

April 5, 2019

Phone call with Jerod Merkle

Breeding Season Date: July 1 – Aug 31

Management: Nov 15 – March 31

In the Diads pdf: the size of the line is how much time each individual spent together. The color of the dots: greener – northern range, brown – central, white – both. The coloration is based on the annual location. Using a function to make a pretty network – so the display is not in anyway spatial tendency.

- In analyzing the data, Ger mentioned that it may be a red flag that animals were collared in Nov-Dec. So how do you deal with the first six months of every collar. Jerod says we should revisit this down the road, once we define the networks.

The word document and all the figures (other than the initial diad pdf) is for years 2007-2017 (when good data on both ranges).

In figure 1: Shows that during the breeding season, basically, if you are in the northern range you spend a lot more time together with your cluster. Much more dispersed during the rest of the year. Also shows that rarely do we have any animals that spend more than 30% of the year together.

In figure 2: A few individuals that are mixed. The overwhelming majority are north or central

Starting with Figure 3, diving into network things: Top left (number of collars per year), Top right On annual data, did a clustering algorithm on every network. Most years there are two clusters on annual data. In 2009 – suggested a third cluster. Two individuals that spent a lot of time together and between the two areas. Bottom left: Edge density – what % of the possible connections between diads are actually realized. This plot is showing that on average, about 50-60% of the possible connections are there. This could suggest that there is mixing in between herds – we need to check the relative proportion of collars in each “area.” Jerod will keep looking into edge density. Bottom Right: Eigen vector centrality is a measure of how connected an individual is to the rest of the network. This showed a relationship over time. Average centrality has gone down – the population is messy today.

Figure 4: Let's not look at figure 4 for now. ID's should be ID-Years

Individual networks pdf: Looked at all individuals collared 3+ years 2007-2017. Removed 2008 b/c bad sample sizes. There are 34 animals we can look at this with. 20 animals have 5+ years. Degree is number of connections, betweenness is the number of paths that connect networks – pulls out the animals in the middle of connecting the networks. Eigen centrality – a measure of whether the animals are in a cliché – if in middle of a cluster – have a high values, if in-between animal have a lower animal

Jerod think the next steps are:

- 1) We need to put our heads together and choose the very specific questions
- 2) Ger: are those with central herd genetics have highest betweenness?
- 3) Ger to look at genetics data in hand

Phone call on April 19th:

What effects an animal when she switched? Is there a sociality aspect? Then do they behave in their new cohort.