Summary of abundance estimates of the North Pacific common minke whales in RMP/IST

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ABSTRACT

To correspond to the request from the second intercessional workshop for the north Pacific common minke whale RMP/IST review in March 2013, we presented the figures showing primary effort, primary sighting position, survey block, sub-area and area definition for abundance estimation. Also we presented the table including area size, research distance, and number of primary sightings, effective search and references.

Table 1 Summray of abundance estimate of the wetern North Pacific common minke whales use dof condition the trials.

sub-area	year	Aerial covarage	Timing	Area size (n.miles2)	effort (n.miles)	*n*	Encounter rate (/100 n.miles)	ESW (n.miles)	Mean school size	*P*	CV(P)	Fig.	Reference
6E	2002	79.1%	May -Jun	71,914	2,605	21	0.806	0.361	1.11	891	0.608	10	SC/D10/NPM11
	2003	79.1%	May -Jun	71,914	2,483	21	0.846	0.361	1.11	935	0.357	11	ditto
	2004	79.1%	May -Jun	71,914	1,064	7	0.658	0.361	1.11	727	0.286	12	ditto
7CS	2004	36.7%	May	9,853	129	7	5.435	0.606	1.14	504	0.291	3	SC/D10/NPM12(rev)
	2006	100.0%	Jun - Jul	26,826	264	23	8.718	0.431	1.36	3,690	1.199	5	ditto
	2012	100.0%	May -Jun	26,826	851	16	1.880	0.349	1.23	890	0.393	7	ditto
7CN	2003	75.4%	May	18,281	247	3	1.214	0.604	1.00	184	0.805	2	ditto
	2012	66.7%	May-Jun	16,171	649	17	2.619	0.863	1.23	302	0.454	7	ditto
	2012	66.7%	Sep	16,171	550	19	3.453	0.863	1.23	398	0.507	7	ditto
7WR	2003	26.7%	May - Jun	21,939	668	7	1.048	0.431	1.00	267	0.700	2	ditto
	2004	88.8%	May - Jun	72,991	789	7	0.887	0.484	1.29	863	0.648	3	ditto
	2007	88.8%	Jun - Jul	72,991	465	3	0.645	0.431	1.00	546	0.953	6	ditto
7E	2004	57.1%	May - Jun	48,208	390	3	0.770	0.422	1.00	440	0.779	3	ditto
	2006	57.1%	May - Jun	48,208	461	2	0.433	0.422	1.00	247	0.892	5	ditto
8	1990	35.0%	Aug - Sep	-	-	-	-	-	-	1,075	0.705	8,9	agreed in 2003 (extact from Buckland et al. (1992))
	2002	65.0%	Jun - Jul	162,689	1,184	0	0.000	-	-	0	-	1	SC/D10/NPM22(rev)
	2004	40.5%	Jun	101,373	917	8	0.872	0.461	1.14	1,093	0.576	3	ditto
	2005	65.0%	May - Jul	162,789	1,434	1	0.070	0.431	1.00	132	1.047	4	ditto
	2006	65.0%	May - Jul	162,789	1,039	3	0.289	0.761	1.00	309	0.677	5	ditto
7E+8	2007	65.0%	Jun - Jul	162,789	914	2	0.219	0.456	1.00	391	1.013	6	ditto
9	1990	35.0%	Aug - Sep	-	-	-	-	-	-	8,264	0.396	8,9	JCRM 6: 124
	2003	33.2%	Jul - Sep	190,676	2,533	40	1.579	0.609	1.03	2,546	0.276	2	SC/D10/NPM22(rev)
9N	2005	67.8%	Aug - Sep	188,452	605	1	0.165	0.371	1.00	420	0.969	15	extract from SC/63/RMP11
10W	2006	59.9%	May - Jun	69,009	1,542	36	2.335	0.361	1.11	2,476	0.312	16	ditto
10E	2002	100.0%	May - Jun	27,823	629	12	1.908	0.361	1.11	816	0.658	10	SC/D10/NPM11
	2003	100.0%	May - Jun	27,823	422	4	0.948	0.361	1.11	405	0.566	11	ditto
	2004	100.0%	May - Jun	27,823	631	7	1.109	0.361	1.11	474	0.537	12	ditto
	2005	100.0%	May - Jun	27,823	513	8	1.559	0.361	1.11	666	0.444	13	ditto
11	1990	100.0%	Aug - Sep	-	-	-	-	-	-	2,120	0.449	8,9	agreed in 2003 (extact from Buckland et al. (1992))
	1999	100.0%	Aug - Sep	-	-	-	-	-	-	1,456	0.565	20	JCRM 6: 124
	2003	33.9%	Aug - Sep	15,243	265	10	3.774	0.361	1.11	882	0.820	14	extract from SC/63/RMP11
	2007	20.2%	Aug - Sep	9,064	535	19	3.551	0.473	1.11	377	0.389	17	ditto
12SW	1990	100.0%	Aug - Sep	-	-	-	-	-	-	5,244	0.806	8,9	agreed in 2003 (extact from Buckland et al. (1992))
	2003	100.0%	Aug - Sep	84,015	493	13	2.637	0.361	1.11	3,401	0.409	14	extract from SC/63/RMP11
12NE	1990	100.0%	Aug - Sep	-	-	-	-	-	-	10,397	0.364	8,9	agreed in 2003 (extact from Buckland et al. (1992))
	1992	89.4%	Aug - Sep	-	-	-	-	-	-	11,544	0.380	21	JCRM 6: 124: extract from SC/46/NP6
	2003	46.0%	Aug - Sep	151,111	694	39	5.620	0.361	1.11	13,067	0.287	14	extract from SC/63/RMP11

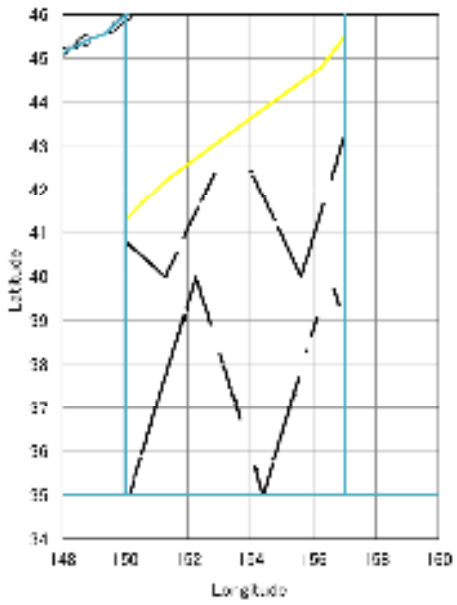

Figure 1. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 8 for JARPN II 2002 survey.

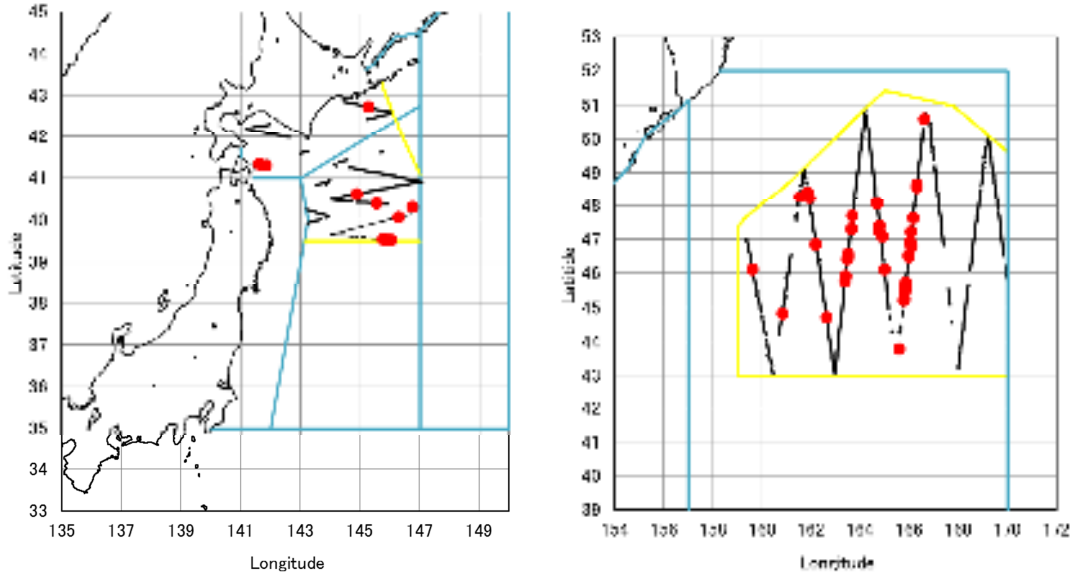

Figure 2. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-areas 7CN and 7WR (left panel) and 9 (right panel) for JARPN II 2003 survey.

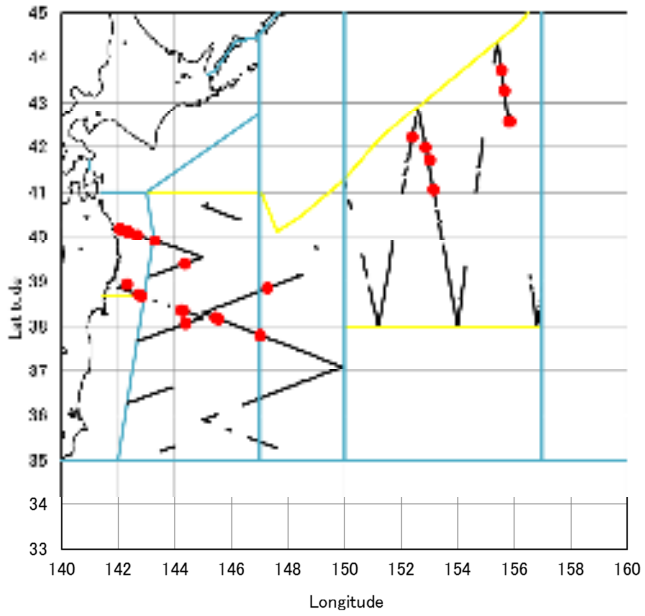

Figure 3. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-areas 7CS, 7WR, 7E and 8 for JARPN II 2004 survey.

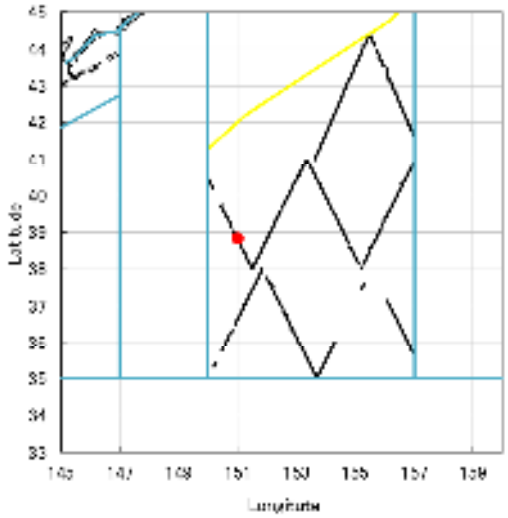

Figure 4. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 8 for JARPN II 2005 survey.

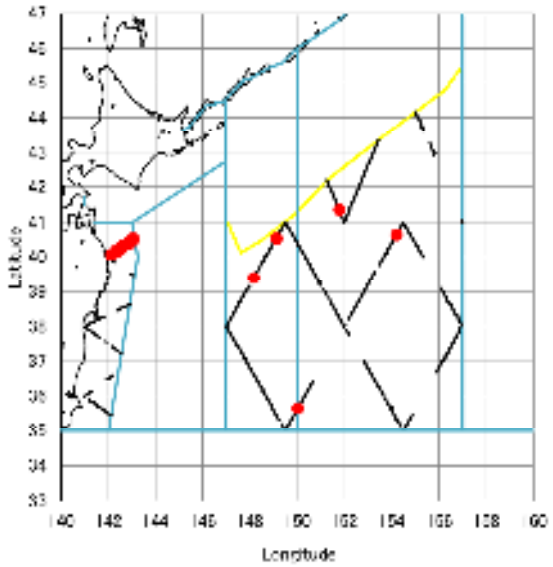

Figure 5. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-areas 7CS, 7E and 8 for JARPN II 2006 survey.

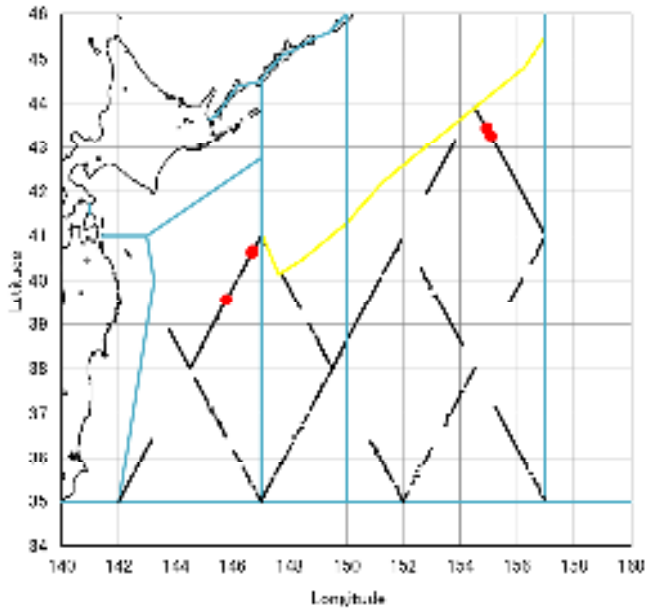

Figure 6. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 7WR, 7E and 8 for JARPN II 2007 survey.

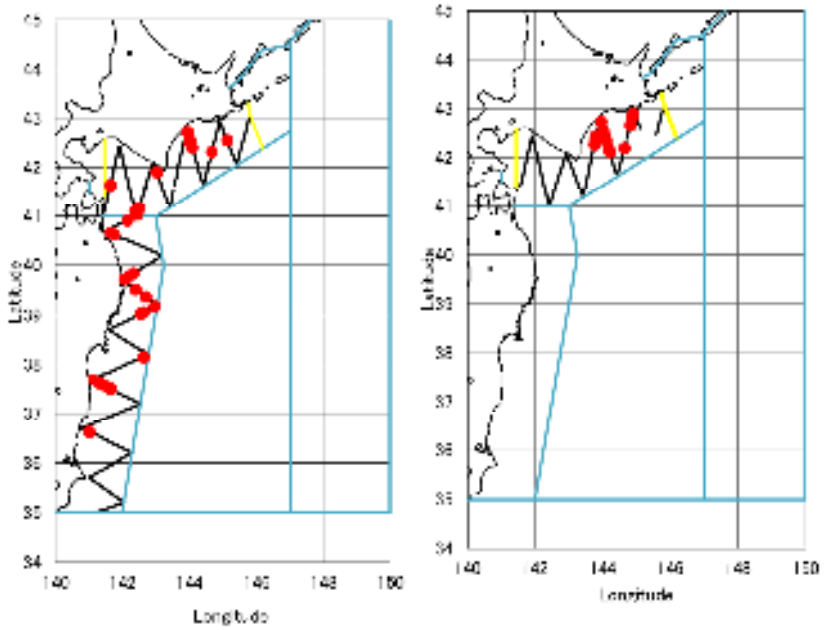

Figure 7. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 7CS and 7CN in the first survey (left panel) and the second survey (right panel) for JARPN II 2012 survey.

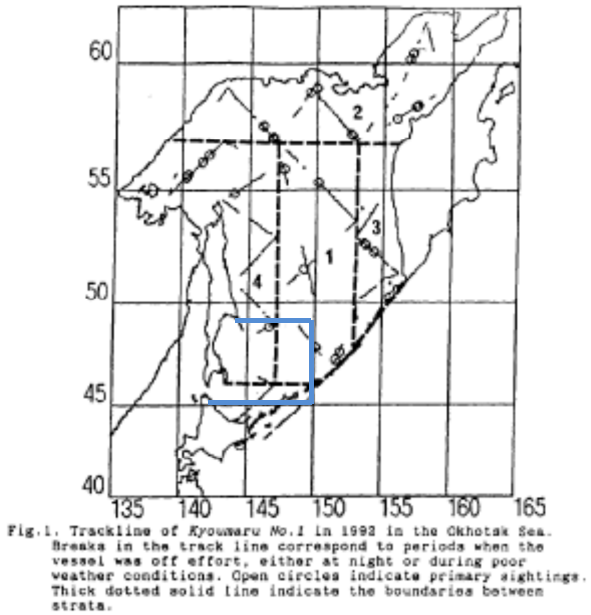

Fig.1. Trackline of *Kyowaru No.1* in 1993 in the Okhotsk Sea. Breaks in the track line correspond to periods when the vessel was off effort, either at night or during poor weather conditions. Open circles indicate primary sightings. Thick dotted solid line indicate the boundaries between strata.

Figure 8. Japanese dedicated survey in 1989. Track line traversed on effort (black thin line), Primary sightings (solid circle), Secondary sightings (open circle) and sub-area definition (blue thick line) in 1989. (modified from Fig. 1 in Buckland et al. (1992))..

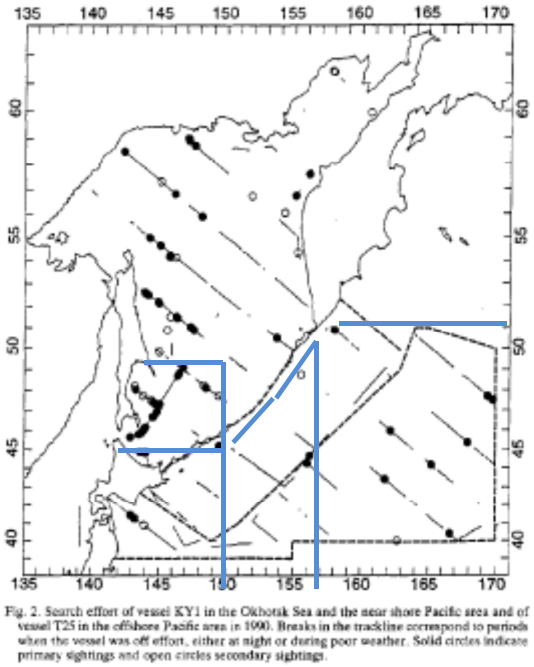

Fig. 2. Search effort of vessel KY1 in the Okhotsk Sea and the near shore Pacific area and of vessel T25 in the offshore Pacific area in 1990. Breaks in the trackline correspond to periods when the vessel was off effort, either at night or during poor weather. Solid circles indicate primary sightings and open circles secondary sightings.

Figure 9. Japanese dedicated survey in 1990. Track line traversed on effort (black thin line), Primary sightings (black circle), secondary sightings (open circle) and sub-area definition (blue thick line) in 1990 . (modified from Fig. 1 in Buckland et al. (1992)..

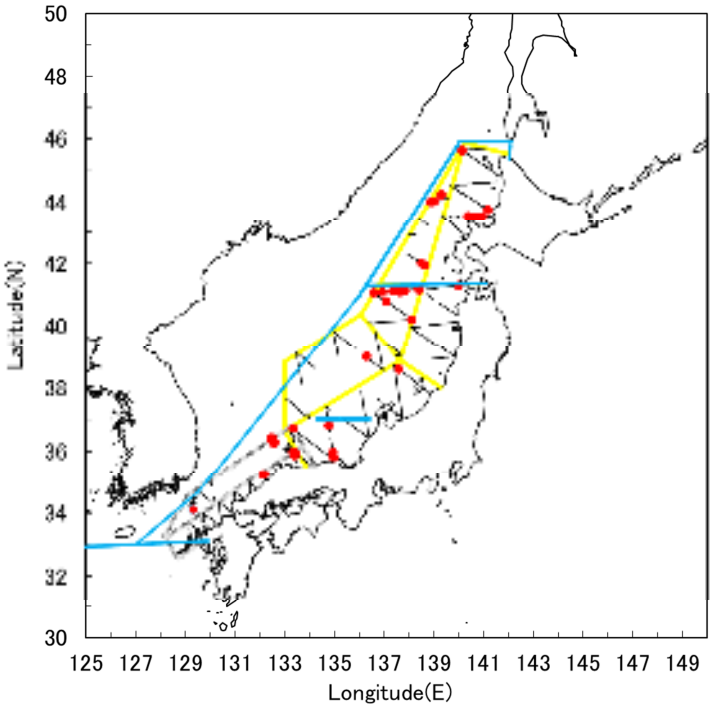

Figure 10. Japanese dedicated survey in 2002. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 6EN and 10E.

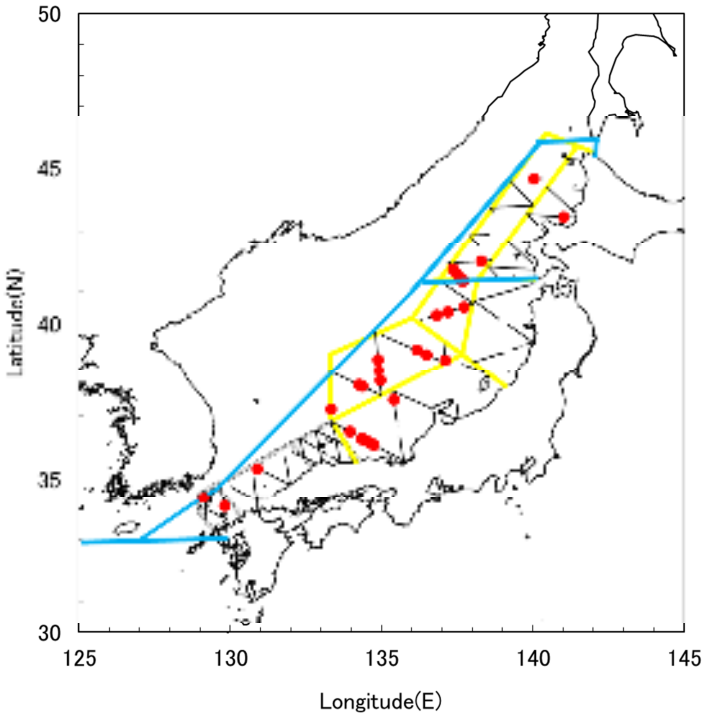

Figure 11. Japanese dedicated survey in 2003. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 6EN and 10E.

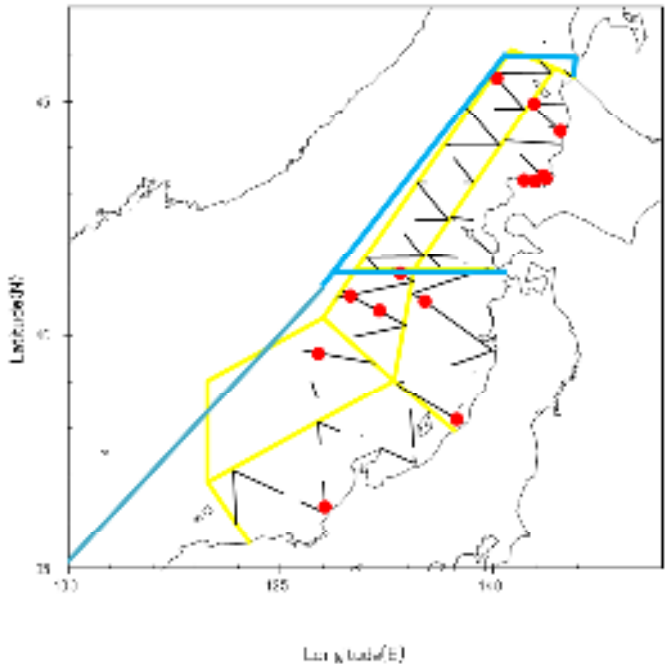

Figure 12. Japanese dedicated survey in 2004. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 6EN and 10E

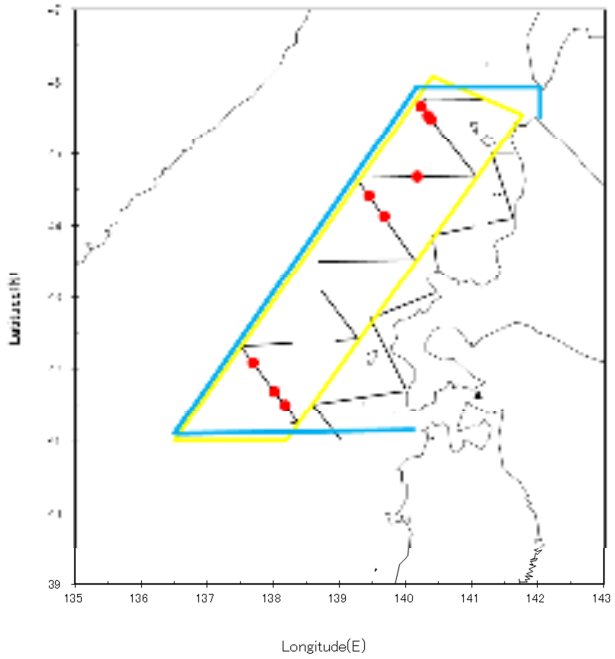

Figure 13. Japanese dedicated survey in 2003. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 10E.

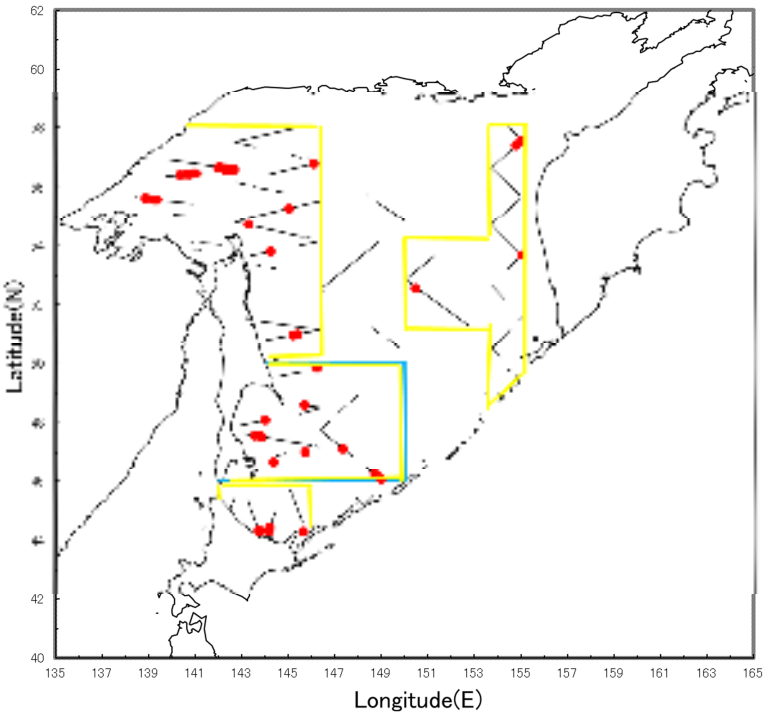

Figure 14. Japanese dedicated survey in 2003. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-areas 12NE, 12SW and 11..

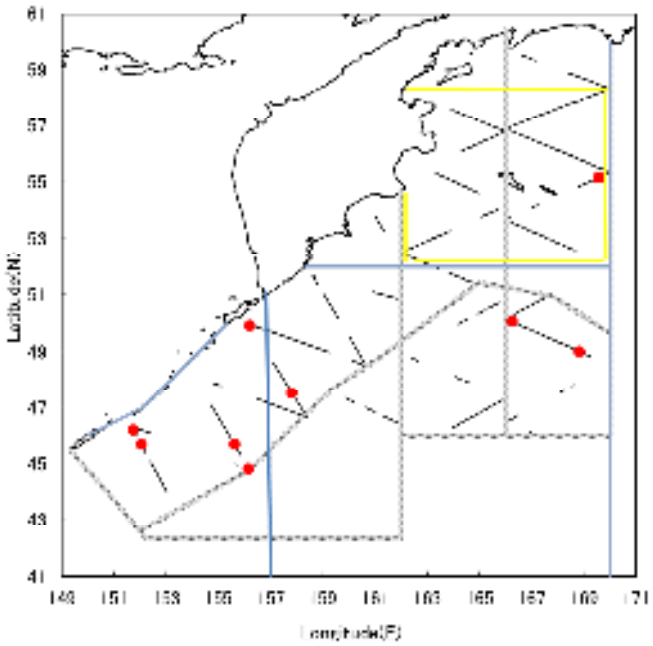

Figure 15. Japanese dedicated survey in 2005. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 9N.

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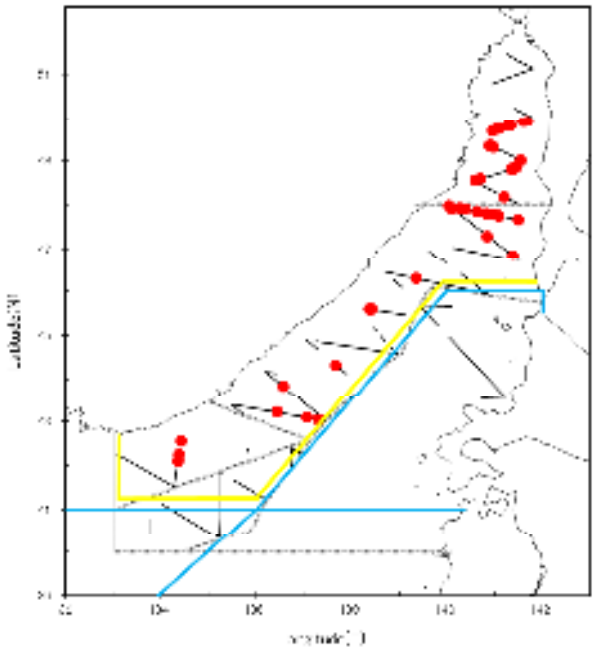

Figure 16. Japanese dedicated survey in 2006. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 10W.

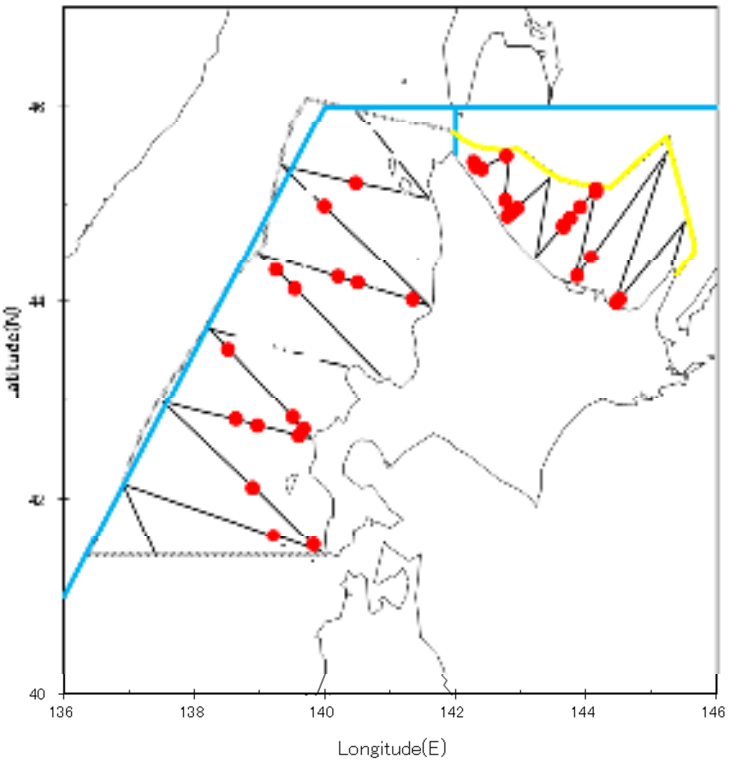

Figure 17. Japanese dedicated survey in 2007. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 11.

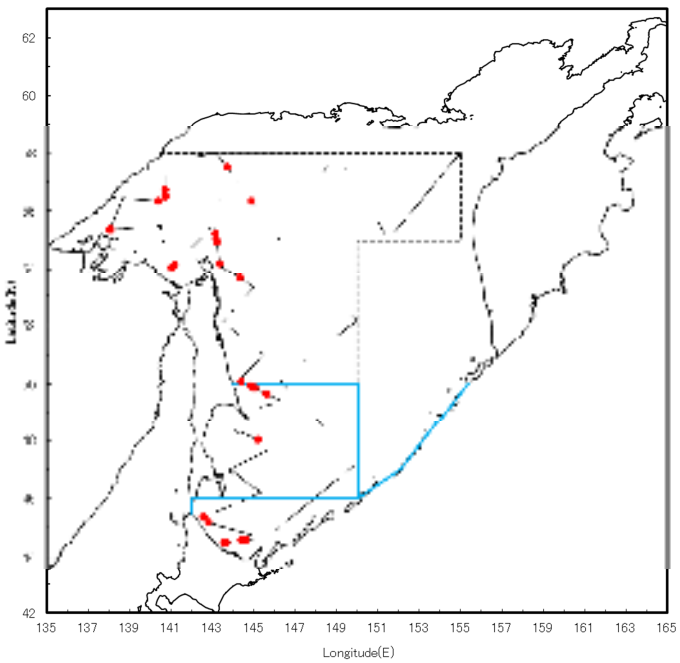

Figure 18. Japanese dedicated survey in 1999. Trackline on effort (black thick line), Primary sightings (red circles), sub-area definition (blue thick line) in sub-areas 10NE, 10SW and 11. Dotted line shows the restriction form the Russian government and observers onboard.

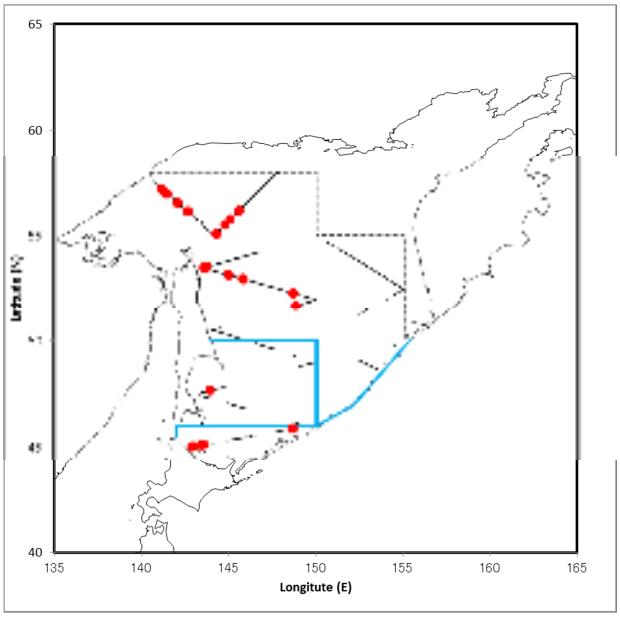

Figure 19. Japanese dedicated survey in 1999. Trackline on effort (black thick line), Primary sightings (red circles) and sub-area definition (blue thick line) in sub-areas 10NE, 10SW and 11. Dotted line shows the restriction form the Russian government and observers onboard.

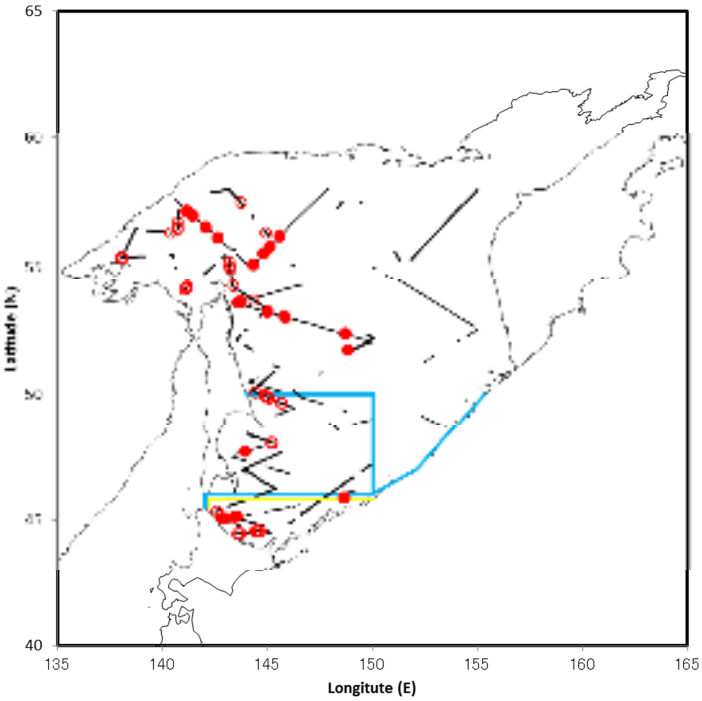

Figure 20. Japanese dedicated surveys in 1999 and 2000. Trackline on effort (black thick line), Primary sightings (solid red circles in 1999 and red open circle in 2000, sub-area definition (blue thick line) and Area definition for estimate (yellow thick line) in sub-area 11.

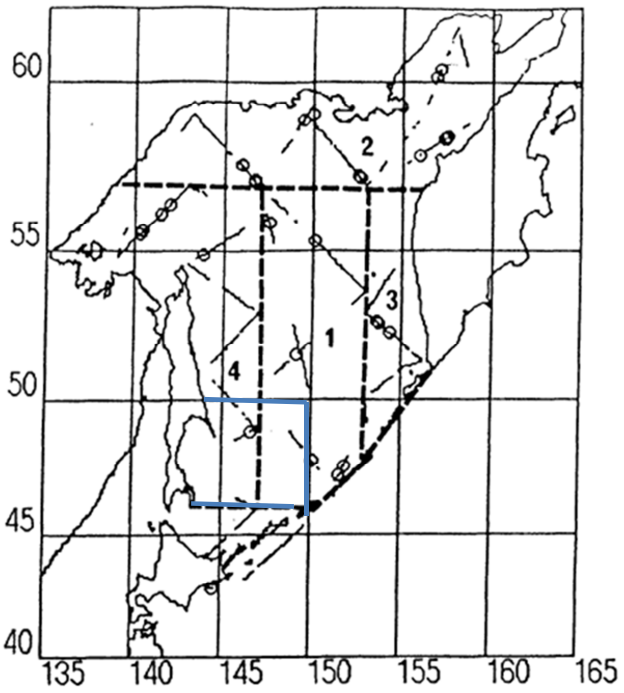

Fig.1. Trackline of *Kyoumaru No.1* in 1992 in the Okhotsk Sea. Breaks in the track line correspond to periods when the vessel was off effort, either at night or during poor weather conditions. Open circles indicate primary sightings. Thick dotted solid line indicate the boundaries between strata.

Figure 21. Japanese dedicated survey in 1992. Trackline on effort (black thick line), Primary sightings (open circles) and sub-area definition (blue thick line) in sub-areas 10NE.

Refeences

Buckland, S.T., Cattanach, K.L. and Miyashita , T. 1992. Minke whale abundance in the Northernwest Pacific and the Okhotsk Sea, estimated from 1989 and 1990 sighting surveys. *Rep. int. Whal. Commn*, 42:387-92.