A Sunshine Coast case study
Adapting regional models to develop tailored local catchment targets

27 February 2020
Outline

• Sunshine Coast waterways & wetlands
• Environment & Liveability Strategy
• Overview of our catchment targets project
• Regional modelling => Catchment grades
• Supplementary modelling scenarios
• Synthesis & conclusions
Sunshine Coast waterways & wetlands
Sunshine Coast waterways and wetlands
Our coastal catchments and waterways
Sunshine Coast
Environment & Liveability Strategy 2017
Environment and Liveability Strategy 2017

Purpose

• Protect the natural environment - the foundation for our way of life
• Manage our natural and built environments in an integrated way
• Respond to key regional challenges and opportunities
Planning for change

- Population growth
- Climate change
- Economic growth
- Technological innovation
Integrated structure – 3 interdependent sections

**THE NATURAL ENVIRONMENT**

focuses on the need to preserve and enhance our natural environment, while supporting opportunities for the community to benefit sustainably from the associated products and ecosystem services.

Themes:
- Landscape and Character
- Biodiversity
- Waterways and Wetlands
- Coastal

**THE ENVIRONMENT WE CREATE**

- focuses on the built environment and in particular growth management, liveability and the sustainable design of our neighbourhoods, dwellings and open spaces.

Themes:
- Open Space
- Flooding and Stormwater
- Neighbourhoods and Housing
- Social Infrastructure
- Sustainable Design

**LIVING IN THE ENVIRONMENT**

focuses on the tools that will equip us to live within the natural and built environments to build resilience and liveability through sustainable, adaptable and affordable living practices.

Themes:
- Energy and Resources
- Sustainable Living
- Adaptation and Resilience
Policy positions

• Natural waterways and wetlands are preserved and enhanced to support healthy and diverse aquatic habitats and species

• Constructed waterbodies are minimised and managed efficiently to provide social and economic outcomes and preserve environmental values

• Waterways and wetlands are valued, respected and used sustainably to support our lifestyle, livelihoods and sense of place
Sunshine Coast catchments: “Good to Excellent grades”
Healthy Land & Water
Environmental condition grades

• Freshwater communities & processes – 20%
• **Estuarine water quality** – 20%
• Estuarine habitat – 20%
• Freshwater habitat – 20%
• **Pollutant loads** – 20%
Component studies

Aug 2017

- Concept study
- => Link management options to Report Card grades

Jun 2018

- Regional scenarios
- => Report Card grades from state modelling project

Sep 2018

- Locally refined scenarios
- => Modelling of loads & water quality

Jun 2019

- Synthesis report
- => Achievable grades & key management strategies
# Mind map - links between management actions and Report Card changes

<table>
<thead>
<tr>
<th>Group</th>
<th>Generic Action (relevant to report card indicators)</th>
<th>Outcomes (relevant to RC indicators) (non-RC indicators grey)</th>
<th>Relative potential influence of generic action on Healthy Waterways Report Card indicators</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater biodiversity</td>
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<td></td>
<td></td>
<td>Freshwater fish habitat</td>
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<td>3. Stream habitat</td>
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<td>4. Migratory habitat</td>
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<td>5. Pollutants</td>
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<tr>
<td>1. FEW management</td>
<td>1. Education and regulatory programs to maintain and improve fish habitats</td>
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<td>2. Education and regulatory programs to maintain and improve wetland habitats</td>
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<td>2. Habitat protection</td>
<td>1. Education and regulatory programs to maintain and improve fish habitats</td>
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<td>2. Education and regulatory programs to maintain and improve wetland habitats</td>
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<td>3. Education and regulatory programs to maintain and improve wetland habitats</td>
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<td>3. Protected and reserved</td>
<td>1. Education and regulatory programs to maintain and improve fish habitats</td>
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<td>2. Education and regulatory programs to maintain and improve wetland habitats</td>
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<td>4. Education and regulatory programs to maintain and improve fish habitats</td>
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<td>4. Rural impact mitigation</td>
<td>1. Education and regulatory programs to maintain and improve fish habitats</td>
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<td>2. Education and regulatory programs to maintain and improve fish habitats</td>
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<td>5. Urban impact mitigation</td>
<td>1. Education and regulatory programs to maintain and improve fish habitats</td>
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<td>5. Education and regulatory programs to maintain and improve fish habitats</td>
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</tbody>
</table>

Notes on potential effect ratings – taking into account feasible scale of actions:
- 0 = no expected effect on report card indicator
- 1 = supports maintaining indicator or potential indication of slight improvement
- 2 = important to maintain indicator or potential direct improvement
- 3 = potential notable and catchment-scale improvement to indicator
SEQ target loads modelling: Calculating report card grades
Overview of EHP project

Methods

• Source models
  => flows & TSS, TN, TP loads
• Linked to TUFLOW FV AED models
  => Turb, TN, TP, Chl-a, DO concentrations
• 14 SEQ catchments/receiving waterways

Scenarios

2. BAU 2030
3. Full investment 2030
4. Partial investment (priority sub/cmts)
5. Partial investment (priority land uses)
Partial investment – our catchments

<table>
<thead>
<tr>
<th>Catchment</th>
<th>Land Use - Rank 1</th>
<th>Land Use - Rank 2</th>
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</thead>
<tbody>
<tr>
<td>Maroochy</td>
<td>Grazing Natural Veg</td>
<td>Rural Residential</td>
</tr>
<tr>
<td>Mooloolah</td>
<td>Future Urban</td>
<td>Urban Residential</td>
</tr>
<tr>
<td>Pumicestone</td>
<td>Horticulture</td>
<td>Future Urban</td>
</tr>
</tbody>
</table>

Legend:
- Catchment Boundary
- BAU
- FI
Results – loads by catchment

Maroochy

Mooloolah

Pumicestone
Results – Maroochy River WQ

Figure 3-4  Comparison of Turbidity medians across scenarios for Maroochy

Figure 3-5  Comparison of TN medians across scenarios for Maroochy

Figure 3-7  Comparison of DO saturation medians across scenarios for Maroochy

Figure 3-8  Comparison of Chlorophyll-a medians across scenarios for Maroochy
Our value add

Calculating report card grades for each scenario
Supplementary modelling – local scenarios
Modelling methods

• Same as SEQ study: Source ↔ TUFLOW FV AED2
• By BMT and HARC (2019)
Changes from previous modelling

**Base data**
- New urban areas added (>2012)
- New land-use in Beerwah area
  - High-N horticulture

**Revised scenarios**
- Extended out to 2041 (from 2031)
- Medium/high urban infill areas modelled (BAU)
- 50% reduction of loads from High-N agriculture
  - Pumicestone
- 1-3m AHD rural lands => Wetlands
  - Maroochy
Putting it all together...
## Potential grades

<table>
<thead>
<tr>
<th>Scenario type</th>
<th>Maroochy</th>
<th>Mooloolah</th>
<th>Pumicestone</th>
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<tbody>
<tr>
<td>Current</td>
<td>C to C+</td>
<td>C to C+</td>
<td>B- to B+</td>
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<tr>
<td>Business as usual</td>
<td>D to C-</td>
<td>D to D+</td>
<td>D to B-</td>
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<tr>
<td>Augmented BAU</td>
<td>C to C+</td>
<td>C to C+</td>
<td>B- to B+</td>
</tr>
<tr>
<td>Stretch investment</td>
<td>C to B-</td>
<td>C to B-</td>
<td>B- to A-</td>
</tr>
<tr>
<td>Maximum investment</td>
<td>B to A-</td>
<td>B- to B+</td>
<td>A-</td>
</tr>
</tbody>
</table>
Catchment possibilities & priorities

All catchments
- Augmented BAU
  ~ increase investment in proportion to population growth

Maroochy
- B could be achieved...
- Priorities: Transition of low rural lands to conservation; Reduced rural pollutant loads; Reduced sewage loads

Mooloolah
- C (possibly B) could be achieved...
- Priorities: Beyond best-practice erosion & sediment control & water sensitive urban design

Pumicestone
- B (possibly A) could be achieved...
- Priorities: Beyond best-practice erosion & sediment control & water sensitive urban design; Reduced loads from high-N agriculture
Thank you