



3rd SUMMIT

Siem Reap, Cambodia | 2-5 April 2018

ONE MEKONG | ONE SPIRIT

The MRC Council Study: Environment Impacts of Water Resources Development in the Lower Mekong Basin

So Nam

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47 Biophysical Indicators

Geomorphology (6)

- Erosion
- Bed sediment size
- Sandy habitat
- Rocky habitat
- Depth of bedrock pools
- Water clarity

Vegetation (6)

- Riparian trees
- Bank vegetation cover
- Herbaceous marsh
- Weeds and grasses
- Flooded forest
- Grassland vegetation

Macroinvertebrates (8)

- Burrowing mayflies
- Snail abundance
- *Neotricula aperta* abundance
- Bivalve abundance
- Polychaete worms
- Shrimps and crabs
- Diversity
- Emergence

Herpetofauna (4)

- Ranid amphibians
- Aquatic serpents
- Aquatic turtles
- Semi-aquatic turtles

Fish (11)

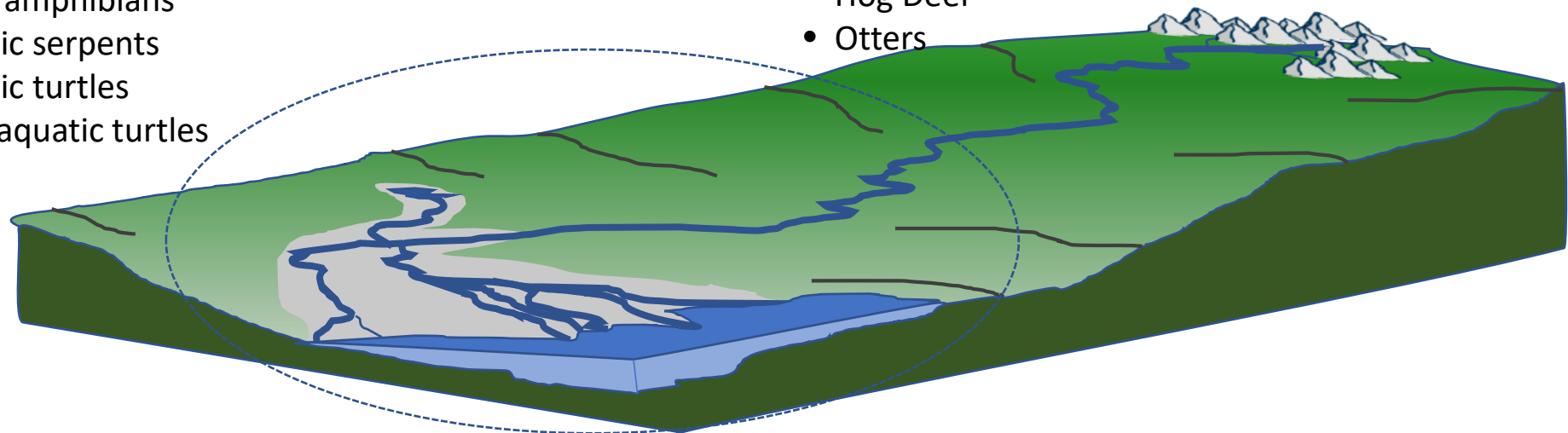
- Rithron residents
- Main channel residents
- Main channel spawner
- Floodplain spawner
- Generalist species
- Floodplain resident (black)
- Estuarine species
- Anadromous species
- Catadromous species
- Marine visitor species
- Non-native species

Birds (9)

- Medium/large ground-nesting channel species
- Tree-nesting large waterbirds
- Bank-/hole-nesting species
- Flocking non-aerial passerine of graminoid beds
- Large ground-nesting species of floodplains
- Large species using bank-side forest
- Rocky-crevice nester in channels
- Dense woody vegetation / water interface
- Small non-flocking using seasonally-flooded plants

Mammals (3)

- Mekong dolphin
- Hog Deer
- Otters



Development Scenarios Assessed

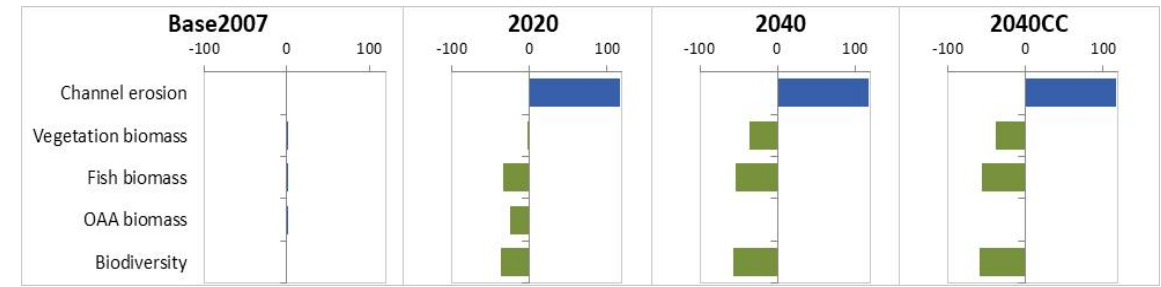
- Four main development scenarios:
 - 2007, 2020, 2040, 2040CC
- Thirteen sub-scenarios
 - Variations in climate change, agriculture and land use, irrigation, flood protection, navigation and hydropower*
- For each BioRA zones (1-8)
- Change reported relative to 2007 Baseline using DRIFT DSS



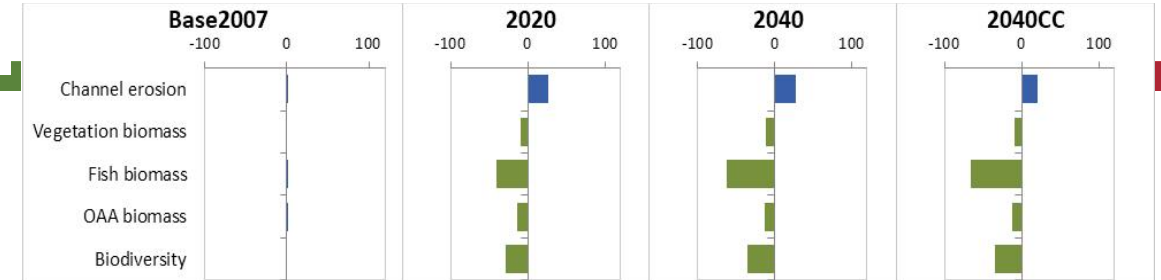
Change in key indicators

- Increased:
 - ✓ Channel erosion
 - ✓ OAAs
- Decreased:
 - ✓ FP sedimentation
 - ✓ Vegetation biomass
 - ✓ Fish biomass
 - ✓ Biodiversity

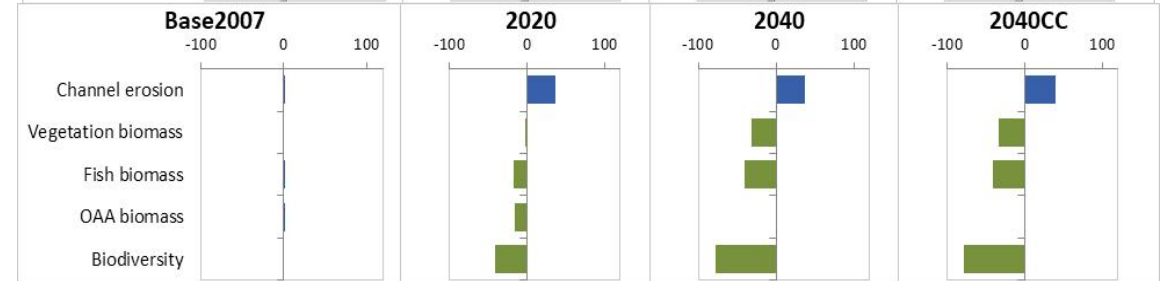
Zone 1



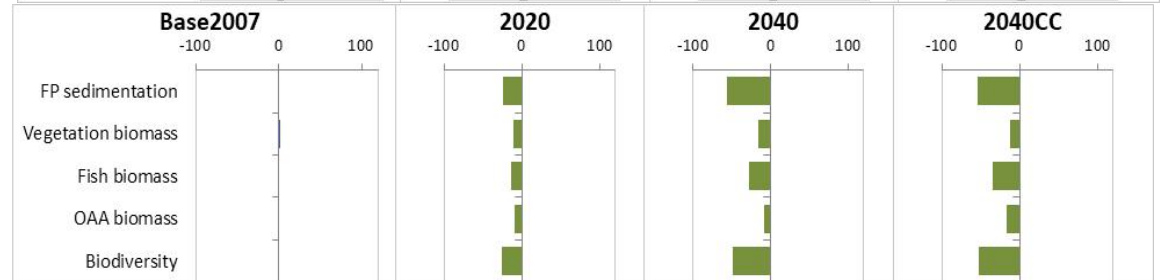
Zone 3



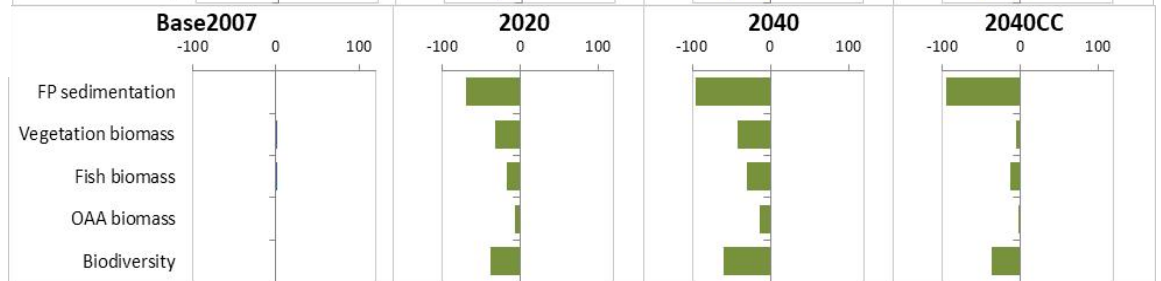
Zone 5



Zone 7

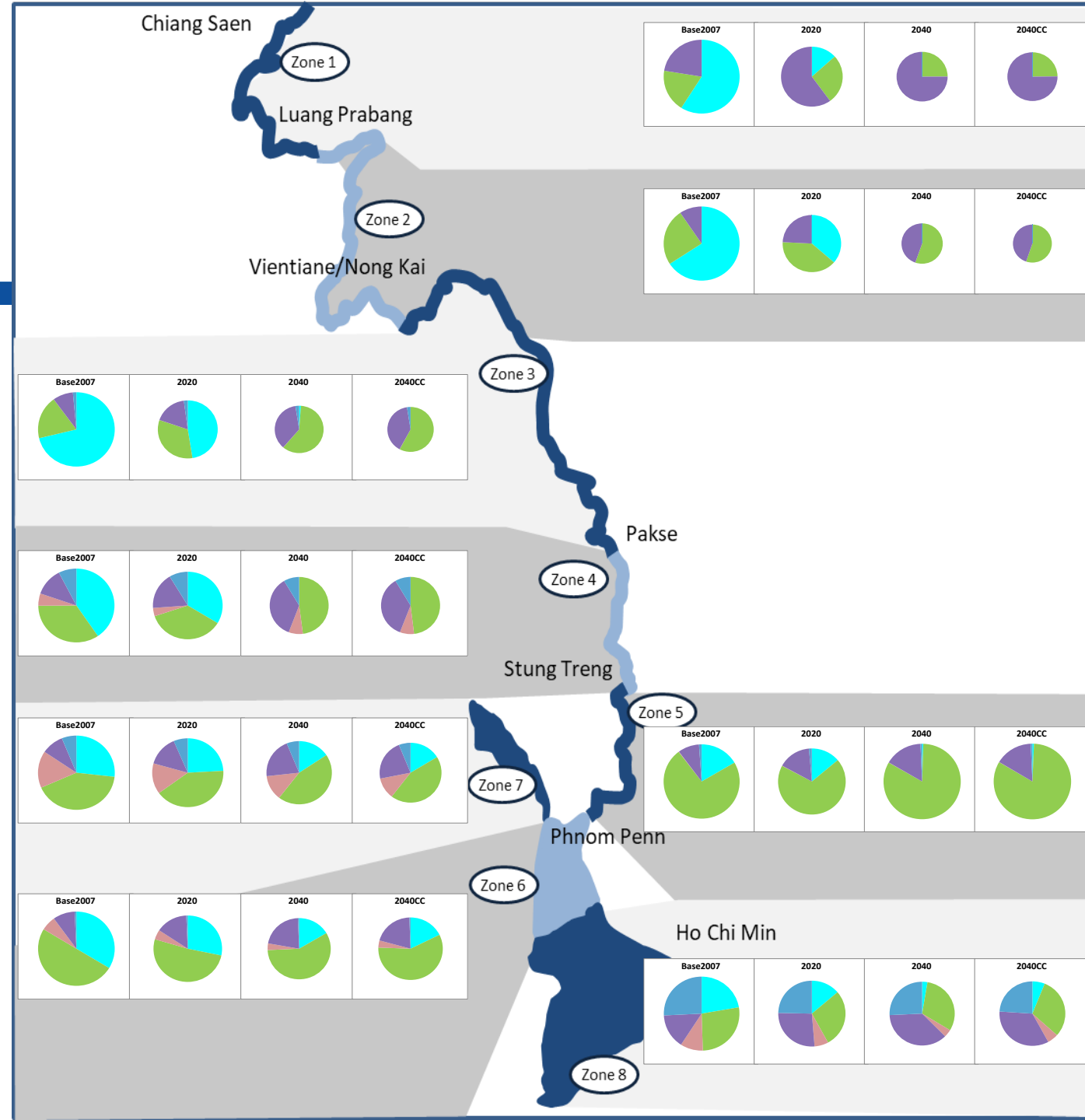


Zone 8

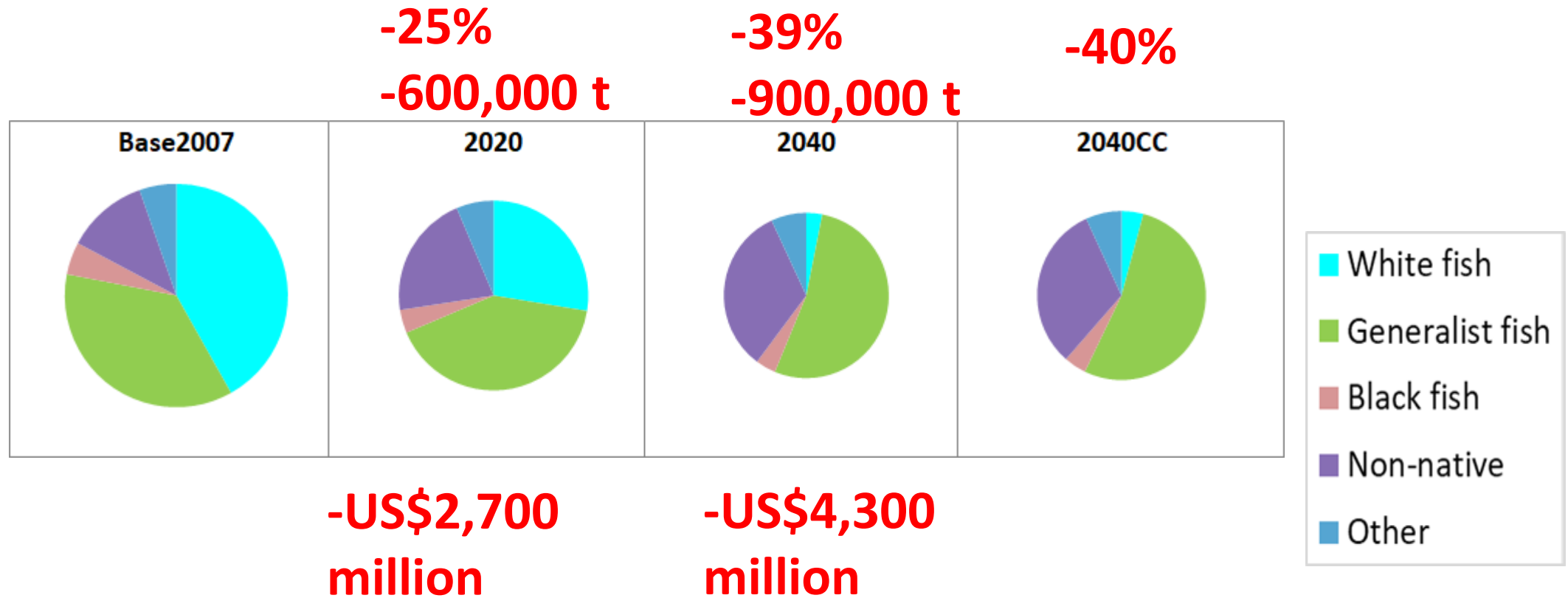


Fisheries

- ✓ Fish biomass drops
- ✓ White fish lost
- ✓ Generalist fish increase
- ✓ Alien fish dominate

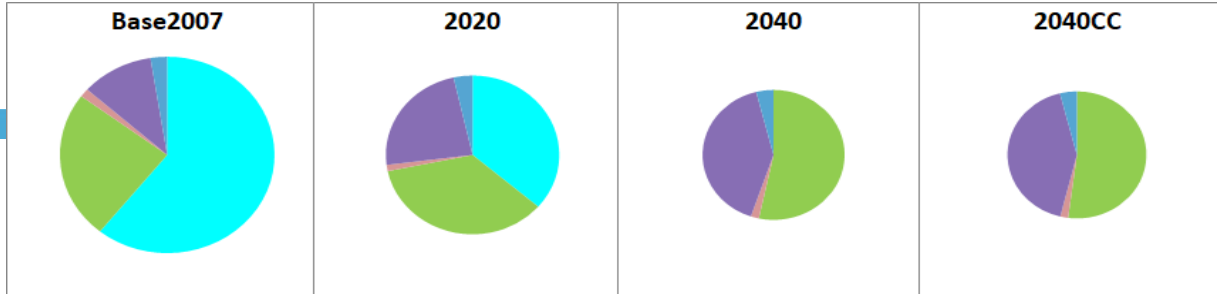


Fish Biomass- Whole LMB



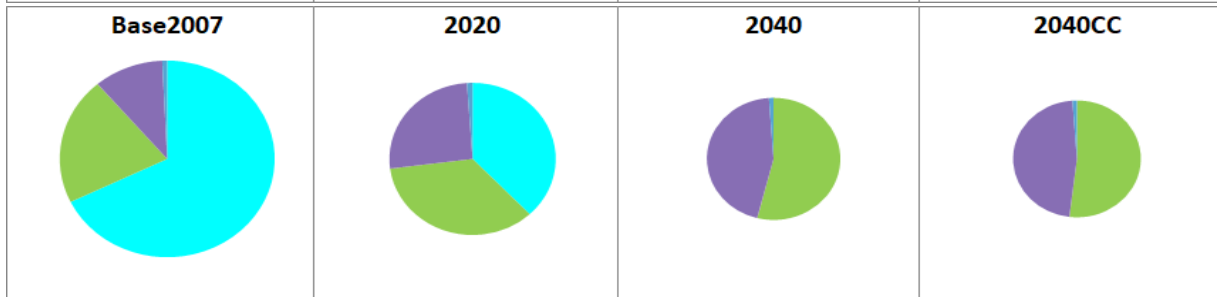
Fish Biomass- Country level

Lao PDR



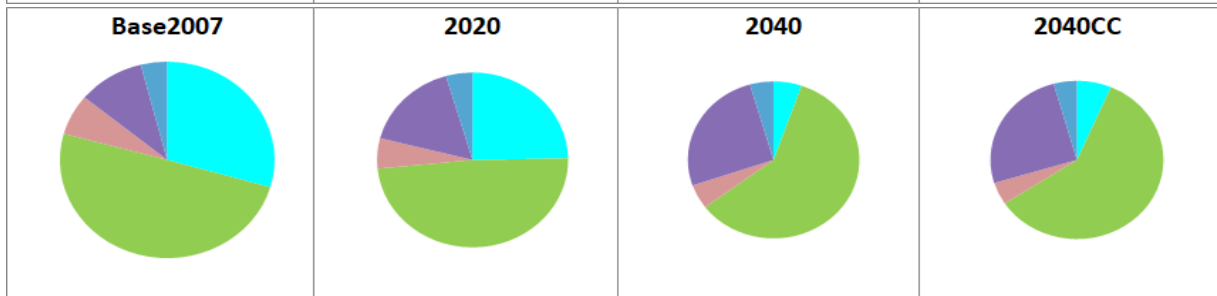
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Thailand



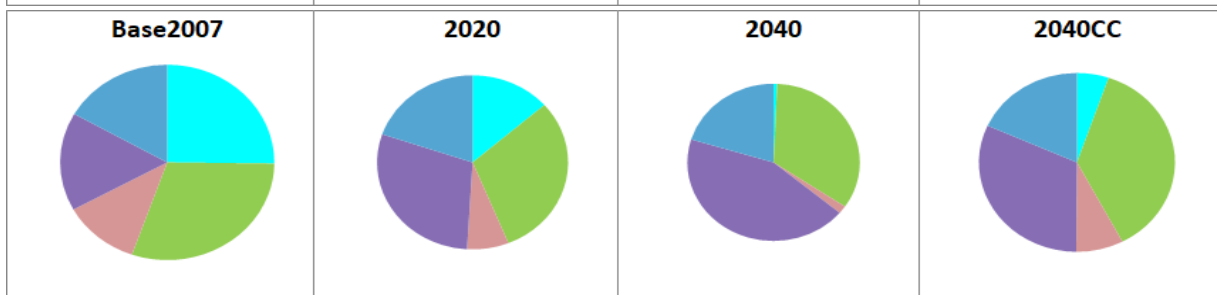
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Cambodia

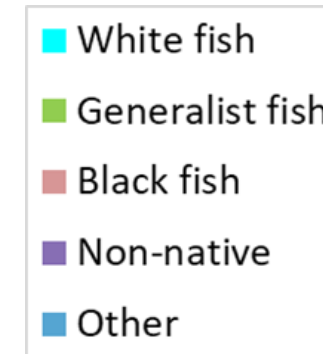


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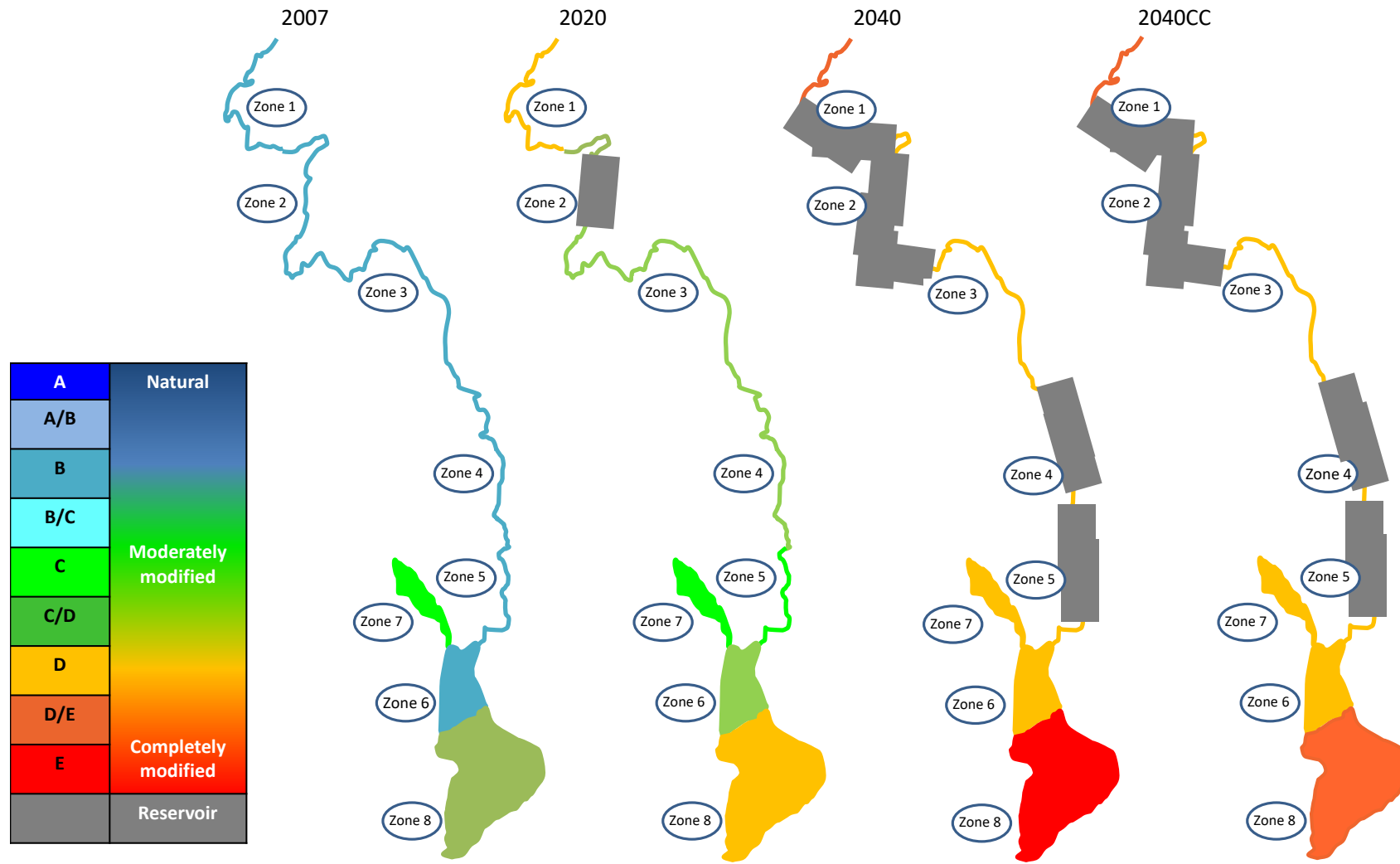
Viet Nam



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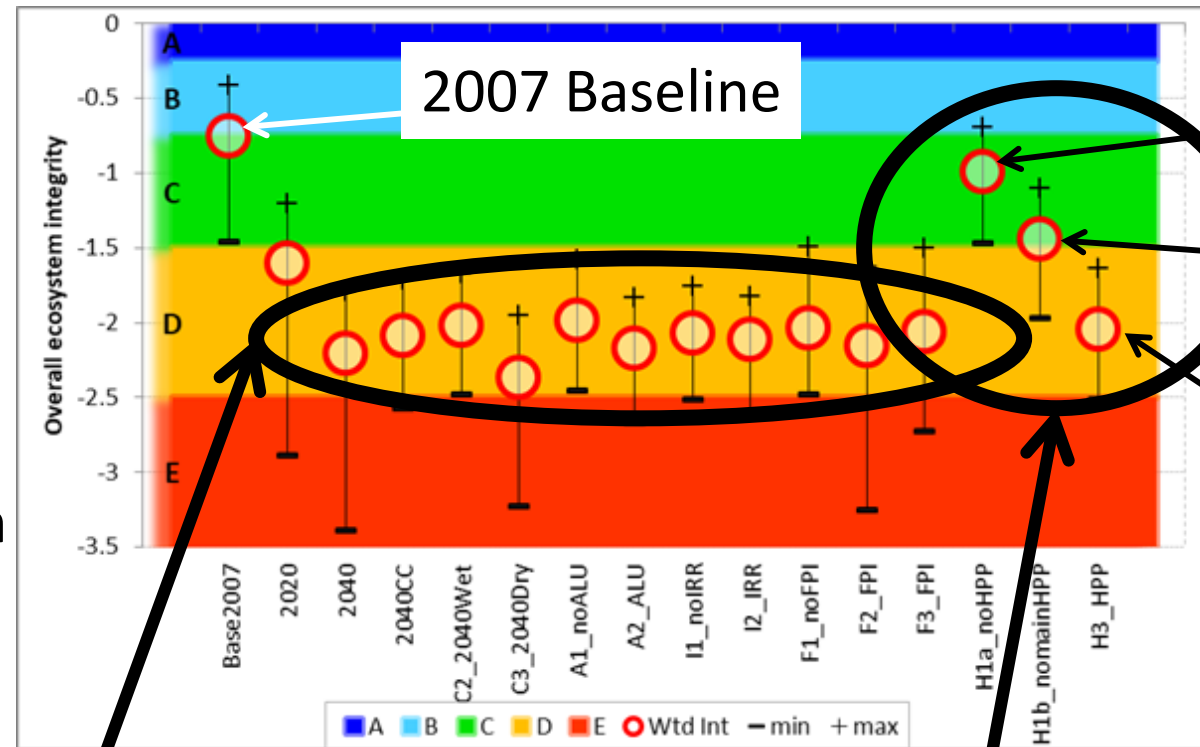
Overall Ecosystem Condition



Ecosystem Health vs Sub-Scenarios

Excellent health

Poor health



No HPP

No mainstream dams

HPP with mitigation

Changing hydropower developments significantly affects impacts

Impacts of most sub-scenarios similar to those for 2040

Conclusions

1. Significant loss of biodiversity and biomass (fisheries and OAAs) with 2040 developments.
2. Hydropower impacts overshadow those of all other planned water-resource developments in the LMB.
3. Wetter climate will mitigate some of the ecological impacts associated with the Scenario 2040, but only slightly.
4. Drier climate future will exacerbate the ecological impacts especially in the Tonle Sap System.
5. Resilience of the LMB aquatic ecosystems to climate change reduced by the developments in Scenario 2040.
6. The extent of floodplain protection infrastructure is expected to have a noticeable negative impact on ecosystem functioning, particularly in the lower parts of the LMB.