

Utilizing R Shiny Within the Likely Suspects Framework

A MISSING SALMON ALLIANCE (MSA) PROJECT



THE MISSING SALMON ALLIANCE



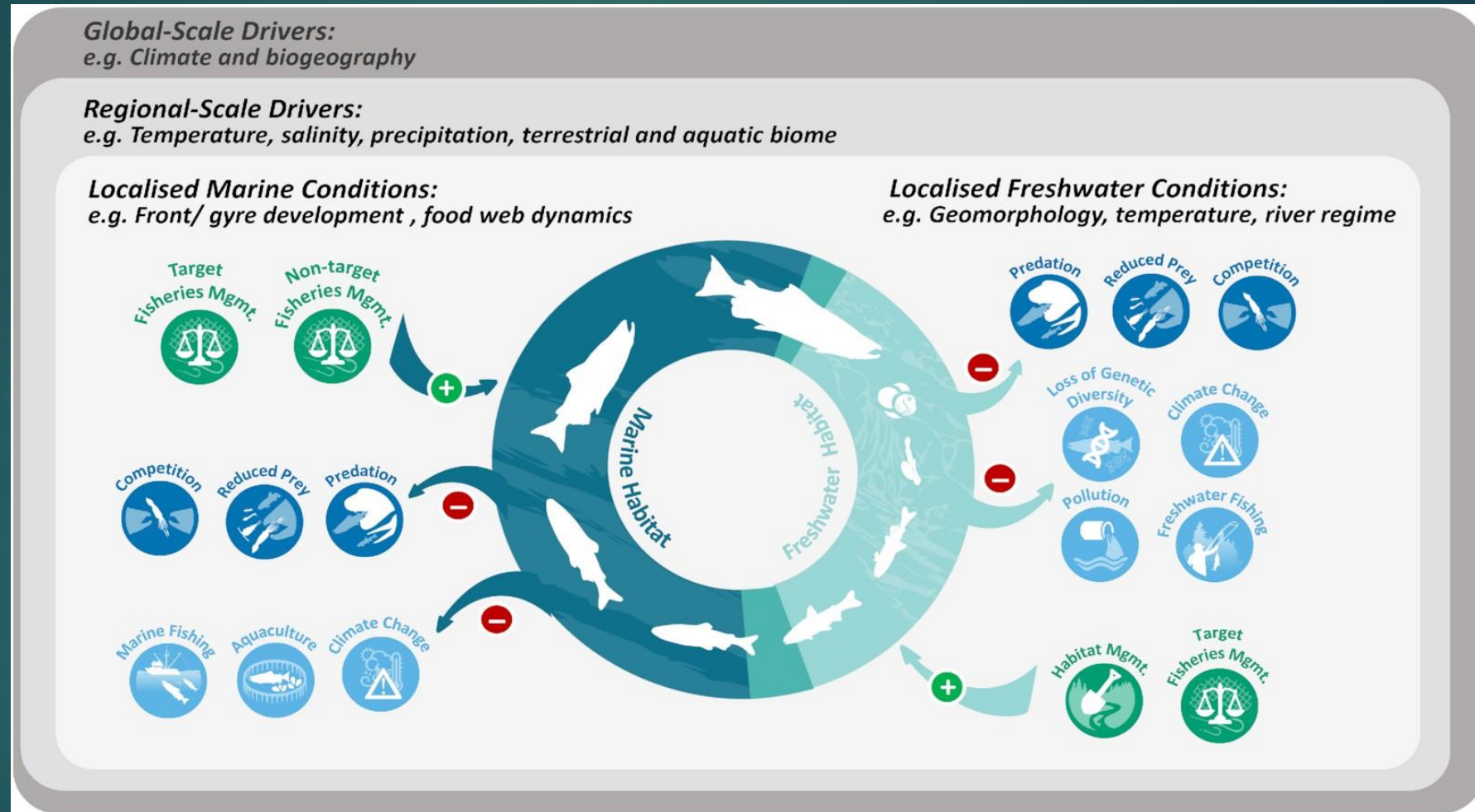
MSA Likely Suspects Framework team

Colin Bull (co-PI) colin@atlanticsalmontrust.org
Jon Emery (co-PI) jon@atlanticsalmontrust.org
Neil Banas (Modeller) neil.banas@strath.ac.uk
Emma Tyldesley (WP Lead) emma.tyldesley@strath.ac.uk
Aislinn Borland (PhD candidate) aislinn.borland@strath.ac.uk
Graeme Diack (Data Specialist) graeme@atlanticsalmontrust.org
Nigel Milner (Consultant) n.milner@apem.co.uk
Elliot Sivel (WP Lead) elliot.sivel@strath.ac.uk

<https://missingsalmonalliance.org/likely-suspects-framework-home>



MSA Likely Suspects Framework

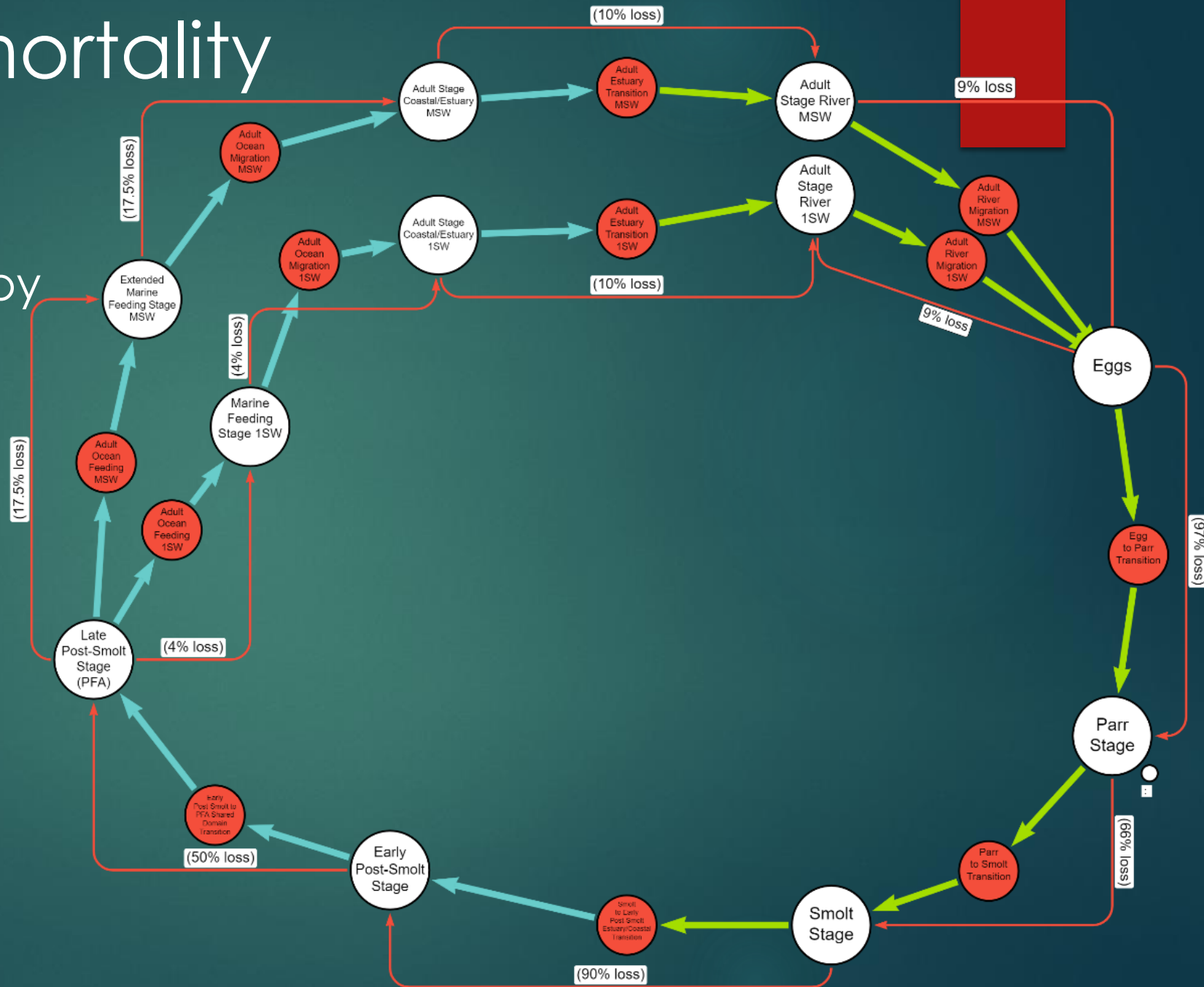


MSA Likely Suspects Framework

- Work Package 1 – Developing a data library (SalHub)
- Work Package 2 – Building the mortality framework (the Model)
- Work Package 3 – Developing Support Tools (Decision Support Tool)
- Work Package 4 – Populating the framework 1: Priority Domains
- Work Package 5 – Populating the framework 2: Integrating across life cycle

Developing a mortality framework

- Building a model driven by growth and survival through the stages in the life cycle
- Place changes into the context of whole lifetime success
- Scenario planning / “what-ifs?” = possible outcomes, prospects, priorities



Developing a mortality framework

- Average length of adults
- Average length of juveniles
- Marine return rates
- Proportions of smolt and sea ages
- Deposited egg abundance and post-smolt abundance
- Accessible wetted area



Improving Framework Accessibility



- Public Web Application
- Intuitive User Interface
- User Database + Persistent Storage
- Visualisation and Formal Report Structure

Improving Framework Accessibility

Atlantic Salmon Decision Support Tool [🏠](#) **1 Select Catchment** [2 Build Reference Cases](#) [3 Test Scenarios](#) [4 Visualise Results](#) [👤 User Help and Information](#)

Select a Stock Unit, Region, and Catchment to populate the information points available for that area and use this information to help frame your Reference Cases. Reference Cases will be tagged with catchment information, however this information does not effect the model output directly.

Select a Catchment [?](#)

Stock Unit

Scotland West [▼](#)

Region

North West Region - Cape Wrath to Kyle of Lochalsh [▼](#)

Catchment

River Applecross [▼](#)

Define a Sub Catchment [?](#)

Sub Catchment Name

Full Catchment

Sub Catchment Wetted Area (m²)

129000

Salmon Conservation Regulation Assessment [?](#)

Year: 2024 Status: Poor (Grade 3)
Catchment Accessible Wetted Area (m²): 129,000
Conservation Limit (eggs/m² [total eggs]): 1.73 [223,170]

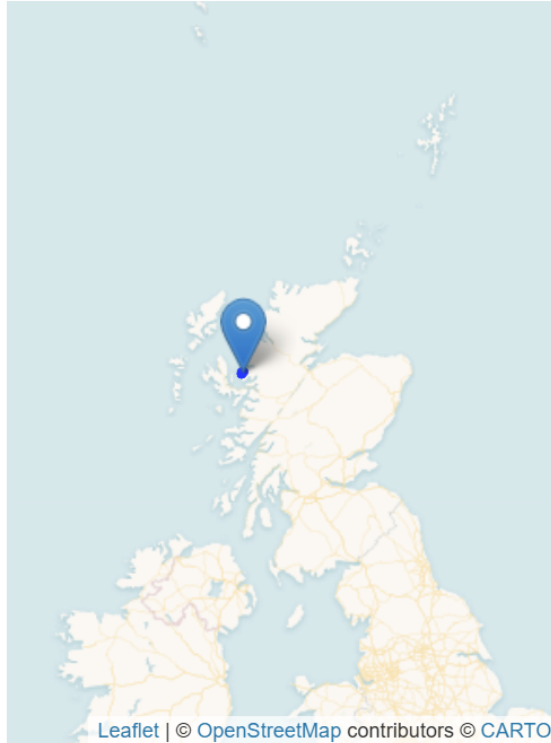
Population Characteristics [?](#)

Returning Adult Stock Estimate (5 year average): 37
Estimated Annual Egg Stock (5 year average): 58,881.3
Management Reference Point* (eggs/m² [smolts/m²): 0.87 [0.008]
Age Distribution (proportions):

	1 year	2 year	3 year
Smolt Age**	0	0.9	0.1
Sea Age***	0.93	0.07	0

* derived by LSF team from published figures
** estimated via expert opinion
*** taken as 5 year average from modelled data.

SR Plot




Leaflet | © OpenStreetMap contributors © CARTO

Environment

Additional

Sources



Improving Framework Accessibility

Create a Reference Case to take to the scenario testing stage. The Model represents the River Bush system in Northern Ireland, the parameter controls can be used to change the model equilibrium point to reflect the current conditions in your chosen catchment. To reload any of the saved settings select the relevant case in the sidebar dropdown menu.

Parameter Controls [?](#)

Life History [?](#)

Smolt Age [?](#)

1 2 3

Sea Age [?](#)

1 2

% 1SW Female [?](#)

% MSW Female [?](#)

Stage Based Mortalities [?](#)

Potential Egg Loss (%) [?](#)

Potential Fry Loss (%) [?](#)

Smolt Carrying Capacity [?](#)

Potential In River Smolt Loss (%) [?](#)

Potential Adult Coastal Loss (%) [?](#)

Potential Adult River Loss (%) [?](#)

Multi-Stage Conditions and Carry Over Effects [?](#)

Potential Juvenile FW Growth [?](#)

Potential Marine Conditions [?](#)

Reset All Defaults

Model Response [?](#)

Management Reference Point:

540.82%

Reference: 4.7 eggs/m²

Catchment: 0.87 eggs/m²

Note: model density is calculated using Bush wetted area

Freshwater Survival:

1.16%

Egg: 80%

Fry: 5.6%

Parr: 32.45%

Smolt: 80%

Marine Survival:

4.95%

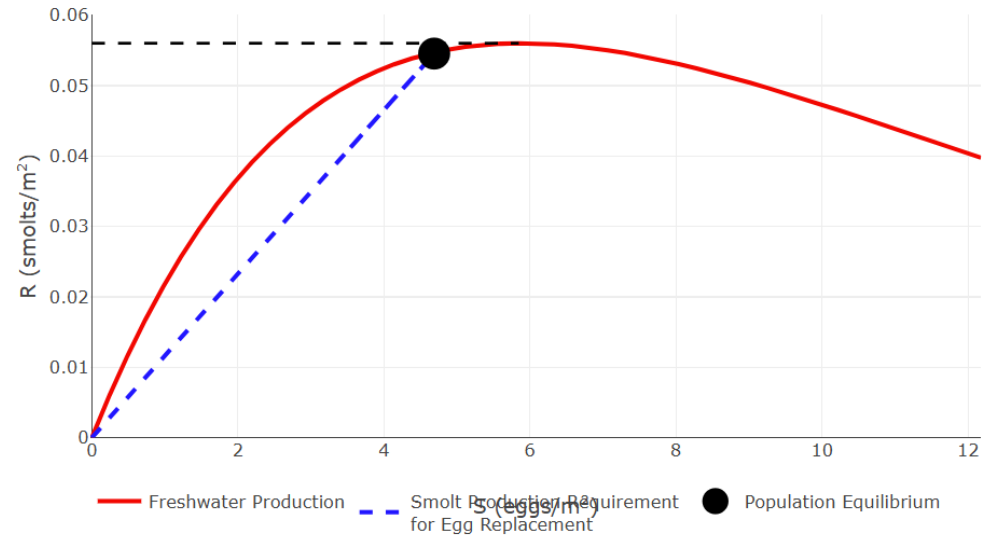
Early Post-smolt: 24.25%

Late Post-smolt: 25.61%

Adult in Ocean: 88.53%

Adult on Coast: 90%

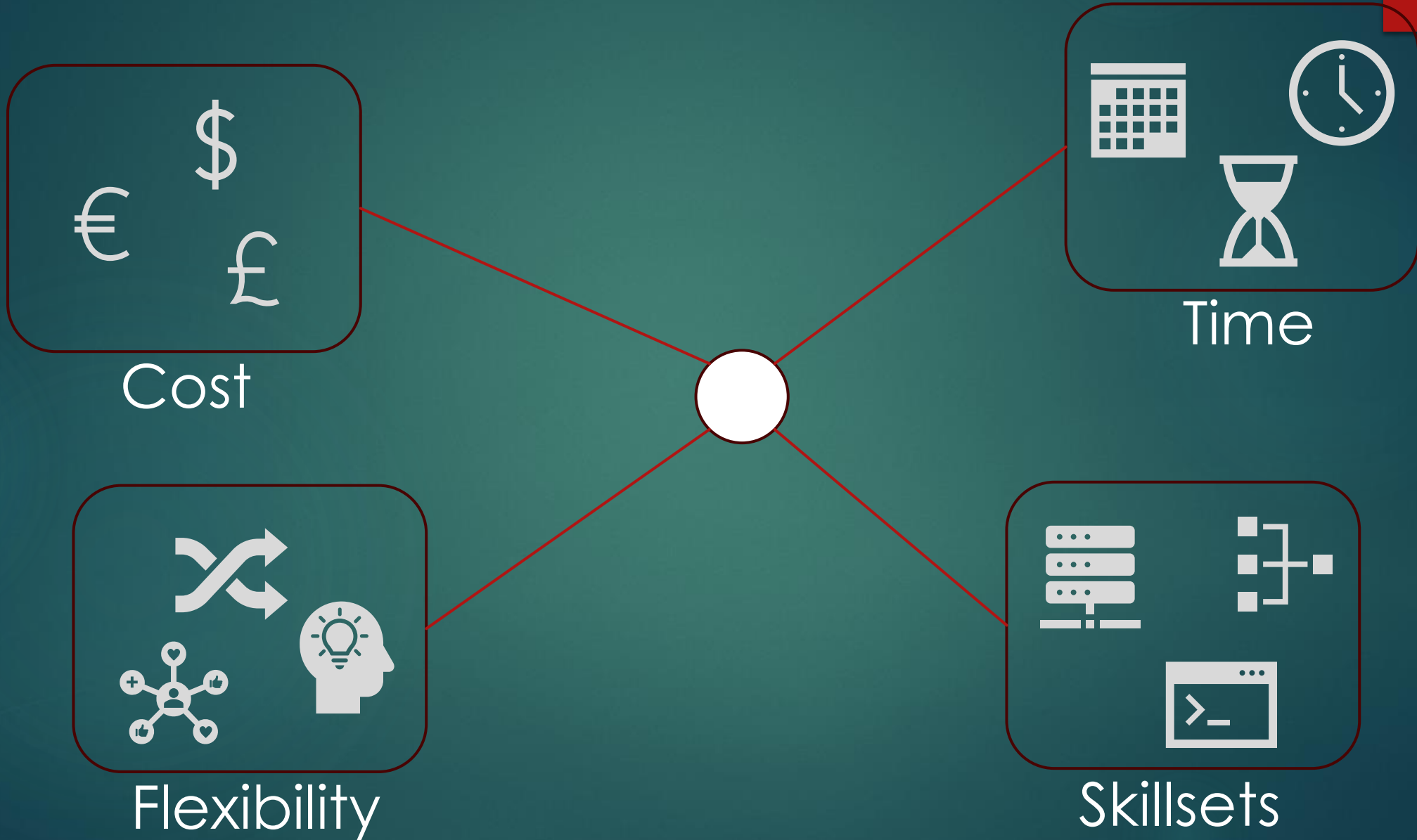
Simulated Stock-Recruitment Curve



Improving Framework Accessibility

 LIVE DEMO 

Pros and Cons of this DIY approach...



Welcome to the Register of *Salmo* PIT Tagging Activity

Fisheries research organisations routinely use PIT tags on salmon and trout. PIT tags are also used at sea as a way of estimating stock dynamics of pelagic fish species (e.g., herring and mackerel). This process involves PIT tag detectors being operated at several fish processing plants.

To take full advantage of the increasing use of this technology, an international database of PIT tags used in salmon and trout management activities has been created. When linked to the collation of tag returns from multiple sources this could provide important new information on the spatial distribution of salmon and trout at sea.

This web application allows you to add your own PIT tag deployment records to the database, and also search for unidentified tags that you have detected.



THERE ARE
592625

ACTIVE tags registered in the database

PIT Tag Deployment and Detector Location Map

This map will be regularly updated with new information on tag deployment and detections as this becomes available. It will provide a high level visualisation of recorded activity.

Red circles = Salmon and sea trout PIT tag deployment activity

Blue squares = Pelagic fish processing plants with PIT tag detectors (ICES Statistical Squares from Norwegian Marine Data Centre)



Other Shiny Projects developed by the LSF Team



[User Guide](#)

Please direct any queries to the
Data Admin

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