Table S1 Summary of data set for each year. Recordings were collected by a fixed hydrophone array (array), deployed autonomous recorders (recorder), or boat-based hydrophones (boat). 2006 and 2007 had small sample sizes due to a lack of high-quality recordings. Themes refer to the total number of themes used in that year.

Year	Collection	Singers	Song Cycles	Song Themes
2002	Array	6	36	7
2003	Array	7	36	6
2004	Array	8	36	6
2005	Boat	7	36	5
2006	Boat	2	12	6
2007	Boat	1	4	4
2008	Array	9	36	6
2009	Array	6	36	3
2010	Array	8	36	5
2011	Array	9	36	4
2012	Recorder	13	36	7
2013	Recorder	9	36	5
2014	Array	10	36	5
All Years	NA	95	412	69

Table S2 Total number and percentage of transition motifs. Percentages of motifs are shown

per year (N=36 song cycles for each year except 2006 N=4 and 2007 N=12), as well as for the

network model with all years combined (N=412 song cycles).

	Deterministic		Non-Deterministic	
Year	One-Way	Bottleneck	Hourglass	Branch
2002	24 (62%)	3 (8%)	8 (20%)	4 (10%)
2003	12 (43%)	4 (14%)	10 (36%)	2 (7%)
2004	33 (58%)	3 (5%)	13 (23%)	8 (14%)
2005	26 (46%)	5 (9%)	19 (34%)	6 (11%)
2006	18 (45%)	2 (5%)	12 (30%)	8 (20%)
2007	9 (43%)	4 (19%)	5 (24%)	3 (14%)
2008	29 (53%)	3 (5%)	18 (33%)	5 (9%)
2009	21 (48%)	4 (9%)	14 (32%)	5 (11%)
2010	33 (51%)	4 (6%)	23 (35%)	5 (8%)
2011	37 (55%)	4 (6%)	21 (31%)	5 (8%)
2012	35 (48%)	4 (5%)	30 (41%)	4 (6%)
2013	31 (63%)	4 (8%)	11 (23%)	3 (6%)
2014	19 (47%)	3 (7%)	12 (29%)	7 (17%)
All Years	74 (52%)	5 (4%)	54 (38%)	9 (6%)

Supplemental Figures S1-S14

The a) directed network models and b) distribution of unit usage for each year separately and all years combined. S=small-world coefficient. Each network model has circles (nodes) to reflect unit types, arrows to indicate direction of transition, and line thickness indicates the frequency of the transitions. Network communities are circled in different colours. Unit usage is a logarithmic distribution of rank of unit use and frequency of occurrence with a dashed regression line of best fit
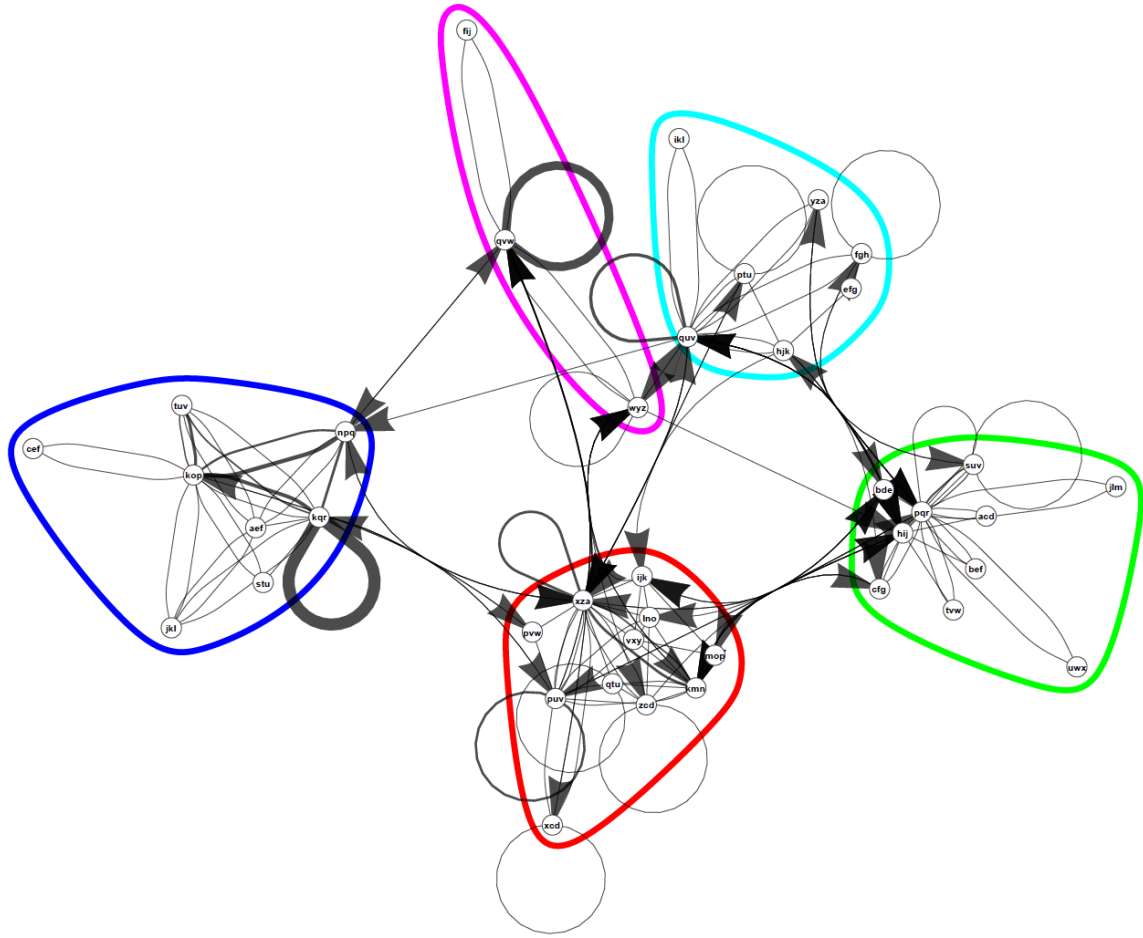
a)
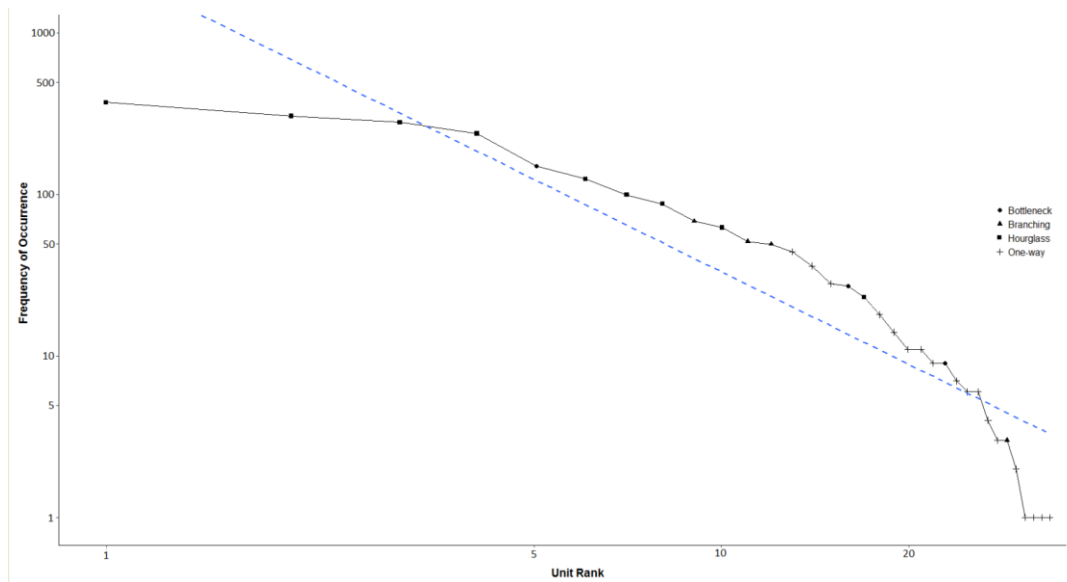
b)

Figure S1 Network features for 2002 (S=3.3, N=36)

a)

b)
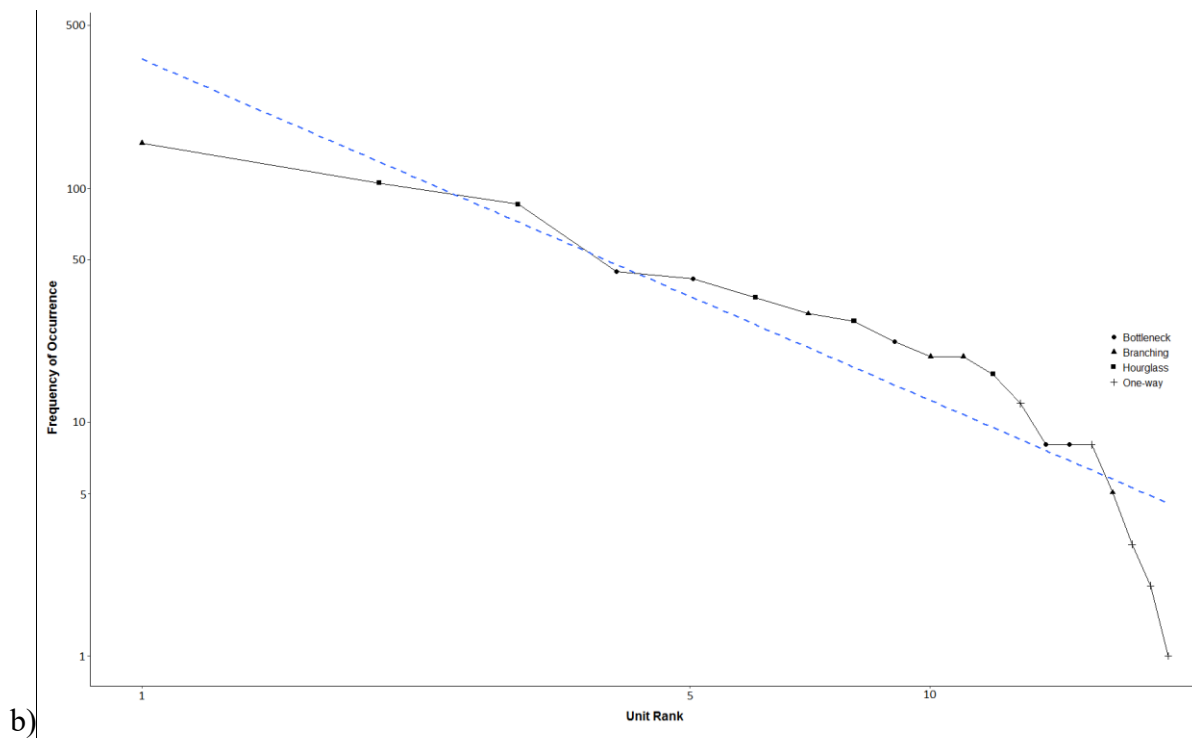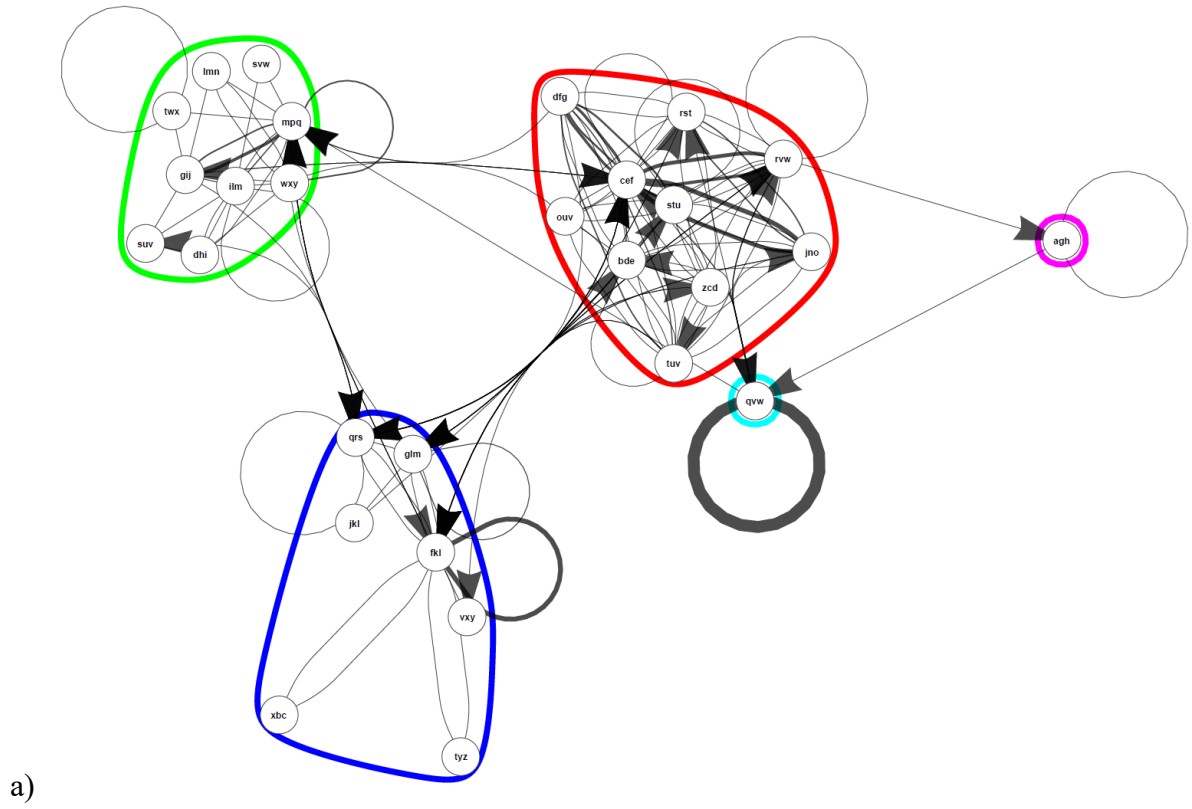
Figure S2 Network features for 2003 (S=1.7, N=36)
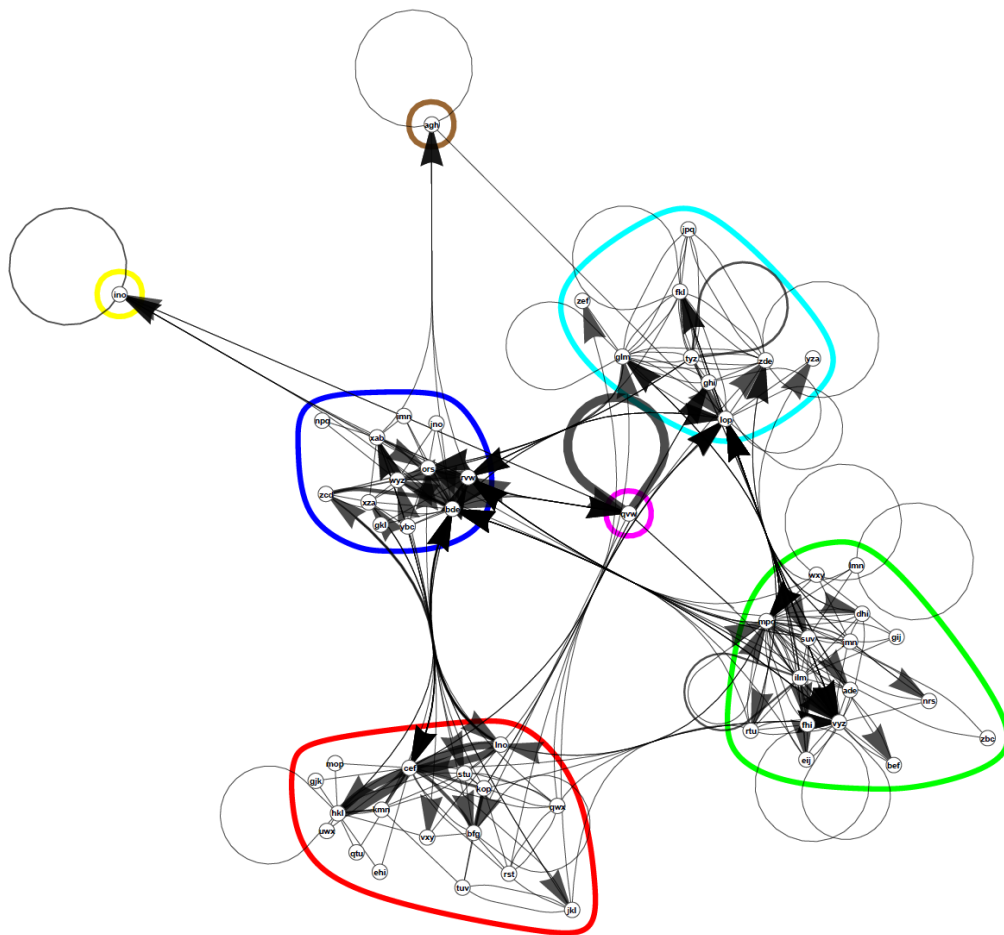
a)
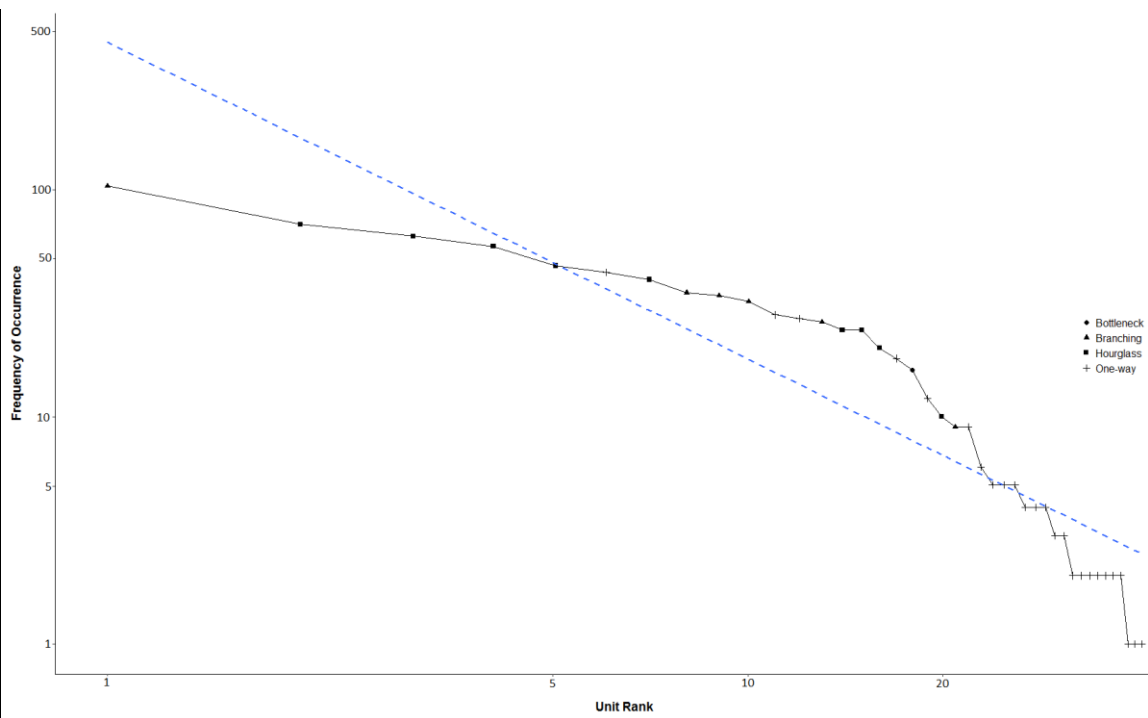
b)

Figure S3 Network features for 2004 (S=4.2, N=36)
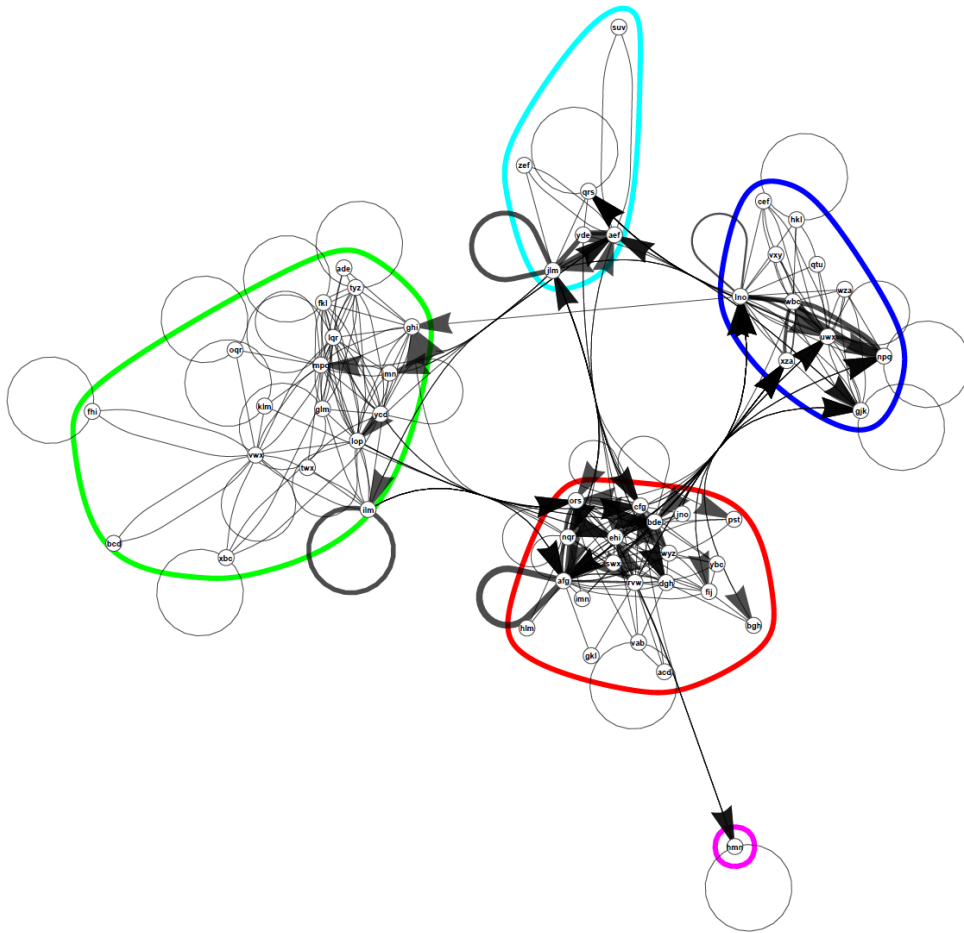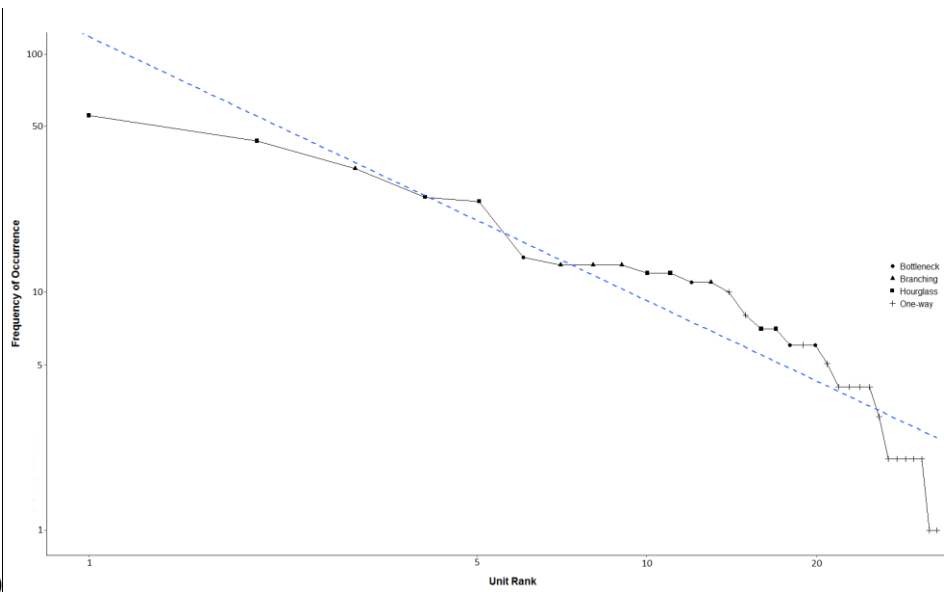
a)
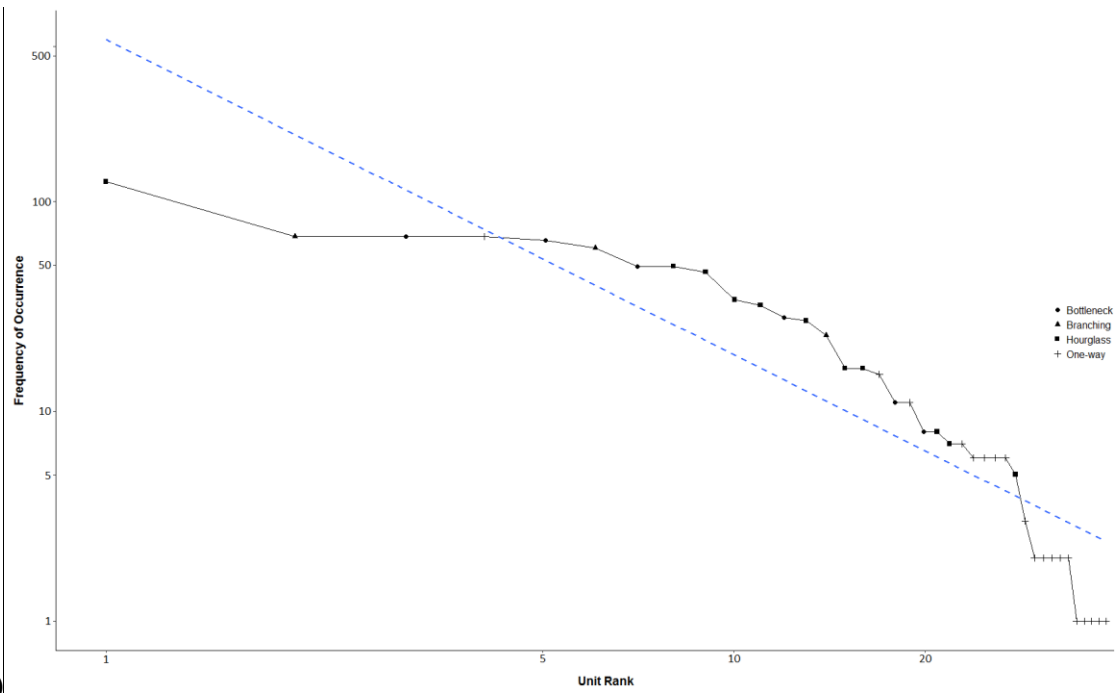
b)

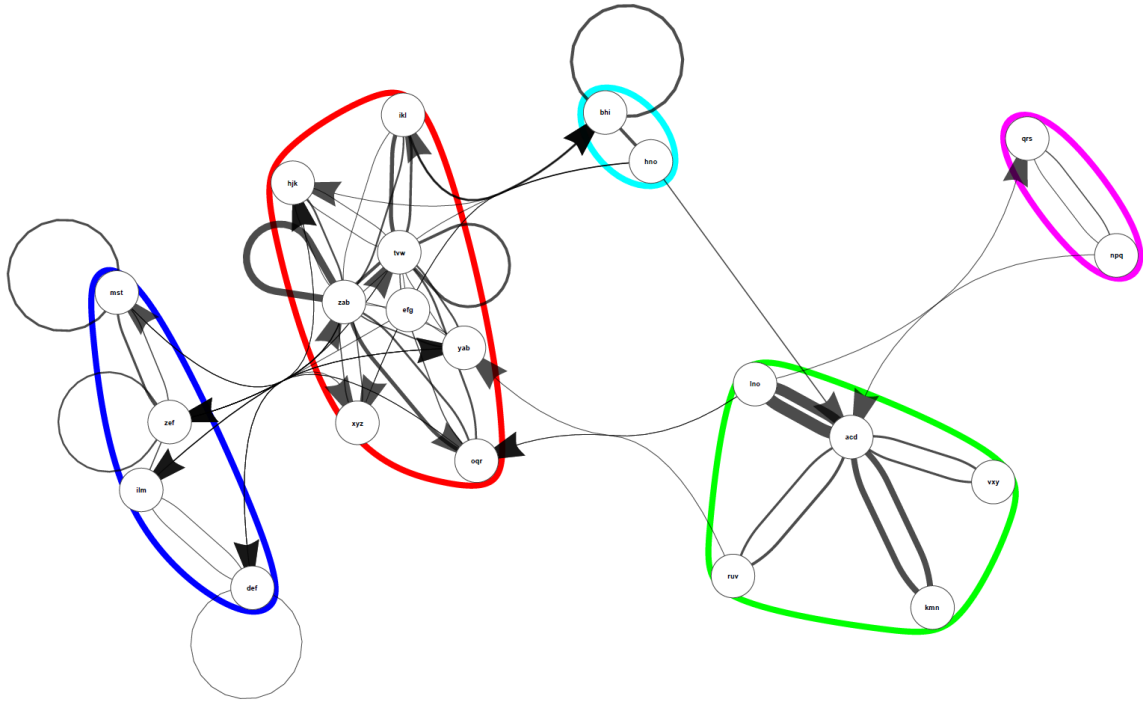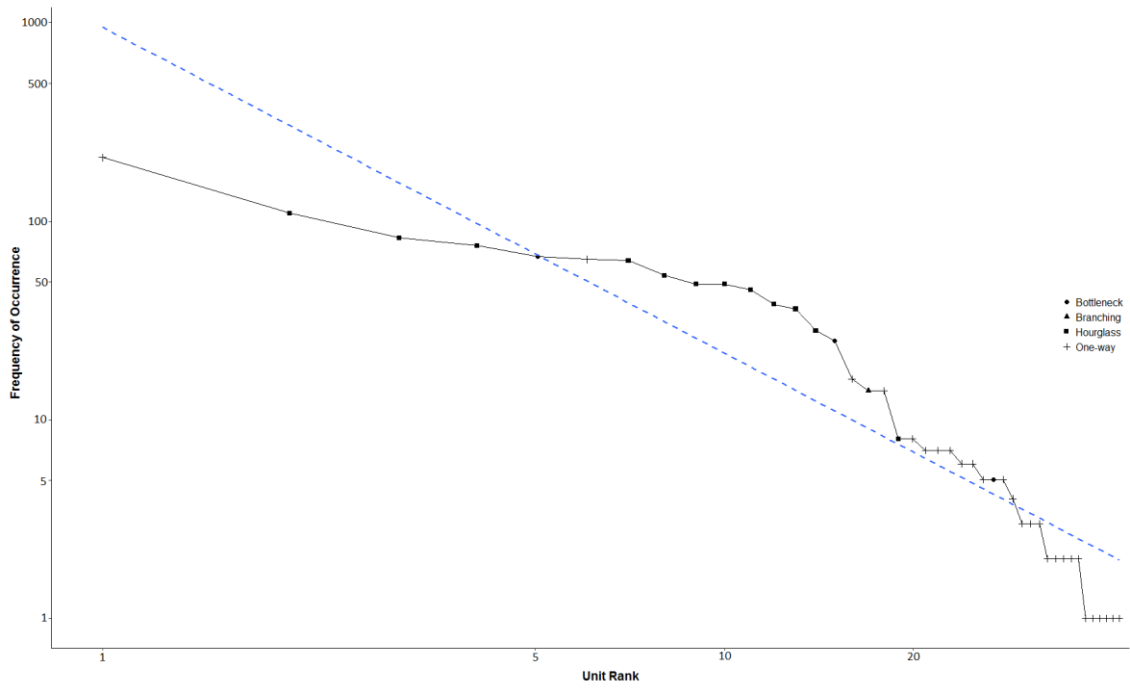**Figure S4** Network features for 2005 (S=3.8, N=36)
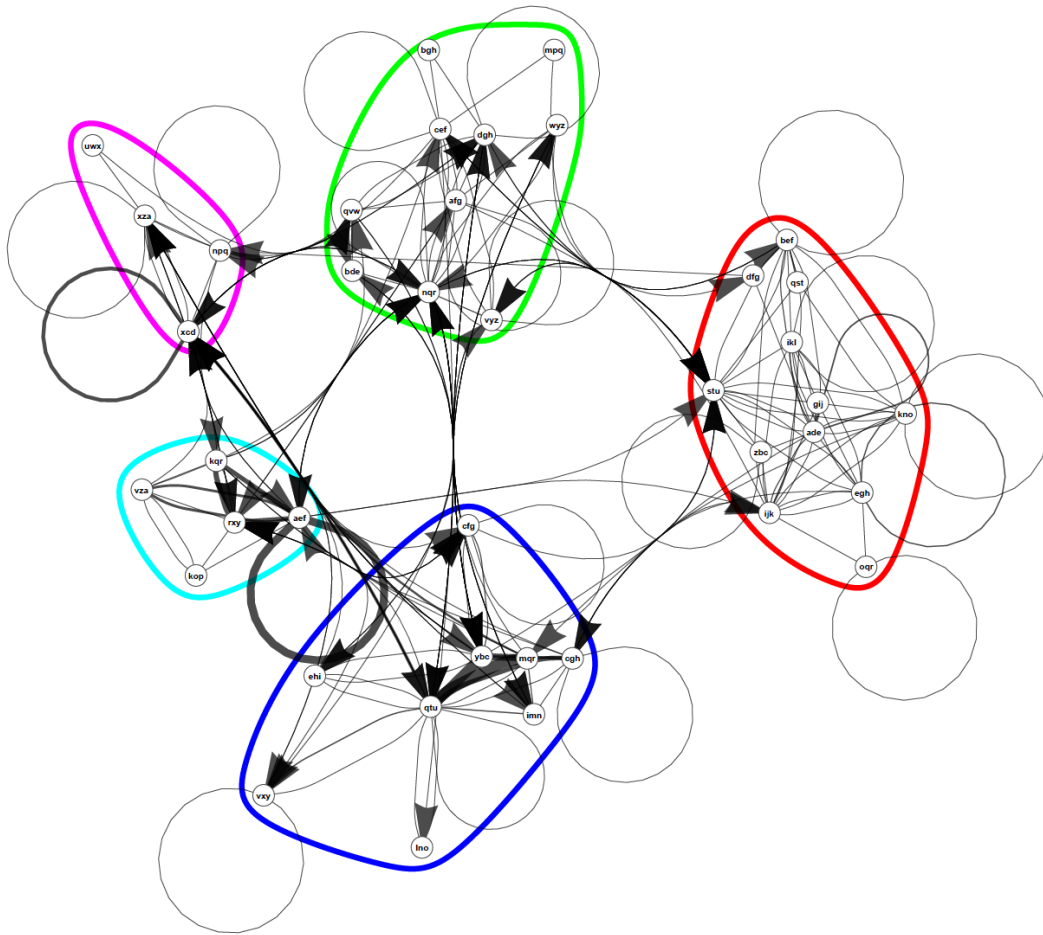
a)

b)

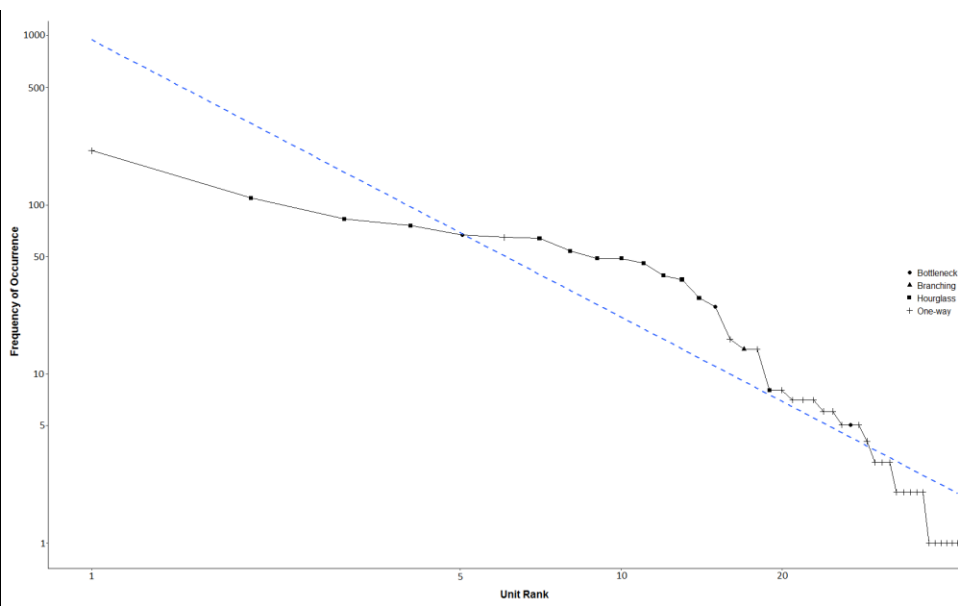**Figure S5** Network features for 2006 (S=2.2, N=12)
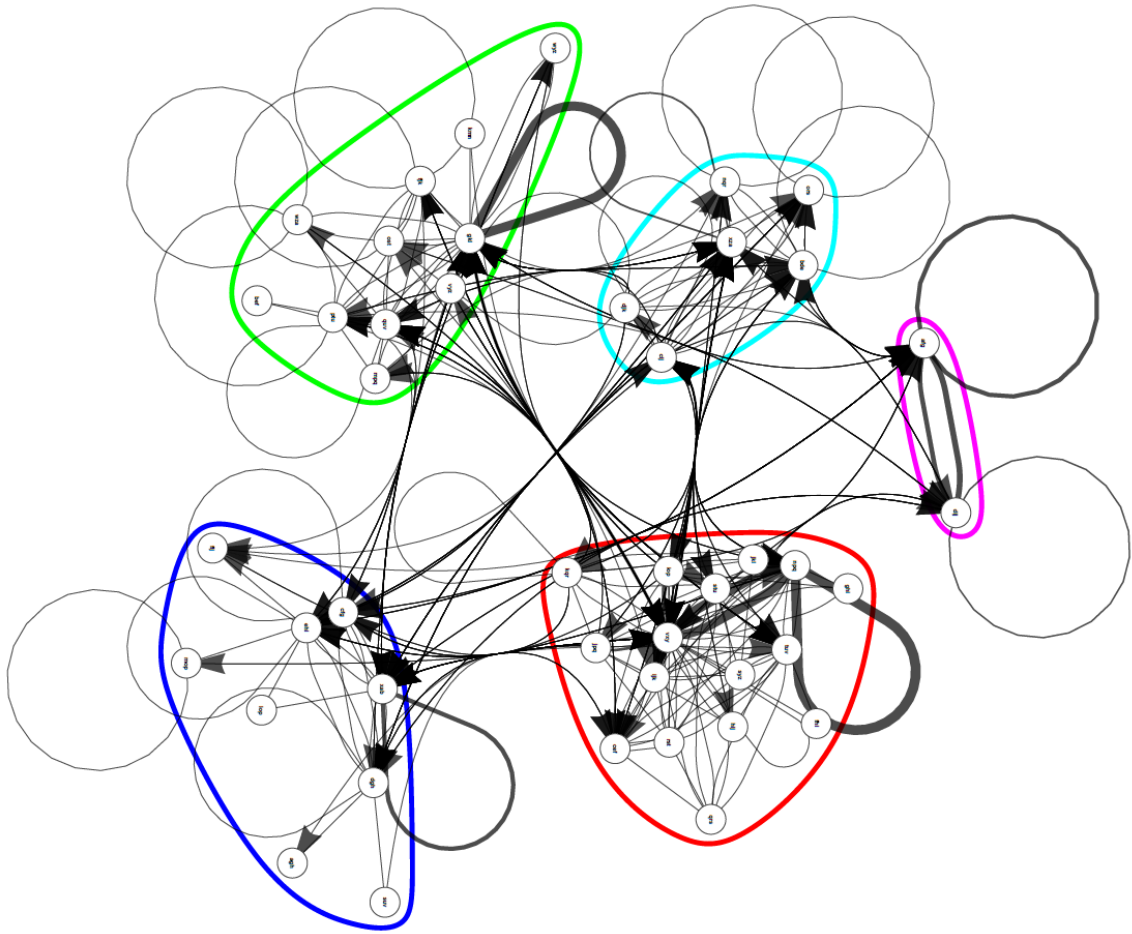
a)

b)

Figure S6 Network features for 2007 (S=1.2, N=4)
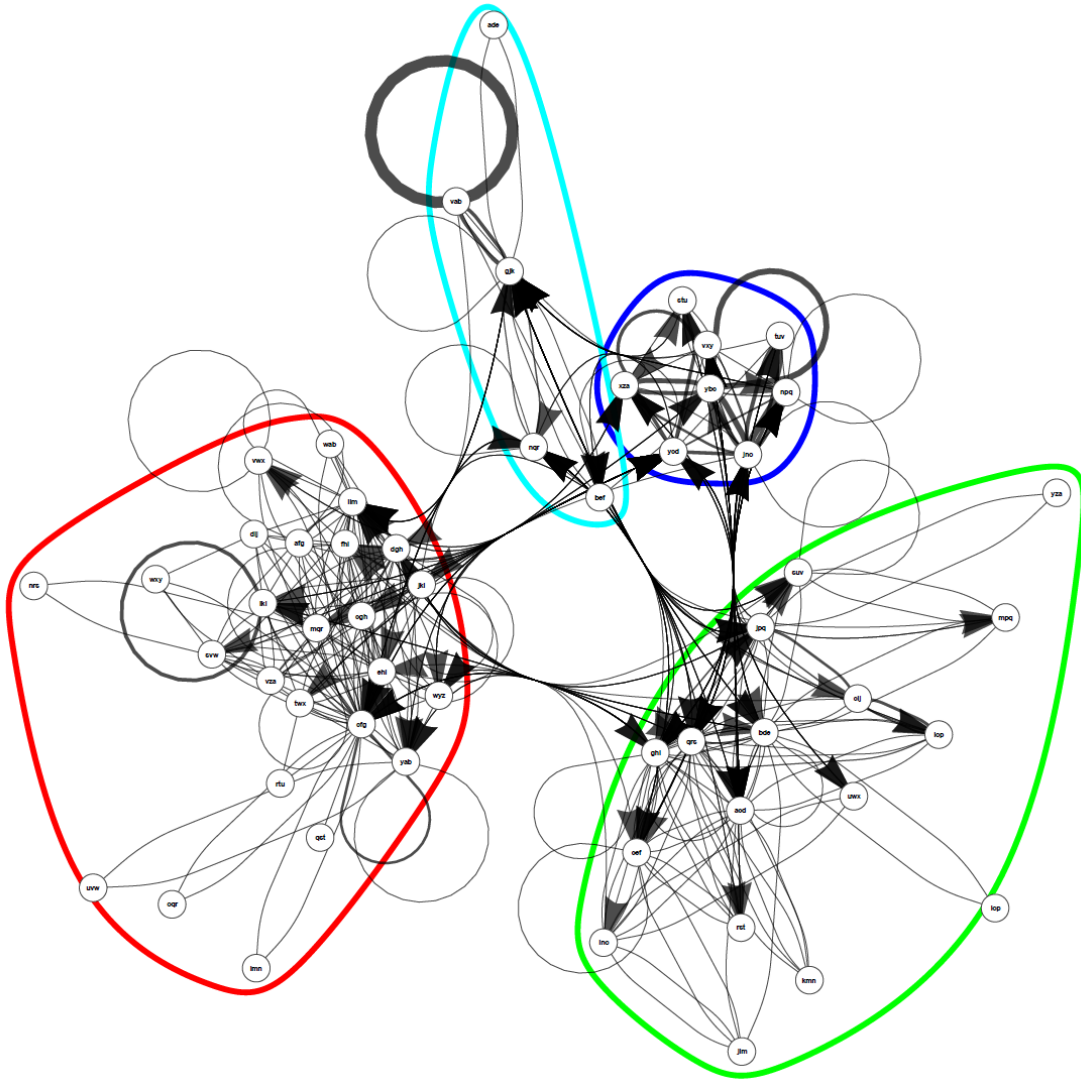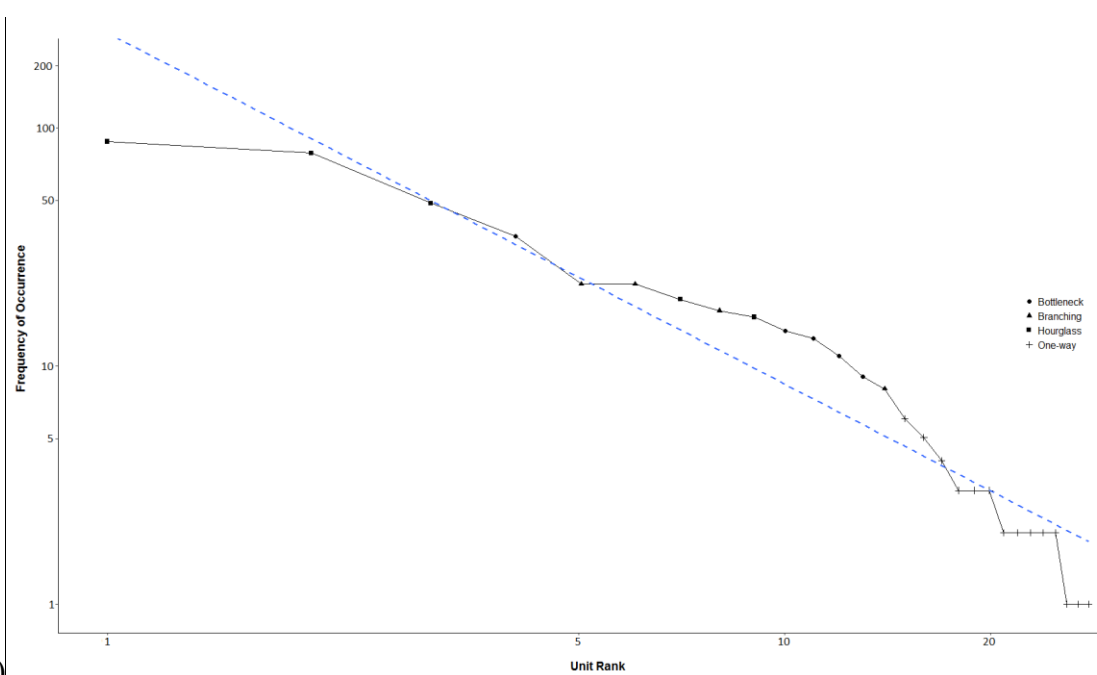
a)

b)

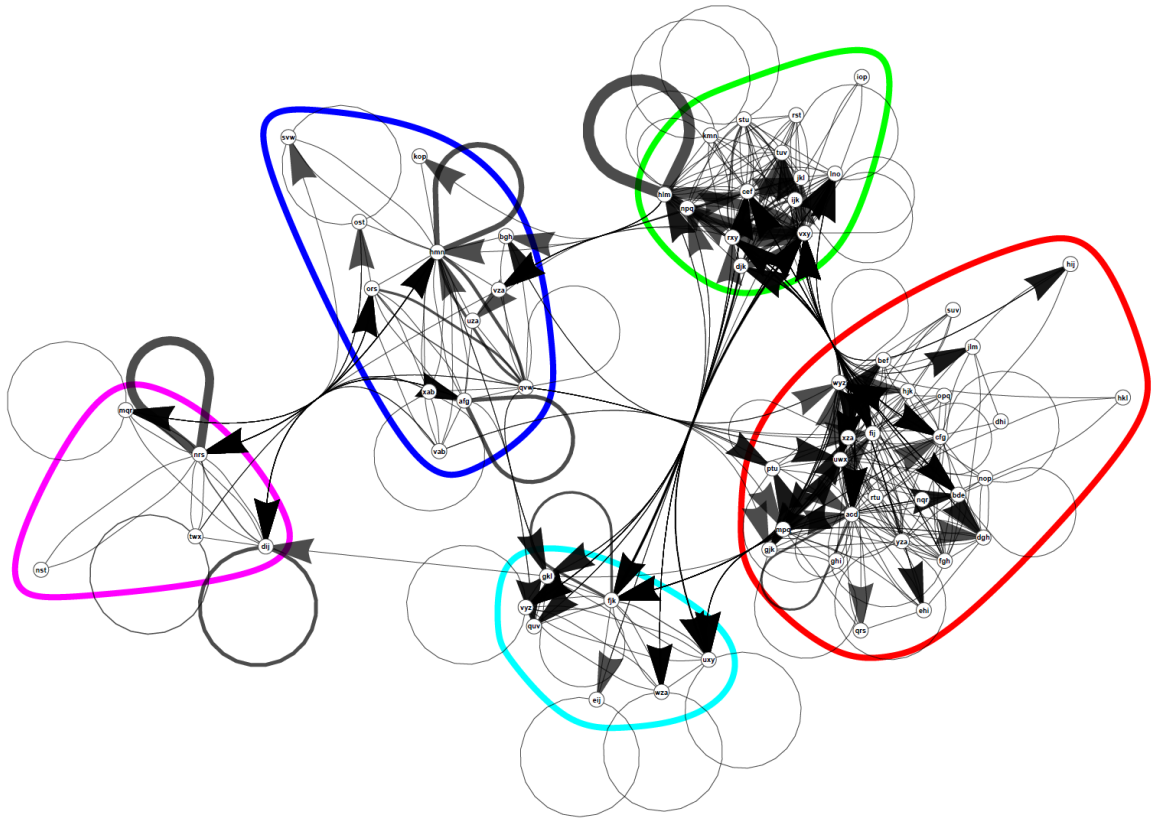**Figure S7** Network features for 2008 (S=2.4, N=36)
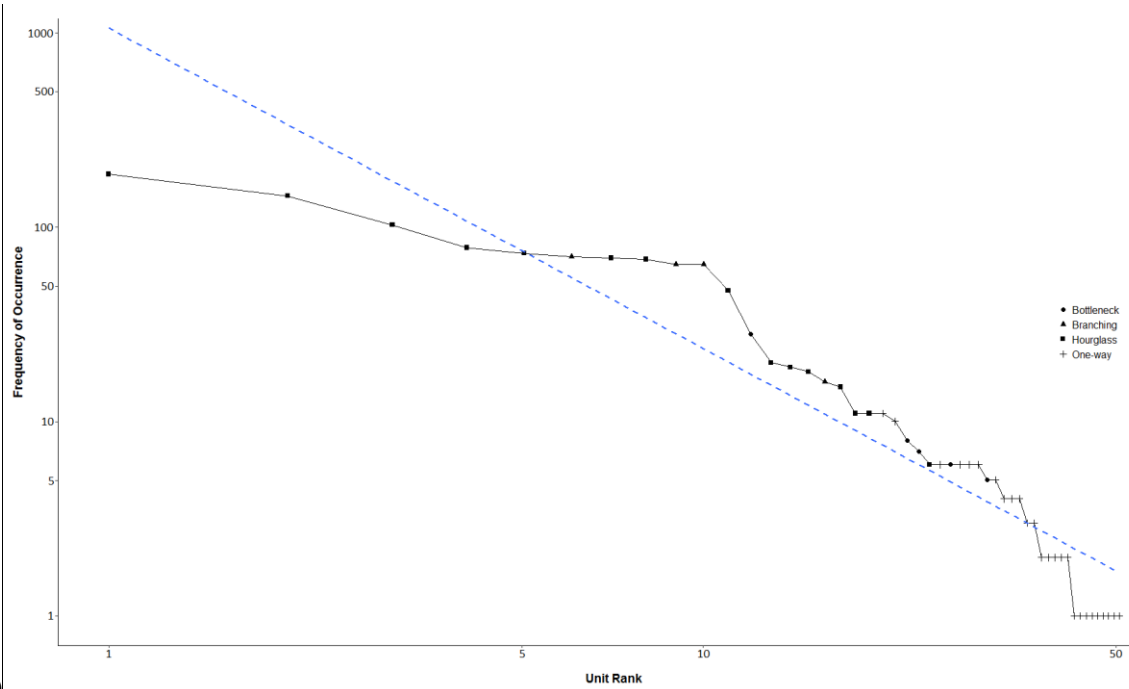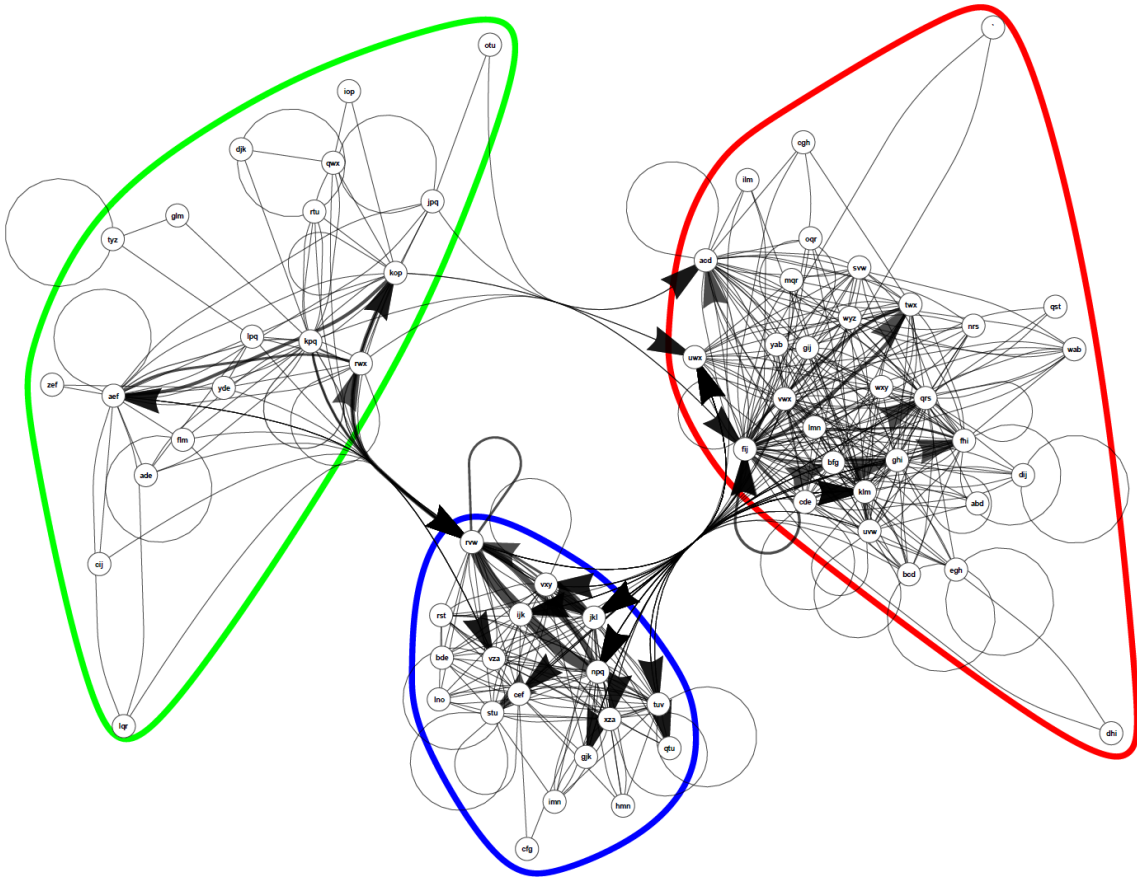
a)

b)

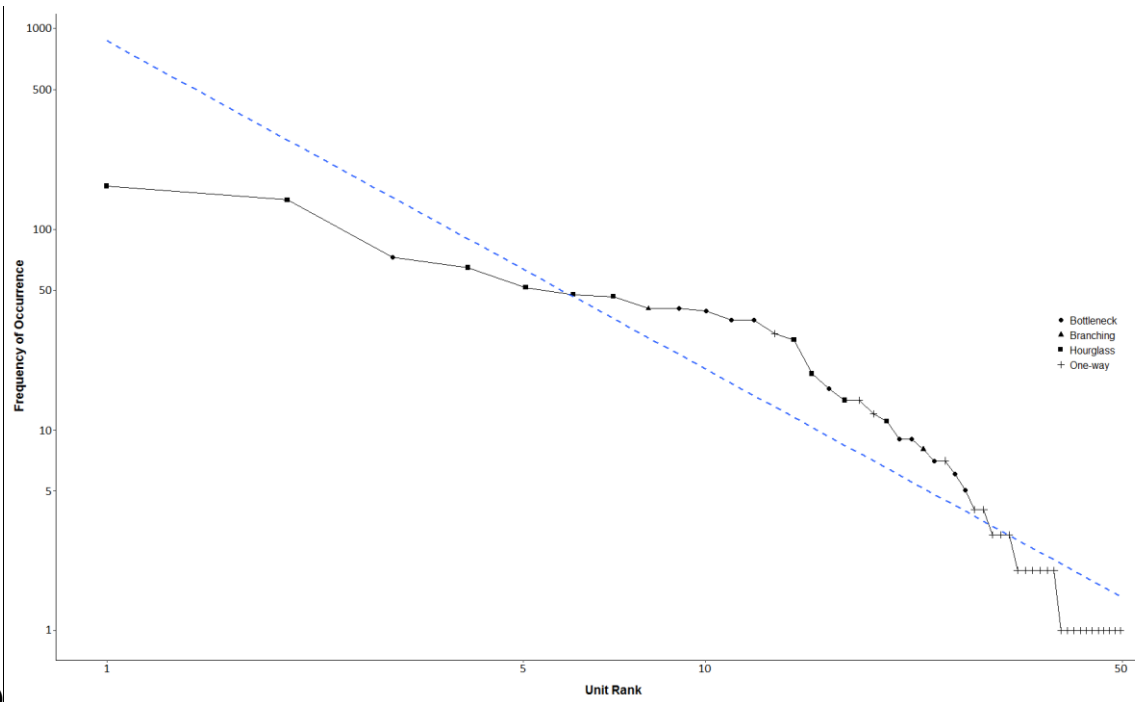**Figure S8** Network features for 2009 (S=2.6, N=36)

a)
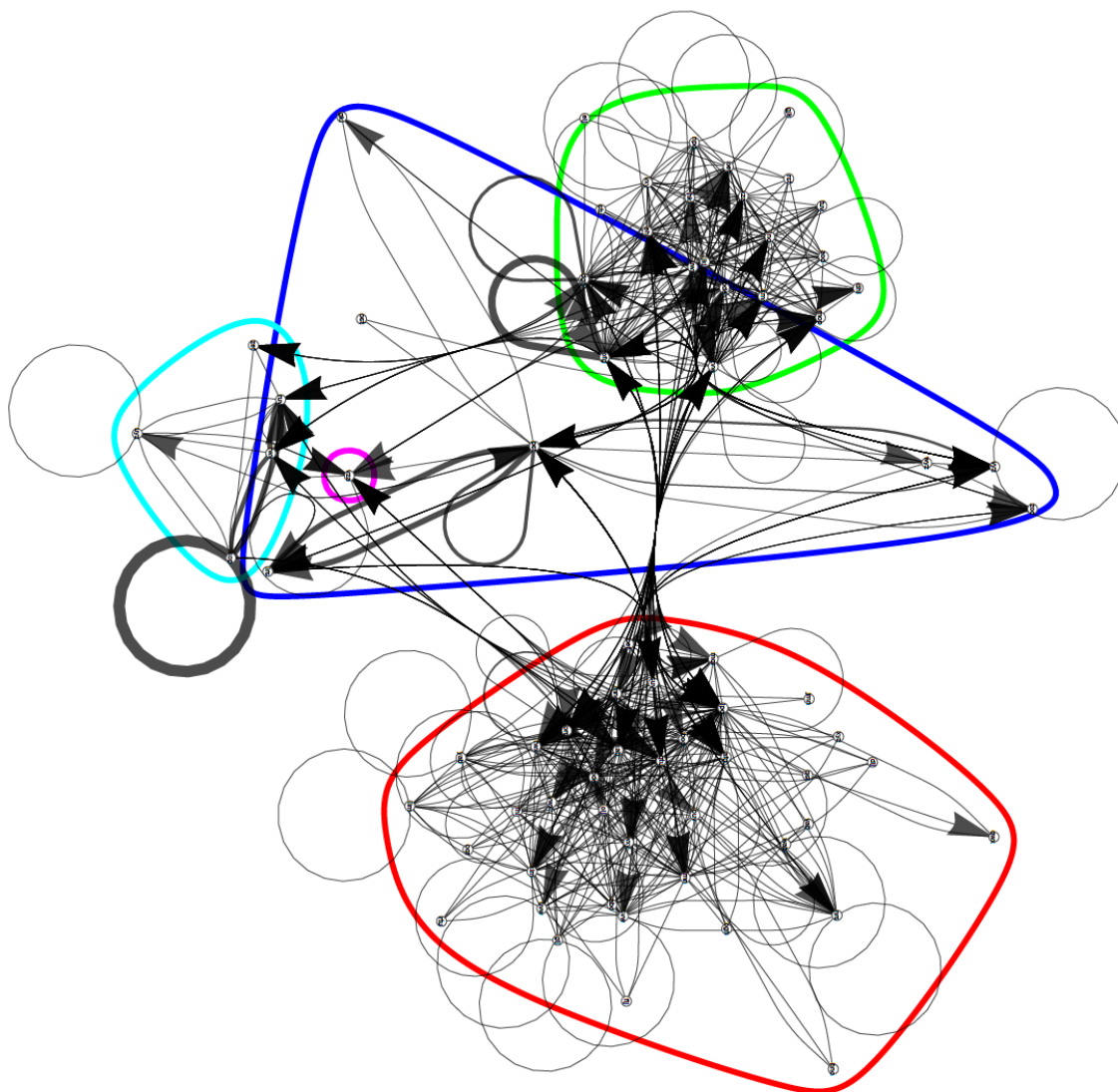

b)

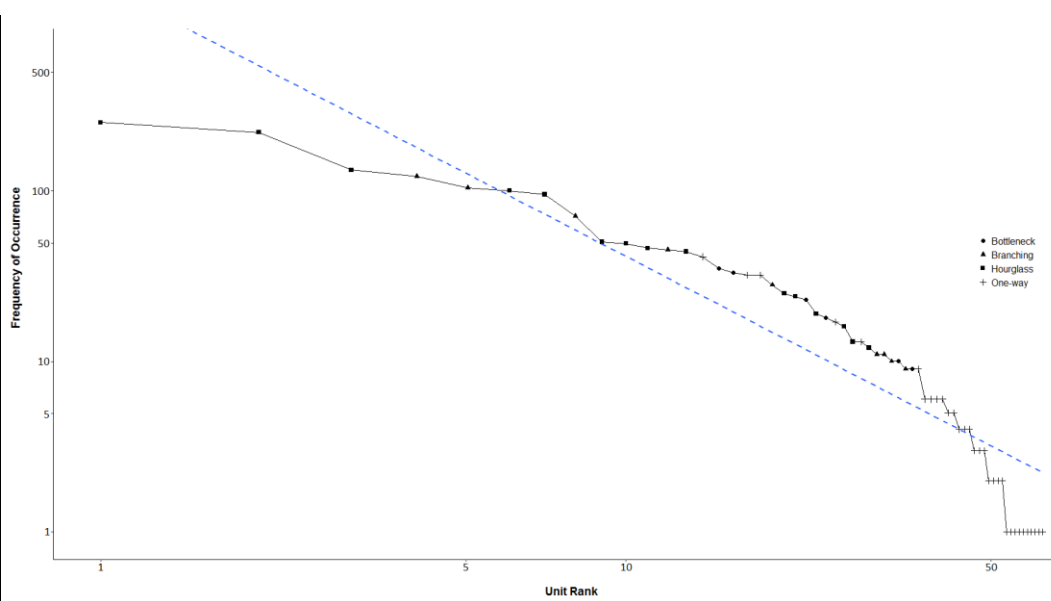**Figure S9** Network features for 2010 (S=3.1, N=36)
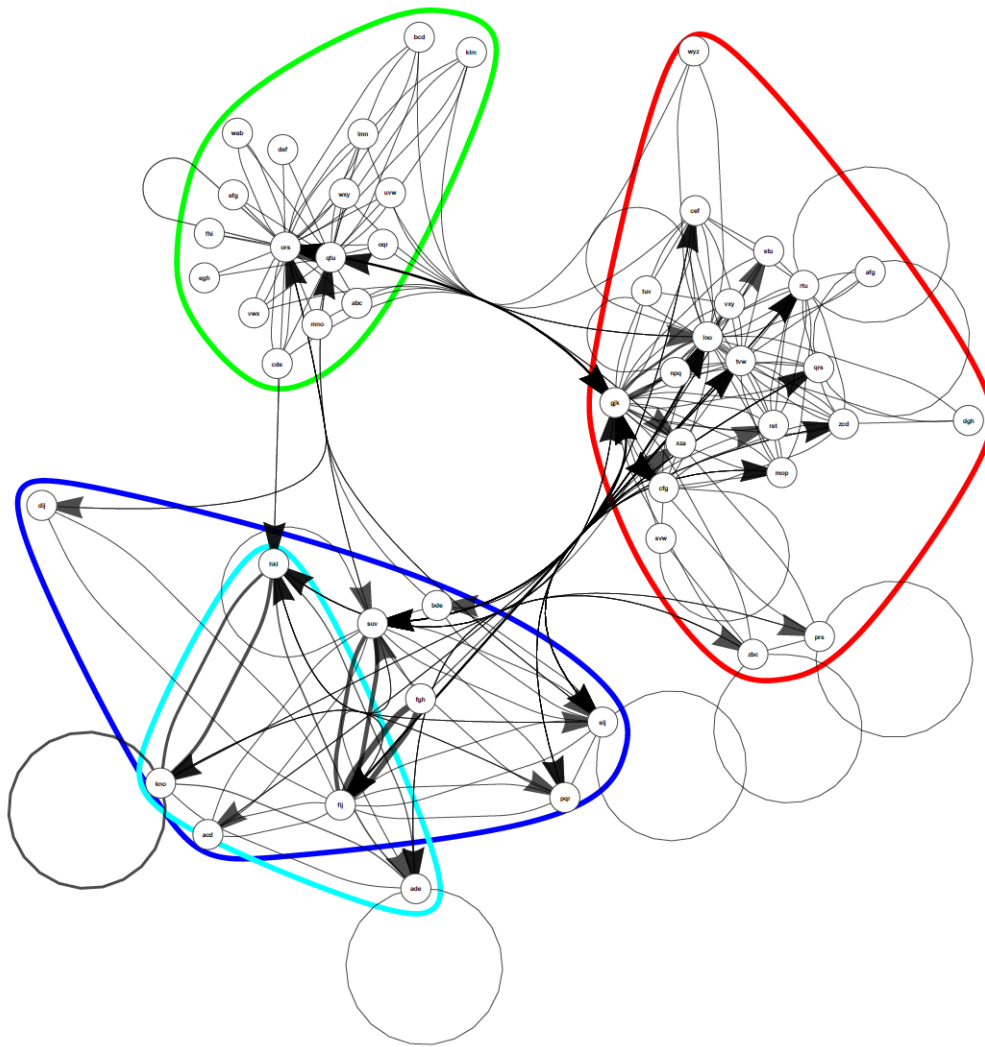
a)

b)

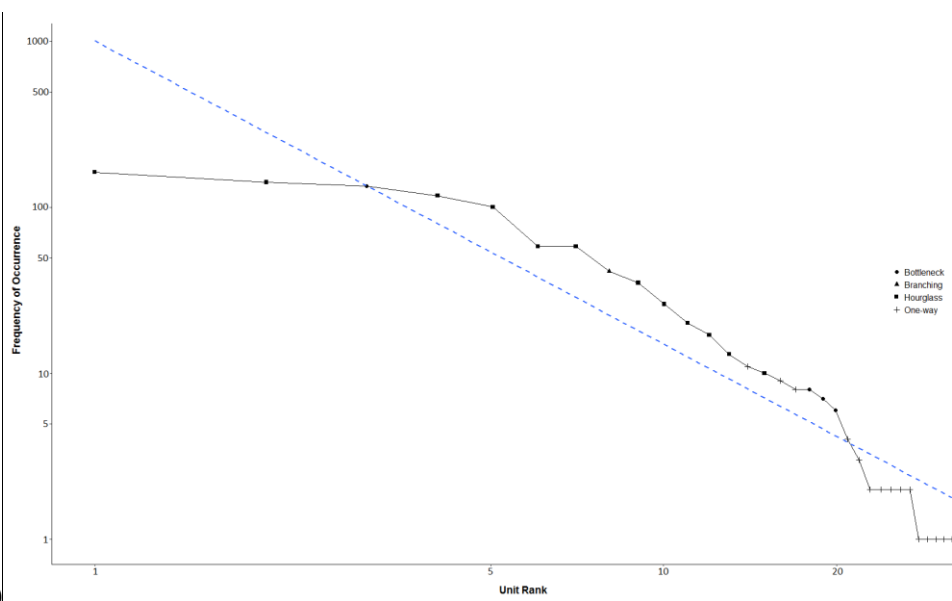**Figure S10** Network features for 2011 (S=3.6, N=36)

a)

b)

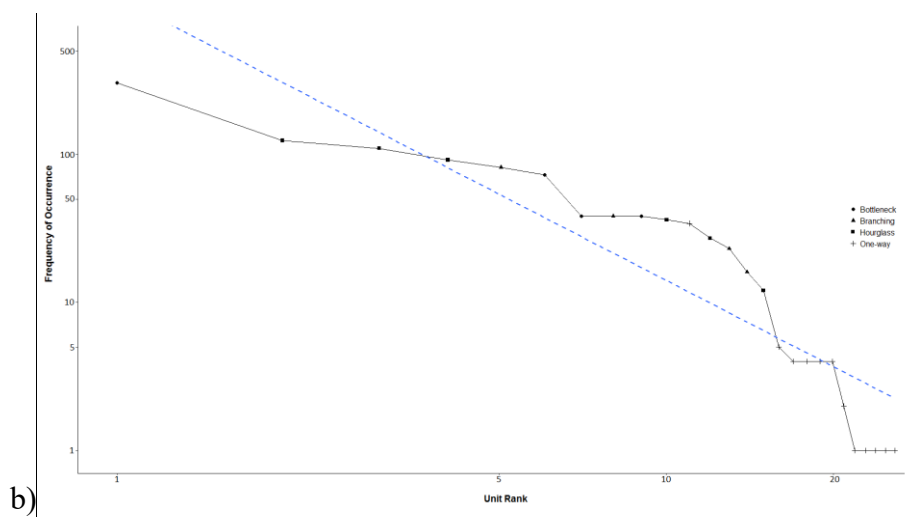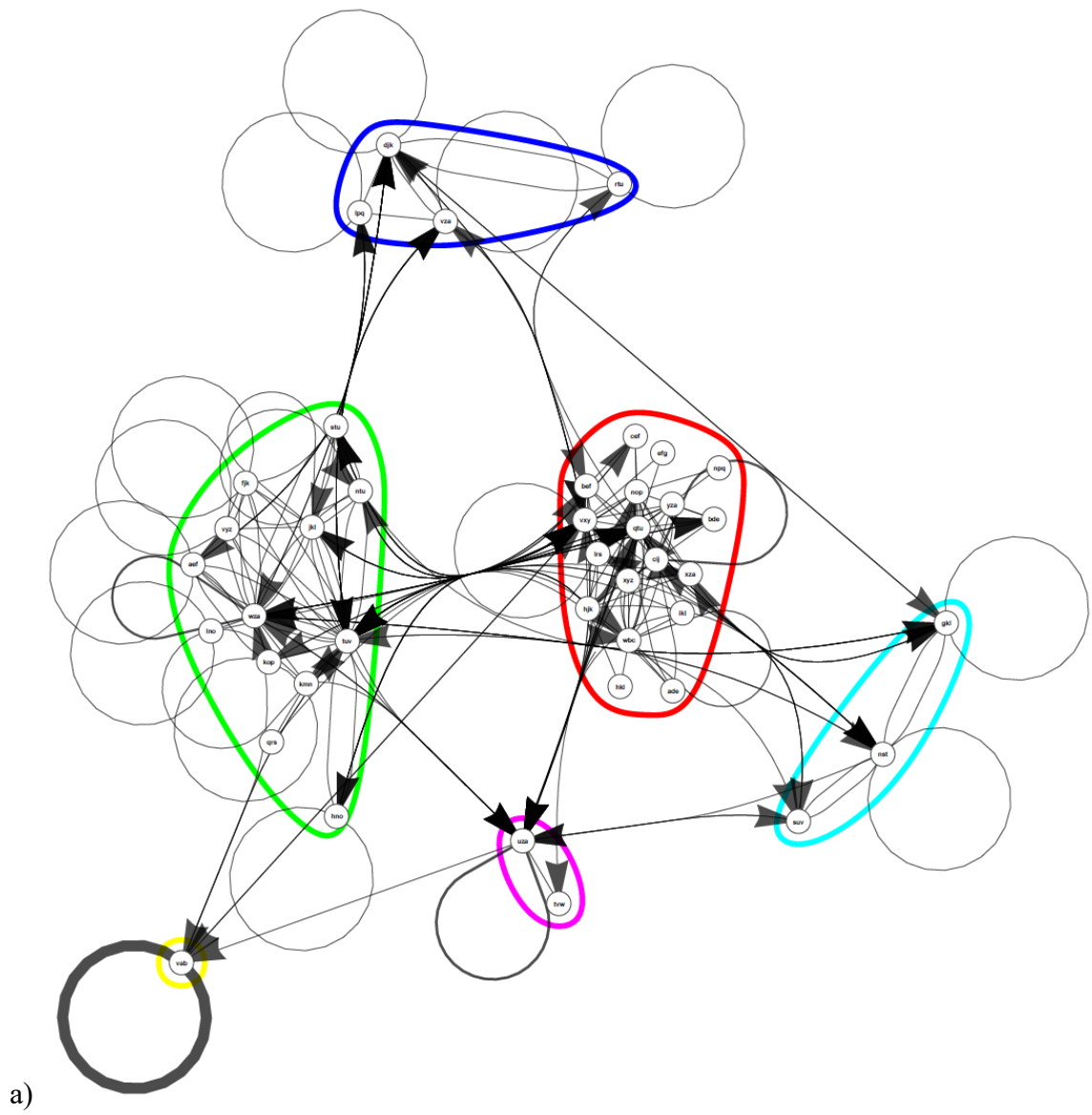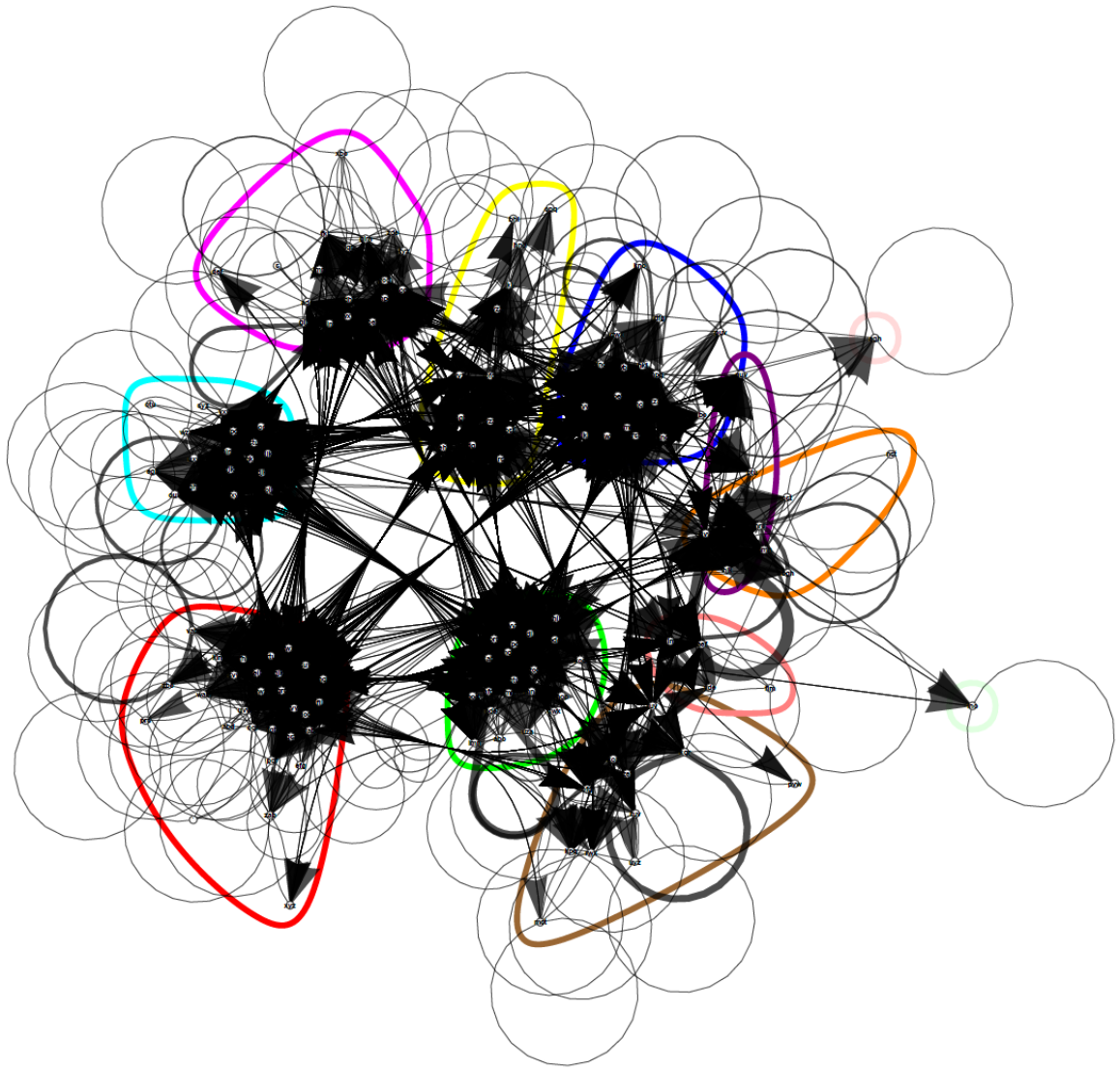**Figure S11** Network features for 2012 (S=3.2, N=36)

a)

b)

Figure S12 Network features for 2013 (S=5.1, N=36)

a)

b)

Figure S13 Network features for 2014 (S=2.5, N=36)

a)
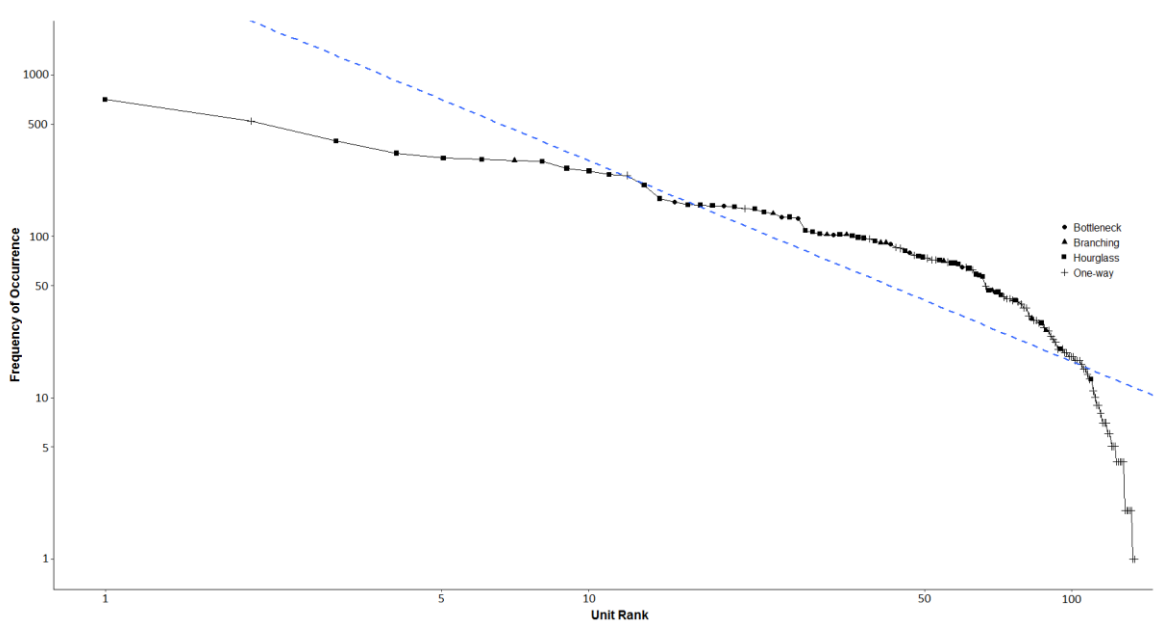
b)

Figure S14 Network features for all years combined (S=2.6, N=412)

Supplemental Figures S15-27

Spectrograms are shown for each year's song type with time (s) on the x-axis and frequency (kHz) on the y-axis.
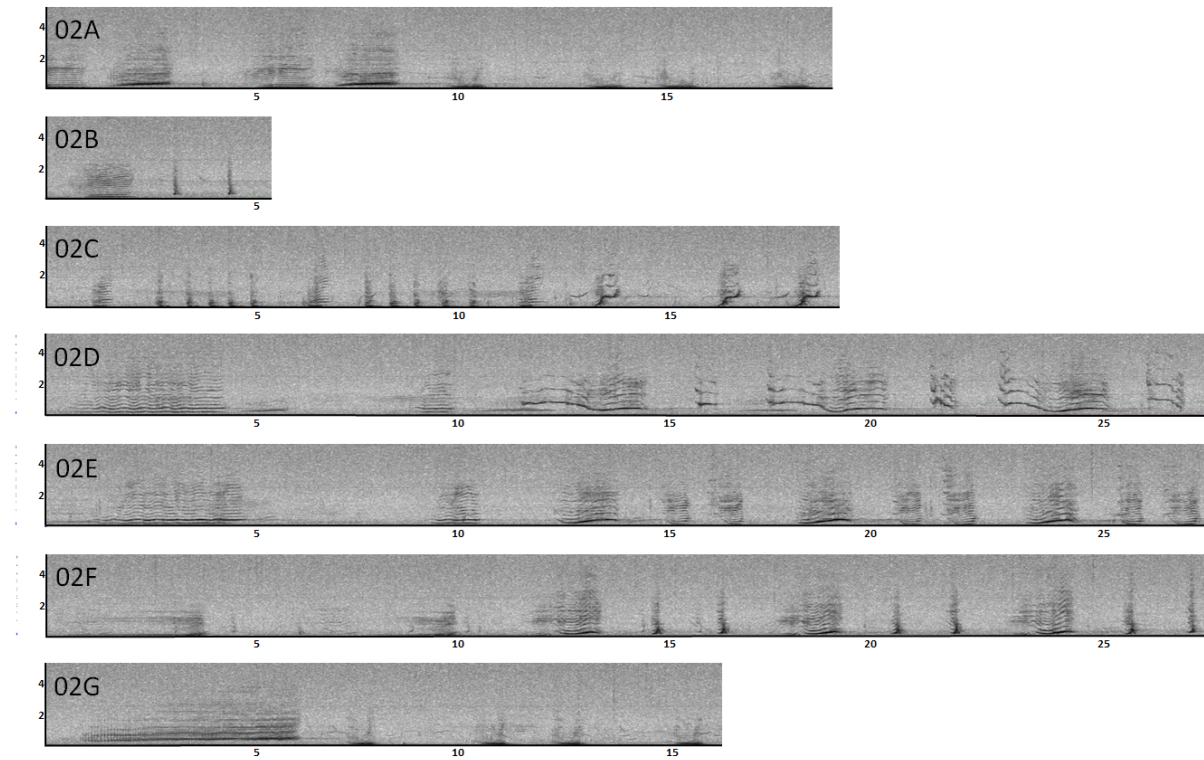
Figure S15 Example of 2002 song labelled with the population (EA), year (02), and themes labelled A-G. Themes correspond to the following Record IDs: Theme A = 17092002-32, Theme B = 08102002-10, Theme C = 17092002-9, Theme D = 21092002-68, Theme E = 08102002-18, Theme F = 23102002-103, Theme G = 05102002-33.
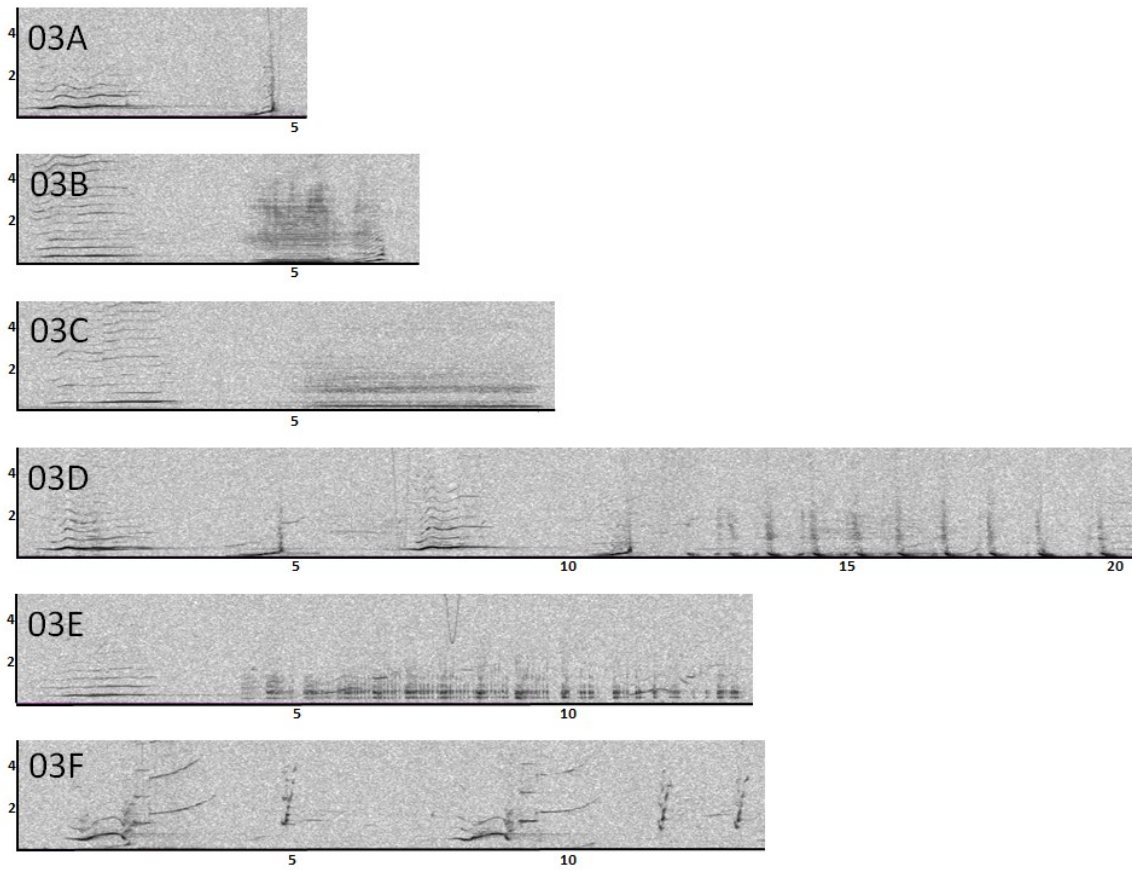
Figure S16 Example of 2003 song labelled with the population (EA), year (03), and themes labelled A-F. Themes correspond to the following Record IDs: Theme A = 18092003-171, Theme B = 18092003-7, Theme C = 03102003-92, Theme D = 15102003-36, Theme E = 03102003-99, Theme F = 18092003-102.
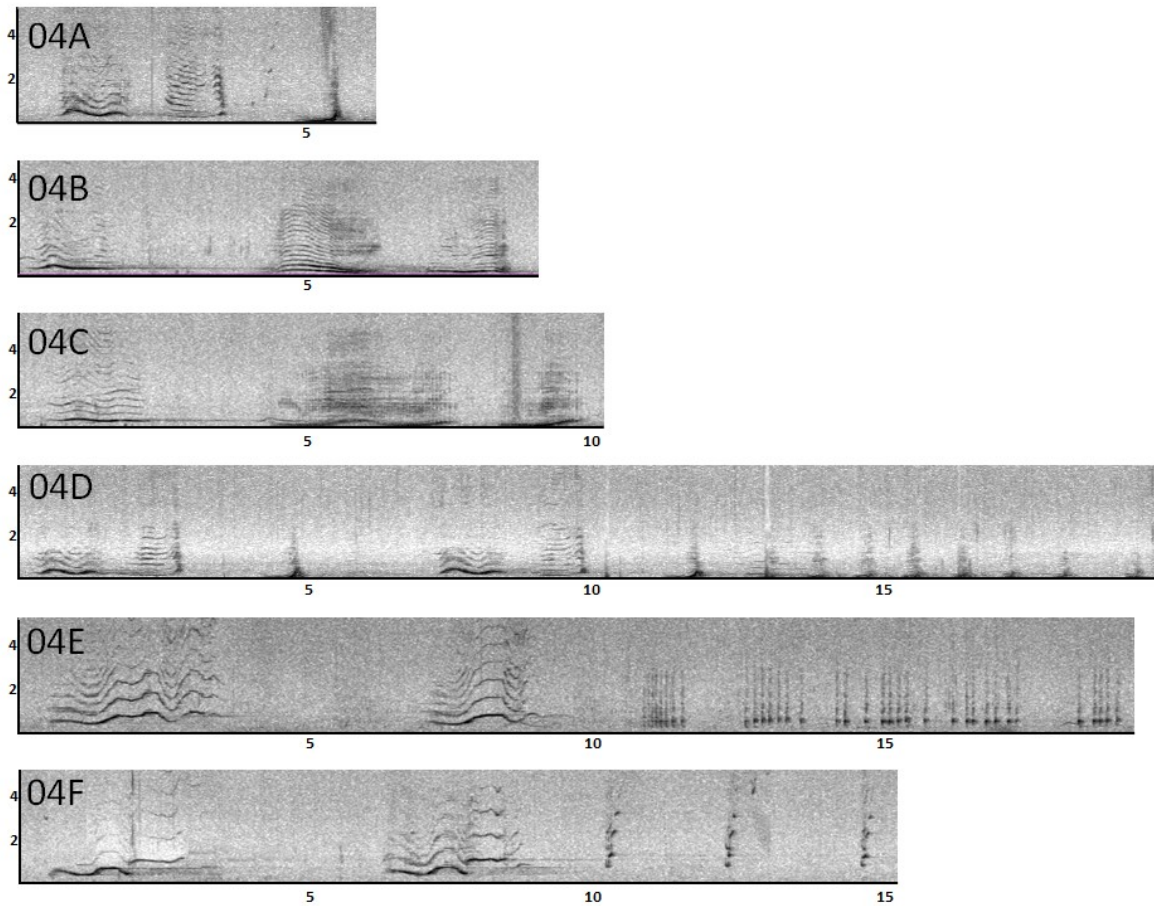
Figure S17 Example of 2004 song labelled with the population (EA), year (04), and themes labelled A-F. Themes correspond to the following Record IDs: Theme A = 08102004-207, Theme B = 25092004-191, Theme C = 08102004-98, Theme D = 25092004-172, Theme E = 29102004-46, Theme F = 25092004-203.
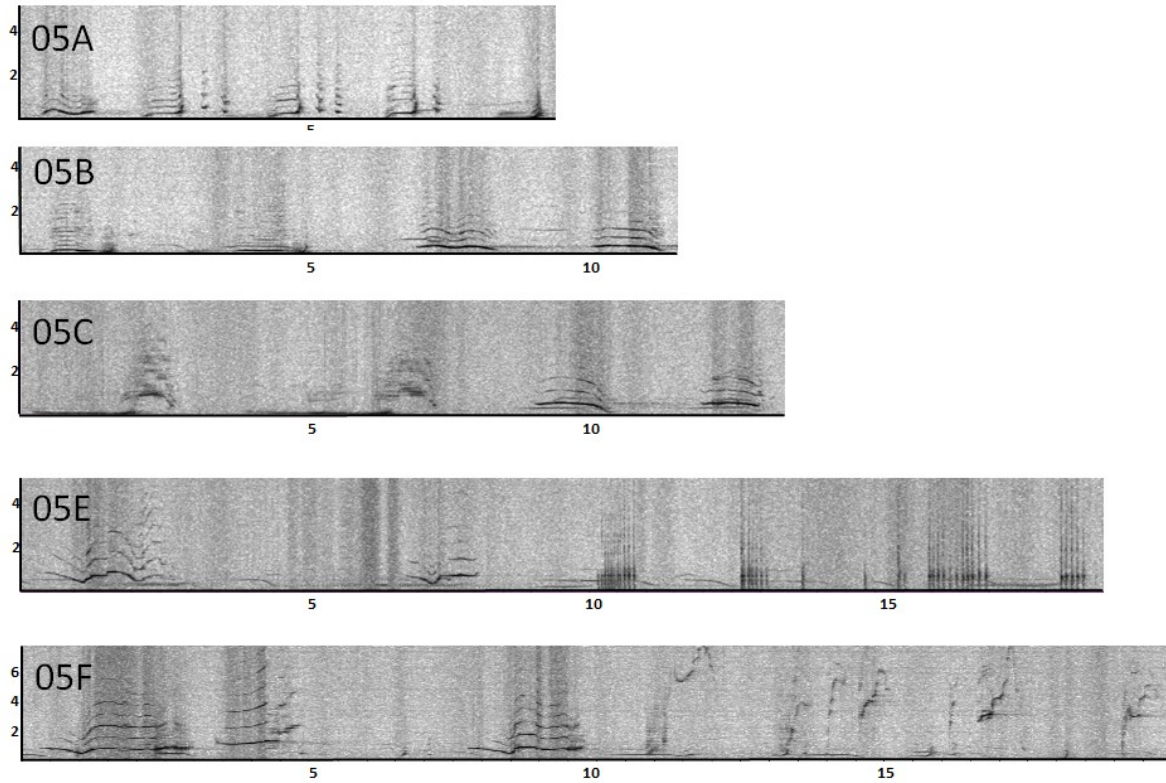
Figure S18 Example of 2005 song labelled with the population (EA), year (05), and themes labelled A-F. Themes correspond to the following Record IDs: Theme A = 06102005-129, Theme B = 29092005-31, Theme C = 02102005-22, Theme E = 03102005-184, Theme F = 06102005-428.
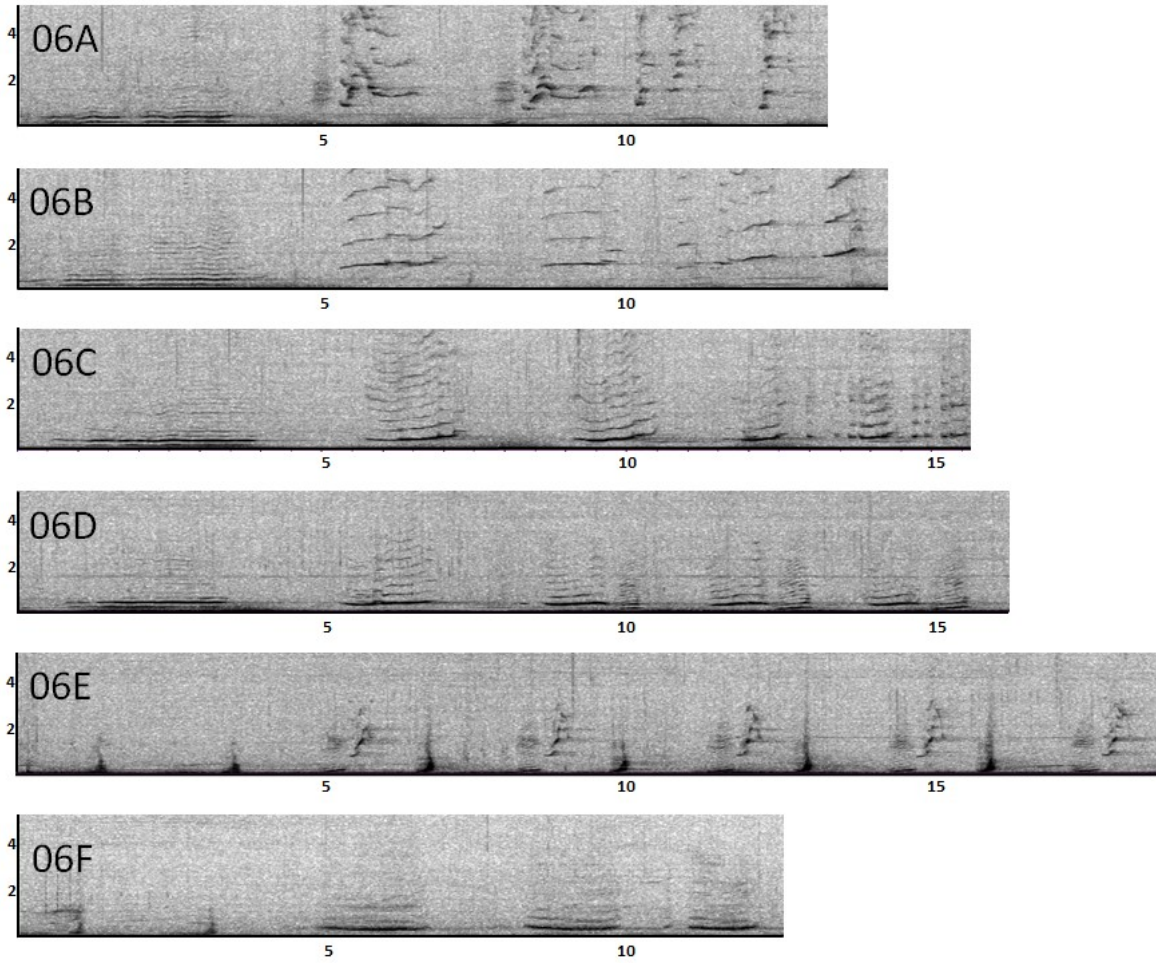
Figure S19 Example of 2006 song labelled with the population (EA), year (06), and themes labelled A-F. Themes correspond to the following Record IDs: Theme A = 02072006-97, Theme B = 02072006-99, Theme C = 02072006-5, Theme D = 02072006-126, Theme E = 02072006-67, Theme F = 06072006-9.
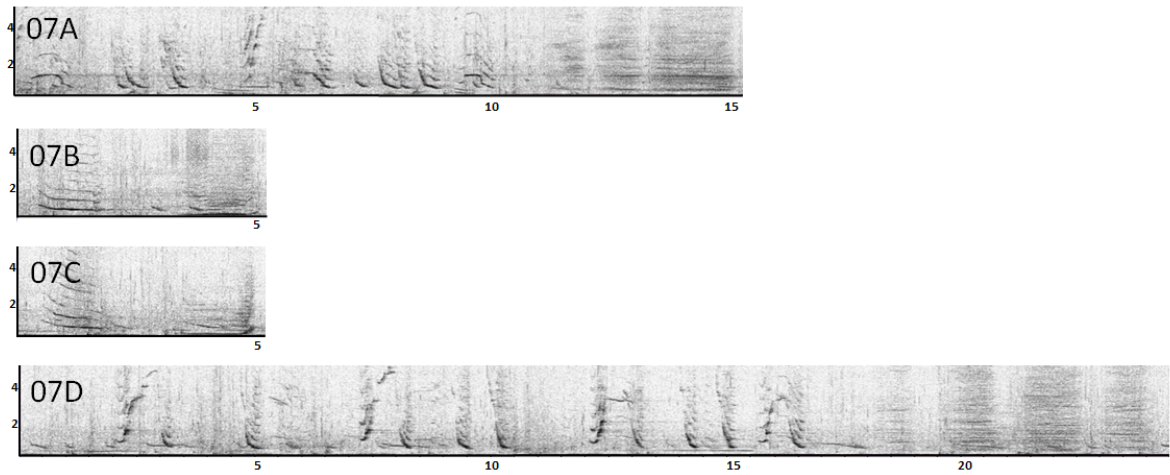
Figure S20 Example of 2007 song labelled with the population (EA), year (07), and themes labelled A-D. Themes correspond to the following Record IDs: Theme A = 84, Theme B = 11, Theme C = 142, Theme D = 147.
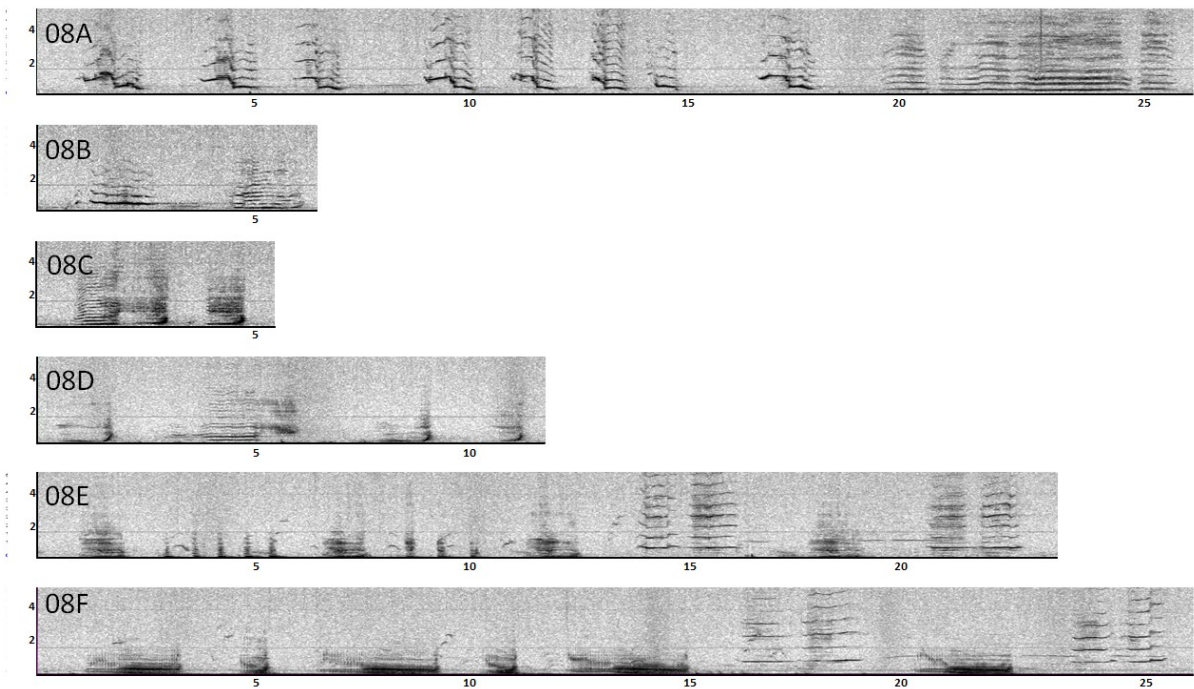

Figure S21 Example of 2008 song labelled with the population (EA), year (08), and themes labelled A-F. Themes correspond to the following Record IDs: Theme A = 23092008-337, Theme B = 03102008-62, Theme C = 23092008-8, Theme D = 23092008-25, Theme E = 03102008-185, Theme F = 26092008-55.
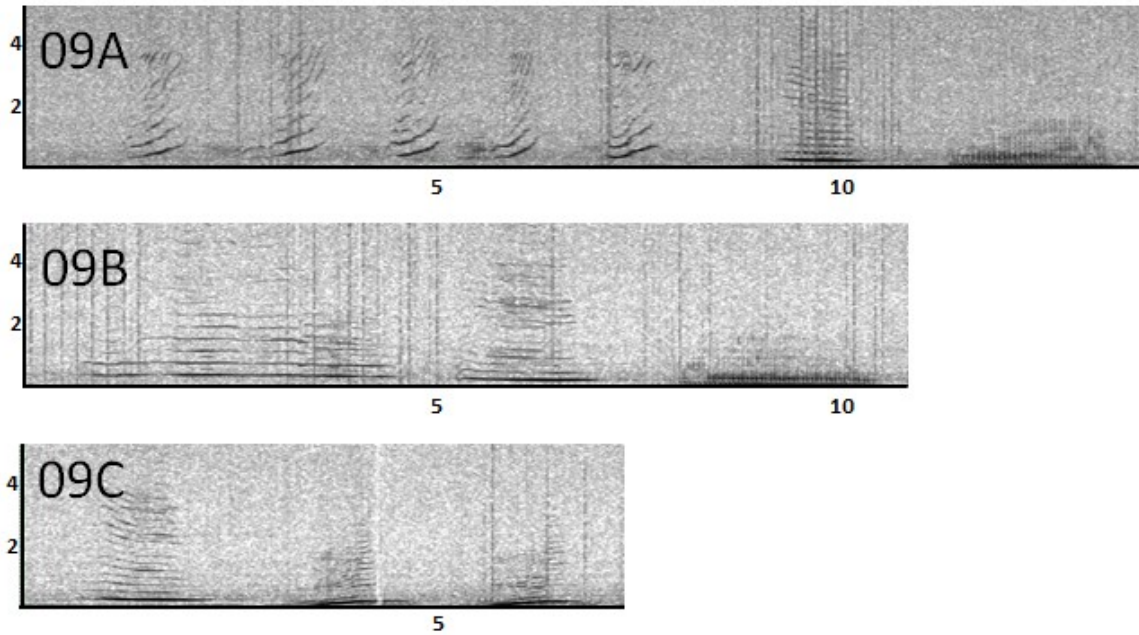
Figure S22 Example of 2009 song labelled with the population (EA), year (09), and themes labelled A-C. Themes correspond to the following Record IDs: Theme A = 22102009-115, Theme B = 29102009-143, Theme C = 24102009-20.
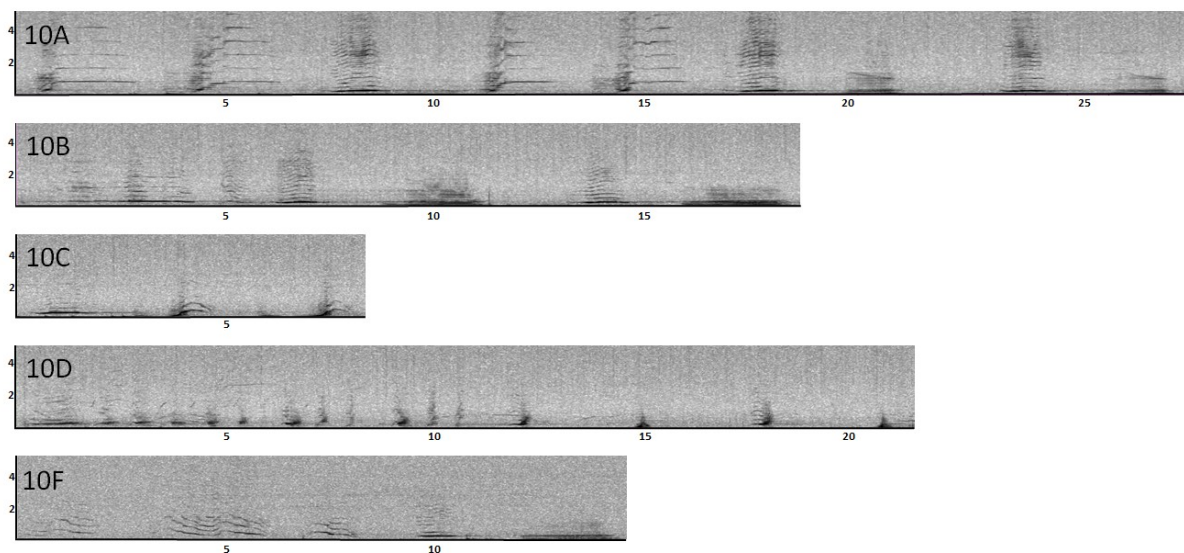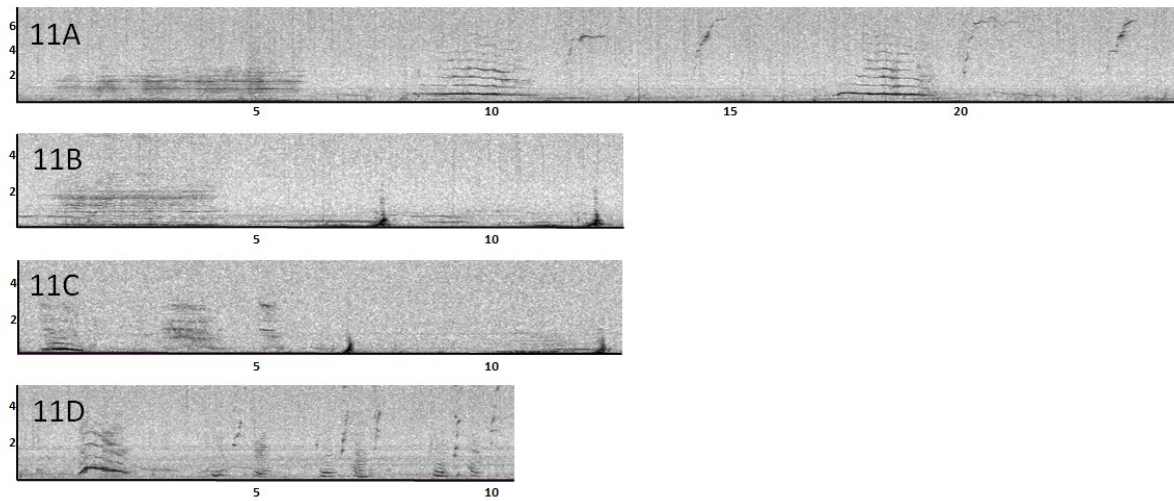

Figure S23 Example of 2010 song labelled with the population (EA), year (10), and themes labelled A-F. Themes correspond to the following Record IDs: Theme A = 01102010-130, Theme B = 29092010-9, Theme C = 29092010-14, Theme D = 29092010-189, Theme F = 13102010-91.

Figure S24 Example of 2011 song labelled with the population (EA), year (11), and themes labelled A-D. Themes correspond to the following Record IDs: Theme A = 02102011-46, Theme B = 25092011-34, Theme C = 25092011-118, Theme D = 06102011-198.
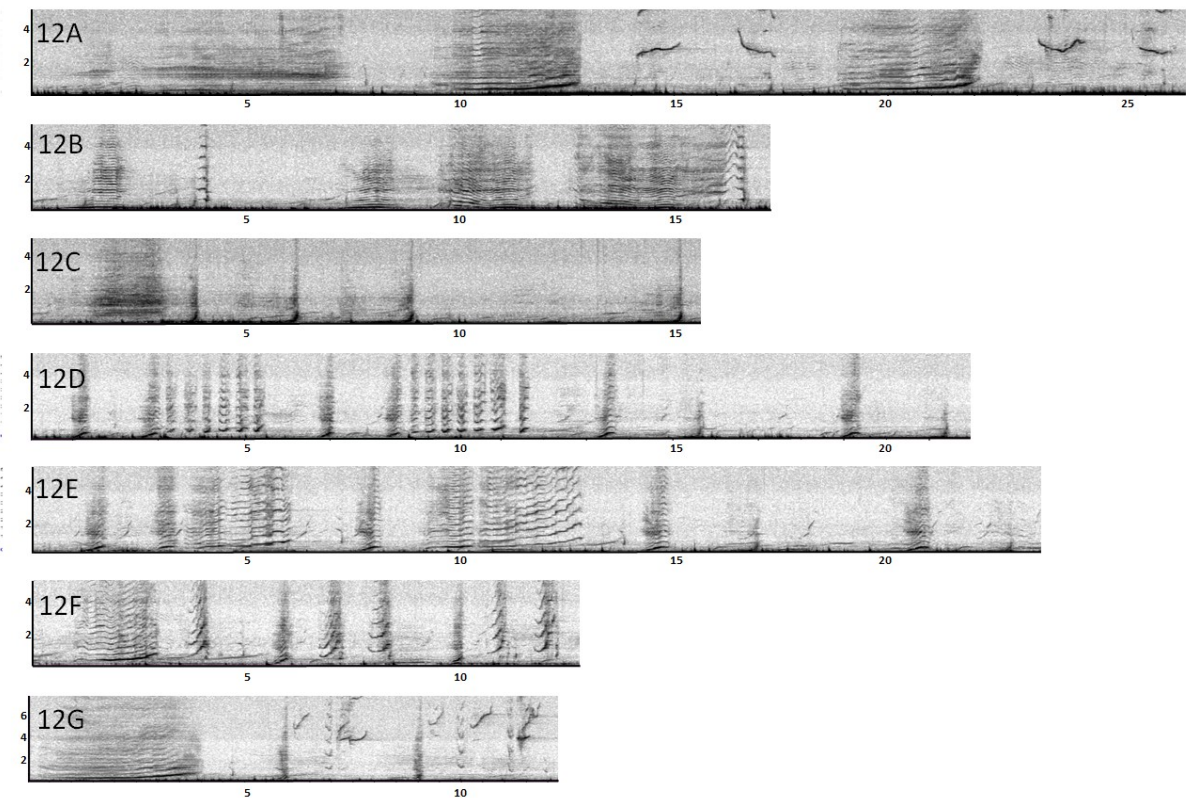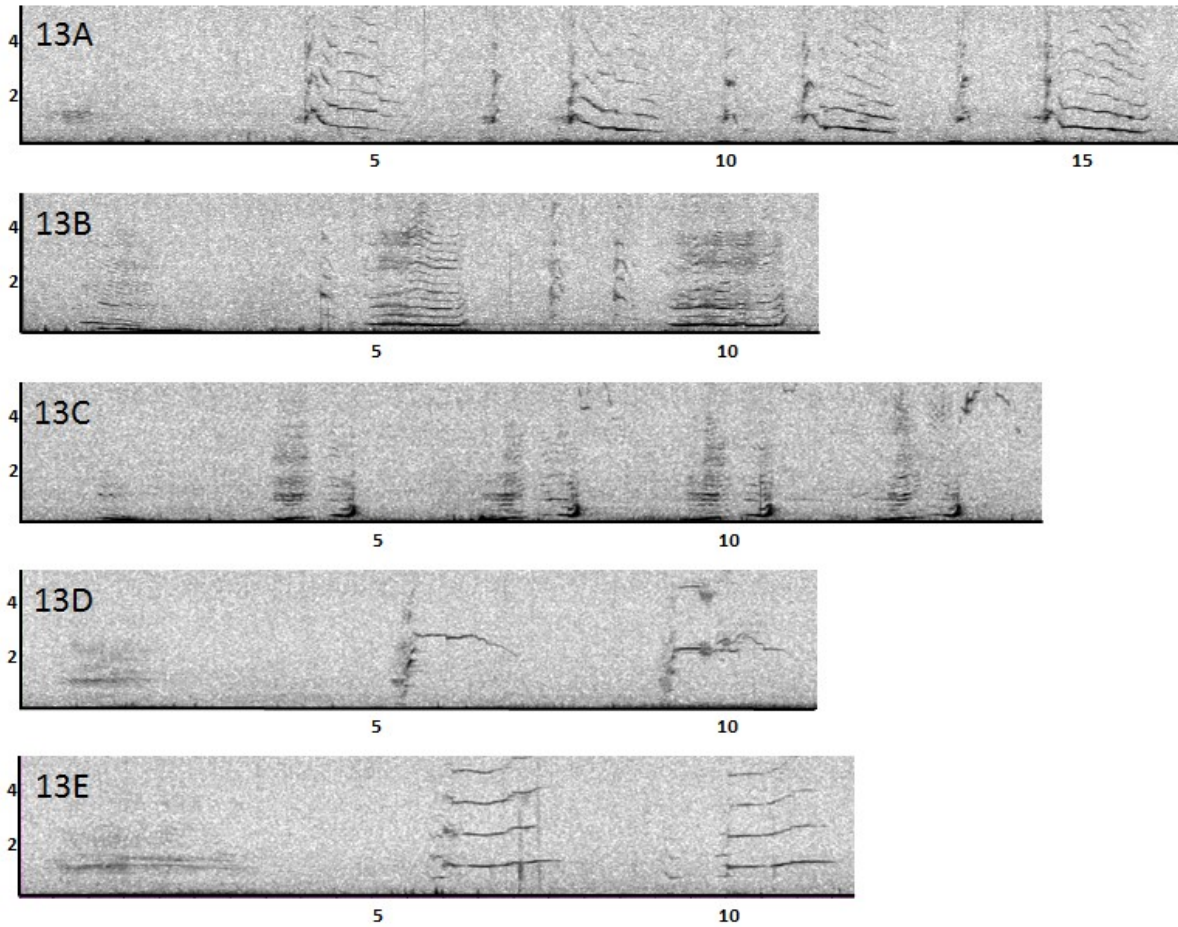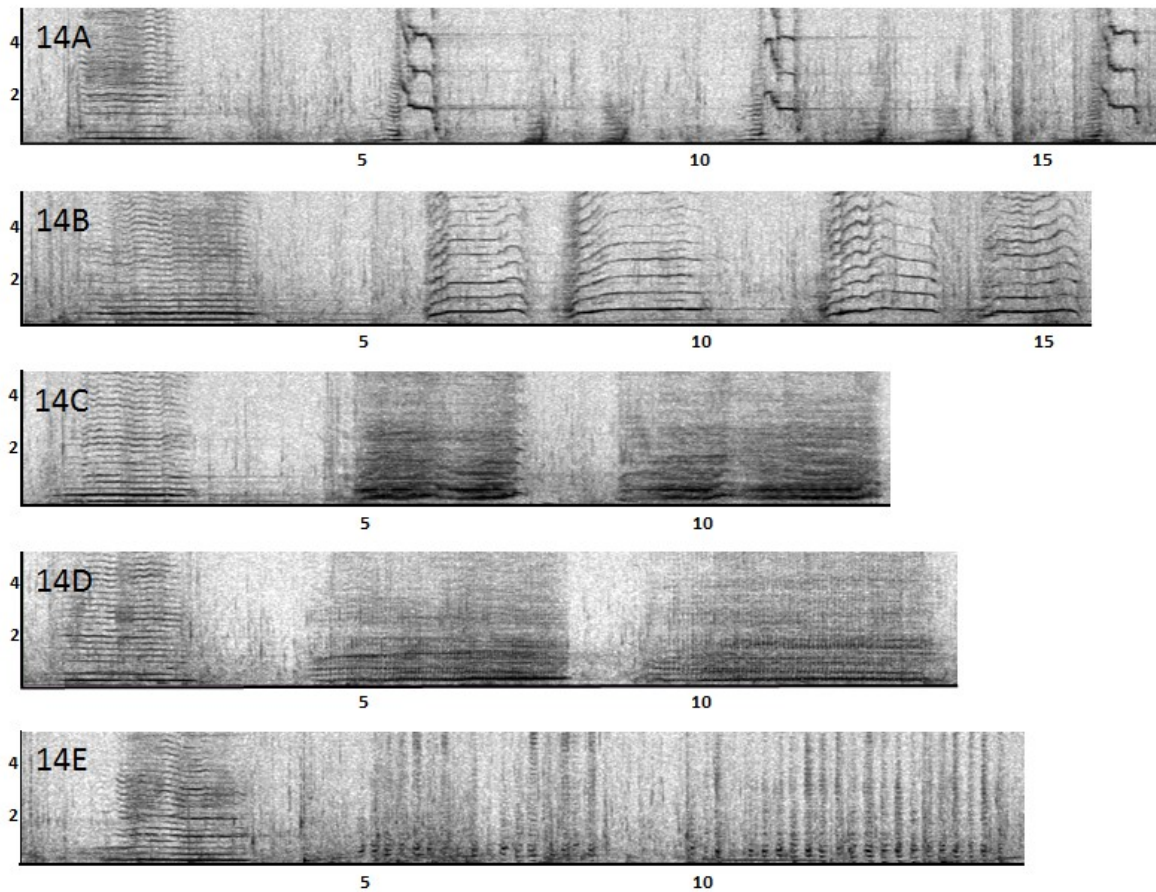

Figure S25 Example of 2012 song labelled with the population (EA), year (12), and themes labelled A-G. Themes correspond to the following Record IDs: Theme A = 22092012-1, Theme B = 19092012-8, Theme C = 10102012-13, Theme D = 21092012-137, Theme E = 14102012-99, Theme F = 19102012-85, Theme G = 14102012-32.

Figure S26 Example of 2013 song labelled with the population (EA), year (13), and themes labelled A-E. Themes correspond to the following Record IDs: Theme A = 08102013-1, Theme B = 15092013-48, Theme C = 11102013-36, Theme D = 15092013-107, Theme E = 11102013-122.

Figure S27 Example of 2014 song labelled with the population (EA), year (14), and themes labelled A-E. Themes correspond to the following Record IDs: Theme A = 04102014-70, Theme B = 04102014-12, Theme C = 12102014-43, Theme D = 04102014-54, Theme E = 04102014-96.