

Instability of wild reindeer migration and possibility of adaptive management by local people in Arctic Siberia

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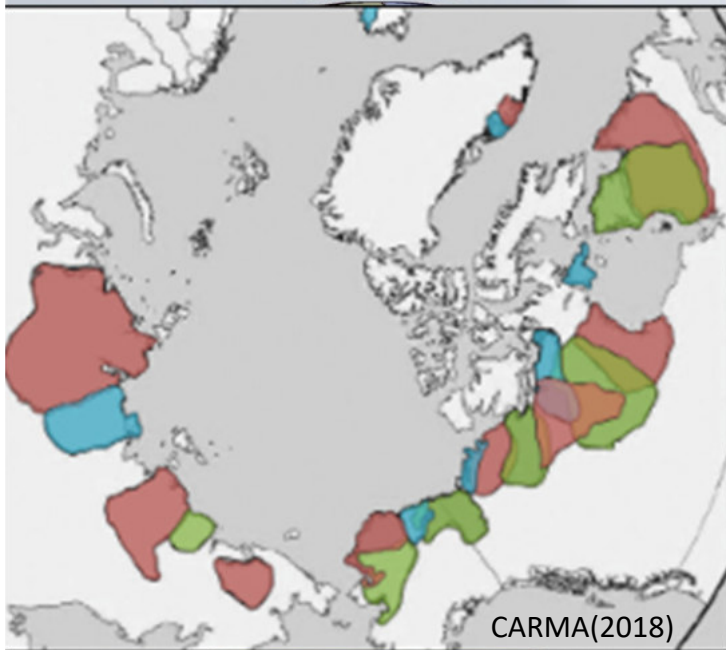
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Olenek: Only Increasing Population in Eurasia



distribution of *Rangifer tarandus* vertical stripe shows domesticated reindeer (Russell and Ulvevadet 2004)

Issues in Siberian tundra reindeer conservation

1. rapid decreasing in distribution and population (Vors & Boyce 2009) (by habitat loss / hunting)
2. conflicts (cross-breeding etc.) with domesticated reindeer herding
3. cross-breeding with forest reindeer (ssp)

- 28% (1.25/4.42million) of wild and 74% (1.36/1.84 million) of domestic are in Russia
- 70% of Russian domestic reindeer are in Siberia (western siberia 50%, eastern siberia & far north 20%)
- 85% of Russian wild reindeer are in 3 districts (Taimir, Northern Sakha, Chukot; 15% of the total distribution area)

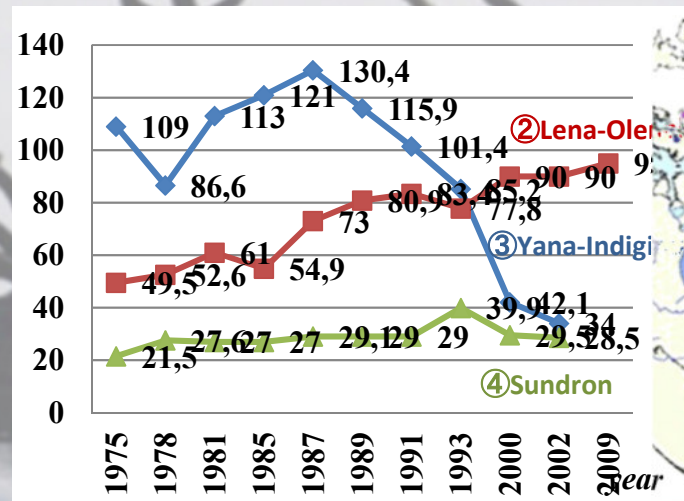
Upper-Olenek river – new emerging population



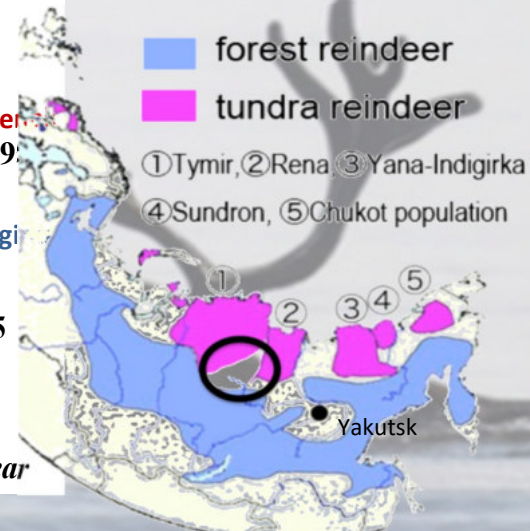
Rangifer tarandus



The statue of "winter God's blessing"



Population trends of tundra reindeer in Sakha (IBPC report(unpublished))

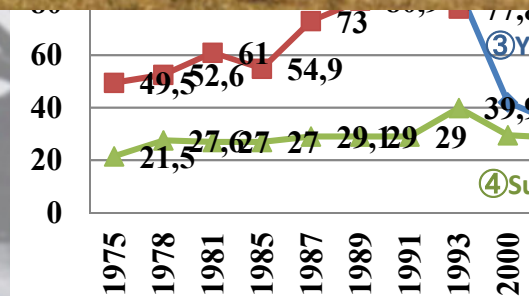


Distribution ranges of wild reindeer in Eurasia (Ulvevadet & Klovov, 2004を改写)

Upper-Olenek river – new emerging population



The statue of
ter God's blessing"



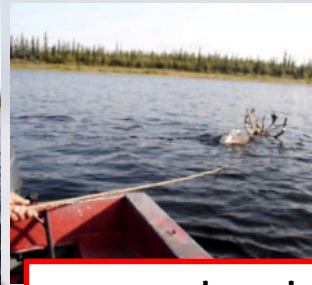
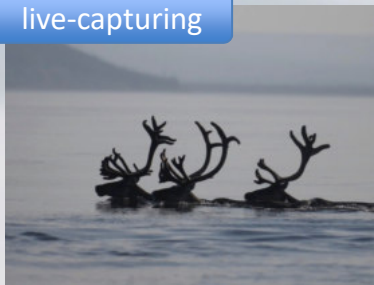
Population trends of tundra reindeer in
(IBPC report(unpublished))



1980's migration route (from Safronov et al, 1999)

Methods with TE Knowledge & Technique

live-capturing



..waiting for reindeer passing on the river .. detect and chase a targeted animal

.. throwing a lasso !

satellite-tracking



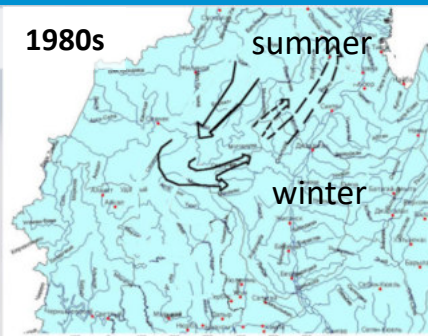
satellite collar- 100% pure russian product

satellite transmitters manufactured by ES-PAS Co.
Argos-Argos, Argos-GPS, 1,050g for 2yrs
located by 5-10min., 105m±95m accuracy

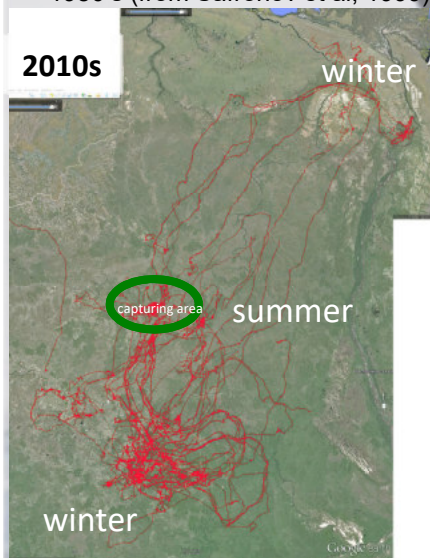


Released ! (average time: 10 min. without anesthesia

Result : shift to the south



1980's (from Safronov et al, 1999)



2010-2016 (34 individuals)

Why South?

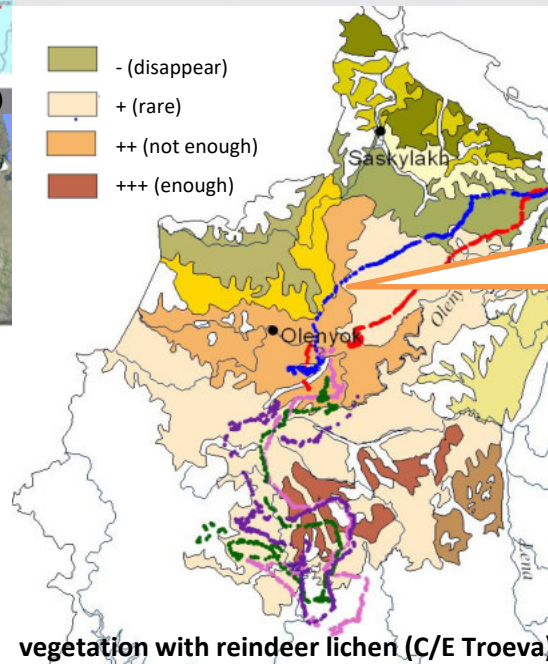
- Good Summer in Highland Condition
- Good condition of reindeer lichen vegetation

- (disappear)

+ (rare)

++ (not enough)

+++ (enough)



<http://enisei2580.a.la9.jp/uctitunguska2.html>



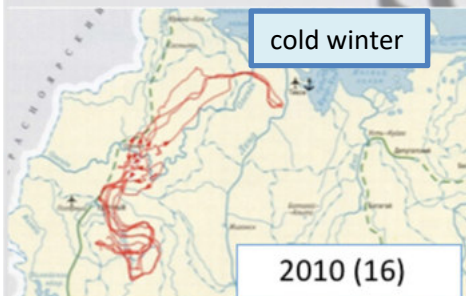
Natural cause of range shift

Why not north?

- Habitat deterioration with RoS and less reindeer lichen

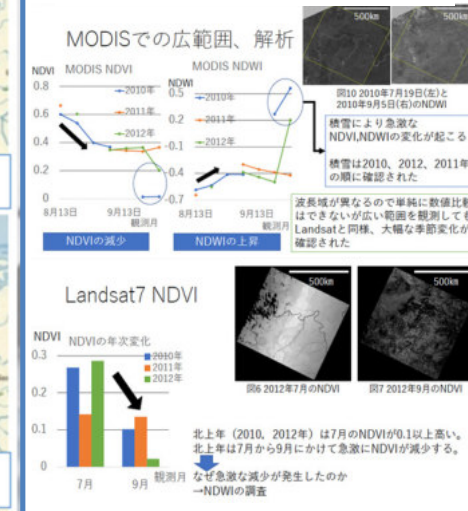


湿地 ・夏: 好適ハビタット
 ・秋春: 移動コスト大
 食物現存量小
 ・冬: 食物アクセス困難



立澤・オクロブコフ(2015)

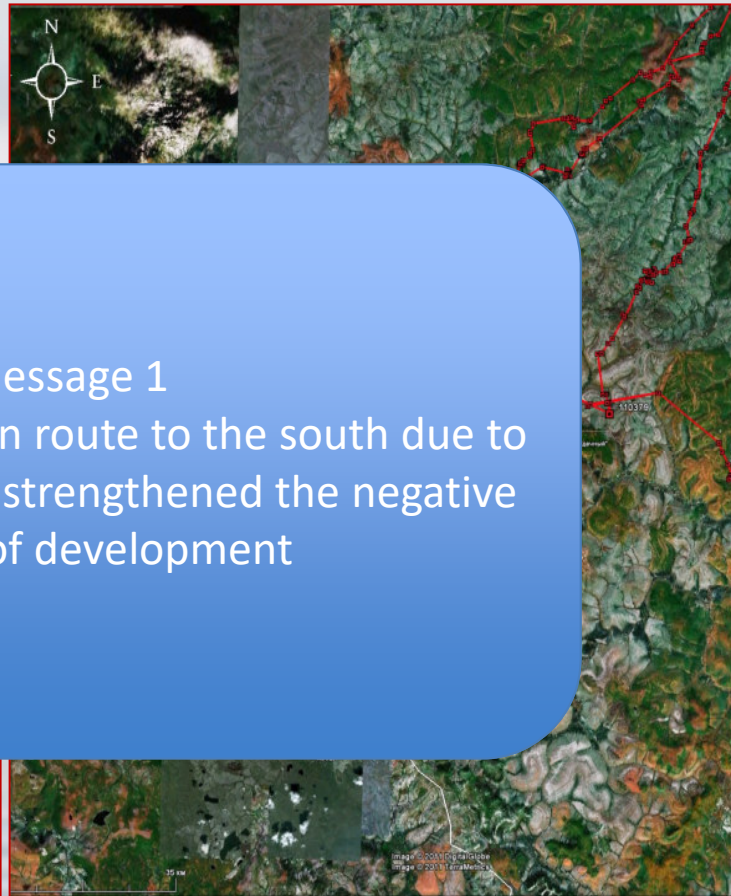
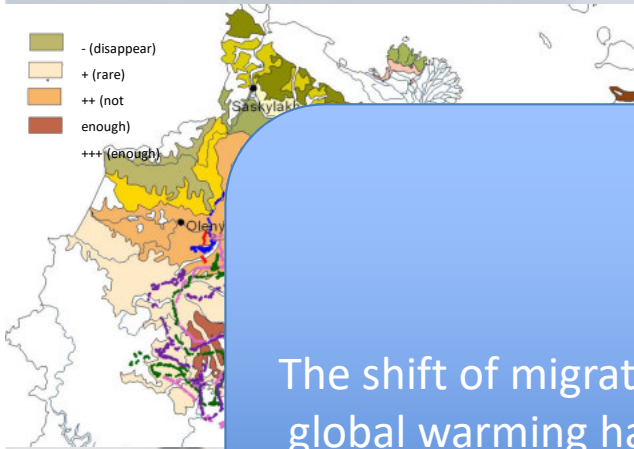
暖かい冬は北に行かない？
 (Suzuki et al. presentation in JpGU2017)



Artificial cause of winter wandering

Why not to better condition?

- (disappear)
- + (rare)
- ++ (not enough)
- enough
- +++ (enough)



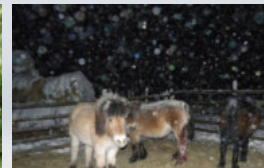
Message 1
The shift of migration route to the south due to global warming has strengthened the negative impact of development



Increasing conflicts, and changing value



Increasing conflicts



Message 2

Unexpected shift of migration route has increased conflicts with local people.

As a result, the values of local residents' reindeer have shifted.

conflicts in local

cross breed
domestic r

Mass adoption of
domestic reindeer

Competition with
domestic reindeer

conflicts
with
local people

reindeer

90-	2010-
00	3000<
00	700*<
+	++
00	500<
50	100<

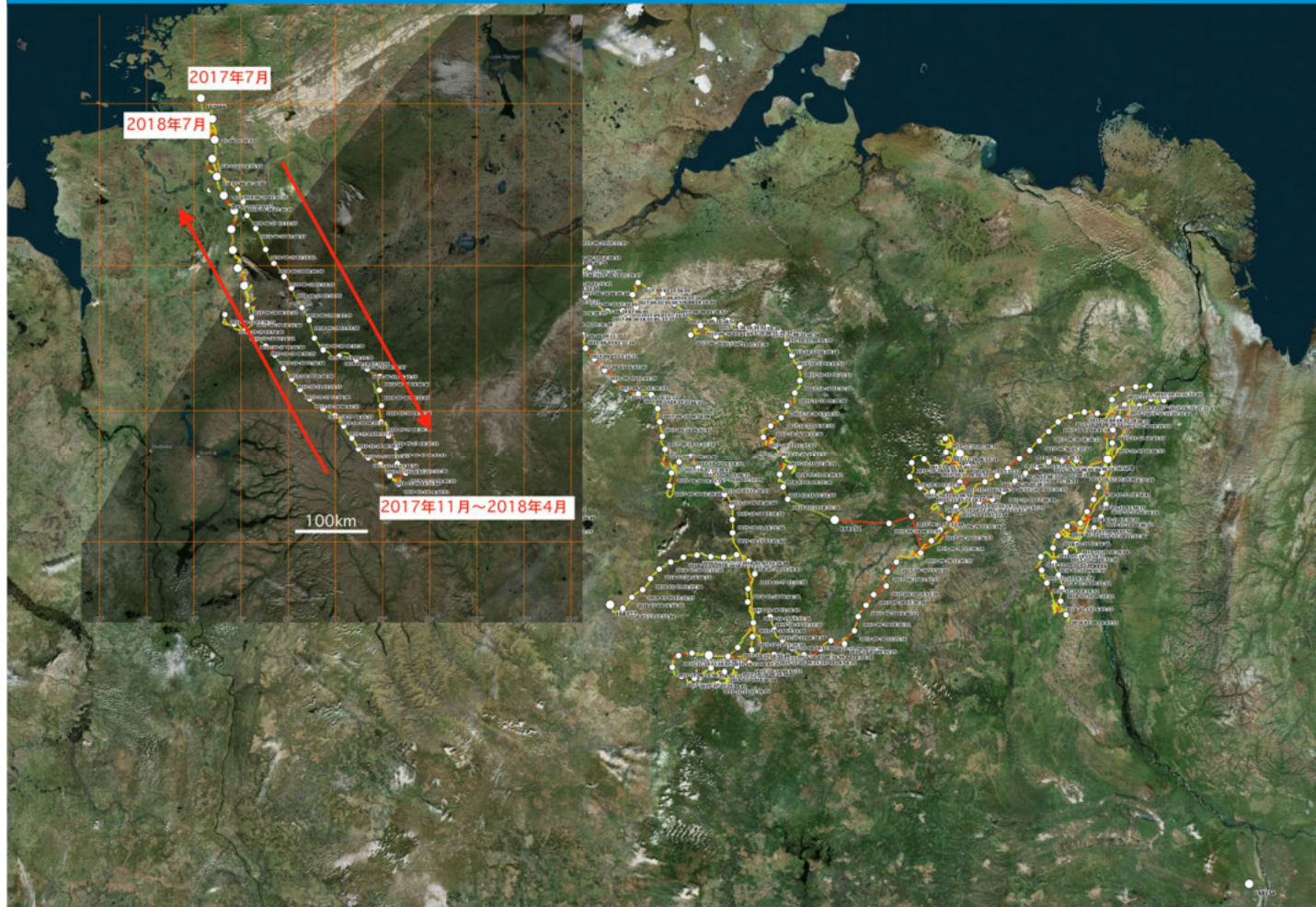


blessed animal

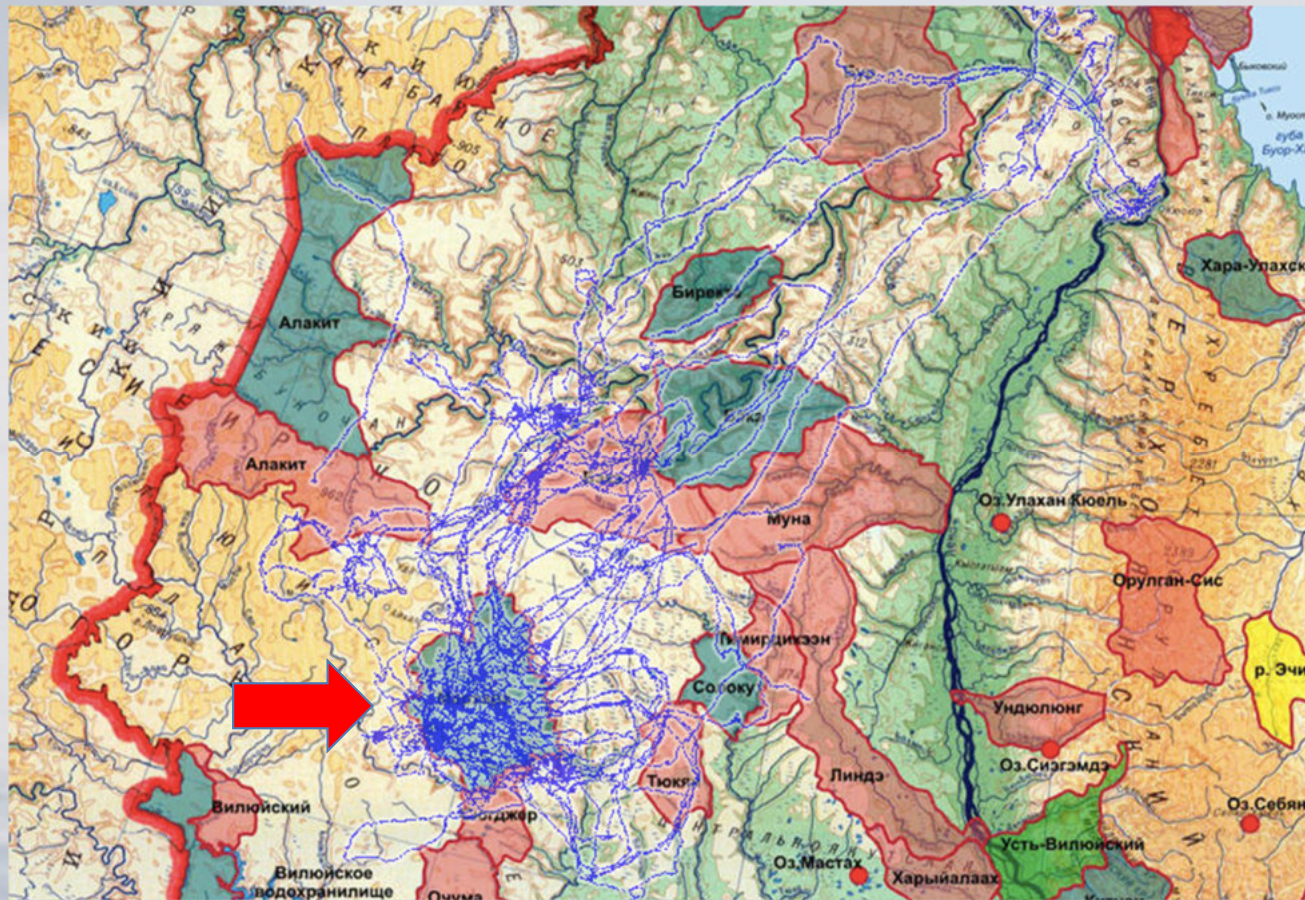


Nuisance animal

“wandering” of reindeer for wintering range



Measures for conflicts: adaptive management



High utility of “Marxara reindeer conservation area” (2014-2016)

Take away messages,



Wild reindeer in upper Olenek area;

- Migration route has shifted to the south by natural factors
- But unstable in wintering range by artificial factor(s)
- Conflicts with local reindeer herding (& ecosystem) are increased by this Migration route shift ,
- So, local people's recognition of wild reindeer has been shifted from "blessed animal" to "nuisance animal"
- "adaptive conservation" may be adaptive, but in short time?



Thank you for your attentions!

and

*I thank local people
for their great collaborations!*

