Exploratory results

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Objective

Produce a series of figures that help validate population projection results.

Question

Is *Podocnemis unifilis* an Endangered species?

To answer this question we use population projection matrices to understand the future impacts of current threats to populations. This is an extension of Norris et al 2019 that includes:

- stochastic population projections
- threats caused by human acessibility and actions that reduce river connectivity.

According to the IUCN Redlist criteria A3, population size reduction is a reduction which is projected, inferred or suspected to be met in the future (up to a maximum of 100 years). Here we use population projection matrices to obtain an index of abundance relevant to the taxon ("b") and consider actual or potential levels of exploitation ("d").

This assessment is therefore based on criteria - A3bd.

Load packages and data

Packages

```r
library(tidyverse)
library(sf)
library(patchwork)
```

Results

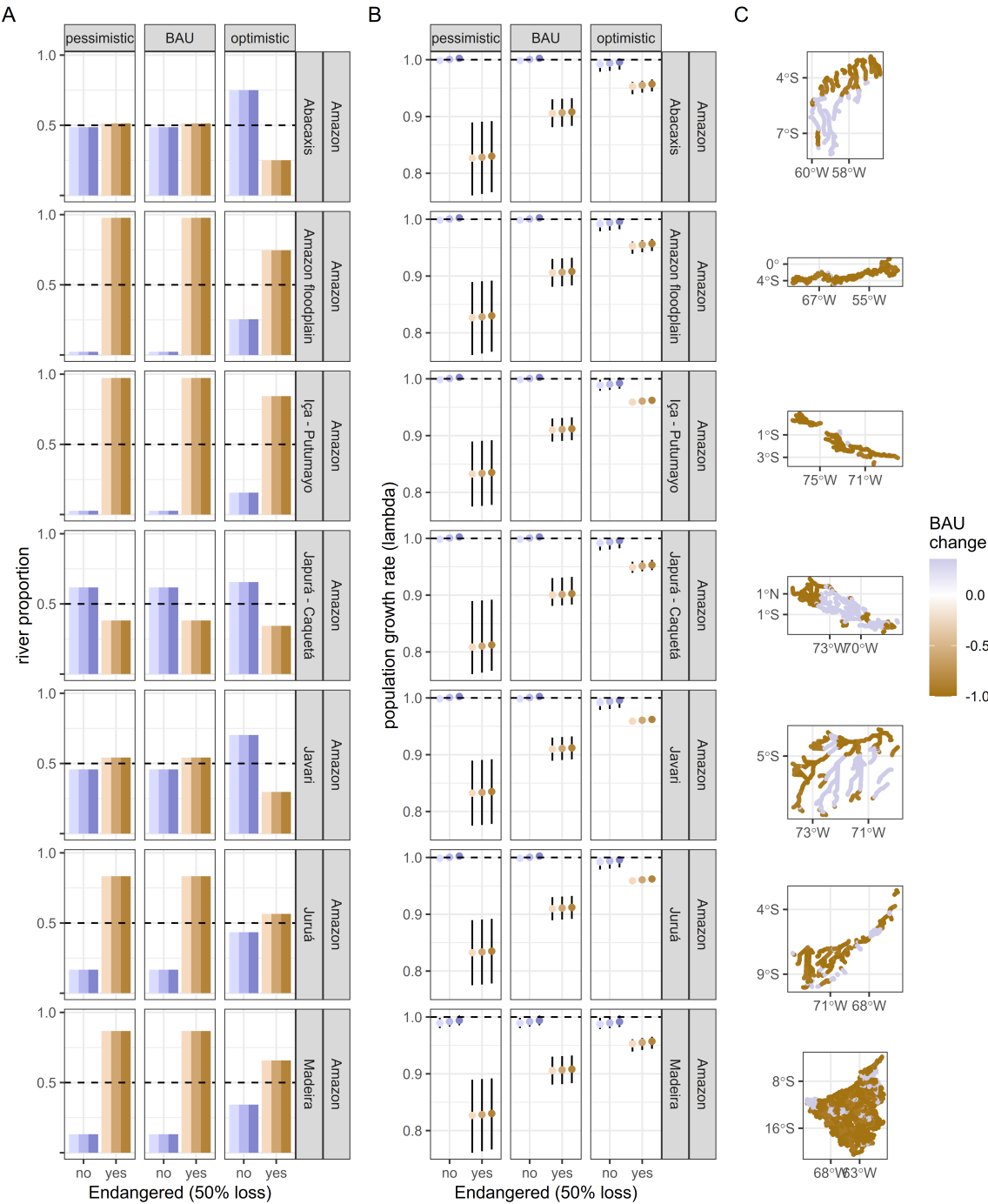For each basin and subbasin there are composite figures that show:

- Projected population changes.
- Projected growth rates.
- Maps of points with 50% population reductions over three generations.

This is a wide ranging species, so it takes several pages to show all the results. Projections are shown by river basin and include the major sub-basins.

Amazon

Now plot.

Population change 42 years (3 generations lower estimate)

Population change 42 years (3 generations lower estimate)