

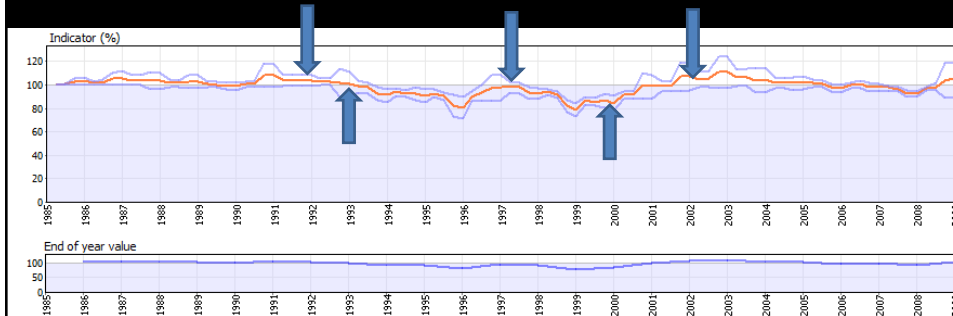
**Council Study BioRA  
Herpetofauna: Interpretation of  
results**

Technical workshop  
15-19 February 2016  
*OSP*  
Presented by Hoang Minh Duc

## Objective

- To illustrate how the DSS reacts to hypothetical scenarios
- To test the response curve under extreme conditions (floods and droughts)
- To adjust individual response curve, if necessary

## Response curve: Aquatic serpent at FA3



- Abundance of aquatic serpent is predicted “increase” in high flood volume years
- Abundance of aquatic serpent is predicted “decrease” in low flood volume years
- The abundance range between 82% to 110% base year.

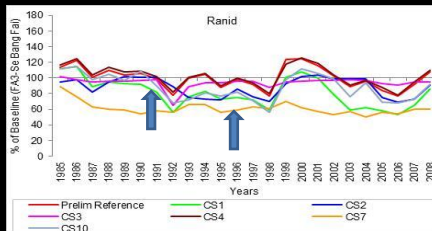
## Calibration scenarios

Scenario	Description	Prediction
CS1	High dry season flow, low wet season flow	Relative increase
CS2	6 dry years, followed by 6 wet years	fluctuation
CS3	A shortened wet season	Severe effect
CS4	Sediment supply at 75% of Preliminary Reference	Relative decline
CS5	Migration blocked between FA1 and FA2 ONLY	Relative decline
CS7	Extreme dry year (1992 – 10%) repeated for whole sequence	Severe effect
CS8	Migration blocked between FA4 and 5 ONLY	Relative decline
CS9	Migration blocked between FA1 and 2 <u>AND</u> between FA4 and 5	Relative decline
CS10	Sediment supply at 25% of Preliminary Reference	Relative decline

## Preliminary results: calibration scenarios

### Ranid at FA3:

- Ranid links
  - Dry duration
  - Wet season onset
  - Wet season duration
  - Sediment concentration
  - Average channel velocity
  - Biomass riparian vegetation
  - Biomass algae



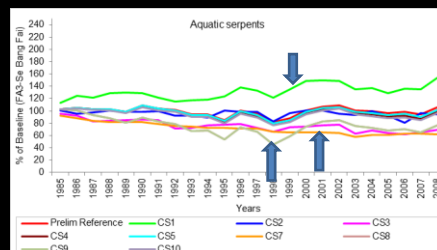
CS3: short wet season duration cause slightly decrease in abundance of Ranids

CS7: extreme dry year cause severe decline of Ranids' abundance

## Preliminary results: calibration scenarios

### Aquatic serpent at FA3

- Links
  - Flood volume in flooding season
  - Wet season average channel velocity
  - Biomass riparian vegetation
  - Fish Biomass

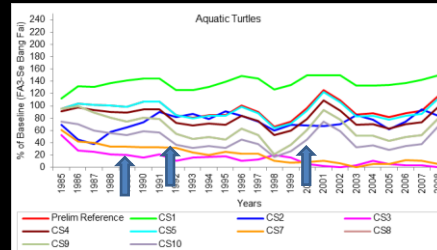


- CS1: low increase (33%)
- CS3 & CS7: sharply decrease (-41% and -52% relative to reference)
- CS9: slight decrease (-18% fish biomass)

## Preliminary results: calibration scenarios

### Aquatic turtle at FA3:

- Aquatic turtle links
  - Wet duration
  - Erosion
  - Exposed sandy habitat in the dry season
  - Extent of grassland vegetation
  - Fish biomass



CS3: short wet season duration cause dramatic decrease in abundance of Aquatic turtle

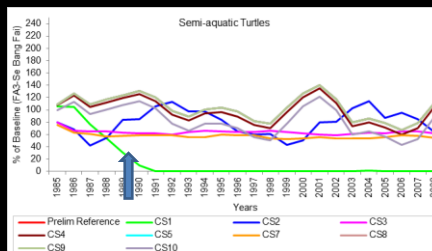
CS7: extreme dry year cause severe decline of Aquatic turtle's abundance

CS10: less sediment cause -40% decrease in aquatic turtle relative to reference

## Preliminary results: calibration scenarios

### Semi-Aquatic turtle at FA3:

- Aquatic turtle links
  - Wet duration
  - Dry max. rate of change
  - Dry max channel depth
  - Wet season duration
  - Erosion
  - Extent riverbank vegetation

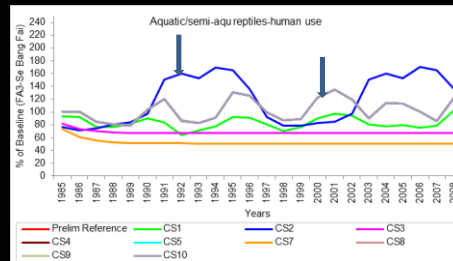


- CS1: High dry season flow & low wet season flow cause severe effect on semi-aquatic turtle

## Preliminary results: calibration scenarios

### Reptiles for human use at FA3:

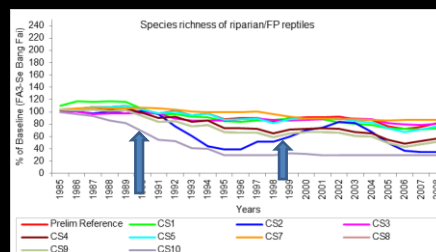
- Links
  - Flood volume
  - Wet season maximum floodplain depth
- CS2: big fluctuation in amount of reptiles that are available for human exploitation (increase 17%)
- CS7: it predicted a decline in amount of reptiles (-25%)



## Preliminary results: calibration scenarios

### Species richness of Reptiles at FA3:

- Links
  - Wet season onset
  - Wet max rate of change
  - Erosion
  - Biomass riparian vegetation
  - Fish biomass
- CS2: it showed a fluctuation in species richness of reptiles, general trend is decline (-11%)
- CS10: it predicted a decline in number of reptile species (-18%)



# Calibration results

Percentage change from reference for every indicators

Indicators	Calibration Scenarios									
	CS1	CS2	CS3	CS4	CS5	CS7	CS8	CS9	CS10	
Discipline : Herpetofauna										
Ranid	-13.1	-9.2	-3.3	3.2	0.8	-34.5	0.8	0.8	-10.0	
Aquatic serpents	33.9	-7.1	-41.7	-6.8	-3.0	-52.8	-18.5	-18.5	-8.9	
Aquatic Turtles	33.3	-32.4	-80.7	-21.4	-8.1	-77.9	-28.7	-28.7	-47.7	
Semi-aquatic Turtles	-83.8	-18.6	-32.2	-2.4	2.2	-37.7	2.2	2.2	-12.6	
Amphibians-human use	0.5	-1.0	-7.3	0.5	0.5	-8.5	0.5	0.5	0.5	
Aquatic/semi-aqu reptiles-human use	-13.8	17.2	-25.6	2.6	2.7	-38.1	2.7	2.7	2.6	
Species richness of riparian/FP amphibians	-14.0	-11.2	11.2	2.8	2.7	0.8	2.7	2.7	-18.1	
Species richness of riparian/FP reptiles	-2.1	-35.9	-11.3	-23.2	-8.1	-16.6	-23.1	-23.1	-49.8	

## Herpetofauna integrity for all scenarios and sites

- CS3 (short wet season) and CS7 (extreme dry) showed the largest relative effects on Herptiles

