Bombus jonellus

Change in Extent of Occurrence (EOO) in North America

Change in the extent of occurrence (EOO) in North America for *Bombus jonellus* is shown in Figure 1. To produce this map, the records for this species were divided into historical (1805-2001) and current (2002-2012) records. Since the historical database had significantly more specimen records, and therefore could lead to an overestimate of range loss due to an increased chance of including outlying records near the edge of each species' range, the historic data set was rarefied by randomly selecting 74,682 records from the historical time period to build EOO polygons.

To measure changes in each species' EOO, first a k-nearest neighbours approach was used to create local convex hulls for each species in each time period (Getz *et al*. 2007). After the local convex hull polygons were created, the polygons were clipped to the North American continent to remove large patches of unoccupied habitat (e.g., the Great Lakes). Sampling effort was also used to inform confidence in range loss. Areas that had been undersampled in the recent time period, relative to historic sampling effort, had the area of range loss adjusted down accordingly, to attempt to account for potential sampling error. Using the areas calculated from these polygons, the current area was compared with the historical area to determine changes in range size. These calculations, trends, published reports of bumble bee decline, were used along with the assessors' best professional judgement to evaluate the change in the species' population that is suspected to have occurred in the last 10 years. For more details see Hatfield *et al*. 2014.

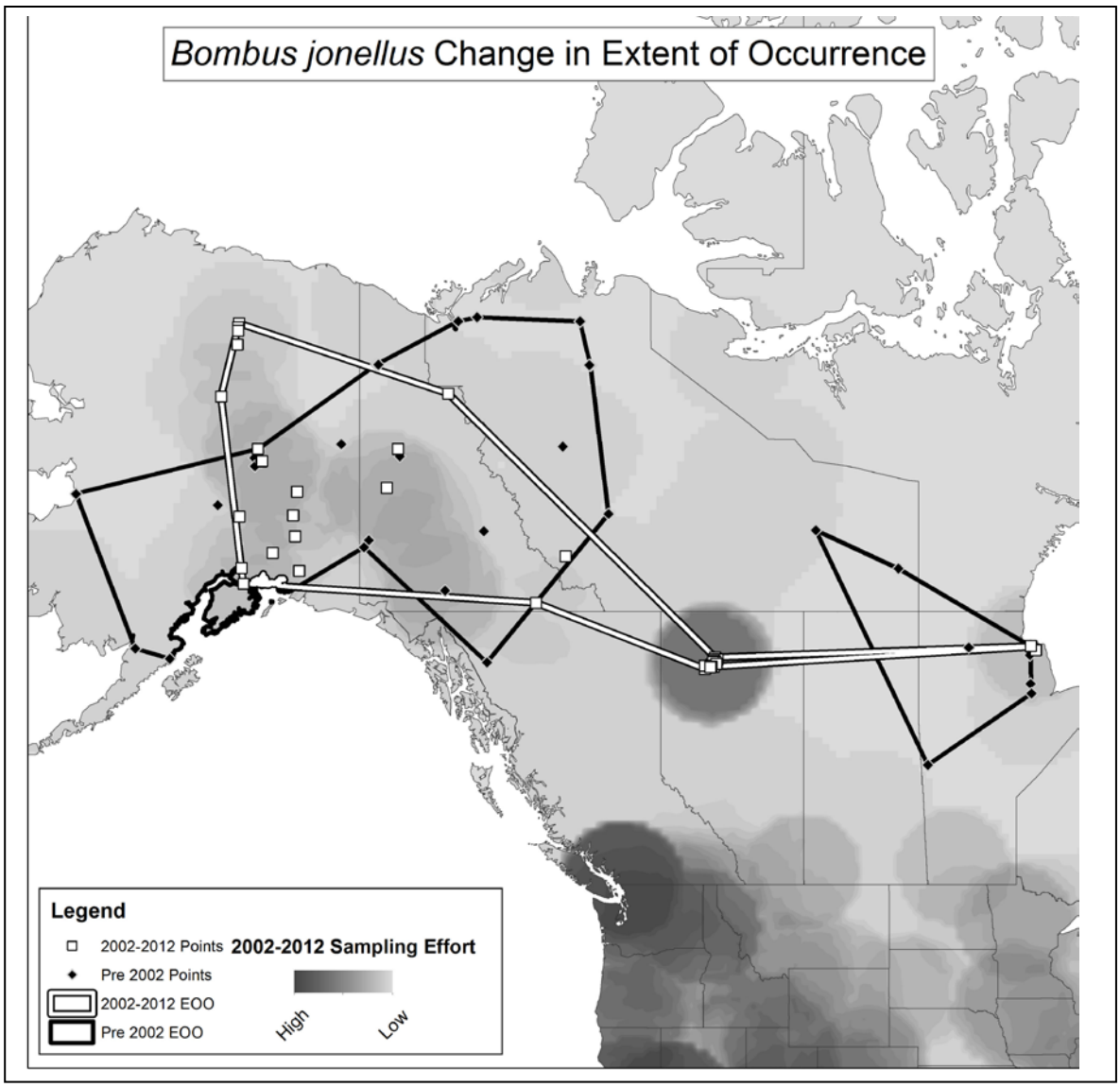

Figure 1. Change in the extent of occurrence (EOO) in North America for *Bombus jonellus*.

Abundance Trends in North America

Relative abundance trends in North America for *Bombus jonellus* are shown in Figure 2. For this calculation, the North American bumble bee database was divided into historical (1805-2001, N=128,572) and current (2002-2012, N=73,626) records and the relative abundance in the current time period was divided by the relative abundance in the historic time period. In addition, the relative abundance was calculated for each decade and the regression of relative abundance over time was examined to observe longer term trends. These calculations, trends, published reports of bumble bee decline, were used along with the assessors' best professional judgement to evaluate the change in the species' population that is suspected to have occurred in the last 10 years.

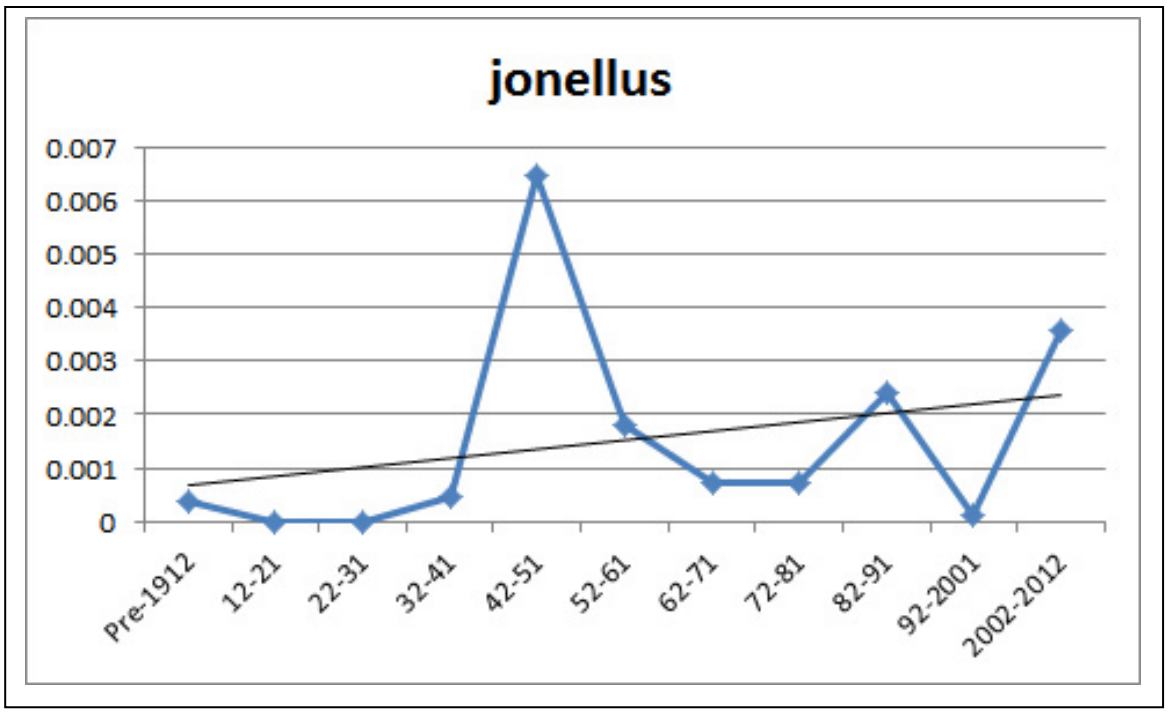

Figure 2. Relative abundance trends in North America for *Bombus jonellus*.