FRDC
FISHERIES RESEARCH & DEVELOPMENT CORPORATION

SEPFA
South Eastern Professional Fishermen's Association Inc.

FINAL REPORT

Southern Rock Lobster IPA: Assessing functionality and suitability of the iPhone [iPad] application 'Deckhand' for on-board electronic data capture in Southern Australian Rock Lobster (*Jasus edwardsii*) fisheries.

South Eastern Professional Fishermen's Association Inc

DECK HAND.

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Executive Officer - SEPFA Inc

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FRDC Project No **2011/250**

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Southern Rock Lobster IPA: Assessing functionality and suitability of the iPhone [iPad] application 'Deckhand' for on-board electronic data capture in Southern Australian Rock Lobster (*Jasus edwardsii*) fisheries.

2011/250

2015

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

Foreword

This project aimed to produce;

1. A functional on-board electronic data capture system which addresses the requirements of regulators, research agencies and industry.

2. A detailed Cost-Benefit Analysis (CBA).

3. A simpler, consolidated, more efficient way of reporting a day's catch.

4. Enhanced resource sustainability through the provision of improved information.

5. More efficient and effective, and therefore profitable, operation at the individual business level through the provision of more detailed information in a timely fashion.

The research was important as it provided the opportunity to close the ‘electronic data capture loop’ in the South Australian Southern Zone Rock Lobster Fishery, by linking with the existing land-based electronic weigh-stations at each port of landing.

It also provided the opportunity to create cost efficiencies for operators in the fishery as well as researchers and regulators, coupled with the provision of more timely data / information required for fishery management purposes.

All stakeholders associated with the fishery, including the broader community, stood to benefit as a result of this project given the overarching objective of enhanced resource sustainability through the provision of this improved data set.

This project has seen the successful transfer of this technology, the Deckhand iPad application, into a commercial Southern Rock Lobster Fishery which has now provided a myriad of further opportunities for information gathering, analysis (at the business level as well as by regulators and researchers) and improved communications.

SEPFA intends that this report be made publicly available.

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Acknowledgments

The South Eastern Professional Fishermen's Association Inc (SEPFA) wishes to acknowledge the support of the FRDC for this project and the resultant transfer of research outcomes into full commercialisation in the Southern Zone Rock Lobster Fishery.

SEPFA would also like to acknowledge the support of its Committee and Members, particularly those who provided a great deal of time and effort in developing concepts and providing feedback during and outside of the formal trials to enhance the Deckhand application generated through this project.

SEPFA acknowledges the support from PIRSA and SARDI in making this project possible together with the considerable follow-up work undertaken by both agencies which has assisted towards the commercialisation of this technology.

RTD approached with project openly and developed a close working relationship with SEPFA. RTD's innovative approach to problem solving and will to deliver the best outcome possible is highly worthy of acknowledgement.

Abbreviations

BCR - Benefit Cost Ratio

CDR - Catch and Disposal Record

DPIPWE - Department of Primary Industries, Parks, Water and Environment

FRDC - Fisheries Research and Development Corporation

IMAS - Institute for Marine and Antarctic Studies

NZRLF - South Australian Northern Zone Rock Lobster Fishery

PIRSA - Primary Industries and Regions South Australia

RTD - Real Time Data Pty Ltd

SA - South Australia

SANZRLFA - South Australian Northern Zone Rock Lobster Fishermen's Association Inc.

SARDI - South Australian Research and Development Institute

SEPFA - South Eastern Professional Fishermen's Association Inc.

SZRLF - South Australian Southern Zone Rock Lobster Fishery

TACC - Total Allowable Commercial Catch

TEPS - Threatened, Endangered and Protected Species

Executive Summary

During January through March 2012, SEPFA trialled a version of the iPad application 'Deckhand', Developed by Real Time Data Pty Ltd (RTD), on-board 22 vessels in the South Australian Southern Zone Rock Lobster Fishery (SZRLF). The SZRLF was the first fishery in Australia to begin commercial trials of this nature with this application.

The intent of the trial was to adapt and refine the application to suit the specific needs of the SZRLF to replace the current, and legislatively required, paper recording system for Part A of the Catch and Disposal Record (CDR) and also the Commercial Logbook.

The trial served as the platform to launch full-scale adoption of the technology on-board every vessel across the fishery (which will occur in the 2015-16 SZRLF season).

This project followed the completion of FRDC Project 2008/003 which involved significant consultation regarding requirements for data standardisation, collection, storage, manipulation and reporting.

The key recommendations of that report were for any future electronic data capture system to;

- Utilise a touch screen interface robust enough to use on deck.
- Cause minimal interruption to the fishing operation.
- Use wireless communication (mobile / satellite network) for uploading data and downloading software updates.
- Provide real time (or minimum near time on a daily basis) data.
- Interact with existing database systems.
- Collect data directly linked to the management of the fishery.
- Receive inputs from a wide variety of sensors.
- Be easily modified to respond to changes in data requirements.

This project (2011/250) intended to address all of these recommendations with a view to implementing a practical and operational system within the SZRLF, with implementation in other Southern Rock Lobster Fisheries across Southern Australia to follow.

The project aimed to deliver a functional on-board electronic data capture system which addressed requirements of regulators, research agencies and industry, and to do so cost-effectively.

A simpler and more time-efficient method of reporting improved information and data and improved profitability for operators were all aims of the project.

The trial was undertaken 'in-season' under commercial conditions, with participating fishers required to meet 'dual reporting' requirements i.e. use of the Deckhand application as well as the legislated paper reporting.

A range of users / fishers with varying ages, skill-levels and also differing levels of enthusiasm for the technology participated.

The trial involved direct interaction between the participating fishers and the application developers, RTD, as well as RTD having pre and post season interaction with regulators, research agencies and fishery compliance personnel.

A Cost-Benefit Analysis, undertaken by EconSearch Pty Ltd, was also completed as part of the project and indicated there would be an, almost, cost neutral position per active vessel in the fishery on an annual basis. However, this result was based on a number of assumptions including a licensing structure for SEPFA to utilise the software on an ongoing basis and limited cost efficiencies from regulatory structures until other State-managed fisheries adopted similar technology.

A number of real-world outcomes have now developed contrary to a number of these assumptions, such as the commercial arrangement reached between SEPFA & RTD, which would skew the overall result, generating a greater cost benefit at the active vessel level.

A legally binding 'Software Licence and Support Agreement' now exists between SEPFA & RTD which grants SEPFA a perpetual, non-exclusive licence to utilise the 'base version' of the software generated as a result of this project. Any Intellectual Property pertaining to modifications (future builds with additional 'components') from this base version of the software, initiated and funded by SEPFA, remain the property of SEPFA.

Relevant communication activity with other industry stakeholders in other relevant jurisdictions regarding the applicability of the technology there was also undertaken.

Ultimately, the project has resulted in functional and robust on-board electronic reporting mechanism for fisherman which will be adopted on a fishery-wide basis in the SZRLF for the 2015-16 season, as well as being trialled currently in a number of other 'like' fisheries including the South Australian Northern Zone Rock Lobster Fishery (NZRLF).

This means a simpler, consolidated, more efficient way of reporting a day's catch, improved data provision, reduced costs and more timely decision making.

It is envisaged this will lead to enhanced resource sustainability through the provision of improved information and more efficient and effective, and therefore profitable, operation at the individual business.

The project has also identified a number of areas for further consideration and development, including, but not limited to;

- Investigation regarding the adaptation of the application for use on other platforms e.g. Android, in a cost-effective way.

- Incorporation of additional components into the application; possibly the industry's voluntary pot sampling (including the use of other available technologies to record additional environmental data via the application e.g. Succorfish tags), required reporting for Threatened, Endangered and Protected Species (TEPS), Clean Green Program Logbook reporting requirements and an industry communications portal to include a range of stakeholders.

Introduction

In addition to addressing the key recommendations from FRDC Project No 2008/003, this project had a direct link with Primary Industries and Resources South Australia's (PIRSA) 'Electronic Directions - SA Fisheries and Aquaculture' project.

That project was part of a broader strategy to ready PIRSA to receive and utilise fishery information collected electronically on-board vessels as well as creating a web-based portal to deliver E-Business solutions to industry within South Australia - this is something which has long been requested by industry.

Previously the SZRLF has undertaken FRDC funded activity to deliver a land-based electronic scales / weighing system at each of the seven ports across the Southern Zone. This system has now been successfully operational for a number of years and has eliminated the need for paper recording of fish weights.

This has delivered significant efficiencies and particularly cost savings to industry, reducing direct fees to licence holders by in excess of $1 million since becoming operational.

The trialling and implementation of an electronic data capture system on-board vessels as a result of this project has now closed the 'electronic data capture loop' in the SZRLF.

The need for finer spatial scale information, identified by both industry and Government, generated during commercial fishing was a key driver to pursue this initiative.

For example, finer spatial scale information will greatly assist industry in better quantifying, conclusively, the potential impact of marine park sanctuary zones on catches. This information would also greatly assist in improved management of the resource and therefore sustainability.

All of this has the potential to directly influence catch rates which in turn impacts on the profitability (via more efficient and effective operation at sea) of licence holders and fishery participants - the provision of more timely and precise information at both the individual boat, as well as the fishery, level via the Deckhand application will assist in delivering this.

In delivering these outcomes this project addressed the relevant and identified FRDC Strategic Challenges, at the time, of improved governance and regulatory systems as well as improved production, growth and profitability.

In summary, what were the key drivers behind this work?

1. Regulators and research agencies, generally, are requiring greater levels of data to demonstrate the sustainability of fisheries resources - this increased level of information provision is also within the interests of industry, particularly within the current political climate. This requirement for further data also increases the impost on fishers to report a day's catch - there was a need to consolidate reporting across all areas.

2. For a range of reasons e.g. implementation of marine parks networks (State and Commonwealth) and for enhanced resource management, there is a need to provide fishery data on a finer spatial scale, or at least make provision to do so in the future.

3. The current environment for fisheries is one of change - access, allocation and increasing external scrutiny are all contributors to this. The provision of data captured on-board the vessel electronically can only expedite the process of decision making providing fishers / business operators with more timely outcomes. There is a need to provide fishers with a greater level of certainty and stability within their operating environment.

4. As we see competition for fishery resources increase between various stakeholders e.g. conservation, community and other industry, there is a need to ensure that the commercial fishing industry, while ensuring sustainability as the absolute priority, has the opportunity to maximise its returns - this is often a legislated objective. Provision of more precise and timely information at both the boat and fishery level will assist in delivering this.

Objectives

1. A functional on-board electronic data capture system which addresses the requirements of regulators, research agencies and industry.

2. A detailed Cost-Benefit Analysis (CBA).

3. A simpler, consolidated, more efficient way of reporting a day's catch.

4. Enhanced resource sustainability through the provision of improved information.

5. More efficient and effective, and therefore profitable, operation at the individual business level through the provision of more detailed information in a timely fashion.

Method

The initial phase of the project focused on the on-board trials of the Deckhand application. It was first intended to only trial the application on-board one vessel from each of the seven SZRLF ports for three months.

Given available funding and final costing of equipment, SEPFA was able to trial 10 iPads between 22 vessels across the SZRLF during this period which ensured that a much greater range of users i.e. participants with varying ages, skill level and levels of enthusiasm for the technology were exposed to the application.

The trials were completed over January to March 2012.

It should also be noted the originally intended platform for the application was to be an Apple iPhone. However during initial project management discussions, obviously prior to purchase of equipment, the preferred platform was identified as the Apple iPad. This choice was primarily driven by the functionality benefits (ease of use) of the iPad and also its superior ability to adapt to possible future enhancements of the application.

SARDI and the PIRSA Fisheries Compliance also had access to iPads and trial information during the three month period.

The on-board trial was underpinned by three ‘sub-stages’ which provided the necessary information for RTD to develop a suitable ‘base model’ of the application which would be largely suitable for use in the SZRLF and could then be refined during and after the trial.

Those sub-stages were:

a) The provision of relevant information / data capture requirements to RTD.

   This stage required input from PIRSA Fisheries and Aquaculture, as the regulator, regarding the legislative requirements required to be met, in addition to SARDI clarifying fishery research requirements, although these were largely documented through project 2008/03.

b) A SZRLF industry briefing to RTD.

This allowed RTD to demonstrate basic functionality aspects to trial participants and a degree of pre-trial refinement of the Deckhand application.

This briefing provided the opportunity to;

i. Introduce everyone.
ii. Gather required participant data (basic info; licence number etc)
iii. Explain to the industry participants in the trial how the application functions in its current form.
iv. Take initial feedback / suggested improvements etc from industry participants regarding the functionality of the application in its current form.
v. Explore with each industry participant the level of 'information collection' required on board their specific vessels, for example - some fishers wished to record information for every pot, some just for strings of pots and some may just want to record information at the end of the day – this all had to be accommodated.

c) A final briefing (immediately pre-trial) by RTD for all stakeholders involved in the trial; industry, the regulator, fishery compliance, research agency.

This meeting provided the opportunity to;

i. To brief the industry participants again regarding functionality following revisions / feedback provided at first industry / RTD briefing.
ii. To brief Management Agency participants regarding functionality of the application / system and features / aspects relevant to their respective operations.
iii. To provide Real Time Data Pty Ltd with any further, immediate, feedback from all trial participants present.
iv. To issue industry and management agency trial participants with their respective units (iPads).
v. To provide any required one-on-one tutelage / instruction to trial participants as required.
vi. To advise appropriate / most effective channels of communication for trial participants to provide ongoing feedback to RTD on an ad hoc basis during the period of the trial.
vii. To advise of the next steps.

The second phase of the project required the production of a cost-benefit analysis.

EconSearch Pty Ltd was engaged to undertake this work for SEPFA, which was carried out following the completion of the on-board trial and involved EconSearch meeting with the various stakeholders involved in the project to gather the required information.

The cost-benefit analysis was delivered by EconSearch in July 2012.

Lastly, SEPFA convened a workshop with stale holders representing industry, regulators, research agencies and compliance personnel from each of the jurisdictions where Southern Rock Lobster is commercially fished (South Australia, Tasmania and Victoria). This workshop was utilised as a forum to communicate the results of the trial and discuss the options for further adoption of the technology amongst other jurisdictions.

The workshop also served as an opportunity for RTD to gather information which may be required for refinement of Deckhand for use in trials elsewhere.

Results

Phase One:

- On-boat component of trial completed (January - March 2012).
- 10 'devices' were used across 22 different boats for varying periods of time during the trial.
- SARDI and PIRSA Compliance also had access to devices and trial information over that period.
- This ensured that a range of users i.e. age, skill level, varying levels of enthusiasm for the technology were exposed to Deckhand over the course of the three month trial period.
- Much improved functionality of the Application as a result of the trial.
- All iPads and covers procured using project funding returned to SEPFA Inc.

Phase Two:

Production of the following report;

EconSearch Pty Ltd. On-Board Electronic Data Capture System (Deckhand) - Cost Benefit Analysis, 17 July 2012.

Key Findings:

- The net present value of implementing Deckhand on a fishery-wide basis was estimated to be -$0.46 million, with a Benefit-Cost Ratio (BCR) of 0.87.

- This is equivalent to an average annual cost of $240 per active boat per year. This cost needs to be considered in the context of the range of non-priced benefits, such as more timely decision making, savings on prior reporting costs, data consistency and future potential.

- The principal drivers of the estimated negative outcome are the ongoing operating costs that were associated with owning a Deckhand licence and the replacement cost of the required hardware.

  As highlighted earlier in this report, this result has now changed given the final commercial arrangement between RTD and SEPFA for the purchase of the Deckhand software.

Phase 3:

On Friday 7 September 2012, SEPFA convened an 'On-Board E-Data Collection Workshop' in the Conference Room at SARDI Aquatic Sciences, West Beach, South Australia.

The workshop was attended by the following individuals (in no particular order):

- Dr Gary Morgan (Chair, Southern Rocklobster Limited - SRL).
- Joel Redman (SA Southern Zone Fisherman, SEPFA Committee Member, closely involved with Project 2011-25)
- David Manser (SA Southern Zone Fisherman, SEPFA Committee Member, closely involved with Project 2011-25)
- Hilary Revill (Principal Fisheries Management Officer, DPIPWE)
- Rodney Treloggen (Executive Officer, Tasmanian Rock Lobster Fishermen's Association - TRLFA).
- Tom Robinson (Real Time Data Pty Ltd)
- Dr Adrian Linnane (Senior Rock Lobster Fishery Scientist, SARDI Aquatic Sciences)
- Annabel Jones (Rock Lobster Fishery Management, PIRSA Fisheries & Aquaculture)
- Peter Walsh (Data & Information Systems Manager, IMAS)
- Dr Klaas Hartmann (Senior Research Fellow, IMAS Fisheries, Aquaculture & Coasts)
- Renee Vajtauer (Executive Officer, Seafood Industry Victoria)

- Benn Gramola (Business Services Manager, PIRSA Fisheries & Aquaculture)
- Simon Malcolm (Strategic Projects & System Development, PIRSA Fisheries & Aquaculture)
- Trent Gregory (President, SA Northern Zone Rock Lobster Fishermen's Association, Commercial Licence Holder and Exporter)
- George Kouts (Manager, PIRSA ICT Projects Group)
- Steve Withers (Manger, Compliance & Fisheries Monitoring - Tasmania)
- Peter Dietman (Director, PIRSA Fisheries & Aquaculture, Operations)
- Lisa Rippin (EconSearch Pty Ltd)
- Julian Morison (EconSearch Pty Ltd)

Table 1: Key outcomes of / comments from SEPFA's On-Board E-Data Collection Workshop.

Relevant Issue	Comment / Question	Outcome (If Relevant)
Use of the Deckhand Application on other devices / platforms / systems.	Can the Deckhand Application be used on the 'iPad Mini'?	Yes. The Application can be used on all Apple devices; however its 'display-ability' and ease of use may be impacted on smaller devices. The preferred platform is the Apple iPad / iPad Air.
	Can the Application be 'converted' for use on other 'device types' e.g. Android?	Yes. The Application has been developed for Apple given the 'ease of use' it is capable to achieve, but also and importantly because the 'Apple system' provides the greatest level of inherent security.
Combined Industry Comments (Victoria, Tasmania & SA Northern Zone)	• Supportive of the technology • Fishers likely to accept technology • Potential as also a compliance & research tool • Cost effectiveness would need to be proven in Tasmania • Legalities around security, confidentiality, privacy, information sharing etc would need to be made very clear. • Very simple to use. • Potential to link directly with relevant databases and improve efficiency of decision-making in relation to TACCs etc. • Potential to link with existing IT development in relevant jurisdictions e.g. Integrated Catch & Effort (ICE) in Victoria. • Noted the potential for a baseline system specification or scope which could then be altered to suit specific fisheries.	

	• Important for fisheries to adopt this technology soon to ensure progress is made and efficiencies are achieved. • SA Northern Zone indicated their intention to move down this path ASAP. • Issues around duplication of / integration with existing systems should be addressed e.g. the Deckhand Application's 'tracking capability' coupled with the existing use of VMS in various fisheries. • Fishery specific challenges were noted e.g. multiple and random points of landing (SA Northern Zone), requirements for beach-weighing of catch and entry of that data into an electronic system / Application.	
Network Coverage / Connectivity	How does the Application work outside of areas with good cellular coverage?	The Application will still function, record all information (including tracking information) when outside of cellular range. All of this information is recorded in a 'tamper-proof' fashion and will be submitted as soon as sufficient coverage is available (a key fisheries compliance requirement).
Ultimate Responsibility	Noted it will still be the ultimate [legal] responsibility of fishers / licence holders to ensure information is accurately submitted to the regulator in a timely manner.	
Integration	Can the data collected via the Application be submitted in formats acceptable to existing electronic regulatory systems e.g. PIMMS, ICE etc.	Yes.
Next Steps		• Dialogue between industry stakeholders to determine desire to proceed with similar trials in other jurisdictions. • Regulators in each jurisdiction need to consider their positions i.e. are they happy to accept information in certain / various formats from a range of systems across a range of fisheries, or are they looking to provide the 'total solution' themselves? • Possibility for further project work (across jurisdictions) to be explored.

Discussion & Conclusion

SEPFA is certain that this has been a successful project and the outputs have achieved many tangible benefits for the SZRLF and associated stakeholders.

This project has delivered a functional on-board electronic data collection system which will be implemented on a fishery-wide basis in the SZRLF for the 2015-16 commencing on 1 October 2015.

While the Deckhand application was targeted at replacing the most basic legislatively-required reporting requirements, it already provides the opportunity for fishers, on a voluntary basis, to collect fine spatial scale catch data not previously recorded for the fishery, this is a significant development.

The application also provides substantial scope to 'value-add' data collection into the future across a range parameters, notably a number environmental parameters e.g. tide / current, water temperature, exact depth per pot, soak time and even turbidity. All of this would be possible through integrating the application with a number of 'off-the-shelf' and market-ready tag / data logger solutions.

While the project delivered a detailed and comprehensive cost-benefit analysis, SEPFA believe it has delivered a data capture system which is more cost effective than suggested in the report, this is a direct result of commercial negotiations between RTD and SEPFA.

A legally binding 'Software Licence and Support Agreement' now exists between SEPFA & RTD which grants SEPFA a perpetual, non-exclusive licence to utilise the 'base version' of the software generated as a result of this project. Any Intellectual Property pertaining to modifications e.g. future builds with additional 'components', from this base version of the software, initiated and funded by SEPFA, remain the property of SEPFA.

Already Deckhand, and its 'associated application' Trip Viewer (which lets the fisher view their spatial data in an easy-to-read and adaptable format), is proving its value in situations other than legislated catch recording e.g. in event of failure of a vessel's navigation systems.

Fishers who have been using the application are already finding value in analysing the spatial data recorded via the application to assess the efficiency of their fishing operations (directly related to profitability) and for practical reasons such as identifying the location of fishing gear (rock lobster pots) when the usual technology used for this purpose on board the vessel fails.

Currently fishers in the SZRLF are not required by law to report their catch at a spatial scale finer than Marine Fishing Area (MFA - 55 nautical mile square blocks) however, with permission even from a limited number of fishers who may be reporting the location of every pot they fish, it will now be possible to deliver analyses of catching activity at a significantly finer spatial scale than ever before. This is an incredibly powerful data set and is of value in many varied contexts.

SEPFA is confident that this project has achieved desired outcomes against all project objectives, together with the technology actually being adopted into the fishery by all operators.

Implications

This project has resulted in the first on-board electronic data capture system of this type being used full-scale in any South Australian commercial fishery. The project has achieved its objectives.

With PIRSA Fisheries and Aquaculture looking to implement paperless systems in the near future, this project has seen the SZRLF have significant input and influence in developing the on-board e-data collection concept in South Australia.

The project has also provided SZRLF licence holders with 'electronic reporting options' as opposed to operators having to utilise the base-system provided by the Regulator.

The spatial reporting benefits and time [and therefore cost] efficiencies accruing from the implementation of this technology in the SZRLF have been achieved with minimal cost to industry and in a relatively short period of time.

Not only should this improve operational efficiency on board the vessel, but it is expected to improve the timeliness of data being available and in a form ready for analysis and therefore improving the efficiency of fishery management decisions. The effective adoption of the technology within the industry also highlights the effective use of project funds and transfer of project outcomes.

The use of this type of technology in the SZRLF also provides licence holders with a myriad of other information sharing options now available on-board each vessel in the fishery.

Assessment of the impact of the outcomes on end users such as management, industry, consumers, etc in Australia (where possible provide a statement of costs and benefits).

Recommendations

In order to capitalise on the benefits seen within the SZRLF, trials of the Deckhand application in other Australian Southern Rock Lobster Fisheries should be undertaken to assess its applicability and suitability for use.

Further refinement of the application is required to ensure it can be utilised on platforms other than Apple, specifically development for use on Android devices should be investigated.

An assessment should be undertaken of other relevant technologies which may compliment the Deckhand application and add further value to the user, fishery researchers and the regulator. An example of such technology are gear tags (for rock lobster pots) which may assist in collecting environmental data which may then be reported / collated via the Deckhand application.

Further Development

- Incorporation of additional components into the application possibly including;
  - The SZRLF voluntary pot sampling program.
  - The use of other available technologies e.g. gear tags, to record additional environmental data via the application.
  - Required reporting for Threatened, Endangered and Protected Species (TEPS).
  - Clean Green Program Logbook reporting requirements.

- An industry communications portal to include services for a range of stakeholders.
- Ability to use the application on Android devices.

Extension and Adoption

The Deckhand application was utilised on-board 50% of SZRLF vessels during the 2014-15 season (around 75 vessels).

The application will be used full-scale across the fishery (all vessels) in the 2015-16 season (around 165 vessels).

The application is likely to be trialled in the NZRLF in 2015-16 and / or 2016-17, the South Australian Northern Zone Rock Lobster Fishermen's Association Inc (SANZRLFA) and RTD have already had preliminary discussions regarding the structure of a trial to be conducted under commercial fishing conditions.

SEPFA wil be sending a number of iPads with the Deckhand application installed to Tasmania for industry trials there later in 2015.

Project Materials Developed

The project produced the following materials;

1. 'SEPFA version' of the iPad Application; Deckhand.
2. iPad / Deckhand User Guide
3. iPad / Deckhand Quick-Start Guide
4. Deckhand User Survey
5. Deckhand Account Creation Form
6. Project 2011-250 Extension Plan
7. Project 2011-250 Media Release
8. EconSearch Pty Ltd Cost-Benefit Analysis
9. Agenda - SEPFA On-Board E-Data Collection Workshop (7 September 2012)
10. Presentations - SEPFA On-Board E-Data Collection Workshop (7 September 2012):
    a) Introductory presentation
    b) Presentation from Real Time Data Pty Ltd
    c) Industry presentation regarding the on-boat trials
    d) EconSearch Pty Ltd presentation in relation to the Cost-Benefit Analysis
    e) PIRSA presentation regarding 'e-catch'
    f) 'Next steps' / conclusion presentation

Appendices

Please note that given file sizes, Appendices 1 - 9 have been provided separately to the report document and can be accessed from the FRDC (www.frdc.com.au) or via this Dropbox link:

https://www.dropbox.com/sh/qfcamtb9nwu76x0/AAB0SWpYCF5_ZOyUB-zCAETSa?dl=0

1. iPad / Deckhand User Guide
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3. Deckhand User Survey
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10. References:

    EconSearch Pty Ltd. 17 July 2012. On-Board Electronic Data Capture System (Deckhand) - Cost Benefit Analysis.

    Linnane A. and Walsh P. 2011. Standardising data collection across the southern rock lobster fisheries of South Australia, Victoria and Tasmania.

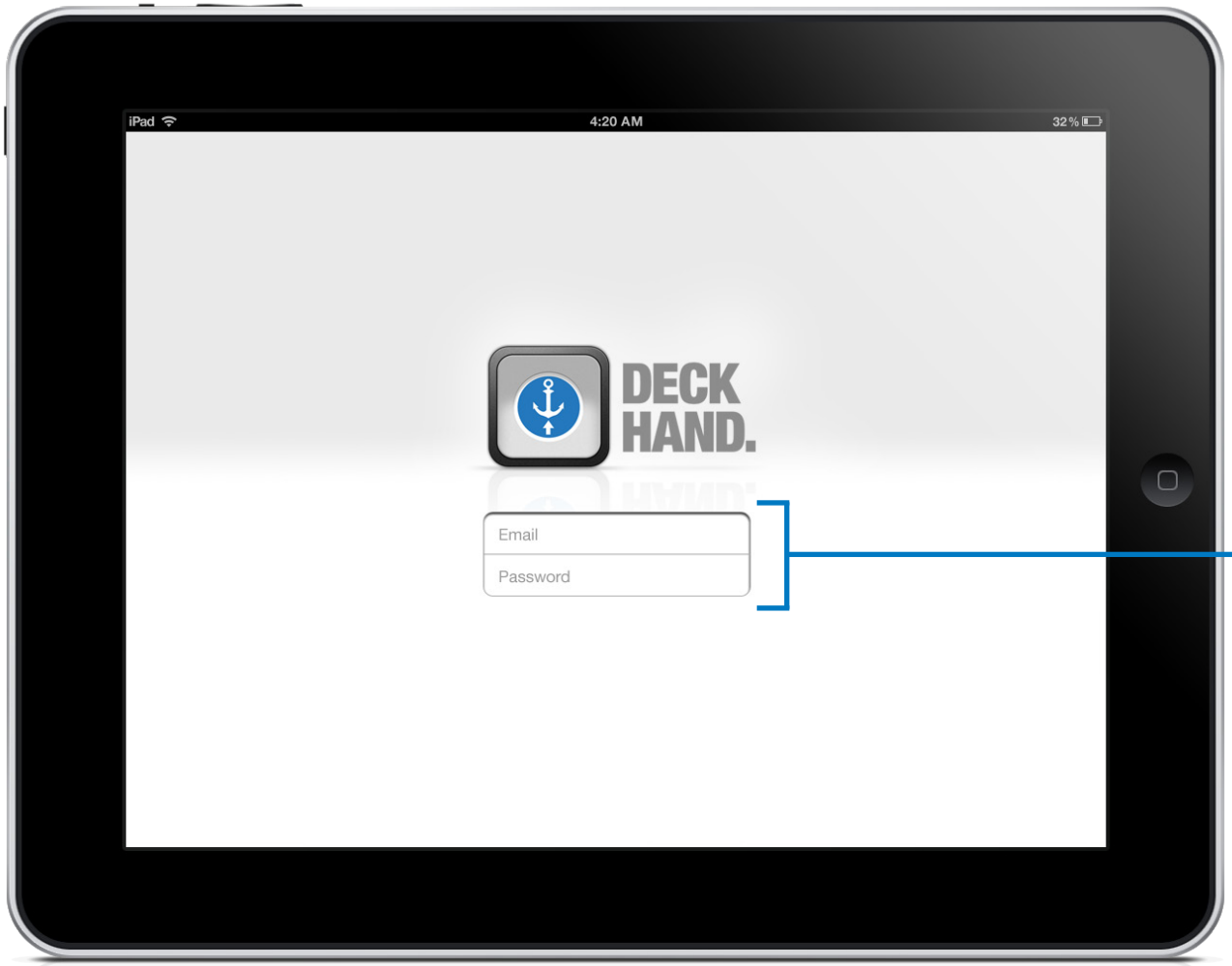
DECK HAND.

USER GUIDE

SEPFA Trials

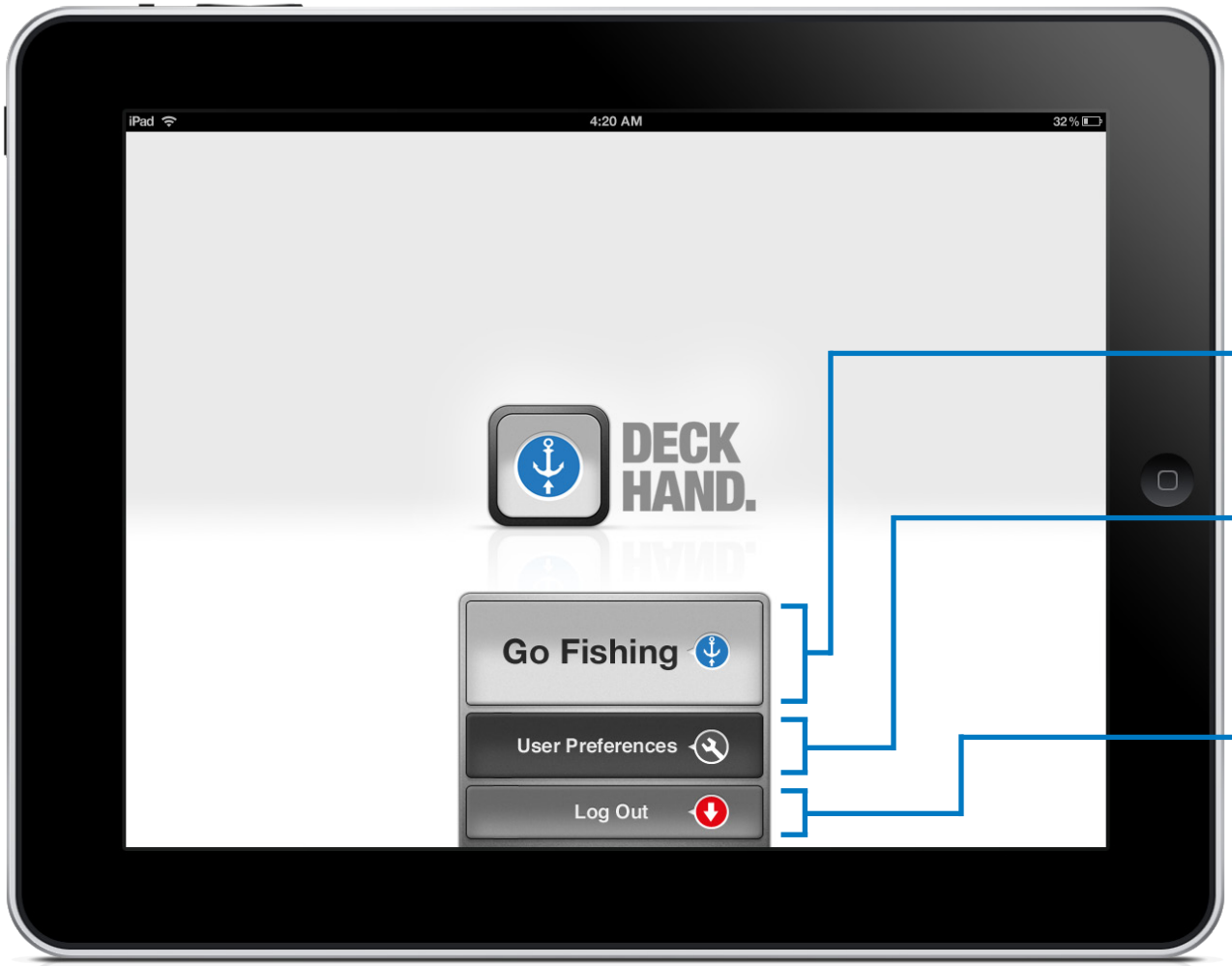
SEPFA South Eastern Professional Fishermen's Association Inc.

realtimedata



User account

Enter your trial device number (eg RTD020) and password (password)
This only needs to be done once.



Page 3.

Go Fishing

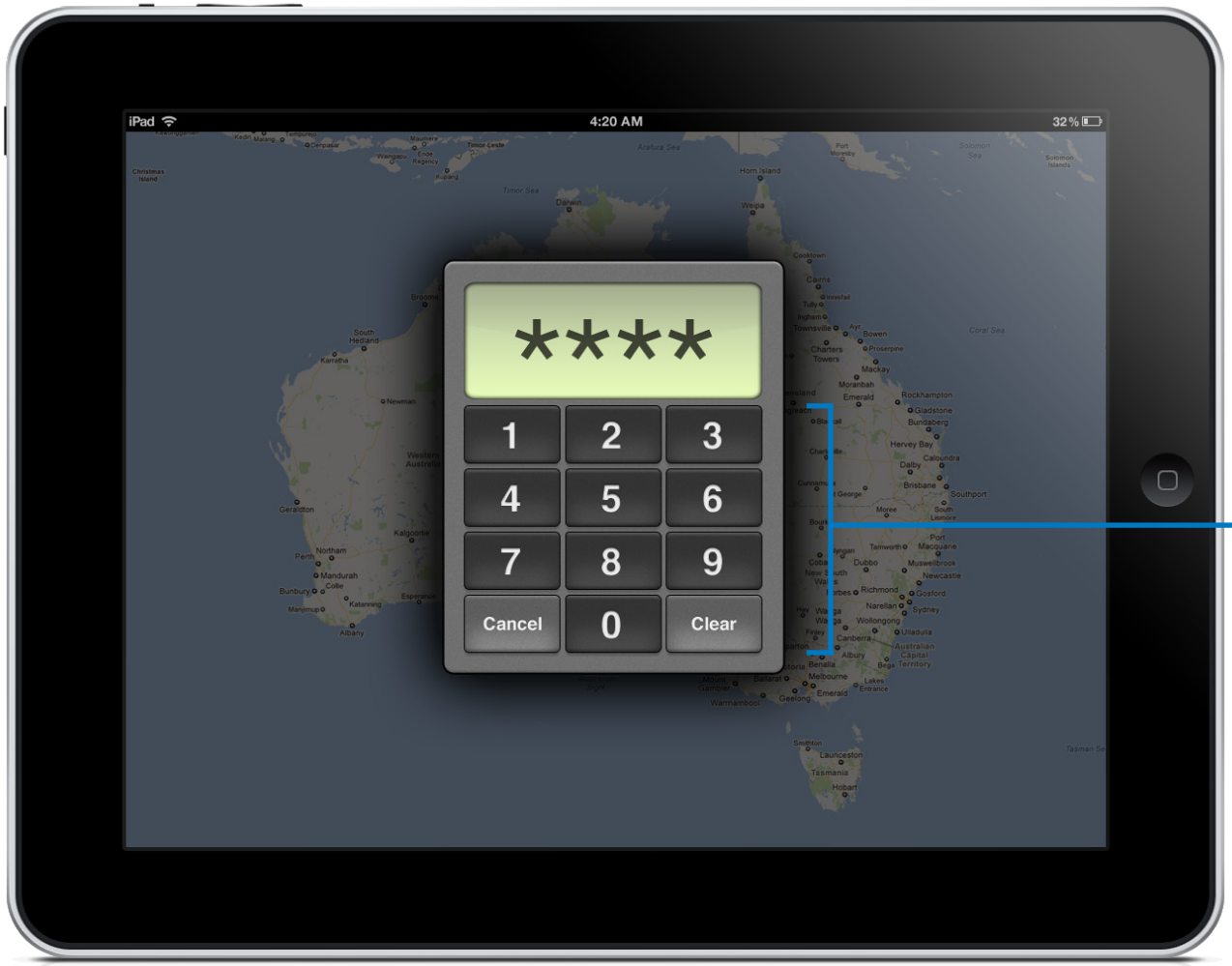
Push this to go fishing.
(Page 2)

User Preferences

You can change some settings for your fishing session, Fathoms to meters for example.

Log Out

Returns you to the login screen (Page 1).



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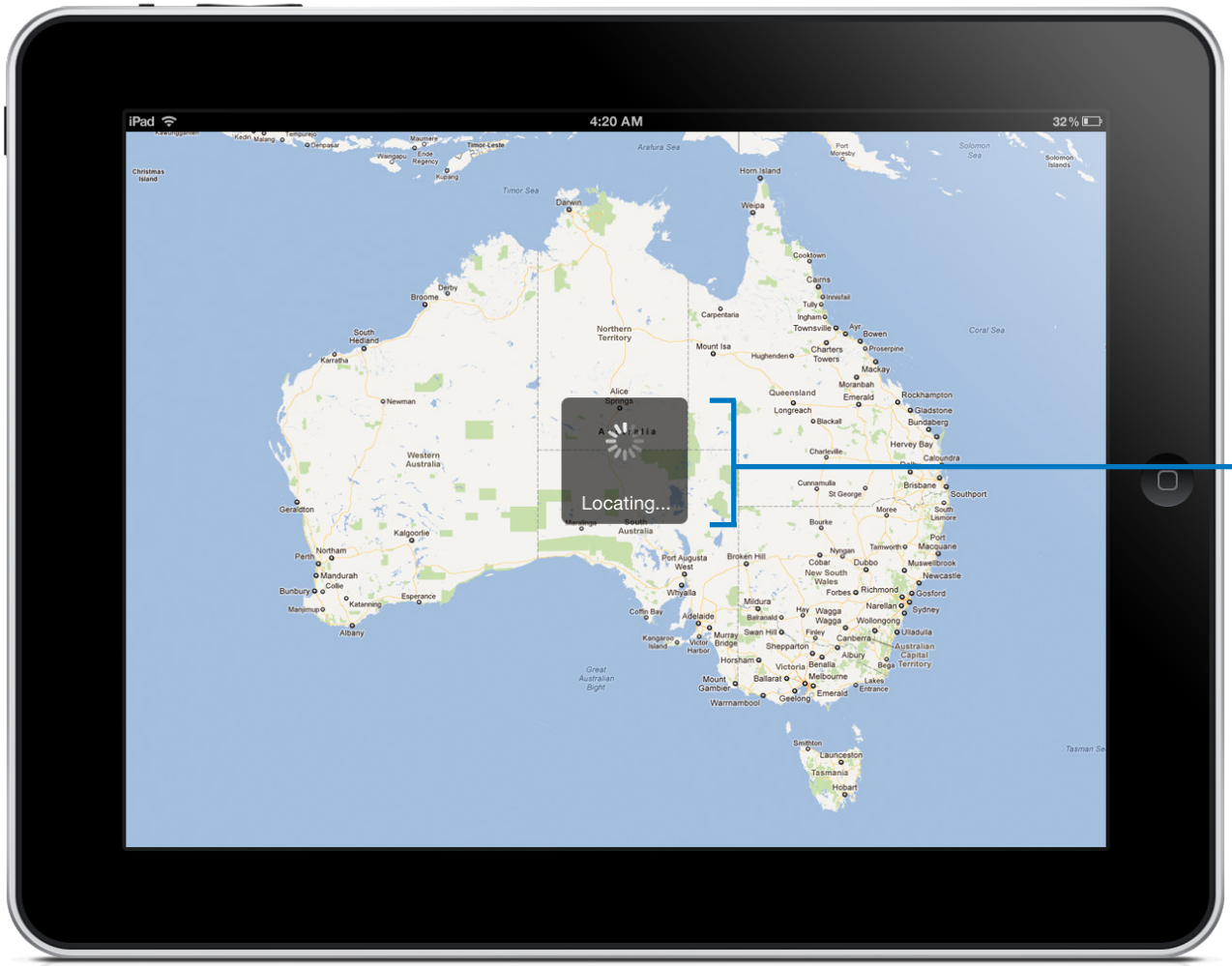
Pin entry

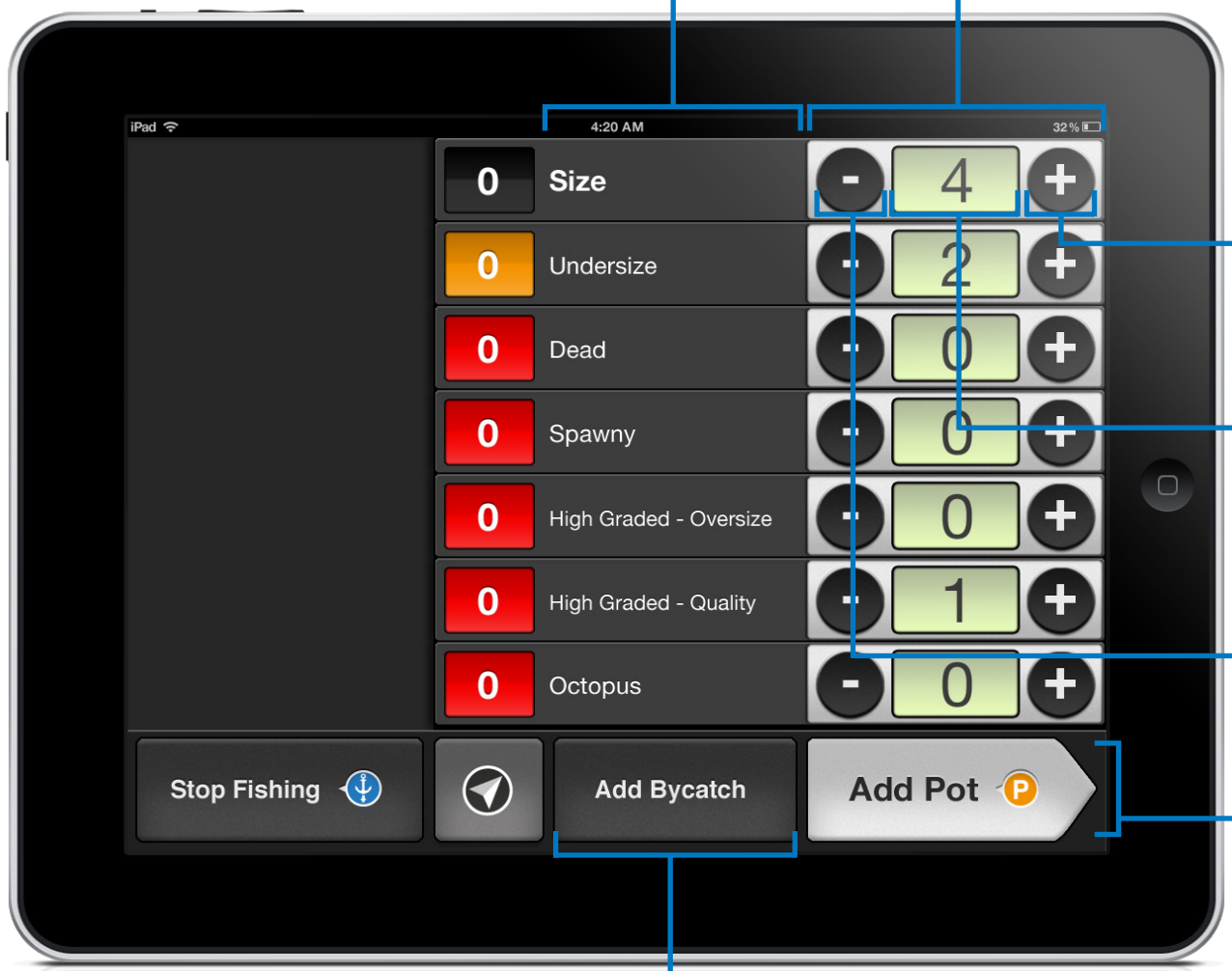
Enter your 4 digit pin. (1234)



Page 5.

Locating

If an accurate location cannot be established ensure you have an unobstructed view of the sky and that no large objects are nearby.



Catch Categories

A list of all catch categories.

Enter Catch Counter

Plus button

Each tap will increase the counter by 1.

Counter

Tapping on the counter will display a keypad for faster entry of larger numbers.

Minus button

Each tap will decrease the counter by 1.

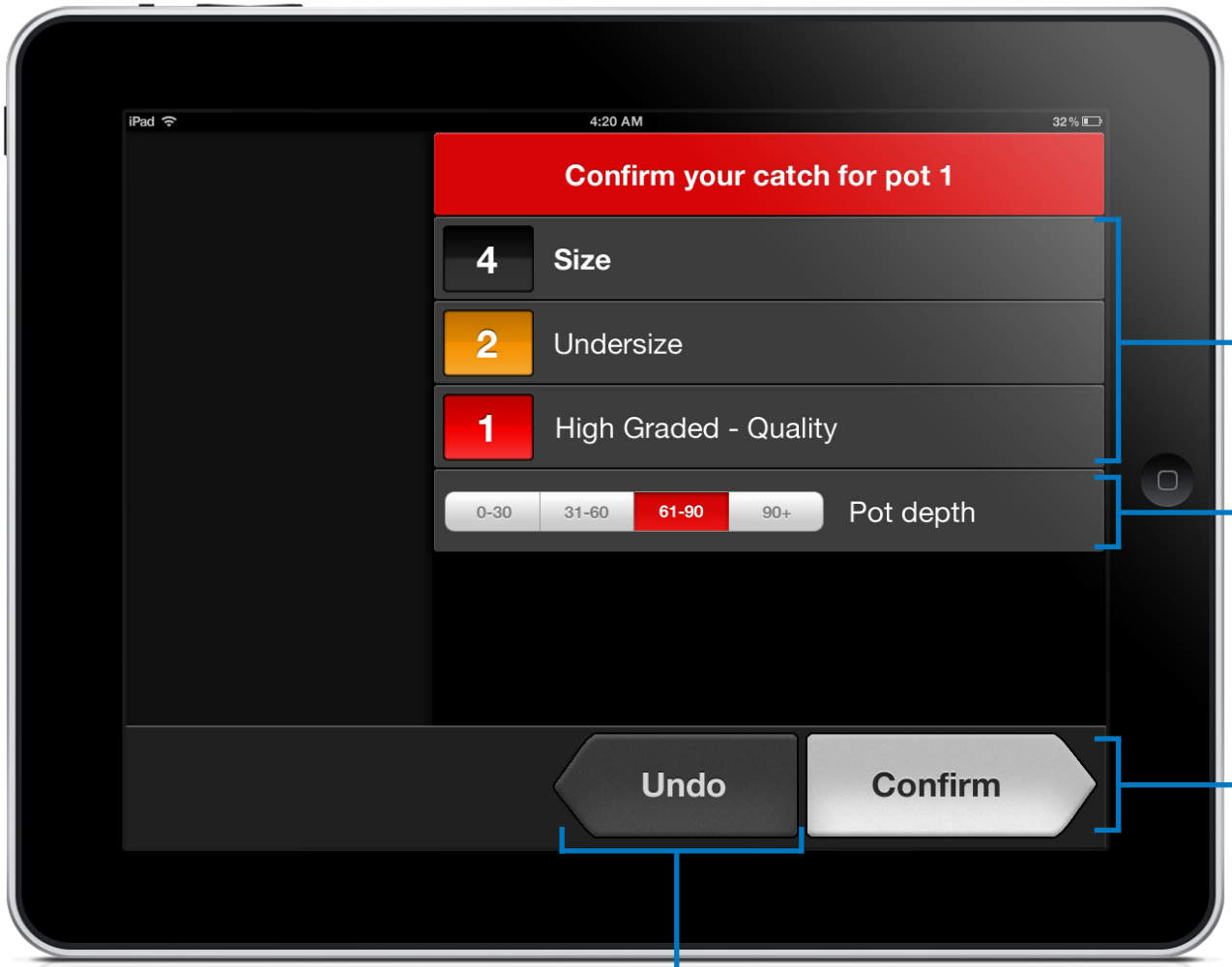
Page 6.

Add Pot

Once you have entered your catch, tap here to add the pot.

Bycatch toggle

Tap here to enter any bycatch.



Check your catch

Check the pot summary to ensure what you entered is correct.

Pot depth

Select the pot depth, this will remain the same until changed.

Page 7.

Confirm

Once you have checked your catch, tap confirm.

Undo

If you have made a mistake, tap undo to go back to the previous screen.

Pot List

All recorded pots are listed here. The large number represents retained lobsters, the small number is non-retained lobsters.

Running totals

Displays the confirmed running total for each category.

Page 8.

Stop Fishing

When you have stopped fishing, press here to begin the reporting process.

Map View

Toggle the map view with this button.

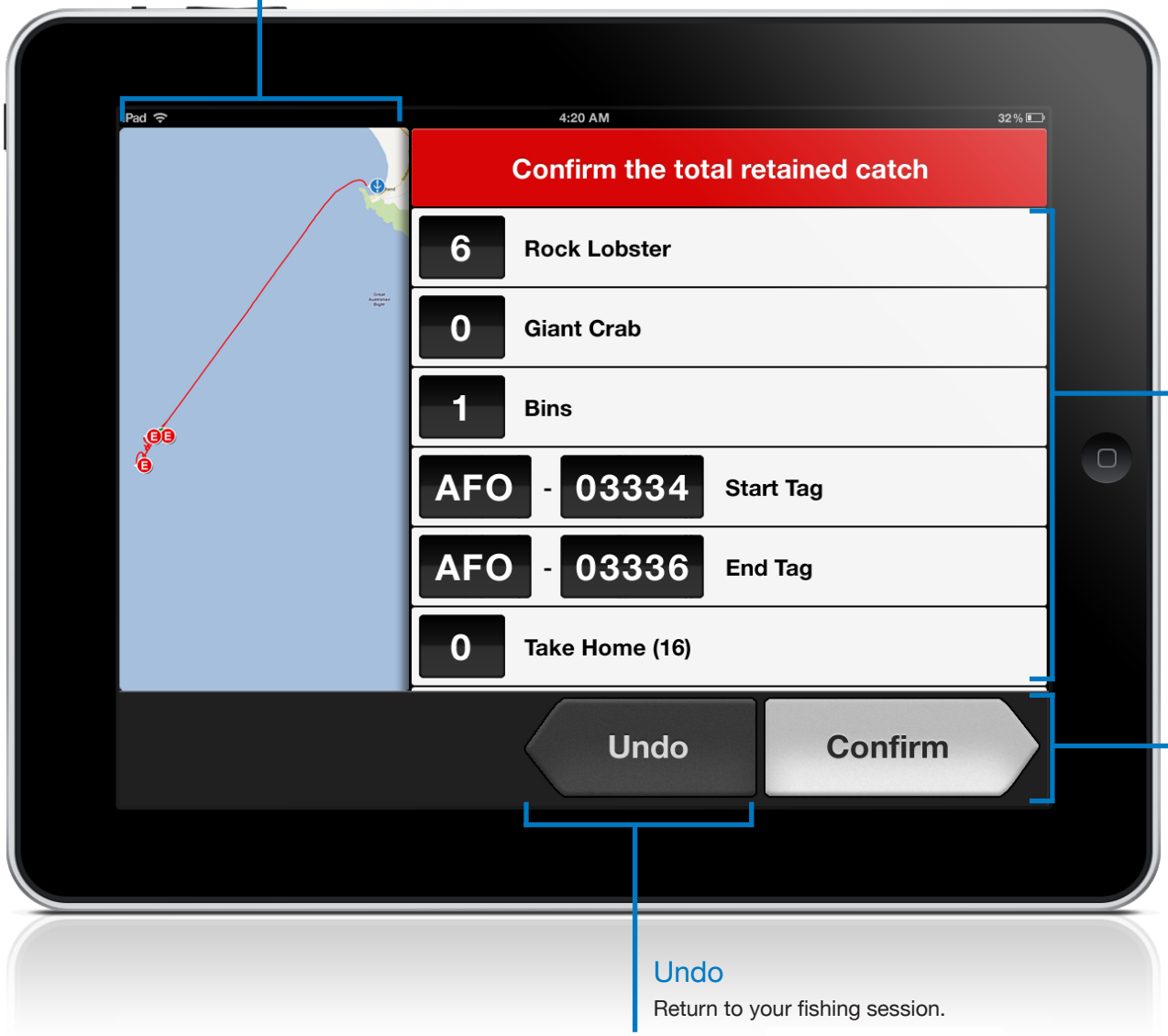
Page 6.

Add Pot

Continue adding pots until you have pulled them all.

Path view

See the path of the completed fishing session.



Total Catch Report

You can adjust any of these fields to ensure you are reporting the correct information..

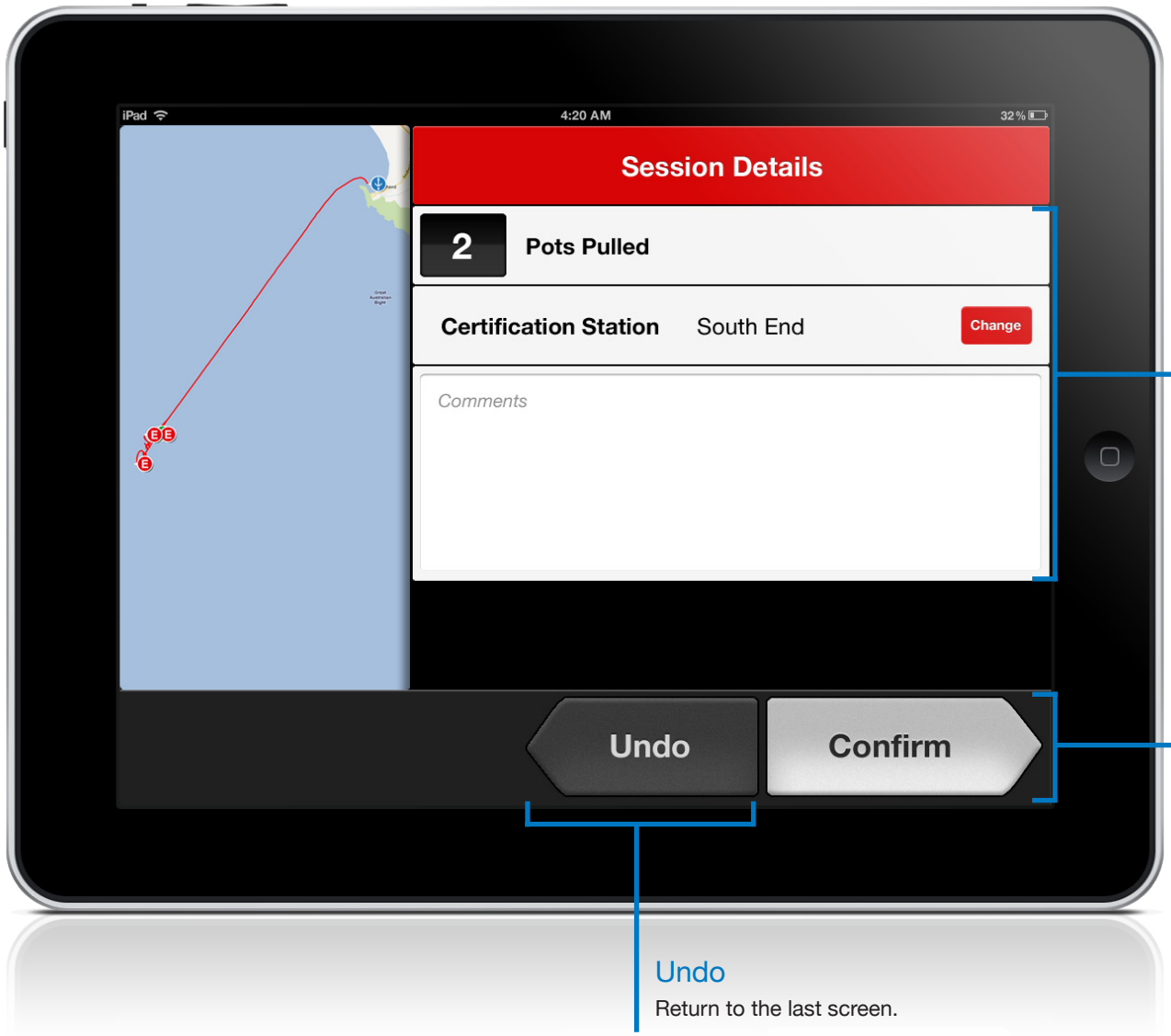
Page 9.

Confirm

Press confirm to continue.

Undo

Return to your fishing session.



Session Details

You can adjust any of these fields to ensure you are reporting the correct information.

Page 10.

Confirm

Press confirm to continue.

Undo

Return to the last screen.

Report summary

Ensure that all your fishing session details are correct.

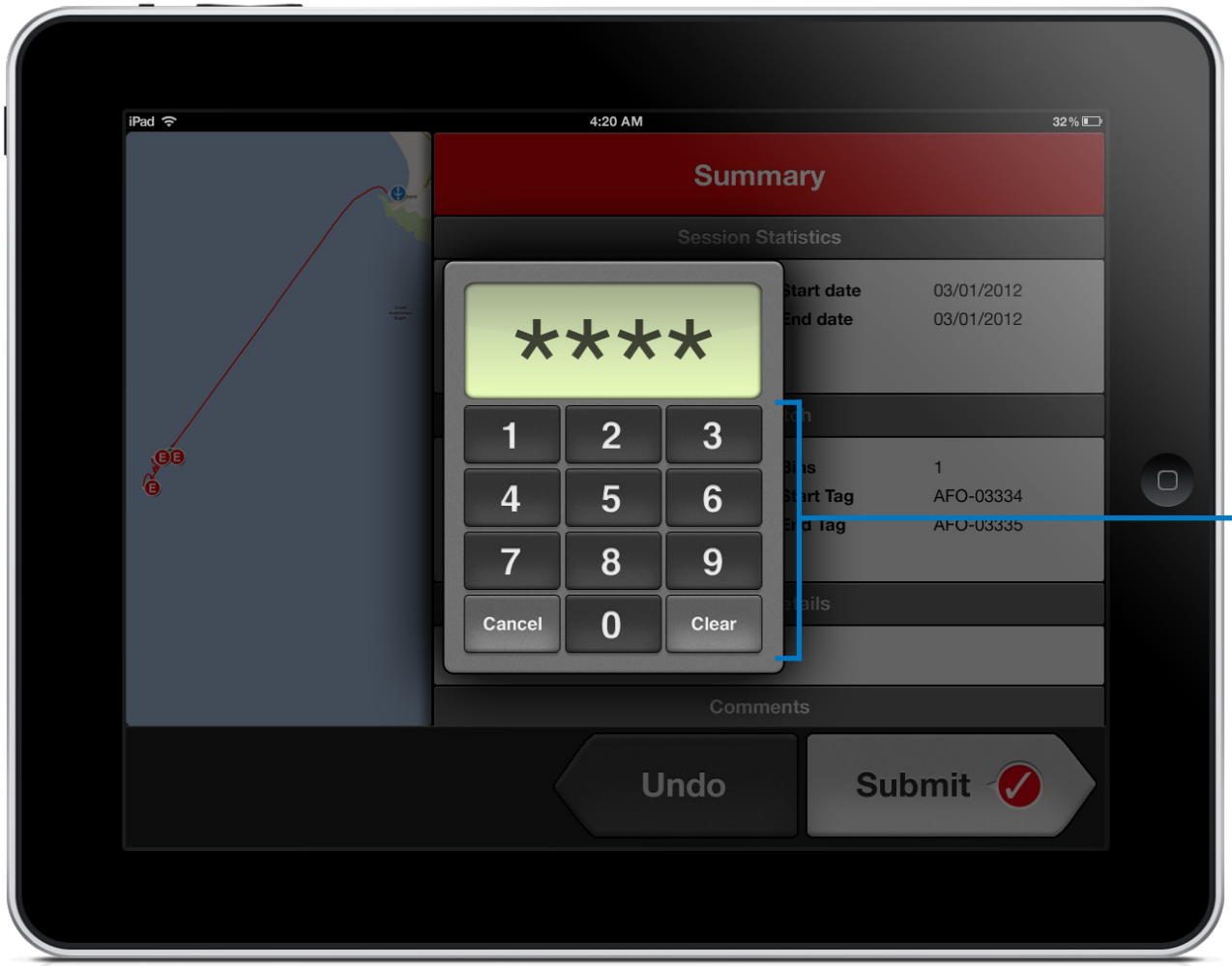
Page 11.

Submit

Press to submit your end report.

Undo

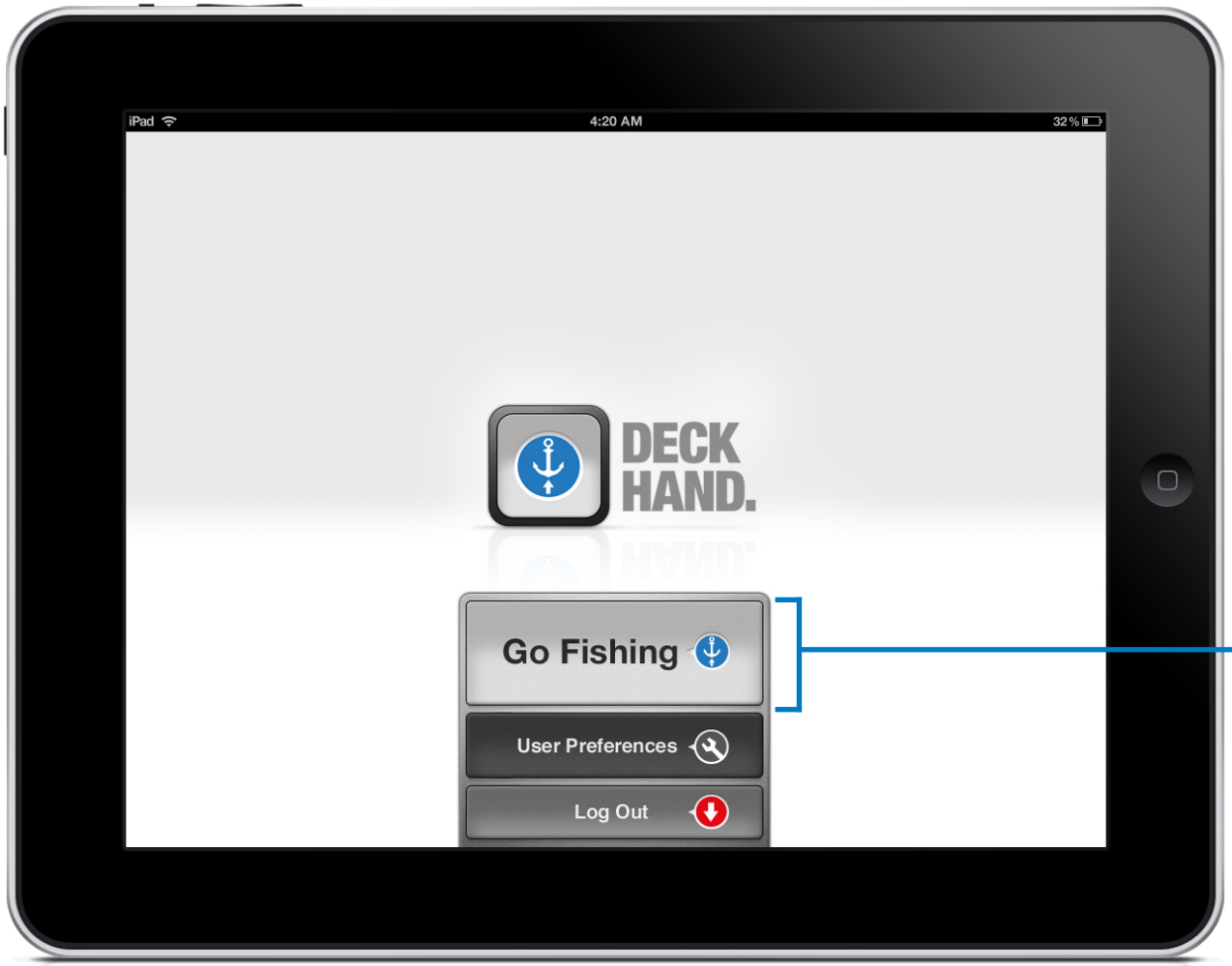
Return to the last screen.



Page 12.

Security PIN

Enter your PIN (1234).



Page 3.

Session complete

You're finished. Press Go Fishing when you are ready to start another fishing session.

CONTACT DETAILS

Please email any feedback on Deckhand to:
feedback@real-time-data.com.au

Or call:

Simon Dick
Mobile: **0413 299 335**
Email: **simon@real-time-data.com.au**

Tom Robinson
Mobile: **0427 262 553**
Email: **tom@real-time-data.com.au**

Justin Phillips
Mobile: **0400 281 904**
Email: **justin@jp-consulting.com.au**

DECK HAND. QUICK START GUIDE

SEPFA South Eastern Professional Fishermen's Association Inc.

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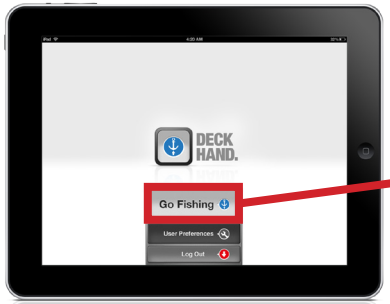
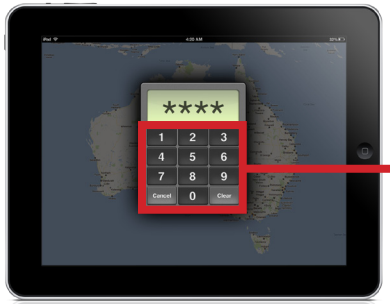
1.



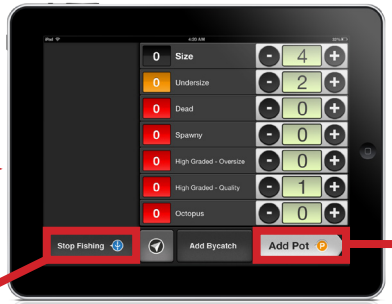
Tap ‘Go Fishing’

2.



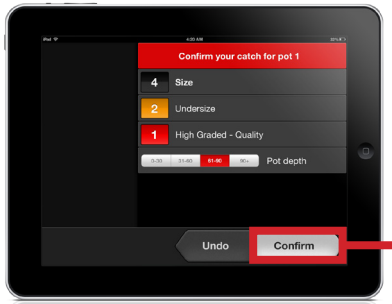
Enter ‘1234’

3.



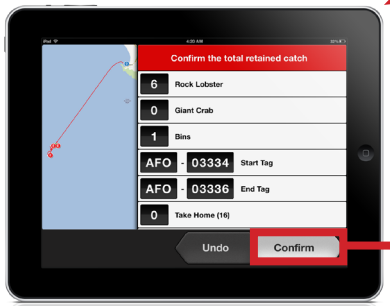
Enter pot contents.
Tap ‘Add Pot’.

4.



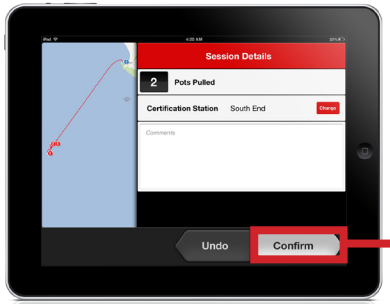
Confirm your catch.
Add pot depth.

5.



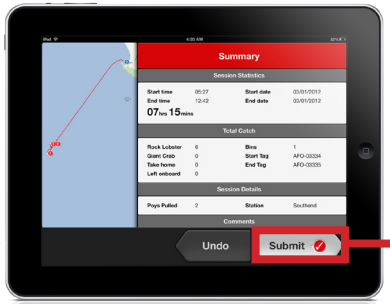
Enter retained catch details.

6.



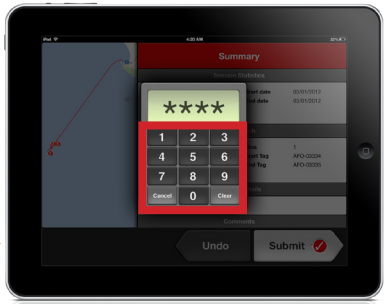
Enter Fishing Session details.

7.



Review all details.
Tap ‘Submit’.

8.



Enter ‘1234’ to authenticate submission.

DECK HAND.

USER SURVEY

SEPFA Trials

SEPFA South Eastern Professional Fishermen's Association Inc.

realtimedata

Deckhand feedback survey.

Thank you for taking the time to trial Real Time Data's Deckhand software. To assist with SEPFA's evaluation of the trial can you please take ten minutes to answer this questionnaire.

Part A requires you to rank a series of statements about the functionality of the software.
You should circle the number you believe best answers the statement. Please avoid answering 'not sure' as much as possible.

1 = Strongly Disagree	2 = Disagree	3 = Agree	4 = Strongly Agree	5 = Not sure?

Ease of use.	Because of its intuitive design, anyone can use Deckhand.	1	2	3	4		5
Training time.	Learning to use Deckhand takes less than 15 minutes.	1	2	3	4		5
Robustness.	When protected with the hard-case, the iPad is as durable as any other electronics on my boat.	1	2	3	4		5
Prior report.	Prior reporting would be easier using the PIN on Deckhand than making a call to a call-centre.	1	2	3	4		5
Data security.	The legal contracts proposed for Deckhand give me confidence that the data I collect is secure.	1	2	3	4		5
Replacing paper.	Recording my catch on Deckhand is easier than writing it down on paper.	1	2	3	4		5
Data interface.	The touch screen works well.	1	2	3	4		5
Size of buttons.	The buttons were big enough for me to use at sea.	1	2	3	4		5
Data accuracy.	The data I entered seemed to be very accurate.	1	2	3	4		5
Data coverage.	I never had a problem with cellular coverage. (Logging on and off was always easy).	1	2	3	4		5
Battery life.	I never had a problem with battery power to the device.	1	2	3	4		5
Printing a CDR.	It would be easier for me to print and sign my CDR than the current paper based system.	1	2	3	4		5

For **Part B** we would like you to answer the following questions with a simple one word or one-line answer.

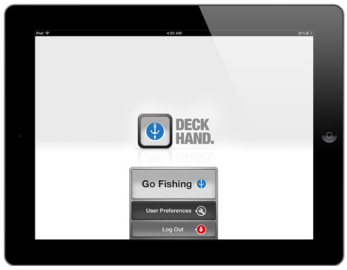
If you could replace your CDR and Catch and Effort reporting by lodging it all with the push of a button on Deckhand, how much time would it save you per trip?

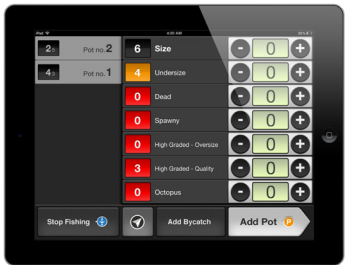
Do you see any other financial benefits for your business?

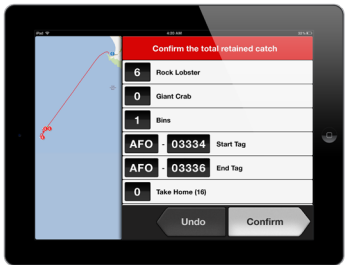
If collecting some fine-scale information became mandatory (say 1 day per month) would you be prepared to support it? Particularly if it could be used to reduce the amount paid to SARDI in the cost recovery process?

If you were confident that your data would be treated confidentially, would you share some of your catch and effort information to assist SEPFA in defending a position with SARDI / PIRSA or any other government bodies?

For **Part C** we ask you to look at the following screen shots. If you have any comments to make about the functionality of that specific screen please write them in the area provided.

Homescreen	Developer comments	Additional Comments / Suggestions
	**User Preferences need to include:** - Change unit of measure. - Disable / enable Headsets. - Disable / enable SARDI voluntary information.	

Catch Entry	Developer comments	Additional Comments / Suggestions
	- Make pots editable. - Disable auto centering of the map while you're interacting with it. - Include the ability to cancel a session and delete all captured data for that session. - Add a running tally of retained catch to the pot list information.	

End Reporting	Developer comments	Additional Comments / Suggestions
	- Tag numbers need up to 6 numbers. - ETA field may be required. - Integration with electronic scales.	

For **Part D** we would like you to think about any additional features you think would improve the way Deckhand functions. It doesn't matter how technically difficult (or even silly) you think it is. No idea is a dumb idea!

Write any suggestions you have for software improvements here.

Finally, if you have any additional comments you'd like to make about Deckhand or the trial process itself, please write them here.

Write any additional comments you have here.

Thank you taking the time to fill in this survey.

Regards,

Justin.

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SEPFA Deckhand account creation form.

Please fill in the details below to create your SEPFA Deckhand account. Complete all fields using the **license holder's** details unless otherwise stated.

IMPORTANT Relief Masters must also be entered (please ensure the details are the same as you have registered with PIRSA). Relief Masters PINs cannot be the same as your PIN and must not match any of the other Relief Masters PINs.

If you have any questions, please contact Simon Dick (0413 299 335).

You can also fill in this form online here: **http://bit.ly/1o18lf5**

Account Holder Details

First Name	
Last Name	
Account Password	
SEPFA to supply iPad & Cover?	**Yes / No**
Phone Number	
Email	
Street	
Suburb	
Post Code	
State	

License Details

License Number	
Masters First Name	
Masters Last Name	
Masters PIN (i.e. 1234)	
Boat Name	
Departure Port	

A PO BOX 370, Port Elliot, SA, 5212
M 0413 299 335
E simon@real-time-data.com.au
W deckhandapp.com

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Relief Masters

1 - Name (First & Last)	
1 - PIN (i.e. 1234)	
2 - Name (First & Last)	
2 - PIN (i.e. 1234)	
3 - Name (First & Last)	
3 - PIN (i.e. 1234)	
4 - Name (First & Last)	
4 - PIN (i.e. 1234)	
5 - Name (First & Last)	
5 - PIN (i.e. 1234)	

Once complete, please either scan and email to justin@jp-consulting.com.au or fax to 08 8132 0161.

Thank you.

Simon Dick - Director

A PO BOX 370, Port Elliot, SA, 5212
M 0413 299 335
E simon@real-time-data.com.au
W deckhandapp.com

FRDC Project 2011/250

Assessing functionality and suitability of the iPhone application 'Deckhand' for on-board electronic data capture in Southern Australian Rock Lobster (Jasus edwardsii) fisheries.

February 2012

Extension / Communication Plan

1. Background

This project follows the completion of FRDC Project No 2008/003 regarding requirements for data standardisation, collection, storage, manipulation and reporting.

The key recommendations of that report were for any electronic data capture system to be developed in future to;

- Utilise a touch screen interface robust enough to use on deck
- Cause minimal interruption to the fishing operation
- Use wireless communication (mobile / satellite network) for uploading data and downloading software updates
- Provide real time (or minimum near time on a daily basis) data
- Interact with existing database systems
- Collect data directly linked to the management of the fishery
- Receive inputs from a wide variety of sensors
- Be easily modified to respond to changes in data requirements.

That project is part of a broader strategy to ready PIRSA Fisheries and Aquaculture to receive and utilise fishery information collected electronically on-board vessels as well as creating a web-based portal to deliver E-Business solutions to industry within South Australia - this is something which has long been requested by industry.

Previously the SA Southern Zone Rock Lobster Fishery has undertaken FRDC funded project work to deliver a land-based electronic scales / weighing system at each of the seven ports across the Southern Zone. This system has now been successfully operational for a number of years and has eliminated the need for paper recording of fish weights.

This has delivered significant efficiencies and particularly cost savings to industry, reducing direct fees to licence holders by in excess of $1 million since becoming operational.

The success of project 2011/250 the subsequent trials and implementation of an electronic data capture system on-board vessels will effectively close the 'electronic data capture loop' in Southern Zone.

2. Objectives

a) Full scale implementation of the system in the Southern Zone in 2013/14.

b) Successful on-boat trials in the South Australian Northern Zone Rock Lobster Fishery, Tasmanian and Victorian Southern Rock Lobster Fisheries.

3. Target Audiences

- Industry - (South Australia, Tasmania, Victoria)
- Industry Representative Bodies (SA, Tas, Vic)
- Regulators across Southern Australia
- Research Agencies across Southern Australia

4. Key Messages

Communication of the demonstrated benefits from implementation of the system:

- Better way to do day-to-day business on board the vessel - more efficient
- Finer spatial scale information recorded leads to better fishery management, leads to enhanced resource management and stock sustainability.
- Data confidentiality issues simple to manage
- Electronic recording of all information (CDR and Commercial Logbook) will expedite the reporting process as it removes data entry requirements - more informed management decisions.
- Possible efficiencies / benefits from a fisheries compliance perspective
- Potential for cost reductions (licence fees - data entry, research, compliance)
- Possibilities for the future:
  - Advertising and industry revenue streams to offset costs
  - Generation of customised reports for individual fishers to assist in managing their fishing and associated business operations.
  - Other?

Communication of the basic steps required to achieve full scale implementation:

- Initial Application Development
- Small Scale Trial
- Cost-Benefit Analysis
- Application Review
- Larger Scale Trial
- Application Review
- Implementation of appropriate governance / management arrangements for the application between, industry, service provider, research and management agencies.
- Full scale implementation
- Ongoing discussions with management agencies throughout the process.

5. Methods

A range of methods are planned across 2012/13 and 2013/14. It should be noted that PIRSA Fisheries and Aquaculture are currently developing their own e-business solutions and systems - we have advised that on-line quota balances will be available as soon as mid-2012.

However while PIRSA have a clear understanding of the format and frequency that information from the iPad application 'Deckhand' is required to be received in, it is not envisaged that PIRSA the PIRSA system will be entirely functional until the 2013/14 commercial rock lobster fishing season in South Australia.

This provides the opportunity to:

a) Conduct further trials outside of project 2011/250 during the 2012/13 season to further improve the operation of the application. It is envisaged that this may be on up to 20 SA Southern Zone vessels (this activity is likely to be funded separately by industry) - the current trial is taking place utilizing ten iPads / devices used across multiple vessels.

b) From now until the commencement of the 2013/14 season; communicate the requirements to, and sufficiently educate, fishers for the system to be implemented full-scale across all vessels within the fishery. This is beneficial as it provides an ample period in excess of 12 months to phase in the technology, pending the success of this trial, with industry and also to deal with and address any issues that may be identified during that period. It is critical to comprehensively advise fishers of the system's operational requirements and functionality aspects and the process for phasing in of the technology on-board vessels.

Methods to be utilized during this period may include:

Produce Extension Material

- Production of specific extension materials including inclusions in industry newsletters, media releases and A/V presentations that incorporate the key messages. Linkages to other projects and consistency of format will be established.
- Utilisation of the Southern Rocklobster Limited (SRL) industry website and posting of updated materials and newsletters and reports from this project.

Direct Communication

- Meeting with other representative fishers from SRL member States, together with research and management agencies - this activity will be funded as part of Project 2011/215. It is intended that this meeting will be the catalyst for similar trials to be undertaken in the other States / fisheries.
- Ongoing port-based meetings with SA Southern Zone licence holders over the course of the remainder of 2011/12 and 2012/13 to communicate the outcomes of the project and the requirements for implementation in the 2013/14 season (this will require an absolute minimum of two rounds of port meetings, ideally three or four rounds). This process is also envisaged to identify any other additional issues, not identified as part of the project so that they may be addressed.
- Ongoing and regular direct written licence holder communication via circulars, letters and email.
- Ongoing direct in-person communication with the service provider, wider industry and Government and management agencies.

- Participation and presentations at key industry functions / seminars – e.g. national congress, launches and displays. Possibly attendance at meetings of other State-based industry representative bodies (VRLA and TRLFA).
- Presentations at stakeholder and industry seminars, meetings etc.

Industry Extension Events

- Participation, through displays and attendance at broader industry extension events such as the Rock Lobster Congress 2013, Sydney.

Media Interaction

- Media releases to outlets as well as industry networks and association representatives on a regular and as-needs basis.
- Participate in interviews in conjunction with service provider, research and management agencies.

Outside of communications requirements to the industry, there will also need to be a significant investment of resources into finalising governance issues such as contractual arrangements and ensuring various responsibilities for ensuring service delivery, troubleshooting, ownership and management of data (confidentiality concerns) and ongoing licensing arrangements for use of the Deckhand application are appropriately addressed.

It should be noted that the majority of the activities of the below action plan, except for the initial workshop with other SRL member States, are not funded as part of Project 2011/250.

SEPFA has been in discussions with the Service Provider, Real Time Data, regarding an appropriate arrangement to fund such activity, pending the success of the current trial.

6. Action Plan

No:	Activity:	Additional Information:	Timeline:
1	SEPFA workshop with SA Northern Zone, Tasmanian and Victorian Industry Representatives (Adelaide -post production of Cost-Benefit analysis from Project 2011/250)	Purpose - to discuss preliminary results of trial and Cost-Benefit Analysis conducted as part of Project 2011/215. Also to assess and address any barriers to implementation of further trials in alternate fisheries - SA Northern Zone, Tasmania and Victoria. Provide info for preliminary refinement of Deckhand in readiness for future trials in other States. Funded as part of Project 2011/250.	August 2012
2	Port Meetings in SA Southern Zone	Communicate the outcomes of the project and the requirements for implementation in the 2013/14 season (this will require an absolute minimum of two rounds of port meetings, ideally three or four rounds). This process is also envisaged to identify any other additional issues, not identified as part of the project so that they may be addressed.	Ongoing - Initial Round of Meetings Pre 2012/13 season (September 2012)
3	Written Licence Holder Contact	Ongoing and regular direct written licence holder communication via circulars, letters and email.	At Least Quarterly
4	Update SRL Website	Include port meeting presentations, circulars, industry newsletter excerpts, operational guides for using the iPad Application including relevant visuals.	At Least Quarterly
5	Ongoing Liaison with Other Stakeholders	Service Provider, Other State Industry Bodies, Management and Research Agencies	As Required
6	Participation / Presentation at Industry Functions / Extension Events	2013 Sydney Rock Lobster Congress, VRLA and TRLFA AGMs and other meetings	To Be Advised
7	Media Interaction	Relevant Media Releases	At Least Quarterly

7. Evaluation

Success will be measured against the level of adoption of the technology amongst industry, cost and operational efficiencies gained and the delivery of data to relevant research providers and regulators meeting the required standards.

The specific activities noted in the Action Plan will be evaluated as follows:

- Industry participation in key projects
- Industry attendances at port and other meetings
- Requested feedback from stakeholders

South Eastern Professional Fishermen's Association Inc

MEDIA RELEASE

Friday 24th February 2012

Rock Lobster Looks to Go 'Paperless'

South Australia's Southern Zone [Southern] Rock Lobster Fishery has long been known for its innovative approach to fishery management issues and a current project looking into the electronic recording of real-time catch information on board fishing vessels is no exception.

The project is trialling an iPad application used on board vessels to replace all of the legislated reporting requirements currently undertaken on paper each day by fishermen.

President of the South Eastern Professional Fishermen's Association Inc (SEPFA), David Manser, said if implemented in the future, the technology had the potential to provide a number of significant benefits directly to fishers.

"Obviously cost is a factor for fishermen as we're all running businesses, this may be able to save time and money in areas such as data entry and reporting given all of the data will be submitted electronically and is available to use straight away," said Mr Manser.

"Following completion of the on-boat trials at the end of March, we will be undertaking a cost-benefit analysis to try and identify some of those efficiencies.

"Generally though, it's appears to be a better way for fishers to business and it will also generate a range of fishery management benefits which is fantastic as the sustainability of the resource is the primary objective.

"In the Southern Zone half of our catch information is already recorded electronically via the automated scales at each port which are linked to a centralised system, so it makes sense that we should close the electronic data capture loop by doing this on board."

Tom Robinson, Director of Real Time Data Pty Ltd, the company partnering with SEPFA to develop the iPad application says he's excited to finally see the technology on board commercial vessels.

"We've identified a number of improvements by working with the fishermen through SEPFA and we've been able to amend the application accordingly, all we have to do is then ask the participating fishers to upload an updated version of application to their devices - it's that simple," Mr Robinson said.

Next steps for the project include working with Southern Rock Lobster fishers in the South Australian Northern Zone Rock Lobster Fishery and the Tasmanian and Victorian fisheries to share the experience and to test the relevance of the technology there.

The project, *Assessing functionality and suitability of the iPhone application 'Deckhand' for on-board electronic data capture in Southern Australian Rock Lobster (Jasus edwardsii) fisheries*, is supported by funding from the Fisheries Research and Development Corporation on behalf of the Australian Government and is due to be completed in November this year.

SEPFA Media Contact: Justin Phillips (Executive Officer) - 0400 281 904

On-Board Electronic Data Capture System (Deckhand) Cost Benefit Analysis

A report prepared for

South Eastern Professional Fishermans Association Inc

Prepared by

17 July 2012

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www.econsearch.com.au

Contents

List of Tables

Abbreviations

BCR	benefit cost ratio
CBA	cost benefit analysis
CDR	catch disposal record
CPUE	catch per unit effort
FRDC	Fisheries Research and Development Corporation
IRR	internal rate of return
NPV	net present value
PIRSA	Primary Industries and Regions South Australia
SA	South Australia
SARDI	South Australian Research and Development Institute
SEPFA	South East Professional Fishermans Association
SZRL	Southern Zone Rock Lobster
TACC	Total Allowable Commercial Catch

Document History and Status

Doc Ver	Doc Status	Issued To	Qty elec	Qty hard	Date	Reviewed	Approved
1	Draft	Justin Phillips	1 Word	-	30/05/12	JBM	JBM
2	Final	Justin Phillips	1 Word, 1 pdf	-	17/07/12	JBM	JBM

Printed:	17/07/2012 1:11:00 PM
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Project Manager:	Julian Morison
Principal Author/s:	Lisa Rippin and Julian Morison
Name of Client:	South Eastern Professional Fishermans Association Inc
Name of Project:	On-board Electronic Data Capture System (Deckhand) Cost Benefit Analysis
Document Version:	2
Job Number:	1201

1. Introduction

Regulators, research agencies and industry, generally, are requiring greater levels of data to demonstrate the sustainability of fisheries resources. This requirement for additional data increases the impost on fishers to report a day's catch. The electronic capture of data on-board the vessel can reduce this impost on fishers whilst providing data in a timelier manner to aid decision making.

To explore the potential for data to be captured on-board a vessel electronically, a trial of a functional on-board electronic data capture system, developed for the Southern Zone Rock Lobster (SZRL) fishery, was undertaken. The Fisheries Research and Development Corporation (FRDC) funded trial involved a number of licence holders (approximately 20) in the SZRL fishery using the Deckhand application, specially developed by Real Time Data Pty Ltd for this purpose.

EconSearch Pty Ltd was commissioned by South Eastern Professional Fishermans Association Inc (SEPFA) to conduct a cost benefit analysis of implementing the Deckhand application on a whole of fishery basis. The financial analysis has been conducted from the perspective of the SZRL fishery, whereby only the costs and benefits relevant to the licence holders have been taken into account.

The objectives from the fishery-wide implementation of Deckhand include:

- A simpler, consolidated, more efficient way of reporting a day's catch.
- Improved data provision, reduced costs and more timely decision making.
- Enhanced resource sustainability through the provision of improved information.
- More efficient and effective, and therefore profitable, operation at the individual business level through the provision of more detailed information in a timely fashion.

2. Method of Analysis

2.1 Purpose and Scope of the Cost Benefit Analysis

A key objective of the project was to undertake a cost benefit analysis (CBA) to determine the net economic impact to the industry of implementing Deckhand. One option for the on-board electronic data capture system (Deckhand) was compared against a base case scenario of no change to the current method of fishery data collection. The option and base case scenarios are described in Table 2.1.

Table 2.1 Alternative options for the cost benefit analysis

Option	Description
Base Case (Do Nothing)	No change to the current method of fishery data collection. That is, fishers fill out paper catch disposal records (CDRs) and log books and post into PIRSA, for manual data entry.
Option 1 (Implementation of Deckhand within industry)	Implementation of a functional on-board electronic data capture system (Deckhand) developed for the Southern Zone Rock Lobster fishery which addresses the requirements of regulators, research agencies and industry. Deckhand is capable of capturing the CDR and catch and effort data electronically and providing it to PIRSA. It is assumed Deckhand is adopted by all licence holders in the fishery.

2.2 Method of Analysis

The starting point for the analysis was to develop the 'base case' scenario, that is, the benchmark against which the options were compared. For the purpose of this analysis the 'base case' was defined as a 'do nothing' scenario, that is to say no change to the current method of fishery data collection and no implementation of Deckhand.

Given that costs and benefits were specified in real terms (i.e. constant 2012 dollars), future values were converted to present values by applying a discount rate of 7 per cent. A sensitivity analysis was conducted using different discount rates.

The financial analysis was conducted over a 25 year time period and results were expressed in terms of net benefits, that is, the incremental benefits and costs of the option relative to those generated by the 'base case' scenario. The evaluation criteria employed for these analyses were as follows.

- Net present value (NPV) – discounted[1] project benefits less discounted project costs. Under this decision rule an option was considered to be potentially viable if the NPV was greater than zero. The NPV for option *i* has been calculated as an incremental NPV, using the standard formulation:

  NPV_i = (PV (option $_i$ benefits – 'base case' benefits) – (PV (option $_i$ costs– 'base case' costs))

[1] Discounting refers to the process of adjusting future benefits and costs to their equivalent present-day values (Sinden and Thampapillai 1995).

- Benefit-cost ratio (BCR) – the ratio of the present value of benefits to the present value of costs. Under this decision rule option *i* was considered to be potentially viable if the BCR was greater than one. The ratio was expressed as:

  BCR_i = PV (option $_i$ benefits – 'base case' benefits) / PV (option $_i$ costs– 'base case' costs)

- Internal rate of return (IRR) – the discount rate at which the NPV of a project is equal to zero. Under this decision rule an option was considered to be potentially viable if the IRR was greater than the benchmark discount rate (i.e. 7 per cent for the financial analysis).

3. Data Sources and Assumptions

3.1 Data Sources

The costs and benefits of the project were estimated using a 'with' and 'without' project framework, that is, quantification of the incremental changes associated with the options compared with the base case scenario. The method, data sources and assumptions used to quantify these values are described below. Consideration was given to those benefits and costs likely to occur over a 25 year time period.

The major costs and benefits of the project are listed in Tables 3.1 and 3.2, respectively. Sensitivity analyses were undertaken to reflect the uncertainty associated with the estimated values. Further details of these analyses and results are detailed in Section 4 of this report.

Table 3.1 Costs of the options

Option	Description of Costs	Bearer of Cost	Valued in Monetary Terms	Source of Information
Base Case	Printing, postage and couriers	Industry	Yes	PIRSA
Option 1	PIRSA backend system	FRDC/ PIRSA/ Industry	Yes	PIRSA
	PIRSA backend system maintenance	Industry	Yes	PIRSA
	Deckhand licence fee	Industry	Yes	Real Time Data
	Hardware (iPad and case)	Industry	Yes	Real Time Data
	Data plan	Industry	Yes	Real Time Data
	Training	Industry	Yes	Industry

Table 3.2 Benefits of the options

Option	Description of Benefits	Beneficiary	Valued in Monetary Terms	Source of Information
Base Case	No perceived benefits	-	-	-
Option 1	PIRSA data entry staff savings	Industry	Yes	PIRSA
	Time savings for fishers	Industry	Yes	Industry
	Prior reporting savings	Industry	No	PIRSA
	Quota decision making earlier in the year	Industry	No	Industry/ PIRSA/ SARDI
	Consistency of data	Industry/ PIRSA/ SARDI	No	PIRSA

3.2 Quantifiable Costs and Benefits

3.2.1 Start-up Costs

PIRSA is currently developing a backend system that will enable them to receive data from any on-board electronic data collection system (e.g. Deckhand). It is estimated that this system and all accompanying documentation and legislation will cost approximately $250,000 (PIRSA pers. comm.). It is envisioned that half of this cost will be funded by FRDC. Of the remaining $125,000, PIRSA will fund half ($62,500) and seek the remaining half from industry. Therefore, the cost that will initially need to be funded by all quota based fisheries is $62,500.

It was assumed that only a proportion of this cost will be incurred by SZRL licence holders. Using the proportion of SZRL licence holders compared to all other quota based fishery licence holders as a basis to apportion this cost, it would equate to around $30,500 (almost 50 per cent).

There will be no upfront costs for SARDI so long as the catch and effort data they receive are in a form that it compatible with their current database (SARDI pers. comm.).

It is estimated that the time required by licence holders to learn to use Deckhand is approximately 15 minutes[2]. Assuming an average value of time of $24/hour and 164 active licence holders, the total investment in training across the fishery would be an estimated $989.

3.2.2 Operating and Maintenance Costs

The estimated operating and maintenance costs for PIRSA are approximately $65,000 per annum for all quota based fisheries. All costs incurred by PIRSA will be recovered from industry through licence fees (PIRSA pers. comm.). It was assumed that only a proportion of this cost will be incurred by SZRL licence holders. Using the proportion of SZRL licence holders compared to all other quota based fishery licence holders as a basis to apportion this cost, it would equate to around $32,000 (almost 50 per cent).

Ongoing costs for licence holders will include:

- Deckhand licence fee – software pricing has not been finalised but it is assumed to be $1,250 per annum (Real Time Data pers. comm.). Given there are currently 164 active licence holders, this means an annual cost to the fishery of $205,000.
- Hardware (iPad and case) – given the rate of change in technology and the difficult operational environment, it was assumed the hardware would be replaced every four years. At a cost of $900 (Real Time Data pers. comm.), this will mean an average annual cost for the fishery of $36,900 ($225 per annum and 164 active licence holders).
- Data plan – it was assumed that each active licence holder will require a data plan to use Deckhand, costing approximately $150 per annum (Real Time Data pers. comm.). This would equate to an annual cost of $24,600 for the fishery. It is worth noting that there are likely to be more cost effective ways of structuring the data requirements across the industry, and it is likely that these

[2] Sourced from the survey of licence holders who trialled Deckhand.

requirements (for all fishers) may be negotiated under one plan to achieve a more cost effective rate.

3.2.3 Benefits

The implementation of a paperless system will result in costs savings for PIRSA which in turn could be passed on to licence holders through a reduction in licence fees. Any cost savings cannot be guaranteed until a fully functioning system is in operation and to realise any savings from a paperless system all quota based fisheries would need to participate (PIRSA pers. comm.).

One form of cost savings for PIRSA would be a reduction in data entry staff. Currently there are 5 fte jobs allocated to quota monitoring, which manage data entry for the Southern Zone Rock Lobster, Blue Crab, Abalone, Pipi, Northern Zone Rock Lobster and Mud Cockle fisheries. Any reductions in the data entry workload would depend on the level of data entry reductions attributable to the removal of CDR's from the Southern Zone Rock Lobster fishery. The impacts are unknown and will remain so until the capabilities of proposed system are fully understood. Even if all quota fisheries adopted the proposed system, some quota officers would still be required for analysis and integrity work (PIRSA pers. comm.). The reduction in data entry staff that would occur as a result of a functioning electronic data collection system for the SZRL fishery is 2 fte jobs (PIRSA pers. comm.). Using an average salary of $45,000 (AS02 level) the saving in data entry would be approximately $112,500 per annum after applying a modest on-cost and overhead multiplier of 1.25 to take account of superannuation, workers compensation and overhead factors.

Another form of cost savings for PIRSA would result from the ceasing of printing, posting and couriering logbooks and CDR records (around $20,000 per year attributable to the SZRL fishery) (PIRSA pers. comm.).

It was estimated that the time saved by licence holders from using Deckhand, as opposed to filling out paper records, would average around 16 minutes per fisher per trip[3]. Assuming the value of time foregone is approximately $24 per hour[4] and there are on average 19,941 trips in the fishery per year[5], then the aggregate value of licence holders' time that could be saved using the electronic data system would be almost $132,000 each year on a whole of fishery basis.

The most significant benefit to licence holders of more timely decision making through the speedier delivery of data has not been quantified. However, the potential benefits are described in some detail in Section 4.3.

[3] Sourced from the survey of licence holders who trialled Deckhand.

[4] Valuation of time is a difficult concept. The key question is whether one should use the value of time in work to value time spent on leisure or other non-work related activities. The use of $24 per hour is an approximation of the opportunity cost of time in work for the average person (i.e. an approximation of the average wage rate).

[5] Average over the last 10 years, 2001/02 to 2010/11, sourced from SARDI.

4. Results of the Financial Analysis

4.1 Results

The results of the financial analysis have been expressed in terms of two evaluation criteria, the net present value (NPV) and the benefit-cost ratio (BCR)[6]. The NPV is a measure of the aggregate, annual net benefits (i.e. benefits – costs) of an option over a 25 year period, discounted (i.e. expressed as a present value[7]) using a discount rate of 7 per cent for the financial analysis. The BCR is the ratio of the present value of benefits to the present value of costs.[8]

- The net present value of implementing Deckhand on a fishery-wide basis was estimated to be -$0.46 million, with a BCR of 0.87.
- This is equivalent to an average annual cost of $240 per active boat per year. This cost needs to be considered in the context of the range of non-priced benefits, such as more timely decision making, savings on prior reporting costs, data consistency and future potential, which are detailed in Section 4.3 below.
- The principal drivers of the estimated negative outcome are the ongoing operating costs associated with owning a Deckhand licence and the replacement cost of the required hardware.

Details of the calculations are provided in Appendix 1.

4.2 Sensitivity Analysis

The results of the financial analysis were re-estimated using values for key variables that reflect the uncertainty of those variables. The sensitivity analysis included changes in the following:

- discount rate;
- Deckhand licence fee;
- time of the replacement of hardware; and
- time savings for licence holders.

The range of values used for each uncertain variable and detailed results of the sensitivity analysis are set out below with some interpretation of the results. Note that the sensitivity analysis was undertaken by assuming that all other variables were held constant at their 'expected' values.

[6] A third evaluation criterion, the internal rate of return (IRR), is also commonly used in this type of analysis. The IRR, the discount rate at which the NPV of a project is equal to zero, could not be defined in this analysis.

[7] The present value is the value now of a sum of money arising in the future. Money now is worth more than money in the future because it could be invested now to produce a greater sum in the future. The present value of money in the future is calculated by discounting it at a rate of interest equivalent to the rate at which it could be invested (Bannock et al. 1979). A discount rate of 7 per cent was used in this financial analysis.

[8] For more detailed explanation of each criterion and the method of analysis see Section 2.2.

4.2.1 Discount Rates

Costs and benefits are specified in real terms (i.e. constant 2012 dollars) and future values are converted to present values by applying a discount rate of 7 per cent. A sensitivity analysis was conducted using discount rates of 4 and 10 per cent. The results of the analysis are detailed in Tables 4.1.

Table 4.1 Sensitivity of results of the financial analysis to changes in the discount rate

Discount Rate	NPV [a] ($m)	BCR
4 per cent	-0.60	0.87
7 per cent [b]	-0.46	0.87
10 per cent	-0.37	0.87

[a] In 2012 dollars

[b] Expected value

Source: EconSearch analysis

The results for the financial analysis were shown to be moderately sensitive to changes in the discount rate, which reflects the substantial ongoing costs in the evaluation period.

4.2.2 Deckhand Licence Fee

The results of the financial analysis were based on the assumption that the cost of a Deckhand licence would be $1,250 per boat per annum. A sensitivity analysis was undertaken to highlight the effect of a 20 per cent increase or decrease in this cost. The results of this analysis are presented in Table 4.2.

Table 4.2 Sensitivity of the results of the financial analysis to changes in the Deckhand licence fee

Deckhand Licence Fee ($)	Change from Expected Value	NPV [a] ($m)	BCR
1,000	-20%	0.06	1.02
1,250 [b]	-	-0.46	0.87
1,500	20%	-0.98	0.76

[a] In 2012 dollars

[b] Expected Deckhand licence fee

Source: EconSearch analysis

The results of the financial analysis were shown to be sensitive to changes in the Deckhand licence fee. This is a function of the significant scale of these costs compared to the other costs and benefits of the project. If the Deckhand licence fee was 20 per cent lower ($1,000 per licence holder per year) than that assumed for the analysis ($1,250 per licence holder per year), the NPV would be positive and the BCR would be greater than one.

4.2.3 Time of the Replacement of Hardware

The results of the financial analysis were based on the assumption that the hardware required to use Deckhand (iPad and case) would be replaced every four years. A sensitivity analysis was undertaken to highlight the effect of replacing the hardware after 3 years and after 5 years. The results of this analysis are presented in Table 4.3.

Table 4.3 Sensitivity of the results of the financial analysis to changes in the time of the replacement of hardware

Time to replace hardware (years)	NPV [a] ($m)	BCR
3	-0.62	0.83
4 [b]	-0.46	0.87
5	-0.37	0.89

[a] In 2012 dollars

[b] Expected time to replace hardware

Source: EconSearch analysis

The results of the financial analysis were shown to be moderately sensitive to changes in the time hardware is replaced. This is a function of the significant scale of these costs compared to the other costs and benefits of the project.

4.2.4 Time Savings for Licence Holders

The results of the financial analysis were based on the assumption that the time saved by licence holders by using Deckhand rather than paper records would be 16 minutes per boat per trip. A sensitivity analysis was undertaken to highlight the effect of a 50 per cent increase or decrease in this time saving. The results of this analysis are presented in Table 4.4.

Table 4.4 Sensitivity of the results of the financial analysis to changes in time savings for licence holders by using Deckhand

Time savings for licence holders (mins/trip)	Change from Expected Value	NPV [a] ($m)	BCR
8	-50%	-1.30	0.64
16 [b]	-	-0.46	0.87
24	50%	0.37	1.10

[a] In 2012 dollars

[b] Expected time savings

Source: EconSearch analysis

The results of the financial analysis were shown to be very sensitive to changes in the amount of time licence holders save by using the Deckhand application rather than paper records. If by using the Deckhand application the time saved by licence holders was 50 per cent higher (24 minutes per trip) than that assumed for the analysis (16 minutes per trip), the NPV would be positive and the BCR would be greater than one.

4.3 Non-Price Benefits of Deckhand

Although the quantitative CBA reported in Sections 4.1 and 4.2 indicate a negative result, there would be a number of positive non-price values[9] associated with implementing Deckhand. These non-price values have not been included in the quantitative analysis but are potentially significant benefits and are discussed below.

More timely decision making

Through the use of electronic data delivery the speed at which PIRSA and SARDI receive CDR and catch and effort information would be improved. The current system requires paper CDRs to be filled out per trip, posted to Mount Gambier where the data are collated and verified before they are sent to PIRSA in Adelaide. Electronic data delivery could speed up this process by a couple of days. While currently this is not of significant benefit to licence holders, it could be valuable when PIRSA are in the position to provide real time quota balances (i.e. licence holders would know up to the day how much of their annual quota they have caught).

Of even more significance is the speed at which SARDI could receive the catch and effort data as a result of electronic data collection. Currently licence holders fill out log books which are posted into PIRSA each month, within two weeks of the end of the month. Taking into account late returns and the time it takes PIRSA to enter the data, SARDI usually receive the catch and effort data four weeks after the end of the month. At the end of the season SARDI use this information to produce a stock assessment report on the status of the fishery. Usually these reports are released to PIRSA and industry by the end of August. SARDI estimate that through the use of electronic data collection it could speed up the release of the stock assessment report by one month.

This is important because PIRSA use the stock assessment report to make decisions on the Total Allowable Commercial Catch (TACC) for the following fishing season. From the point of view of SZRL licence holders, this is the most significant benefit of electronic data capture system. Through earlier knowledge of what the TACC will be for the following season, licence holders will be in a position to make better business decisions. For example, they would have more time to go to their financier and seek the funds they require for the next season (e.g. for more pots or new boats and equipment). This could result in more efficient and effective, and therefore profitable, operations at the individual business level.

Save on prior reporting costs

The electronic data system could be used to prior report for when prior reporting is required (i.e. outside of business hours). However, these costs have not been quantified as they are minimal for the SZRL fishery.

Consistency of data

With Deckhand providing one data collection process rather than the current two (CRD and logbook), it would ensure consistency and improve the overall quality of the data collected for the fishery.

[9] Items of value that cannot be readily priced or for which there is currently no market.

Future potential

Deckhand has the potential to be used in other ways which could be beneficial for fishing businesses. These include but are not limited to:

- High quality mapping showing CPUE for individual businesses.
- Calculations of direct fishing costs per trip (e.g. fuel and bait).
- Fishery information and regulations could be accessed while out fishing (e.g. access information on quota while at sea).

Threshold value of non-price benefits

Clearly there are many benefits that would accrue to licence holders that have not been valued in the cost benefit analysis (CBA). One way to consider the value of these benefits is to compare them to the results of the CBA. Where the incremental costs of the project exceed the incremental benefits, the threshold value becomes important. The estimation of a threshold value enables decision makers to recognise the presence of additional unquantifiable financial, environmental and social benefits that are expected to flow from the investment. A threshold value provides an estimate of the magnitude of the unquantified benefits necessary for the project to return a break-even result.

The results showed a net return of -$0.46m. Over a 25 year period and a discount rate of 7 per cent this equates to around -$40,000 per annum. Given there are 164 active licence holders in the fishery this is approximately -$240 per boat per year. If active licence holders in the fishery believe the benefits detailed above would have a value to their business of more than $240 each year, then the investment in the Deckhand application would be worthwhile.

References

Bannock, G., Baxter, R.E. and Rees, R. 1979, *The Penguin Dictionary of Economics,* Penguin Books, Middlesex.

Sinden, J.A. and Thampapillai D.J. 1995, *Introduction to Benefit-Cost Analysis,* Longman, Melbourne.

Disclaimer

We have prepared the above report exclusively for the use and benefit of our client. Neither the firm nor any employee of the firm undertakes responsibility in any way whatsoever to any person (other than to the above mentioned client) in respect of the report including any errors or omissions therein however caused.

Appendix 1 Detailed Financial Analysis Spreadsheet Model

Appendix Table 1.1 Financial analysis for Deckhand Implementation [a]

	Present Value	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25
BASE CASE													
Benefits													
No percieved benefits	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Benefits	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Costs													
Postage, courier & printing costs	253,072	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Total Costs	**253,072**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**
Deckhand Application (OPTION 1)													
Benefits													
PIRSA data entry costs savings	1,423,528	112,500	112,500	112,500	112,500	112,500	112,500	112,500	112,500	112,500	112,500	112,500	112,500
Time savings for fishers	1,666,641	131,713	131,713	131,713	131,713	131,713	131,713	131,713	131,713	131,713	131,713	131,713	131,713
Total Benefits	**3,090,169**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**
Costs													
Deckhand Application licence fee	2,593,985	205,000	205,000	205,000	205,000	205,000	205,000	205,000	205,000	205,000	205,000	205,000	205,000
Hardware	466,917	36,900	36,900	36,900	36,900	36,900	36,900	36,900	36,900	36,900	36,900	36,900	36,900
Data plan	311,278	24,600	24,600	24,600	24,600	24,600	24,600	24,600	24,600	24,600	24,600	24,600	24,600
Training	989	989	0	0	0	0	0	0	0	0	0	0	0
PIRSA backend system (SZRL share of cost)	30,492	30,492	0	0	0	0	0	0	0	0	0	0	0
PIRSA backend system maintenance (SZRL share of cost)	401,265	31,712	31,712	31,712	31,712	31,712	31,712	31,712	31,712	31,712	31,712	31,712	31,712
Total Costs	**3,804,926**	**329,692**	**298,212**	**298,212**	**298,212**	**298,212**	**298,212**	**298,212**	**298,212**	**298,212**	**298,212**	**298,212**	**298,212**
Incremental Benefits	**3,090,169**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**	**244,213**
Incremental Costs	**3,551,854**	**309,692**	**278,212**	**278,212**	**278,212**	**278,212**	**278,212**	**278,212**	**278,212**	**278,212**	**278,212**	**278,212**	**278,212**
Net Benefit (NPV)	**-461,685**	**-65,479**	**-33,999**	**-33,999**	**-33,999**	**-33,999**	**-33,999**	**-33,999**	**-33,999**	**-33,999**	**-33,999**	**-33,999**	**-33,999**
BCR	**0.870**												
IRR	**Undefined**												
Discount Rate	**7%**												

[a] In 2012 dollars. Complete analysis covers 25 years (years 6 to 19 hidden for presentational purposes).

Source: EconSearch analysis

SEPFA South Eastern Professional Fishermen's Association Inc.

Australian Government Fisheries Research and Development Corporation

realtimedata

South Eastern Professional Fishermans Association.Inc

On-Board E-Data Collection Workshop (FRDC 2011/250)

10:00am Friday 7th of September 2012

Conference Room - SARDI Aquatic Sciences 2 Hamra Avenue WEST BEACH SA

Workshop Agenda

10:00am

1. Introduction - Justin Phillips, SEPFA — **20 mins**
   a) Workshop Outline
   b) Project Outline
   c) Work Previously Completed
2. Deckhand - Tom Robinson, Real Time Data Pty Ltd — **25 mins**
   a) Product Genesis
   b) Starting Point for SEPFA Trial (Initial Capability)
3. The SEPFA Trial - Joel Redman & David Manser, SEPFA — **30 mins**
   a) Interface & Functionality Enhancements
   b) Other Issues Identified
   c) IP & Licensing Use Issues

11:15am - Break for Morning Tea

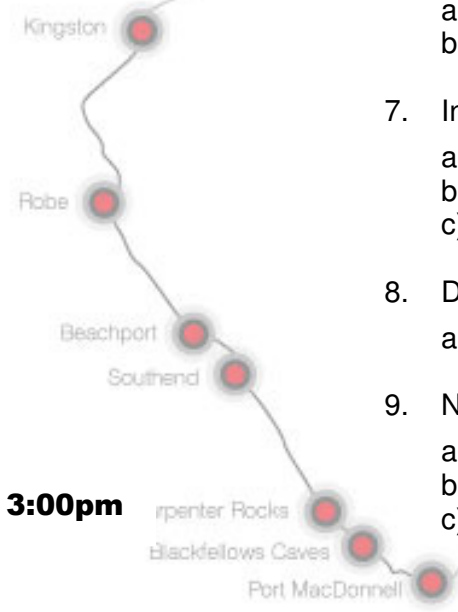
11:30am

4. Deckhand MkII - Tom Robinson — **20 mins**
   a) Back-end Enhancements from Trial
   b) Finished 'SEPFA Version'
   c) Improvements Since
5. Cost Benefit Analysis - Julian Morison & Lisa Rippin, EconSearch Pty Ltd — **40 mins**

12:30pm - Break for Lunch

1:15pm

6. 'The Other End' - Simon Malcolm, PIRSA Fisheries & Aquaculture — **40 mins**
   a) PIRSA Fisheries & Aquaculture
   b) Comments From Other Regulatory Agencies
7. Industry Requirements / Comments from Other Jurisdictions — **20 mins**
   a) SA Northern Zone - Kyri Toumazos (SANZRLFA)
   b) Tasmania - Rodney Treloggen (TRLFA)
   c) Victoria - Renee Vajtauer (SIV)
8. Discussion - Justin Phillips — **30 mins**
   a) Barriers to Implementation & Solutions (All Jurisdictions)
9. Next Steps - Justin Phillips — **15 mins**
   a) Commercial Discussions
   b) Possible Further Trials / Program of Implementation
   c) Communication between the Jurisdictions



3:00pm

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SEPFA South Eastern Professional Fishermen's Association Inc.

realtimedata

Australian Government
Fisheries Research and Development Corporation

SEPFA On-Board E-Data Collection Workshop - FRDC Project 2011/250

Assessing functionality and suitability of the iPhone [iPad] application 'Deckhand' for on-board electronic data capture in Southern Australian Rock Lobster (Jasus edwardsii) fisheries.

Justin Phillips
(SEPFA Executive Officer)

SARDI Aquatic Sciences - Friday 7th September 2012

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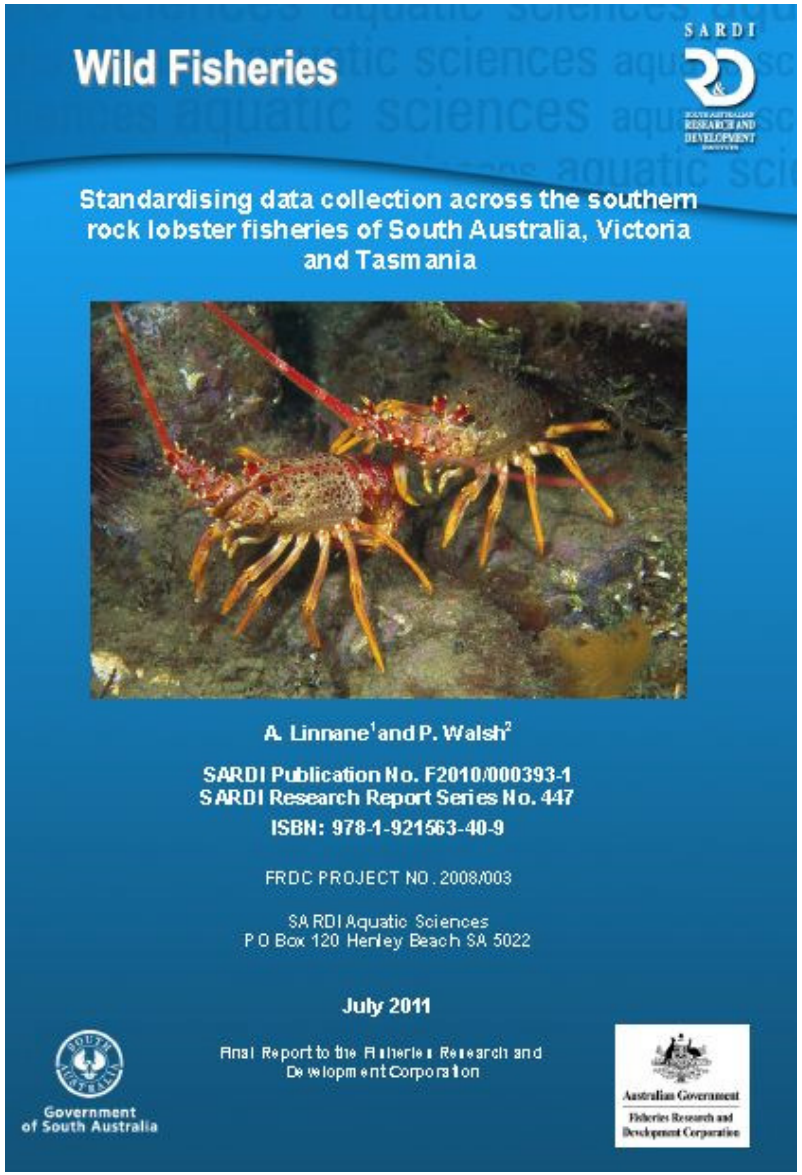
SEPFA South Eastern Professional Fishermen's Association Inc.

Work to Date…



SEPFA South Eastern Professional Fishermen's Association Inc.

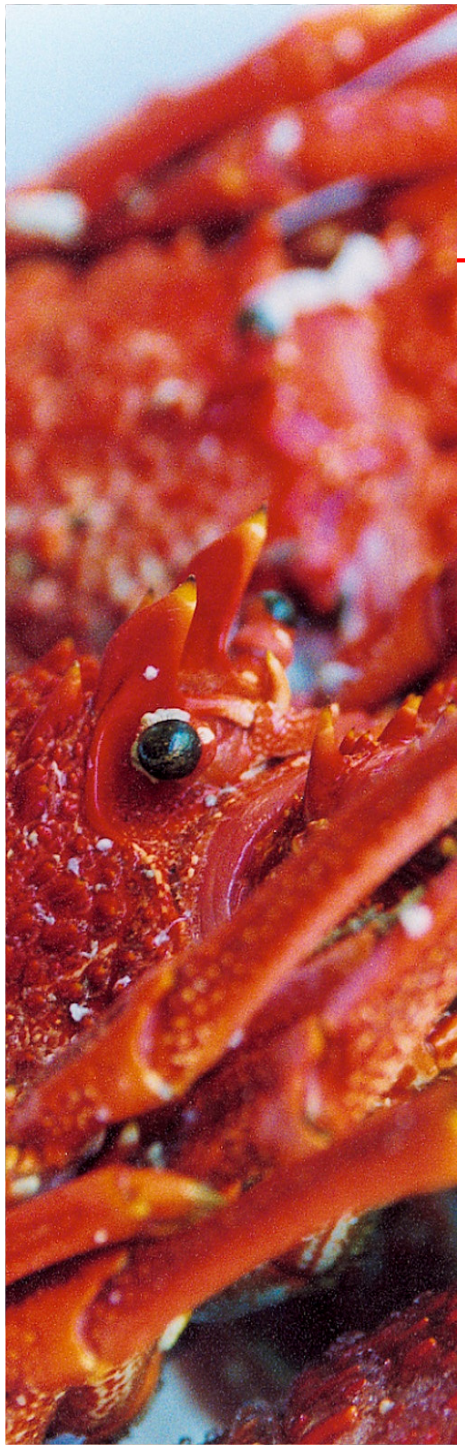
2008/003 Objectives

1. Establish requirements for standardised data collection, storage, manipulation and reporting across the rock lobster fisheries of South Australia, Tasmania and Victoria.

2. Identify opportunities for database standardisation across the three States to enable a common operating environment for the storage and use of data.

3. Identify operationally feasible, cost effective methods of data collection and delivery through Electronic Logbook Automation.

The project achieved each of these objectives with 4 different systems being assessed against the ‘criteria’.



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2008/003 Assessment Criteria

Primary:

- Robust
- Simple to use
- Adaptable
- Data quality (improvements e.g. finer spatial scale)
- Data volume (increased)
- Linked to management of the fishery

Secondary:

- Operates in ‘real-time’ (or near real-time)
- Compatible (links to existing systems)
- Efficiency across other data users (managers, compliance, researchers etc)
- Can result in economies of scale
- Set-up Costs

SEPFA South Eastern Professional Fishermen's Association Inc.

2008/003 Recommendations

- Utilise a touch-screen interface robust enough to be used on-deck.
- Cause minimal interruption of the fishing operation.
- Use wireless communication for uploading data and downloading software updates.
- Provide real-time (or near-time on a minimum daily basis) data.
- Interact with existing database systems.
- Collect data directly linked to management of the fishery.
- Receive inputs from a wide variety of sensors (RFID, temp, GPS).
- Be easily modified to respond to changes in data requirements.

FURTHER DEVELOPMENT:

- Establish trials of catch & effort logbook automation using e-data (✓)
- Standardisation of catch sampling & puerulus data (✗)
- Investigate using e-logbooks for quota monitoring (✓)

SEPFA South Eastern Professional Fishermen's Association Inc.

Project 2011/250 - The Next Step

Assessing functionality and suitability of the iPhone [iPad] application 'Deckhand' for on-board electronic data capture in Southern Australian Rock Lobster (Jasus edwardsii) fisheries.

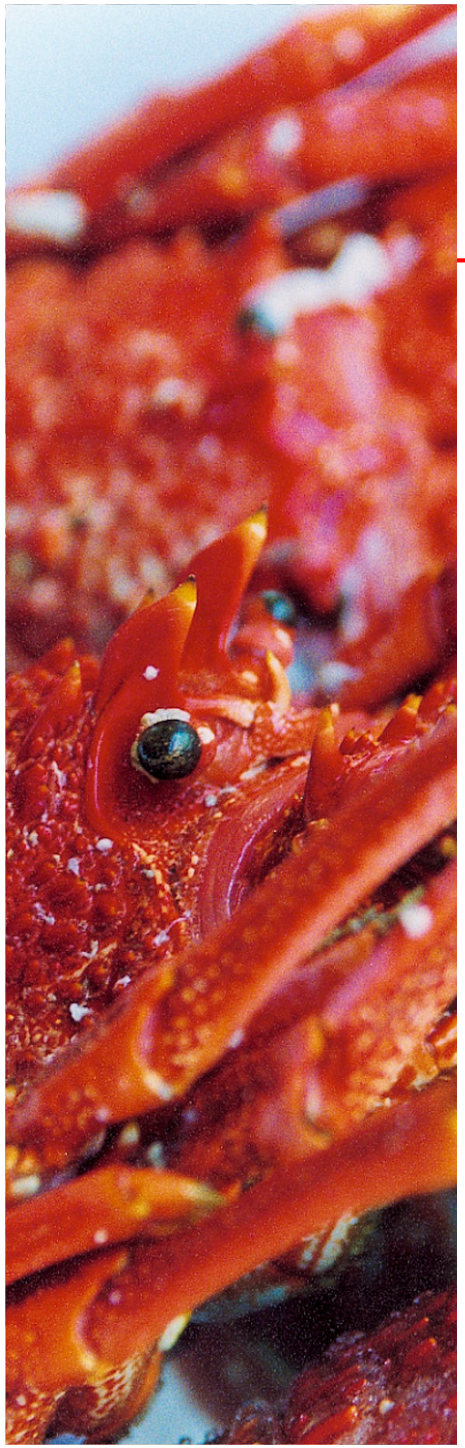
While not identified as part of the initial 2008/003 Project, Deckhand was introduced to industry via initial approaches from Real Time Data Pty Ltd and generated sufficient interest to secure the trial.

Essentially a '3-phase' project:

1. Trial the Deckhand application and improve functionality
   - 10 devices, 22 vessels, 3 months (varying age, skill level & enthusiasm)
   - SARDI & Compliance also had access to devices
   - Supply of information to regulator in acceptable format

2. Cost-Benefit Analysis (EconSearch Pty Ltd)

3. Dissemination of results / information to other 'like' fisheries with a view to implementing similar trials for E-Data collection in a coordinated manner. TODAY.



2011/250 - Objectives

1. A functional on-board electronic data capture system which addresses the requirements of regulators research agencies and industry.

   - SEPFA Drivers were: Replace Part A CDR & Logbook Paperwork (close the loop with the electronic scales), 'tracking' was a secondary focus, as were additional parameters / fields for data recording (will come later).
   - Requirement to only 'deliver' data to the regulator's 'gateway' - separation of development for the regulator's system (many reasons for this).

1. A detailed Cost-Benefit Analysis (CBA).

2. A simpler, consolidated, more efficient way of reporting a day's catch.

3. Enhanced resource sustainability through the provision of improved information (more, faster, better spatial scale etc)

4. More efficient and effective, and therefore profitable, operation at the individual business level through the provision of more detailed information in a timely fashion (faster reporting / individual business analysis)

SEPFA South Eastern Professional Fishermen's Association Inc.

Project 2011/250 - Outputs

1. Functional on-board data capture system developed for the Southern Zone of SA which meets the requirements of the Regulator, Research Agency and Industry.

2. A detailed Cost-Benefit Analysis undertaken in relation to, and based on, implementation of the system in the Southern Zone of SA.

3. A detailed understanding of the requirements needing to be met in order to implement similar on-board trials in the Northern Zone of SA, Tasmanian and Victorian Southern Rock Lobster Fisheries.

4. Proof of concept of a more efficient way to capture data on-board vessels resulting in enhanced resource sustainability and improved business efficiency / profitability

Whose Next?

- Tom Robinson from Real Time Data Pty Ltd will take you through the origins of Deckhand and where we started with this trial.
- Joel Redman and David Manser will take you through the trial itself from the fishers' perspective.
- Break for morning tea - 11:15am
- Tom to return to explain the 'finished SEPFA product' from the trial and any additional improvements
- Presentation of cost-benefit analysis by EconSearch Pty Ltd.
- Break for lunch - 12:30pm
- Hear from PIRSA / SA Regulator
- Discussion with other jurisdictions - both industry & regulators.

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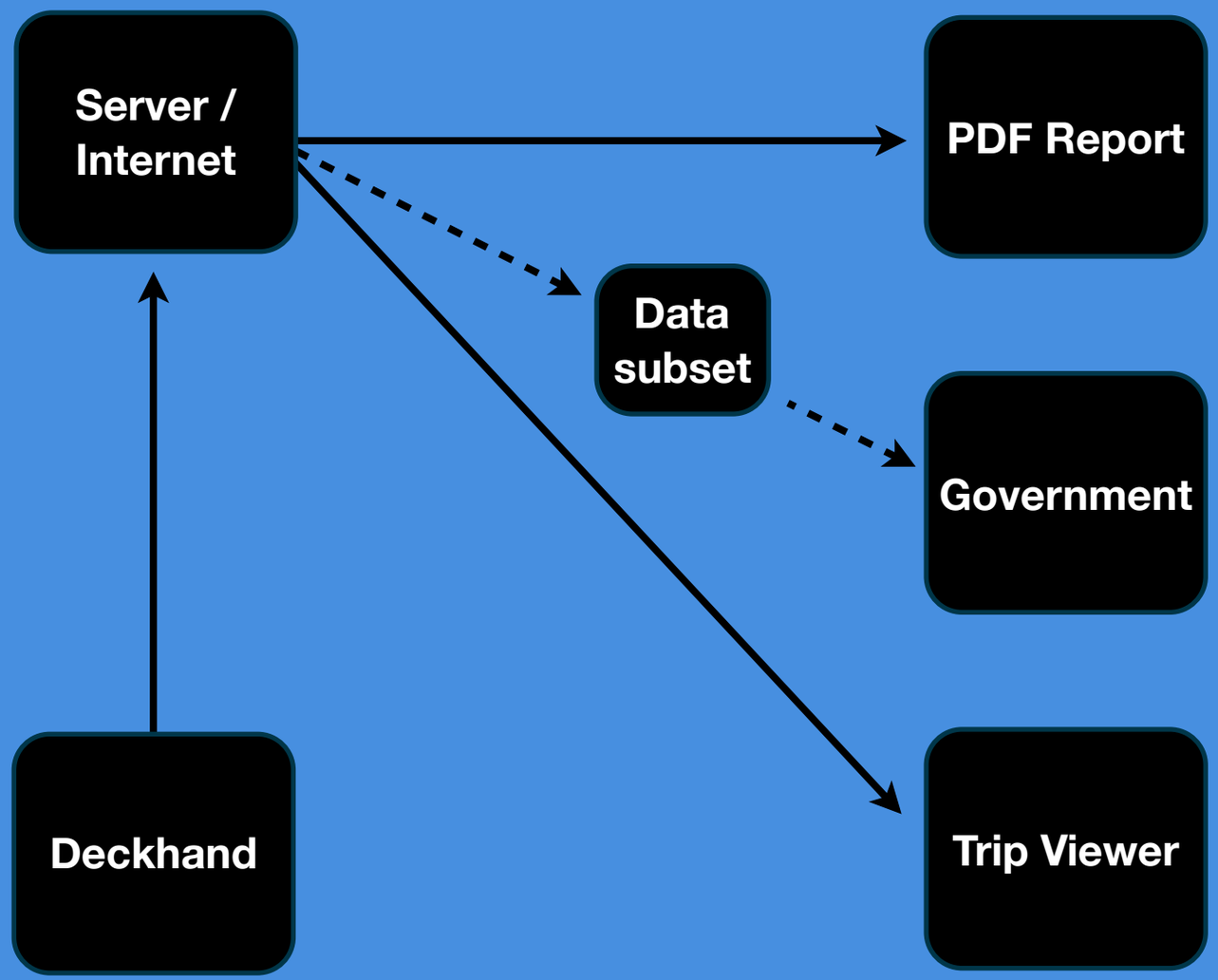
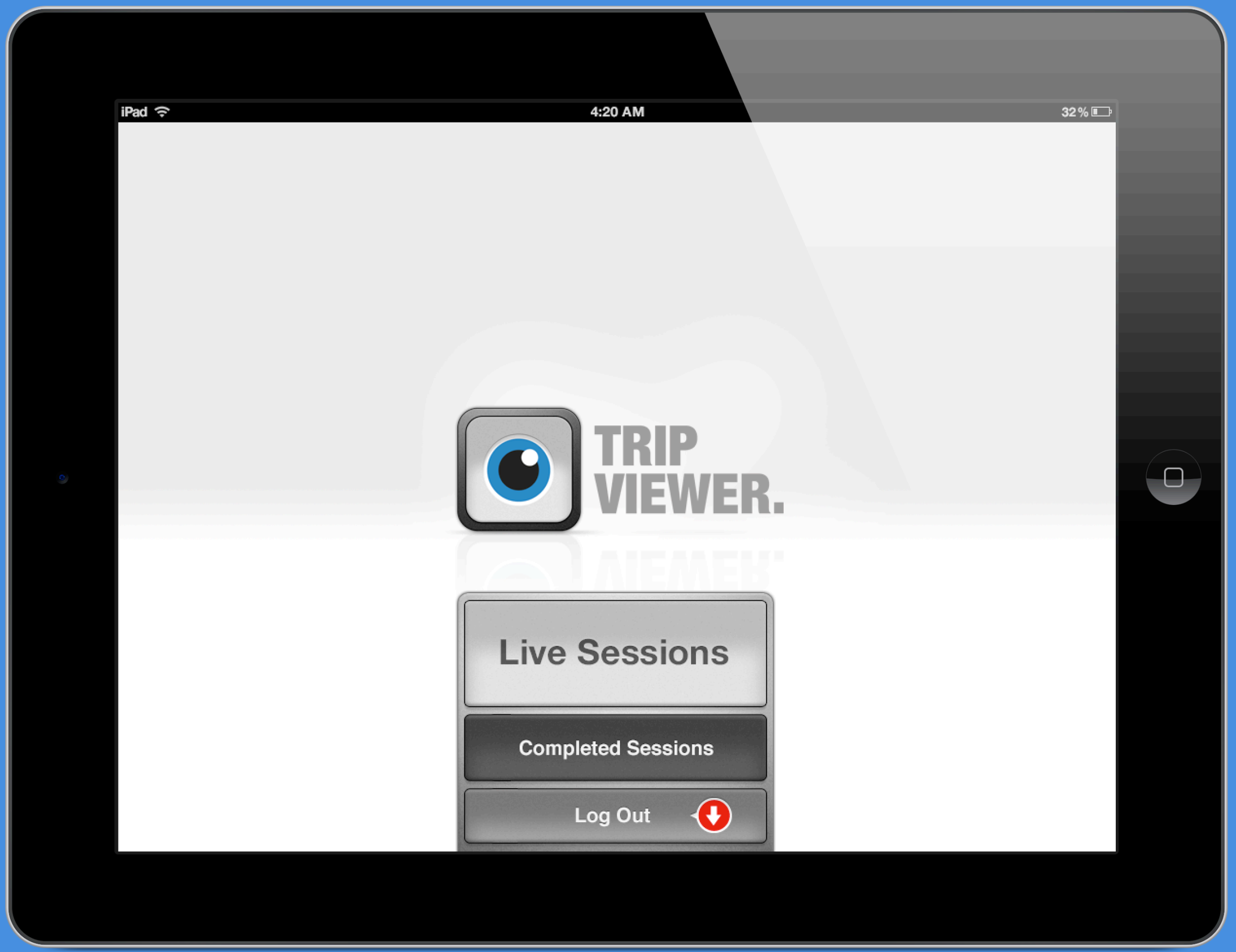
DECKHAND | PRODUCT GENESIS

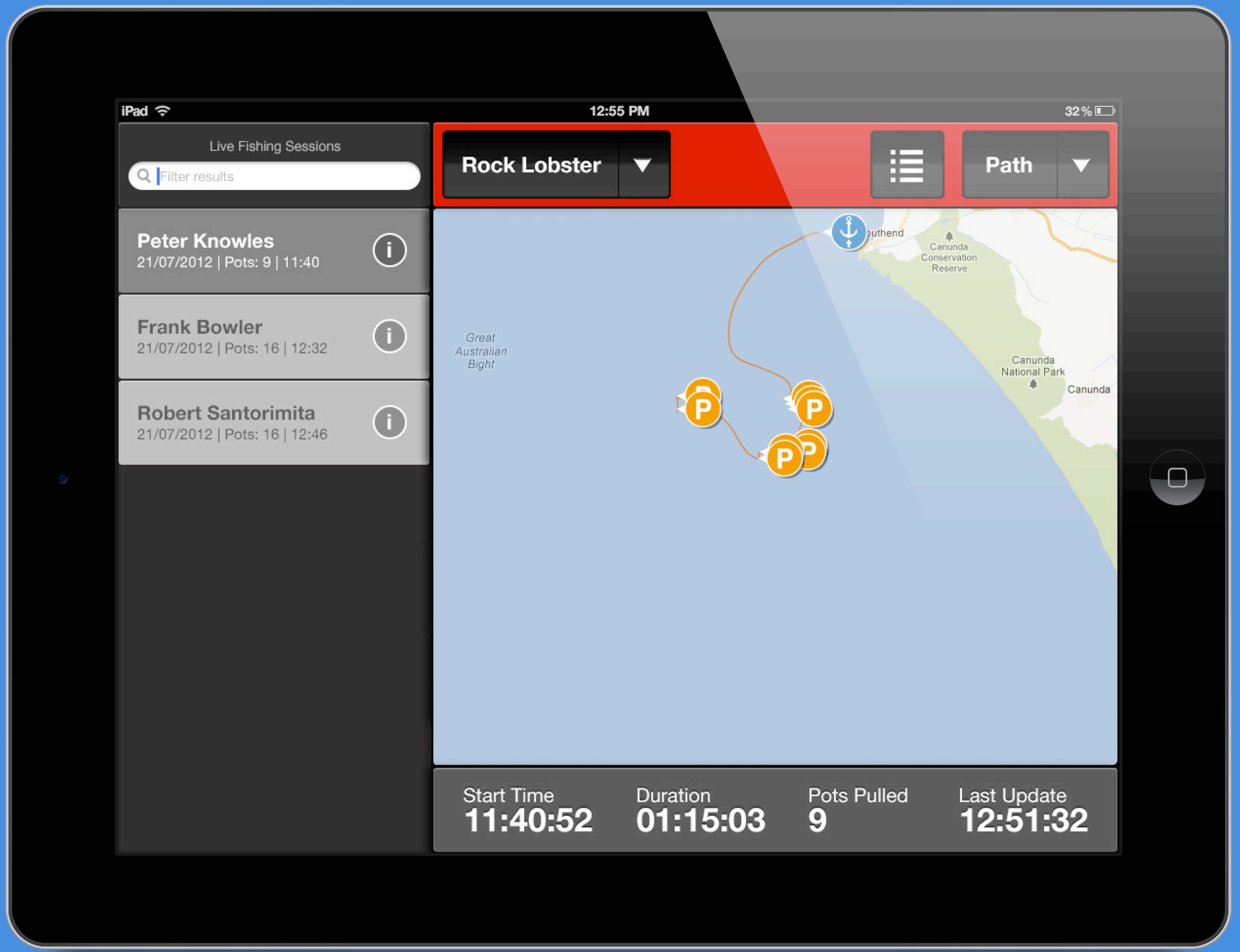
DECKHAND | TRIALS CAPABILITY


Server / Internet
PDF Report
Data subset
Government
Deckhand
Trip Viewer

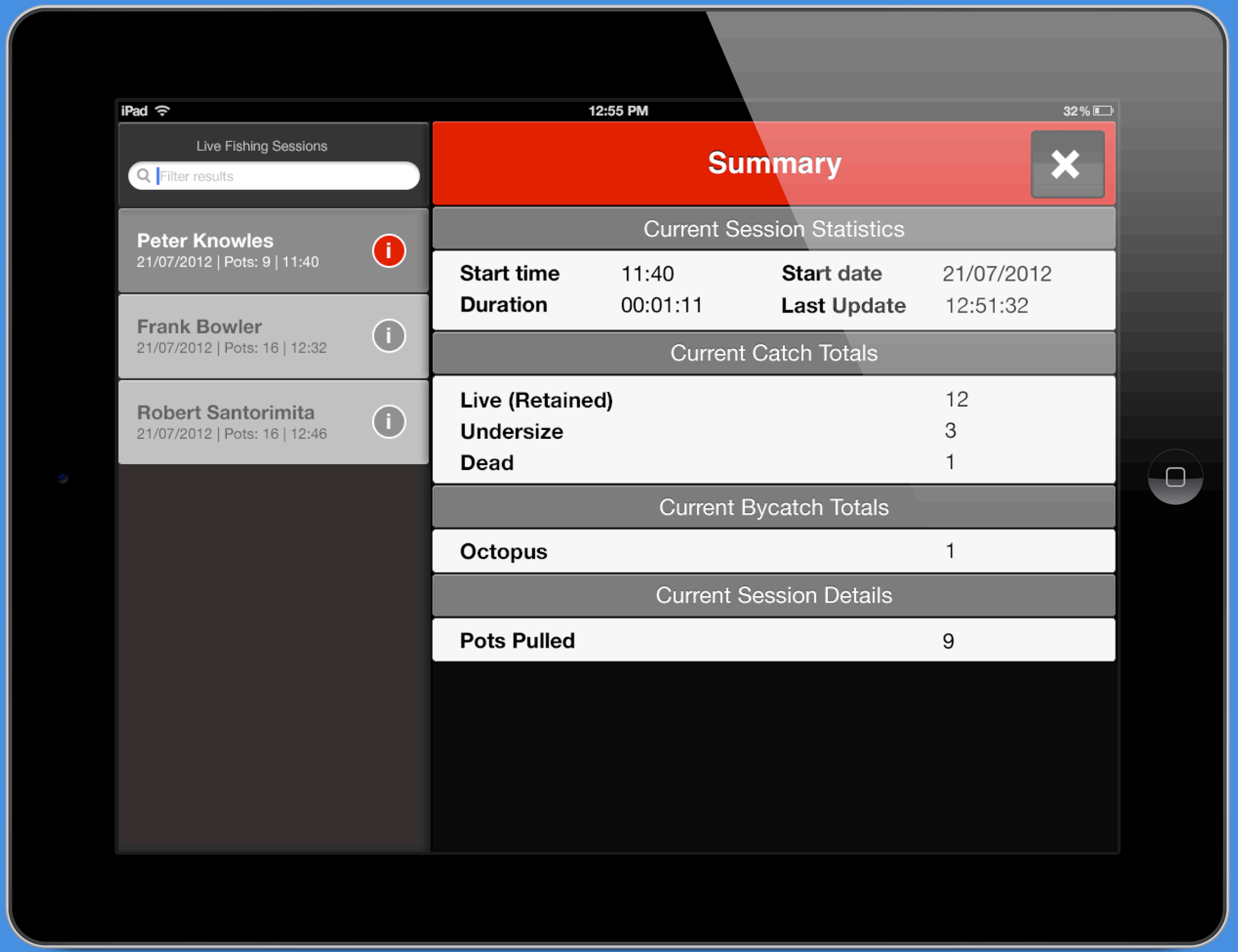
TRIP VIEWER


iPad
4:20 AM
32%
TRIP VIEWER.
Live Sessions
Completed Sessions
Log Out

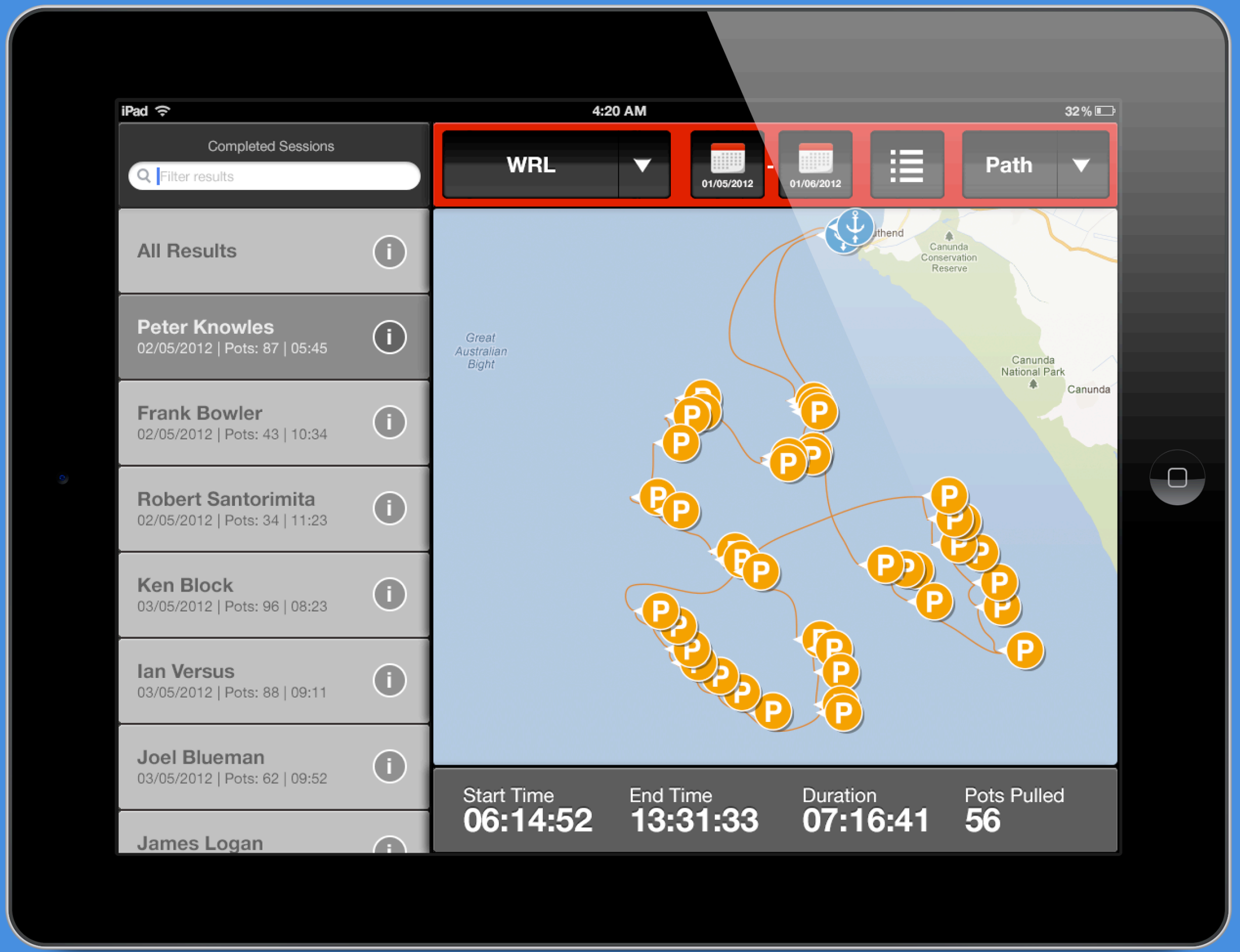
LIVE FISHING SESSION



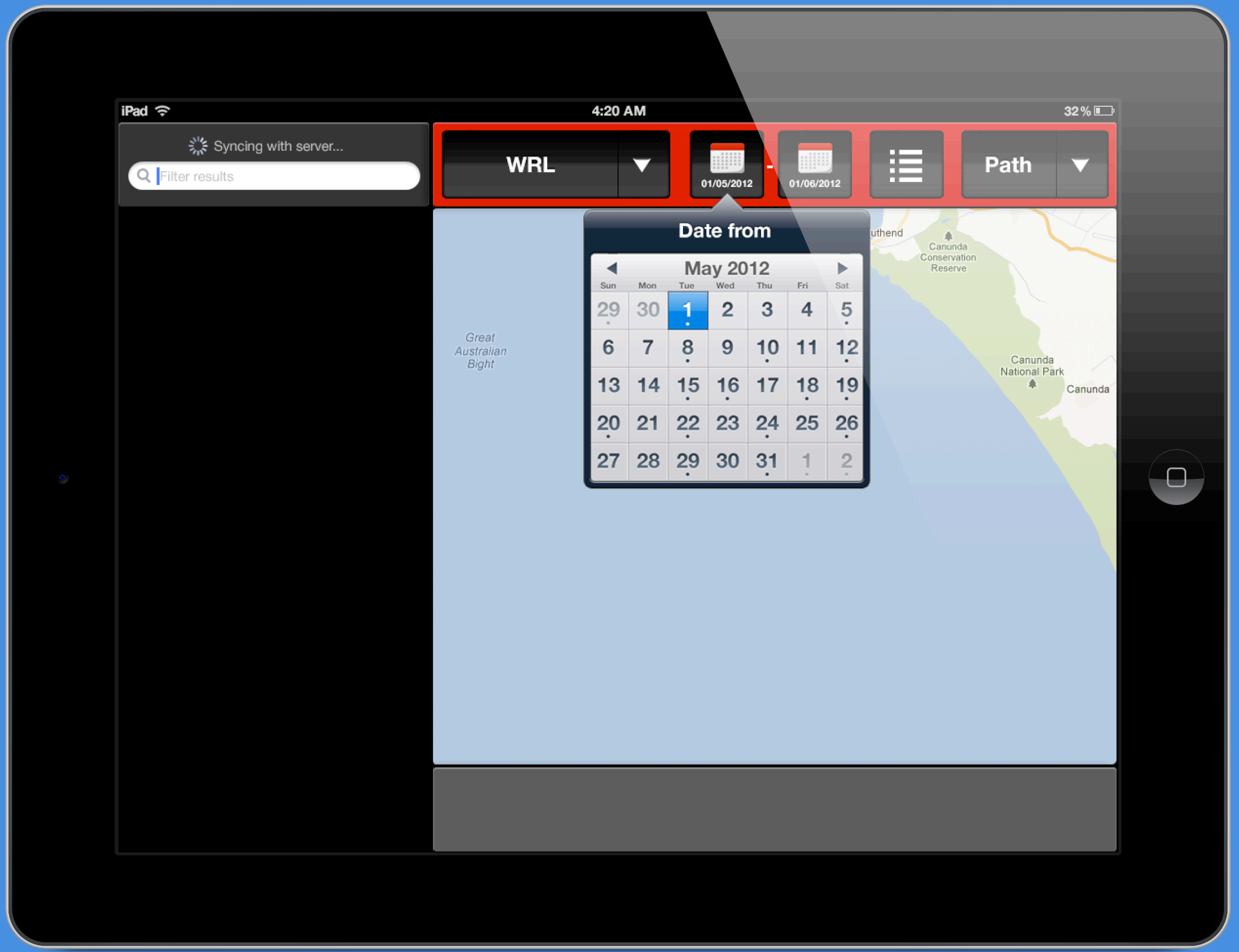
LIVE FISHING SESSION SUMMARY



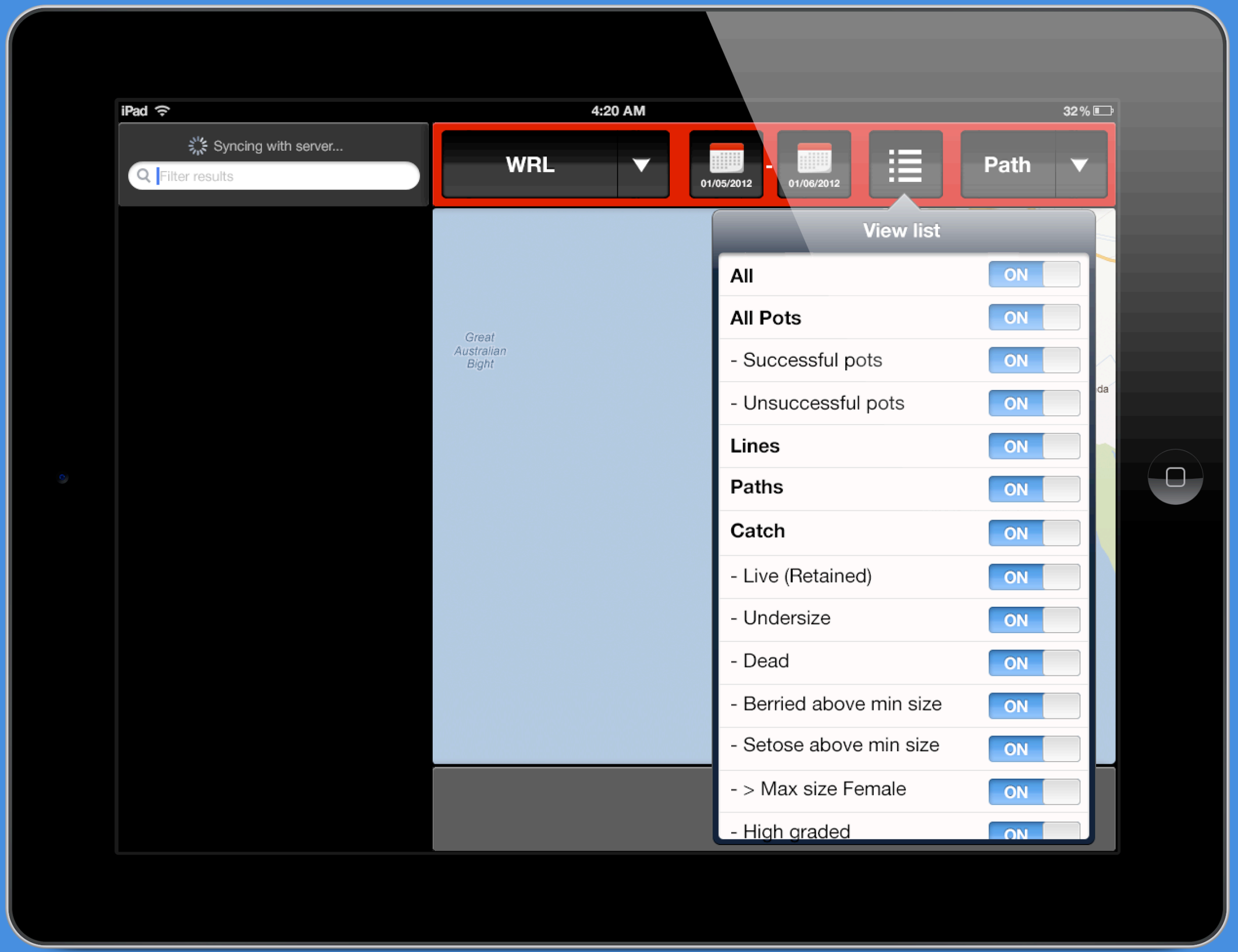
COMPLETED FISHING SESSION



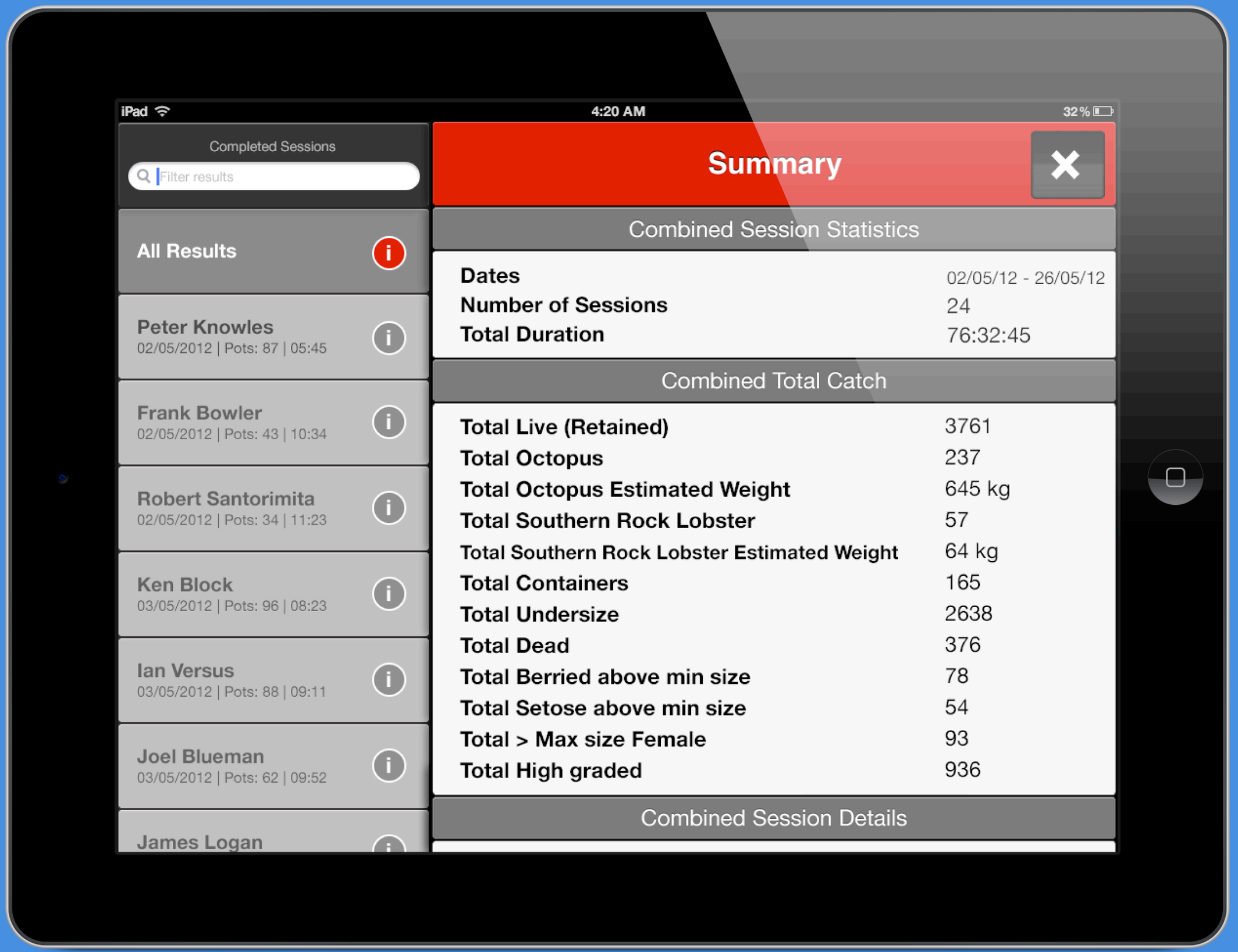
FILTER BY DATE



FILTER BY CATCH



COMBINED SESSION SUMMARIES



DECKHAND | TRIALS ENHANCEMENTS

1. PATH DATA BUILD UP CRASH

2. OUT OF NETWORK SYNCING

DECKHAND | FINISHED ‘SEPFA VERSION’

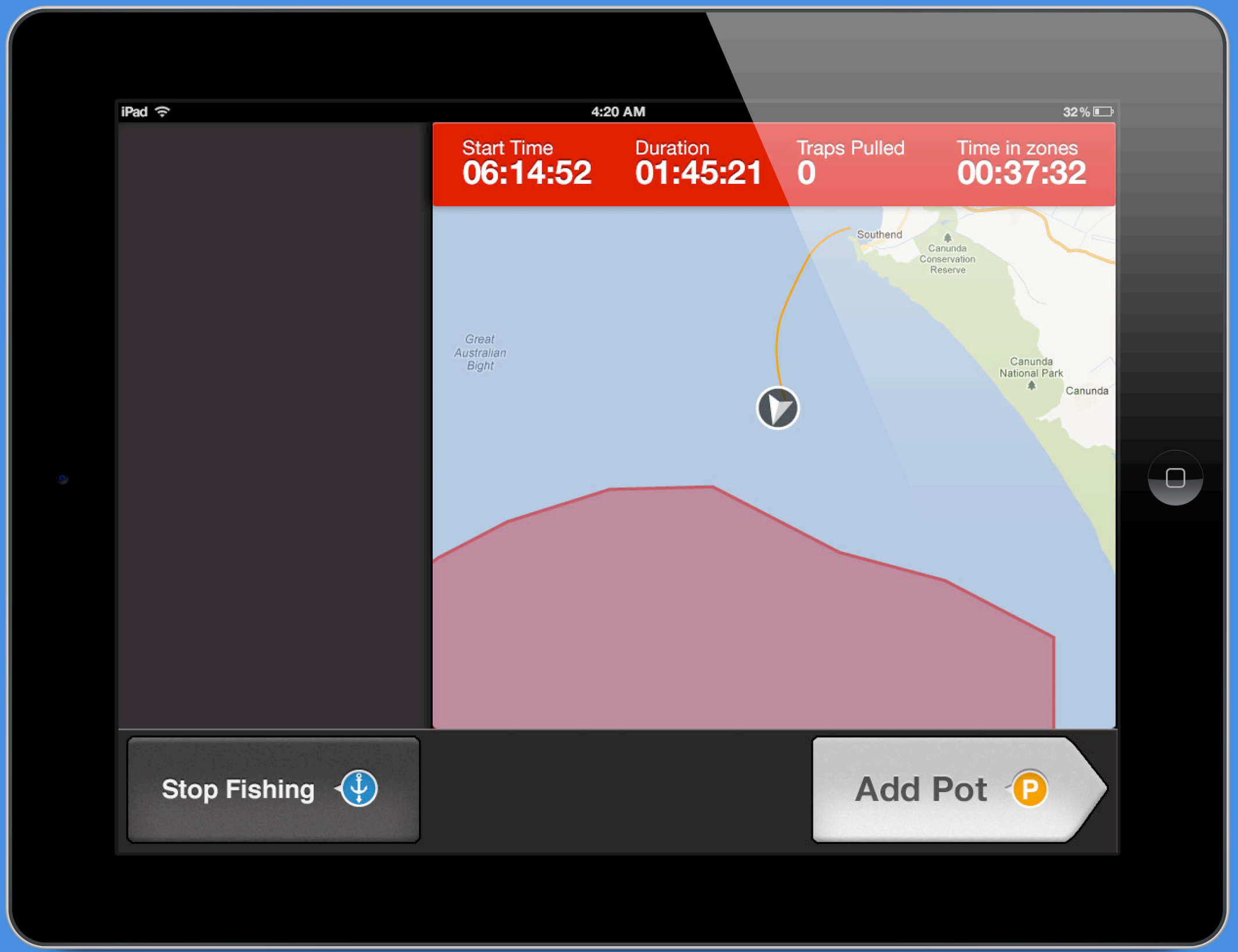
WEIGH STATION INTEGRATION

GOVERNMENT INTEGRATION

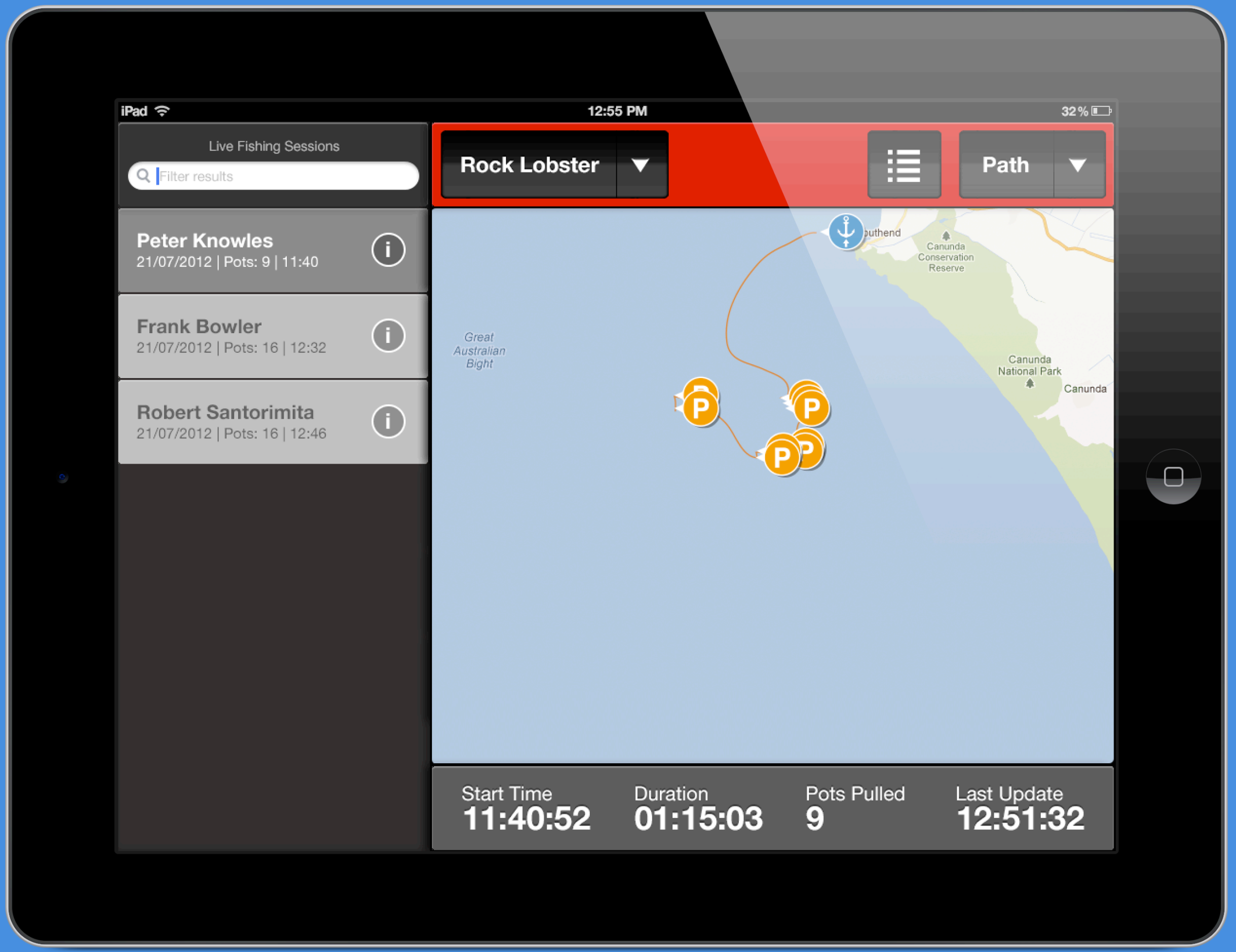
NEW FEATURES

DECKHAND | LATEST PRODUCT ENHANCEMENTS

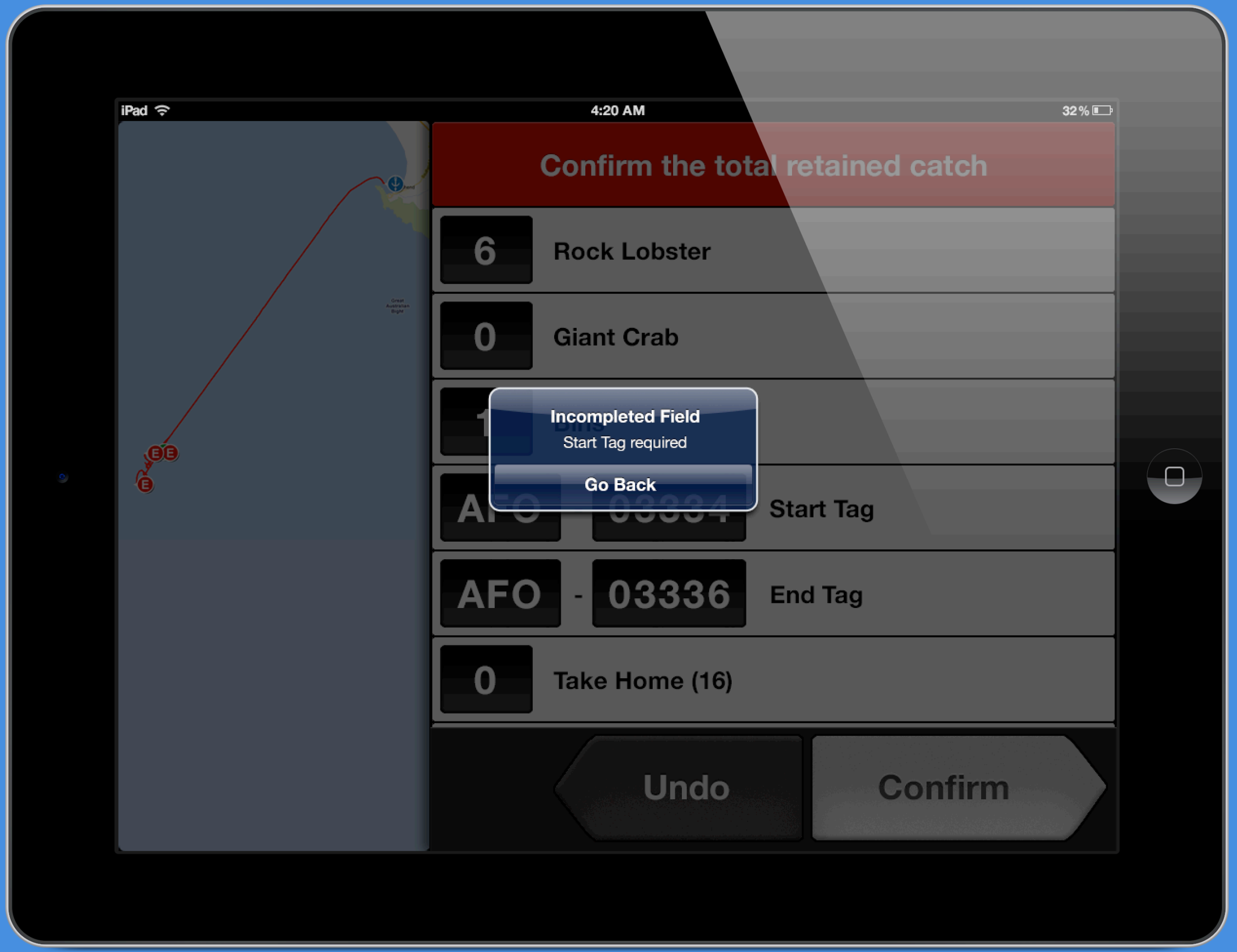
GEOFENCING / TIME IN ZONES



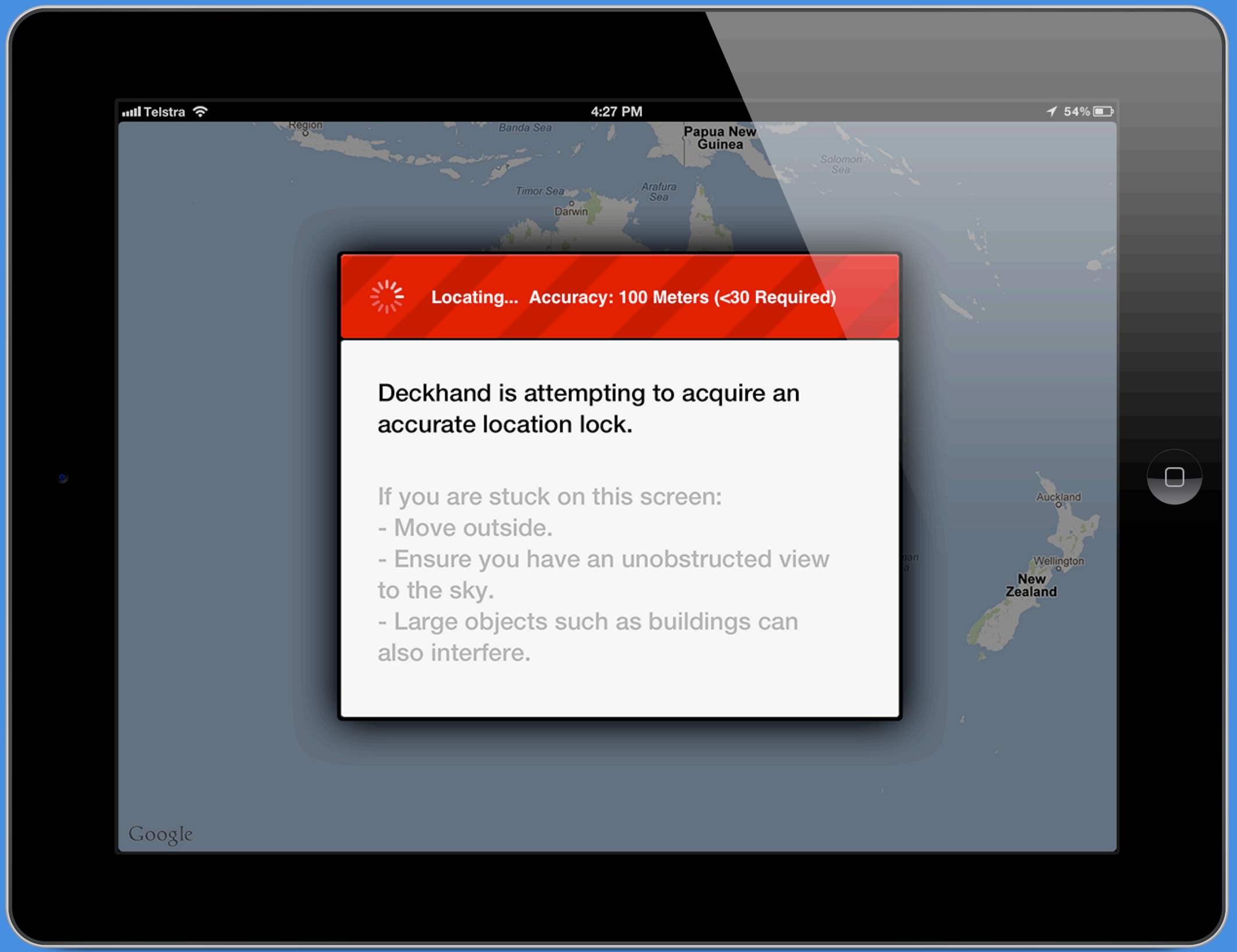
LIVE FISHING SESSIONS



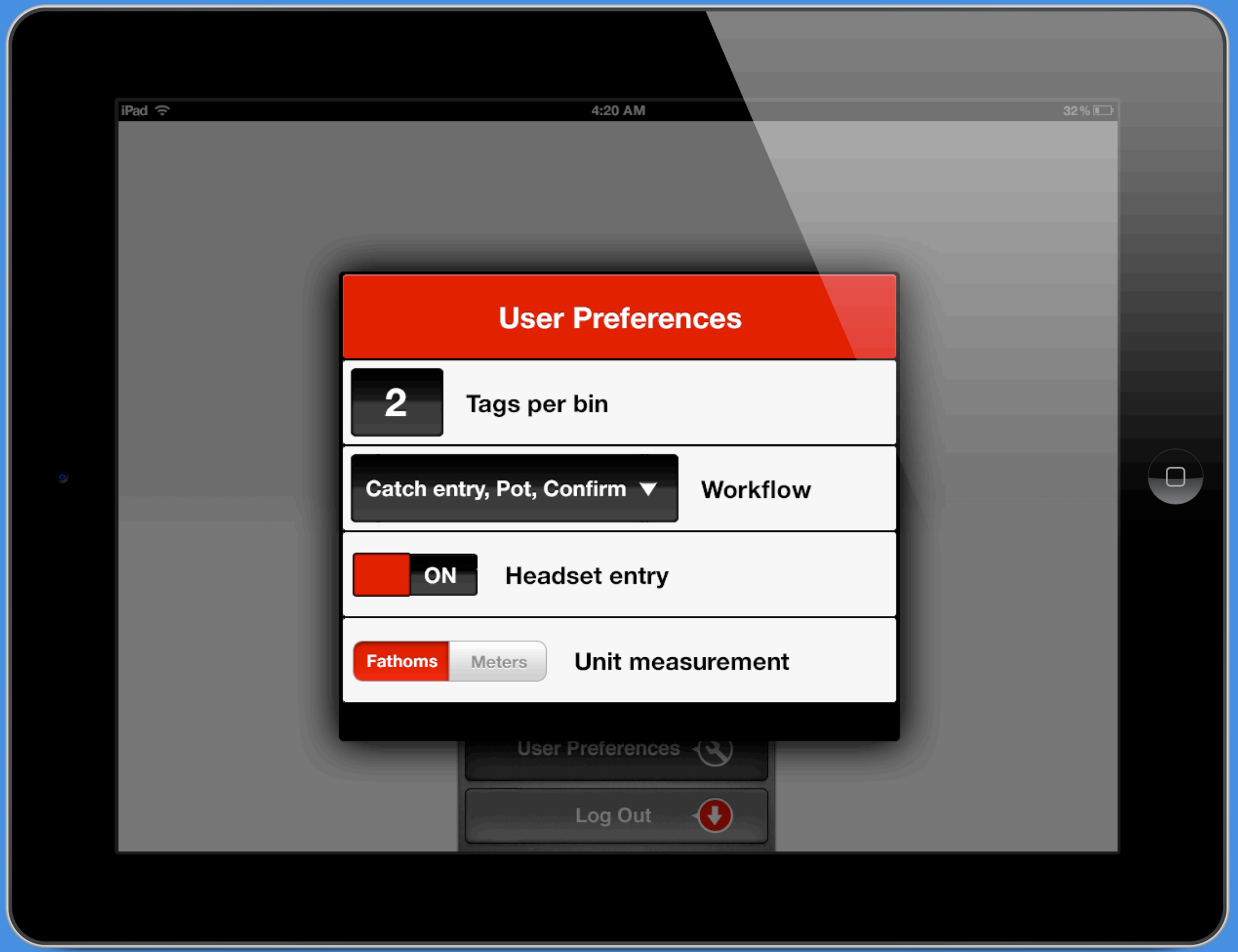
MANDATORY FIELDS



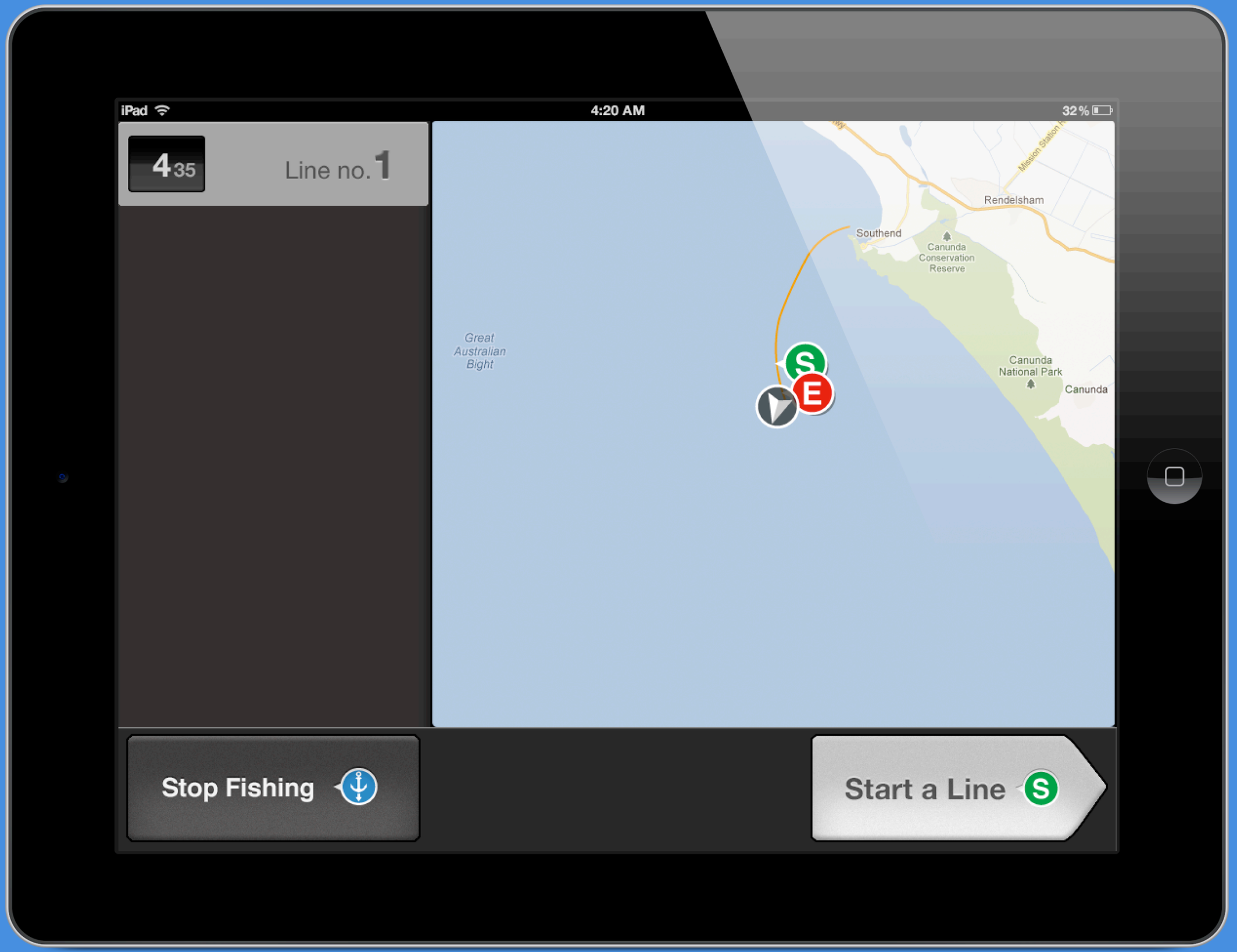
MORE USER FRIENDLY



USER PREFERENCES



LINE FISHING



ENHANCED REPORTING

DECKHAND | ARCHITECTURE

DECKHAND ARCHITECTURE

Deckhand

Application

Support / Maintenance

Significant New Features

NEW

Government integration
Weigh station integration

Hardware

Hard Case

SSL Security

Carrier Data plan

Apple account

Developer

Internet

Airwatch Licenses

airwatch™

Data management

Power

Data backup

Questions?


iPad
4:20 AM
32 %
25
Pot no. 2
43
Pot no. 1
6
Size
4
Undersize
0
Dead
0
Spawny
0
High Graded - Oversize
3
High Graded - Quality
0
Octopus
Stop Fishing
Add Bycatch
Add Pot
Telstra 3G
4:20 PM
DECK HAND.
Go Fishing
User Preferences
Log Out

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Australian Government
Fisheries Research and Development Corporation

SEPFA On-Board E-Data Collection Workshop - FRDC Project 2011/250

THE TRIAL

Joel Redman & David Manser

SARDI Aquatic Sciences - Friday 7th September 2012

PO Box 3450 NORWOOD SA 5067
Telephone: 08 8132 0257 **Mobile:** 0400 281 904 **Facsimile:** 08 8132 0161 **Email:** justin@jp-consulting.com.au

SEPFA South Eastern Professional Fishermen's Association Inc.

Trial Structure

1. Initial Meeting (15 December 2011)
   - Trial participants & Real Time Data
   - Explanation of current functionality
   - Gather initial industry feedback re functionality & make adjustments
   - To explain the 'options' for spatial scale of data collection e.g. per pot, per string, per 'fishing trip'

2. Secondary Meeting (5th January 2012)
   - Participants & Real Time Data & PIRSA Policy & SARDI & Compliance
   - Functionality briefing including any initial changes
   - Issue iPads / devices to participants together with covers
   - Brief regulators, researchers and compliance team
   - Advise protocols for communication
   - One-on-one tutelage re operation of devices

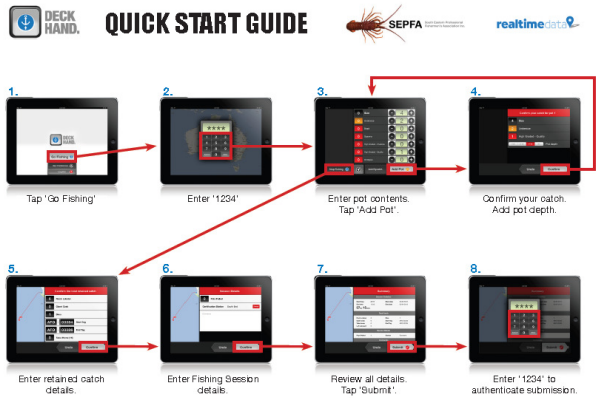
3. Trial ran January / February / March 2012

4. Period of application / device use by participants was at their discretion, then device passed on to others (22 participants in total).

Help!

Development by Real Time Data Pty Ltd of:

1. Deckhand ‘Quickstart’ Guide (1 pager):



2. Deckhand User Guide (more detail):

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In-Trial Functionality Issues

- Access to historical catch totals
- Access to historical 'track' info
- Need for ETA field (prior report)
- Refinements to better match with 'bin-tagging' requirements (numbers & letters, pre-emptive tag numbers)
- Inclusion of 'in-session' capability for editing by fishers i.e. 'tap' a previous pot to edit info entered.
- Map override on scrolling
- Inclusion of provision to give instant feedback
- Provision to cancel a fishing session
- Interface alterations (inclusion of numerical key pad for specific fields.
- Options for 'pot confirmation', was it required.
- Ability to 'turn-off' the GPS

- **'Backing-up' of data during a session when out of range, causing system to crash when re-enter signal coverage. KEY ISSUE.**

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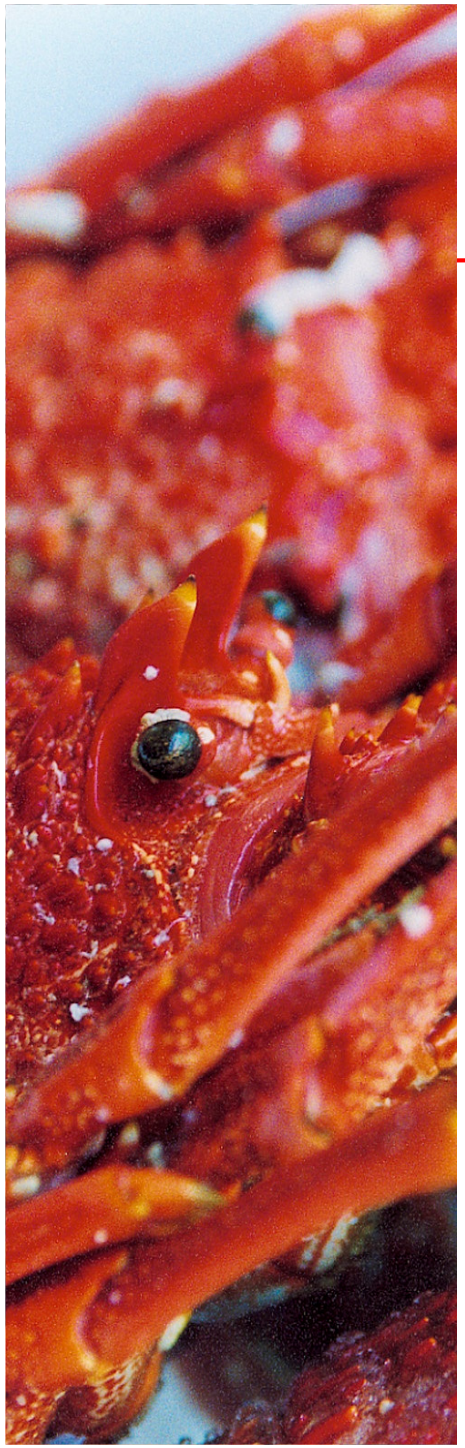
Overall Message from Trial

- Very positive feedback from all trial participants
- All participants were able to successfully master and utilise the application.



Post Trial Participant Survey

DECK HAND.

USER SURVEY

SEPFA Trials

SEPFA

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Deckhand feedback survey.

Thank you for taking the time to trial Real Time Data's Deckhand software. To assist with SEPFA's evaluation of the trial can you please take ten minutes to answer this questionnaire.

Part A requires you to rank a series of statements about the functionality of the software.
You should circle the number you believe best answers the statement. Please avoid answering 'not sure' as much as possible.

1 – Strongly Disagree	2 – Disagree	3 – Agree	4 – Strongly Agree	5 – Not sure?	
Ease of use.	Because of the intuitive design, an inexperienced Deckhand...	1	2	3	4	5
Training time.	Learning to use Deckhand takes less than 1 x 15 minute...	1	2	3	4	5
Robustness.	When presented with the hardware, the iPad is durable and no other alternative is...	1	2	3	4	5
Prior report.	Prior reporting would be easier using the PIN on Deckhand than making a call to our all-ve...	1	2	3	4	5
Data security.	The legal contract I signed for Deckhand gives me confidence that the data I collect is secure...	1	2	3	4	5
Replacing paper.	Recording my catch on Deckhand is easier than writing it down on paper.	1	2	3	4	5
Data interface.	The touch screen works well.	1	2	3	4	5
Size of buttons.	The buttons were big enough for me to use easily.	1	2	3	4	5
Data accuracy.	The data I entered seemed to be very accurate.	1	2	3	4	5
Data coverage.	I never had a problem with cellular coverage. (Logging on and Pre-trial were used).	1	2	3	4	5
Bluetooth.	I never had a problem with bluetooth pairing or connecting devices.	1	2	3	4	5
Printing of CDR.	It would be easier for me to print and sign my CDR than the current paper based system.	1	2	3	4	5

For Part B we would like you to answer the following questions with a simple one word or one-line answer.

If you could replace your CD R and Catch hand Effort reporting by lodging it all with the push of a button on Deckhand, how much time would it save you per trip?

Do you see any other financial benefits for your business?

If collecting some financials information became mandatory (say 1 day per month) would you be prepared to support it if? Particularly if it could be used to reduce the amount paid to SARDI in the cost recovery process?

If you were confident that your data would be treated confidentially, would you share some of your catch and effort information to assist SEPFA in defending a position with SARDI / PIRSA or any other government bodies?

For Part C we ask you to look at the following screen shots. If you have any comments to make about the functionality of that specific screen please write them in the area provided.

Homescreen	Developer comments	Additional Comments / Suggestions
	User Preferences need to include: - Change unit of measure. - Disable / enable Headsets. - Disable / enable SARDI voluntary information.	

Catch Entry	Developer comments	Additional Comments / Suggestions
	- Make pots editable. - Disable auto centering of the map while you're interacting with it. - Include the ability to cancel a session and delete all captured data for that session. - Add a running tally of retained catch to the pot list information.	

End Reporting	Developer comments	Additional Comments / Suggestions
	- Tag numbers need up to 6 numbers. - ETA field may be required. - Integration with electronic scales.	

For Part D we would like you to think about any additional features you think would improve the way Deckhand functions. It doesn't matter how technically difficult (or even silly) you think it is. No idea is a dumb idea!

Write any suggestions you have for software improvements here.

Finally, if you have any additional comments you'd like to make about Deckhand or the trial process itself, please write them here.

Write any additional comments you have here.

Thank you taking the time to fill in this survey.

Regards,

Justin.

Issues raised by participants already listed…

Intellectual Property & Licensing

Three DRAFT 'agreements' were developed by Real Time Data and SEPFA in conjunction with independent legal expertise (funded outside of the project scope), these agreements have not been 'actioned' to date:

1. Overarching licensing agreement between SEPFA and Real Time Data:
   - Excludes other parties / providers for duration of trial
   - Copyright Issues
   - Use of Deckhand application only by approved parties for purpose of trial
   - Confidentiality (fisher info & location info)

2. Licensing acknowledgement by all users:
   - Included on the device – accept / reject to actually use device
   - Reflects all the points in 1 above – just a short summary

3. IP (Terms Sheet)
   - Real Time Data retains ownership of the back-end
   - SEPFA retains ownership and access to all input provided to develop the interface (fields, layout etc).

On-Board Electronic Data Capture System (Deckhand) Cost Benefit Analysis

On-Board E-Data Collection Workshop

7 September 2012

EconSearch Pty Ltd

econsearch

Overview

- Method
- Assumptions
  - Benefits
  - Costs
  - Non-price benefits
- Results
- Sensitivity Analysis
- Threshold Value of Non-Price Benefits

Method

Cost Benefit Analysis (CBA)

- Estimate the **net economic impact** to the industry of implementing Deckhand
- **Base case:** no change to the current method of fishery data collection
- **Option 1:** on-board electronic data capture system **(Deckhand)**
- Costs and benefits were specified in real terms (i.e. constant 2012 dollars)
- Future values were converted to present values applying a **discount rate of 7%**
- Conducted over a **25 year time period**
- Results were expressed in terms of net benefits: the **incremental benefits and costs** of Option 1 relative to the 'base case' scenario
- **Sensitivity analyses -** reflects the uncertainty associated with key variables
- A **threshold value -** provided an estimate of the magnitude of the unquantified benefits necessary for the project to return a break-even result

Benefits

- Reduction in data entry staff
  - 2 fte jobs
  - approximately $112,500 per annum using an average salary of $45,000 (AS02 level) applying a modest on-cost and overhead multiplier of 1.25 to take account of superannuation, workers compensation and overhead factors
- Ceasing of printing, posting and couriering logbooks and CDR records
  - around $20,000 per year attributable to the SZRL fishery

Benefits

- Time saved by licence holders from using Deckhand, as opposed to filling out paper records
  - Would average around 16 minutes per fisher per trip (survey result)
  - Approximately $132,000 each year on a whole of fishery basis assuming $24 per hour and 19,941 trips in the fishery per year (average over the last 10 years)
- The most significant benefit to licence holders of more timely decision making through the speedier delivery of data has not been quantified

Costs

- Start-up Costs
  - around $30,500 for the PIRSA backend system
    - approximately $250,000 for this system and all accompanying documentation and legislation
    - $125,000 will be funded by FRDC
    - PIRSA will fund $62,500 and seek $62,500 from industry (quota based fisheries)
    - Using the proportion of SZRL licence holders compared to all other quota based fishery licence holders as a basis to apportion this cost (almost 50%)
  - There will be no upfront costs for SARDI
  - Around $989 in training time across the fishery assuming it takes licence holders 15 minutes to learn to use Deckhand, an average value of time of $24/hour and 164 active licence holders

Costs

Operating and Maintenance Costs

- Around $32,000 for PIRSA's operating and maintenance costs
  - approximately $65,000 per annum for all quota based fisheries.
  - assuming that the proportion of this cost that will be incurred by SZRL licence holders is based on the proportion of SZRL licence holders compared to all other quota based fishery licence holders
  - All costs incurred by PIRSA will be recovered from industry through licence fees
- $205,000 per annum for Deckhand licence fees, assuming $1,250 per annum per licence and 164 active licence holders
- $36,900 per annum for hardware (iPad and case), assuming a cost of $900 every 4 years and 164 active licence holders
- $24,600 per annum for data assuming that each active licence holder will require a data plan to use Deckhand costing approximately $150 per annum and 164 active licence holders

Non-Price Benefits

- More timely decision making
- Save on prior reporting costs
- Consistency of data
- Future potential

Results

- Net Present Value (NPV): -$0.46 million
- Benefit-Cost Ratio (BCR): of 0.87
  - Equivalent to an average annual cost of $240 per active boat per year.
  - Needs to be considered in the context of the range of non-priced benefits
  - The principal drivers of the estimated negative outcome are the ongoing operating costs associated with owning a Deckhand licence and the replacement cost of the required hardware

Sensitivity Analysis

The sensitivity analysis included changes in the following variables:

- Discount rate
- Deckhand licence fee
- Time of the replacement of hardware
- Time savings for licence holders

Sensitivity Analysis

- Discount Rate
  - Moderately Sensitive

	Change from Expected Value	NPV [a] ($m)	BCR
4 per cent	-3%	-0.60	0.87
7 per cent [b]	-	-0.46	0.87
10 per cent	3%	-0.37	0.87

[a] In 2012 dollars

[b] Expected discount rate

Sensitivity Analysis

- Deckhand licence fee
  - Sensitive

Deckhand Licence Fee ($)	Change from Expected Value	NPV [a] ($m)	BCR
1,000	-20%	0.06	1.02
1,250 [b]	-	-0.46	0.87
1,500	20%	-0.98	0.76

[a] In 2012 dollars

[b] Expected Deckhand licence fee

Sensitivity Analysis

- Time of the replacement of hardware
  - Moderately sensitive

Time to replace hardware (years)	Change from Expected Value	NPV [a] ($m)	BCR
3	-1	-0.62	0.83
4 [b]	-	-0.46	0.87
5	1	-0.37	0.89

[a] In 2012 dollars

[b] Expected time to replace hardware

Sensitivity Analysis

- Time savings for licence holders
  - Very sensitive

Time savings for licence holders (mins/trip)	Change from Expected Value	NPV [a] ($m)	BCR
8	-50%	-1.30	0.64
16 [b]	-	-0.46	0.87
24	50%	0.37	1.10

[a] In 2012 dollars

[b] Expected time savings

Threshold Value of Non-Price Benefits

- Many benefits that would accrue to licence holders that have **not been valued** in the cost benefit analysis (CBA)
- One way to consider the value of these benefits is to compare them to the results of the CBA
- Where the incremental costs of the project exceed the incremental benefits, the threshold value becomes important
- The estimation of a threshold value enables decision makers to recognise the presence of additional unquantifiable financial, environmental and social benefits that are expected to flow from the investment
- A threshold value provides an estimate of the magnitude of the unquantified benefits necessary for the project to return a break-even result

Threshold Value of Non-Price Benefits

- The results showed a net return of -$0.46m
- Approximately -$240 per boat per year given a 25 year period, discount rate of 7% and 164 active licence holders
- If active licence holders in the fishery believe the unquantified benefits would have a value to their business of more than $240 each year, then the investment in the Deckhand application would be worthwhile

On-Board Electronic Data Capture System (Deckhand) Cost Benefit Analysis

On-Board E-Data Collection Workshop

7 September 2012

EconSearch Pty Ltd

econsearch

eCatch

FISHERIES
& AQUACULTURE
PIRSA

Simon Malcolm

Strategic Projects and System Development

growing
sustainable
regions

Government
of South Australia

Primary Industries
and Regions SA

In the beginning?

FISHERIES
& AQUACULTURE
PIRSA

eScales

- Built and maintained by Control Corp.
- 8 Scales in 7 locations
- Scales communicate through either NextG or ADSL
- Scale holds quota balances, provides receipt
- Scale delivers information to central server, pushes on to PIRSA

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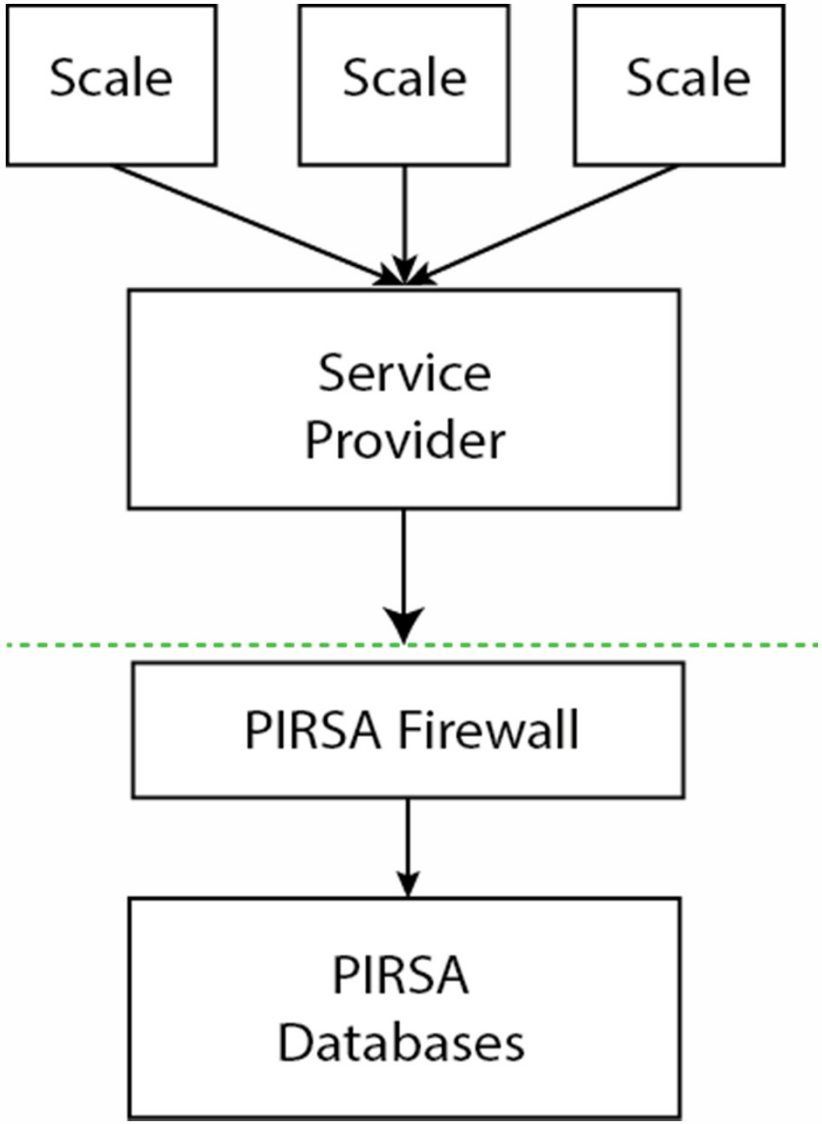

FISHERIES & AQUACULTURE
PIRSA

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eScales lessons

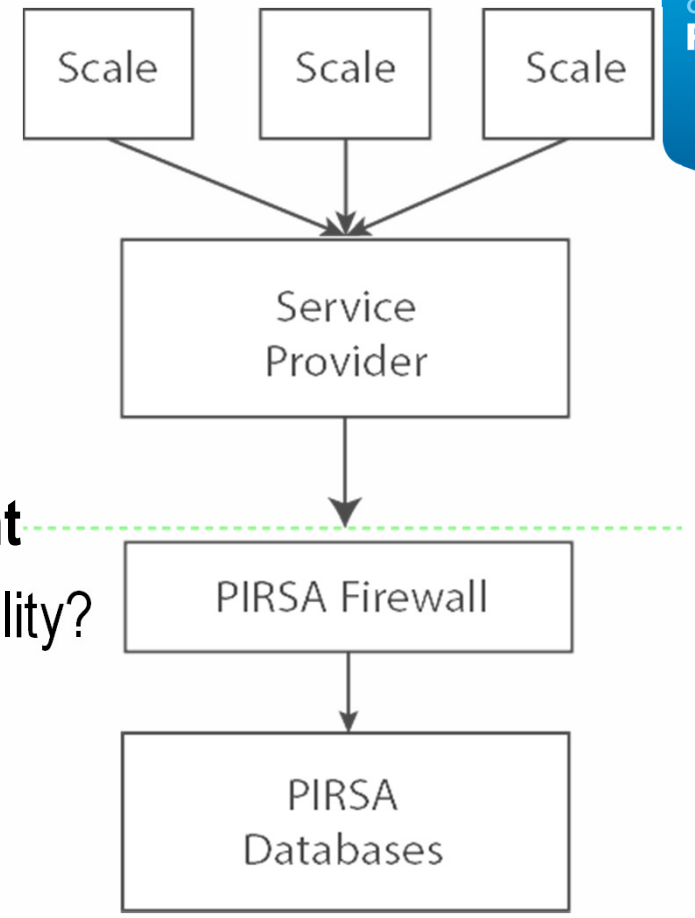
FISHERIES & AQUACULTURE
PIRSA

The Good

- Service provider model
- Multiple redundancy
- Secure system

Opportunities for improvement

- Accountability and responsibility?
- Technology advancements
- Competitive market



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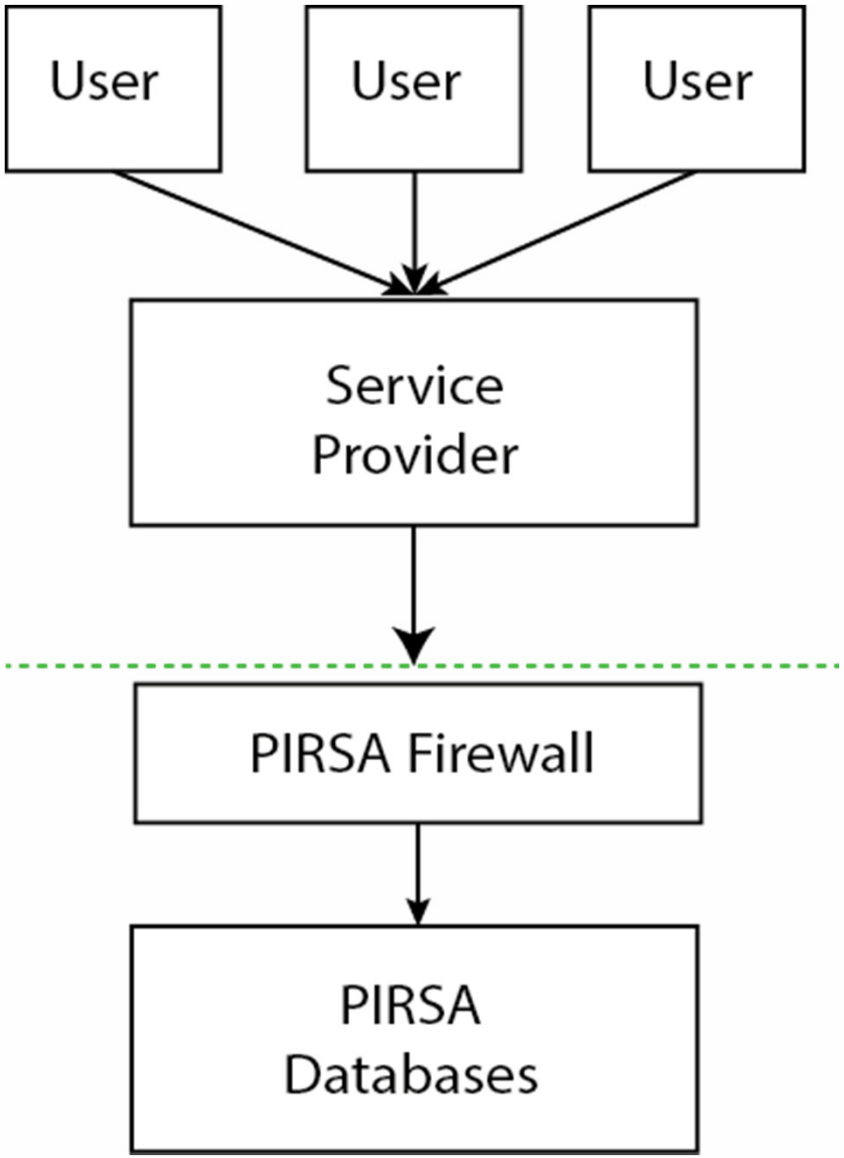

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eCatch – PIRSA responsibilities

FISHERIES
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PIRSA

- Only interested in timely, accurate receipt of required data
- Develop technical and security specifications
- Build gateway with open standards
- Build in (prior) reporting capabilities
- Contracts between PIRSA and industry sectors

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eCatch - Industry side

- Industry maintains relationship with provider
- Additional functionality may be added to system

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eCatch – where to?

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PIRSA

Funding

- PIRSA funding secured (12/13)
- FRDC funding sought

Support

- Determine which fishing sectors will participate

Proposed testing date

- Ready for testing late 2013 (for season 2013/14)

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SEPFA South Eastern Professional Fishermen's Association Inc.

realtimedata

Australian Government
Fisheries Research and Development Corporation

SEPFA On-Board E-Data Collection Workshop - FRDC Project 2011/250

1. *Industry Requirements / Comments (All Jurisdictions)*
2. *Discussion on Barriers to Implementation & Solutions*
3. *Next Steps*

Justin Phillips
(SEPFA Executive Officer)

SARDI Aquatic Sciences - Friday 7th September 2012

PO Box 3450 NORWOOD SA 5067
Telephone: 08 8132 0257 **Mobile:** 0400 281 904 **Facsimile:** 08 8132 0161 **Email:** justin@jp-consulting.com.au

SEPFA South Eastern Professional Fishermen's Association Inc.

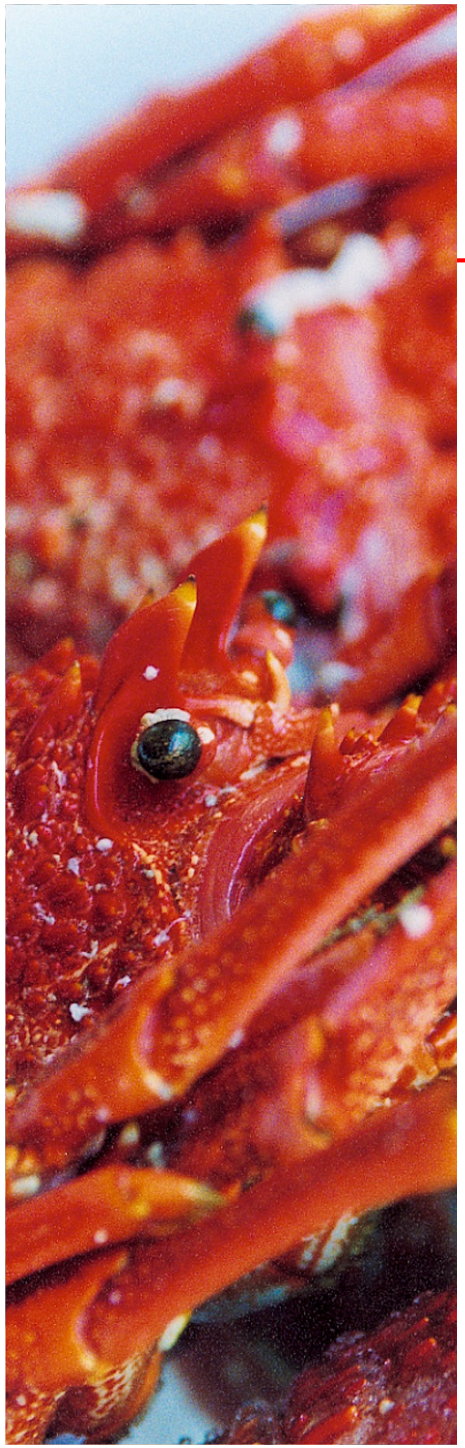
1. Industry Requirements / Comments

1. South Australian Northern Zone

2. Tasmania

3. Victoria

- Would this work in your fishery?
- Would fishers accept it?
- Can you envisage any initial changes that would be required?
- Pros / Cons?



SEPFA South Eastern Professional Fishermen's Association Inc.

2. Barriers & Solutions - Implementation

Barriers:

1. Readiness of Regulator / Timing for Implementation
2. Cost (this was also a key driver, SZ scales have saved in excess of $1 million)
3. 'Tracking' (also a KEY benefit)
   - SA Northern Zone already has VMS, would this be duplication?
   - Other jurisdictions don't have VMS, would this be welcome?!
4. Fisher Acceptance / Flexibility for Fishers
   - How they use the device i.e. per pot, per string, per trip / session
   - Are we just restricted to apple devices?? What about android? KEY POINT

Solutions:

1. Interim measures to capitalise on the lead-in time (larger scale trials, partial implementation, education of industry)
2. Commercial discussions
3. Management of that data [by industry]
4. Make it flexible to meet the varying requirements of fishers.

MORE…???

3. Next Steps

Commercial Discussions:

- The product works well, the trial was successful.
- We have invested time and resources with Real Time Data Pty Ltd. We don't want to waste that
- Need to agree on the costs and the 'management model' either with Real Time Data or another provider.
- There are some basic options:
  1. Pay a licensing fee each year (as per cost benefit analysis) - this is very expensive, but includes everything i.e. management support etc – could industry purchase and own a system for that cost?
  2. Pay a one-off development fee for industry to 'own it' / buy it
     - Removes ongoing licensing fees
     - Need to explore the management options underneath this e.g. retainer for annual management, ad-hoc / as-needs basis for assistance, engagement of industry management resource i.e. who mans the 'help-line'? DIAGRAM
     - Overarching consideration is; what happens if the provider ceases to operate – cost involved to develop an alternative.

- Following the completion of this project SEPFA and Real Time Data will enter into discussions to explore the various options.

3. Next Steps (Cont…)

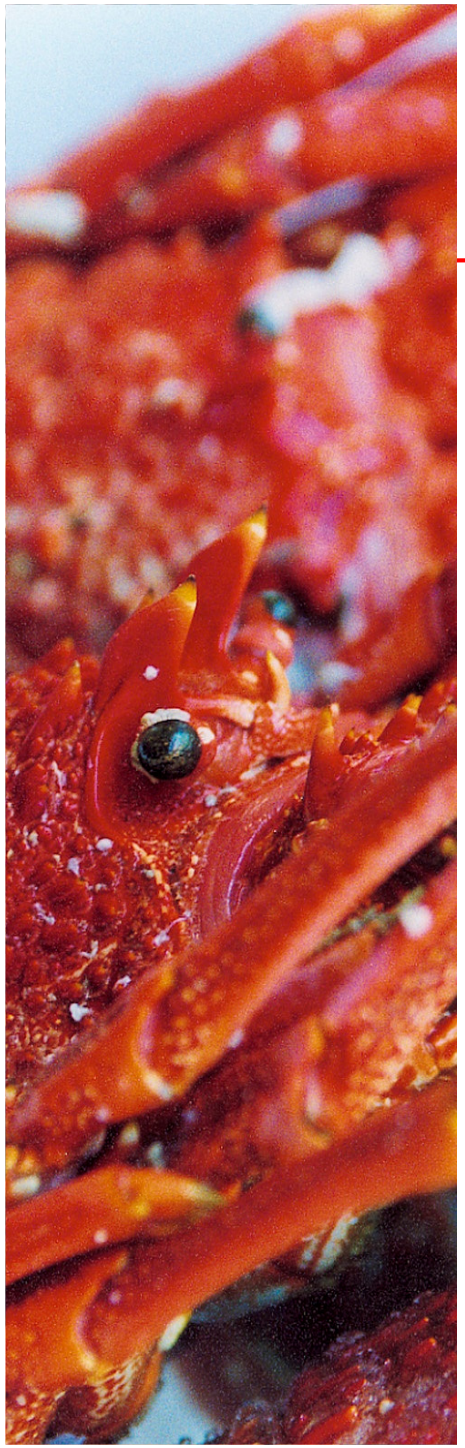
Possible Further Trials / Program of Implementation

SA Southern Zone:

- Depends on which ‘product’ is selected in the SA Southern Zone
- Possible extension of this project in the SA Southern Zone towards implementation or development of a new 2 tiered project (1; implementation in SASZ, and 2; trials in other jurisdictions),
- Program / timing will depend on readiness of the regulator.
- Lead in-time should be utilised for at least a season-long larger-scale trial (20 vessels) doing ‘dual recording’ (paper and e-Data).
- This would allow further refinement and time to implement a comprehensive program of education / extension to ready the broader industry for implementation.
- Pending timeline of regulator, can industry establish an ‘interim arrangement’ for e-data collection & managament? See DIAGRAM. Benefits are available (timely data provision, systems development)

Other Jurisdictions:

- Imitate multiple trials of a similar nature in SANZ, Tas and Vic.
- Coordinate a separate, multi-jurisdictional, project to implement similar trials - possible key facilitation role for Southern Rocklobster Limited (SRL). This would be preference for SEPFA as it delivers the next steps for this current project.



3. Next Steps (Cont…)

Communication between the Jurisdictions

- SEPA can initiate, together with SARLAC and through SRL, communication with industry stakeholders as part of this current project.
- Need to determine:
  - Desire for each jurisdiction to proceed with any such trial
  - The position of the regulator on this issue in each jurisdiction i.e. does it reflect PIRSA's (separation of e-data collection / provision from receipt and use by Govt) or are regulators looking to deliver the 'total solution' for industry to use.
  - Desired 'product' for each jurisdiction (Outcomes of SEPFA commercial discussions to be provided i.e. product choice) - would make sense to go with one system, but not necessarily deal breaker.
  - Structure for further work i.e. coordinated project (makes most sense) vs multiple individual trials
  - Development of project application
  - As for the SEPFA trial, regulators and researchers for each jurisdiction must be involved in this process - SRL's current structure has the capacity to do this.

THANK YOU & CLOSE