BioRA DSS Workshop

Process for populating response curves

Contents

• Background
• Process for constructing response curves
BACKGROUND

Response Curves

- Response curves are the ‘brains’ of the DSS
- They are constructed by specialists
- They are created for each link
- A scoring system is used to capture the direction and magnitude of each response
- Some response curves address connectivity and/or non-WR ‘exogenous’ pressures
- 200-400 response curves per FA
Indicators and Linked Indicators

Severity rating | Severity change | Equivalent Loss or gain
--- | --- | ---
5 | Very large | 501-∞ (to pest proportions)
4 | Large | 251-500
3 | Moderate | 68-250
2 | Low | 26-67
1 | Negligible | 1-25
0 | None | No change
-1 | Negligible | 0-20
-2 | Low | 20-40
-3 | Moderate | 40-60
-4 | Large | 60-80
-5 | Very large | 100-80

Scoring system

Severity Score vs. % loss/gain relative to reference
Example: Response Curve

Response of one ecosystem indicator (Fish Guild A) to minimum dry-season flows in a year.

DSS operation

Scenario: Dry season minimum discharge for each year
External modelled time series

Transformed into time series of driving indicators

Each responding indicator

DRIFT prediction of change for each year
30 years of record = 30 values

Curves combined using multi-criteria decision analysis procedures

PROCESS FOR CONSTRUCTING RESPONSE CURVES
BioRA: Constructing curves

March 2015: Introduction to DSS
Field visit to the Delta and Tonle Sap

April 2015: Literature search
Status and trends assessment

June/July 2015: DSS Set-up Workgroup Meetings (initial RCs)

September 2015: Knowledge Capture Workshop (RCs)

October 2015: Individual liaison and refinement

February 2016: This workshop

June 2016: Calibration Workshop

July-October 2016: Individual liaison and refinement

DSS before specialist input

- Erosion
- Linked to:
  - Shear stress
  - Duration of wet
  - Sediment load
  - Sediment concentration
  - Onset sediment delivery
  - Duration sediment delivery
  - Sediment grain-size
  - Within day range of discharge
  - Biomass on bank
Develop response curves (FA1)

Erosion vs Sediment load (wet)

The higher the wet season average sediment load, the more river energy that is expended carrying sediment, and the lower likelihood of erosion.
Rhithron fish vs onset of dry season

The onset of the dry season represents a time rhithron species are able to migrate to shallower areas with suitable substrate for spawning, earlier onset allows the fish greater time to migrate but late onset can disrupt spawning migration and maturation. Also if dry season starts earlier, it beneficial as fish can mature in less stressful conditions prior to spawning.

Compare with monitoring data

Data from www.mrcmekong.org
## Teams responsible for curves

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<thead>
<tr>
<th>Discipline</th>
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<th>National</th>
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<tr>
<td>Geomorphology</td>
<td>Lois Koehnken</td>
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<td>Hoang Minh Duc</td>
<td>Pich Sereywath</td>
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<td>Birds and mammals</td>
<td>Anthony Stones</td>
<td>Phaivanh Phiapalath</td>
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**Thank You**