



Assessing flow management using risk to ecological assets

Brian Bycroft
Jonathan Marshall
Glenn McGregor
Julie Coysh
Chris Marshall



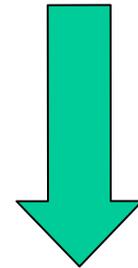
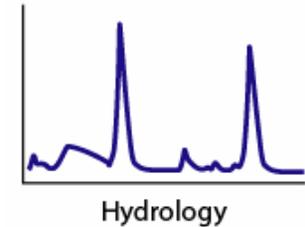
Background to methodology

- Provide **ecological** input only for decision makers
- Water planning in Queensland - 'rule-based' management vs discrete parcels

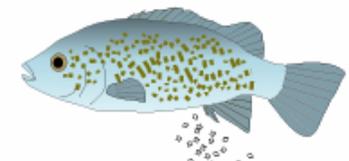


The 'traditional' flow-ecological response approach

- Implies a direct relationship between flow regime and ecological outcomes;
- Assess the effectiveness based on monitoring for ecological response

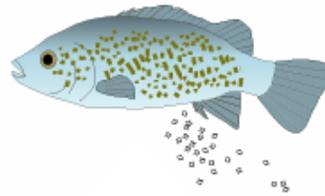
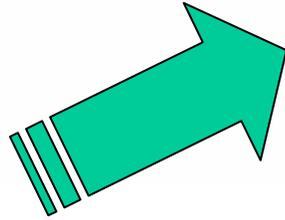
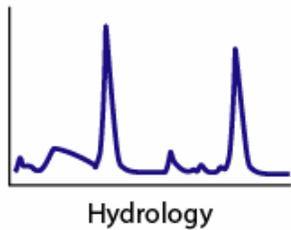


Ecological Response



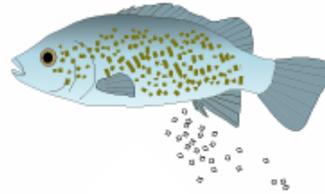
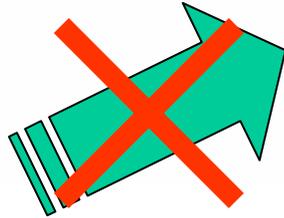
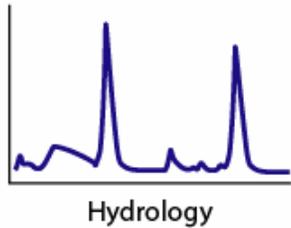


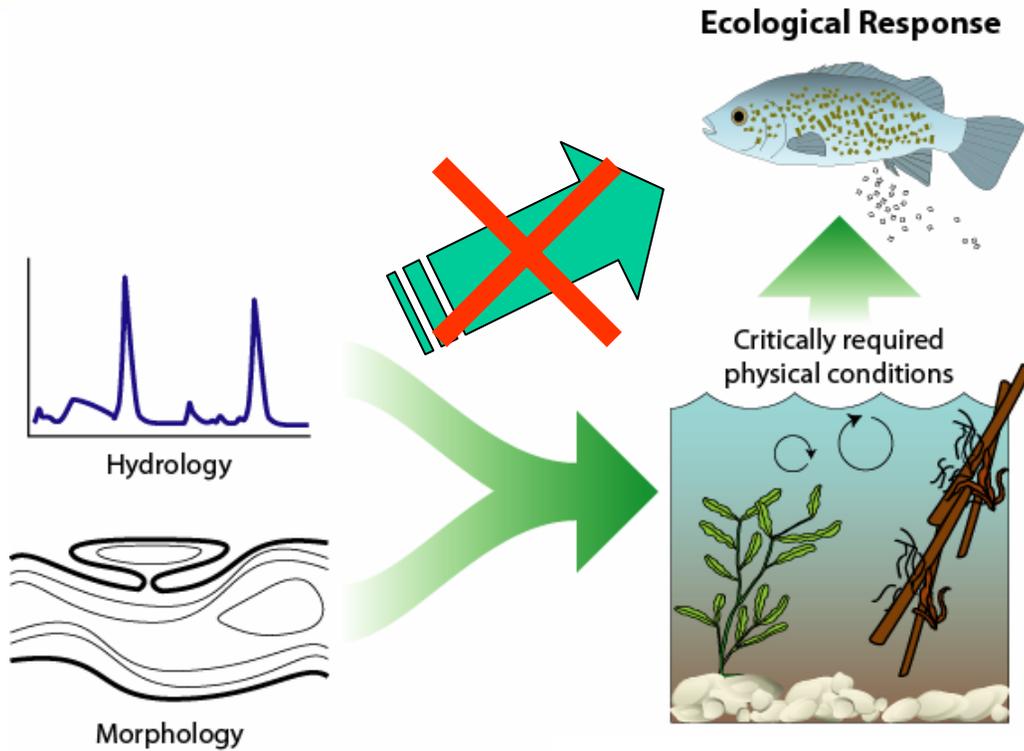
Ecological Response

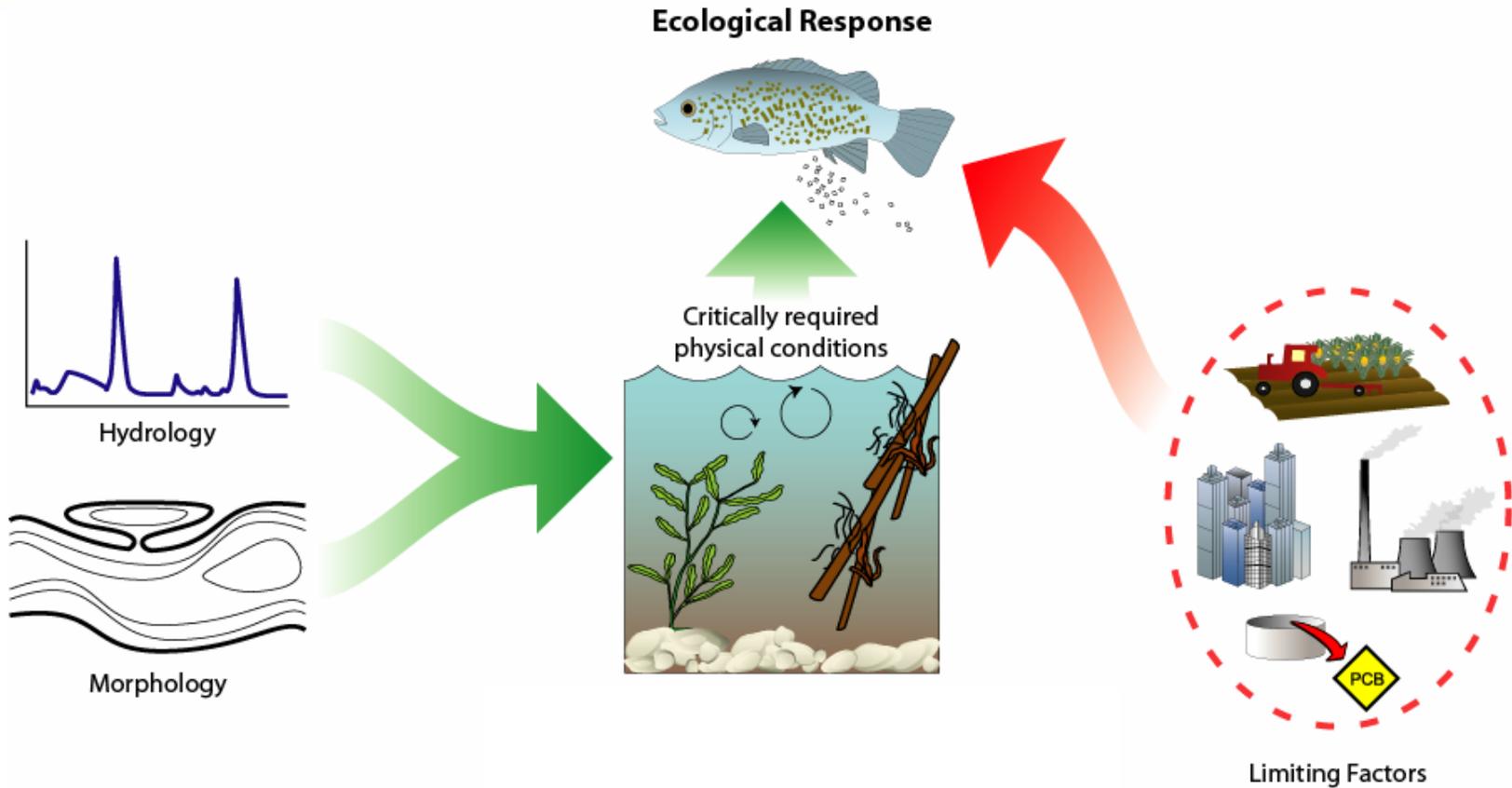




Ecological Response



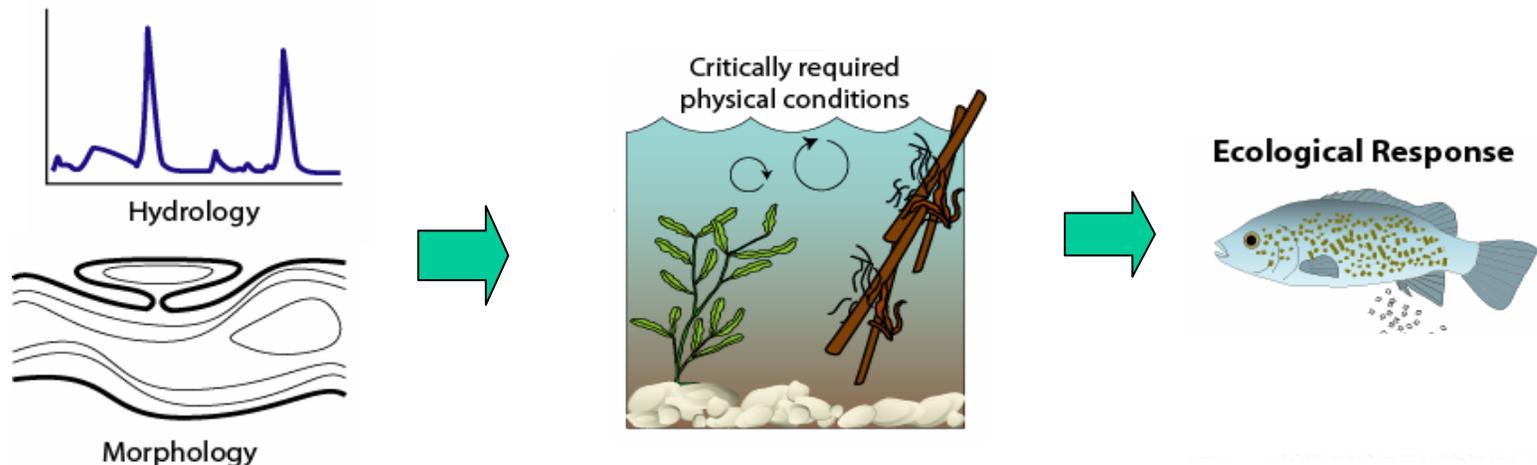






Problems with flow – ecological response

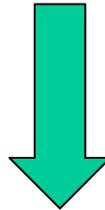
- Ecology responds to the **hydraulic** conditions created by flows
- Ecology affected by multiple drivers





Principle of Queensland's Monitoring Program

Provision of hydraulic habitat



Risk to Ecological Outcome



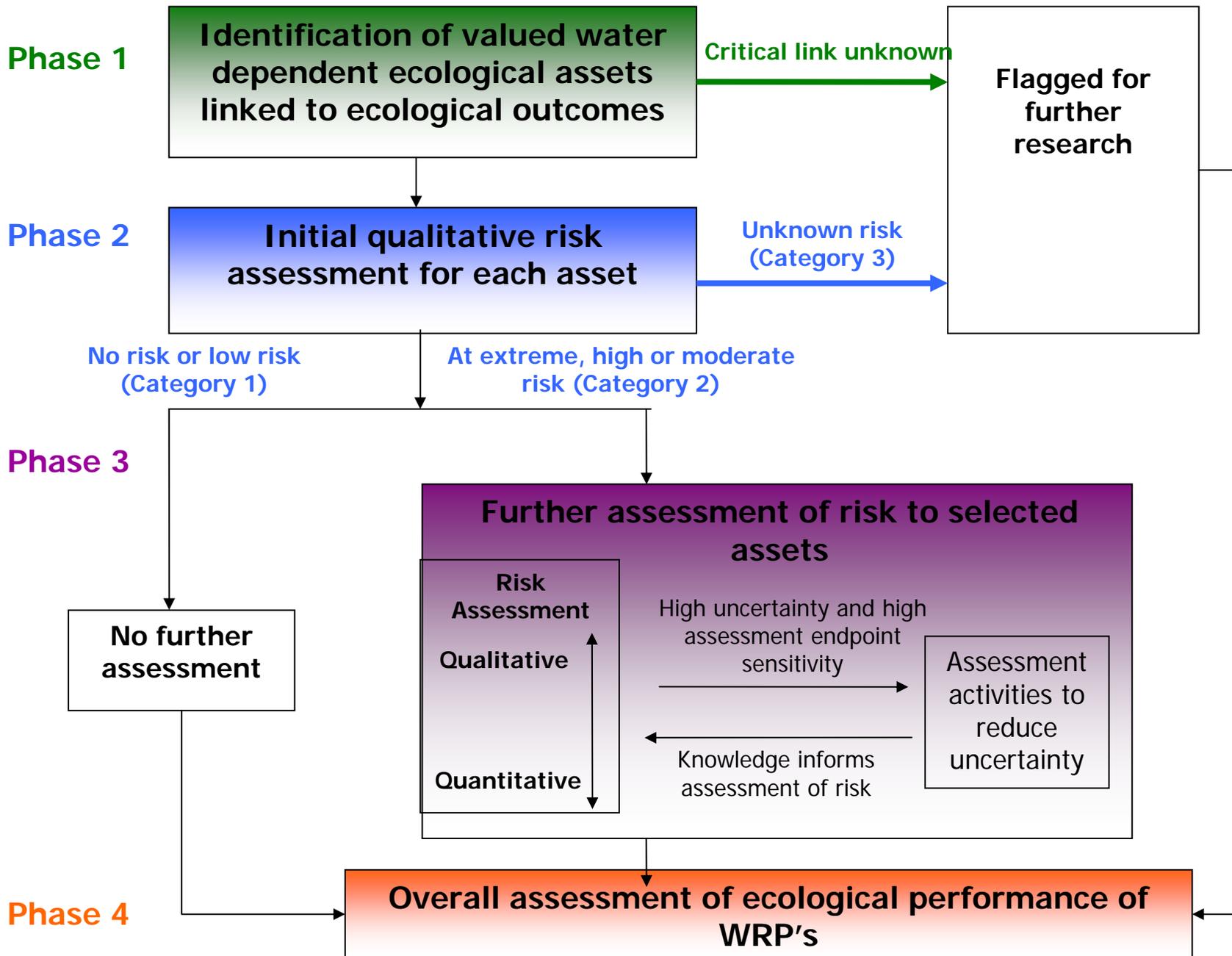
Assessment Framework Principles

- Explicit about what we are evaluating – ‘ecological assets’
- **Risk** to the long-term viability of assets as assessment endpoint
- Assessment based on meeting **critical** habitat needs



Phases of Assessment Framework

1. Identification of 'ecological assets'
2. Initial qualitative risk assessment
3. Detailed risk assessment
4. Overall assessment





Ecological Assets

- Species, group of species, biological function, place of natural value
- Need to be explicit to better quantify ecological outcomes

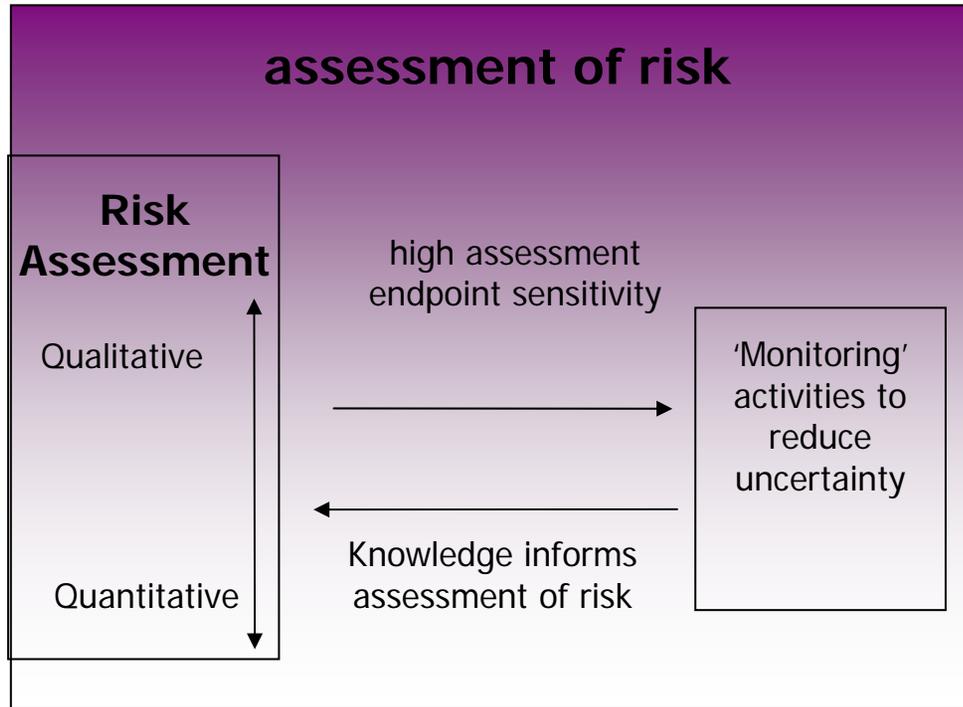


Assessing Risk to Ecological Assets

- Assessment based on predicted risk to ecological assets **from flow management** (provision of hydraulic habitat)
- Varying degrees of quantification
- Trialling use of Bayesian Belief Networks



Phase 3

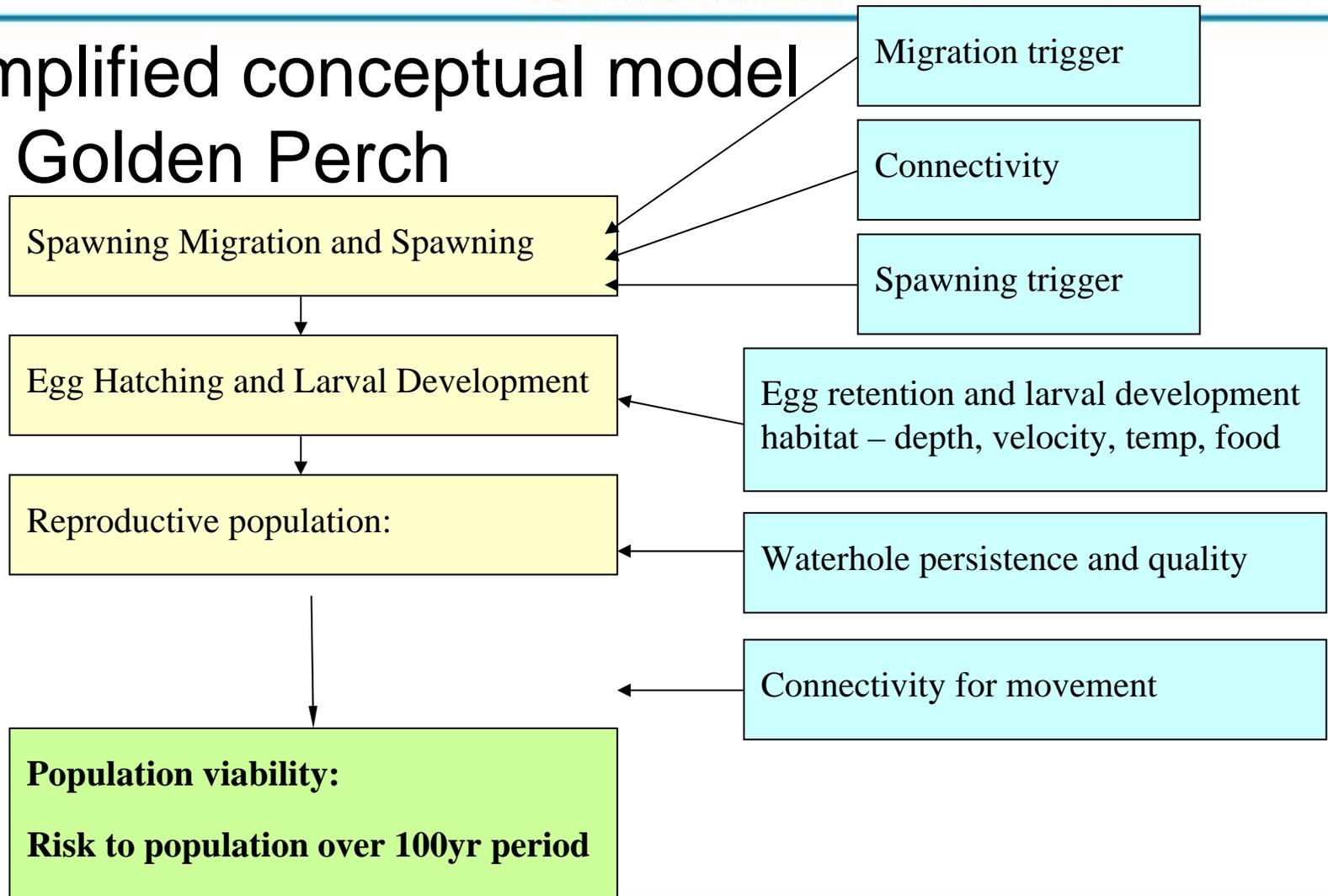


Phase 4





Simplified conceptual model for Golden Perch





Nature of the Monitoring Program

1. To clarify the **critical** water requirements of the assets
2. To determine the risk to ecological assets





Advantages of overall approach

- Use of best available scientific knowledge
- Isolate the influence of flow management
- Not only a tool to assess if currently meeting outcomes but can look at alternative scenarios
- Identify critical knowledge gaps





Challenges for implementation

- Knowledge gaps
- Combining risk for assets
- Spatial and temporal scale
- Estimating hydraulic habitat across large areas of Queensland
- New approach - Communication of approach



For more information – see other presentations

- Satish Choy– Historical perspective
- Norbert Menke – Bayesian Belief Network
- Minna Tom (Poster) – Hydraulic habitat estimation
- Andrew McDougall (Poster) – Regional implementation perspective