

New Look Q2

Colin Dassow and Chelsey Neiman

10/30/2020

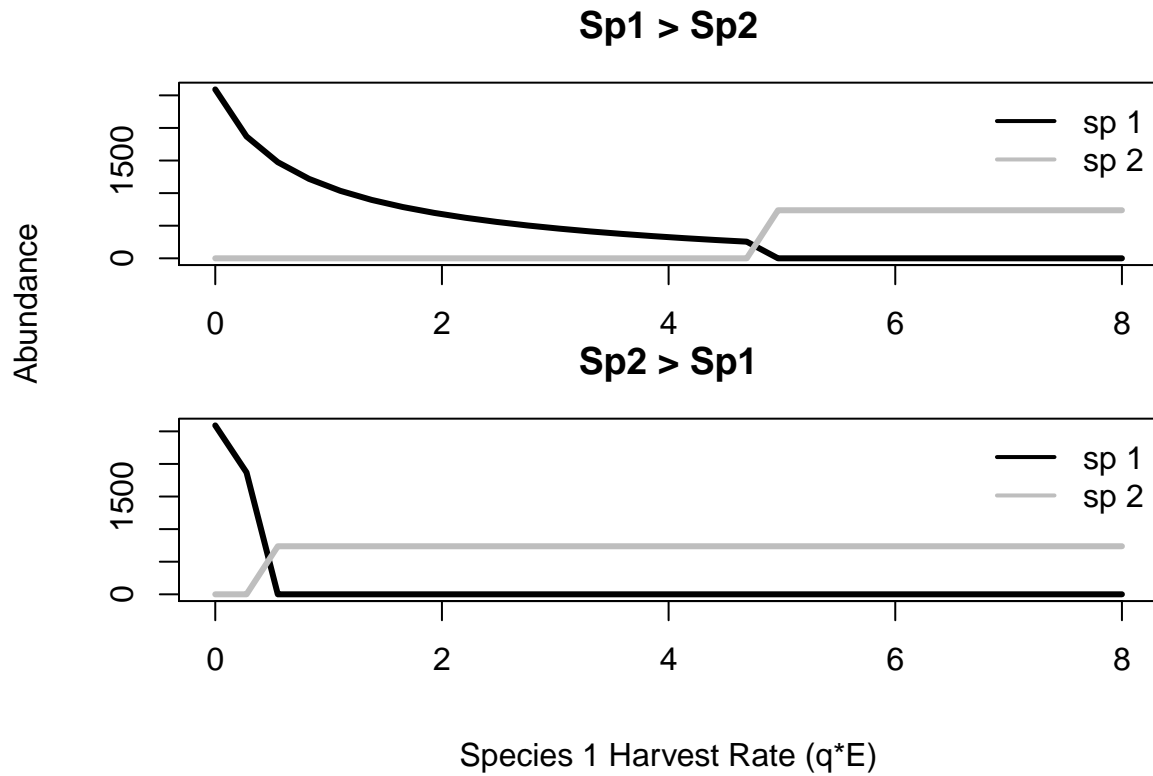


Figure 1: Figure 1. Model run to equilibrium over a range of harvest parameters for species 1, species 2 harvest is held constant at 1.8. No stocking. Top panel shows equilibrium abundances for the range of harvests when species 1 is initially dominant. Bottom panel shows equilibrium abundances for the range of harvests when species 2 is initially dominant.

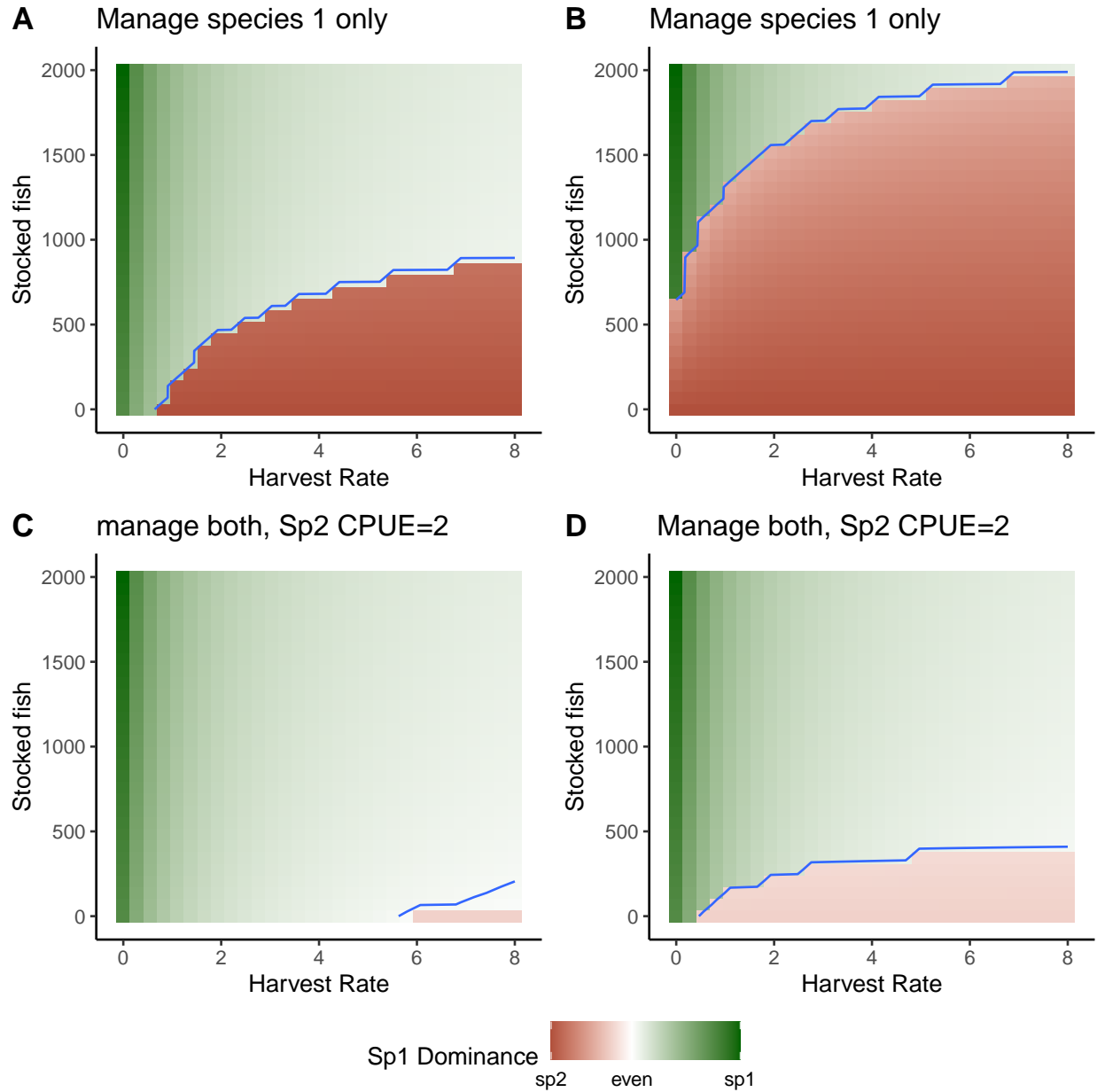


Figure 2: Figure 2. Effect of ‘multispecies’ thinking on either maintaining sp1 dominance (A&C) or flipping to a state where sp 1 dominates (B&D). This is described for systems where a manager manages only the focal species (A&B) or both species (B&D). Green = sp1 > sp2, red = sp2 > sp1. Blue line marks boundary where sp1 > sp2 by at least 100 individuals. This is shown as an example of what a manager may care about, not just that sp1 is a little more abundant than sp2 but that the difference meets some minimum requirement.

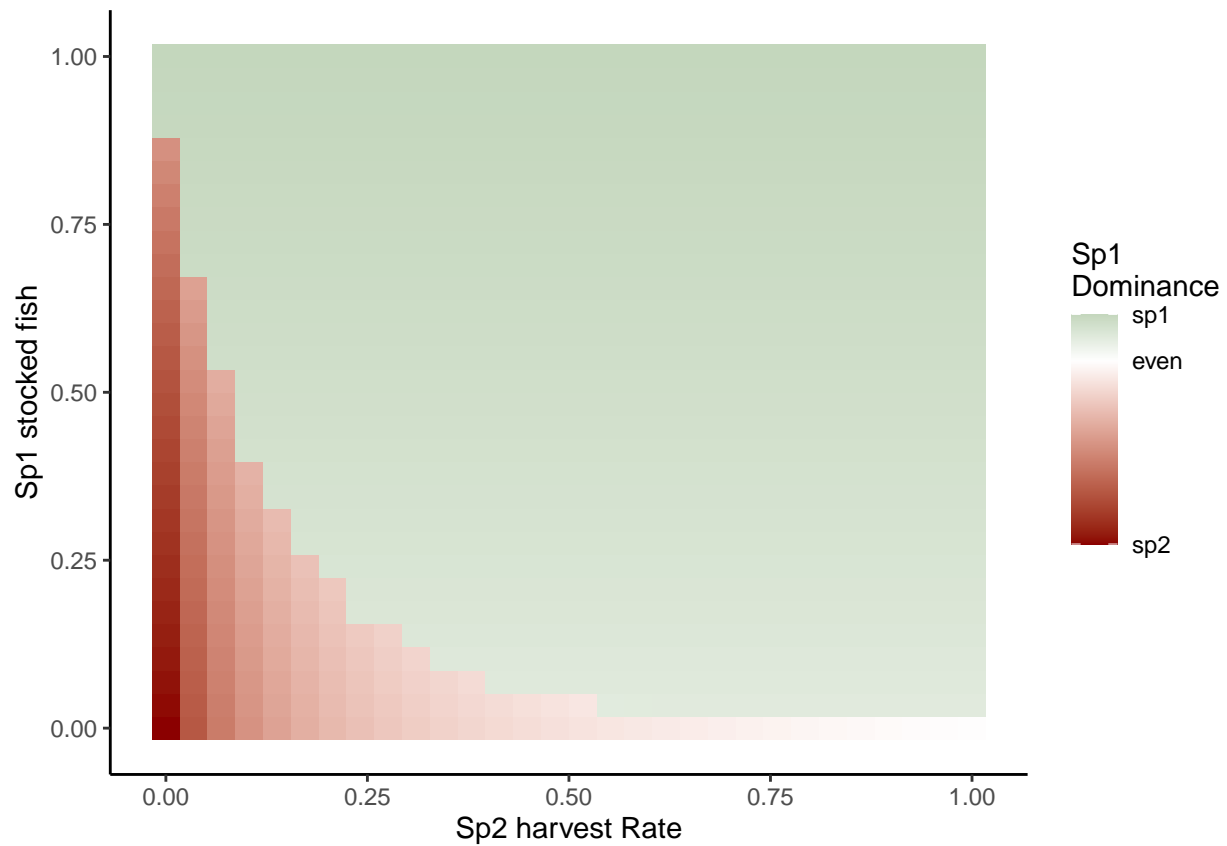


Figure 3: Figure 3. Differences between species 1 and 2 at equilibrium. Here managers can stock species 1 (y axis) or increase harvest on it's predator (species 2, x axis). I was trying to show that adding harvest of sp2 in makes it much easier to reach management goals. I held sp1 harvest constant at 4. If you look at panel B from the previous figure you see that with no amount of stocking at a harvest of 4 should we be able to flip a system from sp2 to sp1 dominant. Here we see that if you add some harvest of sp2 in addition to stocking then you can stock less or stock just as much but tip the scales farther towards sp1. Not sure if this is the best way to vizualize this but it's a start.

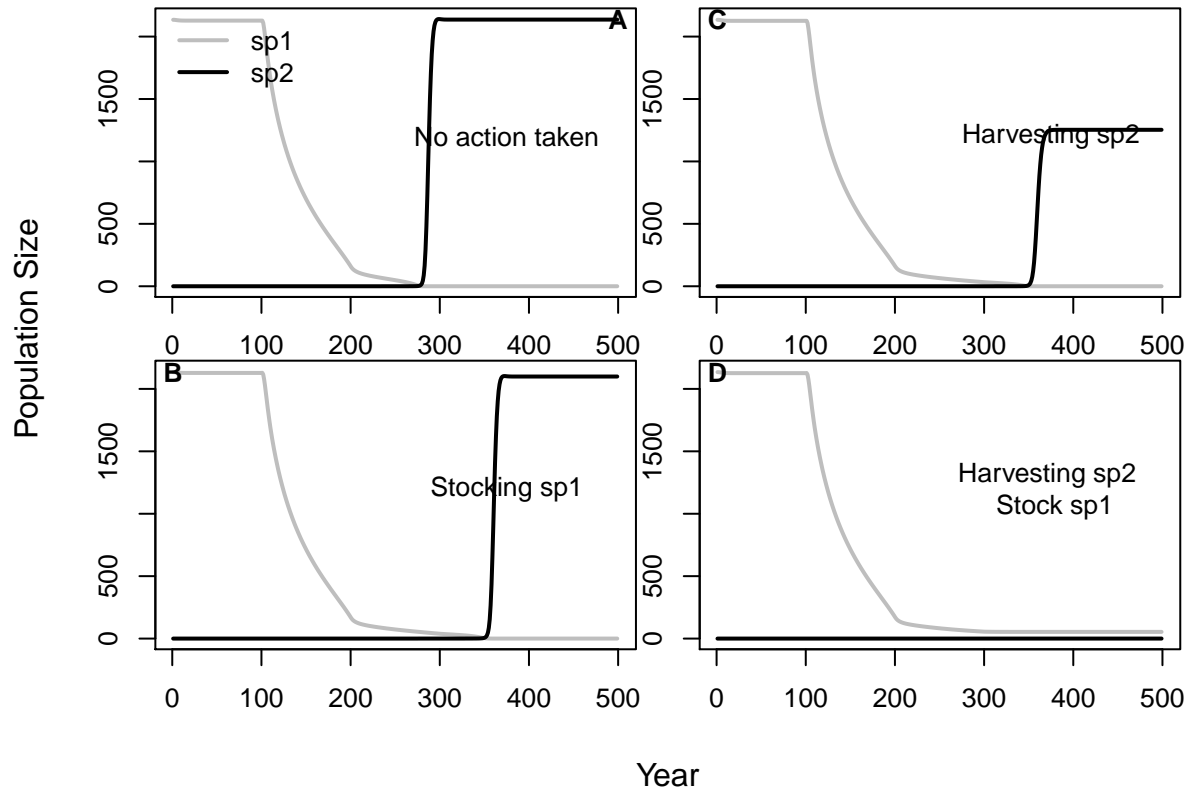


Figure 4: Figure 4. Delaying a transitions. Slow moving variable 'h' represents changing habitat availability which will inevitably flip system from sp1 dominated to sp2 (panel A). The flip in system state can be delayed through either stocking of the desired species (panel B), harvest of it's competitor (panel C), or perhaps prevented altogether by stocking and harvesting (panel D).