

## **Black bear translocations in response to nuisance behaviour indicate increased effectiveness by translocation distance and landscape context**

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**Table S1. A review of published estimates of maximum home range (HR) size for adult black bear from the northern mixed hardwood ecotone.**

Home range diameter was calculated as the diameter of a circle equal in area to the home range. Abbreviations are as follows: FK = fixed kernel, MCP = minimum convex polygon, LSCV h = least-squares cross-validation bandwidth, REF = reference bandwidth.

Study	Location	Sex	Duration	N	Estimator	Max. HR Size (km <sup>2</sup> )	Diameter (km)
Alt et al. 1980	Pennsylvania	Females	"Total" HR <sup>a</sup>	12	Bivariate normal	84.00 <sup>b</sup>	10.34
Garshelis and Pelton 1981	Tennessee	Females	Annual	12	95% confidence ellipse	45.00	7.57
Garshelis and Pelton 1981	Tennessee	Females	Annual	14	95% MCP	23.00	5.41
Mitchell and Powell 2007	North Carolina	Females	Annual	104	95% FK with LSCV h	61.25 <sup>c</sup>	8.83
Sadeghpour and Ginnett 2011	Wisconsin	Females	May-August	19	100% MCP	36.50	6.82
Jones et al. 2015	Maryland	Females	Spring	8	95% FK, 0.8 of REF <sup>d</sup>	35.54	6.73
Jones et al. 2015	Maryland	Females	Summer	12	95% FK, 0.8 of REF <sup>d</sup>	48.01	7.82
Jones et al. 2015	Maryland	Females	Fall	6	95% FK, 0.8 of REF <sup>d</sup>	80.95	10.15
Jones et al. 2015	Maryland	Females	Spring	8	100% MCP <sup>d</sup>	34.79	6.66
Jones et al. 2015	Maryland	Females	Summer	12	100% MCP <sup>d</sup>	27.75	5.94

Jones et al. 2015	Maryland	Females	Fall	6	100% MCP <sup>d</sup>	39.35	7.08
Alt et al. 1980	Pennsylvania	Males	"Total" HR <sup>a</sup>	5	Bivariate normal	413.00	22.93
Garshelis and Pelton 1981	Tennessee	Males	Annual	8	95% confidence ellipse	60.00	8.74
Garshelis and Pelton 1981	Tennessee	Males	Annual	10	95% MCP	28.00	5.97

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<sup>a</sup>Duration over which home ranges were calculated not reported

<sup>b</sup>Extra-home range movements were excluded for two females

<sup>c</sup>Largest mean annual home range from Table 1

<sup>d</sup>GPS telemetry

**Table S2. Candidate model rankings based on  $AIC_c$  for the effects of translocation distance (DST), age (AGE; cub, yearling, adult), and sex (SEX) on probability of returning by translocated nuisance black bears, with random intercepts for individuals, including one observation of an adult male not returning after being translocated 165 km.**

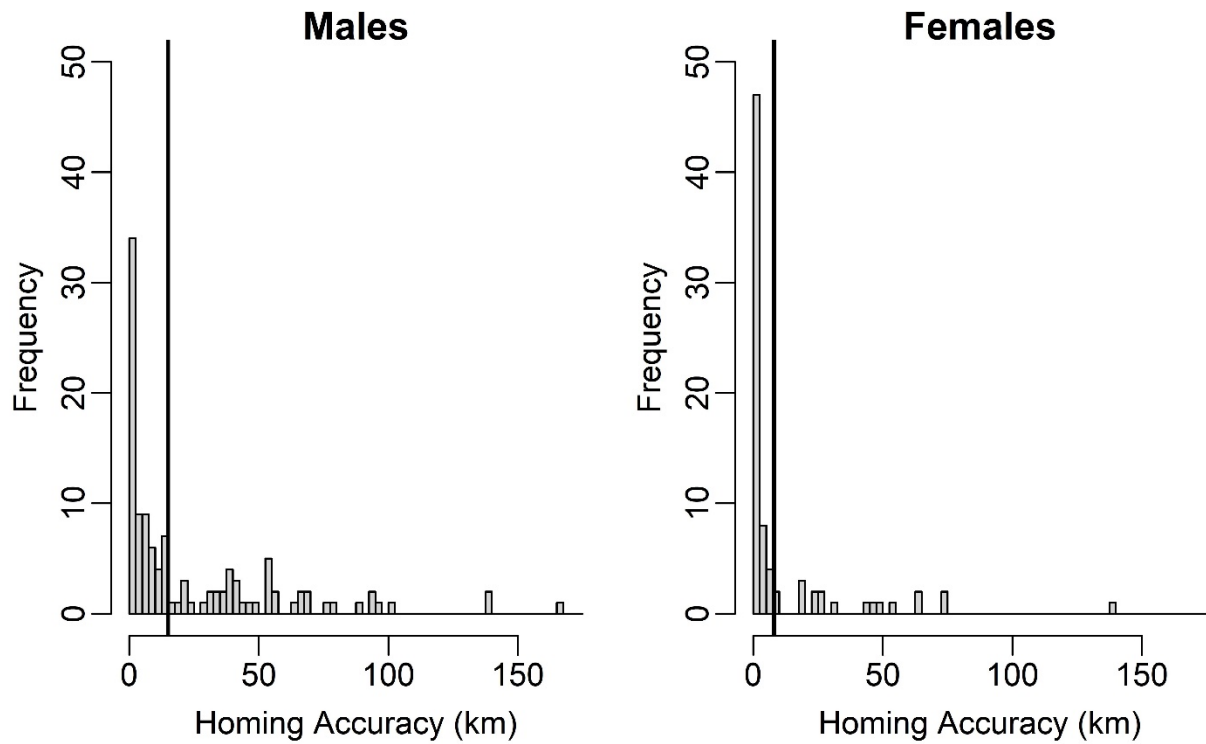
	$K$	Log Likelihood	$AIC_c$	$\Delta AIC_c$	$w$	Cum. $w$	Evidence Ratio
SEX+AGE*DST	6	-75.53	163.69	0.00	0.40	0.40	1.00
SEX+AGE+DST	5	-76.95	164.35	0.65	0.29	0.69	1.39
AGE	4	-78.61	165.53	1.83	0.16	0.84	2.50
AGE+SEX*DST	6	-76.47	165.58	1.89	0.16	1.00	2.57
SEX	4	-86.21	180.72	17.03	0.00	1.00	4995.82
Null	2	-90.44	184.97	21.28	0.00	1.00	41862.10
DST	3	-89.66	185.50	21.81	0.00	1.00	54531.10

**Table S3. Candidate model rankings for the effects of translocation distance, age (yearling, adult), sex, and land cover covariates on probability of returning by translocated nuisance black bears including one observation of an adult male not returning after being translocated 165 km.**

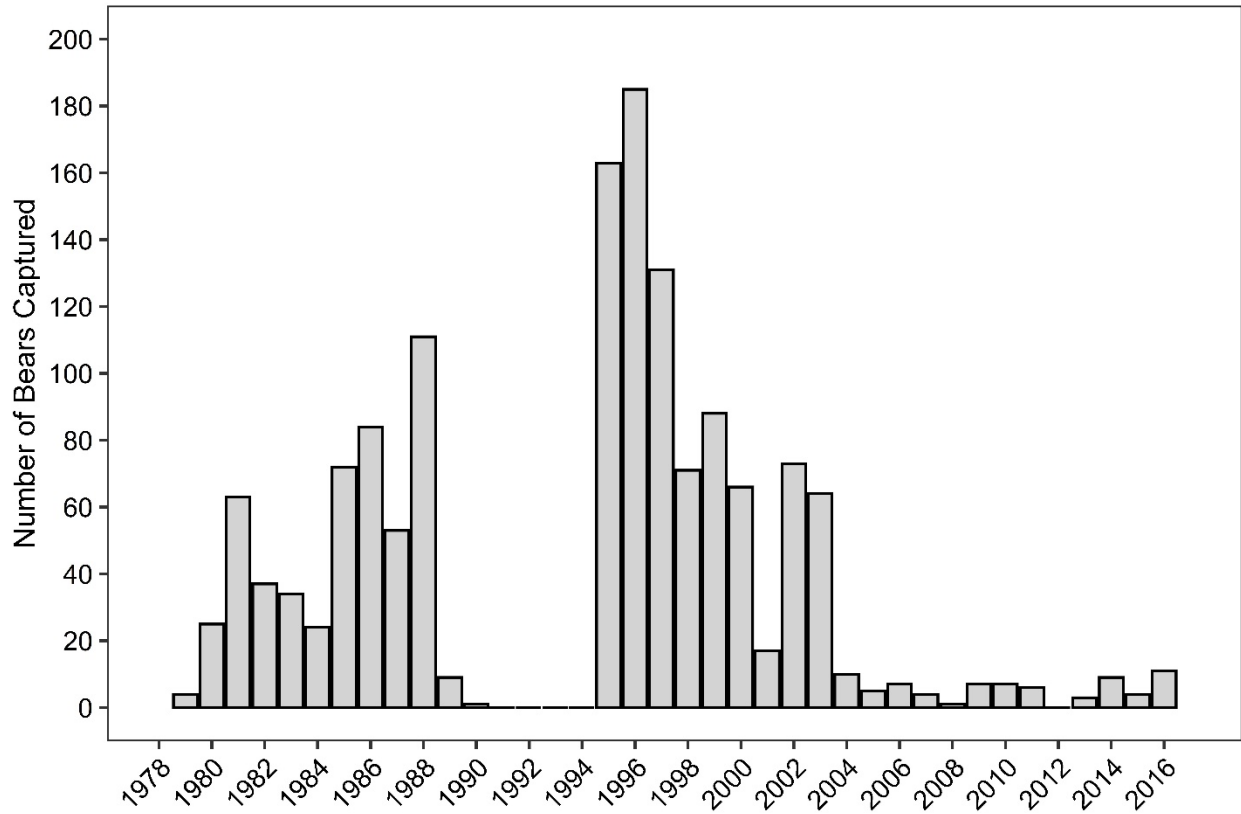
Each land cover covariate was included at its characteristic scale (10 km for urban, 75 km for agriculture, 100 km for forest and wetland) and the null model includes only non-land cover covariates. The evidence ratio indicates the support of model *i* relative to the null model. Beta is the fixed-effect parameter estimate with its 95% CI.

	<i>K</i>	Log			<i>w</i>	Cum. <i>w</i>	Evidence Ratio	$\beta$	Lower	Upper
		Likelihood	AIC <sub>c</sub>	$\Delta$ AIC <sub>c</sub>					95% CI	95% CI
AGRICULTURE+SEX+AGE*DST	7	-52.14	119.42	0.00	0.78	0.78	20.50	1.02	0.18	1.86
FOREST+SEX+AGE*DST	7	-53.91	122.95	3.54	0.13	0.91	3.50	-0.58	-1.13	-0.02
SEX+AGE*DST	6	-56.31	125.46	6.04	0.04	0.95	1.00	-	-	-
WETLAND+SEX+AGE*DST	7	-55.53	126.20	6.78	0.03	0.98	0.69	-0.31	-0.81	0.18
URBAN+SEX+AGE*DST	7	-55.63	126.40	6.98	0.02	1.00	0.63	0.27	-0.19	0.73

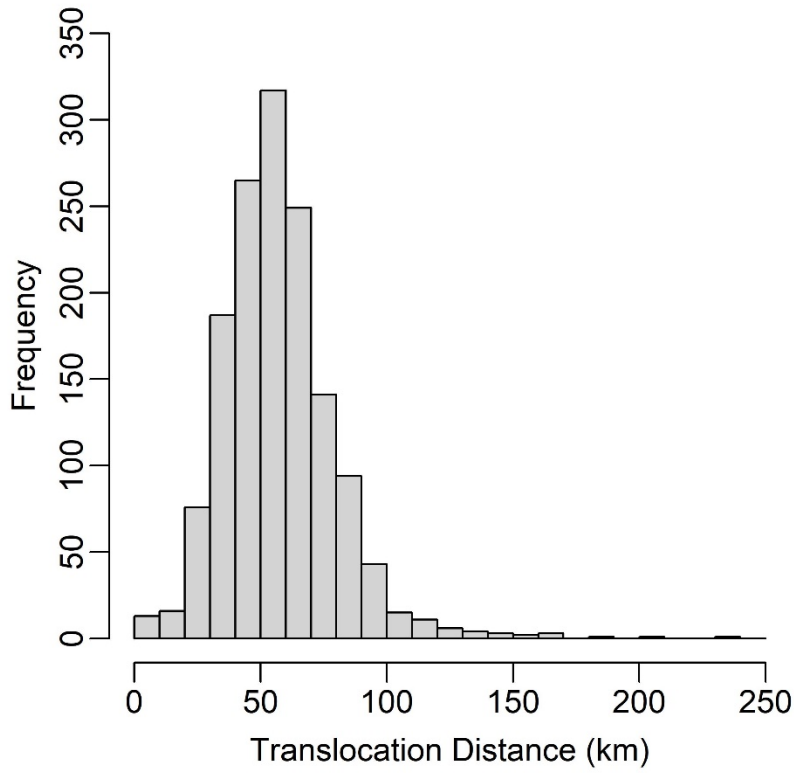
**Fig. S1.** Distributions of distances between the release location and subsequent capture location (i.e., homing accuracy) for translocated nuisance black bears in Wisconsin by sex ( $n = 114$  and  $78$  entries for males and females, respectively). The vertical black lines represent the cutoff values (13 km for males and 8 km for females) used to determine if a bear returned to its home range.



**Fig. S2.** Number of captures by year of nuisance black bear in Wisconsin ( $n = 1,449$  entries for 1,282 bears).

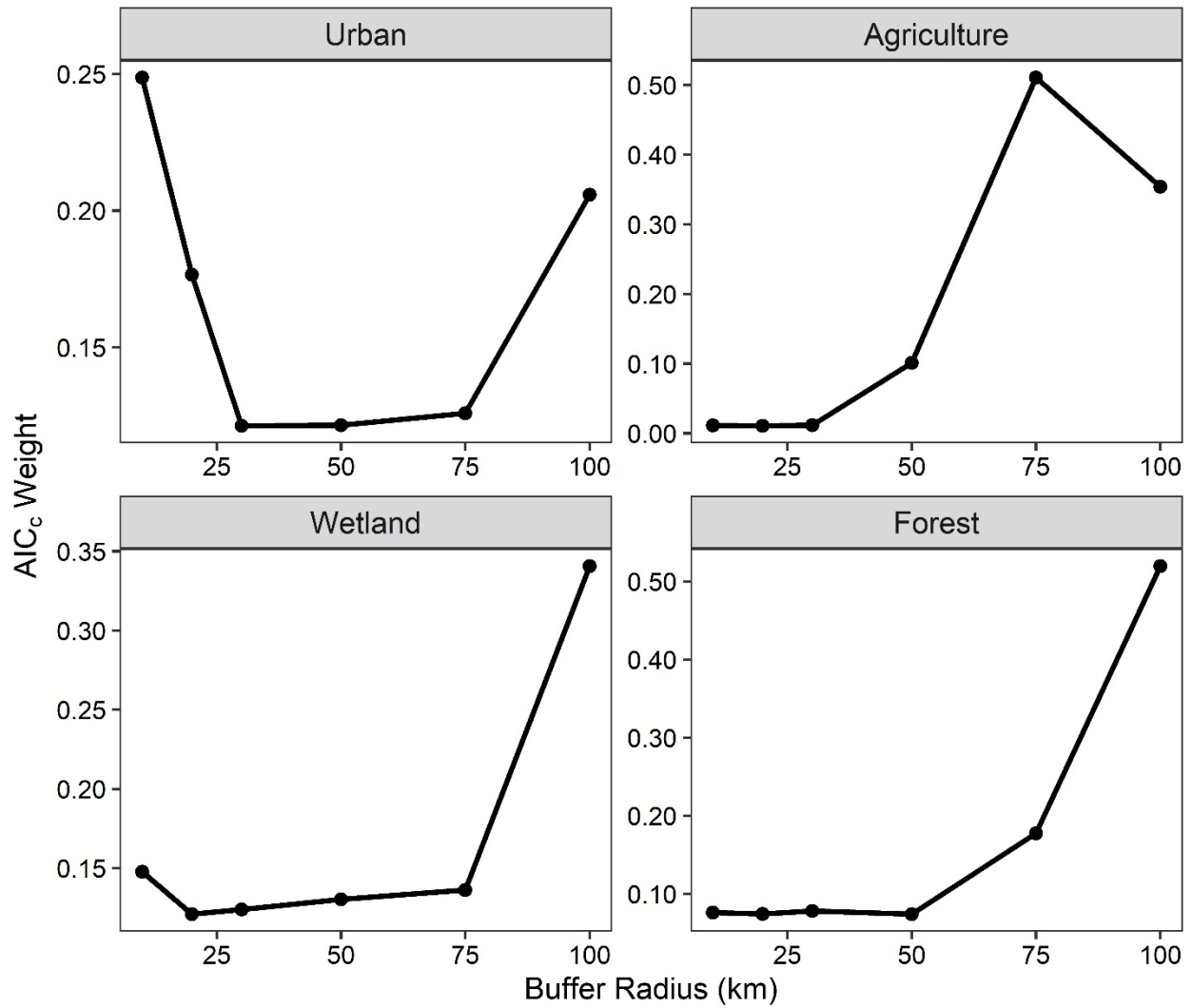


**Fig. S3.** Distribution of translocation distances for nuisance black bear in Wisconsin ( $n = 1,449$  entries for 1,282 bears). Bin width is 10 km and maximum translocation distance is 235 km





**Fig. S4.** Empirical support for land cover covariates on probability of homing by translocated nuisance black bears across a range of spatial scales (10–100 km). We excluded one observation of an adult male not returning after being translocated 165 km. The scale with the highest AIC<sub>c</sub> model weight is the characteristic scale



**Fig. S5.** Model-averaged predicted probabilities of return for females of each age class at known translocated nuisance black bear locations in Wisconsin. Locations represent capture points of translocated bears that were used in the analysis of return probability. Probabilities were estimated excluding one observation of an adult male not returning after being translocated 165 km.

