Heidi Swanson, Martin Lysy, Michael Power, Ashley Stasko, Jim Johnson, and James Reist. 2014. A new probabilistic method for quantifying n-dimensional ecological niches and niche overlap. *Ecology*

APPENDICES

Appendix D. A comparison of overlap at different α.

APPENDIX D. COMPARISON OF OVERLAP AT DIFFERENT α

In the manuscript, we define N_R at the nominal level of $\alpha = 0.95$. Here, we show how changing α affects the overlap metric. Using our example data, we estimated probability of overlap at $\alpha = 0.8, 0.9, 0.95, 0.99$ (Table D2). While increasing α results in higher probability of overlap, the ordering of pairwise overlap metrics remains the same. For example, Least Cisco has a higher probability of overlapping onto the niche of Arctic Cisco than either Broad Whitefish or Lake Whitefish, regardless of α) (Table D2).

We first present a summary of data that were used in this analysis.

TABLE D1: Summary of the stable isotope data for four species of fish.

		Isotope ‰ : mean(sd)		
Species	N_{samples}	$\delta^{15}N$	$\delta^{13}C$	$\delta^{34}S$
Arctic Cisco	69	13(0.82)	-24(1.1)	15(1.2)
Broad Whitefish	71	9.3(1.2)	-27(2)	-3.1(9.9)
Lake Whitefish	67	11(0.91)	-25(1.5)	6.1(4.8)
Least Cisco	70	12(0.73)	-25(1.2)	11(3.4)

TABLE D2: Posterior means and 95% credible intervals for the overlap metric, with α for N_R varying from 0.8-0.99. Probability of overlap (%) increases with increasing α, but patterns of pairwise overlap remain the same. Species abbreviations are: Arctic Cisco (ARCS), Broad Whitefish (BDWF), Lake Whitefish (LKWF), and Least Cisco (LSCS).

BDWF onto ARCS

α	Mean	95% C.I.
0.8	0.083	(0, 0.26)
0.9	0.17	(0.02, 0.49)
0.95	0.3	(0.05, 0.8)
0.99	0.78	(0.19, 1.8)

ARCS onto BDWF

α	Mean	95% C.I.
0.8	1.3	(0.03, 6)
0.9	4.7	(0.36, 17)
0.95	11	(1.4, 32)
0.99	33	(9, 67)

LKWF onto ARCS

α	Mean	95% C.I.
0.8	3.6	(1.6, 6.5)
0.9	5.5	(2.6, 9.4)
0.95	7.4	(3.7, 12)
0.99	12	(6.5, 19)

ARCS onto LKWF

α	Mean	95% C.I.
0.8	28	(8.4, 54)
0.9	49	(24, 75)
0.95	66	(41, 87)
0.99	87	(69, 98)

LSCS onto ARCS

α	Mean	95% C.I.
0.8	22	(15, 31)
0.9	31	(22, 41)
0.95	38	(28, 49)
0.99	50	(39, 62)

ARCS onto LSCS

α	Mean	95% C.I.
0.8	60	(45, 76)
0.9	73	(58, 87)
0.95	81	(68, 93)
0.99	92	(82, 98)

LKWF onto BDWF

α	Mean	95% C.I.
0.8	50	(31, 71)
0.9	66	(46, 85)
0.95	78	(59, 93)
0.99	92	(80, 99)

BDWF onto LKWF

α	Mean	95% C.I.
0.8	12	(6.6, 19)
0.9	19	(11, 28)
0.95	26	(16, 37)
0.99	41	(28, 55)

LSCS onto BDWF

α	Mean	95% C.I.
0.8	17	(4.3, 40)
0.9	34	(12, 65)
0.95	51	(24, 82)
0.99	80	(53, 97)

BDWF onto LSCS

α	Mean	95% C.I.
0.8	1.7	(0.58, 3.4)
0.9	3	(1.1, 5.7)
0.95	4.5	(1.9, 8.5)
0.99	9	(4.3, 16)

LSCS onto LKWF

α	Mean	95% C.I.
0.8	64	(47, 81)
0.9	80	(64, 92)
0.95	89	(76, 97)
0.99	97	(92, 100)

LKWF onto LSCS

α	Mean	95% C.I.
0.8	31	(21, 43)
0.9	43	(30, 57)
0.95	53	(39, 67)
0.99	70	(56, 83)