Water-bird registration in the common water-body of Pasvik Zapovednik (Russia) and Pasvik Nature Reserve (Norway)

Tiia Kalske
Office of the Finnmark County Governor, Norway

Workshop 02 - Europarc 2013 Conference, October 9-13 Debrecen Hungary

Paul Eric Aspholm, Tor Arne Bjørn – Bioforsk Soil and Environment, Norway
Natalia Polikarpova, Olga Makarova – Pasvik zapovednik, Russia

Pasvik Inari Trilateral Park

FINLAND

NORWAY

RUSSIA

Sevettijärvi

Svanvik

Nikel

Pasvik Zapovednik

Joint annual bird registrations

Vaggatem

Vätsäri Wilderness Area

Øvre Pasvik National Park

Pasvik Nature Reserve

Øvre Pasvik Landscape Protection Area

Lake Inari

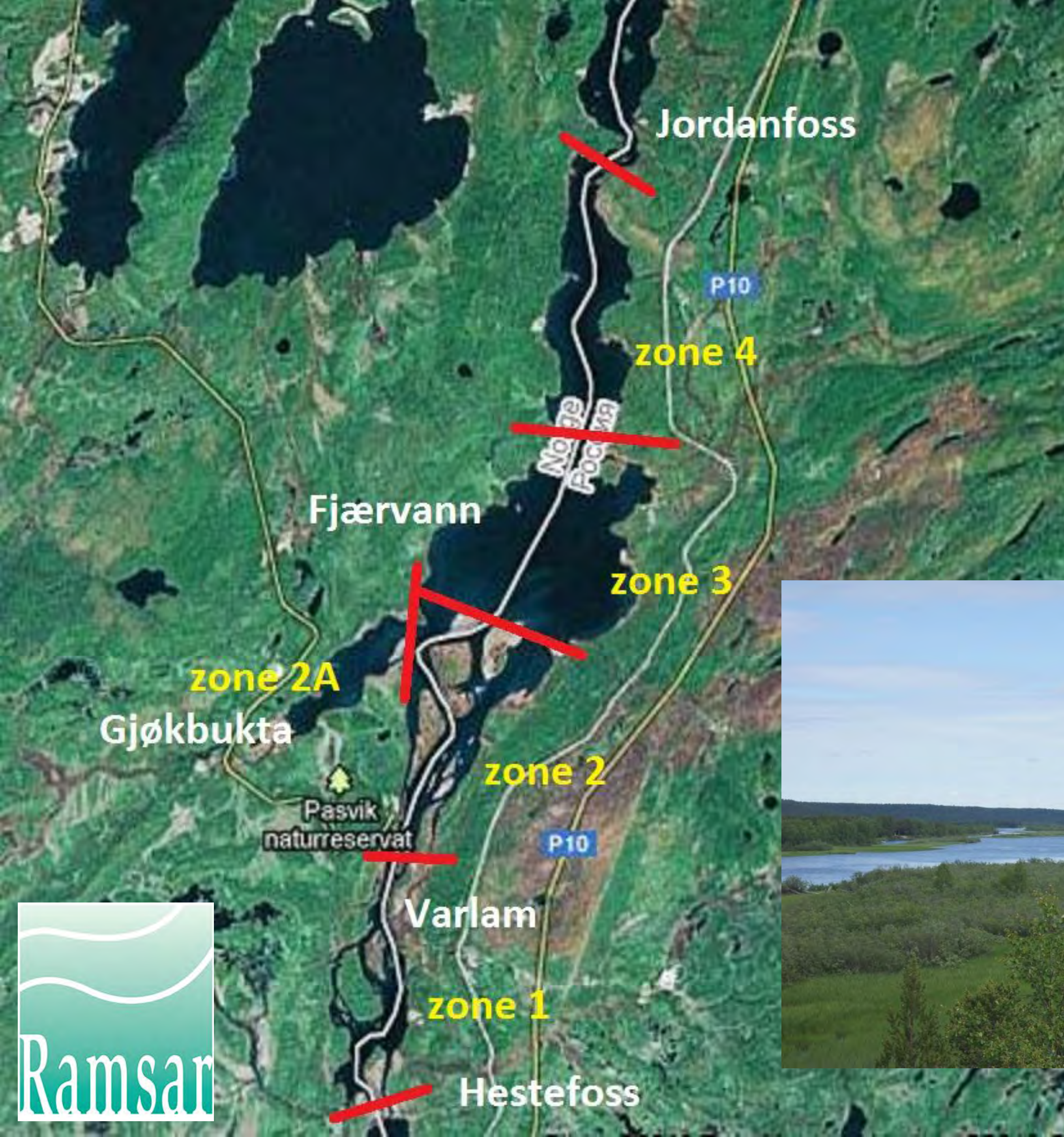
River Pasvik

Rajakoski

Nellim

- Bothnian bay ——— 250 m ——— Barents sea

Bioforsk



Ramsar

Photos: Bioforsk Svanhovd

Photo: Bioforsk Svanhovd

Art	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Sum
Storlom	21	7	11	12	16	12	8	14	12	13	12	10	23	17	5	0	5	198
Smålom	2	2	0	0	4	0	0	1	2	5	2	2	9	0	2	0	15	46
Storskarv	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0		4
Sangsvane	24	8	19	23	1	50	43	93	70	48	31	78	103	81	91	110	87	1010
Sædgås	0	0	0	7	3	78	1	8	30	3	0	0	16	52	34	38	64	332
Brunnakke	132	122	104	113	103	188	239	238	282	68	196	127	157	80	64	40	185	2438
Snadderand	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	3
Krikkand	52	10	18	58	13	29	18	19	32	18	9	33	84	28	6	0	34	451
Stokkand	18	11	13	32	8	26	29	24	34	22	11	23	43	19	10	8	19	348
Stjertand	4	3	2	12	2	12	16	10	13	2	29	1	11	8	2	12	[illegible]	[illegible]
Knekkand	0	0	0	2	0	0	0	0	0	0	0	0	0	4	0	2	[illegible]	[illegible]
Skjeand	0	2	2	0	0	0	3	2	12	2	7	4	0	0	0	0	[illegible]	[illegible]
Toppand	130	7	9	48	6	28	64	26	25	43	24	75	42	18	17	2	[illegible]	[illegible]
Bergand	0	0	2	0	0	3	1	0	2	13	8	0	0	0	0	0	[illegible]	[illegible]
Havelle	6	0	11	0	0	0	0	0	2	41	4	1	10	0	0	0	[illegible]	[illegible]
Svartand	45	7	12	35	300	12	67	18	35	56	56	25	48	42	40	2	[illegible]	[illegible]
Sjøorre	29	0	5	0	23	2	7	2	51	23	2	19	15	0	0	3	[illegible]	[illegible]
Kvinand	163	128	233	155	250	172	246	140	116	83	76	161	156	147	136	33	[illegible]	[illegible]
Lappfiskand	23	7	15	15	9	16	32	21	22	49	16	15	23	25	6	11	[illegible]	[illegible]
Siland	39	12	12	19	19	39	34	54	29	41	41	31	41	27	25	14	[illegible]	[illegible]
Laksand	45	10	48	38	13	32	31	24	24	28	56	21	45	22	55	24	[illegible]	[illegible]
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Sandlo	0	0	0	22	0	4	3	2	3	0	0	0	0	0	0	8	[illegible]	[illegible]
Heilo	2	4	2	0	1	0	4	0	0	0	9	0	0	0	0	0	[illegible]	[illegible]
Temmincksnipe	1	1	0	10	0	5	0	0	0	0	0	0	0	0	0	0	[illegible]	[illegible]
Myrsnipe	0	0	0	2	0	3	0	0	1	0	1	0	0	0	0	0	[illegible]	[illegible]
Brushane	11	1	2	72	5	10	22	0	8	0	17	2	8	0	0	0	[illegible]	[illegible]
Kvartbekkasin	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	[illegible]	[illegible]
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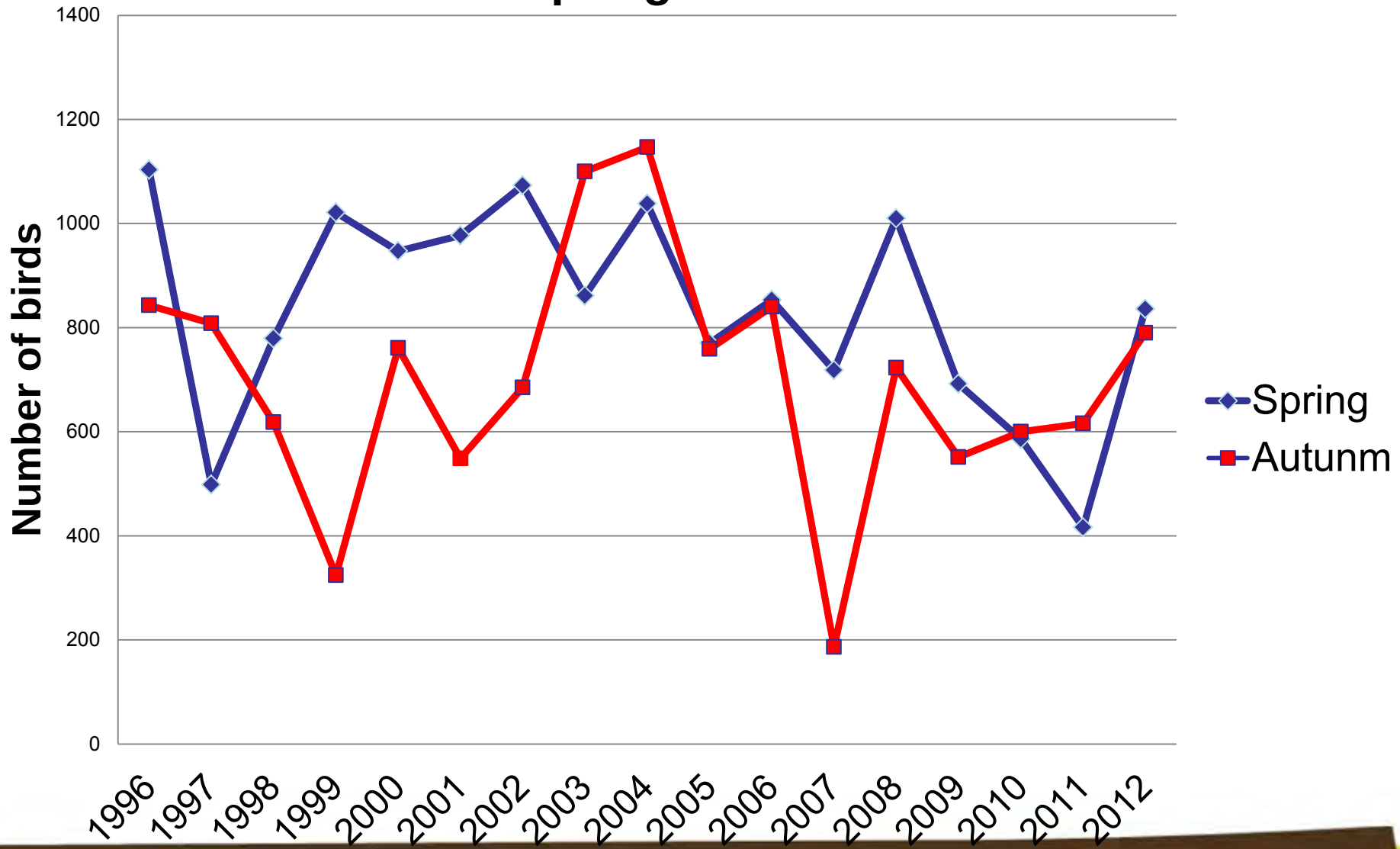
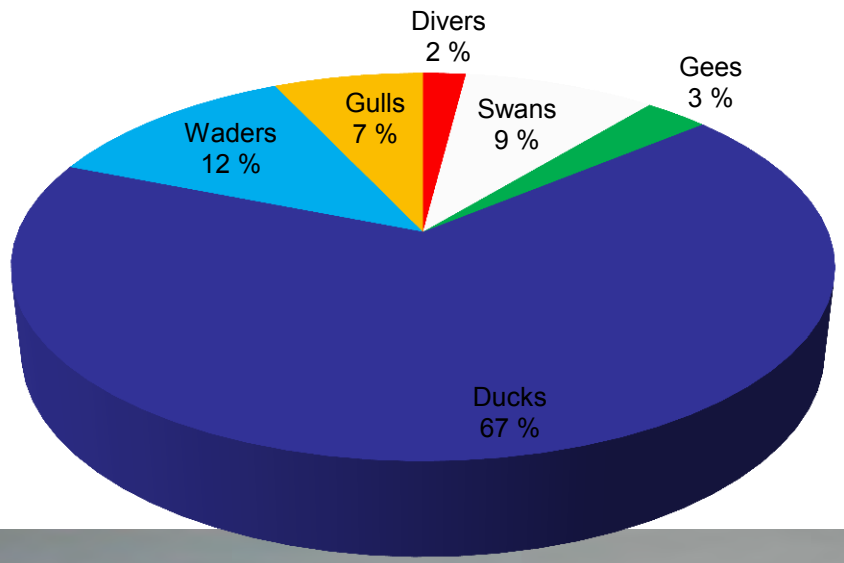
Storspove	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]	[illegible]
Sotsnipe	31	2	5	57	0	13	8	9	6	4	1	2	6	0	0	0	[illegible]	[illegible]
Rødstilk	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	[illegible]	[illegible]
Gluttsnipe	13	3	6	22	3	28	7	11	24	10	12	21	14	9	15	12	[illegible]	[illegible]
Grønnstilk	31	24	44	77	12	16	15	10	18	11	12	0	10	7	5	3	[illegible]	[illegible]
Strandsnipe	17	3	4	8	18	3	12	3	5	14	9	5	15	12	9	15	[illegible]	[illegible]
Steinvender	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	[illegible]	[illegible]
Svømmesnipe	15	28	4	3	28	0	0	0	3	11	0	0	0	0	1	0	[illegible]	[illegible]
Tyvjo	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	[illegible]	[illegible]
Dvergmåke	15	0	0	3	8	27	3	14	60	24	55	12	19	5	0	0	[illegible]	[illegible]
Hettemåke	2	0	0	21	6	2	0	6	8	0	7	3	1	3	0	0	[illegible]	[illegible]
Fiskemåke	13	18	27	37	35	35	77	22	24	17	36	13	34	16	6	11	10	431
Gråmåke	3	3	3	1	3	0	18	1	4	7	2	3	4	4	1	4	0	66
Svartbak	2	10	11	3	1	5	4	1	2	5	0	0	0	0	1	0	0	45
Sildemåke	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
[illegible]	2	0	2	0	0	1	0	0	2	3	60	0	1	0	0	0	0	71
Rødnebbterne	200	52	145	78	43	108	43	70	58	101	1	29	87	55	53	14	18	1127
Havørn	1	3	1	1	1	1	2	2	1	1	2	1	2	1	1	1	1	23
Myrhauk	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Fiskeørn	2	4	1	2	1	3	2	5	3	0	1	1	1	2	0	0	0	28
SUM	1103	498	779	1021	947	977	1073	881	1038	770	858	718	1010	892	586	416	838	14178

Branta bernicla –
Чёрная каза́рка
Brant Goose

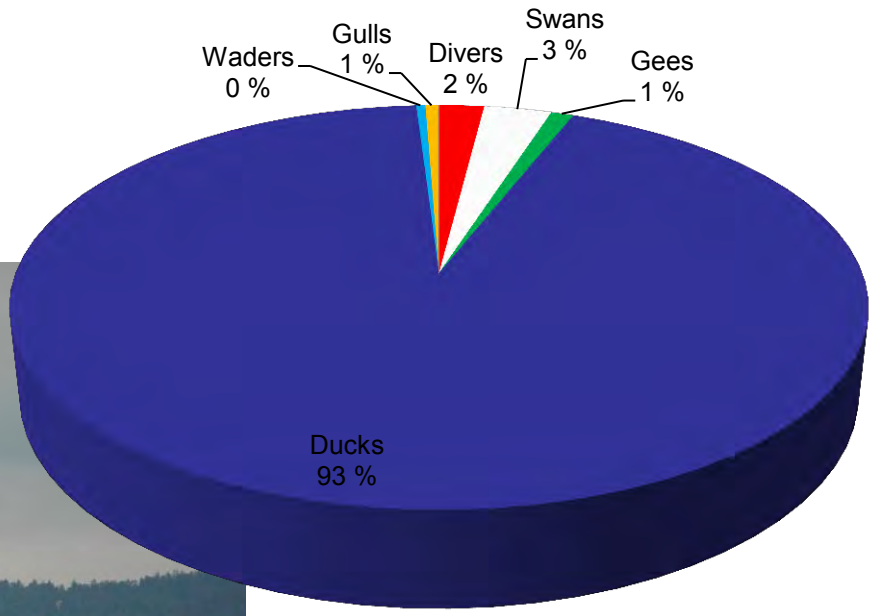
The variation of number of birds during the day-count in spring and in autumn



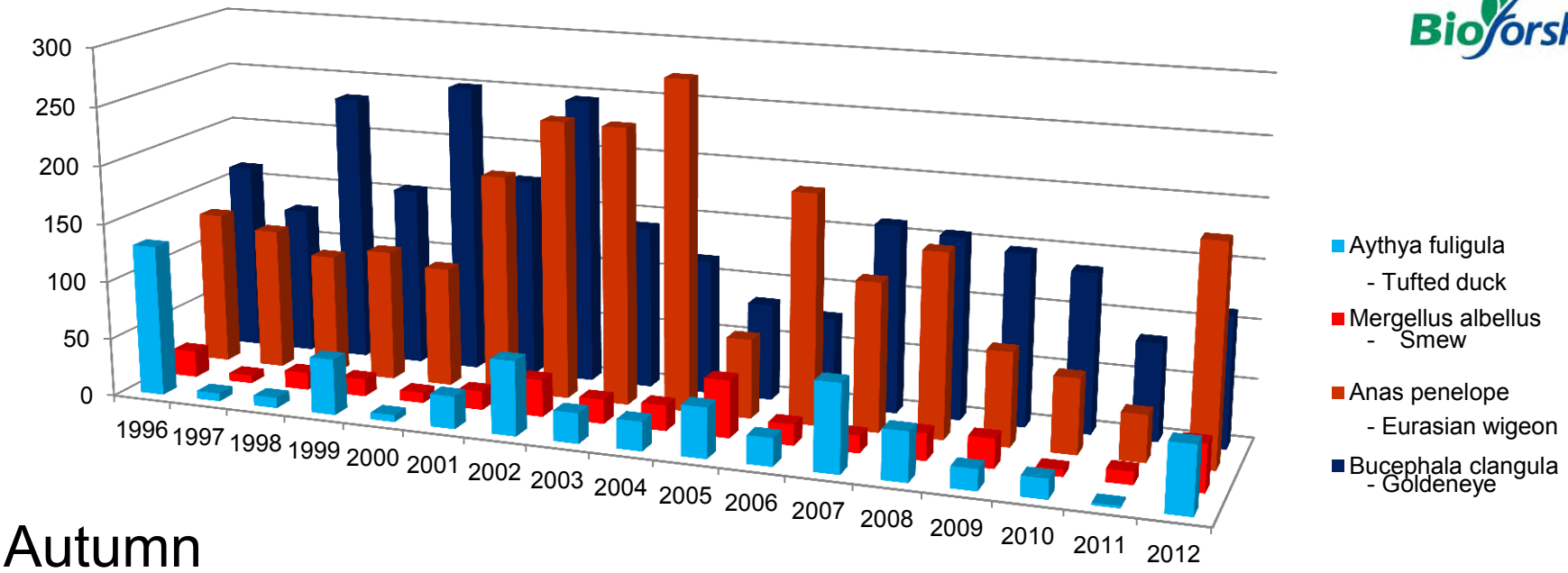
The average persentage of birds in spring



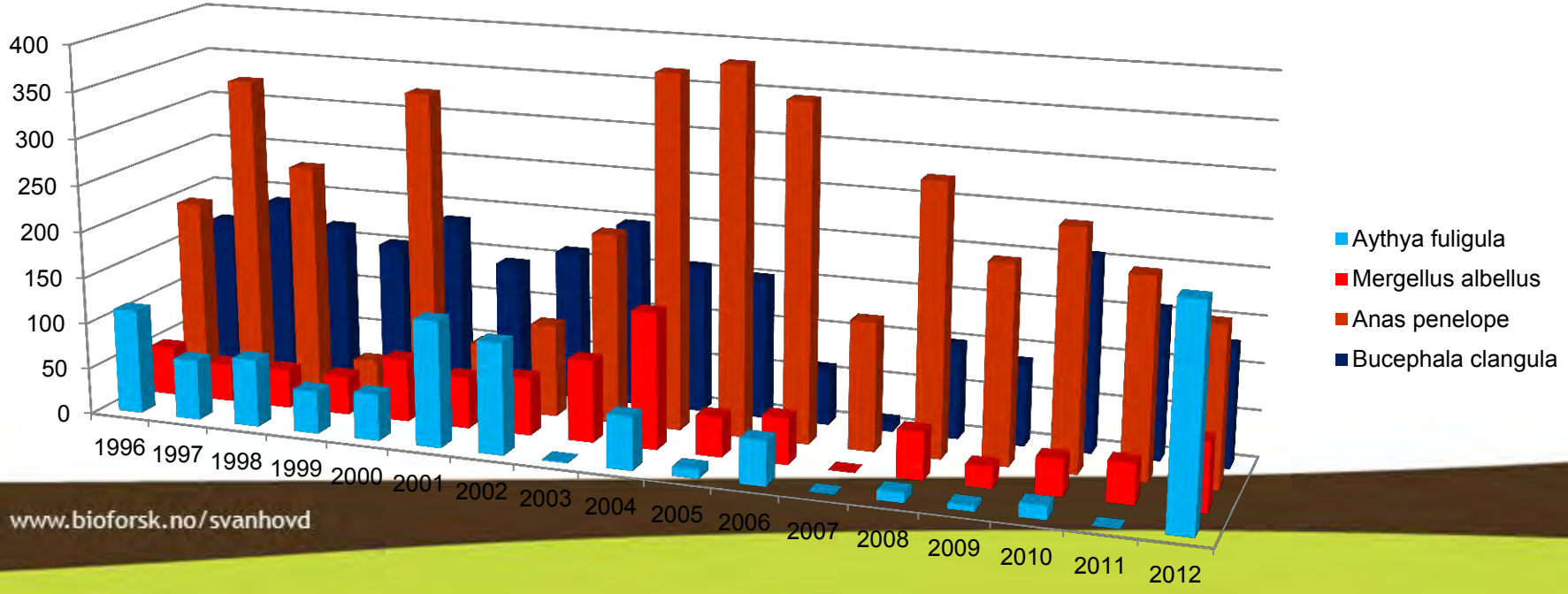
The average persentage of birds in autunm



Spring



Autumn



***Sterna paradisaea* - Arctic tern**

Photo: Bioforsk Svanhovd

Biodiversity

- Shannon-Wiener index

$$H = - \Sigma p_i * \log_2 p_i$$

(unpredictability – the difficulty to predict next species) high H -> high diversity

S-W H= 0,56

- Simpsons ”reciprocal” index

$$D = 1 / \Sigma (p_i)^2$$

(probability that two choosen individuals will be of different species)

Simp reciprocal

D= 0,91

However; huge variations in the indexes from year to year…..

Melanitta nigra – Common scoter

Photo: Bioforsk Svanhovd

The brown bear population of Pasvik-Inari-Pechenga – Management, monitoring and research

Tiia Kalske

Office of the Finnmark County Governor, Norway

Workshop 02 - Europarc 2013 Conference, October 9-13 Debrecen Hungary

Julia Schregel, Alexander Kopatz, Hans-Geir Eiken – Bioforsk Soil and Environment, Norway
Natalia Polikarpova, Olga Makarova – Pasvik zapovednik, Russia
Tuomo Ollila – Metsähallitus, Finland

Pasvik Inari Trilateral Park

Bioforsk

METSÄHALLITUS

Pasvik Inari Trilateral Park

FINLAND

NORWAY

RUSSIA

Sevettijärvi

Svanvik

Nikel

Vaggatem

Pasvik Zapovednik

Vätsäri Wilderness Area

Øvre Pasvik National Park

Pasvik Nature Reserve

Øvre Pasvik Landscape Protection Area

Lake Inari

River Pasvik

Rajakoski

Nellim

Brown bear distribution in Europe

European Russia: ~40.000
(Kolesnikov 2009)

Finland: ~2000
(Kojola, pers. comm)

Norway: 151
(Tobiassen et al. 2012)

Sweden: 3300
(Kindberg et al. 2011)

Large Carnivore Initiative for Europe (LCIE)

What methods do we have to study bears?

- Observations
- Dead bears
- Marked and collared individuals
- Non-invasive sampling


Photo: Staffan Widstrand

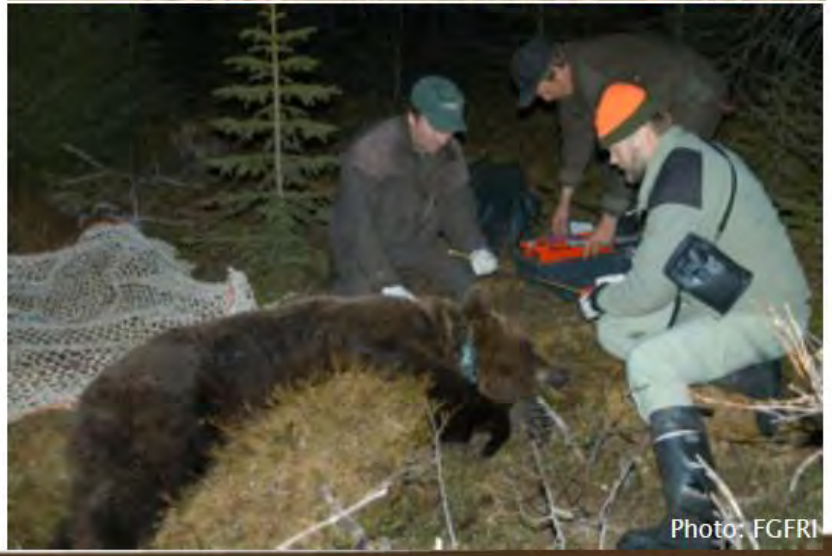


Photo: FGFRI

Noninvasive genetic sampling techniques

- Biological samples
- No contact with the animal
- Genetics for identification
- Capture-mark-recapture

Photo: Alexander Kopatz

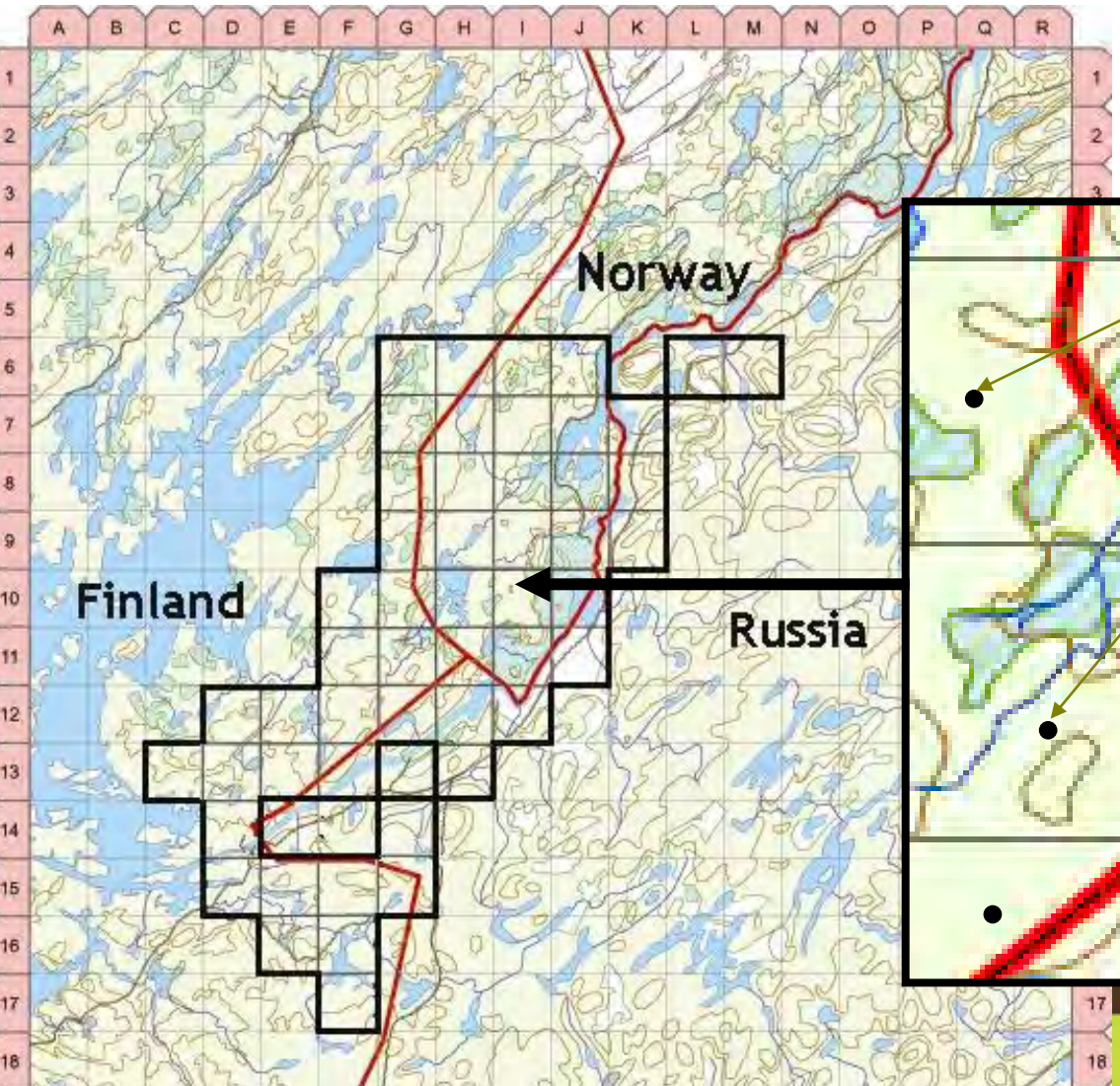
Drawing by Leif Ollila

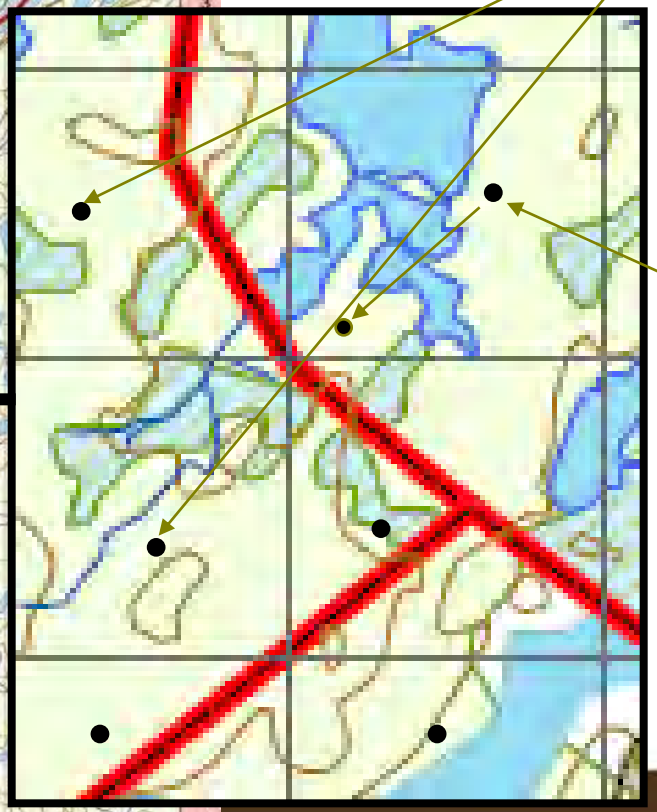

Photo: Sari Magga


Photos: Alexander Kopatz

Photos: Alexander Kopatz

Hair-trapping





1 hair snare per 5x5 km grid

Check snares at least every 2 weeks

Move the snares once each month within the same grid

Snare placement was localized in advance to avoid potential conflicts with people

Hair trapping 2007 and 2011 in Pasvik

2007

56 traps
5 x 5 km grid (1400 km^2)
for 2 months
0.17 individuals/10 km^2

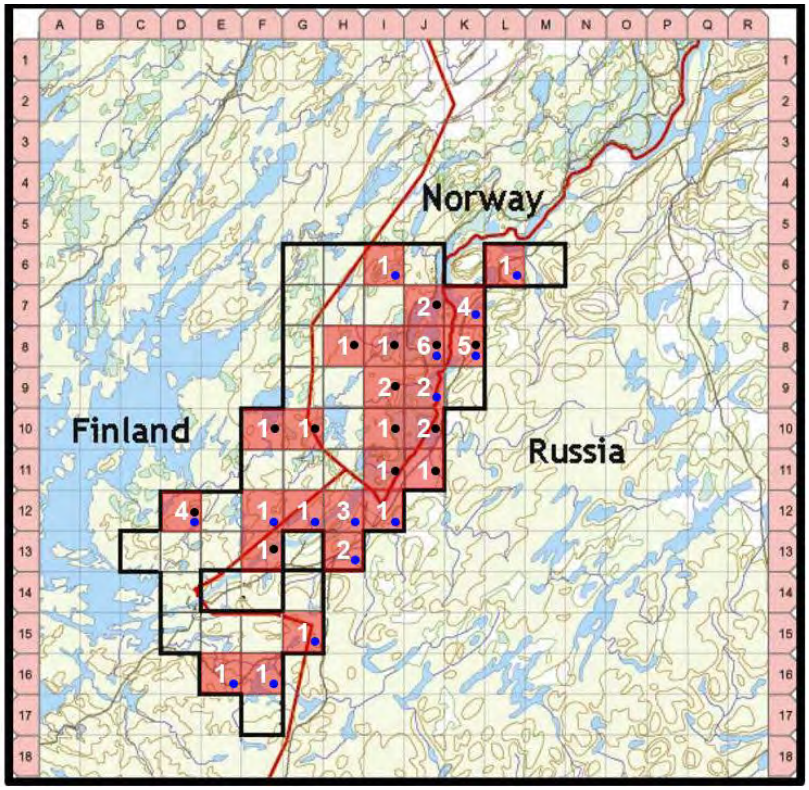
196 samples collected
26 of 56 grids showed activity
24 bears identified (10 females, 14 males)
11 new identified, 13 known

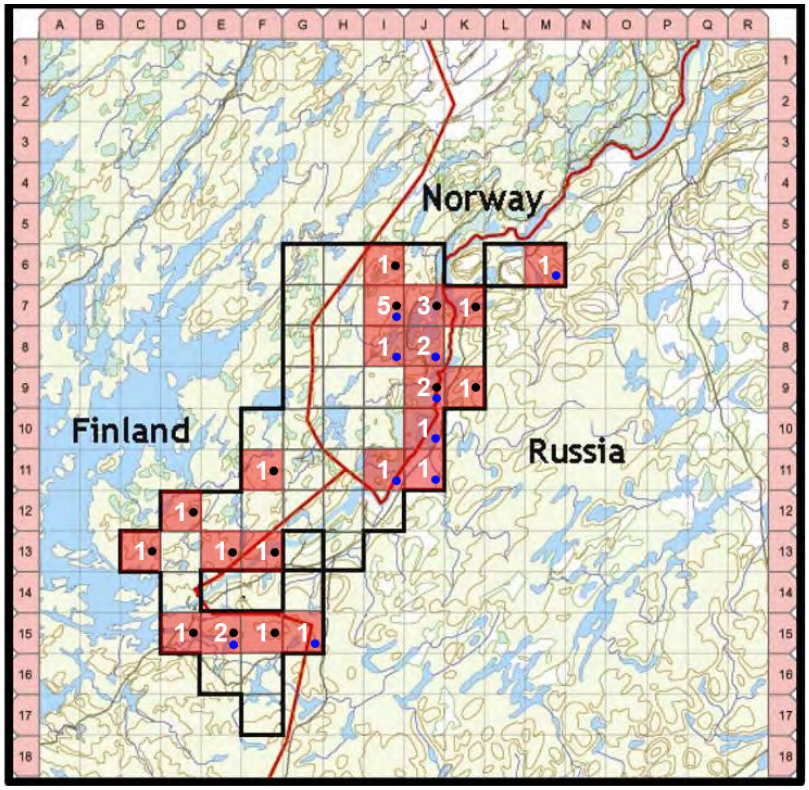
2011

56 traps
5 x 5 km grid (1400 km^2)
for 2 months
0.14 individuals/10 km^2

88 samples collected
27 of 56 grids showed activity
20 bears identified (**12** females, **8** males)
4 new identified, **16** known

Hair trapping 2007 and 2011 in Pasvik





2007

Photo: Martin E. Smith

2011

Photo: Alexander Kopatz

Photos: Bioforsk Svanhovd, Alexander Kopatz

Hair trapping 2007 and 2011 in Pasvik

In summary:

- less samples and found a slight decrease in detected brown bears
- both findings may be caused by less bear activity within the study area, compared to 2007
- No new individuals in Pasvik
- sensor triggered cameras did not record any harm to wildlife when using hair-trapping

Photo: Bioforsk Svanhovd

ID	Gender	MU05		MU09		G10L		MU10		MU23		MU50		MU51		MU59		Registered in
FI101	M	117	127	110	114	182	182	145	149	170	172	120	124	145	145	226	242	2010
FI105/MO15	M	115	127	098	110	182	190	135	149	170	178	126	130	141	147	226	242	2010
FI109	F	125	125	112	112	182	192	135	147	172	174	124	126	141	140	240	250	2010
FI110	F	121	125	112	116	182	192	135	135	172	176	120	124	139	141	240	250	2010
FI111	F	121	125	112	116	182	182	135	143	172	174	120	124	145	149	240	250	2010
FI38/MO18	F	121	125	110	112	182	182	145	147	174	176	106	106	139	147	240	242	2005, 2007
FI43/MO3	F	109	125	112	112	182	182	135	147	174	176	120	126	139	149	240	248	2005, 2007, 2008, 2009, 2010
FI64/LL21	F	115	127	112	118	184	192	135	145	172	174	120	124	139	141	240	250	2007
FI69	M	121	127	110	116	184	192	135	145	172	174	120	130	141	145	250	250	2007
FI70	M	115	121	098	120	182	182	145	147	172	174	120	120	145	145	250	250	2007, 2008, 2009, 2010
FI71	M	115	125	098	110	182	184	135	145	170	174	120	126	145	147	226	250	2007, 2008, 2009
FI74	F	121	129	098	116	182	192	135	145	172	172	106	124	141	140	226	250	2007, 2008, 2009, 2010
FI78/MO19	M	115	123	112	116	182	182	147	147	170	172	120	130	145	145	240	248	2008, 2009, 2010
FI98/MO17	F	109	117	112	112	182	182	135	135	172	174	106	106	139	143	242	242	2010
LL22	F	115	127	098	098	184	192	145	147	172	174	120	124	141	145	242	250	2007
LL36	F	115	117	098	110	182	184	135	145	170	176	120	126	145	145	226	250	**2011**
LL37	F	115	117	110	112	180	182	135	147	172	172	120	130	145	145	248	250	**2011**
LL38	M	109	117	110	112	182	184	135	135	172	172	106	130	141	145	240	250	**2011**
LL39	F	109	115	098	112	182	184	135	147	172	172	120	130	141	145	240	250	**2011**
MO8/LL44	M	115	123	102	112	172	184	147	147	168	170	106	118	149	151	226	248	2007

DNA-profiles

STR-markers and gender → DNA-profile

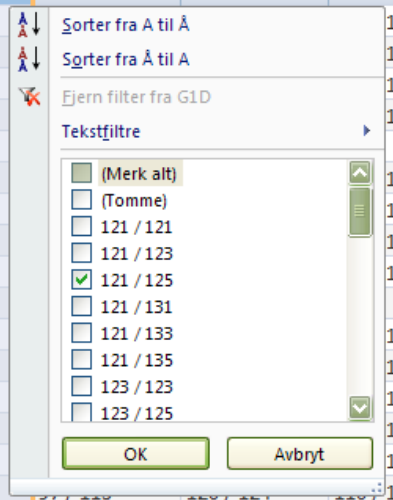
Sample No.	G1D	G10B	MU05	MU09	MU15	MU26	Gender	Ind.
1	123/127	109/109	114/116	96/124	111/115	82/82	Male	A
2	121/121	97/99	114/116	96/120	113/115	82/86	Female	B
3	123/127	109/109	114/116	96/124	111/115	82/82	Male	A

- Probability of identity (10 STRs) = 5.67×10^{-10}
- Probability of sibling identity (10 STRs) = 1.68×10^{-4}

Database for monitoring, research and forensics

Internt_Prøvenr	Eksternt_Prøvenr	ID	Land	InnsamlingsÅR	FunnDato	Materiale	Individ	Individ_Norge
BH319	F16-4-A	1048	Finland	2007	20.08.2007	Hair		
BH320	F16-4-B	1049	Finland	2007	20.08.2007	Hair		
BH321	G10-4-A	1050	Finland	2007	21.08.2007	Hair		FI64
BH322	F10-4-A	1051	Finland	2007	21.08.2007	Hair		
BH323	F10-4-B	1052	Finland	2007	21.08.2007	Hair		

Individer	Kjønn	G1D	G10B	MU05	MU09	MU15	MU26
FI1	M	125 / 125			122	109 / 113	82 / 82
FI10	F	123 / 127			118	111 / 115	82 / 82
FI11	M	127 / 133			118	111 / 115	82 / 82
FI12	M	127 / 127			118	111 / 111	82 / 82
FI13	M	121 / 121					82 / 82
FI14	F	123 / 127			122	109 / 115	82 / 90
FI15	M	121 / 131			124	115 / 117	82 / 86
FI16	-	123 / 123			114	109 / 109	82 / 90
FI17	M	121 / 123			124	113 / 117	82 / 86
FI18	M	121 / 133					
FI19	F	125 / 135			114		
FI2	M	127 / 131			16		
FI20	M	125 / 125			122		
FI21	M	123 / 125			110		
FI22	F	127 / 131			124		
FI23	M	123 / 135			114		
FI24	M	123 / 135	97 / 97	120 / 120	110 / 110		

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Forensic Science International: Genetics Supplement Series 2 (2009) 273–274

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Research article

Population data for 12 STR loci in Northern European brown bear (*Ursus arctos*) and application of DNA profiles for forensic casework

H.G. Eiken [a,*], R.J. Andreassen [b], A. Kopatz [c], S.G. Bjervamoen [a], I. Wartiainen [a], C. Tobiassen [a], P.M. Knappskog [a], P.E. Aspholm [a], M.E. Smith [a], J. Aspi [c]

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[b] *Faculty of Health Sciences, Oslo University College, Norway*
[c] *Department of Biology, 90014 University of Oulu, Finland*

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Scientific publications

- Data from hairtrapping projects contributed to scientific publications:

Schregel et al. (2012): Limited gene flow among brown bear populations in far Northern Europe? Genetic analysis of the east-west border population in the Pasvik Valley. **Molecular Ecology 21 (14): 3474-3488**

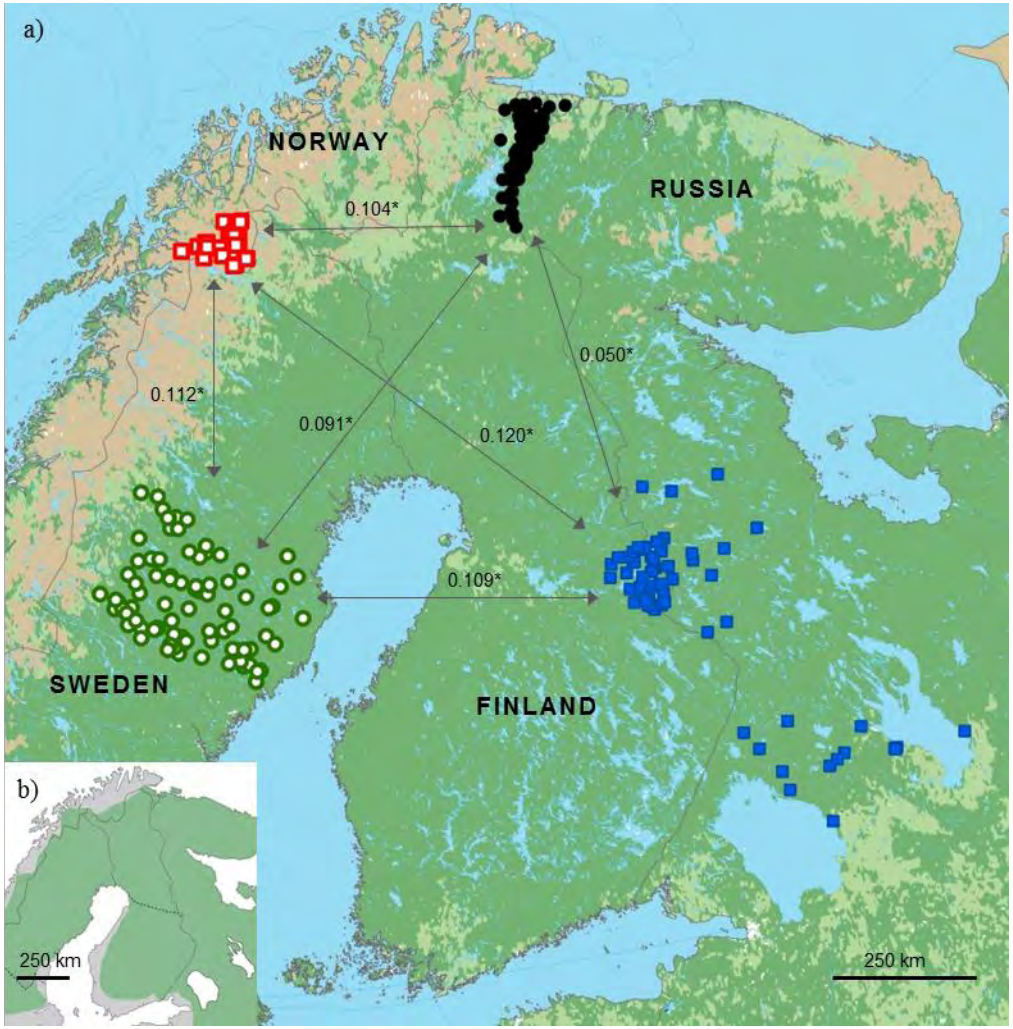
Kopatz et al. (2012): Connectivity and population subdivision at the fringe of a large brown bear (Ursus arctos) population in North Western Europe. **Conservation Genetics 13 (3): 681 – 692.**

Kopatz et al. (2012):

- Limited gene flow between the northern and southern populations
- Possible geographic barriers between north and south
- Strong isolation-by-distance pattern overall

Schregel et al (2012):

- Pasvik population at fringe of large eastern population
- Limited geneflow towards the west
- Population size *Nc*: 40-70 bears
- Breeding population *Ne*: 12-25 bears



International collaborators and funding:

- Pasvik Nature Reserve (Russia): Olga Makarova, Natalia Polikarpova, Vladimir Chizhov
- Metsähallitus (Finland): Tuomu Ollila;
- Assistance in the field: Magne Asheim (SNO), Jørn Monsen (SNO), Sari Magga, Veli-Matti Kangasniemi, Jari Kangasniemi, Petteri Polojärvi, Gennady Dmitrenko, Alexander Karachevtsev and Yury Snegirev
- Funding: Office of the Finnmark County Governor, Nordic Council of Ministers, Bioforsk and partners

Male bear FI78/MO19, 21.06.2011, 07:44, Pasvik Valley