

The Rufford Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Olga Mochalova
Project title	The research and conservation of rare endemic plants and its habitats in the Magadan Region (Northern Far East Asia, Russia)
RSG reference	9 July 2012
Reporting period	July 2012 – September 2013
Amount of grant	£ 5800 (exchange app. 47, 4 rubl. - 51, 5 rubl.)
Your email address	mochalova.om@gmail.com
Date of this report	12 October 2013

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Complex investigation and protection of rare endemic plants and its habitats in Northern Far East Asia.				
The investigation of the biology and ecology of 10 endemic species of plants from the south part of the Magadan Region.			+	We researched the distribution, ecology, some peculiarity of biomorphology, viability of 11 endemic plants (10 planned+1 unplanned species - see below) (Khoreva, 2013; Mochalova, Khoreva, 2012; Mochalova, 2013, etc.). We described by typical geobotany methods the sampling areas for each species of plant with more details. We determined the seed productions and study the regeneration ability for 4 year (including previous data). (Andrijanova, 2013).
The organization of the long-time monitoring of the threatened species			+	We continued the advanced monitoring of 4 local endemic plants from 2010 to 2013 and begin the periodical observation of typical populations for 7 other species from 2012. The all seasons (incl. automatically temperature registration) conducted on the six model plots.
The mapping and description the main populations of plants, estimate the quantity and conditions.		+		We have mapped the area of endemic species in the field by GPS. Then we have prepared digital maps of areas of each species. We will prepare these maps as electronic source in the near future.
The inspection of 16 regional natural protected areas ("pamajtnik prirody") in the Magadan Region for occurrence and distribution of endemic plants			+	We visited and observed vascular plants in the 16 protected areas in Magadan Region (from 0.2 to 1, 8 sq.km). The endemic species were revealed at the 3 protected area only. Simultaneously we have begun the floristic revision of regional nature reserves for the first time.

The revealing of the important endemic plant areas for conservation of rare plants		+		We increased the number of model plots for monitoring investigations from 3 to 6 plots. All these areas are the most representative as supposed conservation area for endemic plants. We recommend the localities of our plots as most suitable for establishing local natural reserves
The creation of practical recommendations for the protection of rare plants and their important area			+	The biological descriptions for some species were prepared in 3 peer-reviewed articles and in 3 conference participation (in Russian) We are going to prepare the list of the important plant areas for Magadan Department of Natural Resources
Information and Education Programs				
The organization of the photo-exhibitions.			+	We made more than 40 large photos of rare and endemic plants with small stories for the Visit Center of Magadan State Nature Reserve and the Ecological Center for Teenagers (NGO).
The publication the second issue of illustrated booklet.			+	We prepared and published second issue of illustrated booklet "Rare and endemic plants of the Magadan Region" with illustrated information about new species endemic plants of the vicinity of Magadan with common biological information about endemic species. We published the extra edition of our first illustrated booklet "Endemic plants of the Magadan Region" (published in 2011 – supported by project 8284-1). This booklet was presented in the Ecological Center and several schools in Magadan, Magadan State Nature Reserve and etc.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

- We carried out the phenology observations of endemic plants during our project. We expected to get some tourists to take part in the work for increase of observation's frequency. It was not realized because of specificity of botanical monitoring investigations. However, some interesting materials were collected by recruited tourists.
- Unfortunately, we can't find reliable source of information for the Northern Far East Asia, which contribute to determine proper status for some endemics with restricted areas, but abundant within the limits of their areas.

3. Briefly describe the three most important outcomes of your project.

1. The long-time monitoring of the four threatened endemic species, periodical observation of other rare endemic plants.

It was known that ranges of the four studied plant species are very small, from one to several tens sq. km. As a result of our first project 8284-1 we found that in fact these species have even smaller ranges: *Minuartia tricostata* was infrequent and occasional in the area of 0.3-0.4 sq. km, *Magadania olaensis* was rare, and occupied an area of approximately 10 sq. km, *Pulsatilla magadanensis* was occasional in the area of 2-2.5 sq. km, *Leontopodium stellatum* was infrequent in the area of 3-4 sq. km. To monitor populations of these species, we established six model plots in the vicinity of the city of Magadan (Fig.1): three in 2010- 2011 (for *Minuartia tricostata* and *Pulsatilla magadanensis*) and another three in 2012 (for *Magadania olaensis*, *Leontopodium stellatum* and *Bupleurum atargense*). The soil surface temperature in the plots has been recorded by the *iButton* data loggers since 2011 and 2012 until present (the projected working time is until 2014-2015). We also recorded vegetation cover and other characteristics of the plots. We recommend the localities of our plots as most suitable for establishing local natural reserves.

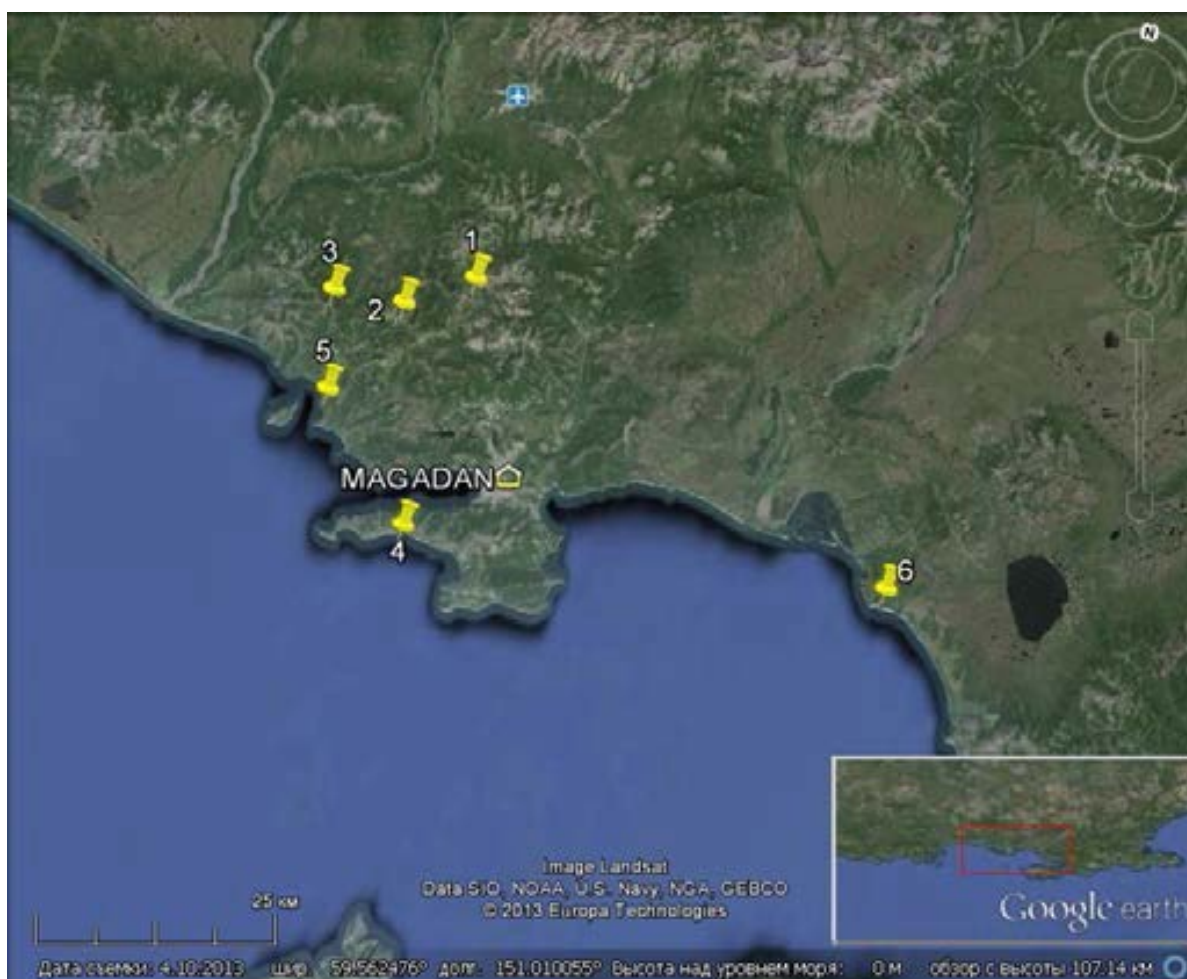


Fig.1 The map of location of the main model plots.

The population structure of the studied plant species was examined every year at the same model plots. In each population all individuals were recorded and classified into the following easily recognizable life cycle stages: generative (flowering), adult, vegetative adult, juvenile and other. As an example, the ontogenetic spectrum of the population of *Minuartia tricostata* is shown in Fig. 2. The prevalence of generative stages in ontogenetic spectrum of each species indicate their high vitality levels.

X-abcissa - life cycle stages: p, g, im, v, g1, g2, g3, s, m.
Y-axis – number of specimen of plants
1 – model plot 1,
2 – model plot 2.

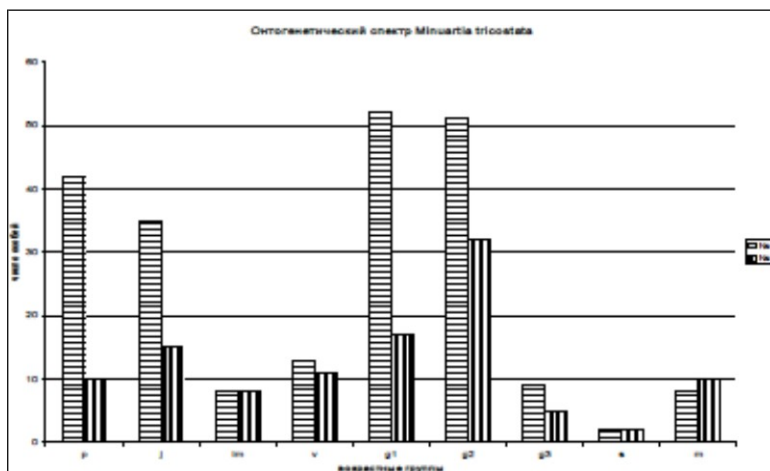


Fig.2 The ontogenetic spectrum in the population of *Minuartia tricostata*

We also studied seed production of the endemic species. In most cases it correlated with climatic conditions of the year. Climate not only influenced seed production, but also probability of seed germination. Collected seeds were analysed for their germination and their cultivation was attempted. We managed to maintain a population of the rarest species of *Minuartia* in the conditions similar to those observed in its natural range. The juvenile plants started to appear on the third year of the population existence when we were continuously planting new seeds.

Unexpectedly, we managed to establish the monitoring of *Magadania olaensis*, which is the only plants species of Magadan Region included into the Red Data List of the Russian Federation. We have not been planning this work as all known populations of this species were in extremely remote locations (see report of project 8284-1). While mapping the populations of *Primula mazurenkoeae* and *Bupleurum atargense* near cape Harbis we came across a small population of *Magadania*. Now a model plot of all three species is established there. We cannot exclude that more populations of this rare species can be found in the future as another small one was observed in the Zavyalova Island in 2011.

We published some preliminary results of this study in peer-reviewed papers (Mochalova and Khoreva, 2012a, Khoreva, 2013, etc.) and gave oral presentations at scientific conferences at Blagoveschensk "X Far East Conference of Nature Reserve" (Andriyanova, 2013). We are working now on separate papers dealing with *Pulsatilla magadanensis* and *Leontopodium stellatum* these will be published in 2013-2014.

In 2012-2013 we began the periodical observations of typical populations of other endemic species: *Draba magadanensis*, *Primula mazurenkoeae*, *Bupleurum atargense*, *Astragalus vallicoides*, *Pedicularis ochotensis*, *Saxifraga derbekii*, and *Salix magadanensis*. We mapped distribution of each species using GPS and established model plots for future observations. We collected data on the geomorphology and vegetation cover of habitats, as well as on the morphology, ecology and viability of these plants. We also studied seed production of these plants and collected seeds for experimental research. The first results of this works were published (Mochalova and Khoreva, 2012b). It was very important to organize the long-term monitoring of these rare plants because it provides scientific data for assessing the conservation status of each species. Such data is the basis of placement of the plant species in one of the categories of the classification of Red Data List of Russian Federation, or of the JUCN classification, or of the Red List.

As result of our investigation we classified as VULNERABLE (VU, a species that is not Critically

Endangered or Endangered, but is facing a high risk of extinction in the wild in the medium-term future) or as category “3a” of the Red Data List of Russian Federation (3a, rare species, endemic of Russia, northern coast of the Sea of Okhotsk, with relict restricted area) eight endemic vascular plants: *Primula mazurenkoeae*, *Bupleurum atargense*, *Astragalus vallicoides* and studied earlier *Draba magadanensis* *Minuartia tricostata*, *Pulsatilla magadanensis*, *Leontopodium stellatum*, *Magadania olaensis*. Three other species, *Pedicularis ochotensis*, *Saxifraga derbekii*, and *Salix magadanensis*, despite having very small ranges, are quite abundant and have vigorous populations. We will continue their monitoring in the future to determine their conservation status.

2 The investigation of the populations of rare endemic plants in natural protected areas of various ranks.

As part of this project, we collected data on distribution and magnitude of population of endemic plants on the currently existing natural protected areas of the Magadan Region.

Only three species of locally endemic plants occur in the Magadan State Nature Reserve: *Pedicularis ochotensis*, *Saxifraga derbekii*, and *Salix magadanensis*. The Magadan Nature Reserve consists of the five non-connected divisions with total area of more than 8800 sq.km. However, these species grow only in the Ola division of the Reserve (the area of the Ola division is 1034 sq.km.) (Fig.3) and their occurrence frequency is “occasional”. We summarized all data on ranges, biology and ecology of these endemic plants in the Magadan Nature Reserve in the scientific reports “Letopis prirody” (= Chronicle of Nature). and in our article published in the journal “Herald of the Far East Branch of Russian of Academy of Science”. We indicated the Ola division of the Magadan Nature Reserve as one of main area for conservation of the endemic plant species. We made a presentation and took photographs for the mobile photo exhibit to Ecological Education Group of the Magadan Reserve “Endemic and rare plants of the Reserve” (<http://www.magterra.ru/novostnaya-lenta/1231>).

The lack of information on flora of local natural protected areas for the rational of our work on the revision of their vascular flora and documentation of rare endemic species. We visited and observed vascular plants in the 16 local protected areas (“pamajtnik prirody” = memorial of wild nature) in the Magadan Region (from 0.2 to 1, 8 sq.km. each). The endemic species were found only in three protected areas (Fig.3). Simultaneously we began the floristic documentation of the following regional nature reserves:

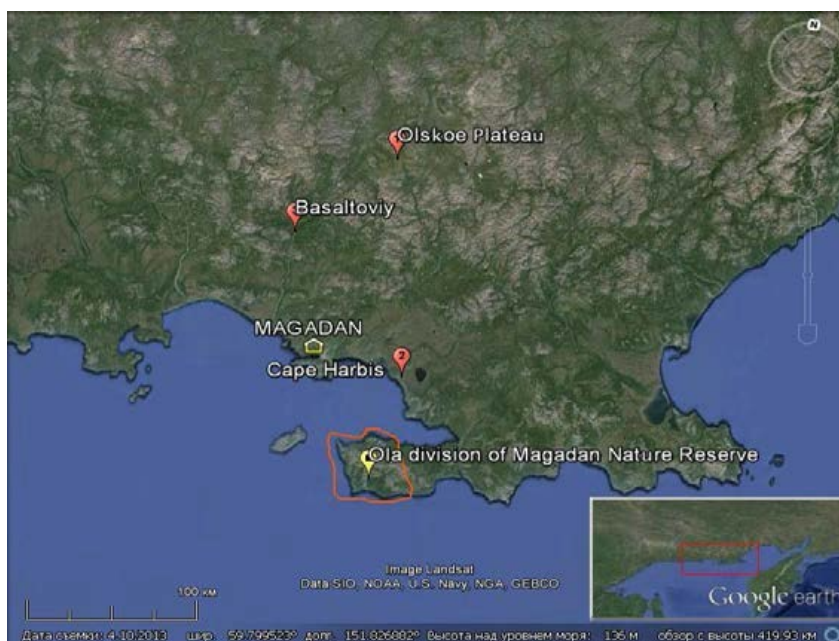


Fig.3 The natural protected areas of various ranks with locals endemic plants.

“Cape Harbis” – 5 species: *Pedicularis ochotensis*, *Saxifraga derbekii*, *Primula mazurenkoeae*, *Bupleurum atargense*, *Magadania olaensis*

“Olskoe Plateau” – 2 species *Pedicularis ochotensis*, *Magadania olaensis*

“Basaltoviy” -1 species *Pedicularis ochotensis*

We found that growth areas of the five rare species, *Astragalus vallicoides*, *Draba magadanensis*, *Minuartia tricostata*, *Pulsatilla magadanensis*, and *Leontopodium stellatum*, are not protected at all. As result of our investigation we classified these species as belonging to category “3a” of the Red Data List of Russian Federation. It is similar to category VULNERABLE (classification of JUCN): taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium- term future. We planning to give publicity the fact of not protected of vulnerable plants.

Our investigation showed that at present the anthropogenic influence on habitats of all studied species is minimal and is not a factor limiting their distribution. All habitats of these endemic plants are seldom visited by people due to their remoteness. The only potential, but very serious threat may be the habitat destruction by the mining and road construction companies or oil exploration on the shelf.

Five plants under investigations have narrow ecological niches and their ranges are limited to the coastal slopes in within 100-200 km from the only city on the Northern coast of the Sea of Okhotsk. At present, these localities only experience a very light human influence from occasional recreational activities. There is, however, a growing risk of the future oil exploration on the shelf of the Sea of Okhotsk. The coastal ecosystems are the most vulnerable and will be the first to experience disturbance in the case of such exploration, especially in the case on any potential oil spills. Our data provide an important baseline for future environmental assessments and ecological monitoring in the area.

3. The distribution of the illustrated and popular scientific information of the rare endemic plants for a wide audience.

One of the most important results is the distribution of the illustrated and popular scientific information for a wide audience. Two years ago, we were surprised realizing the popularity and interest to our booklet, which was published by project 8284-1. We prepared and published second issue of illustrated leaflet “Rare and endemic plants of the Magadan Region”. Six endemic plants of the vicinity of Magadan were described and illustrated in detail: *Salix magadanensis*, *Pedicularis ochotensis*, *Astragalus vallicoides*, *Primula mazurenkoeae*, *Bupleurum atargense*, *Corydalis magadanica*. The photos of five rarest endemic plants from difficult to access areas of the Magadan region were added to the leaflet. We have reprinted the first booklet “Endemic plants of the Magadan Region”. The 600 copies of the leaflets were printed and distributed among schoolchildren, tourists, students etc. As a result, we received additional information about new locations of rare and endemic plants at some difficult to access areas.

The increase of public awareness for rare and threatened plants (its identification and distinguishing from other plants) is the evident result of our photo-exhibitions in Visit Center of Magadan State Nature Reserve and in Ecological Center for Teenagers. There was an increase in public participation for the preservation of rare plants and their habitats.

Due to our work for rare plants and wide information about it, the project leader was involved to the inspection of 16 regional natural protected areas in the Magadan Region.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

We worked with tourists, teenagers, indigene hunters and fishermen and other naturalists.

We contacted with Ecology Center for Teenagers (local NGO). We have prepared wall exhibition including our scientific materials for ecological education of schoolchildren and helped with the opening of the exhibition. Lectures and studies of the Ecology Center were not only for the members of the Center, but using our booklets and photos, the Ecology Center conducted informal lessons for school children from other city schools.



The gratifying letters from the Ecology Center

Besides, we helped Ecology Center with illustrations for exhibition and contest in “Wonders of wild Nature”.

We worked with Magadan State Nature Reserve. Some scientific information was prepared for their report “Letopis prirody” (= Chronicle of Nature). Photo of rare and endemic plants have presented to Visit Centre of Magadan Nature Reserve and they photo exhibition at cultural centre (<http://www.magterra.ru/novostnaya-lenta/1231>) (Fig. 4)



Fig.4. the schoolchildren on the exhibition “Plants and animals of Magadan Nature Reserve

Some tourists showed interest to our work with rare plants from the surroundings of city Magadan after presentation of second leaflet. Two tourists gave us new information about the distribution of rare plants. We received many requests concerning publish and disperse on more similar booklets for other rare plants.

During our field seasons we had many contacts with indigenous hunters and tourists. We talked

with them about the problem of protecting rare and ornamental plants in surrounding area of Magadan, local villages, and in Northern Far East as a whole. Several leaflets were distributed among tourists, hunters and fishermen during launching the inquiry on area of distribution of rare plants.

Unfortunately, the Governmental Department of Nature Resource has not shown any interest in our reports about area of threatened species or on the urgent need of their protection. We hope that our information will be interesting for Department when the new edition of Red Data List of Magadan Region will be prepared. However, our works engaged hunting inspectors in vegetation descriptions and searching of threatened species into project of Hunting Management of several part of Magadan Region. We have participated in the inspection regional protected areas in the Magadan Region for occurrence and distribution of endemic plants. Inspector (project owner) took part in our work with endemic and rare plants also.

5. Are there any plans to continue this work?

We are going to continue the monitoring investigation on the model plots to estimate the populations' conditions and viability of restricted ranged endemic species of plants. On the six model plots we left the automatic temperature registration loggers iBDL until 2014-2015, and every year we will observe the condition of this populations, to watch they fenology and correlate with environmental conditions. As a result, we will have the long-term data and characterization of biology of 4 species *Minuartia tricostata*, *Pulsatilla magadanensis*, *Leontopodium stellatum* and *Magadania olaensis* which will be published in Russian and foreign scientific journals. We are going to continue the field works and collecting data on biology for other endemic plants. This data will be used in the biology and nature protection publications.

We are going to develop collaboration with Ecology Center for Teenagers and Magadan State Nature Reserve and help them with photo, topic and other information about rare, endemic and ornamental plants.

We hope also that cooperation with hunting inspectors will continue and they will invite us for vegetation descriptions and searching of rare and protected species of plants into project of Hunting Management.

We expect also that Governmental Department of Nature Resource will use our data for organize and management Local Nature protection areas.

6. How do you plan to share the results of your work with others?

During our field season we had many contacts with indigene people and tourists. We talked with them about the problem of protected of plants and other environmental problems. We are eager to share information about our project implementation during trekking at surrounding of Magadan, expedition on the Northern Far East Asia and at the scientific meeting.

We detect the area in the Magadan surroundings (~ 40 sq. km., upper stream of Oksa River and Medvezka River), where 3 species (*Minuartia tricostata*, *Pulsatilla magadanensis*, *Draba magadanensis*) are growing together, but not in the same habitats, as priority for new protected area. We described this area as one of the main objects to organize the local protected area ("zakaznik") by typical nomination in the report for Governmental Department of Nature Resource.

The results of our investigations will be included to the new edition of regional Red Data List and will be

sending to the editors of Russian Red Data List.

Some scientific results we published in peer-reviewed papers and gave presentations at scientific conferences. The peculiarity of ecology and biology of *Magadania olaensis* (species included in Red Data List of Russia) we plan to presentation in scientific press after data processing.

Peer-reviewed publications

- M. Khoreva, E. Andrijanova. *Minuartia tricostata* Khokhr. // Biology and ecology of vascular plants of the Russian Far East. Ussurijsk, DFGU, 2013, P. 35-42 (in Russian) Хорева М.Г., Андриянова Е.А. Минуарция трехреберная – *Minuartia tricostata* Khokhr. // Биология и экология растений российского Дальнего Востока. Уссурийск: Издательство Дальневосточного федерального университета, 2013. С. 35-42.
- O. Mochalova, M. Khoreva Rare species of vascular plants at the Nature Protection Area of the Magadan Region // Vestnik Far East Branch of Russian Academia of Science, 2012, № 3. P. 74-82. (In Russian). Мочалова О.А., Хорева М.Г. Редкие виды сосудистых растений на особо охраняемых природных территориях Магаданской области // Вестник ДВО РАН. 2012. № 3. С. 74-82.
- O. Mochalova On the finding of *Minuartia tricostata* Khokhr. (Caryophyllaceae) on the Peninsula Chmitevskogo (south-west of the Magadan Region) // Vestnik North-East Scientific Center, Magadan, 2013, № 1. P. 122-124 (in Russian) Мочалова О.А. О новом местонахождении минуарции трехреберной (Caryophyllaceae) на полуострове Хмиевского (юго-запад Магаданской области) // Вестник Северо-Восточного научного центра ДВО РАН. 2013, № 1. С. 122-124.

Conference participation – publication

- M. Khoreva The morphology and ontogenesis *Minuartia tricostata* (Caryophyllaceae) // Proceeding XIII conference of Russian Botanical Society “The modern botany in Russian”. V. 1. Toliatty, 2013. P. 98-100. (in Russian). Хорева М.Г. Морфология и онтогенез *Minuartia tricostata* (Caryophyllaceae) // Современная ботаника в России. Труды XIII Съезда Русского ботанического общества и конференции «Научные основы охраны и рационального использования растительного покрова Волжского бассейна» (Тольятти 16-22 сентября 2013). Т. 1. Тольятти, 2013. С. 98-100.
- O. Mochalova, M. Khoreva Endemic species of vascular plants at the Nature Protection Area of the Magadan Region // Conservation of biodiversity of Kamchatka and coastal waters. Abstracts of XIII international scientific conference. Petropavlovsk-Kamchatsky, 2012. P. 281-287 (in Russian). Мочалова О.А., Хорева М.Г. Эндемичные виды сосудистых растений на ООПТ Магаданской области // Сохранение биоразнообразия Камчатки и прилегающих морей: тезисы докладов XIII международной научной конференции. Петропавловск-Камчатский, 2012. С. 281-287.

Conference participation - publication and presentation:

- E. Andrijanova Seed productions of the several endemic plants of northern coast of the Sea of Okhotsk // X Far East conference of National Reserve. Blagoveschensk, 2013. P. 44-45. (in Russian) Андриянова Е.А. Семенная продуктивность некоторых эндемичных видов Северного Охотоморья. // X Дальневосточная конференция по заповедному делу 25-26 сент 2013 Благовещенск. Благовещенск, 2013. С. 44-45.

Illustrated leaflet:

- Rare and endemic plants of the Magadan Region (in Russian) *Редкие и эндемичные растения Магаданской области.*

7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

The timescale of our work on project did not deviate from what we planned. We worked in the field on this project in July –September 2012 and May - September 2013. The field research was conducted between two to four days every tree week. Six model plots we were examined every month during all period of works (July 2012- September 2013). Several observations continue periodically to the present tense. Some investigations (for example, the description of local protected areas) we made at the same time with other field botanical investigation in the Institute of Biological Problems of North.

Our communication activities with locals, tourists and scientific continued as necessary. We conducted our popularization activities from November to December 2012 and in February- April 2013, when we prepared a photo-exhibition, presentation and booklets. It took approximately a half of day of work per week.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

In general, we spent less money from budget of project for the field and travel expenses.

Item	Budget £	Actual £	Difference	Comments
Travel expenses	£500	£545	-45	
<i>Rent a car UAZ</i>		295		<i>4 trips to: Cape Atargan, upper Rv.Chasin, Madaun Village, Yabloneviy Pass.</i>
<i>Rent off-road truck</i>		160		<i>One side stream trip to Baaltoviy</i>
<i>Bus ticket</i>		90		<i>Many short trips in vicinity of city Magadan.</i>
Field expenses	£2,220	£2,310	-110	
<i>Fuel and motor oil for car & motorboat</i>		2,070		<i>Fuel: 1l = £0.76 –£0.87 Total: 2,500l = £2,010 2T Oil: 1l = £4.50 =£60</i>
<i>Camp gas & repellent</i>		60		<i>NC</i>
<i>Field equipment</i>		180		<i>Backpack, river boats, waterproof & camping equipment</i>
Accommodation during field research	£400	£440	-40	*£5 per day: 2-4 people = 24- 30 days = 88 days
Consumables stationery	£400	£295	105	
<i>Batteries charger, batteries, flashcard & CD</i>		105		<i>NC</i>
<i>Paper, cartridges</i>		115		<i>NC</i>

printer	o r				
Field markers, zip-lock & rope		65			NC
Silica gel		10			For molecular data
Equipment	£1,200	£1,340	-140		
GPS Oregon 450		420			2 pcs GPS x £210
Macro lens for Nikon		315			Nikon 60mm/2.8 micro
iBDL (12pcs)		520			The automatic sensor (logger) for temperature measurement, 12 pcs x £43.30
Storage device		85			External hard drive for notebook
Printing booklets	£900	£790	110		
Printing booklets		430			1 edition x 200 copies 2ed x 400 copies
Printing photo		180			50 pcs (30x40), 12 pcs (40x60)
Photo frame		160			NC
Printing poster		20			Presentation at the conference of the far East National Reservation
Contingency	£200	80	120		
		55			Accommodation 2 people at the camp Boevoy
		25			Freight, ferry by car to Yana River
TOTAL	£5,800	£5,800	0		

* Accommodation during field research. There were 2-4 persons in the field works at a time, worked in the field by this project during app.21 days in July –September 2012 and 45 day from May to September 2013 (the research work was conducted between two to five day with short intervals in between). Half of this work we keep at the same time with other field botanical investigation in the Institute of Biological Problems of North. Therefore, field accommodation was combined with other activities and cost reduced.

9. Looking ahead, what do you feel are the important next steps?

Public information dissemination on the rare and threatened plants: to print more information about rare and protected plants. To organize more public events connected with plants.

To replicate our work at the different Natural Protected Area of Magadan Region, at the Magadan State Nature Reserve. It would be a good thing to organize the monitoring of conditions of populations of rare and protected plants in the legacy local nature reserves.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

We used the RSGF logo in the booklet and on the photo-exhibition of the Magadan State Nature Reserve and the Ecological Center for Teenagers (“The research and printing supposed by the project of Rufford Small Grants Foundation”).

We noted the financial support of Rufford Foundation in the acknowledgement section at the end of all our articles and publications.

11. Any other comments?

We are extremely grateful for Rufford Small Grant that has funded our projects, and we hope to receive more supports for the research and conservation of rare threatened plants in the Northern Far East Asia.

Acknowledgments

We would like to thank the Rufford Small Grants Foundation for their great support this project. We are also grateful to many people who helped us during the realization of the project: the many colleagues from the Institute of Biological Problems of the North (N. Sazanova, A. Kondratiev, E. Mescherayakova, A. Andreev,) and the Institute of the Biology and Soil Science from Vladifistok (V. Barkalov, T. Bezdeleva), geology (I. Malievskiy, V. Gartvik), tourists and lovers of nature (V. Kurochkin, M. Voroshilova, V. Ivanov) and many others (M. Potapova, D.Sokolova).

Abstract

Out of over 1100 species of vascular plants growing in the Magadan Region, only *Magadania olaensis* is included into the Red Data List of Russian Federation. There are more than ten species of vascular plants growing at the northern coast of the Sea of Okhotsk that have restricted distribution ranges from one to several tens sq. km. The two rarest of these species, *Minuartia tricostata* and *Pulsatilla magadanensis*, were identified as Vulnerable (VU) during our first project 8284-1

We researched the distribution, ecology, some peculiarity of biomorphology, viability of 11 endemic plants. We described by typical geobotany methods the sampling areas for each species of plant with more details. To monitor populations of the rarest species (*Minuartia tricostata*, *Pulsatilla magadanensis*, *Leontopodium stellatum* and *Magadania olaensis*), we established six model plots in the vicinity of the city of Magadan. We began the periodical observations of typical populations of other seven other endemic species:

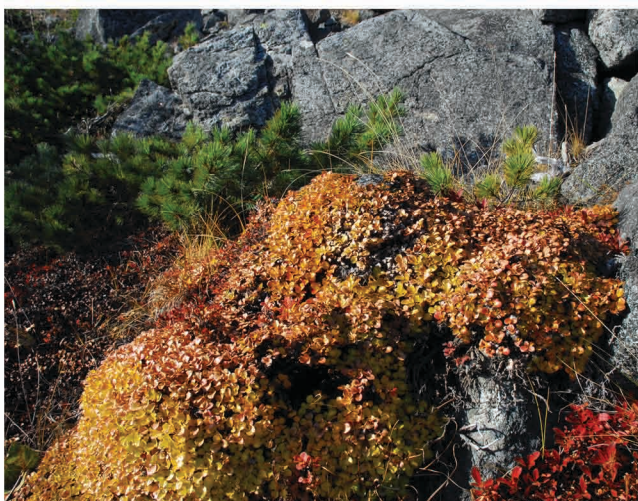
We classified as VULNERABLE (VU) eight endemic vascular plants: *Primula mazurenkoeae*, *Bupleurum atargense*, *Astragalus vallicoides* and studied earlier *Draba magadanensis* *Minuartia tricostata*, *Pulsatilla magadanensis*, *Leontopodium stellatum* and *Magadania olaensis*. Three other species, *Pedicularis ochotensis*, *Saxifraga derbekii*, and *Salix magadanensis*, despite having very small ranges, are quite abundant and have vigorous populations.

Only six species of locally endemic plants occur in the Magadan State Nature Reserve and natural protected areas of various ranks: *Pedicularis ochotensis*, *Saxifraga derbekii*, *Salix magadanensis*, *Primula mazurenkoeae*, *Bupleurum atargense* and *Magadania olaensis*. The areas of the five endemic threatened species: *Astragalus vallicoides*, *Draba magadanensis*, *Minuartia tricostata*, *Pulsatilla magadanensis*, and *Leontopodium stellatum*, are not protected at all.

There was increase public participation in the preservation of rare and endemic plant and their habitats. We distributed the illustrated and popular scientific information for a wider audience.

Appendix 1

Photo of endemic plants of the Magadan Region



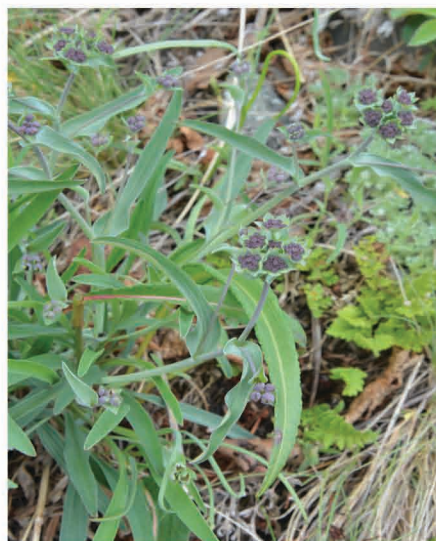
Salix magadanensis Nedoluzhko



Saxifraga derbekii Sipl.



Primula mazurenkoae Khokhr.



Bupleurum atargense Gorovoi



Pedicularis ochotensis Khokhr.



Astragalus vallicoides Khokhr.

Appendix 1: photographs of endemic species



Leontopodium stellatum Khokhr.



Draba magadanensis Berkutenko et Khokhr.



Pulsatilla magadanensis Khokhr. et Worosch.



Minuartia tricostata Khokhr.



Magadania olaënsis (Gorovoi et N. S. Pavlova) M. Pimen. et Lavrova