, add any extra parts to your animal with crayon or marker!
5. Now that you've made an animal, it needs a name! Choose a name for your animal and their species!

### Safety Precautions:

Do NOT take any leaves or any other materials from living plants! They have feelings too!



#### YEAR LEVELS

All Ages (Early)

#### MATERIALS

Sticks, leaves, rocks, and anything else you can find outside  
Paper  
Glue  
Coloring supplies

#### COST

N/A

#### DOCUMENTS INCLUDED

N/A

#### THEMES

Australian Animals, Farm Animals, Design

*Classroom Activity (Build Farm Animals with Natural Elements)*

Home / Teachers / My Workspace

Hello, Fabio! 

## My Workspace

**My Folders**

-  [Add New](#)
-  [Local Species Unit](#)
-  [Zoos Victoria Campaigns](#)
-  [Outdoor Activities](#)
-  [Reptiles](#)

<b>Real World Learning Opportunities</b>	▼
<b>Lesson Plans</b>	▼
<b>Citizen Science Websites</b>	▼
<b>Community Forum Posts</b>	▼

### Local Species Unit Folder

Home / Teachers / My Workspace

Hello, Fabio! 

## My Workspace

**My Folders**

-  [Add New](#)
-  [Local Species Unit](#)
-  [Zoos Victoria Campaigns](#)
-  [Outdoor Activities](#)
-  [Reptiles](#)

### Local Species Unit

<p><b>Local Legends</b></p> <p>In this new version of the Local Legends program, students will discover animals that are Local Legends and learn how they can become a hero in the lives of these unique creatures.</p>			
<p><b>They're Calling on You</b></p> <p>Get involved in Zoos Victoria's They're Calling on You campaign with this specially designed Teacher Resource Pack. With access to a range of unique resources and classroom ideas, this pack will help you guide students through an integrated curriculum experience exploring inquiry questions that investigate wildlife...</p>			
<p><b>Wipe For Wildlife</b></p> <p>Get involved in Zoos Victoria's Wipe for Wildlife campaign with this specially designed Teacher Resource Pack. With access to a range of unique resources and classroom ideas, this pack will help you guide students through an integrated curriculum experience exploring inquiry...</p>			
<p><b>Love Your Locals</b></p> <p>Get involved in Zoos Victoria's Love Your Locals campaign with this specially designed Teacher Resource Pack. With access to a range of unique resources and classroom ideas, this pack...</p>			
<p><b>Zoos: For People Or Animals?</b></p> <p>In this lesson, students tune into the topic of zoos and animal welfare. The class begins by participating in a 'Stand On The Line' barometer activity about their understanding and thoughts on animals and zoos. They are then introduced to the topic of animal welfare ...</p>			

### My Workspace

## Community

Search results... 

### Category

- Real World Activities
- Lesson Plans
- Conservation Organizations
- Questions

Apply Filters



Create Post

#### Supporting Local Wildlife posted 8 hours ago by Ms. Frizzle

Hi! I am a Year 1-2 primary teacher in Ouyen and my students are interested in improving our school ground to support local wildlife. Any suggestions for me and my class?

[Comment](#)
[Share](#)
[Save](#)

#### Collingwood Children's Farm Trip posted 16 hours ago by Dr. Antle

Collingwood Children's Farm is definitely an awesome place to explore. With lots of animals around the property (for kids to chase and play with), it also includes scheduled "meet & greet" times with animals too.

[Comment](#)
[Share](#)
[Save](#)

#### Endangered Species Unit Question posted 18 hours ago by Joe Exotic

Hello everyone. I am a Year 9 teacher at Ballarat secondary. My students would like to focus on a local endangered species in Science this term. Does anyone have any lesson plan or activity suggestions?

[Comment](#)
[Share](#)
[Save](#)

#### Big Cat Activities? posted 2 days ago by Carole Baskin

Has anyone had any good experiences with real world big cat activities around the Melbourne area? I'm also looking for in class activities if y'all have any.

[Comment](#)
[Share](#)
[Save](#)

#### VCAA has released updated VCE study posted 3 days ago by KoalaLover

It looks like subjects have generally had a reduction in the number or complexity of tasks in Unit 4, with the Unit result being marked out of 70 or 75 rather than 100, and Unit 3 having greater weighting than...

[Comment](#)
[Share](#)
[Save](#)

## Community

Home / Teacher / Community / Create Post

Hello, Fabio! 

## Community

Title

Text

+ Questions + Lesson Plans + Conservation Organisations + Real-world Activities + Classroom Activities
Cancel Post

### Create Post

Home / Teacher / Community

Hello, Fabio! 

## Community

### Supporting Local Wildlife

Hi! I am a Year 1-2 primary teacher in Ouyen and my students are interested in improving our school ground to support local wildlife. Any suggestions for me and my class?

3 Comments Share Save

posted 8 hours ago by Ms. Frizzle

Comment as Fabio

Enter your comment here

Comment

### Comments

Fabio commented 2 hours ago

In my class we followed this Zoos Victoria activity: <https://www.zoo.org.au/love-your-locals/>

Reply

Joe Exotic commented 4 hours ago

Composting is a good idea and it's super easy to do!

Reply

Jimmy Fitzsimons commented 6 hours ago

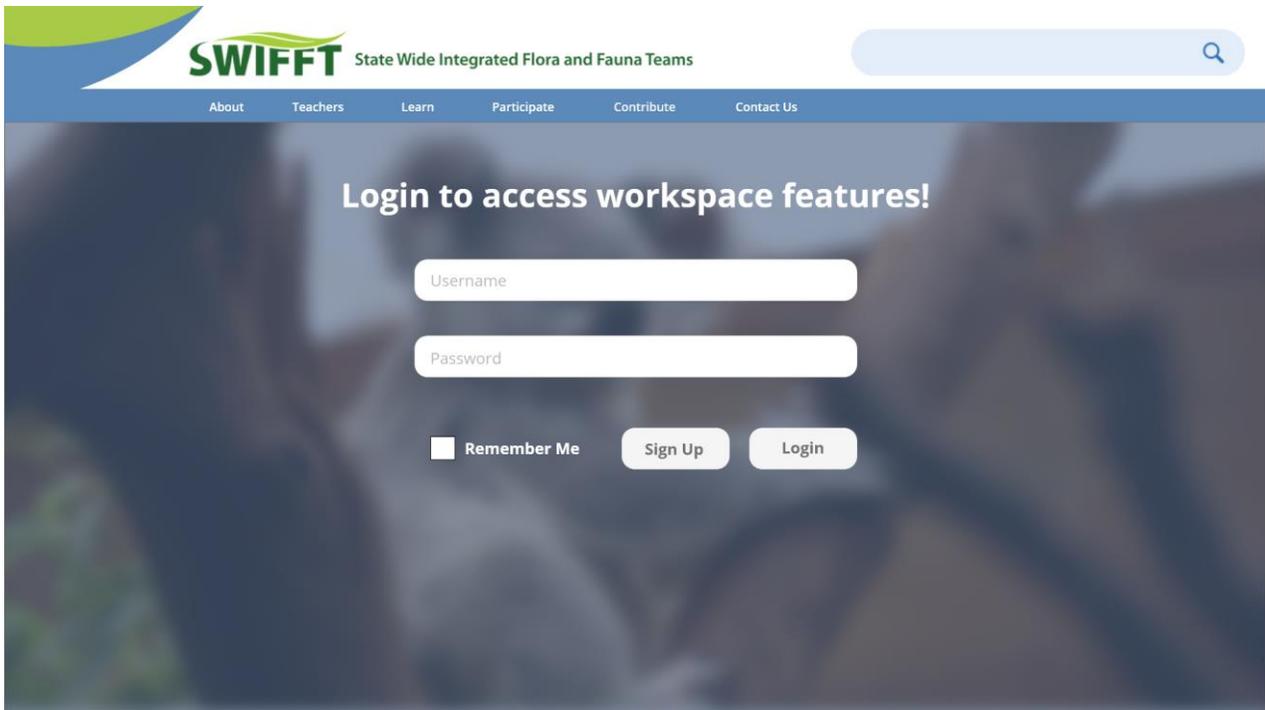
If you have access to carpet squares (I believe a lot of elementary classrooms already have them), you can do a fun activity about environment destruction.

Put the squares in a line so that the kids can easy walk from one end to the other. The kids represent a migratory species. The carpet squares represent natural habitat. Then, build a shopping mall or housing development by removing one of the carpet squares. The kids should still be able to cross, but will have to put in some effort to cross this new gap. Continue removing squares with new construction until eventually there is no way to cross while only touching the carpet squares.

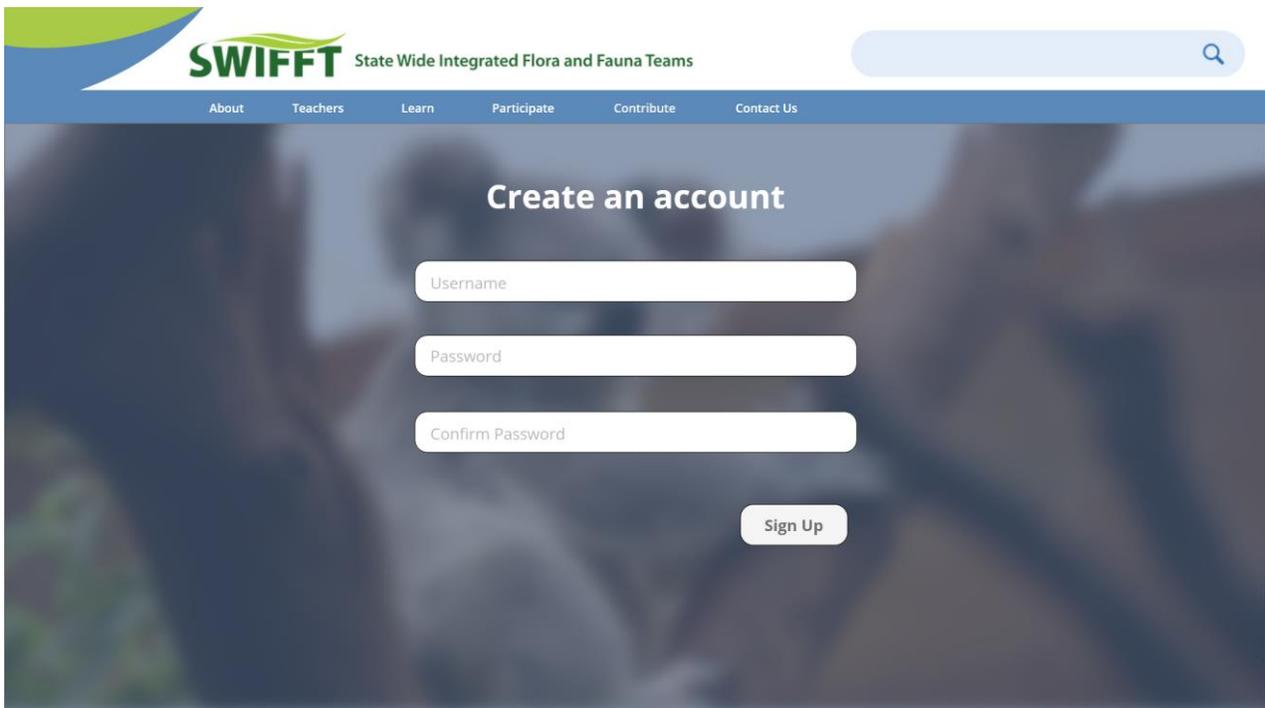
This is a lot of fun because it's engages them physically, encourages them to empathize with the animals, and, of course, fosters are desire to save natural spaces.

Reply

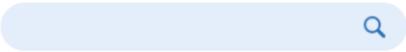
### Post Example (Supporting Local Wildlife)



*Login Page*



*Signup Page*



**Profile Picture**



[Upload an Image](#)  
[Remove Photo](#)

**\* First Name:**

**\* Last Name:**

**\* Email:**

**\* School:**

**\* Address:**

**\* Suburb:**

**\* Zip Code:**

**Year:**

**Biography:**

*Create Profile Page*



**Fabio Carrera**

Worcester Polytechnic Institute  
Year: 11-12

Areas of Interest:  
Biodiversity  
Computer Science

## Welcome, Fabio! ✎

### Recently Favorited



**Local Legends**  
Melbourne Zoo | Year 3, Year 4  
RWL 28 Jan - 26 June, Mon-Fri  
In this new version of the Local Legends program, students will discover animals that are Local Legends and learn how they can become a hero in the lives of these...



**Zoos: For People Or Animals?**  
Secondary | Year 7 to Year 8  
LESSON  
In this lesson, students tune into the topic of zoos and animal welfare. The class begins by participating in a 'Stand On The Line' barometer activity about their...



**Activity: Building Farm Animals with Natural Elements**  
Primary | Early  
ACTIVITY  
Go on a nature walk to collect leaves and sticks. Use your imagination and put together your own farm animal. Don't...

### Explore Resources



Activities to bring real world experiences into the classroom

### My Workspace



Tailored educational resources/ lesson plans based on location and grade level

### Community



Connect and share with other teachers

*User Profile Page*



[Home](#) / [Teacher](#) / [Community](#) / [Share](#)

## Share

Support other teachers in the Victorian area by contributing to our wildlife conservation education database through filling out the forms below!



### Lesson Plans & Activities

[Share](#)



### Events

[Share](#)



### Other Resources

[Share](#)

*Share page*

[Back to Share](#)

Hello, Fabio! 

## Share a Lesson Plan or Activity

Got an exciting and engaging wildlife conservation lesson plan or activity that you would like to share with other teachers? Please fill out the form below to contribute to our database!



The required fields are denoted by an asterisk \*

**\* Name of Lesson Plan/Activity:**

**\* Type of Resource:**

**\* Grade Level:**

**\* Topic:**

- Biology
- Camps
- Civics & Citizenship
- Critical & Creative Thinking
- Design and Technologies
- Geography
- Science
- STEM

**Web Link (if applicable):**

**\* File:**    N/A

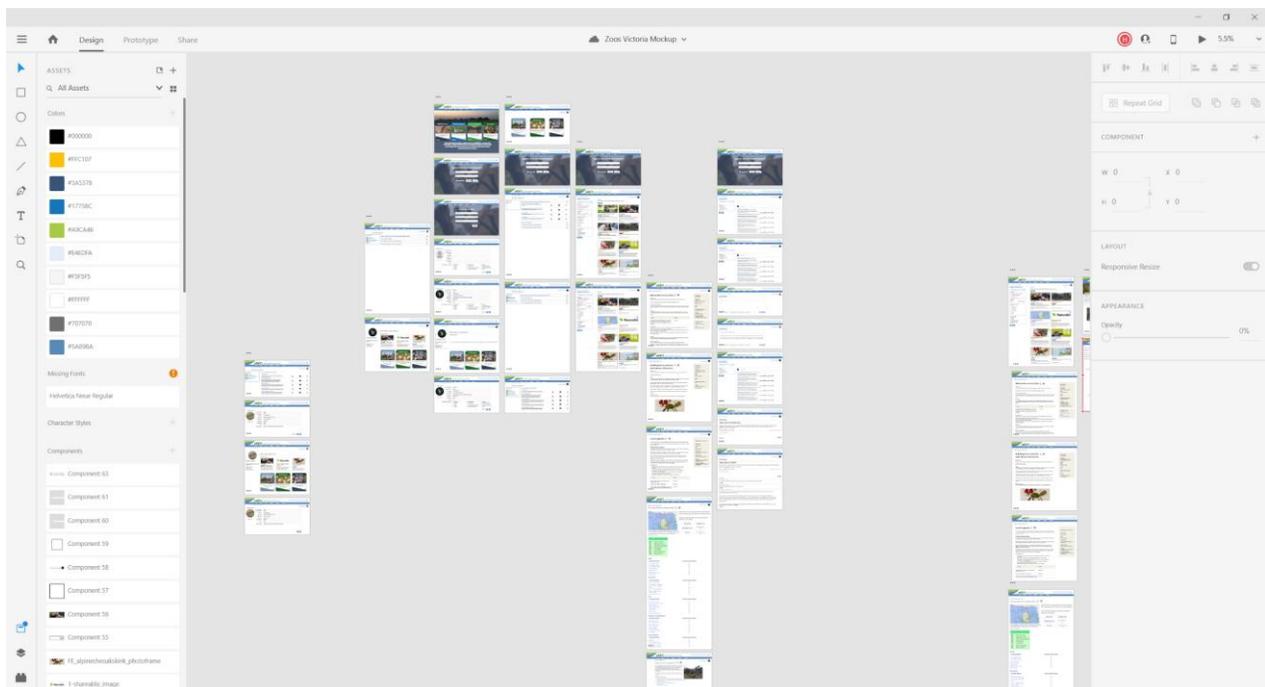
**Description of Lesson Plan/Activity:**

*Share a Lesson Plan or Activity*

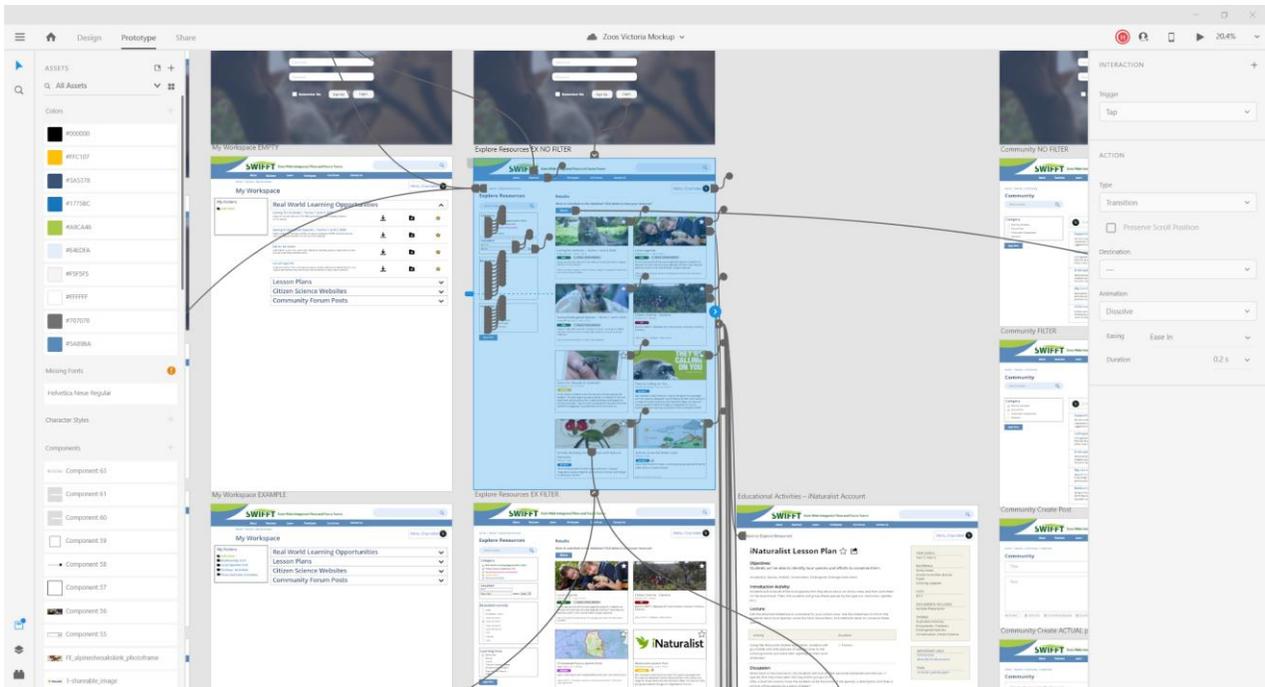
## Mockup Manual

Adobe XD allows for anyone to easily make changes and additions to the mockup. Details to obtaining the project files of our mockup can be found in Appendix G. Anyone with any experience using any software in the Adobe Creative Cloud will find Adobe XD intuitive to use.

Adobe XD has two main sections that we used to make our mockup Design and Prototype. Design is where users can construct each individual page and add all the elements as seen in Figure 4.18. Prototype is where the mockup comes to life and interactivity can be added allowing users of the mockup to go to different pages as seen in Figure 4.19. We also used Prototype to create advanced features in our mockup like displaying different versions of pages based on if the user has signed into an account and animations for favoriting pages, checking checkboxes, and dropdown menus.



*Design page of Adobe XD*



*Prototype page of Adobe XD*

## **Maintenance Plan**

In order to develop a maintenance plan for our proposed additions to the SWIFFT website, we worked closely with the developers from CeRDI. The maintenance of the SWIFFT site will be greatly facilitated by CeRDI's own in-house content management system (CMS) called Content Builder. A CMS is a powerful tool that allows for people with little to no programming experience to maintain and update their website. We are recommending that CeRDI should continue using Content Builder, as the volunteer who is currently maintaining the site is comfortable with it. The web application will utilize the CMS to add new teacher resources, keep existing ones up to date with new information, and to remove old real-world learning opportunities whose scheduled dates have already come and gone.

The Explore Resources page, which is the main proposed addition to the site, will require little to no additional storage. This is because we plan to utilize existing resources from the SWIFFT page as well as brand new ones that have been aggregated from conservation organizations. This will entail re-categorizing the existing resources to meet the criteria of the new teacher resources. Furthermore, the pre-existing Resource Library page on SWIFFT will provide a solid structure for this new page. Lastly, the My Workspace page may also require a separate database in order to store user data, which CeRDI has previous experience with from their other websites. Both CeRDI and our sponsor have expressed interest in allowing teachers to login via their school emails in order to encourage more teachers to use the site by removing the hassle of having to create an account. The user data used on the My Workspace page will consist solely of each teacher's organizational folders and favorite resources so that they may access them without having to browse Explore Resources to find them again.

As previously mentioned, CeRDI uses Content Builder as the CMS for the SWIFFT website. However, if there is interest in transitioning away from Content Builder in the future, we recommend that CeRDI use WordPress for their new CMS due to its extreme popularity, flexible and simple interface, and ability to be self-hosted with the SWIFFT website for no extra cost. Another advantage of WordPress is that it meets CeRDI's commitment to open-source software. Moreover, the CeRDI development team has expressed interest in moving away from their existing search engine, SWISH-E, and to one that is more efficient and provides more relevant results. We recommend Algolia for this purpose as it is the leading search API used among software engineers and is capable of delivering real-time results based on less user input.

## **Additional Features**

Based on the results from the feedback form, there are several future improvements that could be made to our mockup. One is creating a space for video resources. One of our teachers in the feedback form noted that “Children love videos and they are a great learning tool!”. Our sponsor also expressed an interest in incorporating videos through SafeShareTV, which is a platform similar to YouTube, that will allow for teachers to find appropriate videos for use in the classroom. We would also like to add the functionality for viewing other teachers’ profile pages, which would foster deeper connections between teachers. Another improvement is adding more images to the website to increase the visual appeal. As previously seen, a couple of our pages have a lot of text and boxes so adding more videos and colors will add to the visual appeal of the site. The final future improvement is adding student access so students can ask their own questions, view resources, and ask for feedback from conservation members on the work they are doing.