Appendix C. Additional Tables and Figures

Table S1. Chronology of additional data and publications used to update the Alexander Archipelago wolf population model.

Data Type	Data Source
Wolf reproduction	Person and Russell 2009
Wolf survival	Person and Russell 2008
Effect of roads on wolf mortality	Person and Russell 2008
Black bear Predation on fawns	Gilbert 2015
Black bear predation on adult	Gilbert 2015, Person 2009
Climate effects on winter severity	Littell 2015
Wolf Diet	Szepanski et al. 1999

Table S2. Description of scenarios evaluated using the wolf population model.

Scenario	Parameter	Condition
No Change	Vegetation	No change
	Roads	No change
	Wolf harvest	20% harvest cap
	Frequency of severe winter	Predicted average
Scenario A	Vegetation	No change
	Roads	Planned decommission
	Wolf harvest	No legal harvest
	Frequency of severe winter	Predicted low
Scenario B	Vegetation	Young growth transition
	Roads	Planned decommission
	Wolf harvest	20% harvest cap
	Frequency of severe winter	Predicted average
Scenario C	Vegetation	Continued harvest of old growth
	Roads	No change
	Wolf harvest	20% harvest cap
	Frequency of severe winter	Predicted average
Scenario D	Vegetation	Increased harvest of old growth
	Roads	No change
	Wolf harvest	30% harvest cap
	Frequency of severe winter	Predicted high
Scenario E	Vegetation	Maximum harvest of old growth
	Roads	Road construction
	Wolf harvest	30% harvest cap
	Frequency of severe winter	Predicted high

Table S3. Generalized land cover and forest conditions under baseline and future management scenarios in Game Management Unit 2 of southeastern Alaska, 1995 - 2045.

General Land Cover	Baseline		Future Scenarios in 2045				
	1995 (hectares)	2015 (hectares)	No Change (hectares)	Scenario B (hectares)	Scenario C (hectares)	Scenario D (hectares)	Scenario E (hectares)
Old-growth forest	424,656	397,040	397,040	374,588	366,971	354,742	346,639
Logged forest (all)	134,621	165,664	165,664	188,116	195,733	207,961	216,065
Early succession (≤25 yr)	98,230	50,821	0	25,468	21,502	20,328	14,050
Late succession (>25 yr)	36,391	114,842	165,664	162,647	174,231	187,633	202,015
Other	410,720	410,720	410,720	410,720	410,720	410,720	410,720
Total	973,423	973,423	973,423	973,423	973,423	973,423	973,423

Table S4. Sensitivity of wolf and deer spring abundance, hunting, and browsing impacts to changes in forest vegetation, road length, frequency of severe winters, wolf harvest regulation, and wolf diet composition. Abundance is shown as a median, as well as % change by 2045, hunting is shown as % change by 2045, and browsing is show as proportion of wolf ranges with severe browsing impacts by 2045, all with 95 % confidence intervals.

Parameter	Perturbation description	Wolf abundance	% change wolf	% change deer	% change hunt	% browsed
Vegetation	Stable K (restoration)	136 (50, 190)	64 (-40, 129)	-3 (-18, 6)	-21 (-39, -7)	10 (0, 23)
	No timber harvest	130 (49, 184)	65 (-38, 133)	-10 (-23, -2)	-29 (-45, -17)	10 (0, 23)
	Transition to second growth*	129 (44, 183)	62 (-45, 130)	-10 (-23, -2)	-30 (-45, -19)	10 (0, 23)
	Continued old growth harvest	130 (42, 182)	60 (-41, 128)	-12 (-25, -4)	-31 (-46, -19)	10 (0, 23)
	Increased old growth harvest	130 (48, 182)	60 (-41, 125)	-15 (-29, -7)	-35 (-50, -24)	10 (0, 23)
	Maximum old growth harvest	126 (50, 180)	57 (-38, 124)	-17 (-29, -9)	-37 (-50, -16)	10 (0, 23)
Roads	Maximum decommission	133 (50, 187)	66 (-38, 133)	1 (-11, 6)	-39 (-49, -36)	13 (0, 26)
	Increased decommission	130 (43, 185)	63 (-46, 131)	- 2 (-16, -4)	-34 (-46, -29)	13 (0, 26)
	Planned decommission*	129 (44, 183)	62 (-45, 130)	-10 (-23, -2)	-29 (-44, -17)	10 (0, 23)
	No change	133 (51, 184)	62 (-38, 124)	-11 (-25, -3)	-29 (-46, -17)	10 (0, 23)
	Road construction	134 (48, 180)	65 (-41, 122)	-20 (-36, -10)	-23 (-44, -7)	6 (0, 19)
Winter severity	Low frequency	131 (42, 182)	64 (-48, 128)	-10 (-23, -2)	-28 (-44, -17)	10 (0, 23)
	Average frequency*	130 (47, 182)	64 (-41, 130)	-10 (-24, -2)	-29 (-44, -16)	10 (0, 23)
	High frequency	132 (48, 181)	59 (-42, 118)	-11 (-27, -3)	-49 (-49, -18)	10 (0, 23)
Wolf harvest	No wolf harvest occurs	287 (227, 362)	280 (211, 365)	-52 (-63, -40)	-80 (-87, -66)	0 (0, 0)
	Total harvest closure	309 (259, 356)	264 (208, 321)	-38 (-54, -25)	-63 (-80, -45)	0 (0, 0)
	20% cap on reported harvest*	129 (44, 183)	62 (45, 130)	-10 (-23, -2)	-29 (-44, -17)	10 (0, 23)
	30% cap on reported harvest	59 (11, 107)	-26 (-86, 34)	-3 (-16, 0)	-20 (-34, -14)	16 (3, 29)
	0% cap (no limit)	61 (7, 107)	-26 (-92, 33)	-3 (-14, 0)	-20 (-33, -15)	16 (3, 29)
	Wolves extinct	0	-100	0 (-10, 2)	-18 (-29, -14)	29 (10, 32)

Wolf diet	9.5 deer/year	136 (46, 205)	68 (43, 153)	-6 (-18, -1)	-24 (-38, -16)	16 (3, 26)
	15 deer/year*	129 (44, 183)	52 (-45, 104)	-16 (-32, -4)	-36 (-54, -19)	10 (0, 23)
	20.5 deer/year	123 (54, 166)	50 (-34, 102)	-16 (-31, -4)	-35 (-53, -20)	6 (0, 19)
	26 deer/year	105 (44, 142)	30 (-46, 75)	-22 (-39, -6)	-44 (-63, -22)	3 (0, 16)
Deer harvest	Regular hunting*	129 (44, 183)	63 (-42, 122)	-11 (-25, -2)	NA	71 (39, 90)
	No hunting	143 (47, 180)	83 (-42, 159)	13 (6, 17)	NA	10 (0, 23)

* Equivalent to Scenario B

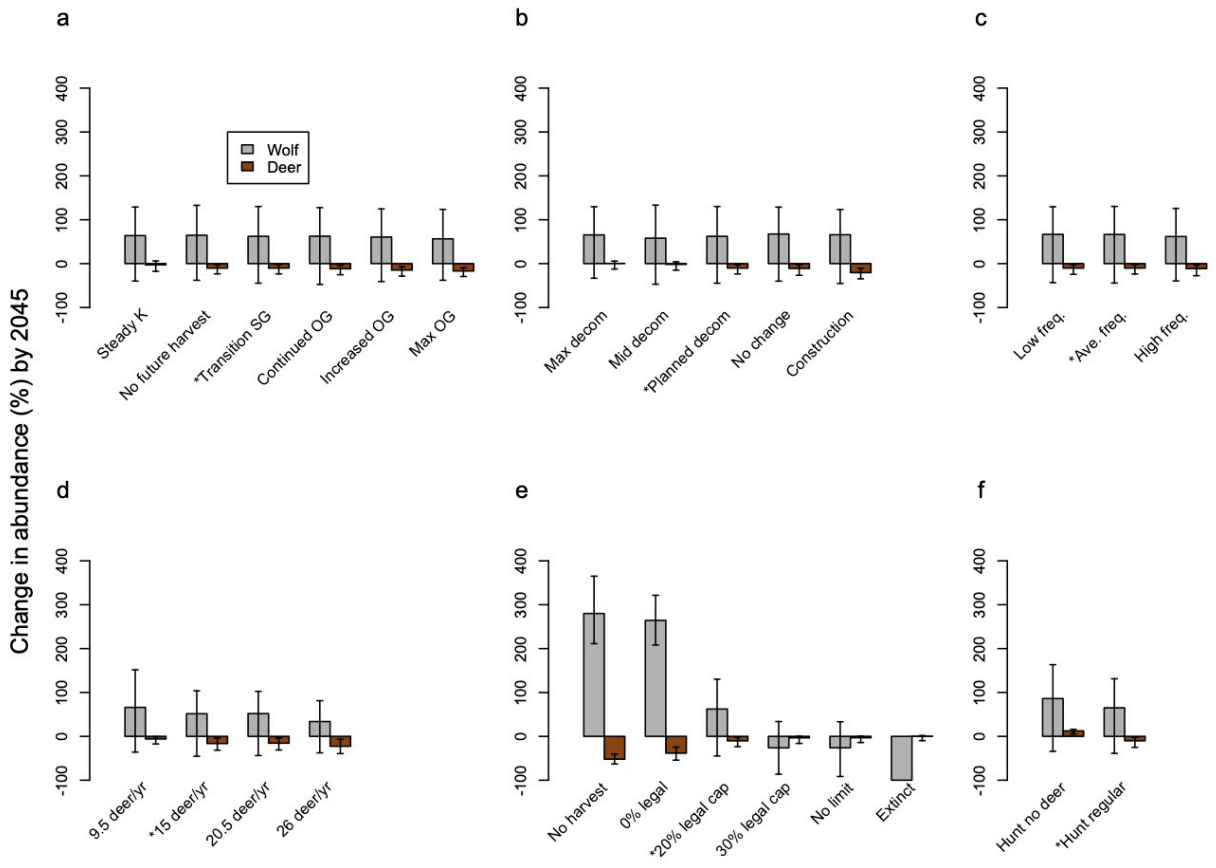

Figure S1. Sensitivity of wolf and deer abundance to a) vegetation change, b) road decommissioning, c) winter severity frequency, d) wolf diet composition, e) wolf harvest conditions, and f) deer hunting. Abundance is shown as percent change from 2014-2045 for wolves (grey) and deer (brown) with 95 % confidence interval bars.

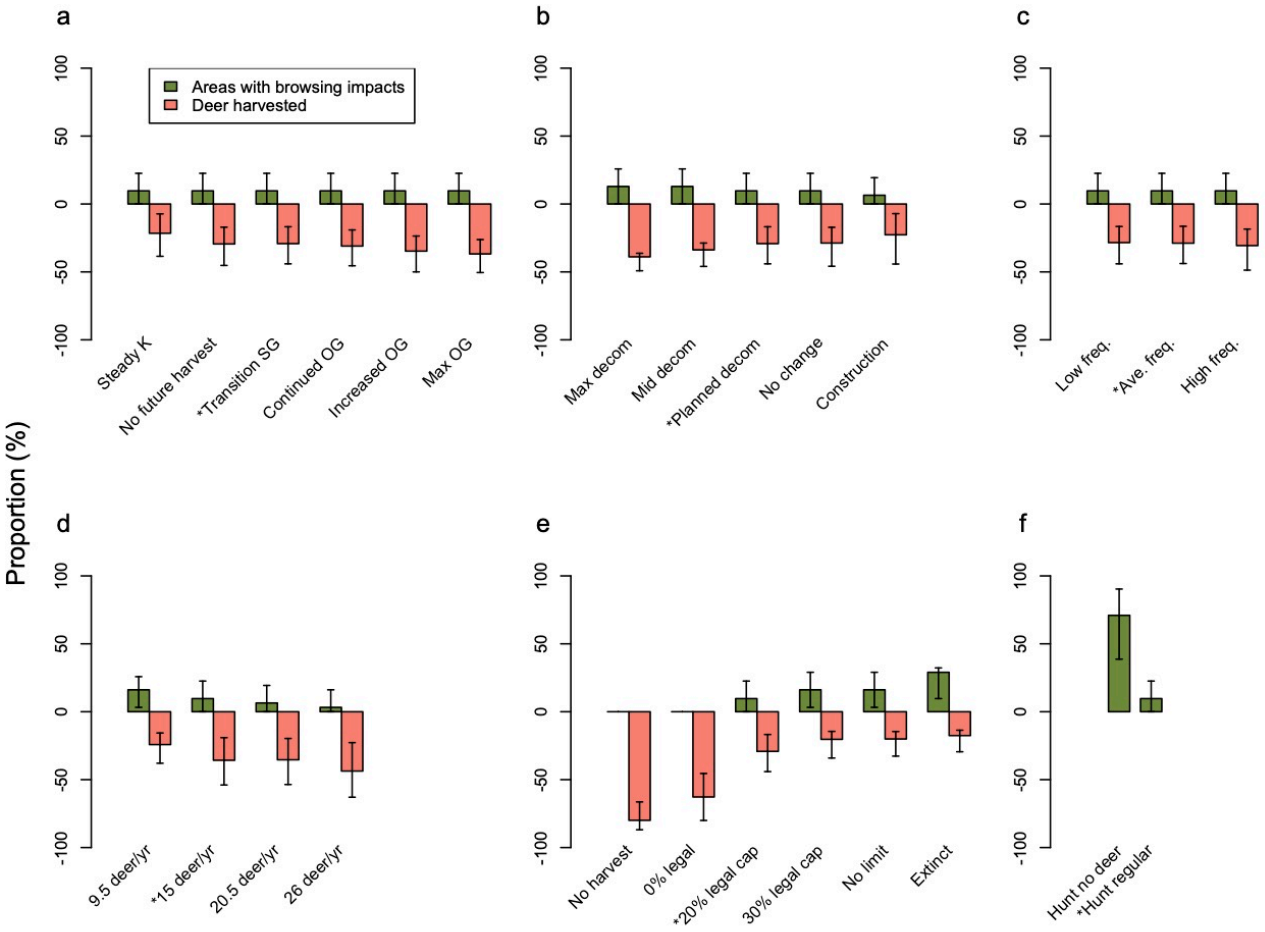

Figure S2. Sensitivity of ecosystem services (hunting opportunity, pink) and disservices (deer browsing impacts to conifers, green) to a) vegetation change, b) road decommissioning, c) winter severity frequency, d) wolf diet composition, e) wolf harvest conditions, and f) deer hunting. Hunting opportunity is shown as percent change from 2015-2045, and browsing impacts represent percentage of wolf pack ranges experiencing severe browsing in 2045, both with 95 % confidence interval bars.

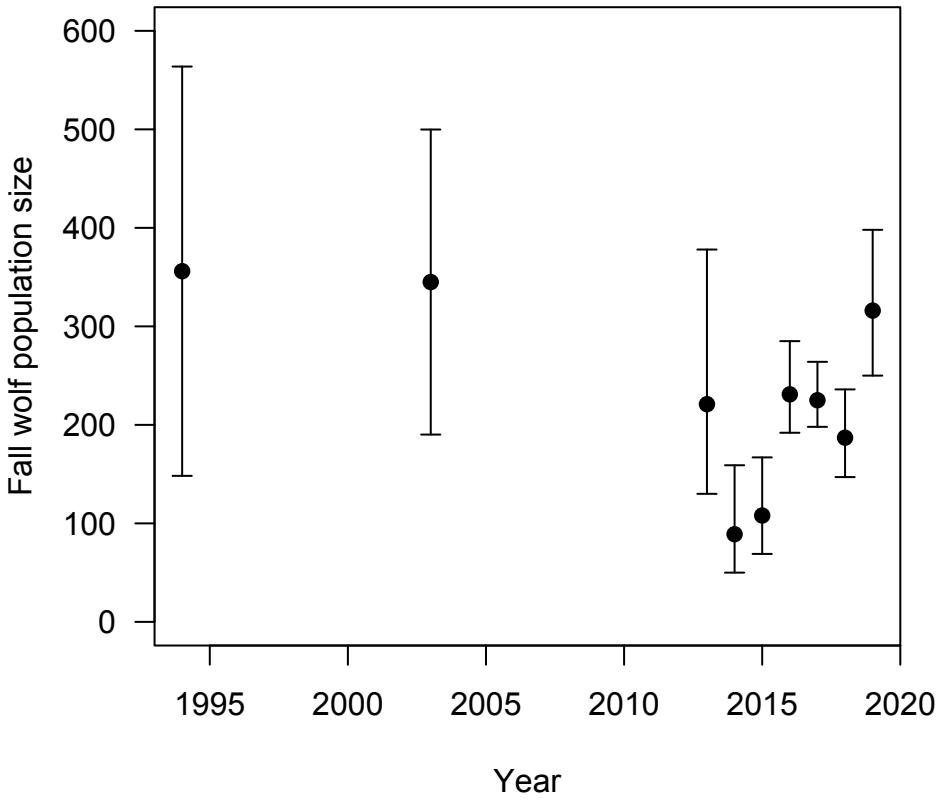

Figure S3. Population estimates produced by the Alaska Department of Fish and Game of fall wolf population size for Prince of Wales and outlying islands (GMU 2). The Fall 2020 estimate has not yet been made available to the public as of publication.