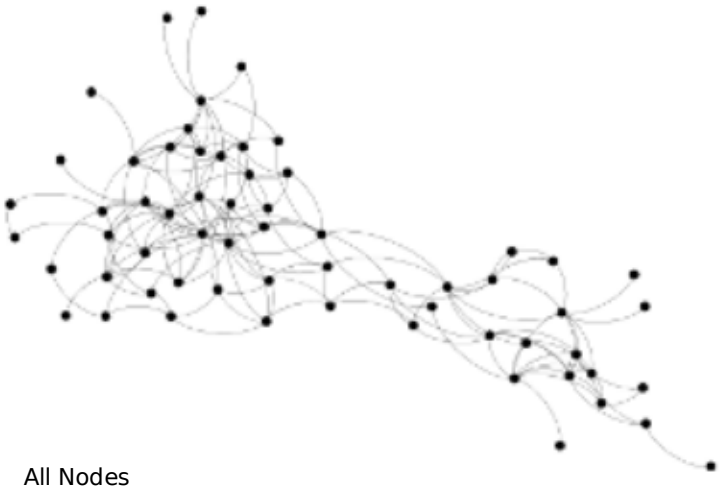
Hypothesis:

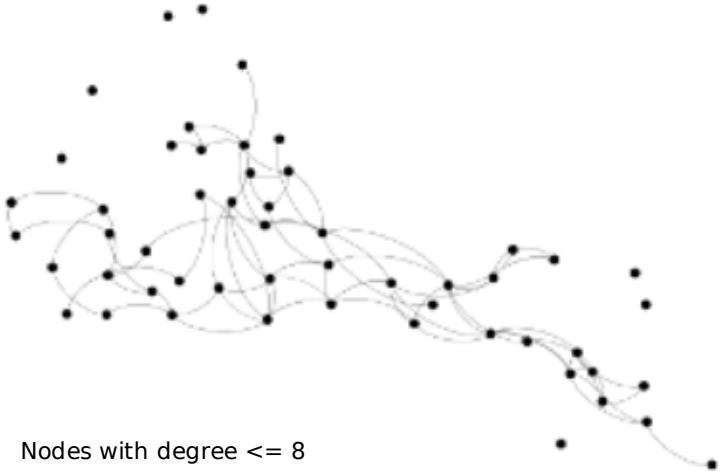
In a graph of the social network of dolphins removing the most highly connected nodes results in smaller disjointed networks.

Source: D. Lusseau, K. Schneider, O. J. Boisseau, P. Haase, E. Slooten, and S. M. Dawson, The bottlenose dolphin community of Doubtful Sound features a large proportion of long-lasting associations, Behavioral Ecology and Sociobiology 54, 396-405 (2003).

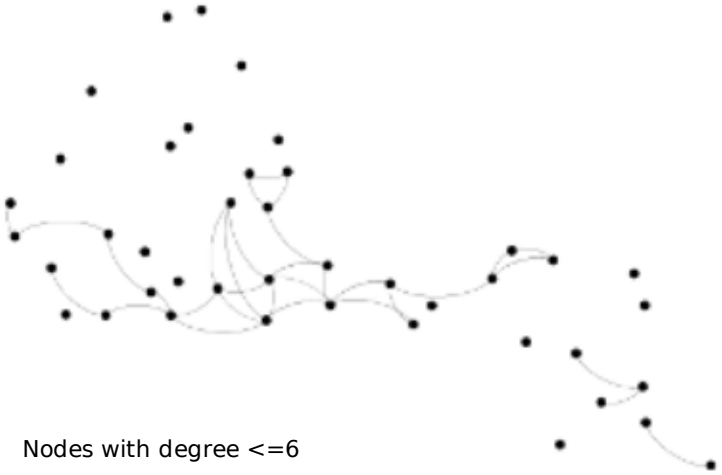


All Nodes

Nodes with degree <= 10



Nodes with degree <= 8



Nodes with degree <=6

About the Data: (David Lusseau)

The Doubtful Sound bottlenose dolphin population is small, 60–65 individuals, and resides year-round in this fjord (Williams et al.1993). I defined social acquaintances in the network as 'preferredcompanionships' (Connor et al. 2001),that is individuals that were seen together more often than expected by chance. Every time that a school of dolphins was encountered in the fjord between 1995 and 2001, each adult member of the school was photographed and identified from natural markings on the dorsal fin. This information was used to determine how often two individuals were seen together. To measure how closely two individuals were associated in the population (i.e. how often they were to be found together) I calculated a half-weight index (HWI) of association for each pair of individuals (Cairns & Schwäger 1987). This index estimates the likelihood that two individuals would be seen together compared with the likelihood of seeing any of the two individuals when encountering a school:

$$\mathrm{HWI} = \frac{X}{X + 0.5(Y_a + Y_b)},$$

where X is the number of schools where dolphin a and dolphin b were seen together; Y a is the number of schools where dolphin a was sighted but not dolphin b; and Y is the number of schools where dolphin b was sighted but not dolphin a.