

TOMSK TAIGA 2007 **REPORT**

Tomsk Oblast, Central Southern Siberia, Russia
1 July – 3 August 2007

**A University of Cambridge Expedition gathering
ecological and sociological data to support an
application for Forest Stewardship Council
Certification**

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Foreword

We live in a time when certainties about the nature of the world we inhabit are fast eroding. We are accustomed to thinking of the earth's biomes as being fixed in certain places and, even if we have not visited them, carry a mental impression of these environments throughout our lives. The mere knowledge that vast wild places survive more or less unmodified by human activities is deeply important to many people. But these places are becoming smaller and harder to find.

The pursuit of resources, agricultural expansion and increasing demand for human living space have made massive impacts on much of the world's natural vegetation. It is tempting to say that this is mainly a recent phenomenon but humans have been massively altering their environments for thousands of years. What is different about the present time is the huge size of the resource demand, coupled with technical know-how that can alter the environment at an unprecedented scale and speed. In the last 50 years this has been witnessed most vividly in the tropical forests. Almost inevitably the next 50 years will see even greater change in the major biomes as effects of global climate change become more evident.

The communities of plants and animals that live at high latitudes are highly vulnerable. In all likelihood, climate warming will result in shrinkage of tundra and taiga. The forests will also increasingly be seen as under-used sources of energy and timber. Of course, people have historically exploited these resources over long periods of time. Especially on the southern fringes of the taiga – the location for the expedition reported here – there is probably little that could be regarded as truly unmanaged forest. Nevertheless, some of the forests in this region are rich in features that one associates with lightly managed, even natural, forests. These places are highly valuable for wildlife and they strongly deserve protection from intensive management. This is all the more important given the future uncertainties.

The expedition to study the forests in the Tomsk region in 2007 was the last of three expeditions to the area mounted by the Cambridge University Expedition Society in partnership with staff and students from Russian universities and other organisations. The expeditions have given insight to social and cultural factors influencing the way that local people perceive and manage the forest. The main aim, however, was to establish a baseline, or yardstick, against which future changes in the forests, whether arising from direct human action or climate change, can be measured. This has been achieved successfully but, more immediately, it is to be hoped that all this information will help to inform sustainable management in these forests.

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Abstract

The expedition gathered ecological and sociological data to support an application for Forest Stewardship Council Certification. Team members were drawn from both British and Russian Non-governmental Organisations (NGOs) and Universities. Ecological data was collected every 10m along transects 50m apart. The data described: overall species diversity, dead wood volume, state of decay, standing tree height and diameter, with field, shrub and canopy layer height, cover and composition characteristics. Sociological data was collected via in-depth interviews with representatives from local businesses, government, NGOs and residents.

Principle component analysis of ecological data demonstrated strong patterns in tree species composition and that tree size and quantity of dead wood associated strongly with stands containing relatively high amounts of Siberian fir or spruce. Separation was clear according to tree species composition, particularly Scots pine. Mixed taiga stands dominated by non-pine conifers are potentially of highest biodiversity value and the pine-dominated stands are of least value.

The sociological research found Non-Timber Forest Product (NTFP) development would benefit from promoting the role of civil society and interest at the community level to foster a sense of control over, and responsibility for the products and the forest. However the immediate future will depend upon foreign donor projects.

I. Introduction

“...the (global) area of forest cover and the internal integrity of forest ecosystems are being lost as the result of excessive human demands and short-sighted use of the landscape” (Salim and Ullsten, WCFSD, 1999, p.2).

Assertions echoing this sentiment have formed the basis for the popularisation of the term ‘sustainability’ in resource management literature since the 1980s. Although many have been offered up, perhaps the most recognisable and widely accepted definition of sustainable development is that of the World Commission on Environment and Development’s (WCED) Brundtland Report (1987, p.43):

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

The utility of the ‘sustainability’ discourse and its connotations are increasingly the subject of intellectual debate, however in practice the principle of adopting a long-term approach to natural resource management and the conservation of nature for the future has spread globally and is gaining in importance.

It is a principle that is common to the majority of projects supported by DEFRA’s (the UK government Department for Environment, Food and Rural Affairs) Darwin Initiative, which aims to “assist countries rich in biodiversity, but poor in resources, with the conservation of biological diversity”.

The expedition to the Tomsk Taiga, on which this report will focus, was the final, of a planned three from the UK, to contribute to a project entitled “Sustainable Support for Biodiversity and Forestry in Tomsk Taiga, Siberia,” which is supported by the Darwin Initiative. The project incorporates the participation of several British and Russian organisations: the Institute of International Environmental Safety (IIES) and Tomsk State University Department of Ecology in Russia, and the Tree Council, the British Trust for Ornithology, the Forestry Commission, Pricebatch (Altai-UK) Ltd, Traidcraft and WTA Education Services in the UK. The UK team that conducted the expedition research were all undergraduate, or recently graduated, students.

The studies of the expedition team members represented a range of academic interests that were combined in order to design and conduct a 4-week research programme in the Kaltaiskii Forest region of the Tomsk Taiga that would contribute to the aims of the overall Darwin Initiative project. There were two broad focuses in the research that came about as a result of the interest areas of the students selected for the expedition. These two areas were ecology and sociology, both of which are areas of research that are intrinsic to the purpose and aims of the overall project.

The Overall Project

The three-year project Sustainable Support for Biodiversity and Forestry in the Tomsk Taiga, Siberia is coordinated through the partnership between the Tree Council in the UK and the Institute of International Environmental Safety in Russia, and it officially became part of the Darwin Initiative in April 2005. The project is due to be completed in March 2008.

The purpose of the project is...

“...to help conserve the biodiversity of the taiga forest and to raise awareness of its social, economic and environmental value, by creating a model of sustainable forestry use involving local communities.” (www.darwin.gov.uk)

One of the main aims outlined as integral to achieving this purpose is to apply for and secure FSC certification for forest authorities in regions where it would be appropriate and would be most beneficial in promoting sustainable forest use. In addition, the foreseen outputs of the project include detailed ecological surveys of the Tomsk taiga, the development of community-based harvesting of sustainable products, a raised awareness of the value of forests and the development of ecotourism.

The aims of the project are aligned closely with many of the articles included in the Russian Federation Forest Code most recently adopted by the State Duma (available at <http://www.forest.ru/eng/legislation/forestcode.html>). Article 54, for example states that “the management of forestry must ensure the:

- multipurpose, continuous and non-depletion use of the forest estate for the satisfaction of the requirements of the society and individual citizens in wood and other forest resources;
- preservation of the biological diversity;”
(Russian Federation, Federal Act No. 22-FZ, 1997)

This adheres strongly to the principle of sustainable forestry and demonstrates how the motivation behind the project closely parallels the ideology of existing Russian forest legislation.

Forest Stewardship Council Certification

The Forest Stewardship Council (FSC) was established in 1990 at a meeting held in California between timber traders and environmental and human rights organisations, and its official founding assembly was held in October 1993. According to statistics on the FSC website, more than seven hundred and thirty thousand square kilometres of forest has been certified in accordance with FSC principles and criteria.

Fundamental to the operations of the FSC are its ten principles, believed to provide the basis for an international push for transparent and participatory management that promotes ‘environmentally responsible, socially beneficial and economically viable’ forestry:

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Principle 1: Compliance with Laws and FSC Principles

Principle 6: Environmental Impact

Principle 2: Tenure and Use Rights and Responsibilities

Principle 7: Management Plan

Principle 3: Indigenous People's Rights

Principle 8: Monitoring and Assessment

Principle 4: Community Relations and Workers' Rights

Principle 9: Maintenance of High Conservation Value Forests

Principle 5: Benefits from the Forest

Principle 10: Plantations

National forest stewardship standards are developed based on these principles in order to assure that standards are appropriate to the legislation and Biodiversity Action Plans of the country to which they are to be applied. National standards must be verified by the FSC's centrally organised General Assembly of Members. It is also the responsibility of this Assembly to accredit certification bodies that can then oversee applications for FSC certification over a national or multinational area. The success of an application depends on the achievement and commitment shown towards the principles and criteria of the FSC and the appropriate national forest stewardship standards.

In Russia, an application for FSC certification might come from either the regional (federal) state authority or from a logging company that is active within a region. For a regional authority, FSC certification is desirable because it represents a commendation of how the forest is being managed. Forest authorities desire to be seen as forward thinking, economically progressive and socially benevolent. Economically, certification may open doors to investment and development in the region whilst also establishing a forum for greater interaction and cooperation amongst the forest's stakeholders. For logging companies, certification represents a means by which they can access international markets that place ethical restrictions on their admittance.

The social benefits of FSC certification will be explored in more detail in the description of the social research aspect of the expedition.

More information on the Forest Stewardship Council can be found on their website at www.fsc.org.

This Report

This report will describe, in detail, both the research aspect of the student-led expedition as well as the administration and logistics that were essential to its organisation. In outlining the expedition's research, the report will look at the aims of both the ecological and sociological research, and will discuss the methodologies utilised in both cases. There will also be a description and discussion of the initial analysis of the research results. The second section of the report will consider all aspects of the logistics and administration from the pre-expedition

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preparation and fund-raising through to the accommodation, food and travel arrangements in Russia.

This report has been jointly produced by all members of the student expedition team.

The Area

The Kaltayskii Forest region is in the south-west of the Tomsk Oblast. Tomsk Oblast lies in the South-West Siberian Plain. 62% of the territory consists of taiga forest. 6% of this is undisturbed primary forest. The area is low-lying, never rising above 180m above sea level. The main rivers are the Ob and its tributary the Tom. The predominant soil type is acidic podzol, and the predominant tree species are mixed *Pinus*, *Picea* and birch. Volcanic activity has provided the region with natural gas and oil deposits. Tomsk Oblast is 316,900km², most of which is inaccessible. The rural nature of the province is reflected by the population distribution. Population density is 3 people per km²; 66% of the 1,071,800 inhabitants live in urban areas, and just 34% in rural areas.

As for the two previous expeditions, the study site was selected by our Russian collaborators. The study area is situated at the southern edge of the taiga within the forest-steppe zone that, as explained above, is a region vulnerable to future intensified timber extraction. The 2007 study site was located next to Lake Nijnee (Нижнее) in Kaltayskii Forest some 50 km west of the city of Tomsk (approximate grid co-ordinates 56° 10'N 84°13'E). This was approximately 15 km north of the centre of the 2005 study site that was centred on Lake Kireksoe (56° 6.603'N 84°14.000'E) within Kaltayskii Forest. For comparison, the 2006 study site lay approximately 80 km north-east of the city of Tomsk (approximate grid co-ordinates 57°24.025'N 85° 22.167'E).

Much of Kaltayskii Forest appeared to be relatively even-aged managed Scots pine *Pinus sylvestris*. These stands appeared to be managed either by small-scale fellings or by systematic thinning which promoted massive regeneration mainly of Siberian pine *Pinus sibirica*. These managed stands were typically dominated by *Pinus sylvestris* trees less than 20m in height and less than 40cm diameter at breast height (dbh). Hence growth stage diversity appeared to be low. Quantities of dead wood were extremely low in these stands presumably as a result of compulsory 'forest sanitation'. Nonetheless, few of the areas visited within Kaltayskii Forest were judged to be intensively or systematically managed by the standards of Scandinavian or western European commercial forestry.

There are several other stand types within Kaltayskii Forest including some that are less obviously managed than the areas dominated by *Pinus sylvestris*. Some contain relatively large trees and substantial quantities of dead wood. These stands form a continuum ranging from almost pure broadleaves (birch *Betula* spp. and aspen *Populus tremula*), through mixtures of broadleaves and conifers, to dominance of conifers other than *Pinus sylvestris*. *Pinus sibirica* and Siberian fir *Abies sibirica*, Siberian spruce *Picea obovata* and (rarely) larch *Larix sibirica* are the other conifer species.

Other habitats present with Kaltayskii Forest of biodiversity interest are extensive bog systems and hay meadows (now mostly abandoned and often turning to scrub).



Map of Russia



Map of Tomsk Oblast

Expedition Members

Iain Barr: Finance Officer

Studying Natural Sciences Tripos at Robinson College, Cambridge (due to graduate 2009).

Dominic O'Connor Robinson: Fieldwork and Ecology Officer

Studying Geography at Robinson College, Cambridge (due to graduate 2008)

2006: 1 week fieldwork in Arolla, Switzerland carrying out dendrochronology; using Arolla Pine *Pinus cembra* and European Larch *Larix decidua* for dendroclimatological reconstructions.

2005: Research project studying the flora and fauna of Gamlingay Wood, Cambridgeshire.

Ongoing: volunteering work with the BTCV and RSPB

Adrien Smith: Student Expedition Leader

M.Phil European Literature and Culture, Emmanuel College, Cambridge University (2007);

B.A. Wellesley College, Russian Language and Literature (2005).

2003: 4-week field course at Lake Baikal that resulted in the publication of a paper on vertical migration of primary producers in the lake.

2006: Participated in the planning and execution of two ten-day winter trekking expeditions in the Khibini Mountains in the Kola Peninsula and of a four-week mountaineering expedition to the Sub-Polar Urals.

2006: 2-week expedition to Lake Baikal as interpreter for a group of American scientists. The expedition brought American ecologists together with colleagues from Irkutsk State University to analyze a long-term data set regarding zooplankton in the lake.

Stephanie Ward: Sociological Researcher

M.A. Russian Studies at School of Slavonic and East European Studies, University College London (2007);

B.A. Russian Civilization and Asia Pacific Studies, Leeds (2002).

Has studied Russian language and politics, including state of civil society and environment in Russia under Putin, Informal Economic Practices in Russia, including influence of informal economy on the forestry industry. Subject for dissertation: Sustainable Management of Siberian Forests: To what Extent can Non-Timber Forest Products Contribute to this end?

2004-present: founding member of "Look East" an organization running projects including study visits and outreach programs to educate about sustainable development and the importance of the Russian and Siberian wilderness to global survival.

2004-2005: 1 year working in East Siberian environmental NGO "Baikal Environmental Wave."

Peter Wood: Recruitment and Logistics Officer

1st year undergraduate at Robinson College, University of Cambridge, studying Geography. Speaks some French and Mongolian. Has studied undergraduate modules on survey techniques and ecology.

2006: 2 months living in Mongolia on Journalism placement. 6 weeks independent travel to China, Mongolia, Nepal. 1 month traveling in Venezuela with World Challenge as Team Chairman.

2005: 1 week carrying out biodiversity studies in Honduras with Operation Wallacea.

Weijia Zhang: Medical Officer

3rd year undergraduate at St John's College, University of Cambridge, studying Medical Sciences. Speaks fluent Chinese, basic French and Russian.

2006: 4-week research project on the cerebellum, in Department of Physiology, University of Cambridge Independent travels to Norway and Sweden.

II. Pre-Expedition Planning, Communication, and Logistics

Recruitment and Preparation

Interviews were conducted by Wayne Talbot, the Project director at the time and three members of the 2006 Expedition. There was e-mail contact between some expedition members during the Christmas vacation 2006. However some members of the group failed to maintain email contact over the vacation and left the expedition. The expedition members of Adrien Smith, Wei Zhang, Peter Wood, Chris Lillycrop and Sarah Xinyuan Lin met to plan further. The main aim of the first meeting was to meet the other team members and to discuss the aims, context and format of the expedition. Roles were not assigned, but fundraising methods were discussed and logistical questions, including the acquisition of replacement members, were investigated.

Meetings were held every 1-2 weeks in the Grad Café at the Cambridge Graduate Centre. The format of the meetings was relatively informal. Over the next months a number of grant

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applications were dispatched to charitable trusts and applications for corporate sponsorship were sent off.

The expedition was approved by the Royal Geographical Society, with the Institute of British Geographers (RGS-IBG). It was also approved by the Cambridge University Expeditions Society, who gave a valuable critique of the expedition's plans. These added greatly to our standing as a reliable expedition, and independent approval was desired by a number of the grants given to the expedition.

In early February, expedition roles were provisionally assigned with Adrien Smith as expedition leader, Wei Zhang as medical officer, Chris Lillycrop as finance officer and Peter Wood as methodology and logistics officer. Sarah Lin unfortunately had to leave the expedition for personal reasons, whilst Stephanie Ward joined the team to complete the sociological research.

Further recruitment was carried out, using the University of Cambridge's departmental undergraduate email lists, and via the social networking site www.facebook.com. Medical training was undertaken at the RGS-IBG Wilderness training weekend over the 10-11th March. After this, the team was qualified to purchase supplies for the medical kit, which had been passed on from the 2006 expedition.

In early April, Chris Lillycrop had to leave the group due to personal reasons and other commitments, leaving the group with three members. Iain Barr and Dominic O'Connor Robinson joined the expedition in late April as Finance officer and Methodology officer respectively. Peter Wood was reassigned as recruitment and logistics officer. Iain and Dominic were able to apply for a number of University of Cambridge charitable grants before May 4th, in which they were successful. However, had they joined one week later, there would have been serious financial problems for the expedition.

The group was able to book flights before the Cambridge exam season began, but was seriously lacking in stability and group bonding. The division of labour and time spent on recruitment meant that the group did very little research into the methodology before the expedition departed.

To rectify this, one meeting was held at the British Trust for Ornithology (BTO) headquarters in Thetford to discuss methodology with Dr Rob Fuller. A brief excursion into the woods beside the BTO was made to clarify canopy profiling techniques and dead wood transect laying.

Finances

A Natwest Charities Bank Account was set up in March 2005 by the Tomsk Taiga 2005 group. This account was then handed over to the 2006 group in May 2006. All previous signatories were removed. In June 2007 the account was handed over again, to Adrien Smith and Weijia Zhang. Two signatures are required for any withdrawal.

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A budget of predicted expenses for the expedition was drawn up based largely on the actual expenditure of the 2005 and 2006 expeditions. It was decided that all money raised would be pooled and shared between the group, to prevent members being in competition with each other for the same grants, and to allow everybody to work together better on applications. This approach was used in 2005 and 2006 and seemed to work well. The budget was continually revised as more precise estimates of costs became available, and prior to departure, the estimated total cost of the expedition was around £8,000 for 6 students.

The group agreed to fund initial expenses themselves, on the understanding that any money raised towards the expedition through fundraising would later be used to reimburse these expenses as far as possible. This was necessary as many of these expenses had to be paid out before fund-raised money was available. It was decided that the money raised should be used firstly to fund items used by the whole group, such as in-country subsistence, the medical kit, technical kit and training courses, and any remaining money to be given to members to help cover the cost of their flights, visas, insurance and vaccinations.

Depending on whether the grants were group or individual, the money was either paid directly into the Tomsk Taiga account or to the individual. Once the bank account had been handed over, any money received by group members through grants and other fundraising activities was then paid into the Tomsk Taiga account.

About 2 weeks prior to the departure of the expedition, a payment of £2,240 was made to IIES to cover the cost of items such as the rent of the camp, transport to and from the camp, food for the expedition, and visa invitations. This money was transferred from the Tomsktaiga account via WTA Education Services. Although transferring money in this way incurred Russian bank tax charges of £40, it was still considered the best way for the payment to be made, as it avoided expedition members having to carry large amounts of cash on them.

A summary of the expedition accounts are provided in the table below.

<u>Income</u>	£	<u>Expenditure</u>	£
Robinson College (3)	750	Equipment/Training:	
Cambridge European Trust (2)	500	Medical training (for two)	£310
Robert Daghish fund (4)	1,200	Travel to medical training	£40
David Richard's travel fund	130	Equipment	£30
Bedford Travel Grant	250	Medical supplies for kit	£50
Look East: Wild Earth	50	Safety blanket	£5
British-Russian Eco-Cultural Network	75	Travel to methodology training	£30
British Russian Society.	200	DEET	£50
Addleshaw Goddard	500	Admin:	
John's travel grant	300	Invitations	£210
Gilchrist Educational Trust	1,000	Bank Charges	£40
The Panton Trust	1,000	Gifts for Russians	£20
Royal Geographical Society	500	In country costs:	
Emmanuel	1,000	Hotel (Tomsk)	£640
Soddy Trust	400	Social Research costs	£240
		Food	£520

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Income	£	Expenditure	£
Total	7,855	Transport to/from forest	£700
		Use of car in forest	£575
		Rent of camp	£235
		Contribution to individual costs per person (eg, flights, vaccinations, insurance)	£693
		Total	7,855

Fundraising

The student team between them needed to raise a total of close to £8,000 to cover the costs of flights, insurance, vaccinations, visas, in-country subsistence, technical equipment, first aid and safety equipment and training. Fundraising was done in a number of different ways, including grant applications; corporate sponsorship and personal contributions. In addition, The Darwin Initiative project 14-045, 'Sustainable Support for Biodiversity and Forestry in Tomsk Taiga', funded some of the in-country costs.

The 2007 team needed to raise and contribute a total of £12,300 to cover the costs of flights, insurance, vaccinations, visas, in-country subsistence, technical equipment, first aid and safety equipment and training. Individual and group grant opportunities were researched, and the team decided to pool all funds and share monies evenly between members. Grant applications and corporate sponsorship were the sources of funding that the group sought most rigorously. The Darwin Initiative project 14-045, 'Sustainable Support for Biodiversity and Forestry in Tomsk Taiga,' funded covered the travel and subsistence costs of Dr. Chris Hewson.

CUEx Approval

Approval from the Cambridge University Expeditions Society was sought early in the fundraising process. Approval entitles expeditions to charitable status and advice from members of the CUEx committee. The team believed that having its plans assessed and endorsed by Cambridge University would prove invaluable in the competition for grants and funds. Adrien Smith and Peter Wood attended a Cambridge Expeditions Committee interview. Approval was granted.

Grant Applications

Information on grant-making bodies was obtained from a variety of sources, including reviews by 2005 and 2006 Tomsk Taiga teams, the *Cambridge University Reporter*, the *RGS Expedition Handbook*, college staff, and internet searches.

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Successful group and individual applications were submitted to the following organisations:

Addleshaw Goddard, LLP: a UK-based law firm with offices in Leeds, London and Manchester. Funding is granted to support team activities in the community that are in keeping with the goals and ethos of the Corporate Social Responsibility agenda.

Bedford Travel Grant: A grant from the Cambridge University Geography Department

BREN: British-Russian Eco-Cultural Network aims to promote communication between grass roots organisations and individuals, who are working on projects of social, cultural and ecological restoration and sustainable development in the Russian Federation, its neighbouring countries and the United Kingdom (U.K.)

Cambridge European Trust: The Trust aims to encourage Cambridge students to improve their knowledge of the history, languages, culture, politics, and styles of teaching and of research organization, of other European countries.

Gilchrist Educational Trust: The Trust supports a number of small or medium-sized British expeditions with teams of three or more proposing to carry out research of a scientific nature in another country.

Look East: A UK-based voluntary association that promotes awareness of global issues of sustainability and environmental conservation, by linking local community organisations and NGOs at an international level.

The Panton Trust: A small registered charity which provides grants for projects associated with animals or wildlife throughout the world or the environment of the UK. The Trust provides sponsorship for student projects, with the support of their Colleges.

Robinson College at Cambridge

Robert Daglish fund: A fund providing grants to undergraduate members of Cambridge University to assist them in travelling to or in Russia in connection with their studies.

Royal Geographical Society: The RGS is a world leading learned society and professional body that has been advancing geographical science and supporting its practitioners since 1830. The Society provides funding for geographical research, fieldwork and teaching.

St. Johns College at Cambridge

Unsuccessful applications were made to the following grant-making bodies:

The Vandervell Foundation, the Rodger and Miriam Pilkington Charitable Trust, the W.W. Spooner Charitable Trust, the Southdown Trust, Shell Personal Development Fund, the Donald Robertson Travel Fund, and the Cambridge University Careers Services Interest Bursary Scheme, The Diana Princess of Wales Memorial Trust, Pushkin House, Russia House, and The Bear Trust.

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Corporate Sponsorship

Letters were sent out to several companies in an attempt to gain support but all but one was unsuccessful. The successful application was to the leading law firm, Addleshaw Goddard, who provided us with a grant.

Some team members also followed up personal contacts within other companies, but unfortunately this approach was not successful either.

Personal Contributions

The total amount raised by the team through fundraising activities was £7855. The rest of the costs of the expedition had to be paid for by personal contributions from team members.

Technical Kit

The main purposes of technical kit on this expedition were to provide communication from camp to the outside world (especially in emergency conditions) and to record the position of transects.

Communications

We were accurately informed, before departure, that the Kaltayskii region had mobile telephone signal. Because of this, we decided not to hire a satellite telephone as the team in 2006 had done due to a lack of mobile telephone signal. A Russian mobile and sim card were donated to the group by our Expedition Leader who had used this on previous trips to Russia. This proved to be very satisfactory for communication both within Russia and also to Britain and facilitated regular contact with family and our partners at WTA during the expedition. One difficulty found was that signal for the mobile phone was not always available throughout the camp; it was always available outside, but rarely within the huts.

GPS Way-marking

The Garmin GPS 60 purchased by the 2006 expedition team was used when near tracks in order to map the location of the start of each transect line. We knew from previous expedition's accounts and from our own experiences of using handheld GPS that they would not be suitable for ground navigational purposes due to the dense tree canopy reducing satellite reception. For off-track navigation we relied upon careful and precise compass bearings, in conjunction with the very detailed map that was provided by our Russian counterparts.

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Power

The expedition team in 2006 used roll-up solar panels to recharge batteries and power the laptop computer. However, as we had decided that we would not be using a laptop in the field, nor a satellite phone this was not deemed necessary. In order to charge the mobile phone, digital camera batteries and other electrical equipment an electric generator, provided by IIES in the camp, was used most nights for around 2-3 hours.

Back-up Data

Whilst previous expeditions had used a laptop to store data, it was decided that paper copies (recorded twice, stored in two separate places) would be kept until returning to England and then turned into digital format. Photographs of the area and stands of specific interest were taken by three members of the expedition and were put on to the laptop used by IIES and also stored on CD upon arriving in Moscow.

Pre-Expedition Training

Pre-expedition training included medical, logistical, and methodological preparation for fieldwork. Adrien Smith attended a meeting at the British Trust for Ornithology on 24 January to review the project progress with project partners and to plan the 2007 expedition. Representatives from The Darwin Initiative, The Tree Council, IIES, WTA Educational Services, and the BTO discussed their future contributions to the project. Svetlana Kozlova presented prospects for 2007 field site locations and explained the new federal forest codes that would impact local management and exploitation of the Tomsk Oblast taiga.

Team members communicated regularly with members of the 2005 and 2006 expeditions to gather information and advice on fundraising, logistical organization, travel, and fieldwork. Alison Beresford and Blaise Martay provided the group with a review of 'lessons learned' on the 2006 expedition; Aiden Brown analyzed field technology with Iain Barr and made suggestions for revisions in 2007 technology systems.

Weijia Zhang and Peter Wood attended a two-day Wilderness Medical Training course offered at the Royal Geographical Society on 10 and 11 March, 2007. This wilderness medicine course is designed for small expedition groups, solo travellers, climbers, trek leaders, and others operating in remote areas overseas where medical help is not readily available.

Dominic O'Conner Robinson proposed to bring his field training in tree coring and GPS use to bear on Tomsk Taiga research and methodology. He acquired these skills on a Geography Faculty fieldtrip to Arolla, Swiss Alps, as part of his second-year studies.

Stephanie Ward prepared for social research with Dr. Chris Gerry from School of Slavonic and East European Studies, UCL. Dr. Gerry provided a questionnaire framework for

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'quality of life' research in Ukraine which was adapted to a rural Siberian context by Stephanie through consultation in the field.

The 2007 student expedition team travelled to the BTO in Thetford on 18 May to meet with Rob Fuller and Chris Hewson. The primary aim of the meeting was to discuss the methodology that would be employed in the forest. The meeting also provided the team the opportunity to discuss the project with its chief scientists and their expectations for the 2007 expedition. Part of the afternoon was spent discussing the methodology that Dr. Fuller developed in 2005, with particular regard to dead wood transects. Dr. Fuller demonstrated these methods in the forest surrounding the BTO. Dr. Hewson discussed mist-netting methodology with the students and the prospects for catching birds in Siberia.

Insurance

All of the UK expedition members chose to use STA Premium insurance policy which provides a suitable level of coverage.

III. Ecological Fieldwork and Research

The forests of the southern Taiga in the forest-steppe zone of Siberia include a broad range of habitats and thus support a great diversity of floral and faunal species. Pockets of classic taiga forest (with a tree composition dominated by spruce *Picea obovata*, Siberian pine *Pinus sibirica* and Siberian fir *Abies sibirica*) are found within extensive areas of birch *Betula* spp. woodland and Scots pine *Pinus sylvestris*. Due to southern Siberia's relative accessibility to growing markets, both within Russia as well as China and Europe, the taiga biome is under threat of over-exploitation. This has huge implications for the array of species dependent on this unique habitat and measures are being brought in to control and monitor the logging processes of these natural and semi-natural stands.

This study has focused on dead wood as the primary measure of biodiversity in this forest ecosystem. The aim of the work carried out by the 2007 expedition team was to study a range of stand types and calculate their dead wood volumes as well as gather data on average tree composition and height, density of canopy, age of stand and ground flora species. A broad range of stand types were studied, from the most intensively managed 100% *Pinus sylvestris* stands to those close to untouched natural taiga.

Challenges in interpreting the management history

In order to understand more about the biodiversity of different types of forest stands it is first important to know the history of the specific stand being assessed. This proved to be quite a challenge when in the field and a range of environmental indicators had to be taken into account in order to build a picture of both the management history and ecological processes operating in the stand. Almost all of the stands studied appeared to show at least some signs of human disturbance. In some areas there was evidence of burning (charred stumps were

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noted and a layer of ash within the soil profile was found in a number of places). There was evidence of recent clear-felling in certain areas, sometimes followed by replanting with single species, single aged trees (mostly *Pinus sylvestris*) or natural regeneration of *Betula* spp. There was widespread evidence of selective cutting, with the removal of individual trees accompanied with sporadic planting. This diverse and apparently random set of management practices is most likely due to the diverse and complex ownership structure of the forest. In years gone by, much of the forest would have been managed and cut by the individual local villagers for their needs. Many people from these small villages that are dotted around the Kaltayskii Forest have abandoned their homes now as young people are seeking work in the city rather than in these villages. Many of the old meadows that were kept to produce hay for the cattle deep within the forest (often many miles from the villages themselves) are now also being left idle. We observed meadows that had been abandoned approximately 15 years earlier and the encroachment of *Betula* spp. was already evident.

Changes in management practice have big implications for the biodiversity of the forest. The mosaic of habitats that resulted in these often apparently sporadic and random disturbances are likely to have supported a greater diversity of species than the more modern and organised method of forest management that is being employed today which, as we witnessed at certain sites, relies on the planting of a single species in straight rows after clear-felling. Numerous studies have shown the importance of diverse habitats for biodiversity and the positive role that human disturbance can play within this (Connell 1978, Pickett and White 1985, Holling 1986 and Holling and Sanderson 1996).

This diverse management history often made it difficult to define which areas of the forest were natural or semi-natural. Often areas of old taiga would be sampled only to come across a single or perhaps a pair of old cut stumps. In areas that looked as though they had been abandoned after clear-felling and where birch had taken over with spruces and firs coming through, one would stumble across 5 or 6 *Picea obovata* planted in a row. This difficulty in defining the level of human disturbance makes it very difficult to define the supposedly 'natural' biodiversity of the taiga forest and the impact that modern management practices are having on this environment within the context of this particular forest. The landscape of the Kaltayskii Forest that we studied is shown here to be the result of a complex interaction between local cultural, economic, socio-political and ecological processes that have evolved and changed over many years. By discounting the importance of any of one of these variables in understanding the nature of the ecological processes at work in the Kaltayskii Forest it will be impossible to construct a plan for conserving the biodiversity of this area.

Fieldwork and Research Results on Forest Stand Structure

The information gathered on this and previous Cambridge University expeditions to the Tomsk oblast will help to inform the development of biodiversity conservation measures in these forests in two ways. The first is through a specific aspiration to establish Forest Stewardship Council (FSC) certification for one forest (Kaltayskii Forest) close to the city of Tomsk. The expeditions in 2005 and 2007 focused their efforts on this particular administrative forest area. At least one specific area that could form a 'conservation zone' has been identified – the establishment of such a zone is one of the important requirements of

FSC certification. The second way in which the expeditions could be useful in any future conservation planning for these forests is by identifying which stand types are of highest potential biodiversity value (see below). These stands are the ones most sensitive to disturbance through timber extraction and ideally they should receive the most sympathetic future management. This is relevant both in an FSC context and more widely.

Direct measurements of biodiversity on a large scale require very substantial resources. This was not a realistic option for the expeditions, even with the involvement of several Russian scientists and students. An approach was therefore developed which quantified the physical structure of forest stands in such a way that conclusions could be drawn about their likely biodiversity value. This approach rests on the assumption that certain elements of forest structure correlate with, and are therefore indicators of, biodiversity value. These elements are (i) dead and decaying wood, (ii) massive trees, (iii) natural treefall gaps.

Dead and decaying wood is of key significance in nutrient cycling and provides a microhabitat for many organisms especially fungi, bryophytes and invertebrates (Falinski 1986, Harmon *et al.* 1986, Andersson & Hytteborn 1991, Warren & Key 1991, Niemala 1997, McComb & Lindenmayer 1999, Bobiec *et al.* 2005). The microhabitats provided by dead and decaying wood cover a huge range associated with variations in decay stage, moisture and nutrient content, shade and tree species. Dead wood also provides invertebrate food resources for many birds and mammals, as well as nesting and roost sites in the form of cavities (though these are also characteristic of large live trees – see below). Fallen trees can be important germination sites for plants and tree seedlings. In recognition of the ecological significance of dead wood an increasing number of studies have estimated quantities of dead wood in a range of stands (see Kirby *et al.* 1998 and references therein). Species that depend on dead wood, such as woodpeckers, have considerable potential to act as indicators of wider forest biodiversity (Angelstam & Mikusiński 1994, Scherzinger 1998, Mikusiński *et al.* 2001). Other studies have attempted to identify deadwood thresholds or particular microhabitats necessary for maintaining biodiversity (e.g. Bütler *et al.* 2004, Mikusiński 1997).

Massive trees are of special biodiversity significance in several ways. Many old living trees contain substantial quantities of decaying wood, either in the form of dead branches or decaying heartwood. Hence such trees add to the dead wood resource within forests. Natural cavities are important for bats, other mammals such as martens, and hole-nesting birds. These tend to be more frequent in large than small trees. Furthermore, some small hole-nesting birds prefer the cavities offered by living rather than dead trees because these tend to be more secure from predators (Wesołowski & Rowiński 2004). Additionally, large trees appear to be uniquely attractive to some species. This is the case with several species of birds such as raptors and black stork (*Ciconia nigra*) that nest in the canopies of large trees (Tucker & Evans 1997). Continuity of very old trees may be especially important for some lichens (Rose 1976).

Treefall gaps arise as a consequence of storm damage or death of trees through disease. Storms are one of the major forms of natural disturbance resulting in the dynamic turnover and regeneration of forests. In the taiga, fires are also an important agent of disturbance. Such disturbance events are important in that they create habitat diversity, especially through the provision of young growth and temporary accumulations of dead and decaying wood.

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Gaps created by storms can provide preferred nesting vegetation structures and concentrations of food resources for some bird species (Fuller 2000).

Broadly speaking, large quantities of dead wood and large trees are the attributes of what is generally termed 'old-growth forest'. In countries such as Sweden that have extremely intensive forest management systems, many threatened species are largely confined to old forests with an abundance of dead wood and large trees (Berg *et al.* 1994). Depending on the intensity of management, these elements can exist in low to moderate quantities within managed forest. However, logging of old boreal forests has a negative effect on those species that depend on a continuity of dead wood, large trees and swampy forest (Niernalä 1997, Bobiec *et al.* 2005).

This section of the report presents the results of work undertaken in 2007 in Kaltayskii Forest to the west of Tomsk city. Variation in habitat structure is documented in relation to the different stand types present. Emphasis is given to quantifying two elements of forest structure that were measured at more than 100 sample locations: (i) numbers of large trees and (ii) amounts of dead wood, quantified as volumes of fallen dead wood and numbers of standing dead trees ('snags'). The 2007 expedition was conducted in the same administrative forest as the 2005 expedition, but in a different part of the forest and at completely different locations to those visited in 2005. The stand types were very similar to those studied in 2005. The 2006 expedition worked in an entirely different area, in the Assinovskii Forest to the north-east of Tomsk. Comparison of results from the three expeditions will give an insight to forest variation in this region of Siberia and to some of the effects of forest management on biodiversity value of the stands.

Ecological Fieldwork Methodology

Forest structure was quantified using the transect method adopted by the 2005 and 2006 expeditions. A summary of the method is provided here; for a full description see Appendix C.

- Each sample consisted of a 50m transect. Each transect was separated by at least 50m from the next transect and the edges of forest tracks and roads were avoided. Transects were marked at 10m intervals.
- Along the transect the following were recorded within a 4m belt i.e. 2m either side of the transect line: all fallen dead wood >10cm diameter, all snags defined as >2m in height and >10cm dbh, stumps <2m in height, root plates >1m in height.
- The length and diameter of all pieces of fallen dead wood and snags were recorded in 0.5m and 10cm classes respectively. State of decay was recorded in three classes: sound, partially rotten, mainly or totally rotten.
- All large standing trees (defined as >40cm dbh), whether dead or alive, were recorded within a 20m belt along the transect.
- At the end points and mid point of the transect, the percentage cover of vegetation in the field layer (<1m), shrub layer (1-5m) and canopy layer (>5m) were estimated to the nearest 5%.

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- At the mid point of the transect, average canopy height and average tree dbh were estimated for a 25m radius circle. Tree species composition was also estimated for this circle with the cover of each canopy estimated to the nearest 5%.
- Woodpecker excavations were recorded for all fallen dead wood, snags and large trees.

The measurements were made by one team of 6 people who collected data from a total of 129 transects during July and August 2007. Individuals changed roles occasionally, primarily when Rita Romanova, a trained biologist, replaced Peter Wood recording vegetation characteristics. Other team roles were also altered, but only after a period of shadowing the previous member, ensuring the data collected was not affected by the change. Working in a large team also gave greater security against bears. All sampled stands were within walking distance of the base camp. However the group spent 3 days in the village of Berezovaya Rechka (Березовая речка) in order to maximize efficient use of time and reduce transport time during surveys of the area around the village. On the last 2 days in the field, a small off-road “argo” vehicle was used to cross bogs, and increase the speed of travel.

In a significant departure from previous years, the group did not simply take transects every 200m, perpendicular to the paths around the camp, due to the possession of a Russian map, showing forest tree species type, age and if the trees had been planted. The group took transects within a variety of what were shown on the map as the oldest stands. The stands surveyed were chosen judgmentally. This ensured that the widest variety of old stands and heavily managed stands were surveyed, excluding recently logged and then abandoned stands.

Analytical procedures

Variables derived from the field measurements are listed in Table 1. Most of these are self-explanatory. Estimates of fallen dead wood volumes (coarse woody debris CWD) were derived directly from the records made within the 50m x 4m transect belt. The volume of each individual piece of dead wood was derived from:

$$\pi (\text{median diameter}/2)^2 \times \text{length}$$

where median diameter was the median of the 10 cm diameter class in centimetres. For each transect, volumes were expressed in cubic metres for each of the three decay classes and these were summed to give an overall estimate of the dead wood volume per transect.

Variation in the structure and tree species composition of the 131 transects (hereafter termed ‘samples’) was examined using ordination (Lepš & Šmilauer 2003). The purpose of ordination is to identify axes that express the greatest variability in the suite of variables and to identify which of the samples shows greatest and which the least similarity in terms of the complex of measured variables. Ordination results are typically presented in the form of ordination diagrams in which scores of each sample on the major axes of variation are plotted against one another. Samples that are close to one another are more similar than ones far apart.

Principal Components Analysis (PCA) was used to examine similarity among the samples in terms of all the variables listed in Table 1. PCA was carried out on the correlation matrix of variables which enabled variables measured with different units to be included on the same axis. Gradients in tree species composition were also explored using PCA. Analyses of these gradients for the 2005 and 2006 data were undertaken using Detrended Correspondence Analysis but in the case of the 2007 data, PCA was used because the calculated short gradient length indicated this technique was more appropriate and it also produced better separation of the transects into distinct clusters.

Kruskal-Wallis tests were used to test for differences between stand types (based on tree species composition) in the average values of the variables listed in Table 1.

Results and discussion

Patterns in vegetation structure and composition

Loadings of each of the habitat variables listed in Table 1 on the first two axes of the PCA are shown in Table 2. The independent variation amongst the variables explained by axes 1 and 2 (the eigenvalues) is 14.9% and 9.7%. Samples with high positive scores tend to have relatively large trees, large volumes of dead wood and high frequency of Siberian fir and Siberian spruce. By contrast, samples with negative scores are typified by birch, Siberian pine and Scots pine. This suggests that amounts of dead wood, both fallen and standing, and numbers of large trees vary with stand type in terms of tree species composition. The second axis distinguishes between stands strongly dominated by birch and ones dominated by Scots pine. Of all the tree species, these are the ones most likely to form pure stands and this is reflected in the very strong loadings of these two variables at opposite ends of the axis.

In summary, the PCA indicates that there are strong patterns in tree species composition among the samples and that tree size and quantity of dead wood are associated with more strongly with stands containing relatively high amounts of Siberian fir or spruce.

Patterns in tree composition were explored further by undertaking a PCA on the percentage cover values of each tree species. The loadings on the PCA axes are given in Table 3. The two axes are similar in the amount of variation they explain in tree composition (eigenvalues of 28% and 24%). Two patterns emerged from this analysis; these are broadly consistent with the analysis of the full set of variables reported above. The first axis strongly contrasts Scots pine stands with other stands. Scots pine has a high positive loading on this axis; all other species have negative loadings with birch the lowest. The second axis represents a gradient from stands with relatively large quantities of broadleaves to ones with high quantities of conifers, especially fir and spruce.

When individual samples are plotted in ordination space there is clear separation according to tree species composition (Fig.1). Three groups have been distinguished in Fig. 3 according to percentage composition of different tree species: broadleaved samples, pine samples and 'mixed taiga'. The latter is mainly mixtures of conifers including relatively large amounts of spruce or fir. Criteria for allocating samples to each category are given in the figure legend. Broadleaved samples are at the bottom left of the diagram (n = 48), pine in the centre right (n

= 38) and mixed taiga at the top left (n = 43). There is some overlap between the three groups but the separation between them is very clear and strong. Therefore, we are justified in treating these as recognisable stand types as a basis for further examination of the variation in forest structure.

Differences between the three stand types in terms of individual structural variables are summarised in Table 4 and discussed here with respect to the statistically significant differences. Mixed taiga tended to have larger trees in terms of DBH than other stands. Pine stands had sparser shrub layers and lower quantities of fallen dead wood than other stands. Mixed taiga had the highest total volume of fallen dead wood and it also had considerably larger numbers of snags than the other stand types. Interestingly, the frequency of woodpecker excavation on fallen wood was highest in the broadleaved stands, even though total volumes were higher in mixed taiga. This may suggest that decaying wood from broadleaved trees is a preferred foraging site. Impressions gained in 2007 were that there were more woodpeckers in the broadleaved stands. Overall, these findings indicate that the mixed taiga stands, dominated by non-pine conifers, are potentially of highest biodiversity value and the pine-dominated stands are of least value.

Preliminary comparison of the three study areas

In this section we make some simple initial comparisons of the three areas visited in 2005, 2006 and 2007 in terms of habitat characteristics. Mean values for each habitat variable at the three study areas are given in Table 5. Comparison based on these gross means is a crude approach because at each study site there was considerable spatial variation in stand types and habitat characteristics; these differences will be explored in more detail in due course. The following general patterns can be identified at this stage. The trees at the Assinovskii Forest study area tended to be smaller in height and DBH. Canopy cover, numbers of snags and Siberian fir cover were lower, but pine cover was higher, than at both the Kaltayskii study areas. A preliminary conclusion, therefore, is that the Assinovskii Forest study area currently offers lower potential biodiversity value than the Kaltayskii study areas. Interestingly, however, fallen dead wood volumes were very similar across the three study areas.

In each study area, it was possible to identify three clear stand types. In each study area there was a broadleaved group, a Scots pine group and an 'other conifer' or 'mixed taiga' group. These three groups were very similar across the study areas, though there were differences of detail in the tree composition. In Assinovskii Forest, the 'other conifer' group was predominantly Siberian pine but in Kaltayskii Forest this group included a greater diversity of conifers and is better referred to as 'mixed taiga'. Estimates of dead wood volumes, numbers of snags and numbers of large trees are given for the different stand types in each study area in Table 6. These are the measures of habitat structure most likely to indicate high biodiversity value in the context of these boreal forests. Several points can be drawn from these summary data. First, the Assinovskii study area was generally poor in numbers of snags and large live trees. Second, total dead wood volumes were highest in the mixed taiga stands of Kaltayskii, but especially in the 2005 study area. Third, Kaltayskii 2005 stands out

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as having exceptional numbers of large trees, both dead and alive. Fourth, dead wood volumes are fairly high in all combinations of study area and stand type.

Presumably the relatively low biodiversity potential of Assinovskii is a consequence of its apparently more recently disturbed character. The trees were smaller, the canopy cover was lower, there was a stronger dominance of pine and there was wide evidence of recent fire in this study area. It is interesting, however, that fallen dead volumes in Assinovskii compared very favourably with Kaltayskii, perhaps because there had been much 'self thinning' through competition of trees during 'stem exclusion' and 'demographic transition' phases following regrowth from an extensive disturbance event (Frehlich 2002). Within Kaltayskii, the mixed taiga was clearly of higher potential biodiversity value than the other stand types based on tree sizes and quantities of dead wood. In 2005 total dead wood volumes were similar in the broadleaved and Scots pine stands but numbers of large snags (>60 dbh) were higher in the broadleaves. In 2007 fallen dead wood volumes were consistently higher in the broadleaved than the Scots pine stands. Overall, this suggests that the ranking of potential biodiversity value of the Kaltayskii stands is mixed taiga >>> broadleaves > Scots pine. The fallen dead wood volumes in the Kaltayskii mixed taiga compare very favourably with those reported by Kirby et al. (1998) who cited a median of 78m³ha⁻¹ for temperate old-growth forests in Poland and the USA.

Ecological Fieldwork Conclusions

This work has indicated certain stand types and locations within Kaltayskii Forest that are worthy of protection as conservation zones. We have no information that allows us to determine how representative the stands sampled in Assinovskii and Kaltayskii Forests are of the range of stands in the Tomsk region. Remotely sensed data prove of some use in identifying broad forest types though it is unlikely to be helpful in providing detailed information on habitat structures or management systems. We do know that our data are unrepresentative to the extent that all the stands examined in both forests have been left unmanaged for several decades. More intensively managed stands, such as tracts of clear-felled and thinned forest within Kaltayskii Forest, are likely to hold lower volumes of dead wood and densities of snags and large trees. Within the range of stands examined in 2005, 2006 and 2007, the mixed taiga stands in Kaltayskii Forest emerge as being of high biodiversity value. The work carried out on the 2006 and 2007 expeditions reinforces the view that the complex of stands in the vicinity of Lake Kireksoe visited in 2005 may be exceptional and that they would be an appropriate focus of a conservation zone within any future FSC certification.

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Tables

Table 1a. List of variables included in the full ordination.

Variable	Variable description
HEIGHT	Estimated canopy height (m) ¹
DBH	Average diameter (cm) at breast height of trees ¹
%ASP	% canopy contributed by aspen ¹
%BIR	% canopy contributed by birch ¹
%SCP	% canopy contributed by Scots pine ¹
%SIP	% canopy contributed by Siberian pine ¹
%SIF	% canopy contributed by Siberian fir ¹
%SPR	% canopy contributed by spruce ¹
FIELD	Cover of vegetation in field layer (%) ²
SHRUB	Cover of vegetation in shrub layer (%) ²
CANOPY	Canopy cover (%) ²
FALL_S	Fallen dead wood volume (m ³) - sound condition ³
FALL_P	Fallen dead wood volume (m ³) - partially rotten ³
FALL_R	Fallen dead wood (m ³) - rotten ³
SNAGS10	Number of snags 10-20 cm dbh ³
SNAGS20	Number of snags 20-40 cm dbh ³
SNAGS40	Number of snags >40 cm dbh ³
SNAGS+WD	Number of snags >10 cm dbh with woodpecker excavations ³
STUMPS	Number of stumps ³
STUMPS+WD	Number of stumps with woodpecker excavations ³
TREE40D	Number of dead trees 40-60 cm dbh ⁴
TREE60D	Number of dead trees >60 cm dbh ⁴
TREE40L	Number of live trees 40-60 cm dbh ⁴
TREE60L	Number of live trees >60 cm dbh ⁴

Footnotes

¹ Variables estimated by a single estimate at the transect centre.

² Variables averaged from 3 estimates at the ends and centre of the transect.

³ Variables estimated from measurements made in the 4 m transect belt.

⁴ Variables relating to standing large trees, estimated from measurements made in the 20 m transect belt.

Table 1b. List of summary variables derived from variables defined in Table1a.

Variable	Variable description
%CON	% canopy contributed by all conifer species
FALL_TV	Total volume of fallen dead wood (m ³)
SNAGS	Total number of snags >10 cm dbh
TREE_TD	Total number of dead trees >40 cm dbh
TREE_TL	Total number of live trees >40 cm dbh

Table 2. Loadings of variables on the first two axis of the PCA of all variables (except summary variables). The PCA is based on a correlation matrix, to account for differences in scaling between variables. Variables are listed in ascending order of the magnitude of their loading on each axis. See Table I for variable definitions.

Variable	Axis 1 loading	Variable	Axis 2 loading
%BIR	-0.253	%BIR	-0.562
%SIP	-0.227	SHRUB	-0.560
%SCP	-0.186	FALL_R	-0.419
SHRUB	-0.021	TREE60D	-0.331
STUMPS	0.016	%SPR	-0.316
%ASP	0.036	%SIF	-0.270
STUMP+WD	0.095	FALL_P	-0.229
TREE 60D	0.127	FIELD	-0.134
FIELD	0.131	%SIP	-0.121
FALL_R	0.153	TREE 60L	-0.104
CANO PY	0.171	TREE 40L	-0.069
SNAGS10	0.277	FALL_S	-0.053
TREE60L	0.319	CANOPY	-0.047
TREE40D	0.340	%ASP	-0.010
SNAG+WD	0.410	SNAGS.40	0.003
%SPR	0.434	DBH (cm)	0.027
%SIF	0.468	TREE40D	0.130
FALL_P	0.476	HEIGHT (m)	0.132
SNAGS40	0.496	SNAGS20	0.135
TREE 40L	0.538	STUMP	0.240
DBH (cm)	0.618	SNAG+WD	0.392
HEIGHT (m)	0.629	STUMP+WD	0.410
SNAGS20	0.678	SNAGS10	0.442
FALL_S	0.684	%SCP	0.710

Table 3. Loadings of variables on the first two axes of the PCA of tree species composition. Variables are ordered in ascending order of the magnitude of the loading on each axis. See Table I for variable definitions.

Variable	AX1	NAME	AX2
%BIR	-0.581	%ASP	-0.7499
%SIF	-0.4782	%BIR	-0.3788
%SPR	-0.4549	%SIP	-0.0376
%SIP	-0.0954	%SCP	0.2624

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%ASP	-0.0949	%SIF	0.5504
%SCP	0.9453	%SPR	0.6149

Table 4. Mean values of dead wood and forest structure variables across three forest types. Variables whose values differed significantly between forest types at $P > 0.05$ are shown in bold; variables that differed at $P < 0.1$ but not $P < 0.05$ are shown in italics. Significance values are shown in the column under P; NS denotes variables that did not differ between forest types. Values shown are means per transect in each forest type. See Table 1 for variable definitions.

Variable	All	Broadleaf	Mixed Taiga	Pine	P
HEIGHT	20.46	20.00	21.63	19.71	NS
DBH	24.22	22.92	27.09	22.63	0.0049
FIELD	83.80	83.14	81.73	87.09	NS
SHRUB	30.00	35.02	32.60	20.59	0.0011
CANOPY	60.53	63.60	55.70	62.36	NS
FALL_S	0.37	0.23	0.68	0.18	0.0026
FALL_P	0.23	0.26	0.28	0.15	0.0051
FALL_R	0.24	0.27	0.32	0.11	0.0034
FALL_TV	0.84	0.76	1.28	0.44	<.0001
SNAGS10-20	1.66	1.42	1.77	1.84	NS
SNAGS20-40	0.40	0.21	0.70	0.29	0.0118
<i>SNAGS>40</i>	<i>0.04</i>	<i>0.02</i>	<i>0.09</i>	<i>0.00</i>	<i>0.0705</i>
SNAG_No	2.09	1.65	2.56	2.13	NS
SNAG+WD	0.17	0.21	0.14	0.16	NS
STUMP_No	2.41	2.04	2.51	2.76	NS
STUMP+WD	0.09	0.13	0.02	0.11	NS
TREE40D	0.12	0.06	0.21	0.08	NS
TREE60D	0.02	0.04	0.02	0.00	NS
TREE_TD	0.14	0.10	0.23	0.08	NS
<i>TREE40L</i>	<i>1.74</i>	<i>1.92</i>	<i>2.07</i>	<i>1.13</i>	<i>0.0566</i>
TREE60L	0.10	0.04	0.16	0.11	NS
<i>TREE_TL</i>	<i>1.84</i>	<i>1.96</i>	<i>2.23</i>	<i>1.24</i>	<i>0.0547</i>
FALL+WD	0.23	0.42	0.21	0.03	0.0028
TREE_D+WD	0.07	0.06	0.12	0.03	NS
TREE_L+WD	0.01	0.02	0.00	0.00	NS

Table 5. Comparison of mean values (with standard errors in brackets) across all transects of all variables recorded in 2005 (n = 112 samples from Kaltayskii Forest), 2006 (n = 146 samples from Assinovskii Forest) and 2007 (n = 129 samples from Kaltayskii Forest). See Table I for variable definitions.

Variable	2005 mean	2006 mean	2007 mean
HEIGHT	26.92 (0.41)	13.36 (0.24)	20.46 (0.46)
DBH	24.91 (0.53)	21.34 (0.48)	24.22 (0.59)
%ASP	14.38 (1.94)	9.53 (1.56)	15.31 (2.2)
%BIR	37.29 (2.98)	30.15 (2.11)	29.77 (2.22)
%LAR	0.01 (0.01)	0 (0)	0.12 (0.12)
%SCP	33.67 (3.58)	47.14 (2.96)	24.11 (3.2)
%SIP	6.1 (1.28)	10.57 (1.74)	8.1 (1.33)
%SIF	9.22 (2.06)	2.16 (0.73)	15.12 (1.89)
%SPR	0.13 (0.07)	0.99 (0.37)	7.33 (1.05)
%CON	48.57 (3.88)	60.86 (2.61)	54.77 (3)
FIELD	89.88 (0.94)	84.7 (1.14)	83.8 (1.12)
SHRUB	35.16 (1.35)	25.73 (1.5)	30 (1.62)
CANOPY	59.67 (1.54)	48.68 (1.14)	60.53 (1.77)
FALL_S	0.04 (0.02)	0.18 (0.03)	0.37 (0.04)
FALL_P	0.08 (0.02)	0.23 (0.03)	0.23 (0.04)
FALL_R	0.77 (0.08)	0.54 (0.05)	0.24 (0.03)
FALL_TV	0.9 (0.09)	0.95 (0.06)	0.84 (0.08)
SNAGS10-20	1.09 (0.13)	0.27 (0.06)	1.66 (0.19)
SNAGS20-40	0.45 (0.07)	0.18 (0.04)	0.4 (0.06)
SNAGS>40	0.19 (0.04)	0.01 (0.01)	0.04 (0.02)
SNAG No	1.7 (0.17)	0.4 (0.06)	2.09 (0.22)
SNAG+WDP	0.46 (0.07)	0.05 (0.02)	0.17 (0.05)
STUMP No	1.44 (0.18)	1.09 (0.11)	2.41 (0.21)
STUMP+WDP	0.09 (0.04)	0.01 (0.01)	0.09 (0.03)
TREE40D	0.58 (0.12)	0.1 (0.02)	0.12 (0.04)
TREE60D	0.18 (0.05)	0.03 (0.02)	0.02 (0.01)
TREE_TD	0.76 (0.14)	0.13 (0.03)	0.14 (0.04)
TREE40L	4.36 (0.29)	1.1 (0.15)	1.74 (0.18)
TREE60L	1.12 (0.16)	0.02 (0.01)	0.1 (0.03)
TREE_TL	5.42 (0.36)	1.12 (0.16)	1.84 (0.2)

Table 6. Comparison of dead wood volumes, numbers of snags and numbers of large live trees in different stand types in the three study areas.

	Kaltayskii Forest 2005	Kaltayskii Forest 2007	Assinovskii Forest 2006
¹ Total dead wood volume (m ³ ha ⁻¹)			
Broadleaves	37	38	40
Scots pine	39	22	51
Other conifers / mixed taiga	83	64	45
² Total number of snags (no. ha ⁻¹)			
Broadleaves	66	83	15
Scots pine	82	107	21
Other conifers / mixed taiga	139	128	47
³ Large snags >40 dbh (no. ha ⁻¹)			
Broadleaves	10	1	1
Scots pine	3	1	2
Other conifers / mixed taiga	13	2	1
⁴ Large live trees >40 dbh (no. ha ⁻¹)			
Broadleaves	50	20	11
Scots pine	44	12	8
Other conifers / mixed taiga	91	22	14

¹ Derived from the variable FALL_TV (defined in Table 1)

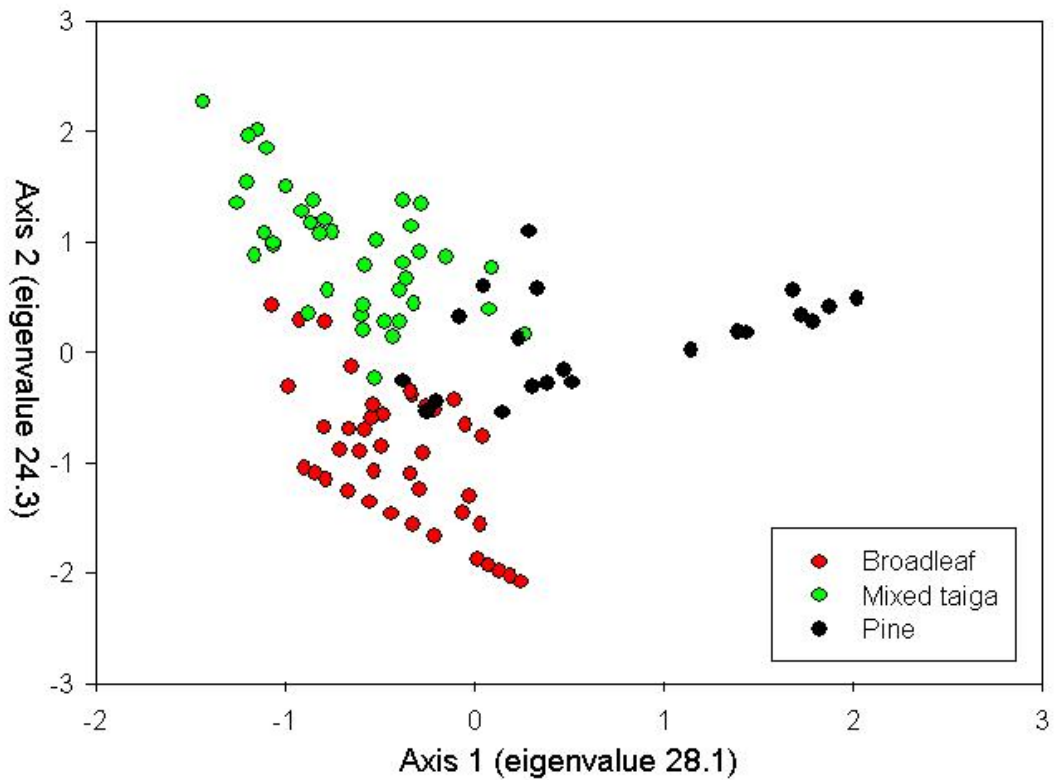
² Derived from the variable SNAGS (defined in Table 1)

³ Derived from the variable TREE_TD (defined in Table 1)

⁴ Derived from the variable TREE_TL (defined in Table 1)

Figures

Fig.1. Ordination (Principal Components Analysis) of the 129 samples in terms of tree species composition. The following tree species were included in the analysis: Scots pine, Siberian pine, Siberian fir, Siberian spruce, birch and aspen. Samples were assigned to groups as follows: **Broadleaf** = samples with >50% cover of birch and aspen combined; **Pine** = samples with >50% cover of Scots pine and Siberian pine combined; **Mixed taiga** = samples with >50% cover of non-pine conifers.



IV. Sociological Research

Introduction

Non-timber Forest Products (henceforth, NTFPs) have great potential to alleviate the tension between the various stakeholders in forestry because, it is argued, NTFPs add value to the forest without undermining the stock.¹ They enable the forest to be valuable without the usual accompanying deforestation. Various actors envisage the role of forests differently; creating tensions amongst the forestry industry, environmentalists and rural people: the forests are simultaneously viewed as an economic asset as well as an ecological asset. The potential of the duality of Non-timber Forest Products as both economically viable as well as environmentally sustainable could be a unique combination that alleviates some of this strain. Relieving such tension is especially important in Russia, because the forests, the economic problems and environmental issues are all very substantial.

Moreover, there are features of Russian history, its sense of identity and aspects of its culture that are conducive to the development of NTFP industry. For example, the Silver Birch (*Betula pendula*) is Russia's national tree. In Siberia the Siberian Pine (*Pinus sibiricus*), or locally, *kedr*, is the most prized species owing to its abundance of valuable and nutritious nuts and high quality timber (the Egyptians were said to have crafted their pharaohs' sarcophagi from Siberian pine, and it was highly valued by the Assyrians, ancient Romans and Greeks).² Siberian Pine grows across Siberia from west to east, so its high visibility adds to its status as the Siberian national tree. Indeed, on President Putin's 50th Birthday, the governor of Tomsk Oblast' presented him with a Siberian Pine sapling complete with 30 pine cones that had been specially cultivated using sophisticated methods to grow over the course of a few years, rather than the 60 or so years it takes trees in the wild to produce such fruits.³

Further illustrating the conduciveness of Russian traditions and cultural norms to the development of Non-timber Forest Products is the seasonal habit of collecting mushrooms and berries: it is a national past time. It is likely that this propensity for disappearing off into the forests during late summer has its roots far in the past, for Russian people have a long history of NTFP use, long before the term first appeared in literature.⁴

At first glance then, NTFP development in Russia appears to have a lot of potential. But, my case study on a small village in Western Siberia shows how NTFPs are actually used in practice. Data was obtained through a series of semi-structured interviews, questionnaire

¹ Cavendish, W., 'Non-timber Forest Products and Rural Poverty: an Economic Analysis', in Evans, J. (Ed) The Forests Handbook, Volume I: An Overview of Forest Science, London, 2001, pp. 372-391 (p.372)

² Khodorych, A., 'Kedry reshaiut vse', Den'gi, 32(537), 15/08/05 from <http://www.kommersant.ru/doc.aspx?DocsID=601074> [accessed 16/08/07]

³ I visited the nursery in Tomsk Oblast' on 26th July, 2007 where this tree was grown, and was informed about the gift by the head of the nursery, Valerii Pinaev.

⁴ The first reference to the term 'non-timber forest products' in English language literature was by De Beer and McDermott in their 1989 article The Economic Value of Non-Timber Forest Products in South East Asia, The Netherlands Committee for IUCN, Amsterdam.

distribution and by keeping a diary of my observations over a five-week period in July and August 2007.

In chapter two, I discuss my field research methodology in more detail. In chapter three, I discuss NTFPs in a more global context: looking at definitions, experiences of NTFP harvesting in other countries, the economic gains that can be made from their exploitation as well as a more detailed look at NTFPs in the context of Russia. Russia has a long history of NTFP usage as well as interesting contemporary projects. In chapter four I present a case study of a village in Western Siberia called Kurlek. After presenting its profile, I discuss my findings that relate to the economic situation of the villagers as well as presenting a profile of their NTFP use. My findings show that although the promises of NTFP development in Siberia at first appear like a ‘win-win’ situation, the reality is in fact much more complex. Indeed, villagers use NTFPs extensively, but on the whole only for personal consumption despite many people living on less than the minimum monthly wage for Russia. By and large, people do not engage in commerce to any significant degree thus limiting the potential to create a vibrant industry that could provide an alternative to illegal logging.

In chapter five I discuss the possible problems that prevent the further development of NTFPs in a rural setting such as Kurlek. Political problems include the introduction of the new Forest Code of the Russian Federation in January 2007. The results of my research have consistently shown the anxiety of local people regarding the security of their rights to forest use under the new forest code. They also fear for the protection of the forests from illegal logging and unscrupulous littering. Such apprehensions are in line with environmental organizations’ responses to the Forest Code. One such organization is the International NGO ‘Taiga Rescue Network’ whose observations highlighted that the Code provides no mechanism for ‘solving conflicts of interest between forest resource users with fundamentally different interests in forest use’. They also highlight that the Code allows lessees to then sublease without stipulating the obligations of the third party to protect biological diversity, for example.⁵

Another obstacle that presents itself in the development of NTFPs in Siberia is a general sense of apathy amongst rural people. There are very few activities and initiatives organized locally. People are not inclined to engage with the idea of creating a vibrant civil society and more specifically, with protecting their environment. This apathy is caused by a number of different factors explored in more detail later.

Nevertheless, things are not entirely bleak. In chapter six, I present my recommendations based on the research conducted here. There are NTFP initiatives and entrepreneurial activities already in progress in Russia. Such projects can be divided into two categories: commercial-based and community-based. Markets have been created and investments have been made into the infrastructure of companies and especially into NTFP projects involving the reclamation of the traditional ways of life of indigenous peoples of Siberia and the North. I discuss the nature of these schemes in more detail below. These projects show that there is interest and certain steps can be taken to move NTFP development forward from this point. My findings show how the success of community-based NTFP projects amongst indigenous peoples can generate insights into how such projects might be successful among non-

⁵ Lesniewska, F., Harris, K., and Lebedev, A., ‘Comments on the new Russian Forest Code’, *Taiga Rescue Network Briefing Note*, January 2007, p. 2

indigenous communities. Such suggestions point to cultivating feelings of pride and ownership amongst communities for their environment and the products their forests nurture and provide. This could lead to a more active approach to citizen-led initiation of NTFP development.

Methodology

Overview

The sociological research element of the Tomsk Taiga project was done over 5 weeks in July-August 2007 where I spent time both in the forest itself (*Kaltaiskii Leskhoz*) in order to understand NTFP development in the context of forest management, as well as with the rural community and forestry units in nearby Kurlek village. My research entailed 8 semi-structured interviews with industry and governmental figures (see Appendix I for identity of interviewees) as well as a comprehensive questionnaire given to 55 inhabitants of Kurlek, which is a settlement 60 minutes outside of Tomsk. (See Appendix E and F for questionnaires in English and Russian).

a. Methodology

Recent studies of NTFP development are based on presenting a broader understanding of the economic value of the products themselves (see e.g. Cavendish, 2001; Marshall, Schreckenburg & Newton, 2006), as well as great focus on the potential social benefits in developing NTFP production amongst both indigenous peoples (see e.g. IUCN, 2006; Batianova et al, 2004) and rural Siberian communities (see e.g. Zakharenkov, 1999). With these studies in mind, I chose to research attitudes of non-indigenous rural Siberians to their surrounding forests, their usage of NTFPs as well as the financial contribution NTFPs make to the household. I also aimed to examine local people's attitudes towards their village and levels of trust towards various organizations. I chose to look at non-indigenous peoples to examine how their attitudes and usage have changed towards NTFPs since the fall of the Soviet Union.

The aim of the research was to discover if in practice the attitudes and uses of non-timber forest products by the inhabitants of a small Siberian village are conducive to improving and increasing current NTFP development in the region. It was important to consider how the villagers not only use the forest's products, but also how they perceive the forest and the way it is managed.

The methodology was influenced by the understanding of the Russian concept of '*nash*': 'ours'. (See e.g. Ledeneva, 1998; Caldwell, 2005) Russian people, especially those living in a small village, can initially be suspicious and even hostile to outsiders. It was necessary therefore, to present myself as someone who could be construed as safe, trustworthy - '*nash*', in order to secure a certain amount of compliance and responsiveness. The means I used in order to do this was to connect with the desired respondent via a third person, such as a friend or acquaintance of the respondent. Such a person becomes a 'bridge' between myself and the person I wish to speak to, which is an introduction that ensures an element of trust when soliciting fairly private (although anonymous) information from someone you are not familiar

with. (See e.g. Granovetter, 1973; 1982) These ideas also applied to the semi-structured interviews I did with those people not living in the village, such as local government officials and directors of companies. I obtained introductions to such people through a third party, in this case Svetlana Kozlova from the Russian organization, IIES.

During the period of research, I lived with a family so I knew that my potential networks for my questionnaires would be quite broad. There could be bridges to friends, relatives, neighbours, colleagues, parents of children's friends and so on.

b. Methods Used

I have used a mixed-method approach, both qualitative and quantitative methods because it enabled me to gather a large quantity of information from a broad spectrum (quantitative questionnaires) as well as deeper insights from specific sources (qualitative semi-structured interviews.) During the interviews I asked a number of prepared questions as well as asked people to elaborate on certain points if necessary. The questionnaires were given to 55 people of various ages, professions and backgrounds. Most of the questions required a yes/no or percentage answer, while others required descriptive answers. Before distributing the questionnaires, I organized a focus-group to advise on its cultural and linguistic appropriateness. There were 6 participants in the group from a variety of backgrounds: representatives from the Administration of Tomsk, two students, a representative from an environmental NGO, a forester and an unemployed local villager. The insights they provided allowed to me adapt a number of questions so they were less intrusive or more understandable for my sample group as they perceived it.

c. Sampling

Due to the detailed nature of the questionnaire (see Appendix E & F for English and Russian versions) it was decided that fewer samples be collected than initially desired in order to spend time with the subject whilst the questions were answered. I had intended to distribute the questionnaires to people I was introduced to and then collect them later on or the following day. The consultative process that took place before research began showed that since many villagers had a low level of education, certain questions might need elaboration by myself at the time of answering.

I planned to conduct semi-structured interviews with representatives from the administration's forestry and environment division, the head of forestry in the village, a representative from a Non-Timber Forest Product business and a representative from a private timber-merchant before I arrived in Tomsk. These meetings were facilitated by a representative of the Tomsk-based organization, IIES.

Friends and relatives of the family I was staying with were reluctant to take part in the questionnaire process so it was necessary to find another means to supplement my data. Stopping randomly selected people in the street and asking them to fill in the questionnaire immediately felt wrong. Similarly did knocking on people's doors. Culturally, this was the wrong approach as people felt invaded and suspicious. The father of the family worked in the local government forestry unit, the *Leskhoz*. Through him I was able to get introductions to the director and managers of the forestry unit. However, while I was reluctant to create a

questionnaire sample from people who knew the forestry system and the forests well, I decided that it would be useful to have a contrast within my sample to highlight the differences in knowledge of forest activities between ordinary people and people who already work in the industry. I also needed to maximise my capacity for introductions in order to facilitate contact with a potentially more honest set of respondents. To minimise the quantity of respondents from within the forest industry and boost my quantity of data, I was forced to try a more random approach of making contact with people without an introduction. The obvious places to ‘drop in on’ were the shops, local council and post office, since workers in these establishments were by the nature of their jobs, ‘accessible’. The responses were mixed, but essentially positive. However, I found that in the service industry the overwhelming majority of respondents were women between 40 and 60 years old.

Setting the Framework

a. Non Timber Forest Products in a global context

i. Definition of terms

The term ‘non-timber forest product’ first appeared in 1989 by De Beer and McDermott. It is significant to note that this viable alternative to deforestation was being researched nearly twenty years ago. To this day, it remains one of the most referred-to definitions.

*The term Non-timber Forest Products (NTFPs) encompasses all biological materials other than timber, which are extracted from forests for human use [...] By ‘forest’ we refer to a natural ecosystem in which trees are a significant component. However, forest products are derived not only from trees, but from all plants, fungi and animals (including fish), for which the forest ecosystem provides a habitat.*⁶

Inconsistencies with NTFP definitions provide a lot of scope for ambiguity. In his article about the challenges of definition, Belcher (1999) writes that ‘this is particularly worrisome as governments and development agencies undertake projects and policy changes in the NTFP sector, probably based on false understanding of the actual and potential role of NTFPs.’ And, furthermore, these ambiguities in understanding mean that otherwise important lessons cannot be learned from one project to another.⁷ In this study, my questionnaires asked inhabitants of Kurlek which of the following NTFPs they used and how often: mushrooms, berries, medicinal plants/herbs, firewood, pine nuts, pine nut sap, hunting, insects, birch bark. My definition did not include fish because there is a main river in the village which people fish from regularly and it is not within the forest. I include firewood

⁶ De Beer, J. H., and McDermott, M., The Economic Value of Non-Timber Forest Products in South East Asia, The Netherlands Committee for IUCN, Amsterdam, 1989 referenced in Belcher, B. M., ‘What Isn’t an NTFP?’ International Forestry Review, Vol. 1(2), June 1999, pp. 161-168 (pp. 161-163)

⁷ Belcher, B. M., ‘What Isn’t an NTFP?’ International Forestry Review, Vol. 1(2), June 1999, pp. 161-168 (pp. 164-165)

here, because if used for subsistence purposes, it is not technically classified as timber under De Beer and McDermott's definition.⁸

The majority of NTFP studies over the last 20 years have concerned themselves with tropical forestry. Interest in NTFP harvesting in northern temperate forests has attracted interest over the past ten to fifteen years. The northern temperate forest is also referred to as *boreal* forest. The definition of a boreal forest varies widely. Some of the common descriptions are that it is vast in size (ranging from between 15-17 million km²), and is distributed globally across high latitudes of the Northern Hemisphere. Plant diversity is remarkably variable between locations despite a relatively low diversity of woody plants, which are dominantly coniferous. The climate is characterised by low temperatures and relatively low precipitation. The growing season is short and some forests are underlain by permafrost. Vast areas of boreal forest remain relatively undisturbed by humans. However, pressure from commercial harvesting is increasing, particularly in Siberian forests.⁹ Thus there is crucial potential for NTFP development in the boreal forest in order to fight this trend and protect the forests.

b. What makes non-timber forest products so special?

NTFPs are remarkable in that their development allows for a convergence of interests. Exploitation of these products may generate income for the forestry units, has the potential to help alleviate poverty amongst the local rural population whilst at the same time conserving forest eco-systems. Cavendish writes in his paper on the economy of NTFP development that

*[...] the most important reason for the rise in work on NTFPs has been the prominence they are given in discussions surrounding the global protection of biodiversity in partnership with local forest-based communities. Indeed, the greater commercial use of NTFPs has been widely promoted by researchers and international agencies as a means of simultaneously promoting the economic development of poor rural areas and of conserving critical tropical and temperate forests and woodlands.'*¹⁰

These converging positive features of NTFP development have been defined by Cavendish as the 'development imperatives' and 'environmental imperatives' of non-timber forest products, since they are thought to both help alleviate poverty in areas where people are dependent or reliant on forest products, as well as in the environmental imperative sense: the exploitation of NTFPs have the potential to preserve forests intact whilst maintaining economic benefit. 'NTFPs add value to the forest without undermining the stock.'¹¹

⁸ The UN Forest and Agriculture Organization (FAO) define such products as "Non-Wood Forest Products". The FAO distinction does not include subsistence fuel-wood harvesting and makes no distinction between natural and plantation forests. See Barry (2005)

⁹ Hendrick, R. J., 'Forest Types and Classification', in Evans, J. (Ed) The Forests Handbook, Volume I: An Overview of Forest Science, London, 2001, pp. 23-67, (pp. 23-24)

¹⁰ Cavendish, W., 'Non-timber Forest Products and Rural Poverty: an Economic Analysis', in Evans, J. (Ed) The Forests Handbook, Volume I: An Overview of Forest Science, London, 2001, pp 372-391 (p372)

¹¹ Cavendish, W., 'Non-timber Forest Products and Rural Poverty: an Economic Analysis', in Evans, J. (Ed) The Forests Handbook, Volume I: An Overview of Forest Science, London, 2001, 372-391 (p372)

c. The Economic Incentive of NTFPs

Certain Non-Timber Forest Products are closely associated with a particular country, so their values are associated, in part, with national prestige, for example *pita*¹² products are given as gifts to other heads of state by the president of Mexico.¹³ Similarly, the role of maple syrup in Canada's national image cannot be overstated. Although no sugar maple grow in Russia, the Canadian example is useful when looking at the development of NTFPs in Russia, due to the shared context of boreal forest NTFPs. Whilst there are numerous small projects involving the trade in NTFPs by indigenous communities in Canada, the maple syrup industry manages to combine big profits from a high quantity of small-scale outfits.

Clearly maple syrup is a huge industry in Canada, and interestingly, on the whole, it is run by small producers who privately own areas of forest. Their production of maple syrup sells to a few large co-operatives and marketing syndicates. According to the FAO, (Food and Agriculture Organization of the UN) there are about 13,000 maple syrup producers in Canada. It is useful to note the scale to which Canada has embraced NTFP development as a serious economic benefit to the country. Production of Siberian pine nuts used to exist on this kind of scale before the first and second world wars, when the cooperatives involved in pine nut harvesting turned to timber harvesting.¹⁴ Maple syrup production is Quebec's fourth leading agri-food industry in terms of exports. This brings great wealth for the Canadian economy as well as local syrup producers. During the period 1985-1995, 68 percent of Canada's maple syrup was exported, valued at an impressive 120 million Canadian dollars.¹⁵

NTFPs are not only edible delights, as Colin Tudge writes in his delightful book about trees, there are also many practical uses for them. 'Needles from the balsam fir (*A. Balsamea*) of Canada and the lake states of the US, yield the scent of 'pine' soap, while resin from its trunk becomes 'Canada balsam', the finest cement for optical instruments, much favoured in microscopy for sticking cover slips to slides.'¹⁶

Of course, the values of NTFPs vary from country to country and location to location. For example, according to researchers at the Canadian Forest Service (CFS), traditional NTFP industries have the potential to contribute \$1 billion to the Canadian economy. The CFS have noted that in Japan, the pine mushroom is a delicacy and can command a price of about \$400 per kilogram.¹⁷ Whereas in the Finnish case, writes Dyke (1999), the integration of NTFP harvesting into wider cultural life is more important than the raw economic value of the products. Similarly, commercial profit is only one element of a more complex picture

¹² Pita is a plant grown in South America, which is harvested and made into high quality yarns.

¹³ Marshall, E., Schreckenber, K., & Newton A.C., (eds.), Commercialisation of Non Timber Forest Products: Factors Influencing Success: Lessons Learned from Mexico and Bolivia and Policy Implications for Decision Makers, UNEP World Conservation Monitoring Centre, 2006, p. 65

¹⁴ Khodorych, A., 'Kedry reshait vse', Den'gi, 32(537), 15/08/05 from <http://www.kommersant.ru/doc.aspx?DocsID=601074> [accessed 16/08/07]

¹⁵ Ciesla, W. M., Non-Wood Forest Products 15: Non-wood forest products from temperate and broad-leaved trees, Food and Agriculture Organization of the United Nations, Rome, 2002, p. 41

¹⁶ Tudge, C., The Secret Life of Trees: How they live and why they matter, London, 2005, p. 115

¹⁷ 'The State of Canada's Forests: Non-Timber Forest Products and Sustainable Development in the Boreal Forest', Canadian Forestry Service, from <http://cfs.nrcan.gc.ca> [accessed 10/8/07]

regarding motivation for NTFP use in Scotland, where recreational value is cited as a strong stimulus for pursuing NTFPs.¹⁸

The issue of nature and forest conservation is a pressing concern for the modern era: on a global scale, by the middle of this century if present trends continue, there will be twice as many people relying on a much smaller area of forest.¹⁹

d. NTFPs in Russia

i. Culture

Beyond economic and ecological values, which are critical in all countries, in Russia NTFP development can rely to some extent on cultural traditions. One example is the celebrated pursuit of mushrooms is one that Russian people of all generations and backgrounds participate in. In contrast to the NTFP situation in Africa, for example, where 'rural households will use NTFPs if it is economically rational for them to do so',²⁰ many Russians collect mushrooms and berries for the joy of it. It forms part of the seasonal interaction with nature, which many still enjoy, despite an increasingly urbanised population. As Colin Thubron writes in his observations on the Russian people:

To the Russians, the wild mushroom has a peculiar mystique, and these [mushroom hunting] expeditions lie somewhere between sport and ritual. They mingle the country-love of an English blackberry hunt with the delicate discrimination of the blossom-viewing Japanese. If Russia's national tree is the silver birch, then her national plant is this magic fungus, burgeoning in the forest shadows. It has sprouted up in Russian literature, even in Russian song. In one of the most poignant passages of Anna Karenina, I remembered, the learned forty-year-old Koznyshev goes mushroom-picking with the delicate orphan Varenka, meaning to propose to her, and both feeling their love; but instead they walk in fear and shyness together, talking of mushrooms instead of one another, and the moment passes forever.²¹

ii. History

In this section I describe the types of NTFP usage amongst Russian peasants in the 19th Century as well as the various projects regarding NTFP during the time of the Soviet Union. Matossian (1968) writes of the Russian peasantry: 'mushrooms, nuts, and berries [were] gathered from nearby woods and salted and dried for winter use...samovars were often used to prepare home-grown "teas" of herbs, carrots, berries or fruits' Moreover, it is not only the edible NTFPs that are traditionally collected from the forest. In Northern Russia and Siberia in the 19th Century, men 'extracted resin, burned charcoal, and constructed [...] bast matting, bast shoes (*lapti*), baskets, wickerwork, and birch bark dishes.'²²

¹⁸ Dyke, A., 'Social and cultural characteristics of non-timber forest product success: applying the Finnish experience to the Scottish context' in International Forestry Review, Vol. 1(2), June 1999, pp 92 - 94 (p. 93)

¹⁹ Bass, S 'The Importance of Social Values' in Evans, J. (Ed) The Forests Handbook, Volume I: An Overview of Forest Science, London, 2001, pp. 362-371 p. 367

²⁰ Cavendish, W., 'Non-timber Forest Products and Rural Poverty: an Economic Analysis', in Evans, J. (Ed) The Forests Handbook, Volume I: An Overview of Forest Science, London, 2001, pp. 372-391 (p. 374)

²¹ Thubron, C., Among the Russians, London, 1983, p. 17

²² Matossian, M., 'The Peasant Way of Life', in Vucinich, W. S. (ed.), The Peasant in nineteenth-century

Pine nuts used to be a reliable source of income for Siberians; in Tomsk region alone, Siberian pine covers two-thirds of the forest area.²³ Pine nuts constituted more than one quarter of the traffic by weight on the Trans-Siberian railroad before the First World War; average yearly shipments were 6,840,000 lbs during the period 1899-1908. Furthermore, said nuts constituted 50 per cent by weight of all the trade traffic heading for the markets of Irbit and Nizhnyi.²⁴ Furthermore, in the writings of the Russian Geographical Society from 1905 it is noted that 'every collector could harvest between 40 and 50 puds of pine nuts. Not to mention other wild plants; in 1889-1898 19 tonnes of cranberries, 57 tonnes of bird cherries and 4.8 tonnes of raspberries were collected.'²⁵

As early as 1957, writes Weiner (1999), the idea to cultivate Non-Timber Forest Products as a wiser approach to forest management, was dreamt of by a radical, yet experienced forestry student from the Leningrad Forestry Technical Academy called Sergei Shipunov. His dream was to establish a model forest plantation in the Altai Mountains in order to harvest the secondary products, the non-timber forest products such as mushrooms, berries and pine nuts, as well as sable, deer and so on. He suggested that the only trees to be cut down would be those that were old or sick. This idea was not one of subversion, but more one of rational resource use, i.e. sustainable resource use. According to Weiner, Shipunov and his fellow students were 'seeking only to make Communism arrive faster by making production less wasteful and more efficient. Shipunov's vision of nature was a workshop, not a temple.'²⁶ Having learned from a short-lived attempt in the early 1920's to 'farm' cedar nuts in a cedar plantation in the Altai Mountains called Karakoshinskii, the forestry students keen on establishing "Kedrograd" ("cedar city") knew that there was a need to diversify their 'crops' to make sure there was enough work year round. They planned to focus on the following activities to ensure they would be able to sustain their NTFP production: 'tapping spruce sap (for turpentine), grinding pine-needles to produce vitamins, bee-keeping, gardening, some agriculture, and limited logging, predominantly sanitary. This was the base for year-round activity on which the superstructure, based on harvesting nuts, mushrooms, berries and pelts would be erected.'²⁷

During Soviet times the situation regarding NTFP usage was in many ways more organized than that of today. According to IUCN research in Kamchatka, approximately 95% of rural households there use NTFPs for their own consumption. During the days of the Soviet Union, the harvesting and marketing of NTFPs was organized by specialised federal and regional processing and marketing, state-owned structures, local forest management units and drug stores. There was a system of centralized harvesting and marketing of berries, fern, birch sap,

Russia, Stanford University Press, 1968, pp. 1-40 (pp 12-14)

²³ Approximately 321,000 hectares. (Khodorych, A., 'Kedry reshaiut vse', *Den'gi*, 32(537), 15/08/05 from <http://www.kommersant.ru/doc.aspx?DocsID=601074> [accessed 16/08/07])

²⁴ Weiner, Douglas R., *A Little Corner of Freedom, Russian Nature Protection from Stalin to Gorbachev*, London, 1999, p. 322

²⁵ Khodorych, A., 'Kedry reshaiut vse', *Den'gi*, 32(537), 15/08/05 from <http://www.kommersant.ru/doc.aspx?DocsID=601074> [accessed 16/08/07]

²⁶ Weiner, Douglas R., *A Little Corner of Freedom, Russian Nature Protection from Stalin to Gorbachev*, London, 1999, p. 323

²⁷ Ibid.

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and medicinal plants.²⁸ In this way, people were able to earn some extra income by selling their harvest. As my research will support, the majority of Russian people now collect NTFPs for personal consumption.

iii. Current NTFP Potential in Russia

The following information gives us some idea of the current potential of NTFP production in various regions of Russia, including Siberia.

*The forests of Archangelsk Region [...] have the potential to provide the local population with an annual harvest of approximately 27kg of berries and 13kg of wild mushrooms per capita. However, these resources are currently underutilized and recent berry harvests have not exceeded 2kg per capita, suggesting that non-timber forest products are a largely untapped resource.*²⁹

Furthermore,

*Approximately 55% of the flora of the Russian Far East has documented human uses, the vast majority of which are used for their medicinal properties. Although only a very small portion of these species are being actively harvested, one estimate projects that non-timber forest products have the potential to inject 23.6 to 32.5 million USD into the Primorskiy region alone.*³⁰

iv. Present-day initiatives – Tomsk and Beyond

Due to Tomsk region's huge number of Siberian pines (62% of Tomsk Oblast' is taiga forest, and 6% of that is undisturbed primary forest), there is a huge diversity of NTFP potential in these forests. Tomsk already has a number of businesses trading in NTFPs, one of which I shall discuss here. 'Lesnoi Tsar' or 'Tsar of the Forest' focuses mainly on pine nuts, but has also diversified into mushrooms and other nuts from China in order to prevent a poor pine nut harvest from affecting the company too much. Its pine nuts are sent for processing to the neighbouring city of Novosibirsk. When they are in season, the factory in Novosibirsk processes ten tonnes of raw pine cones per day. The company policy of *Lesnoi Tsar* is to buy the pine cones from the villages around Tomsk, for which, says the director, Aleksandr

²⁸ IUCN (The World Conservation Union), 'The NTFP Component: Traditions, Markets and Sustainability' unpublished report from the IUCN-CIDA Project: "Building Partnerships for Forest Conservation and Management in Russia" in IUCN Project Concept: 'Determining Beneficial Sustainable Market Use of Non-Timber Forest Products for the People of the Protected Areas of the Russian North West' p.6. I would like to thank Katy Harris from the Taiga Rescue Network for the kind loan of this report.

²⁹ Chibisov, G. & Demidova, N. 'Non-Wood Products and their Research in Arkhangelsk, Russia.' Sustainable Development of Non-Wood Goods and Benefits from Boreal and Cold Temperate Forests, EFI Proceedings No. 23. Joensuu, Finland: European Forest Institute, 1998 quoted in Barry, L., 'Our Life, Medicine Path: Non-Timber Forest Products of the Boreal' Taiga Rescue Network Factsheet, 2005, p. 2

³⁰ Zakharenkov, A. 'The Priority Tasks of Optimization of NTFP management and usage in the Russian Far East.' International Forestry Review 5(2): p89-90 quoted in Barry, J., 'Our Life, Medicine Path: Non-Timber Forest Products of the Boreal', Taiga Rescue Network Factsheet, 2005, p. 3

Konovalov, they pay well.³¹ However, the circumstances surrounding such purchases are far from regulated. Two or three of his employees go to a village with lots of cash to make an agreement with a villager who has a large yard. A notice is then put in the window of the village shop that pine nuts are being collected and people deliver their nuts to the ‘middle man’ from whom *Lesnoi Tsar* collects said nuts. They never buy from the same people, Konovalov says.

A popular NTFP business in Tomsk, apart from pine nuts, is that of birch-bark crafts. A traditional art form in Russia, the sale of these ornaments, boxes and jewellery can be very profitable. One such entrepreneur, Natal’ia Ivanovna³², began by organizing exhibitions of local craftwork and went on to managing a business exporting the crafts all over Russia. Currently she has thirty people working for her. When we met, Natal’ia was not willing to disclose any financial information about her business, suffice to say it has been profitable for five years.³³ Birch bark craftsmen generally tend to work in a craftsman’s guild, and tend to freelance. They attend auctions and bid for part of a birch forest in order to harvest the required quantities of bark.³⁴ Lack of good management of the forests has meant that resources are rare these days. Both Natal’ia and Konstantin were worried about the future of their businesses, since remarked Konstantin, ‘in order to make decent-sized products, it takes the trees 50 to 60 years to grow the requisite amount of bark.’

As we have seen, in Tomsk region, there are a number of businesses trading in NTFPs. However, there is no community-led strategy for their development amongst ‘Russian’ villages, despite there being a strong Soviet-era legacy of co-operative initiatives.

Although the system of NTFP production ceased to function with the collapse of the USSR, reports the IUCN, the berry resources in the Russian Far East, especially of edible honeysuckle (*Lonicera caerulea*) and mountain cranberry (*Vaccinium vitis-idaea*) remained abundant and under-utilized, without a sound marketing strategy in place for the benefit of local people. The old system of NTFP harvesting and marketing collapsed and nothing was created to replace it. Existing small community-based NTFP businesses were faced with a serious challenge. They lacked entrepreneurial skills and initiatives, they had no history of small business development, and they had no access to market information. The IUCN-CIDA Project addressed these issues in targeted native communities in the Russian Far East. Igor Kokorin, Director of Bystrinski Nature Park, a Kamchatkan World Heritage Site since 1996, believed that the proper development of berry resources, herbal teas, and other NTFPs could provide a real alternative to salmon and wildlife poaching for the residents of the two villages located in the middle of the protected area.³⁵

³¹ Interview with director of *Lesnoi Tsar* Aleksandr Aleksandrovich Konovalov, 17th July, 2007, Tomsk

³² Surname withheld

³³ Interview with manager of birch bark business, Natal’ia Ivanovna Podkovyrovna, 17th July, 2007, Asino, Tomsk region

³⁴ Interview with ‘Konstantin’, birch bark craftsman from Asino collective, 17th July, Asino, Tomsk region

³⁵ IUCN (The World Conservation Union), ‘The NTFP Component: Traditions, Markets and Sustainability’ unpublished report from the IUCN-CIDA Project: “Building Partnerships for Forest Conservation and Management in Russia” in IUCN Project Concept: ‘Determining Beneficial Sustainable Market Use of Non-Timber Forest Products for the People of the Protected Areas of the Russian North West’ p.6.

This is one example of how current attempts to revive community-based NTFP development have focussed on Indigenous populations. Why is this, especially if NTFP exploitation used to be more widespread across various regions and communities? Other NTFP projects in Russia tend to be business-led rather than community-led, as we shall see in the following chapter, which is concerned with existing projects in the Tomsk region. What makes NTFP community based harvesting more desirable and more successful amongst indigenous people?

The native peoples of Russia once practiced traditional hunter-gatherer livelihoods where it was not customary to be involved in monetary exchange for goods. When they became collectivised, the USSR encouraged them to mass-produce certain traditional crafts for sale. They were forced to focus on certain types of activity such as carving ornaments for example, thus forsaking traditional pursuits such as medicinal herb collection and berry/mushroom picking, 'gathering'.³⁶ The revival of their traditional ways of life has seen development of creative use of non-timber forest products such as packaging medicinal herbs, elaborate weaving and other. Non-timber forest product development in Russia combining environmental, social and economic objectives have been most successful in the regions where such cultural-reclamation is taking place because of the desire of people of indigenous roots to re-establish their identity in the wake of the collapse of the USSR. On the other hand, non-indigenous communities have had no such revival. Former collectives and cooperatives engaging in NTFP collection and sale no longer function, and what's left of the NTFP business has moved into private hands.

By conducting research in a small village in Western Siberia, I attempt to discover the extent to which rural people still engage in NTFP harvesting, and what are the issues that prevent similar small-scale projects taking root in non-indigenous communities.

³⁶ Batianova, E. P., et al. Sovremennoe polozhenie i perspektivy razvitiia malochislennykh narodov Severa, Sibiri i Dal'nego Vostoka Russian Academy of Sciences Institute of Ethnology and Anthropology, Moscow, 2004, pp. 97-98

The Case Study: Kurlek, Tomsk Oblast'

This narrow case study provides an insight into the interesting intersection of factors that the study of NTFP development lends itself to. The elements of politics, culture, economy, ecology and history involved in the study reflect the larger issues facing rural Russian development today. My analysis is concerned with the economic circumstances of the population, employment levels, most pressing social problems and more generally people's feelings of contentment and views about the future. My questionnaires and interviews seek to provide an understanding of local people's attitudes towards the forests and what they perceive to be its main threats. I also establish their understanding of NTFPs and the role they currently play in the lives of the inhabitants of Kurlek. This data will help to build a picture of how the use of NTFPs, the economic situation and attitudes to NGOs in a small Siberian village relate to the current problems with NTFP development in general.

Research was conducted in the Kaltaiskii forest in south-west Tomsk Oblast' which is managed by Kaltaiskii Opytny Leskhoz, as well as the village of Kurlek, one hour from Tomsk and where the Leskhoz has its headquarters.

Kurlek Village: A Profile

i) *History*

Kurlek village is situated on the river Tom, 70 kilometres south west of the city of Tomsk. In 1905, a protected forestry outpost was created nearby in present-day Kurlek. Shortly after the revolution timber was transported to Tomsk to fuel developing industry and heat the town. In 1937 a *lespromkhoz* (forest processing unit) was established on the river and with it the village of Kurlek. In 1936 a school was opened in Kurlek to support the arriving workforce, and by 1940 there were 500 children learning there. The *lespromkhoz* built rows of houses for the workers and their families.

Many jobs were created at the new *lespromkhoz* and work began 3km into the forests. Gradually the boundaries for logging increased and huts were built at the 13th kilometre post in the forest. Over time many people from the Baltic States were exiled to this '13th kilometre' as it was called; the community there was comprised mainly of Latvians and Lithuanians. This 13th kilometre became one of the first Siberian gulags, although it was not openly acknowledged. Other workers came voluntarily to earn money. A small settlement was built at the 18th kilometre, which became known as 'Larina'. In 1941 a huge number of people were exiled to Larina, and in the 1960's when the settlement stopped working as a timber processing plant the inhabitants moved to Kurlek.³⁷

³⁷ History of Kurlek was obtained from an interview with Liubov' Vasil'evna Gordaneva, attendant of village museum, Kurlek, 26th July, 2007

ii. *Present day Kurlek*

Every year the local council (*Sel'ski Sovet*) takes a census of the inhabitants of the villages.³⁸ (The local council, situated in Kurlek, represents three neighbouring villages). According to 2006 data, which excludes *dachniki* (those who holiday in the village in the summer), there are 1351 permanent residents of Kurlek, 582 of whom are employed and 194 unemployed. There are 360 pensioners, 109 one to six year olds and 206 seven to eighteen year olds. According to the local council's social welfare specialist (*spetsialist po sotsal'noi rabote*), residents of Kurlek engage in a lot of sideline work, which they do not declare in the censuses, so despite some income, are counted as unemployed. The main social problem in the village is the lack of work. There is now a much smaller (and recently privatised) *Lespromkhoz*, employing around fifteen people, and the governmental forestry unit, the *Leskhoz*, currently employs seventy people. New legislation regarding the forest industry will almost certainly affect this *leskhoz* negatively. This will be discussed in more detail in the next chapter. Alcoholism is another issue in the village and naturally accompanies unemployment; specifically alcoholism is rising amongst young mothers. The main complaints by local people concern the lack of decent roads and facilities, and the excess of iron in the water supply.³⁹

iii. *The local forest*

62% of Tomsk Oblast' is taiga forest, and 6% of that is undisturbed primary forest. The major threats facing the forest today are increased logging, (legal and illegal), uncontrolled fires, lack of infrastructure for sustainable forestry, and a lack of detailed knowledge of species distribution. There is also a lack of awareness of forest resources and their relevance to the global community.⁴⁰ Kaltaiskii forest, which surrounds Kurlek, is boreal forest on the edge of the 6% virgin forest, or dark taiga, of Tomsk region. The territory is managed by the *leskhoz* who log and plant as required. The main problems are repeated all over the Tomsk region; that of illegal logging, forest fires and extensive problems of access.

iv. *Results of my questionnaires*

Of the respondents questioned, 100 percent of respondents participated in some kind of NTFP collection. For example, when in season, sixty percent of villagers collect berries at least 3-4 times per month. (See figures 1-9, Appendix G) However, 62 percent were familiar with the term 'Non-Timber Forest Product', '*nedrevesnye lesnye produkty*' which suggests that a third of all respondents engage in NTFP collection without being familiar with what it means in a broader sense, i.e. an alternative to timber-based harvest.

39 percent of people store all their NTFPs over winter, whereas 29 percent of people don't store anything for the winter months. Of those 29 percent, eighty percent consumed all their harvest that season, while twenty percent sold half and consumed half that season. (See figure

³⁸ The next Russian Federation census is due to happen next year, 2008

³⁹ Information about present-day issues in Kurlek was obtained from an interview with Natal'ia Vladimirovna Pudzha, social welfare specialist at the local council, *Sel'ski Sovet*, Kurlek, 26th July, 2007

⁴⁰ Talbot, W., 'Darwin Initiative Project 14-045: "Tomsk Taiga"' paper presented at the Darwin Initiative Workshop: Legacy and Forest Biodiversity, Monday 19th February, 2007, London

10, Appendix H) Crucially, only 3.3% of total respondents sold any of their products. Those who did sell some of their harvest sold between twenty and fifty percent of the total, and the rest they either consumed immediately or kept for winter. The villagers who were engaged in NTFP commerce sold their products locally. The respondents who sold half of their harvest earned less than or equal to the Russian Federation's minimum living wage, and those who sold twenty-thirty percent of their harvest earned more than the minimum living wage. When asked how much the respondents felt the forest contributed to their household income, most people (49 percent) answered that it did not contribute at all. Twelve percent of people felt the forest contributed all of the income to their household. (These people worked in forestry) Whereas twelve percent felt that fifty percent of their household income was attributable to the forest. (See figure 11, Appendix H)

When asked to consider their answers to all the questions and evaluate to what percentage the respondent considered him or herself happy with their life, (where 100 percent is most happy) approximately eighty percent of the inhabitants of Kurlek wrote that they were fifty percent or more satisfied with their lives, as opposed to twenty percent who were less than fifty percent satisfied. (See figure 12, Appendix H) Similarly, when asked to what percentage did the respondent feel he or she had freedom to choose what happened in their lives, eighty percent of the respondents felt that they had fifty percent or more freedom of control over their futures. (See figure 13, Appendix H)

These results show that to a certain extent the population of Kurlek have a positive outlook. This could be conducive to NTFP development, since there is a definite trend showing that the respondents feel as that if changes need to be made in their lives, they have the freedom of choice to make those changes.

We can conclude from this data that indeed, the behaviour of the population of Kurlek's regarding NTFPs fits in with the ideas discussed regarding the tendency of Russian people in modern times to use NTFPs for their own personal consumption rather than engage in commerce. It is relevant to point out that the accuracy of these results may be flawed since by law selling edible goods without a license is illegal in Russia. In reality, however, many people do engage in this activity. In an interview with the forestry representative of Tomsk Administration about this matter he acknowledged that this was an issue and said, 'in reality it is different. It has been going on for so long and actually nobody is about to fine an old lady for selling mushrooms by the side of the road'⁴¹. This leads to speculation to what extent this thinking applies to people engaging in illegal logging 'to make a few quid', or hunting bears without a permit for the same reason. The fact that the system of NTFPs in Russia is not, in the main, organized or managed on a larger by communities themselves or at a policy level creates a dilemma. On one hand, poor people are able to make a little extra by selling small quantities of mushrooms by the side of the road unmolested, on the other hand, such thinking means the rule of law can be disrespected on many other levels such as logging and poaching. Legitimizing and investing in NTFP production on a wider-scale would encourage more people to get involved because, apart from there being more money involved in it, the fact that selling NTFPs is illegal does resonate in the decision-making processes of

⁴¹ Interview with Bogdan Sergeevich Khmel'nitskiy, Vice-chairman of Committee for Regional Forest Policy, and Vladimir Viktorovich Chitorkin, Chief Specialist for Committee for Regional Forest Policy, Tomsk Regional Administration, 18th July, 2007, Tomsk.

some. Naturally, for those who rely on the sales on NTFPs to supplement their income, like the 3.3% of my sample from Kurlek, legitimizing NTFPs may have serious consequences for their lives. This is the reason why development of NTFPs needs to be part of a community-led initiative to ensure that those most reliant on selling them for their income are protected from the negative implications of stricter enforcement of the law. The implications of the new Forest Code of the Russian Federation may make this legitimization a reality. However, this is still not known, since the main document does not specify the procedures pertaining to this possibility and the laws are still being drawn up by the regional administration, which will manage the forest under the new Code.

The Problems Affecting NTFP Development

In this chapter I discuss the reasons why development of non-timber forest products as community-run enterprises have failed to revive themselves in rural communities that are characterised by poverty and degradation. I shall refer to my findings in Kurlek village, as well to the state of civil society and how certain of its characteristics have negatively affected the potential of community-based NTFP development. This is discussed within the broader context of environmental protection initiatives in Russia as a whole. I shall refer to current literature and draw upon my own findings to illustrate the main problems in this sphere.

Particularly, this section looks at the problems of forestry and the Forest Code, the issues of rural apathy and the breakdown of civil society, as well as examining other potential reasons for people's disinterest in environmental protection, such as the Russian world-view and modern role models.

a. Forestry and the new Forest Code of the Russian Federation

There are numerous problems associated with the Russian forestry service, the main one being the absence of any substantial funding to modernize and diversify technology and activities. I shall discuss such issues in more detail below. Suffice to say, the main problems affecting the Kaltaiskii *leskhoz*, or forest unit, can conceivably be applied to other forest units across Siberia because, until very recently (January 2007), Russia's forests were federally owned and centrally managed by *Rosleskhoz* (the governmental forestry service) within the Ministry of Natural Resources (MPR). The potential involvement of the *leskhoz*y in NTFP projects depends on the *Rosleskhoz*, which, having pledged its support to sustainable forest management (see e.g. Roshchupkin, 2007) should in theory be supportive of such initiatives. However, since the introduction of the new Forest Code of the Russian Federation, the future of forest management and the *leskhoz*y themselves is in doubt.

The new Russian Forest Code has been hotly and lengthily disputed in the *Gosduma* (it required two re-drafts) and was finally introduced in January 2007 at its third reading. As one of the most ambitious of Putin's natural resource reforms, the Forest Code is the document that is intended to change the face of Russian forestry. 'The third stage [of the code's implementation] (until 1st January 2008), concerns the reorganization of the [1703] *Leskhoz*y; reformulating forest districts into corresponding territories of regional government; the reorganization of forestry control and supervision; cultivation and consolidation of the forest

plans of Russian Federation's regions, as well as reorganization of forestry regulation and projects of forest exploitation.'⁴² The main changes the new Forest Code will affect were articulated by Mr Roshchupkin, the Chief of the Federal Forestry Agency of the Russian Federation, at the Food and Agricultural Organization of the UN's Committee on Forestry this spring:

- i) *profound decentralization of forest administration and management;*
- ii) *improved possibilities to attract investment and introduce new technologies;*
- iii) *expand rights and responsibilities of forest users*⁴³

There is no doubt that investment and new infrastructure for forestry in Russia is needed, timber production has decreased 54% compared to 1988, the peak year for USSR's economy and the average age of equipment in the industry is 25 years.⁴⁴ Despite the necessity to reform the forestry industry, the recent changes to forest legislation are naturally having a destabilising effect on rural forest units (*leskhoz*) who are genuinely concerned about the future of their existence. This fear is not an irrational one, as job losses occur over restructuring organizations worldwide. As an example, in Russia specifically the reorganization of *Goskomekologia's* regional structure led to the loss of many regional employees' jobs.⁴⁵ The introduction of the new Forest Code of the Russian Federation in January 2007 has created anticipation and uncertainty within the industry, as well as amongst environmental NGOs and people who live in and around Russia's forests. The organizational changes to the *leskhoz* will inevitably lead to the loss of jobs. In Kurlek, for example, the *leskhoz* employs 70 local people, the majority of whom are experienced foresters with unparalleled knowledge of the territory. The management of the *leskhoz* are resigned to the inevitable downscaling and are powerless to influence the decision.⁴⁶ Apart from work in the *leskhoz* there is no employment in the village, as we learned earlier. Since its peak production circa 1988, the village's *leskhoz* and *lespromkhoz* have been in decline.⁴⁷ Rural poverty caused by this decline increases the threats to forest conservation by the activities of those seeking income by illegal logging and poaching. (See e.g. Cavendish, 2001; IUCN, 2006) Unfortunately, although the New Forest Code attempts to streamline the industry, modernize

⁴² 'Rosleskhoz zavershilo peredachu leskhozov v vedeniye sub'ektov Rossiiskoi Federatsii' Lenta.ru Press Release, 1st February, 2007, <http://lenta.ru/news2/2007/02/01/rosleshoz/> [accessed 26/8/07]

⁴³ Roshchupkin, V. P., (Chief of the Federal Forestry Agency of the Russian Federation), Introductory Statement at the Food and Agricultural Organization of the UN's Committee on Forestry, 13th March, 2007, Rome. [http://wbln0018.worldbank.org/ECA/ForestryAR/Docklib.nsf/b559...5729d007b912c/\\$FILE/RUS-FAO-IntroductoryStatement-text-eng.pdf](http://wbln0018.worldbank.org/ECA/ForestryAR/Docklib.nsf/b559...5729d007b912c/$FILE/RUS-FAO-IntroductoryStatement-text-eng.pdf) [accessed 29/8/07]

⁴⁴ Butrin, D., 'Timber Industry 1991-2000', Kommersant, 20th August, 2004, from www.kommersant.com/p307741/r_43/Timber_Industry_1991-2000 [accessed 10/8/07]

⁴⁵ Trumbull, N and ZumBrunnen, 'Abolition of the Russian EPA: the De-ekologizatsiya of Russia', Paper given at The Association of American Geographers Annual Conference, New York, 2001 quoted in Oldfield, J., D. 'Russian Environmentalism' in European Environment, 12, 2002, pp. 117-129 (p. 120)

⁴⁶ Interview with Vasilli Borisovich Viktorov and Yuri Mikhaelovich Kizeev, managers, Kaltaiskii Opytny Leskhoz, Kurlek, Tomsk Region, 23rd July, 2007

⁴⁷ Reasons given for this decline by the director of Kurlek's Leskhoz are due to the more-or-less continuous reorganization of the forestry service without the necessary investment. (Interview with Vladimir Nikolaevich Rogachev, director Kaltaiskii Opytny Leskhoz, Kurlek, 18th July, 2007) Indeed, the timber industry had been lurching between state- and private-ownership for over a decade. No one has had control long enough to make meaningful investments or reforms. For more information on this, see also Butrin, D 'Timber Industry 1991-2000', Kommersant from http://www.kommersant.com/p307741/r_43/Timber_Industry_1991-2000/ [accessed 10/8/07]

its technology and help form modern competitive relationships within the industry,⁴⁸ the atmosphere of decline in isolated rural areas where the operations are small-scale, will inevitably worsen.

i. Impact on rural people: results from the case study

As we have seen, in rural Siberian villages it is not only the forestry service that relies on the forest for its income. Many ‘ordinary’ Siberian people rely on the forests for household income supplementation, foodstuffs, recreation as well as a sense of identity. The new forest code will enable larger businesses to move into the area to lease large areas of the forest for commercial harvesting. Results of the questionnaire suggest that of those who are aware of the new Forest Code (71 percent of respondents) half speculate that the Forest Code will have a negative impact on forest protection and encourage illegal logging. Thirty percent of respondents believe it will have a positive influence on the local economy, whereas 43 percent believe it will be negative. Currently illegal logging is the most worrying of forest management problems for the majority of the inhabitants of Kurlek. Of the fifty respondents to state that there exist problems with their surrounding forest, twenty people cited illegal logging as the biggest problem. The next two most referred to problems were bad forest management (ten respondents) and lack of a reforestation plan (5 respondents). It is reasonable to speculate that there will be increased levels of logging from January 2008, (when the government anticipates the forest code to be fully operational). This may play further into the fears of local people, who will not see any profits from the sale of ‘their’ forests.

Additional problems with the New Forest Code relates to citizens’ rights to access the forest for subsistence use of NTFPs. Indeed, results of the case study show that 46 percent of respondents thought the new Forest Code was likely to have a negative influence on the way they use the forest, while only seventeen percent believed it could have positive effects. Although there are a number of articles relating specifically to subsistence NTFP use (see Articles 11, 25, 30, 33, 35) there is no reference to federal legislation (existing or planned) to protect these rights. For example, clause 1 of Article 11: ‘Stay of Citizens in Forests’ stipulates that ‘Citizens have the right to stay in forests freely and gratis and to harvest and collect wild fruit, berries, nuts, mushrooms, other edible forest resources (food forest resources), and non-timber forest resources, for their subsistence needs’, whereas clause 4 stipulates that ‘Citizens stay’ may be prohibited or restricted in forests which are located on lands of defence and security, lands of specially protected nature areas, other lands where citizens’ access is prohibited or restricted as per federal laws.’ This clause seems more than a little vague, and might easily be bypassed by a ‘federal law’. In addition, Article 35: ‘Harvesting of Food Forest Resources and Collection of Medicinal Plants by Citizens for their Subsistence Needs’ refers the reader to Article 27 for restriction of these rights (which includes ‘restrictions of forest use as established in this code and other federal laws’) and

⁴⁸ ‘Gosduma razreshila rossiianam sobirat’ v lesu iagody I griby besplatno’ from [Lenta.ru](http://lenta.ru/news/2006/11/08/forest/Printed.htm) <http://lenta.ru/news/2006/11/08/forest/Printed.htm> [accessed 28/08/07]

clause 5 leaves the real decisions on the procedures for harvesting to the ‘authorised federal executive body’ to which there is no further reference.⁴⁹

b. Apathy, lack of ownership

Another problem is the sense of powerlessness in the village of Kurlek. As we have seen, of those questioned, 28% admitted to being only fifty percent able to make choices freely about their future, while overall 48 percent of all respondents indicated that they are fifty percent or less able to decide their own future. (See figure 13, Appendix H)

The village is characterised by a certain amount of disillusionment, laziness, and a lack of desire to initiate projects of cultural programs. When questioned on the desirability of Kurlek as a place to live, 25 percent of people believed it was a ‘good’ place to live, whereas twenty percent rated it as a ‘bad’ place to live. The majority, 47 percent, agreed that it was ‘ok’. Without a certain sense of community and ‘togetherness’ people will find it difficult to respond to proposals that address a village as a whole. Furthermore, potential organizing structures overwhelmingly fail to organize citizen’s action due to problems with civil society’s engagement with their communities.

c. The Weakness of Civil Society: Insights from Kurlek and Beyond

We have established the reason why NGO-led community-based NTFP projects work better when focussed on the native populations of Siberia. It is important to understand why NGO’s and civil society in Russia are not equipped to develop similar success stories amongst ‘ordinary Russians’. As we have seen, there are many examples of past successes in NTFP exploitation, yet community-led NTFP enterprise in Russia today are largely organized by environmental NGOs and tend to focus on indigenous peoples. Traditionally NTFP development was not an environmental issue; it had little to do with nature protection and more to do with enabling efficient and maximum use of given resources. Given the negative image of environmentalists in Russia’s society today due to the inability to connect with their communities, their attempts to create community-led NTFP initiatives among ordinary Russian people will fail despite a certain positive inheritance of Soviet systems of production. Indeed, this is reflected in the results from the case study of Kurlek in the answers to two questions the respondents were asked. When asked about their trust in international companies and humanitarian, or non-governmental, organizations, very similar results were found. 37 percent of all respondents did not trust ‘international companies’, and forty percent of respondents did not trust ‘humanitarian or non-governmental organizations.’ Most people however, simply did not know whether to trust such entities or not: 47 percent didn’t know whether or not to trust international companies and 44 percent did not know whether to trust NGOs.

⁴⁹ Forest Code of the Russian Federation, Adopted by the State Duma on November 8th, 2006, [World Bank](#), (unofficial translation), November 2006. I would like to thank Katy Harris from the Taiga Rescue Network for access to this document.

In today's climate where aspirations of ordinary Russians are, broadly yet understandably, about increasing their material wealth, it would seem that the a business approach rather than the environmental approach is likely to be the more successful to develop NTFPs further. I explore here, therefore, what problems civil society is experiencing in more detail.

Putin's increasing control over Russia's civil society will make any self-respecting non-governmental organization want to avoid governmental methods of influence, such as the public chamber⁵⁰, in order to maintain a sense of independence and relevance. However, in order to do so, such organizations have remained within comfortable and reliable networks and structures, based on those that first appeared after the fall of the Soviet Union, which were arguably the very same structures that existed *during* the USSR, i.e., science-based groups, university-affiliated groups and so-called 'eco-clubs'. Henry (2006) notes, 'the country's green NGOs with few exceptions, are based upon pre-existing institutions, networks of individuals and norms.'⁵¹ So such practices continue, arguably aiding organizations to survive in the new 'centralised' political climate. However, these networks can also serve to undermine an organization's relevance to Russian society as it exists today. 'Soviet-era' networks exist within Soviet-era created groups, which are, to this day based on Soviet-era organizational structures. This is a problem in so far as these networks prevent growth of organizations through recruitment of new members. Over the last 5 years NGO's in Russia have not really grown. The reasons given for this by observers are that the reliable sources of self-help have stopped. A major source of human capital has stopped participating and people seem to have stopped grouping.⁵² The main issue is the inability of these models of civil society to attract young people. Young people are not against civil society per se, but they refuse the old model and refuse the old leaders. The old tricks don't resonate with young people and they want a new way and new fashions. There exists in Russia now an alternative parallel civil society, which is not motivated by self-help. The age group 20 – 24 reject terms such as 'democracy' and 'civil society' and as such, there is no bridge to this growing society.⁵³ The implications of this are discussed in more detail below.

Furthermore, Abrams and Auer (2004) cite the inherited soviet models as proving counter-productive in project-development from a donor's perspective. 'In the Environmental aid arena, the now mythologized legacy of late Soviet green activism determined the forms and functions of Western aid programs, and at the expense of thorough needs assessments and feasibility studies performed collaboratively by donors and recipients.'⁵⁴ Indeed, most environmental organizations are to some degree still reliant on Western funding, even

⁵⁰ Briefly, the public chamber, *obshchestvennaia palata*, is Putin's way of determining the extent to which civil society will influence governmental policy: He chooses 42 representatives from civil society, they choose 42 more, these 84 choose 42 more representatives and that body is then used as a governmental consultancy, supposedly giving a voice to the 'Third Sector'. The structure has been widely criticised by representatives of civil society. (See e.g. Evans et al. 2006)

⁵¹ Laura A. Henry, 'Russian Environmentalists and Civil Society', in Evans Jr., Alfred B., Henry, Laura A., and McIntosh Sundstrom, Lisa (eds) Russian Civil Society: A Critical Assessment, London, 2006 p. 233

⁵² Valentina S. Dekalo, from Charities Aid Foundation, Russia. Paper given at Russia Foundation Conference, 'Russian Volunteers at the Crossroads: The Past, Present and Future of Russian Civil Society', London, 29th June 2005

⁵³ Ibid.

⁵⁴ Abrams, Joshua, E., and Auer, Matthew, R., 'The Disappearance of popular Environmental Activism in Post-Soviet Russia', p147, in Auer, Matthew R., (ed.) Restoring Cursed Earth: Appraising Environmental Policy Reforms in Eastern Europe and Russia, Oxford, 2004

competing between themselves for particular funds. In most cases donors assert their own preference for projects and initiatives through criteria drawn up in accordance with their own particular agenda. This type of practice impacts on environmental organizations, which, as a result of shaping a project proposal to grant requirements, can tend to employ strategies alien to local sensibilities, or are ignored or mistrusted by citizens and, increasingly, Russian authorities.⁵⁵ This feeling was echoed by a speaker from the Russian division of the Charities Aid Foundation, whose conference paper highlighted the insecurity of the financial sector. She noted that the fact that 80% of civil society's money comes from foreign grants, or local government budgets, has decreased the need to locally fundraise, support and integrate. She argues that a new 'investor approach' has been promoted, which has developed and supported a self-contained, isolated civil society. This is an important point because it keeps such organizations easy to manage, and, most importantly, it keeps them foreign, not part of society's make up.⁵⁶ In addition, it would seem that the youth is creating a radically different civil society, one not controlled by donors or hiding in old familiar structures. These young people aspire to a more modern and dynamic movement, something more challenging to the existing status quo, which for them means not just challenging governmental policy, but similarly the methods of the organizations themselves. The relevance this problem has to the NTFP debate is that whereas in the West, for example, one can envisage young people rallying to the cause of the forest's ecology by engaging in mushroom related activities, the issue is very different in Russia. Mushroom picking and other forest-related activities echo the old days and do not have the attraction perhaps of something like a protest camp in an attempt to draw attention to a nuclear waste processing plant, for example.⁵⁷

d. A Lack of Perspective?

Despite the failings of civil society, it must be acknowledged that there are other factors that impinge on the successful promotion of a national 'green' conscience. According to Massa and Tynkkyen (2001), and similarly to a large extent my own experience of oral testimony, Russia's mental-spatial delusion means that environmental problems on a local level do not constitute part of a wider environmental problem, let alone a global environmental crisis. The tendency of some Russian people to visualise Russia as an inexhaustible provider of resources, coupled with a lingering imperialistic view of its actual size and make up, has meant that it is generally perceived that most environmental crimes can, at least partially, be ignored. This thinking, according to Massa and Tynkkyen, belittles both global and Russian

⁵⁵ Abrams, Joshua, E., and Auer, Matthew, R., 'The Disappearance of popular Environmental Activism in Post-Soviet Russia', p146, in Auer, Matthew R., (ed.) Restoring Cursed Earth: Appraising Environmental Policy Reforms in Eastern Europe and Russia, Oxford, 2004

⁵⁶ Valentina S. Dekalo, Charities Aid Foundation, Russia. Paper given at Russia Foundation Conference, 'Russian Volunteers at the Crossroads: The Past, Present and Future of Russian Civil Society', London, 29th June 2005

⁵⁷ This particular camp has come to media attention recently in connection with the death of one of the protesters at the hands of neo-Nazis. For more information about this incident and details about the proposed project see Parfitt, T., 'Protester killed in "neo-Nazi" attack on eco-camp' Guardian, Monday July 23rd, 2007 from www.theguardian.co.uk/siljadlfjdlfjddk;k [accessed 10/8/07] and Baikal Environmental Wave Bulletin: 'Neonatsisty snova atakuiut ekologov', 12/8/07, from www.baikalwave.eu.org/sldjcsldjflk [accessed 10/8/07]

environmental problems.⁵⁸ In relation to the development of NTFPs, the idea that Russian forests are inexhaustible does not help to cultivate a positive endorsement of the environmental need amongst 'ordinary' Russians.

e. A Lack of role models

Similar hindrances to the support of environmental initiatives are the lack of positive 'green' role models in Russia. This space in Russia is occupied with other sorts of role models, elucidated by Ianitskii when he wrote: 'the lifestyle of the rich, the so-called new-Russians does not give a positive view of the future of Russian environmentally-oriented thinking [...] especially if the materialist and anti-ecological lifestyle of the economic elite becomes a dogma for the majority of the population'.⁵⁹ This insight has been corroborated by anecdotal evidence from the Russian Economic Forum in London in June 2007, where, on average, each session was attended by at least one hundred conference goers, but the only session on the environment was attended by 7 people, myself included.

In the UK and the USA, eco-role models are relatively new phenomena, in that they have just appeared on the scene. The idea itself, however, is not a new one. Like the pop icons for peace in the 1960s such as John Lennon and Bob Dylan, this century's politico-cultural role models are associated with climate change, global warming and Fair Trade. For example, the lead singer from rock-group 'Coldplay' has ensured that Fair Trade in the west has gone mainstream. The popularity of the zero-emissions car, the Toyota Prius, is very *a la mode* amongst the glitterati of Hollywood. Another apocalyptic film shaming the behaviour of the modern inhabitants of planet earth is soon to be on general release, Leonardo DiCaprio stars in 'The 11th Hour', following in the footsteps of Al Gore's 'An Inconvenient Truth'.⁶⁰ What, then, will capture the imagination of the rural Siberian population in order to make the investment in and development of non-timber forest products successful? I believe the combination of money, nationalism and regional pride are the ingredients to combine in order to make the best of the potential NTFPs offer Russia as a means to address the problems of rural poverty and sustainable forest management.

Recommendations & Conclusions

Success for the future of NTFP development in rural Siberia must focus on the combination of two elements: the role of civil society, and encouraging interest in NTFP development at the community level. Although we have established the existence and relative success of commercial NTFP projects such as *Lesnoi Tsar*, an important factor in NTFP development is using local knowledge and experience to bring income to the village itself. Developments should also aim to foster amongst participants a sense of control over and responsibility for the products and the forest that produces them.

⁵⁸ Massa, I., and Tynkkyen, V., The Struggle for Russian Environmental Policy, Helsinki, 2001, p. 14

⁵⁹ Massa, I., and Tynkkyen, V., The Struggle for Russian Environmental Policy, Helsinki, 2001, p. 18

⁶⁰ Dargis, M., 'Inconvenient Truths on the environment that give breathing room for hope', reviewed in International Herald Tribune, August 18-19th, 2007, p. 7

In Europe there is a rising demand for high-quality foodstuffs, including such categories as 'organic', 'fair trade' and 'wild'. As the international profile of NTFP production in the boreal forest region increases, such markets can potentially stimulate additional investment in community-based NTFP enterprises in Siberia. The reality of civil society in Russia means that due to the lack of alternative sources, its dependence on foreign donors may continue for some time, (despite attempts to limit this funding stream by the Russian government.) The involvement of foreign donors in schemes to aid NGOs in developing NTFP enterprises could stimulate NGOs to be more involved in their wider communities. This would in turn foster an increasingly positive perception of them by rural people. However, further development depends very much on the desire of said communities to engage in increased NTFP harvesting and processing.

There have been successes in the community-led NTFP arena as part of a revival of the traditional ways of life of the indigenous communities of Siberia and the Russian Far East. The fall of the USSR saw an upsurge in reclaiming time-honoured ways of life amongst indigenous peoples; from schools dedicated to traditional methods for hunting and fishing, to revival of tribal languages. (See Batianova et al. 2004) The reclamation of such customs comes from a feeling of pride and identity associated with them. It is this feeling of pride and responsibility that has the potential to inspire the local people to be more actively involved in NTFP projects in rural Siberian villages. Indigenous peoples projects are helping such communities to re-establish ownership of their traditions they are re-identifying what constitutes their 'nash'. The Russian word "nash" means "ours". Caldwell explains its intricacies:

[...] *Nash invokes claims of intimacy and familiarity, it incorporates both the imagined space of the nation, occasionally rendered as otechestvennyi (which means "fatherland" and "domestic industry", also "patriotic"), and the physical space of the home, usually rendered as domashnii (which means "of the home"), or even more simply as bytovoi ("of daily life")*[...] *the process of Nash typically evokes a sense of nationalist qualities, [but] Russian consumers also use it more simply to demarcate feelings of intimacy that are not exclusively national.*⁶¹

Establishing feelings of ownership can, in turn can make people proud of their products especially if they might be in demand from abroad. Anecdotal evidence shows that Russian people are generally patriotic and are encouraged when Russian-made, 'nash', goods are popular abroad. Music is one of these products, as well as vodka and the Kalashnikov. To establish a similar feeling of pride about NTFPs by showing that a market exists could enhance the desire with which people engage in their development.

Certain frameworks for marketing NTFPs internationally do exist. They include for example, the Forest Stewardship Council certification, Fair Trade and Organic Soil Association. And, in addition 'it is increasingly clear that there is considerable financial value attached to brand names of certain leading companies which are known to produce social and environmental

⁶¹ Caldwell, M. L., 'Domesticating the French Fry: McDonald's and Consumerism in Moscow', from Watson, J. L., and Caldwell, M.L., (eds.) The Cultural Politics of Food and Eating: A Reader, Oxford, 2005, p. 182

benefits alongside fibre. For example, the Greenpeace name has been estimated to be worth hundreds of millions of dollars.’⁶²

The results of this study are therefore somewhat counter-intuitive. According to the research results, the development of NTFP production in rural Siberian villages would yield more results if its initiation came from a business perspective rather than an environmental one due to the negative image of civil society amongst rural people. The need to encourage a sense of nationalistic pride in NTFPs rather than an obligation to nature will be more likely to stimulate their development, and therefore, by proxy, the protection of the forests.

⁶² Anon. (1998) ‘The limits to growth?’ The Economist 1 August 1998 quoted in Bass, S., ‘The Importance of Social Values’, in Evans, J. (Ed) The Forests Handbook, Volume I: An Overview of Forest Science, London, 2001, p369

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V. Medical Arrangements

Pre-Departure Medical Preparation

First-Aid Training

Two members of the team attended the RGS Wilderness Medicine weekend course in March.

Questionnaires

All UK members of the team were asked to complete a medical questionnaire before departure. This was read in confidence by the Medical Officer to allow identification of any specific treatment needs or likely problems during the expedition. It also contained medical insurance details and emergency contact information. Sealed copies of the questionnaire were kept with the first aid kit, by the Medical Officer and with the individual, to be opened by any member of the team in an emergency. A further copy was kept by the home contact, Janet Sackman at WTA Education Services. The questionnaires were destroyed after the expedition.

Vaccinations

Team members were advised to plan vaccinations with their GP. Research suggested that the following would be required: tick-borne encephalitis (TBE), rabies, hepatitis A & B, diphtheria, tetanus, polio, typhoid, tuberculosis and meningitis.

First Aid Kits

A substantial group medical kit put together by the 2006 team was taken. This included antibiotics and a sterile needle pack as well as comprehensive first aid and medical supplies. The kit was checked prior to departure and items which had been used up or gone out of date were replaced. A few extra items were also added following advice from the 2006 Medical Officer. Team members were advised to bring their own individual first aid kits containing common items and their own regular medication.

Medicine in the Field

Medical Problems

One member of the team was evacuated from base camp on the 24th July 2007, following a suspected case of abdominal bleeding. The team member presented with symptoms of malaise, shortness of breath on exertion, loss of appetite, dizziness, and absent bowel

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movements for three days. The medical officer was alerted of these symptoms on the 21st of July. A full systems review on physical examination did not reveal any overt abnormalities and vital signs were within the normal range. However the occurrence of melaena on the 23rd of July, raised immediate concerns of possible abdominal bleeding. Despite other non-urgent differential diagnoses, the risks of abdominal haemorrhage was high and it was decided that evacuation would be necessary and immediate.

Issues regarding consent and confidentiality were discussed between the team member and the medical officer. Upon which, the team member's next-of-kin contact, the team member's insurance company, the expedition home contact Janet Sackman and the Russian organisers were all contacted and informed of the situation. Transportation was swiftly arranged for the next day.

The team member concerned was admitted to Tomsk City Hospital (No 3) accompanied by the team leader and the Medical Officer. The diagnosis of peptic ulceration was confirmed by esophagogastroduodenoscopy and the team member was treated with cauterisation, antibiotics, proton pump inhibitors, and food and fluid restrictions. The team member was discharged on the 1st of August and flown home.

Other health matters included presentations of reaction to insect bites, and flu-like symptoms. One member of the team was stung by a bee on the 7th of July 2007. All cases were documented and a medical interview and physical examination was performed where necessary.

Lyme Disease and Tick-Borne Encephalitis

Both Lyme disease and tick-borne encephalitis were of concern as ticks are very prevalent in the forest. All team members had vaccinations against TBE. Team members wore long sleeves and long trousers at all times when surveying and "tick checks" were undertaken after every outing.

One team member was bitten by a tick on one occasion. However, the tick was attached for probably less than 4 hours and was easily removed thus the risk of infection was relatively low. The team member was monitored for symptoms of disease but none were seen. Had symptoms been present the patient would have been evacuated to hospital.

Evacuation Procedures

The nearest hospital was in Tomsk, about 7 hours drive away. The evacuation procedures outlined in the pre-expedition assessment was put to action. The home contact and the Russian organisers were both highly supportive and efficient in co-ordinating the necessary administration concerning the evacuation. The distance of the hospital from base camp could have been a potential problem should the nature of the evacuation required more urgency. In such situations, emergency protocols by airlift would have been arranged.

VI. Tomsk Taiga Expedition Conclusion

The Tomsk Taiga expedition to Siberia had multiple and overlapping aims. The ecological monitoring project, out of which the program took form in 2005, widened to include a sociological study. This study complimented our goal of providing data to support FSC certification in the taiga forest in the Tomsk area. Our aims continued and expanded upon those of the 2005 and 2006 expeditions. As described in the Introduction, our ecological survey work aimed to achieve the following:

To provide scientific evidence to justify selection of the ten percent conservation area, a requirement of FSC certification.

To continue the methods for long-term monitoring developed in 2005 in 2006. This continuation not only allows a broader understanding of the Tomsk-area taiga, but also ensures that the methodology will be repeatable and applicable in other regions of the taiga. In this way, the expedition aimed to continue survey methods that will promote further attempts at FSC certification in Russia.

To investigate a possible link between dead wood volume and biodiversity. Providing evidence for this in Siberian taiga forest was a valuable goal given the controversial nature of this hypothesis in Russia, and may have effects on how dead wood is perceived in Siberia.

To provide data to inform future management of the area to be managed for conservation. As the maintenance of biodiversity is to be a major objective in this management, it is vital to have a picture of the current biodiversity status of the area and the various habitat types present.

The sociological research aimed to compliment these ecological goals with a broader understanding of the social context and economic capabilities of the communities that use the taiga as a material resource. It concentrated both upon the forest and the rural community beside it. As described in the methodology, the aim of the research was to discover if, in practice, the attitudes and uses of non-timber forest products by the inhabitants of Kurlek are conducive to improving and increasing current NTFP development in the region.

It is important to assess our success in achieving these aims, while also examining the broader goals that underpinned our ecological and sociological research. Our expedition sought to highlight the value of the taiga, the necessity of knowing its composition and protecting its resources. By working with local students, professors, residents, and Tomsk administrators, we aimed to show how this goal can be achieved through dynamic cooperation and collaboration. We wished to build upon the relationships with Russian expedition members established in 2005 and 2006, and so provide a foundation for further research projects. Indeed, it was our success in these broader aims and our ability to incorporate local knowledge and collaboration into our methodology that allowed us to achieve our specific research goals.

Over the 5-week period, we successfully carried out the monitoring of 129 transects. Russian participation in the monitoring process allowed us to gather enough data to ensure we could

accurately represent the selected area in our data analysis. As discussed in our results, these data have indicated certain stand types and locations within Kaltayskii Forest that are worthy of protection as conservation zones. These results emphasize the importance of the results acquired in 2005, where the data gathered illustrate that the area surrounding Lake Kireksoe is of sufficiently high biodiversity value to form the ten percent conservation area required for FSC certification. These results also emphasized the repeatability of the methodology that was developed during the expeditions. The focus of the research upon dead wood as an indicator of biodiversity will allow quantitative assessment over time of how this changes, and perhaps comparison between managed and unmanaged zones.

The successful collaboration that occurred between Russian and British expedition members extended to the sociological research. The research found that the behavior of the population of Kurlek regarding non-timber forest products fits in with the tendency of Russian people in modern times to use NTFPs for their own personal consumption rather than engage in commerce. The research also showed the economic incentive for this to change. The contemporary climate in Kurlek suggested that success for the future of NTFP development in rural Siberia must focus on the combination of two elements: the role of civil society, and encouraging interest in NTFP development at the community level. As the sociological-research chapter of this report explains, the development of NTFP production in rural Siberian villages would yield more results if its initiation came from a business perspective rather than an environmental one due to the negative image of civil society amongst rural people. The need to encourage a sense of nationalistic pride in NTFPs rather than an obligation to nature will be more likely to stimulate their development, and therefore, by proxy, the protection of the forests.

The potential to develop commerce through NTFP development returns us to the theme of sustainability with which both this project and this report began and the success with which it has been completed. The project has not only shown an area of the taiga to fulfill the biodiversity requirements for Forest Stewardship Certification, but it has also found communities in which the availability of NTFPs create potential for economic growth. The successful collaboration between British and Russian scientists and students was accompanied by new relationships between Russian artisans and potential markets for 'fair trade,' 'wild,' and 'organic' goods. The connection between Siberian artisans and organizations such as "Look East" increase the possibility of these artisans gaining access to international consumers. Both ecological and sociological research projects have shown the possibility for sustainable development and the importance of Russian and Siberian wilderness to global survival.

Appendix A: Risk Management Plan

Hazards	Risk Level	Control Measures	Additional Action
Mosquito Bites (Mosquitos are common in the taiga forest but we are not visiting a malarial area.)	High Possibility of infection	Insect repellent containing DEET to be worn at all times, especially during evenings and early mornings Long sleeves and long trousers to be worn Mosquito nets may be used when sleeping	Antihistamines, disinfectants and local anaesthetic cream will be carried in the group First Aid Kit
Brown Bear Attack / Wolf Attack (Although the brown bear can be found in the taiga forest, attacks on humans are very rare)	Slight Possibility of death	Group to remain in pairs at all times (brown bears are exceptionally unlikely to attack groups of people) Group will be accompanied by an armed guard when surveying in the forest Group will sing when working in the forest thus making sufficient noise to warn bears of their presence Group members to be regularly reminded of the recommended procedure on meeting a bear (e.g. don't run away, don't make eye contact, play dead)	Any sightings to be reported to the group leader who will reassess surveying activity
Trip or Fall (Much of our survey work will be done on foot, however the terrain visited should not be difficult.)	Moderate Possibility of fractures	Suitable footwear to be worn at all times Group to remain in pairs at all times (one person will carry out the survey work, the other will look out for obstacles)	Group members to be regularly reminded of risk All group members will carry with them their own individual first aid kit when leaving camp
Traffic accident (It is likely that the roads used during the expedition will be quiet but of a poor standard.)	Moderate / low Possibility of death	Before use, any motor vehicle will be checked for road-worthiness (state of tyres, lights, brakes, spare tyres etc.) Safety belts will be worn by all team members when possible Only Russian team members will drive during the	Team members to be reminded of risks of crossing and walking on roads

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Hazards	Risk Level	Control Measures	Additional Action
		expedition Drivers should not be over-tired or under the influence of alcohol Tents should not be pitched immediately adjacent to the road / track	
Loss of group members during survey work	Slight Possibility of death	All group members will carry a compass and whistle The group will carry 2 GPSs and all group members will know the GPS co-ordinates of the camp Group members will always stay within 25m of a transect marker Avoid working in boggy areas Groups to remain in pairs at all times and will be accompanied by a Russian guard	More experienced group members will be teamed up with less experienced members, especially in the early stages of the expedition
Drinking Water (We cannot assume that the water provided will be safe to drink.)	Moderate Possibility of gastrointestinal problems	Water will only be drunk after boiling or purification Drinks containing ice will be avoided Glasses and other drinking containers will be thoroughly cleaned before use	Antibiotics, anti-diarrhoea drugs and oral rehydration sachets included in First Aid Kit
Food Hygiene	Moderate Possibility of gastrointestinal problems	Fruit and vegetables will only be eaten following cooking or peeling Raw and undercooked meat will be avoided	Antibiotics, anti-diarrhoea drugs and oral rehydration sachets included in First Aid Kit
Sanitation (We are unlikely to be camping at recognised campsites)	Moderate Possibility of infections (especially diarrhoea, dysentery etc)	Food preparation and toilet areas to be kept separate Team to be briefed on importance of personal hygiene and campcraft	

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Hazards	Risk Level	Control Measures	Additional Action
Fire (During some of the expedition we will be cooking for ourselves on camping stoves or on open fires.)	Moderate Possibility of burns	All fires to be completely extinguished following use	Team members to be regularly reminded of risks of burns
Heat Exposure (Whilst we are in Tomsk, the average temperature is likely to be 20 °C)	Slight Possibility of death	Wide brimmed hats and suncream will be worn During the hottest part of the day, regular drinks breaks will be taken Group to remain in pairs at all times	If necessary and possible, work will be rescheduled for cooler times of day All group members will be familiar with the symptoms and will monitor one another
Hostage, kidnapping or terrorist attacks (Current FCO guidelines state that further terrorist attacks in Russia are likely, particularly in large cities and in areas bordering Chechnya.)	Slight Possibility of death	At no time will any group member travel to the areas near to the Chechen borders Team members will remain vigilant whilst in crowded areas in Moscow and Tomsk	Continued monitoring of FCO guidelines and appropriate alteration of travel plans
Plane crash (Safety standards on Russian internal flights are often lower than those on international flights.)	Slight Possibility of death	Flights will only be booked with airlines which have a good safety record and which conform to international safety standards	
Victims of street crime	Moderate Possibility of injury	Team to remain in pairs at all times Valuables to be kept hidden	
Loss of data (Data may be lost due to theft or environmental problems)	Moderate Reduced success of expedition NO health and safety problems	Where possible, data should be kept in two separate places and in two different forms	

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Hazards	Risk Level	Control Measures	Additional Action
Loss of equipment (Equipment may be lost due to theft or transport problems)	Moderate Reduced ability to deal with emergencies	Essential equipment (e.g. First Aid Kit) to be carried at all times Where possible, luggage will not be left unattended	
Tick Borne Encephalitis (Untreatable viral disease, transmitted through the bite of an infected tick, in the first instance causes flu-like symptoms, in 25% of cases a more serious febrile illness is seen.) Lyme Disease	Moderate Possibility of death	All group members to receive TBE vaccinations prior to the expedition As far as possible, avoid tick infested areas Wear light-coloured clothing which fully covers body (eg tuck trousers into socks and line cuffs with insect repellent) Routinely check for and remove ticks from body Avoid unpasteurised dairy products	All group members aware of symptoms Report any tick bites to the expedition leader, if necessary the area of work will be changed Medical kit contains suitable antibiotics for treatment of Lyme Disease
HIV/AIDS (HIV/AIDS is far more prevalent in Russia than in the UK.)	Moderate Possibility of infection	All team members to be briefed on risks of infection Team to carry own supply of sterile needles Team members to undergo full medical and dental check-ups before departure, to reduce the risk of requiring hospital treatment	
Swimming (strong current)	Moderate Possibility of death	Swimmers to remain in pairs at all times Always tell someone before going swimming	
Alcohol consumption	High/moderate Consuming alcohol during leisure time may impair judgement and put people at risk of acting impulsively, which they may later	The consumption of alcohol whilst fieldwork is in progress is banned. Participants should be aware of their limits for alcohol consumption and resist being encouraged to over-consume by others with higher tolerance. All group members should monitor how people are	

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Hazards	Risk Level	Control Measures	Additional Action
	regret.	behaving under the influence of alcohol and ensure that they are not exposing themselves to situations that they would otherwise have avoided.	
Local factors	Moderate Restrictions on photography, differing customs/sense of humour, sexual harassment, criminal element	Local knowledge, guide, circumspect behaviour.	
Other stressors	High. Accommodati on problems, differing expectations, language/com munication problems, isolation, remoteness	Open communication between team members before and during the expedition. Support from IIES. Contact arrangements.	
Individual illness	Medium. Pre-existing psychological or physical conditions.	Health declaration, special arrangements. Health surveys distributed in Lent Term.	

Appendix B: Crisis Management Plan

The Risk Assessment is a statement of the hazards that have the potential to cause harm and an indication of how likely the hazard is to happen. Control measures for each identified hazard are designed to minimise the likelihood of occurrence. The RGS states that the key to Crisis Management is:

- (a) To put in place planning systems and measures which help to recognise a crisis in the making.
- (b) To prevent one from happening in the first place.
- (c) To effectively handle a crisis if one does occur.

(a) Recognising a Crisis in the Making

Central to this is our development of the Risk Assessment. Every team member has been involved in writing the Risk Assessment and is familiar with it, so they are aware of potential hazards and are better able to identify a crisis in the making. Our Russian counterparts will be fully briefed before we start the fieldwork, and have already conducted similar studies in this area. We will have a safety briefing/discussion each morning to review potential hazards for that day and how we can minimise the risk. We will be in regular contact with the IIES in order to learn of potential difficulties.

(b) Preventing a Crisis from happening in the first place

The Risk Assessment and daily briefings are important here. Safety will be the primary factor in any decision regarding the team. Time will be taken at the beginning of the expedition, in the first few days in the field, to train team members in fieldwork and camping skills, and to acquaint the team with our Russian counterparts, thus allowing for effective and efficient communication. External hazards are harder to minimise but proper information flows through regular contact with Britain and Tomsk will enable us to adjust our plans whilst in the field according to any unforeseen events. Because we will be mobile whilst in the field it will be essential to maintain a current casualty evacuation plan. This will depend on proximity to local villages, the river (for boat access) and potential helicopter landing sites. Given the flat nature of the landscape, helicopters should be able to land in any reasonably sized forest clearing.

(c) Handling a Crisis Effectively

The RGS advocates worst case scenario planning and using the following 8-step process as a framework on which to base a Crisis Management plan:

- (i) Immediate care of a casualty/ies and other involved parties

Three members of the expedition will undertake the RGS Wilderness Medical Training course, and all remaining members will complete a Basic First Aid course. Relevant briefings (dehydration, potential risks in different study areas) will be given by the Medical Officer (Katie Marwick) and by Russian members of the expedition.

- (ii) Evacuation to relevant medical care

If casualties are mobile, kit will be distributed to non-injured members and the team will walk to the nearest village in order to arrange LandRover and/or boat transport to Tomsk. Our Russian counterparts will be able to liaise with locals to arrange this. If casualty is immobilised, stretcher to the nearest village may be appropriate. If this is not possible, air

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rescue will be arranged via satellite phone to our contact in Tomsk (Svetlana Kozlova, IIES). This will be covered by our insurance policies.

In the worst case scenario of multiple emergency immobilisations, two mobile team members, including a Russian member, will be sent to the nearest village to ask for assistance in moving casualties to the nearest helicopter landing site.

(iii) Revision of expedition logistics/objectives

With a team of 20 (10 Russian and 10 British), a casualty situation would not necessarily mean evacuating all members. However, should a crisis occur that necessitates complete evacuation, all mobile members will move to a village and then establish contact with Tomsk, and arrange removal by LandRover and/or boat. Given that helicopters generally have a carrying capacity of four, if a casualty situation did necessitate complete evacuation, the team would have to be split, with casualties travelling by air and non-injured members by LandRover and/or boat.

(iv) Communication with interested parties at home and overseas

A satellite phone will be carried in the field. Standard mobile phones and landlines should also be usable in the villages. Weekly updates will be phoned to our contact in Tomsk, and the expedition website will then be updated to allow interested parties to know progress.

(v) Monitoring of casualty/ies in care

Casualties will be evacuated to hospital in Tomsk, and our contact in Tomsk will be able to monitor the casualties and inform us (via satellite phone) of developments.

(vi) Liaison with families/close relatives

Communication in normal circumstances will be via satellite phone and our Tomsk contact to provide website updates that relatives can view. In a crisis, communication to Tomsk would be relayed to our home agent, The Tree Council, who will have all contact details for family in the UK.

(vii) Liaison with insurers/assistance agencies

Call direct from the field. Also, our contact in Tomsk will have contact details for insurers should direct contact not be possible.

(viii) Follow-up and review

The team will immediately review the situation, and a medical review will be filed in the Expedition Report.

(d) Additional Information

(i) Medical Umbrella

All British team members will have basic first aid training and the Medical Officer and two others will have attended the Wilderness Medicine Training course run by RGS. Briefings will be run pre-expedition and on arrival. The nearest hospital is Tomsk, but our Russian counterparts have run similar expeditions in the past and will have details of local doctors and health clinics.

(ii) Communications

Our primary link to both the UK and Tomsk whilst away from villages will be a satellite phone. It is important to train the team in use of the phone, and this will be undertaken before departure. A solar panel will be taken for recharging the phone while in remote areas.

The communications protocol entails contact with the Tomsk contact once a week. This should be possible even while in remote areas, as the forest is unlikely to be dense enough to preclude satellite communication. Should communication be lost, and no contact is made by the expedition for one day after scheduled arrival at a village, the 'lost communications'

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procedure will be initiated by our contact in Tomsk. This will involve contacting the village from which the team departed and initiating a search party. Should the situation become more urgent, an air search party would be arranged to fly over our expected area.

(iii) Insurance

The insurance cover will cover emergency evacuation by helicopter, hospital treatment and if necessary transport home. All expedition members will take out a comprehensive policy.

(iv) Legal Considerations

The Wilderness Medical Training covers legal issues on the medical side. We will develop a set of legal considerations resulting from this, and also any other non-medical legal issues.

(v) Contacts

All team members will carry a list of contact information for: home and Russian contacts (The Tree Council and Svetlana Kozlova), the British Embassy, and the insurance company.

Appendix C: Methodology Detail

Transect Selection

Our initial aim was to sample an equal number of managed and unmanaged stands to give comparisons of biodiversity between the two types, perhaps illustrating the value of leaving parts of the forest undisturbed – i.e. as part of a conservation zone. However, as all accessible stands appeared to be managed, we focused on sampling the full range of stand types present in the area.

Stand types were defined by observation of the dominant tree species present (and sometimes by the understory vegetation, as in the transition between dry and boggy areas). Stands ranged from pure Scot's Pine all the way through to pure broadleaf (Birch/Aspen mix), and those sampled were of a number of different ages.

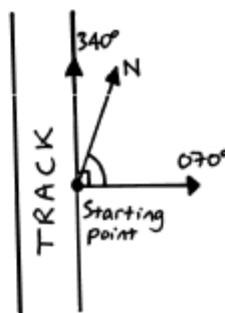
To determine what and where the types of accessible stand were we made observations whilst walking along the main tracks, recording stand changes by noting down the type of mixture (e.g. Birch/Scot's Pine 50:50 mix, 100% Scot's Pine, etc.) as well as the GPS coordinate of the change.

A map was constructed to record which stands had been sampled so that results would be not repeated.

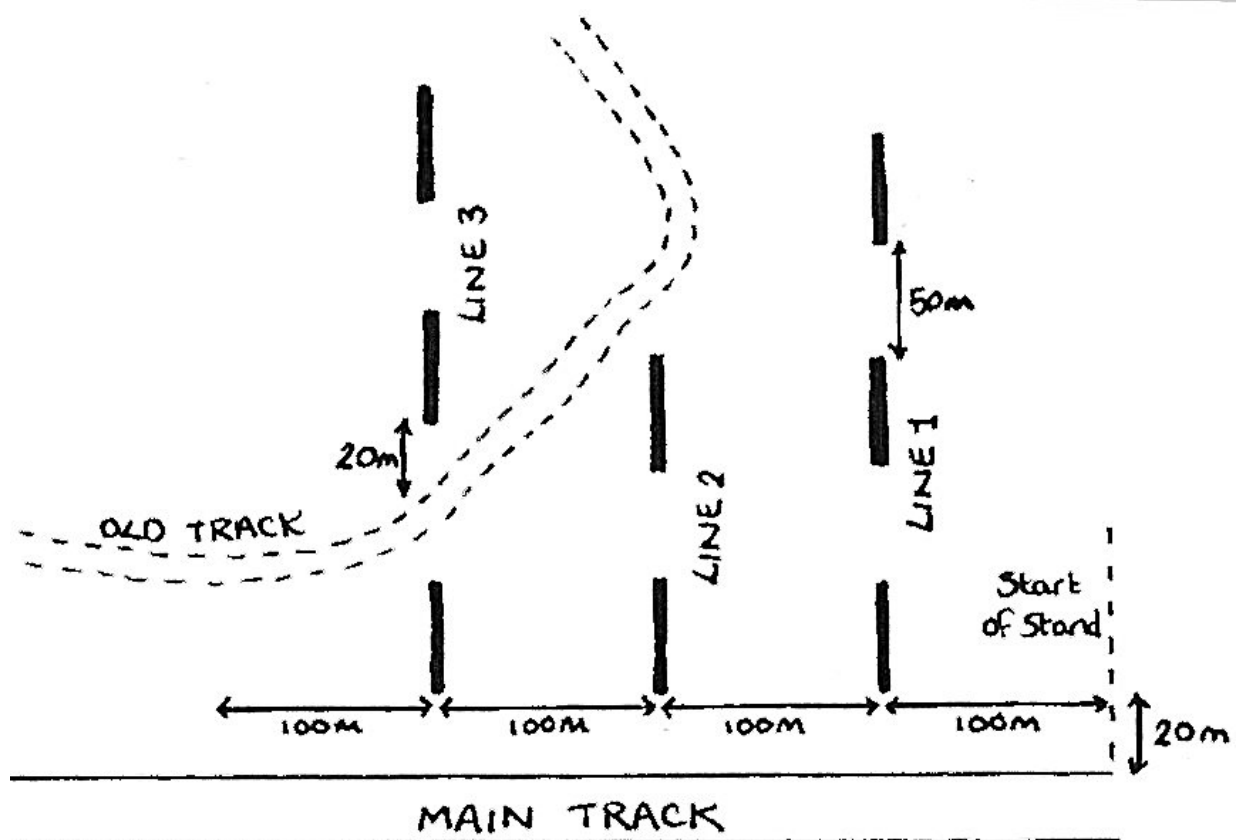
Transect Laying Process

Our method of transect laying was designed with the aim of setting out randomly chosen transects, in order to get a data set representing the stand types as a whole.

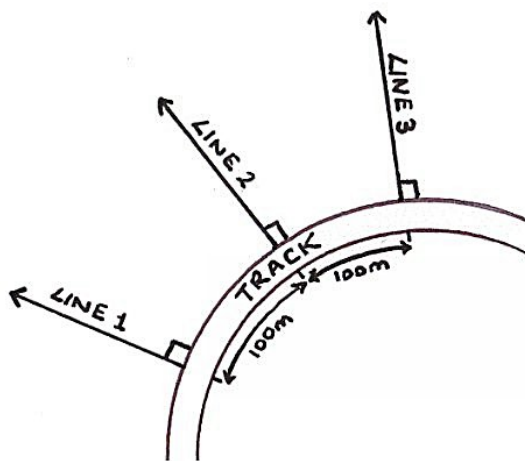
Lines of three 50m transects were laid out at a perpendicular angle ($\pm 90^\circ$) to a starting point on a track using a compass. Starting points were 100m along track from start of stand, or 100m from previous starting point. The first transect of each line was started approximately 20m into the stand, measured either from the track itself, or from the beginning of the edge of the stand if this was set back from the track edge. Each transect in the line was 50m long the line from the previous one.



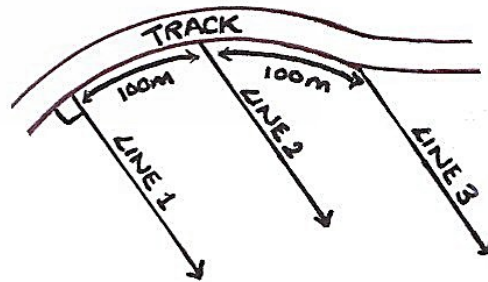
If a major obstacle was encountered (e.g. bog) then the transect line would be terminated and the next starting point found. If a minor obstacle was encountered (e.g. old track, small clearing) then any transect in progress was terminated, 20m would be measured along the bearing from the far edge of the obstacle and the transect would be re-started (such continuation of the transect line was dependant upon the stand being homogenous before and after the obstacle). In some cases if the stand edge was encountered whilst laying out the transects, any transect in progress would be terminated, 20m would be measured into the edge of the new stand along the line bearing, and a new transect laid (with a new stand number).



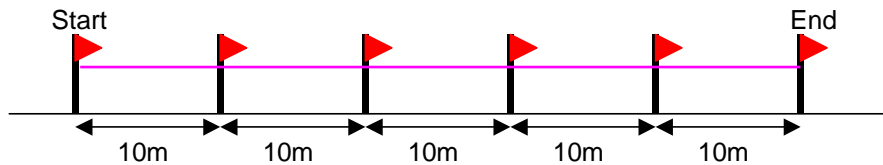
Transect lines were laid on a bearing perpendicular ($\pm 90^\circ$) to the track apart from where there was a danger of transects overlapping (e.g. on the inside of bends in the track). In such cases the first transect line would be laid on a bearing perpendicular to the track, and any subsequent lines would be laid parallel to the first. These method helped to avoid personal bias in the selection of 'random' bearings used to determine the direction of transect lines and reduced the probability of transect lines crossing.



Parallel lines on the inside of the bend.



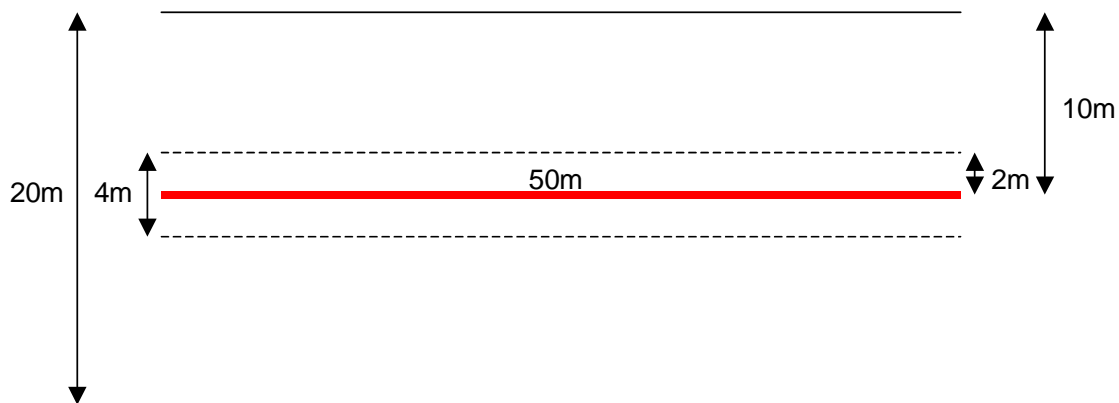
The transects themselves were marked out using flag poles placed at 10m intervals, measured and marked out by means of 10m lengths of pink and lilac nylon cord. Tying the cord around each pole and pulling it taught enabled more accurate measurements, and also increased the ease of navigation along the transect line in areas of dense undergrowth or close-growing trees. (Cord was cut to 11m: 10m length plus 50cm at either end for tying to the poles.)



Fluorescent orange plasticised-fabric flagging tape was used to mark the transect line, enabling easy navigation back to the track after the completion of the last transect. Tape was tied around large trees 10-20m apart at head height. Occasionally the entrance (starting points) of stands we meant to return to would also be marked with flagging tape.

Each transect was given a unique identifier number, and GPS coordinates were noted down at the track starting point of each transect line.

Appendix D: Data Collection - Summary



Data collected in 4m belt:

- Fallen dead wood >10cm diameter
- Snags >10cm DBH (Diameter at Breast Height), >2m in height
- Stumps <2m in height
- Root plates >1m in height
- Mammal signs, ant hills

Data collected in 20m belt:

- Large trees >30cm DBH, living or dead
- Signs of woodpecker excavations

Profiles:

- Canopy tree composition within a 25m radius from the midpoint (25m) of the transect
- Canopy height and average DBH within a 25m radius from the midpoint (2m) of the transect
- % cover of canopy, shrub and field layer within a 5m radius, taken at 0m, 25m, and 50m
- Species composition of the shrub layer and field layer within a 5m radius, taken at 0m, 25m and 50m.

Diameter classes

Diameter classes used will run as follows

- Class 1 = 10 – <20cm
- Class 2 = 20 – <30cm
- Class 3 = 30 – <40cm
- Class 4 = 40 – <50cm , etc.

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Species Codes

Scots Pine (<i>Pinus sylvestris</i>)	SCP
Siberian Pine (<i>Pinus siberica</i>)	SIP
Aspen (<i>Populus tremula</i>)	ASP
Birch (<i>Betula spp.</i>)	BIR
Siberian Fir (<i>Abies sibirica</i>)	SIF
Spruce (<i>Picea obovata</i>)	SPR
Bird Cherry (<i>Prunus padus</i>)	BCH
Rowan (<i>Sorbus sibirica</i>)	ROW
Caragano (<i>Caragana arborescens</i>)	CAR
Unknown	???

(a) Dead Wood

e.g. 2; 3.5; RR; BIR; N = Diameter Class 2; Length/Height; Rot Class (Really Rotten); Species (Birch); Naturally fallen

Two expedition members specialised in recording data on all types of dead wood (fallen dead wood, snags, stumps and root plates). Initially they conferred to ensure consistency in recording techniques. One then recorded the left hand 2m of the dead wood belt, the other recorded the right hand 2m.

(i) Fallen Dead Wood

Length (to the nearest 0.5m) and diameter (to the nearest 10cm, using diameter classes) recorded of fallen pieces of dead wood, of those parts only that are contained within 4m belt of the transect line, measured as close as possible to the line. These measurements can be used to calculate the volume of dead wood along the transect.

Stage of decay also recorded:

S = Sound (hard, most of the bark intact)

P = Partially rotten (wood hard or reasonably hard, areas of bark lost)

R = Rotten (soft when kicked)

RR = Really Rotten (disintegrates when kicked)

This will allow volumes of fallen dead wood to be calculated within the transect belt.

Pieces must touch the ground somewhere (within 4m belt) to count as fallen. Only pieces longer than 25cm and greater than 10cm in diameter were counted. Species were identified and recorded if possible (if not then '?' written on data sheet). Whether the wood had been cut by humans or was a natural fall was also recorded (as C = cut, N = natural, ? = unknown, on the data sheets).

Problems with fallen dead wood measurements:

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Apparent state of decay in birch and pine forest differed. Birch often decayed in the middle leaving much of the bark, whilst pine wood disintegrated more evenly. Therefore the state of decay was determined by the softness of the wood as well as the amount remaining.

In many areas, especially marshland areas where moss is abundant, dead wood appeared to be grown over and immeasurable (NB maybe not a problem as dead wood that has been covered would be unusable for woodpeckers and mammals).

(ii) Snags

Standing dead wood over 2m high was counted as a snag. DBH must be over 10cm.

Diameter, height, state of decay, species and whether the tree was cut or had naturally fallen were recorded where possible. Lengths were given to the nearest 0.5m, or 5m once above 12m (i.e. 10m, 12m, 15m). Diameter was given to the nearest 10cm. Woodpecker excavations were also recorded.

(iii) Stumps

Standing dead wood less than 2m high was counted as a stump, with a minimum height of 0.5m. Diameter was measured at 0.5m, to the nearest 10cm. Height to the nearest 0.5m, state of decay, species (where possible) and whether the stump was natural or as a result of logging were recorded. Also whether or not the stump was hollow through decay was recorded, as this affects volume calculations.

(iv) Root Plates

Height of root plates over 1m tall was measured to nearest 0.5m, counted if the centre of the plate fell within 4m belt. To count as a root plate it had to still have soil on it.

(b) Large Trees

e.g. L;4;BIR = Live, Diameter Class 4, Birch

[If the species could not be determined but the tree was definitely a conifer then CON (for "conifer") was written in the species section on the data sheets. '?' was written if the species was unidentifiable.]

All trees over 30cm DBH were recorded, by diameter to the nearest 10cm (using 10cm diameter classes), species, and whether they were dead or alive. This will give an indication of how many old trees are in a given area, and possibly of whether recent management is likely to have occurred (very few large trees may infer that these have been left as seed trees; a lot might mean no recent management).

Large trees were measured within the 20m belt by one set member of the team.

[In at least one instance a large tree had a double trunk, where at least one trunk had a diameter greater than the minimum required (30cm). In this case, every trunk with a diameter over 30cm was recorded as a separate large tree (trunks < 30cm were not recorded).

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In another instance a tree split to 2 trunks just above breast height, but had an obvious split down to below breast height. The tree was recorded as 1 large tree of a large diameter as the data collector could not see through the split in the trunk until above breast height.]

If trees had been burnt or charred then this was also recorded by writing '(burnt)'. If there was not enough space to apply this to every burnt tree, a 'b' was used to direct the readers attention to the "comments" box. Beetle borings were marked with a '+'. Woodpecker excavations were similarly marked with '*'.

(c) Profiles (at 0m, 25m, 50m)

These are intended to give a description of the stand type or habitat of the transect, in terms of tree species distribution and coverage of each layer, split into three:

1. Field layer, <1m in height
2. Shrub layer, 1-5m in height
3. Canopy, canopy height (>5m?)

Tree composition in the canopy was estimated only at the 25m centre point for a 25m radius, and was given to the nearest 5% for each different species, e.g. 80% Birch (BIR), 5% Aspen (ASP), 15% Scots pine (SCP). If any species was present at less than 5%, it was recorded as "trace".

Also at the 25m centre point (for a 25m radius) the average height of the canopy to the nearest 5m was given, as well as average diameter of trees at breast height (using diameter classes), to the nearest 5cm. For recording of the DBH, the average diameter class of trees would be noted \pm the range of diameter classes within the stand.

e.g. DBH = 2 ± 2 (average DBH class 2, but DBH ranges from class 0 to class 4)

This should help to give some approximate indication of the tree age in the stand. Both height and diameter measurements were estimated by eye. The percentage coverage of all 3 layers was given to the nearest 10% to indicate the structure of the habitat in terms of strata. If percentage cover was between 0% and 10% it was recorded as "<10%".

Where possible, species in the shrub layer were identified. The field layer was described in terms of presence or absence of species (over 5%). These were identified and recorded either in the field or from samples collected and taken back to the camp. Where species were unknown the nearest classification known was recorded (e.g. *Equisetum*) or a generalised group name was recorded (e.g. moss, lichen, grass, mixed broadleaf, woody herbaceous).

Average height of field layer was estimated to the nearest 20cm. Many of these measurements could only be estimated, but to ensure consistency 2 team members were kept as profile specialists. Having a picture of the habitat in the stands will allow us to correlate the types of habitat with quantities of dead wood and other indicators of biodiversity.

(d) Other signs

(i) Woodpecker excavations

Recorded (by * on the form) for every tree measured elsewhere (e.g. snags and large trees) and noted in “comments” if found elsewhere within the 20m belt. This is because woodpecker feeding sites are seen as an indicator of biodiversity, especially on dead wood.

(ii) Mammal signs

Droppings, holes/homes, feeding signs, foraging signs, digs, bark scrapings (elk), and other mammal signs – as well as actual sightings – recorded for each transect when seen. No active searching was carried out however due to lack of time and lack of expertise. It is also possible that mammal signs were missed due to a lack of expertise in recognition.

Given variable detectability depending upon density of foliage, these recordings will not necessarily be representative and so should not form a major or important part of data analysis.

(e) Insects

Due to lack of expertise, insect sightings were not recorded specifically. Presence and distance along the transect of ant hills was recorded however (in the “comments” box).

(f) Photos

To give a more visual representation of the types of stand found in the area, digital photographs were taken when sampling a new stand. If a photo was taken, this was recorded on the data sheets as “photo”.

Data Collection process

The data collection process followed the sequence dictated by the data sheets, though there were specialists in the monitoring group focussing upon one aspect (e.g. dead wood or large trees). These team members collected data individually, and then data was collated onto a data sheet at the end of each day (whilst back at camp).

GPS co-ordinates were logged at the start of each transect line rather than at the beginning of each transect due to low satellite coverage and low signal under the forest canopy (if this was not possible then an approximate position was calculated from the distance walked and the bearing, or if this was impossible then “not obtained” was recorded on the data sheet). Transect GPS readings are therefore readings from the track starting point plus 20m into the stand, plus 100m, plus 200m, etc.

e.g. 1st transect in line = starting point GPS reading + 20m
2nd transect in line = starting point GPS reading + 120m
3rd transect in line = starting point GPS reading + 220m

Appendix E: List of People Interviewed, Date and Place

- 1) Chitorkin, Vladimir Viktorovich, Chief Specialist for Committee for Regional Forest Policy, Tomsk Regional Administration, 18th July, 2007, Tomsk
- 2) Gordaneva, Liubov' Vasil'evna, attendant at Kurlek village museum, 26th July, 2007, Kurlek
- 3) Khmel'nitskii, Bogdan Sergeevich, Vice-Chairman of Committee for Regional Forest Policy, Tomsk Regional Administration, 18th July, 2007, Tomsk
- 4) Konovalov, Aleksandr Aleksandrovich, Director, *Lesnoi Tsar*, 17th July, 2007, Tomsk
- 5) Kizeev, Iuri Mikhailovich, Manager, *Kaltaiskii Opytny Leskhoz*, 23rd July, 2007, Kurlek
- 6) Ivanova, Natal'ia, Manager of birch bark craft business, 17th July, 2007, Asino, (Tomsk Region)
- 7) Pinaev, Valerii, Head of *Kaltaiskii Opytny Leskhoz* Nursery, 26th July, 2007, Kurlek
- 8) Pudzha, Natal'ia Vladimirovna, Social Welfare Specialist at Kurlek village council, 26th July, 2007, Kurlek
- 9) Rogachev, Vladimir Nikolaevich, Director, *Kaltaiskii Opytny Leskhoz*, 18th July, 2007, Kurlek
- 10) Viktorov, Vasilli Borisovich, Manager, *Kaltaiskii Opytny Leskhoz*, 23rd July, 2007, Kurlek
- 11) Konstantin, birch bark craftsman, 17th July, 2007, Asino, (Tomsk Region)

Section two – Living Conditions/Community

13. Were you born in the village? a. Yes [] b. No []

14. Have you always lived in the village? a. Yes [] b. No []

15. (If they say no, then ask)

Where else have you lived and date?

.....
.....
.....

16. How long have you lived in this house? (years/months)

17. Did you build your house yourself? a. Yes [] b. No []

18. (If they say no, ask) Who built it? When?

.....
.....

19. Overall, how would you rate this village as a place to live?

a. Very good [], b. Good [], c. Ok [], d. Bad [], e. Very bad []

20. Do you think there are sufficient amenities in the local area such as schools, shops and other places to work? a. Yes [] b. No []

If not, what in particular is lacking?

.....

21. Do you belong to any religion or religious denomination? If yes, which one:

a. No, I do not [] b. Muslim [] c. Russian Orthodox [] d. Jew []

e. Roman Catholic [] f. Protestant [] g. Other [].....

22. How much influence does the local church have on the day-to-day running of village life? a. A lot [], b. Some [], c. Not much [], d. None [], e. Don't know []

Section three – The Forest

22a. Have you always worked as a (see question 4) a. Yes [] b. No []

23. (If they answer no, then ask)

What other occupations have you had?

.....

24. Did you know there is a new Russian Forest Code? a. Yes [], b. No []

25. (if yes, then)

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To the degree that you are familiar with the Code, how in your opinion will it affect the following points. For a positive influence put +, and for negative put - .

- a. Forest conservation []
- b. Local Economy []
- c. Local Business []
- d. Regional Business []
- e. National Business []
- f. International Business []
- g. Illegal Logging []
- h. Personal needs []
- i. The village []
- j. Future generations []

26. Do you think there are any problems with the forest currently? a. Yes [], b. No []

27. (if they say yes, ask)

What problems are you referring to?
.....

28. Is there a need to change the way the forest is managed? a. Yes [] b. No []

29. Do you know what Forest Stewardship Council certification means? a. Yes [] b. No []

30. (If they say yes, ask)

Please explain what you understand by FSC certification

.....
.....
.....
.....

31. Which of the following do you think is the best way to ensure you can continue using the forest the way you currently do?

- a. Leave the forest alone, untouched []
- b. Only take minimal products, like a small amount of fire wood occasionally []
- c. Cut down some areas of forest completely, but leave others standing []
- d. Do whatever you want []

Section Four: Investment in the village

32. Have there been any new projects begun in the village over the past 5 years? a. Yes [] b. No []

33. (If yes, then ask)

Please elaborate on these projects:

.....

.....
.....
.....
.....

Section Five: Non Timber Forest Products

34. Do you understand the term: Non Timber Forest Products? a. Yes [] b. No []

35. (If yes, then ask)

Please tell me what you understand by that phrase?.....
.....
.....

(If they say no, explain the concept briefly)

36. Has anyone, Russian or foreign, spoken to you about selling these products on a larger scale? a. Yes [] b. No []

37. (If yes, then ask)

Please tell me what was suggested.
.....
.....
.....

38. When in season, which of the following forest products do you use? Please state whether you use them 1 – regularly (daily), 2 – often (3-4 times a week), 3 – a lot (1-2 times a week), 4 – sometimes (3-4 times a month), 5 – rarely (1-2 times a month), 6 – very rarely (5-8 times a year), or 7 – never.

a. Mushrooms [], b. Berries [], c. Firewood [], d. Herbs [], e. Pine nuts [],
f. Pine sap [], g. Hunting [], h. Insects [], i. Birch bark []

39. What do you do with these products? Please state the percentage of the collection appropriate to each use.

- a. Sell all [] (100%) To whom?
- b. Sell some [%] To whom?.....
- c. Consume immediately at home [%]
- d. Store for winter [%]

40. (If products are stored for winter, then ask) How do you mainly store your food for winter?

- a. Pickle [] What?.....
- b. Dry [] What?.....
- c. Salt [] What?.....
- d. Sugar [] What?.....

History of Non Timber Forest Product Usage

41. Are there products you used to collect but no longer do? a. Yes [] b. No []

42. (If yes, then ask) What are the products you no longer collect and what is the reason for no longer collecting them?

.....
.....
.....

43. When did you stop collecting them?

- a. Within the last year []
- b. Within the last 2-3 years []
- c. Within the last 5 years []
- d. Within the last 10 years []
- e. Within the last 15 years []

Section six – Income

I am going to ask some questions about your household income.

44. Is your income more or less than the national minimum?

a. Same [] b. More [] c. Less []

45. Have you ever borrowed money in order to increase your access to Non-Timber Forest Products? a. Yes [] b. No []

46. (If yes, then) What did you borrow and what was the result of the purchase?

.....
.....

47. What is currently your household’s main source of income?

48. In which of the following ways does your household supplement its income?

- a. Tree felling [] b. Berry picking [] c. Mushroom picking []
- d. Pine cone collecting [] e. Arts and Crafts [] f. Networks (family, friends, neighbours etc) []
- g. Physical work [] h. Government support [] i. NGO/church help []
- j. Other [].....

49.

- a. What percent of your household budget would you estimate the forest accounts for? [%]
- b. What percent of your household budget does your paid work account for? [%]

50. On average, how many hours a day do you spend relaxing? [] hours

51. How do you spend this time?.....

52. On average, what percentage of your household's weekly income is spent on food? [%]

51. What percentage of your household's weekly income is spent on accommodation and bills? [%]

52. Overall, how satisfied are you with the financial situation of your household, percentage wise where 0% is completely dissatisfied, and 100% is completely satisfied: []

55. How do you think the financial situation of your household compares to 1/5/10 years ago, on a scale of 1-10 where 1 is much worse, 5 is the same and 10 is much better:

I) 1 year ago

- a. Increased (if so, by how much [in percentage]) [%]
- b. Stayed the same
- c. Decreased (if so, by how much [in percentage]) [%]

II) 5 years ago

- a. Increased (if so, by how much [in percentage]) [%]
- b. Stayed the same
- c. Decreased (if so, by how much [in percentage]) [%]

III) 10 years ago

- a. Increased (if so, by how much [in percentage]) [%]
- b. Stayed the same
- c. Decreased (if so, by how much [in percentage]) [%]

Section seven – Attitudes to organisations and institutions

Having talked earlier about your neighbourhood, I would now like to ask a few questions about your relationship with the institutions of the wider community.

56. I am going to name a number of organisations. For each one, can you tell me whether or not you trust them. You have three variants for this answer:

- 1. Trust – please mark box with +
- 2. Distrust – please mark box with –
- 3. Don't know – please mark box with a /

- a. The church []
- b. The armed forces []
- c. Media []
- d. The police []
- e. The government []
- f. International companies []
- g. Regional companies []
- h. Charitable or humanitarian organisations []

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57. Do you vote? a. Yes [] b. No [] c. Sometimes []

Section six – overall attitudes

Finally I would like to ask you some questions about your overall attitudes.

58. Taking all things into account, how much would you say you were happy with your life? [in percentage – where 100% is maximum happiness] [] %]

59. Some people feel that they have a completely free choice and control over their lives, while others feel that what they do has no real effect on what happens to them. Please indicate how much freedom of choice and control you feel you have over the way your life turns out: [in percentage – where 100% is maximum control] [] %]

Thank you for your answers!

Appendix G: Russian Language Questionnaire

Анкета

Уважаемые жители, в рамках проекта по совершенствованию лесопользования в Томской области проводится социологический опрос. Мы будем очень признательны, если Вы найдете время ответить на несколько вопросов. Анкетирование носит анонимный характер, то есть сведения о Вашем ФИО и месте жительства не включены в анкету.

Информация о себе

1. Пол а. Мужской [] б. Женский []
2. Возраст []
3. Место рождения.....
4. Профессия.....
...
5. На каком языке вы разговариваете дома?
а. Русский [] б. Татарский [] в. Оба [] г. Другой []
какой?.....

Семья

6. Сейчас вы:
а. Свободны [] б. Женаты (замужем)/гражданский брак [] в. Живете отдельно/Разведены []
г. Вдовец/Вдова []
7. Сколько человек проживают с вами постоянно.
а. – Сколько детей до 16 лет? []
б. – Сколько человек трудоспособного возраста? []
в. – Сколько пенсионеров? []
8. Есть ли у вас дети? а. Да [] Сколько?..... б. Нет [] в. Беременна []
9. Имеете ли вы родственников, которые проживают в более крупных городах?
а. Да [] (Где?.....) б. Нет []
10. Переехали ли они из села в город? а. Да [] Когда?..... б. Нет []
11. (Если да, то) Почему?.....
12. Чем они теперь занимаются?.....

Условия проживания/сообщество

13. Родились ли вы здесь? а. Да [] б. Нет []
14. Всегда ли вы жили в этом деревне? а. Да [] б. Нет []
15. (Если нет, то) Где еще вы жили и когда?
.....
...

А сейчас мне бы хотелось узнать, как у Вас решаются проблемы с жильем:

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16. Как долго вы живете в этом доме? (годы/месяцы)

17. Вы сами построили дом? а. Да [] б. Нет []

18. (Если нет, то) Кто его построил? Когда?

.....

...

19. В общем, как вы оцениваете эту деревню в качестве места проживания?

а. Очень хорошо [], б. Хорошо [], в. Нормально [], г. Плохо [], д. Очень плохо []

20. Как вы думаете, достаточно ли здесь школ, магазинов и т.д.? а. Да [] б. Нет []

Если нет, то что именно?

21. Исповедуете ли вы религию? Если да, то какую:

а. Нет [] б. Ислам [] в. Православие [] г. Иудаизм []

д. Католицизм [] е. Протестантизм [] ж. Другое []

].

22. Какое влияние оказывает местная церковь на жизнь местного населения? а. Большое []

б. Некоторое [], в. Небольшое [], г. Никакого [], д. Не знаю []

Лес

22а. Всегда ли вы работали (см. вопрос 4) а. Да [] б. Нет []

23. (Если нет, то)

Чем еще вы занимались?

24. Знаете ли вы, что принят новый лесной Кодекс? а. Да [] б. Нет []

25. (Если да, то)

На сколько вы знаете про лесной Кодекс, как, по вашему мнению, Кодекс влиял бы на следующие пункты. На что положительное влияние поставьте +, а на что отрицательное поставьте - :

а. Защита леса []

б. Местная экономика []

в. Местный бизнес []

г. Областной бизнес []

д. На российский бизнес в целом []

ж. Международный бизнес []

е. Незаконная вырубка леса []

и. На собственные нужды []

к. На деревни []

л. Будущие поколения []

26. Как вы думаете существуют ли проблемы, связанные с лесом, в настоящее время?

а. Да [], б. Нет []

27. (если они отвечают «да», спросите)

Какие вы проблемы имеете в виду?

.....

28. Существует ли необходимость изменить подход к лесопользованию? а. Да [] б. Нет []

29. Знаете ли вы, что такое FSC сертификация (сертификация лесного попечительного совета)? а. Да [] б. Нет []

30. (если «да», то)

Пожалуйста, объясните, что вы понимаете под FSC сертификацией

.....
.....

31. Что из перечисленного ниже, по вашему мнению, является наилучшим способом продолжения использования леса?

- а. Оставить лес в покое, нетронутым []
- б. Брать только минимальные продукты, как то, небольшое количество леса изредка []
- в. Полностью вырубать небольшие участки, но оставлять другие нетронутыми []
- г. Делать что угодно []

Инвестирование в деревню

32. Запускались ли какие-либо проекты в деревне за последние 5 лет? а. Да [] б. Нет []

33. (Если да, то) Пожалуйста, расскажите о таких программах

.....
.....
.....
.....

Недревесные лесные ресурсы

34. Вы понимаете термин: недревесные лесные ресурсы? а. Да [] б. Нет []

35. (Если «да», то) Пожалуйста, скажите мне что вы понимаете под данной фразой?

.....
..
.....
.....

(Если они отвечают «нет», объясните вкратце концепцию)

36. Кто-нибудь предлагал Вам, русский или иностранец, продавать эти продукты в большом объеме? а. Да [] б. Нет []

37. (Если «да», то)

Пожалуйста, скажите что вам предлагали.

.....
.....
.....

38. Какие из нижеследующих лесопродуктов вы используете? Пожалуйста, ставьте подходящую цифру в коробке. **Ключ:** 1 – регулярно (ежедневно), 2 – часто (3-4 раза в неделю), 3 – много (1-2 раза в неделю), 4 – иногда (3-4 раза в месяц), 5 – редко (1-2 раза в месяц), 6 – очень редко (5-8 раз в год), или 7 – никогда.

- а. Грибы [], б. Ягоды [], в. Дрова [], г. Травы [], д. Кедровые орехи [],
- е. Ореховое масло [], ж. Охота [], з. Насекомые [], и. Кора березы []

39. а) Что вы делаете из этих продуктов? Пожалуйста, уточните процент сбора каждого из продуктов.

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- а. Продаю все [100 %] Кому?
- б. Продаю кое-что [... %] Кому?.....
- в. Потребляю сразу же дома [... %]
- г. Заготавливаю на зиму [... %]

40. (Если продукты заготавливаются на зиму, тогда спросите) Как обычно вы заготавливаете продукты на зиму?

- а. Мариную [] Что?..... б. Засушиваю [] Что?.....
- в. Солю [] Что?..... г. Засахариваю [] Что?.....

История использования недревесных лесных ресурсов

41. Есть ли какие-либо продукты, которые вы собирали, но больше не собираете? а. Да [] б. Нет []

42. (если да, то спросите) Какие продукты вы больше не собираете, пожалуйста, пишите причины этого.

.....
.....
.....

43. Когда вы перестали их собирать?

- а. В прошлом году []
б. В течение прошлых 2-3 лет []
в. В течение прошлых 5 лет []
г. В течение прошлых 10 лет []
д. В течение прошлых 15 лет []

Раздел четвертый- домашний доход

Я собираюсь задать вам вопросы о вашем семейном доходе.

44. Ваша зарплата больше или меньше прожиточного минимума (примерно 3500 руб.)

- а. Также [] б. Больше [] в. Меньше []

45. Брали ли Вы кредиты для увеличения процента заготовки лесных продуктов?

- а. Да [] б. Нет []

46. На что брали и какой результат?.....

47. Что является основным источником семейного дохода?

48. Какие из перечисленных ниже пунктов приумножают ваш доход?

- а. Рубка леса [] б. Сбор ягод [] в. Сбор грибов []
г. Сбор сосновых шишек [] д. Искусство и ремесла [] е. Связи (семья, друзья, соседи и т.д.) [] ж. Трудовая деятельность [] з. Правительственная поддержка [] и. неправительственная организация /помощь церкви [] к. Другое [].....

49. а. Какой процент в семейном бюджете играет лес? [%]

- б. Какой процент от Вашего семейного бюджета формирует основная работа? [%]

50. В среднем, сколько часов в день вы отдыхаете?.....

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51. Как вы проводите это время?.....

52. В среднем, какой процент вашего месячного дохода вы тратите на продукты питания? [..%]

53. Какой процент вашего домашнего месячного дохода вы тратите на коммунальные услуги? [%]

54. В целом, насколько вы удовлетворены Вашим семейным достатком: (удовлетворен в %, максимум 100%): [%]

55. Как вы оцениваете свое финансовое положение в сравнении с тем, что было 1/5/10 лет назад? Поставьте Ваши варианты ответов в процентах:

i) 1 год назад:

а. Улучшилось (если да, то на сколько %, максимум 100%): [..%]

б. осталось без изменений []

в. ухудшилось (если да, то на сколько %, максимум 100%): [..%]

ii) 5 лет назад:

а. улучшилось (если да, то на сколько %, максимум 100%): [..%]

б. осталось без изменений []

в. ухудшилось (если да, то на сколько %, максимум 100%): [..%]

iii) 10 лет назад:

а. улучшилось (если да, то на сколько %, максимум 100%): [..%]

б. осталось без изменений []

в. ухудшилось (если да, то на сколько %, максимум 100%): [..%]

Раздел пятый – отношение к организациям и институтам

Мы уже говорили ранее о вашем районе, в связи с этим мне бы хотелось задать вам несколько вопросов о вашем отношении к институтам более широкого объединения.

56. Я хочу вам назвать несколько организаций. Как вы относитесь к данным организациям: У вас есть 2 варианта ответов для каждого пункта:

▪ доверяю (если да, то поставьте «+», если нет, то поставьте «-»)

▪ не знаю (поставьте «/»)

а. Церковь []

б. Вооруженные силы []

в. СМИ []

г. Милиция []

д. Правительство []

е. Иностраннные компании []

ж. Региональные компании []

з. Благотворительные или гуманитарные организации и другие общественные объединения []

57. Ходите ли Вы на выборы? а. Да [] б. Нет [] Иногда []

Раздел шестой – общее отношение

В конце мне бы хотелось задать вам несколько общих вопросов.

58. Учитывая все вышесказанное, насколько вы довольны своей жизнью (на сколько %, максимум 100%): [%]

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59. Некоторые люди чувствуют, что они имеют абсолютную свободу выбора и контроль над своей судьбой, в то время как другие думают, что они не влияют на то, что с ними происходит. Укажите, какую свободу выбора и контроля над своей жизнью вы имеете: на сколько %. (максимум 100%) [%]

Спасибо большое за Ваши ответы!

Appendix H: Figures 1-9

For a given product, figures 1-9 show how often a certain percentage of Kurlek uses that product when it's in season.

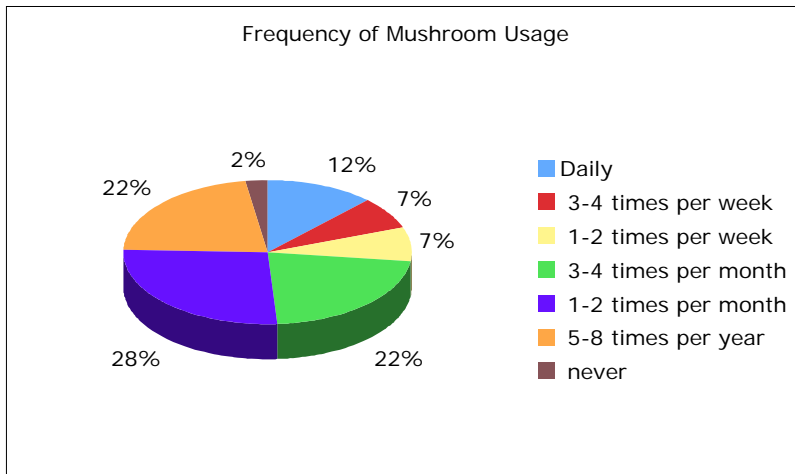


Figure 1

Figure 2

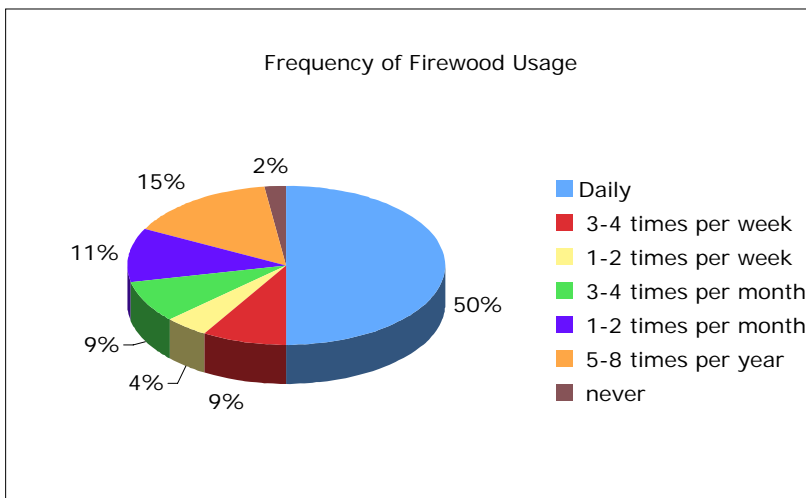


Figure 3

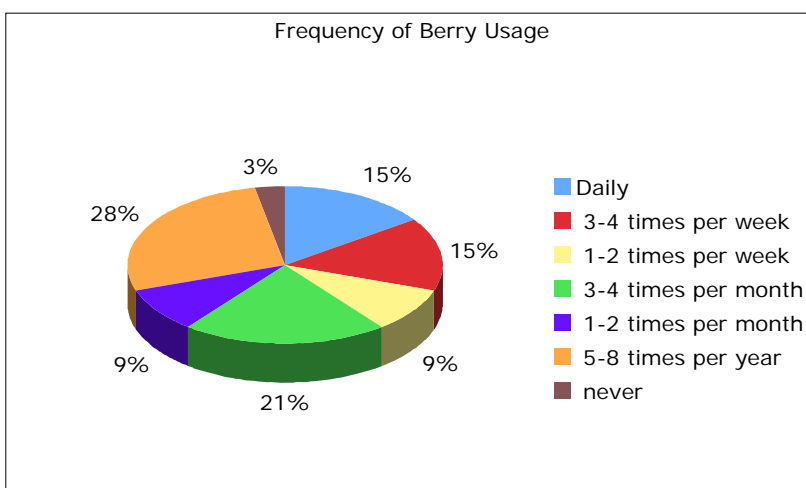


Figure 4

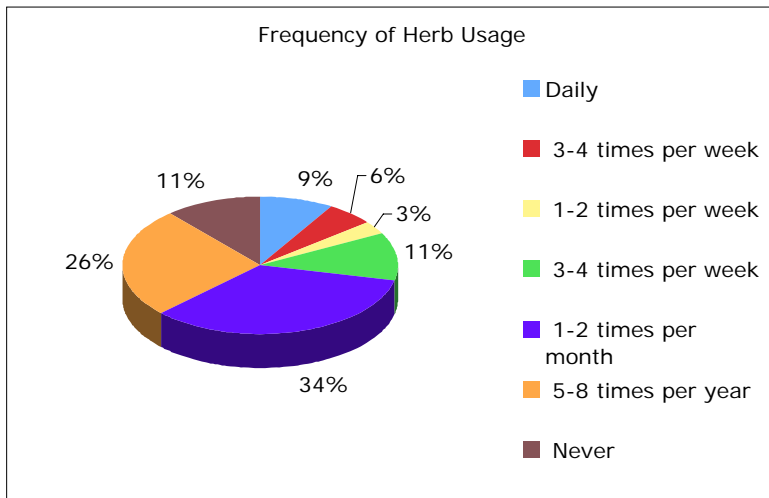


Figure 5

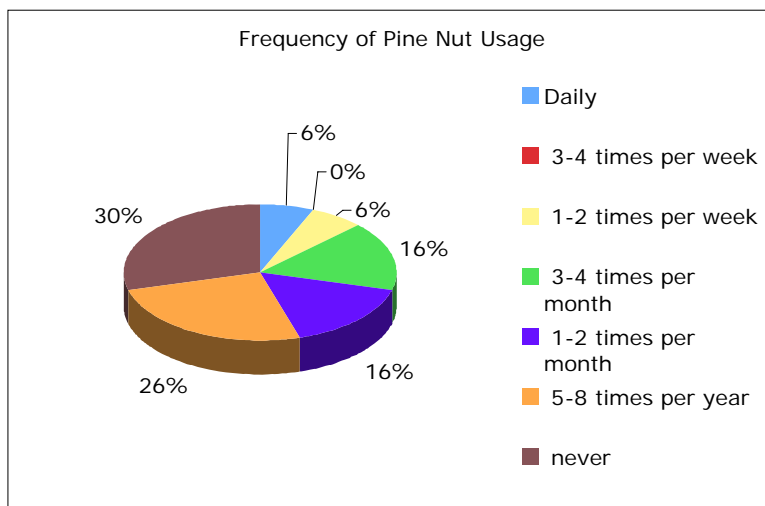


Figure 6

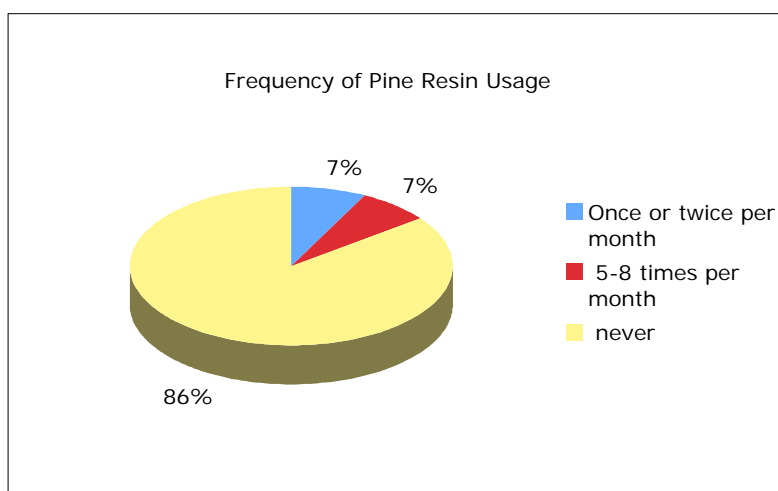


Figure 7

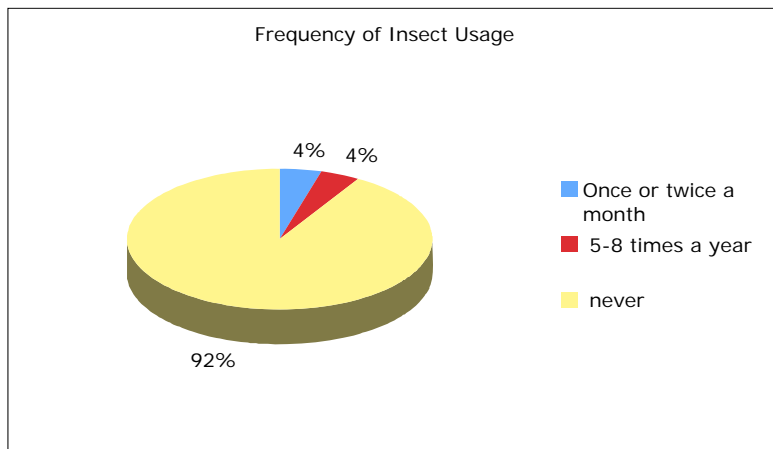


Figure 8

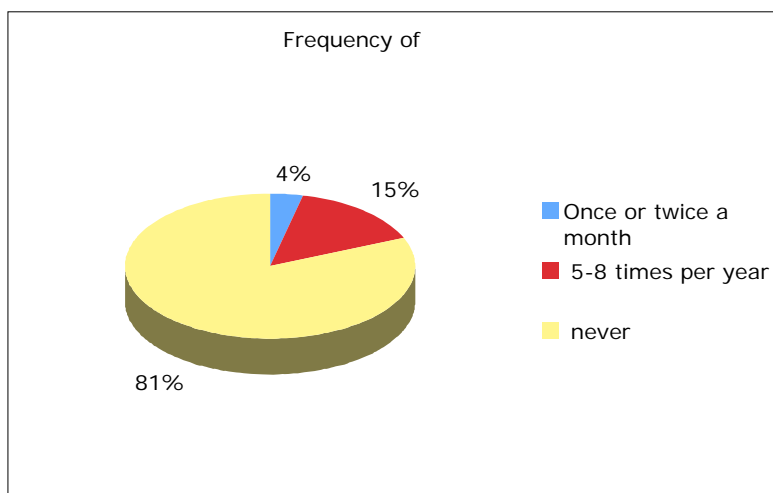
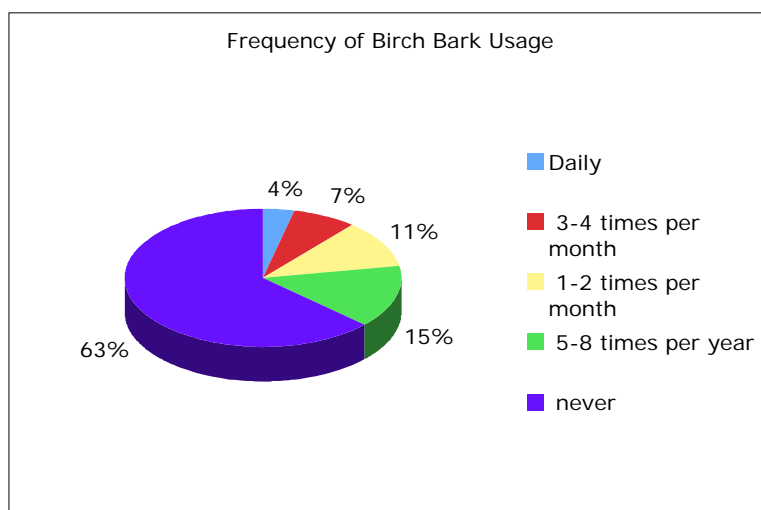


Figure 9



Appendix I: Figures 10-13

Figure 10 shows the percentage of Kurlek’s population that stores a certain percentage of their NTFP harvest for winter, Figure 11 shows what percent the forest contributes to a certain percentage of the population’s household income.

Figure 10

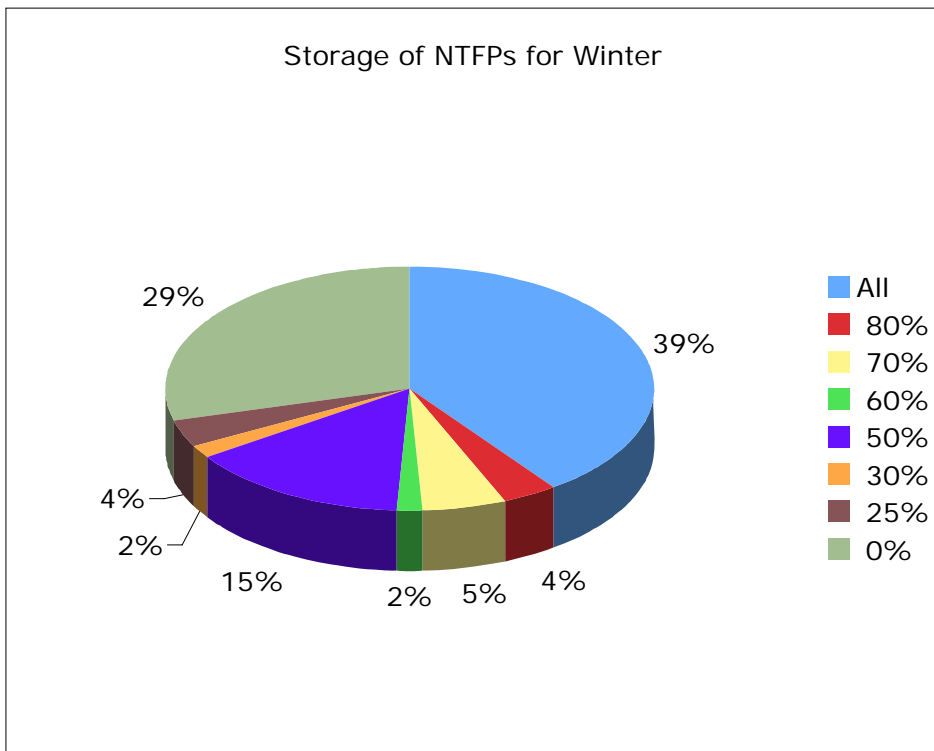


Figure 11

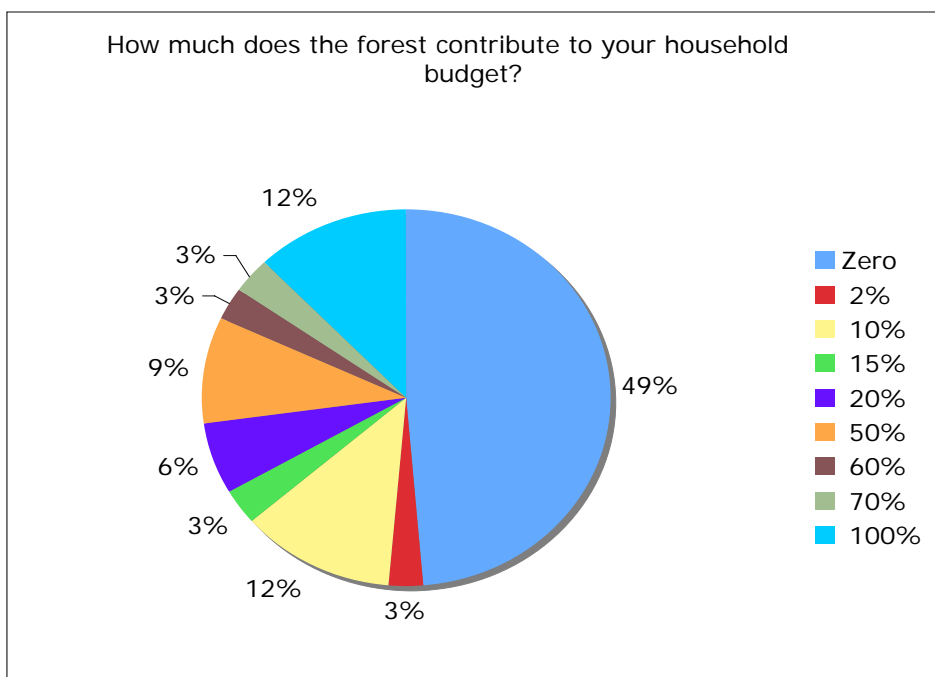


Figure 12 shows the percentage of villagers' satisfaction with their lives: 100% = very satisfied; Figure 13 shows the percentage of villagers who feel a certain freedom over their choices: 100% is absolute freedom

Figure 12

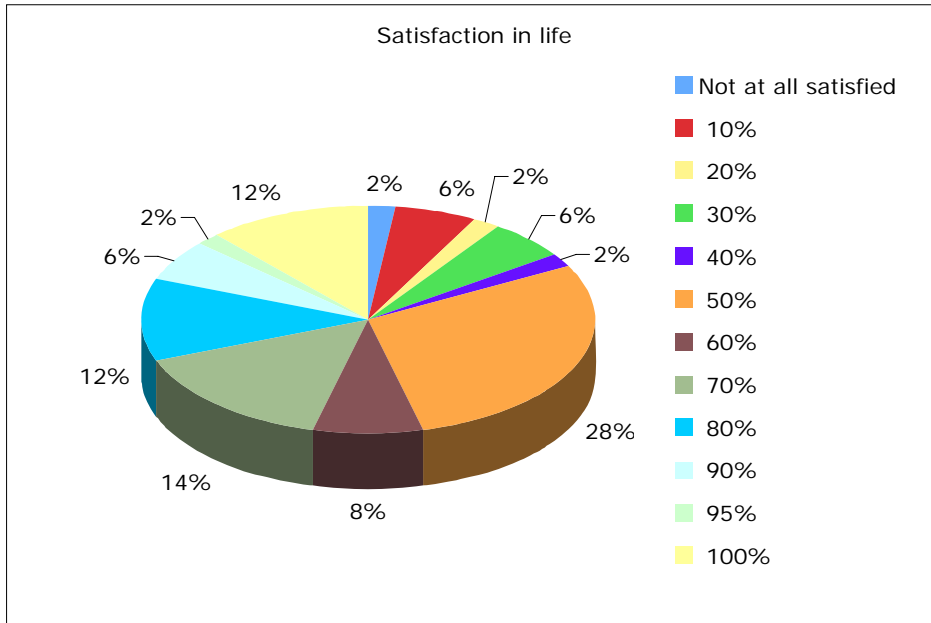


Figure 13

