

## **Fidelity to natal social groups and mating within and between social groups in an endangered false killer whale population**

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### Age-class determination

All individuals are given an identification (ID) number in the catalog regardless of distinctiveness or photo quality; however, analyses are usually restricted to individuals that are distinctive and sightings with good or excellent photo quality. Re-sightings of individuals are based on natural markings on the body such as scars or notches on the dorsal fin. Dorsal fin notch acquisitions or changes for this population have been estimated to occur on average every 6.9 to 8.8 years (Baird et al. 2008); thus, individuals with notches are typically at least a year old. To avoid falsely excluding a true parent from the candidate pool, we purposely erred on the late side when determining the latest year the individual could possibly have been born (`birth_year`) and on the early side when determining the earliest year the individual could possibly have reproduced (`repro_year`). An individual was deemed an adult once eight years had passed since it was first identified (either genetically or photographically). If eight years had not passed since it was first identified, all photographs of the individual when other individuals were visible in the photo were assessed to determine relative size (e.g., whether the individual was approximately the same size as other known adults or smaller indicating it may be a sub-adult or juvenile). Given the slow acquisition of notches, the number of notches on the dorsal fin was also considered, with individuals with few or no notches and small relative size categorized as juveniles. For individuals classified as juveniles or sub-adults the first year in which they were sighted, `birth_year` equaled the year they were first identified. For those identified as adults in their first sighting, `birth_year` equaled 10 years prior to first sighting for females and 15 years prior to first sighting for males, as females and males are thought to reach physical maturity at ages 10 and 15, respectively (Ferreira et al. 2014). For individuals classified as juveniles, `repro_year` was defined as the year after they were last seen as a juvenile. The earliest possible year of reproduction could not be confidently determined for any individuals that were first sighted as adults or sub-adults. Females were deemed adults due to having a small calf in close proximity only when photos clearly showed a calf in infant position relative to the identified mother during surfacing. In these instances, calves could not reliably photographically-identified due to lack of body scars and dorsal fin notches.

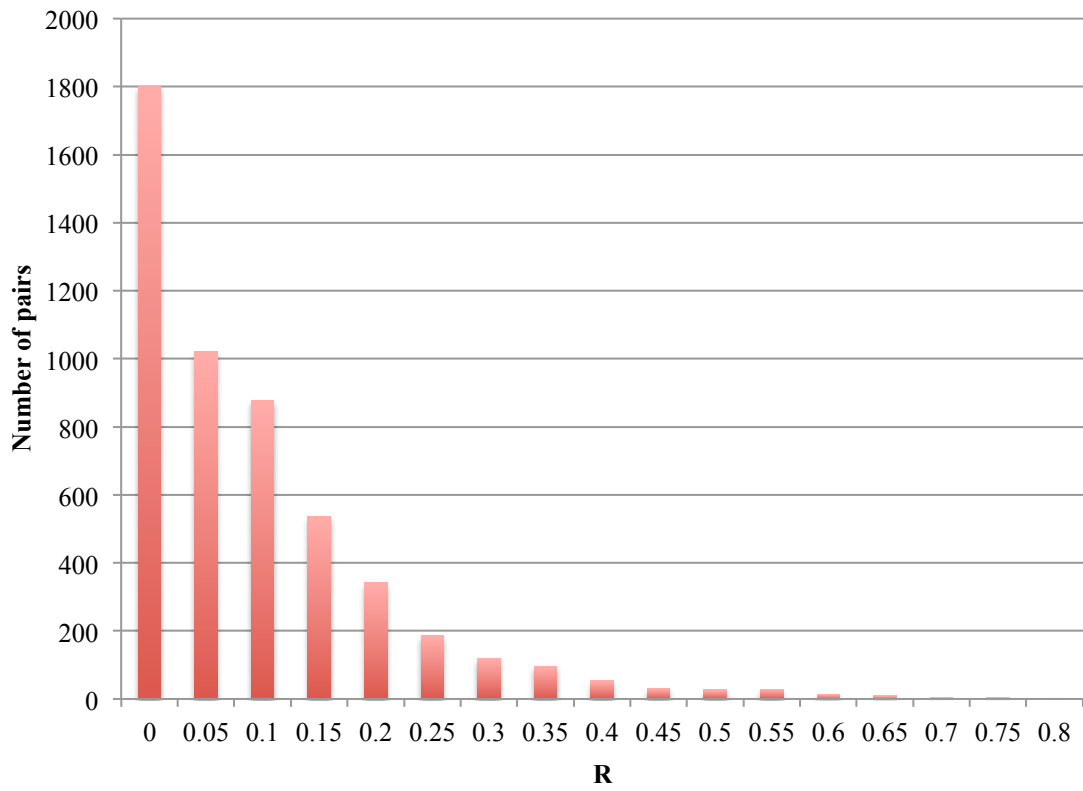


Figure S1. Distribution of pairwise relatedness values for all individuals in the data set.

Table S1. Stage categories of individuals based on photo-identification data collected through 2013. Categories are A=adult, SA=sub-adult and J=juvenile. Stages prefaced with P are probable categories. Stage categories given are for the most recent year seen, unless a year is noted in parentheses. The column labeled 'Basis' indicates the data on which the age determination is based. IC=in catalog more than eight years, M=markings, RS=Relative size in photographs with other individuals present, and W/C means with calf (year seen with calf in parentheses). Distinctiveness of the individual was rated as 4=very distinctive, 3=distinctive, 2=slightly distinctive, 1=not distinctive.

ID	First seen	Last seen	# years seen	# times seen	Distinctiveness	Stage category	Basis
18945	1988	2010	9	21	4	A	IC
18946	2000	2010	7	10	4	A	IC
18954	2000	2000	1	1	2	P A	M
18955	2000	2008	2	3	3	A	IC
23316	2001	2010	7	16	4	A	M / IC
23317	2001	2010	6	8	4	A	IC
23318	2000	2010	5	13	2	A	IC, W/C (2008)
23319	1990	2010	10	15	4	A	IC
23320	1999	2008	6	10	4	A	IC
23321	2001	2010	6	15	4	A	M, W/C (2006)
27453	2002	2010	3	3	1	P A	RS, W/C
30073	2002	2004	2	2	4	A	M
33885	2003	2010	4	7	4	A	M/RS
33886	2003	2003	1	1	4	A	M
33887	2003	2010	5	7	4	A	RS, M
33888	2003	2010	4	6	3	P SA	RS, M
33890	2002	2003	2	2	1	P SA	M
33892	2002	2003	2	2	4	A	M
33895	2003	2010	5	7	3	A	W/C (2009)
33898	2003	2010	5	8	3	P A	RS, M
33899	2003	2007	3	4	3	A	W/C (2007)
33902	2003	2008	3	4	3	P SA	M
33903	2003	2010	5	6	4	A	M/RS
33905	2003	2010	4	4	3	P A	RS
33906	2003	2009	4	5	3	A	M
33907	2003	2004	2	2	3	A	M
33908	2003	2010	5	9	4	A	RS, M
33909	2003	2004	2	2	4	P A	M
41286	2001	2010	7	10	4	A	IC
45925	1986	2010	6	6	4	A	IC
45928	2003	2010	4	5	4	A	RS, M
45932	2003	2010	4	5	4	A	M
49043	2005	2010	2	2	4	P A	M
49046	2005	2010	2	2	4	A	RS, M
49048	2002	2009	3	3	3	P J	M
49050	2004	2008	3	3	4	A	M
49051	2005	2010	2	2	3	A	M
49052	2005	2005	1	1	3	A	M
71016	2005	2010	5	14	3	P A	RS

71017	2000	2010	8	17	4	A	IC
73895	2008	2008	1	1	3	P A	M
75660	2003	2010	6	7	3	P A	RS, M
75661	2008	2008	1	5	3	P A	M
75662	1990	2010	9	13	4	A	IC
75663	2000	2010	7	13	4	A	IC
75665	1991	2010	12	16	4	A	IC
75676	2005	2010	6	19	3	P A	RS
75677	2008	2010	3	12	1	J (2008)	RS
75678	2007	2010	4	9	2	P J (2007)	M
75679	2005	2010	6	16	3	P J	M
91081	2006	2009	2	4	2	P SA	RS, M
91082	2009	2009	1	3	3	A	W/C
91083	1999	2009	3	3	4	A	IC, M
91084	2009	2009	1	1	4	A	M
91085	2000	2009	2	3	3	A	IC
91086	2009	2009	1	1	1	J	RS
91274	2004	2009	2	3	4	A	M
91275	2009	2009	1	1	2	J	RS, M
91276	2009	2009	1	1	3	A	W/C
91277	2009	2009	1	1	1	J	RS
91278	2009	2009	1	1	2	P A	M
91284	2009	2009	1	3	1	J	RS
91285	2008	2011	4	15	1	J (2008)	M/RS
92254	2009	2010	2	6	1	P J	M
92256	2007	2010	4	14	3	P J (2007)	M
98732	2004	2010	7	17	3	P A	RS
98734	2005	2010	3	6	4	A	M
98735	1995	2010	10	15	4	A	IC
98736	2004	2010	7	21	4	A	M/RS
98737	2008	2011	5	14	1	P J (2008)	M
98738	1999	2010	10	18	4	A	IC
98740	2000	2010	6	9	3	A	M, IC
98743	2010	2010	1	1	2	P J	RS, M
98744	2010	2010	1	1	3	P SA	M
98745	2009	2009	1	1	2	P SA	M
98746	2005	2010	4	4	3	P A	M
102483	2008	2010	2	4	4	J (2008)	RS
102485	2004	2010	3	5	4	A	M
102500	2005	2010	6	10	3	A	RS
123188	2004	2010	3	4	3	P A	M

Table S2. Parent/offspring pairs identified with high confidence by CERVUS. For those pairs in which the relative ages of the individuals could be determined from photographic and sighting data, the ID of the individual identified as the parent is in bold. The first six columns provide the sample identification numbers, sex, and haplotype for the two individuals in the pair. The columns labeled ‘Soc1’ and ‘Soc2’ give the social group for MHI individuals. A blank indicates that the social group affiliation is unknown, while ‘NWHI’ indicates the individual is from the NWHI population. ‘Loci’ indicates the number of microsatellite loci at which both individuals were scored and could therefore be compared and ‘Mis-match’ indicates the number of loci at which the two individuals do not share at least one allele. Mismatches can occur due to mutation, genotyping error, or incorrect assignment of parentage.

ID1	ID2	Sex1	Sex2	Hap1	Hap2	Soc1	Soc2	Loci	Mis-match
<b>18945</b>	75677	F	F	2	2	1	1	13	1
18954	33907	M	M	1	1	P	3	16	0
18955	91083	F	M	1	1	P	P	16	0
23316	23321	M	F	1	1	1	1	16	0
23316	98746	M	M	1	2	1	2	16	0
<b>23317</b>	91277	M	F	1	1	1	P	13	0
<b>23317</b>	92256	M	M	1	1	1	1	15	0
23318	30078	F	M	2	2	1		15	0
23318	75666	F	F	2	2	1	1	16	0
23320	98738	F	M	2	2	1	1	16	0
27453	27454	F	F	1	1	3		16	0
<b>30072</b>	98743	F	F	1	1	2	2	16	0
30073	23321	M	F	1	1	2	1	16	1
30077	49054	M	F	1	1		2	15	1
<b>30077</b>	102483	M	M	1	1		3	14	0
30081	49049	F	M	1	1	2		13	0
33886	45932	M	M	1	1	3	3	16	0
33886	75666	M	F	1	2	3	1	16	1
33887	123188	F	F	1	1	3	3	12	2
33888	30078	F	M	1	2	3		14	0
33890	30078	F	M	1	2	3		15	0
33890	123188	F	F	1	1	3	3	15	0
33892	33909	F	M	1	1	3	3	14	0
33895	45932	F	M	1	1	3	3	16	0
33902	33908	F	M	1	1	3	3	16	2
33902	45928	F	F	1	1	3	3	15	0
33903	33904	F	M	1	1	3	P	14	0
33907	98736	M	F	1	2	3	1	16	0
45925	75666	M	F	2	2	2	1	14	0
49044	30072	F	F	1	1		2	13	1
49046	49051	F	F	2	2	2	2	15	1
49047	30078	F	M	2	2	2		14	0
49047	49051	F	F	2	2	2	2	14	1

49051	98746	F	M	2	2	2	2	15	0
<b>49052</b>	98745	M	M	5	2	2	2	13	0
71016	71017	M	F	2	2	1	1	16	0
75661	33886	M	M	1	1	1	3	16	1
75663	30078	M	M	2	2	1		15	1
75666	75677	F	F	2	2	1	1	16	0
<b>75676</b>	75679	F	F	1	1	1	1	16	0
75678	75679	F	F	1	1	1	1	16	0
75679	92256	F	M	1	1	1	1	16	0
<b>91276</b>	91277	F	F	1	1	P	P	14	0
91284	<b>18938</b>	M	F	1	1	P		14	1
91284	<b>23317</b>	M	M	1	1	P	1	14	0
98732	98737	F	F	2	2	1	1	16	0
98740	30078	F	M	1	2	1		15	0
98743	<b>102485</b>	F	M	1	1	2	3	16	0
98744	<b>30078</b>	M	M	1	2	2		15	0
102500	23318	M	F	1	2	1	1	16	1
102500	30078	M	M	1	2	1		15	0
123188	33907	F	M	1	1	3	3	15	1

## LITERATURE CITED

Baird RW, Gorgone AM, McSweeney DJ, Webster DL and others (2008) False killer whales (*Pseudorca crassidens*) around the main Hawaiian Islands: long-term site fidelity, inter-island movements, and association patterns. *Mar Mamm Sci* 24:591–612