



Schools Project Stage 1 and 2

Development of Teacher Kits and Resources

Primary and Secondary School Resources Audit

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In submitting this report, the researcher has agreed to FRDC publishing this material in its edited form.

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"By reaching out to our next generation, we are bridging the gap and educating our community about the wonderful opportunities available – the variety of fresh local seafood, the rich cultural community we are and the pride we have in the adventure that is our lives"

Professional Fishermen's Association CEO Tricia Beatty

Executive Summary

The Professional Fishermen's Association (PFA) in New South Wales was successfully awarded funds to hold a "Seafood Industry in Partnership" program in conjunction with Coffs Harbour School and Karangi Public School (Grades 2-6). The program consisted of school visits to the Coffs Harbour Fishermen's Cooperative as an interactive excursion experience with the New South Wales fishing industry. Fishermen conducted the excursions along with a representative from the Professional Fishermen's Association.

To support this excursion a series of lesson plans to support teaching before the planned industry excursion, during the industry excursion and then to cement knowledge learnt after the industry excursion back in the classroom.

The second part of this project was to conduct an audit of existing primary and secondary school resources that are available in digital and hard copy. There was a need to identify existing resources and to collate them together in to one location.

There were two objectives to the school project. The first was to develop two teacher kits with lesson plans linked to Australian curriculum that were suitable for grades two to six to support the fisheries themed school excursion and the second was to identify existing digital and hardcopy teacher and student resources within a seafood, environment and fisheries theme.

A lesson plan framework was developed after consultation with two experienced primary and secondary school teachers. Both teachers provided their expertise as to what they would look for in a lesson plan and what elements and learning objectives each lesson plan should contain.

This knowledge then supported the development of two teacher kits with a total of 13 lesson plans. All lesson plans were accompanied and supported by either online or hardcopy resources that were located via teacher portals or websites. Both online and hardcopy resources were appropriately referenced. In addition, all lesson plan activities (roughly 45 minutes to an hour in length) were clearly mapped against relevant curriculum.

A total of 59 students participated in the excursion initiative and feedback from the Professional Fishermen's Association on the teacher kits was that they were well received and used.

The next stage of the project collected existing primary and secondary teacher and school resources through a variety of methods. Methods included face to face meetings with relevant FRDC staff, investigating the FRDC website and FRDC Trello storage cloud, mining FRDC final reports and then contacting key associates to identify relevant resources. Lastly detailed desktop online research took place.

188 resources were located within the specified investigation time frame of seven days. The results of the audit discovered that some themes were resource rich, while other themes were lacking.

This project has delivered strong outcomes. It has developed a framework for other teacher kits to be developed for different industry sectors and different states and has demonstrated that teachers value such resources when provided. It also demonstrated that a significant number of student and teacher resources exist online that relate to the fishing environment and the Australian seafood industry, including the recreational sector. There are now opportunities to house and promote these collated resources on one platform to support teaching of Australian curriculum that has a focus on the industry, the environment and the products.

Finally, a number of recommendations have been made as part of this project. These include:

- The lesson plans and teacher resources to support the New South Wales Coffs Harbour Cooperative excursion may be adapted and developed to suit other states, cooperatives and species.
- The lesson plans and teacher resources to support the New South Wales Coffs Harbour Cooperative excursion may be adapted and developed to suit secondary teaching.
- Additional digital and online resources could be collected further via investing more time to the research and talking to more people and organisations.
- Creation of a platform on the FRDC website to house all the collated resources (or provide collated resources to existing platforms such as PrimeZone or with the Marine Discovery Centres).
- Utilise the information presented in the resource gap table to develop new (or adapt) existing suitable resources.
- Identify international resources that are good frameworks and models for such gaps and develop resources based on that identified framework.
- Identify resources that should be updated or that could be adapted to suit other industry sectors.
- Consider a cost benefit analysis of the resources (identify the investment amount and then determine the level of uptake of resources into schools and use in the classroom)

Keywords

fisheries school resources, lesson plans, teacher kits, student kits, curriculum

Introduction

Stage 1

The Professional Fishermen's Association (PFA) in New South Wales was awarded a small amount of funds to hold a "Seafood Industry in Partnership" program in conjunction with Coffs Harbour School and Karangi Public School (Grades 2-6). The program consisted of school visits (excursion format) to the Coffs Harbour Fishermen's Cooperative where the students could have an interactive experience with the New South Wales fishing industry. The funding received covered the buses to and from the excursion venue and lunches for the students. Fishermen conducted the excursions along with a representative from the Professional Fishermen's Association.

To support this excursion, there was a need to develop a series of lesson plans (teacher kits) to support teaching before the planned industry excursion, during the industry excursion and then to cement knowledge learnt back in the classroom after the industry excursion.

Stage 2

A significant number of primary and secondary school and teacher resources currently exist nationally. They have been created by a large variety of organisations including government entities, education organisations and the Fisheries Research and Development Corporation (FRDC).

There was a need to identify existing resources and to collate them in one location. As such, an audit was commissioned by the FRDC, to be undertaken by Honey and Fox Pty Ltd, to locate as many relevant primary and secondary school and teacher resources within a set time frame of seven days.

This piece of work will form the beginning of a much larger suite of activities to be determined by the FRDC and other industry sectors in due course.

Objectives

- To develop two teacher kits linked to Australian curriculum suitable for grades 2-6 to support a fisheries themed school excursion in New South Wales
- To identify existing hard-copy and digital teacher and student resources within a seafood and fisheries theme

Method

Stage 1

A lesson plan framework was developed after consultation with two experienced primary and secondary school teachers. Both teachers provided their expertise as to what they would look for in a lesson plan, resources and what elements and learning objectives each lesson plan should contain.

This knowledge then supported the development of two teacher kits for two student cohorts who were participating in the hands on and interactive industry excursion held at the Coffs Harbour Fishermen's Cooperative on the 21st and 22nd May 2019. The cohorts were categorised as:

- Cohort 1 = Grades 2, 3 and 4

- Cohort 2 = Grades 4, 5 and 6

A total of 13 lesson plans (six lessons for Cohort 1 and seven lessons for Cohort 2) were then crafted as part of the two teacher kits. They were designed as:

- Two lessons to support teaching before the planned industry excursion
- Two lessons to support excursion activities which included:
 - ☐ Showing students boats and nets
 - ☐ Seafood handling and filleting
 - ☐ Fishing methods
 - ☐ The ocean to plate story
 - ☐ How fish are caught sustainably and managed by both fishers and the Government
 - ☐ Discovering how Australian fishing is one of the most highly regulated and monitored natural resources in the world
 - ☐ How to hold a fish
 - ☐ The seafood species caught or farmed in New South Wales
 - ☐ Seafood cooking
- Two to three lesson plans to cement knowledge learnt back in the classroom after the industry excursion.

As such, the lesson plans incorporated both indoor and outdoor learning and were developed to contain key learning areas of:

- English
- Mathematics
- Science
- Humanities and Social Sciences
- The Arts
- Technologies
- Health and Physical Education
- Languages

Specifically, each lesson plan had two to three areas of concentration which can be described as:

Before excursion

- 1 x listening, reading and viewing (literacy)
- 1 x technologies/history (looking at the equipment/tools the fishermen use, how have they advanced from the past (e.g. poles and spears used by indigenous fishers vs rods, nets, machine operated equipment now used by fishers).

During excursion

- 1 x biological sciences (applying knowledge learned about species of fish in real life, the relationship between fishing and the environment - why sustainable fishing is important)
- 1 x technologies (referring back to the previous “before excursion” lesson, getting the students to take note of the modern equipment)

After excursion

- 1 x inquiry and critical thinking presentation:
 - ☐ How is Australia sustainable in its fishing practices?
 - ☐ Demand for seafood in future with growing population - how can it be improved/addressed?
 - ☐ What is the relationship between humans, fishing and the environment?

The excursion also linked very closely to the humanities and social sciences/critical thinking/sustainability/ethical understanding sections of the Australian curriculum. As such, each lesson plan covered two, three, four or even more areas at once.

All lesson plans were accompanied and supported by either online or hardcopy resources that were located via teacher portals or websites. Both online and hardcopy resources were appropriately referenced.

In addition, all lesson plan activities (roughly 45 minutes in length) were clearly marked against relevant curriculum that they linked to (<https://www.australiancurriculum.edu.au>)

The two kits which were approved by the Professional Fishermen's Association for content were then provided to each school principal a week before the excursions were scheduled. Letters to principals were also crafted to accompany the teacher kits when they were distributed to the schools by the Professional Fishermen's Association.

Stage 2

This stage of the project collected existing primary and secondary teacher and school resources through a variety of methods. These included:

- Face to face meetings with relevant FRDC staff to locate primary and secondary school and teacher resources on the FRDC website, Trello storage cloud, FRDC final reports and provision of key associates to contact for relevant resources.
- Desktop online research to locate existing digital resources.
- Contacting key contacts to locate resources.

A visit to the FRDC office in June 2019 and alternative investigations identified 13 people/organisations to make contact with in regard to locating resources. The majority of those contacted provided resources and input to the research.

All identified resources located were then compiled into a comprehensive report that included the resource level (primary or secondary), a description of each resource, the learning intention/s and a link to the resource.

All resources collated were grouped according to a theme. The nine themes established were:

- Marine, freshwater habitats and environments
- Recreational fishing
- Indigenous fishing
- Aquaculture
- Fisheries management and sustainability
- General fish and seafood species
- Seafood handling, filleting and processing
- Industry careers and business
- Health, nutrition and cooking

This stage of the project did not include:

- Mapping resources against curriculum (but if this information was available, it was captured for each resource entry as part of the report).
- Any strategic recommendations or analysis of existing resources for adaption or update.
- Arranging for the resources to be published online on the FRDC website or other platforms (e.g. PrimeZone or Marine Discovery Centres) but all material locations were included as hyperlinks or information provided on where they can be sourced.
- Face to face visits/meetings with identified key contacts and organisations.

Results, Discussion and Conclusion

Stage 1

The excursions to the Coffs Harbour Fishermen's Cooperative were undertaken as half day activities by the school, the fishers and the Professional Fishing Association in the following groups:

- Group 1: Year 2 = 14 students
- Group 2: Year 3 = 15 students
- Group 3: Year 4 = 14 students
- Group 4: Years 5 and 6 = 16 students

Two teachers accompanied each group during the excursion.

Feedback from the Professional Fishing Association on the teacher kits was that they were well received and used.

However, despite providing well researched, interesting and interactive lesson plans that provide evidence-based facts to the Australian and New South Wales fishing industry sectors, teachers will still go down the path of allowing their students to "critically think about the fishing industry". This means that teachers are likely to find resources from overseas that show poor fishing management practices and apply these falsely to Australian fishing and use these in conjunction with the lesson plans supplied. It is a teacher's belief that not doing so provides a disservice to students and their education by not giving them an alternative/slightly different viewpoint and to get their students to think critically and "make up their own minds" (about the fishing industry). This aspect is considered a very important part of the curriculum by teachers and this came through strongly in the advice during the consultation period with two teachers. With this said, the FRDC and the Australian seafood industry are certainly supportive of the idea of developing critical thinking amongst Australian school students. As such, teacher kits should emphasise the distinction between local and overseas industry examples to prevent confusion.

Stage 2

A visit to the FRDC office in June 2019 and alternative investigations identified the following people and organisations to make contact with in regard to locating hard copy and digital resources. The results of this activity are listed below in Table 1:

Person Contacted	Provided Resources or Input
University of Wollongong	Yes
National Seafood Industry Leadership Program	Yes
Torres Strait Regional Authority	Yes
OceanWatch	Yes
Marine Discovery Centre	No (Tim Hoile -Retired)
Michael Burke	Yes
Brett McCallum	Yes
Sydney Fish Markey	Yes
Australian Fisheries Management Authority	Yes
Chris Calogeras	Yes
Australian Barramundi Farmers Association	No
Josiah Pitt	Yes
Tasmanian Seafood Industry Council	Yes

Table 1: People and organisations contacted to locate hard copy and digital resources

In addition to contacting the identified people and organisation listed in Table 1, a desktop study was undertaken to locate resources online. Resources were collected via FRDC reports, reports, websites and teacher portals.

Whilst the author took all reasonable steps to check all listed resources for appropriateness and that content is not misguided in regard to the Australian seafood industry, some teacher and school resources could only be accessed with a school email or via registration/subscription to portals. As such, it is important before any resource is promoted for it to be independently checked for appropriateness, factual correctness and that scientifically valid information is included.

In addition, it is important to note that some teacher and school resources have been located from old FRDC reports and therefore may be out of date, contain old links or have since been updated since publication in a FRDC report. As a result, any resource before it is used should be independently checked they are suitable.

A total of 188 resources were located within the specified investigation time frame of seven days. Some teacher and school resources identified spanned a number of themes and as such, included both primary and secondary school curriculum. The report groups resources according to their dominant theme and grade suitability.

The results of the research discovered that some themes were resource rich, while other themes were lacking in scope and number of resources. These can be summarised in the below overview table which gives an indication as to the resource gaps (where high represents many resources available, medium represents some resources are available but not a large selection of choice and low represents not many or no resources are available):

Resource Theme	Level	Quantity of Resources Identified
Marine, freshwater habitats and environments	Primary	High
Marine, freshwater habitats and environments	Secondary	High
Recreational fishing	Primary	High
Recreational fishing	Secondary	High
Indigenous fishing	Primary	Low
Indigenous fishing	Secondary	Low
Aquaculture	Primary	High
Aquaculture	Secondary	High
Fisheries management and sustainability	Primary	Medium
Fisheries management and sustainability	Secondary	Medium
General fish and seafood species	Primary	High
General fish and seafood species	Secondary	High
Seafood handling, filleting and processing	Primary	Low
Seafood handling, filleting and processing	Secondary	Medium
Industry careers and business	Primary	Low
Industry careers and business	Secondary	Medium
Health, nutrition and cooking	Primary	Medium
Health, nutrition and cooking	Secondary	Medium

Table 2: School resource gap overview table

Implementations

This project has developed a framework for other teacher kits to be developed for different industry sectors, different states and species and has demonstrated that teachers value such resources when they are provided.

This project has also demonstrated that a significant number of student and teacher resources exist online that relate to the fishing environment and the Australian seafood industry, including the recreational sector. There are now opportunities to house and promote these resources on one platform to support teaching of Australian curriculum that has a focus on the industry, the environment and the products.

Recommendations

Stage 1

1. The lesson plans and teacher resources to support the New South Wales Coffs Harbour Cooperative excursion may be adapted to suit other cooperatives, states, industry sectors and species.
2. The lesson plans and teacher resources to support the New South Wales Coffs Harbour Cooperative excursion may be adapted to suit secondary teaching.

Stage 2

1. The author does not claim they have captured every resource available online or offline as part of the audit process. As such, additional resources could be collected via further investment in time to research further and to talk to more people and organisations.
2. Creation of a platform on the FRDC website to house all the available and existing resources (or provide resources to existing platforms such as PrimeZone or with the Marine Discovery Centres).
3. Utilise the resource gap table to develop new (or adapt) existing suitable resources.
4. Identify resources that should be updated or that could be adapted to suit other industry sectors, states and species.
5. Identify overseas resources that are good frameworks and models for resource gaps and develop resources based on that identified framework/model.
6. Consider a cost benefit analysis of the resources (identify the investment amount and then determine the level of uptake of resources into schools and use in the classroom)

Extension and Adoption

Stage 1

The teacher kits were extended directly to and adopted by two schools (Coffs Harbour School and Karangi Public School) in New South Wales. As a result of the excursion and its activities, the Professional Fishermen's Association secured media exposure with TV coverage and within local publications. The Professional Fishermen's Association were also finalists in the the Promotion Award for the 2019 NSW Seafood Excellence Awards for the initiative.

During the process of distributing the teacher kits, the FRDC developed fliers to accompany the kits to support the Primary Industries Education Foundation Australia who run a number of programs and who host a variety of resources to help teachers and their students connect with the primary sector and integrate experiences in the curriculum.

Lastly, the teacher kits and resources could be further adopted by other industry sectors and cooperatives in New South Wales, furthering the reach of this project output.

Stage 2

There are now opportunities to house and promote the collated resources on one platform to support teaching of Australian curriculum that has a focus on industry, the environment and the products using quality and accurate resources.

Project Materials Developed

Teacher Kit – Grades 2,3 and 4) – Appendix 1

Teacher Kit – Grades 4, 5 and 6 – Appendix 2

School introduction to the teacher kit letters – Appendix 3

Research report outlining existing Australian seafood, aquaculture and wild-catch school resources currently available nationally – Appendix 4

PIEFA flier – Appendix 5