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
Joint annual bird registrations

Pasvik Inari Trilateral Park

FINLAND

NORWAY

RUSSIA

Vätsäri Wilderness Area
Øvre Pasvik National Park
Pasvik Nature Reserve
Øvre Pasvik Landscape Protection Area
Pasvik Zapovednik

Lake Inari
Nellim
Rajakoski
Vaggatem
- Bothnian bay

Flyway

Barents sea
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Branta bernicla</td>
<td>21</td>
<td>7</td>
<td>11</td>
<td>12</td>
<td>12</td>
<td>8</td>
<td>14</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>23</td>
<td>17</td>
<td>9</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>188</td>
</tr>
</tbody>
</table>

**Branta bernicla** – Чёрная каза́рка
**Brant Goose**
The variation of number of birds during the day-count in spring and in autumn
The average percentage of birds in spring:

- Divers: 2%
- Swans: 9%
- Gees: 3%
- Waders: 12%
- Ducks: 67%
- Gulls: 7%

The average percentage of birds in autumn:

- Waders: 0%
- Gulls: 1%
- Divers: 2%
- Swans: 3%
- Gees: 1%
- Ducks: 93%
Spring

Autumn

Aythya fuligula
- Tufted duck

Mergellus albellus
- Smew

Anas penelope
- Eurasian wigeon

Bucephala clangula
- Goldeneye
Biodiversity

• Shannon-Wiener index

\[ H = - \sum p_i \log_2 p_i \]

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

S-W H = 0.56

• Simpsons "reciprocal" index

\[ D = \frac{1}{\sum (p_i)^2} \]

(probability that two chosen 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
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)
What methods do we have to study bears?

- Observations
- Dead bears
- Marked and collared individuals
- Non-invasive sampling
Noninvasive genetic sampling techniques

- Biological samples
- No contact with the animal
- Genetics for identification
- Capture-mark-recapture
Snare placement was localized in advance to avoid potential conflicts with people. Move the snares once each month within the same grid. Check snares at least every 2 weeks. Snare placement was localized in advance to avoid potential conflicts with people.

1 hair snare per 5x5 km grid.
<table>
<thead>
<tr>
<th>Year</th>
<th>Traps</th>
<th>Grid Size (km²)</th>
<th>Duration</th>
<th>Density</th>
<th>Samples Collected</th>
<th>Grids with Activity</th>
<th>Bears Identified</th>
<th>New Identified</th>
<th>Known</th>
<th>Females</th>
<th>Males</th>
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</thead>
<tbody>
<tr>
<td>2007</td>
<td>56</td>
<td>5 x 5 km</td>
<td>2 months</td>
<td>0.17</td>
<td>196</td>
<td>26</td>
<td>24</td>
<td>11</td>
<td>13</td>
<td>10</td>
<td>14</td>
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<tr>
<td>2011</td>
<td>56</td>
<td>5 x 5 km</td>
<td>2 months</td>
<td>0.14</td>
<td>88</td>
<td>27</td>
<td>20</td>
<td>4</td>
<td>16</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>
Hair trapping 2007 and 2011 in Pasvik
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
**DNA-profiles**

**STR-markers and gender**

Arrow pointing to **DNA-profile**

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

• Probability of identity (10 STRs) = $5.67 \times 10^{-10}$
• Probability of sibling identity (10 STRs) = $1.68 \times 10^{-4}$
Database for monitoring, research and forensics

<table>
<thead>
<tr>
<th>Internnt Prøven</th>
<th>Eksternt Prøven</th>
<th>ID</th>
<th>Land</th>
<th>InnsamlingsÅR</th>
<th>Funndato</th>
<th>Materiale</th>
<th>Individ</th>
<th>Individ_Norge</th>
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<tbody>
<tr>
<td>BH319</td>
<td>F16-4-A</td>
<td>1048</td>
<td>Finland</td>
<td>2007</td>
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<tr>
<td>BH323</td>
<td>F10-4-B</td>
<td>1052</td>
<td>Finland</td>
<td>2007</td>
<td>21.08.2007</td>
<td>Hair</td>
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</tbody>
</table>

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


*Bioforsk Svanhus, Norwegian Institute for Agricultural and Environmental Research, Sandvold, N-9925 Sandvik, Norway
*Faculty of Health Sciences, Oslo University College, Norway
*Department of Biology, 56014 University of Oulu, Finland

Received 17 July 2009; accepted 29 July 2009
Scientific publications

- Data from hairtrapping projects contributed to scientific publications:


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 $N_c$: 40-70 bears
- Breeding population $N_e$: 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