International Institute for
Applied Systems Analysis
Schlossplatz 1
A-2361 Laxenburg, Austria

Tel: +43 2236 807 342
Fax: +43 2236 71313
E-mail: publications@iiasa.ac.at
Web: www.iiasa.ac.at

Interim Report **IR-01-015**

Assessment of Potential Productivity of Tree Species in China, Mongolia and the Former Soviet Union: Methodology and Results

Günther Fischer (fisher@iiasa.ac.at)
Harrij van Velthuizen (velt@iiasa.ac.at)
Sylvia Prieler (prieler@iiasa.ac.at)

Approved by

Arne Jemelöv (jernelov@iiasa.ac.at)
Acting Director, IIASA

March, 2001

Contents

Figures

Plates

Tables

Appendixes

Abstract

Over the past twenty years, the term agro-ecological zones methodology (AEZ) has become widely used for global regional and national assessments of agricultural potentials. The AEZ methodologies and procedures have recently been extended and newly implemented to make use of the latest digital geographical databases, and to cope with the specific characteristics of seasonal temperate and boreal climates.

This report presents details of a companion model of AEZ that enables assessments of potential productivity of forest tree species. It is referred to as FAEZ.

The FAEZ methodology follows an environmental approach; it provides a standardized framework for the characterization of climate, soil and terrain conditions relevant to forest production and it uses environmental matching procedures to identify limitations of prevailing climate, soil and terrain for a range of tree species and assumed management objectives.

The model for the estimation of biomass increments is based on two well established and robust models: the Chapman-Richard biomass increment model, and the AEZ potential biomass model.

FAEZ includes an inventory of ecological adaptability characteristics as well as an inventory of specific ecological and environmental requirements for 52 boreal and temperate forest tree species. The natural resources inventory is based on the up-to-date LUC-GIS database of climate, soil, terrain and vegetation covering China, Mongolia and former Soviet Union.

Results of potential productivity for tree species in North, Central and East Asia are presented under three different sets of assumptions of forest resources management and exploitation, namely: conservation forestry, traditional production forestry and biomass plantation forestry.

Acknowledgments

This study is a first systematic ecological assessment of land productivity for boreal and temperate tree species for a large area. It covers the territory of China, Mongolia and the States of the Former Soviet Union. The study builds on methodologies and procedures developed by IIASA and FAO for its recently completed Global Agro-Ecological Zones 2000 study. This current study, specifically for boreal and temperate tree species, would not have been carried out at this time without the financial support provided by the New Energy and Industrial Technology Development Organization(NEDO), (IIASA-Contract 99-148, NEDO, Paris, France), and the Netherlands Organization for Scientific Research (NWO), (IIASA Contract 00-140 -- NWO, The Netherlands) and without intellectual support and the facilities made available by IIASA's Land Use Change (LUC) project.

Further we wish to express our gratitude to Mr. Otto Vaessen jr., student of Larenstein University of Professional Education in Velp, The Netherlands for assistance with data collection and to Ms. Cynthia Enzlberger-Vaughan for editing the report.

About the Authors

Günther Fischer is the leader of a major research project at IIASA on *Modeling Land Use and Land Cover Changes in Europe and Northern Asia (LUC).* A primary research objective of this project is the development of a GIS-based modelling framework, which combines economic theory and advanced mathematical methods with biophysical land evaluation approaches to model spatial and dynamic aspects of land-resources use. He was a member of the IGBP-HDP Core Project Planning Committee on Land-Use and Land-Cover Change (LUCC), and is a co-author of the LUCC Science Plan. He serves on the Scientific Steering Committee of the joint LUCC Core Project/Programme of the IGBP-IHDP, and leads the *LUCC Focus 3 office* at IIASA.

Harrij van Velthuizen has over twenty years experience in applied land resources ecology. He was a member of the working group that developed FAO's Agro-Ecological Zones (AEZ) methodology. As senior consultant and chief technical advisor, van Velthuizen has been working for projects on agro-ecological assessments for agricultural development planning in countries in Asia, Africa and South America. Since 1995, van Velthuizen has been working closely with the IIASA-Land Use Change Project on enhancement of the AEZ methodologies and various applications for the Former Soviet Union, China, Bangladesh, Kenya and Nigeria and at the global level. Recently he has also been serving as land resources ecologist in a FAO/UNDP project concerned with *Utilization of Agro-ecological Zones Databases* at the Bangladesh Agricultural Research Council, and as an advisor on agro-ecological zoning in a DANIDA/World Bank project on *Environmental Information Systems Development* in Ghana.

Sylvia Prieler is a Research Scholar and Geographic Information Systems (GIS) expert with the Land-Use Change (LUC) Project at IIASA. In 1994 she obtained her Master's degree in landscape planning and ecology at the University of Agricultural Sciences, Vienna. She studied at the University of Manchester for a year in 1993, where she wrote her dissertation on *Environmental Assessment - Assessing Impacts on Terrestrial Ecology and on the Landscape in the British context.*

In 1994 Ms. Prieler joined the IIASA project on "Regional Material Balance Approaches to Long-Term Environmental Policy Planning". In 1997 she joined the IIASA LUC project as a GIS expert. She maintains the large LUC Arc/Info GIS databases, and handles many requests for GIS-related services both from the LUC researchers and outside collaborators. In addition, Ms. Prieler is working on specific LUC research tasks with regard to climatic variability in China and its impact on agricultural production potential.

Assessment of Potential Productivity of Tree Species in China, Mongolia and the Former Soviet Union: Methodology and Results

Günther Fischer, Harrij van Velthuizen, and Sylvia Prieler

Chapter 1 Approach for the Assessment of Tree Species Productivity

1.1 Background

Why do particular trees grow where they do? How do they cope with their environment? How do they respond to change? How productive are they – or could they become? These questions can only be answered if we know how trees and forests function from eco-physiological and environmental perspectives, and the way environmental factors and management (e.g. drought, competition, fertilization, thinning) affect growth and partitioning.

Research in forestry has traditionally been empirical – treatments are applied and results are observed, usually over periods of years (Landsberg, 1986). Forest yield predictions are traditionally based on the site-index method and growth site correlation. The site-index estimation is made on the basis of the height of the dominant and co-dominant trees of a fully stocked and evenly aged stand. The index is estimated for permanent sample plots, which are normally established on sites with varying environmental conditions. Growth-site correlations are based on such sample plots, laid in a substantial number of stands that are well distributed over a range of environments found within an area, and are measured repeatedly over a period of time to obtain growth data. In each of the sample plots, values of land characteristics thought likely to affect tree growth are recorded. In this way, simple or multiple correlations can be established between growth and site factors. Site factors, significantly related to growth, are subsequently surveyed for other parts of the area for which no direct growth data is available, thus enabling yield predictions to be made for the entire study area. These techniques are empirical instruments and do not employ information on tree and forest ecologies.

With an increased emphasis on multiple use forestry, plantation forestry, community forestry, agroforestry, and more recently on forests as renewable energy sources and the role of forests in global CO_2 balances, the scope of quantitative land evaluation for forestry is widening. In land evaluation, the definition of land qualities is generally dictated by the sophistication of the ecological characterization embodied in the land resources inventory. Also, the formulation of land use requirements, in terms of land qualities, depends on the knowledge concerning the processes that govern the growth of trees and forests, and how those processes are affected by the prevailing environmental conditions.

1.2 Ecological Approach

Quantitative and semi-quantitative land evaluation methods in particular the FAO/IIASA Agro-Ecological Zones (AEZ) approach for crop productivity assessment, have been adapted for the development of a companion model that assesses potential productivity of forest tree species, referred to as FAEZ.

Similar to AEZ, the FAEZ methodology follows an environmental approach; it provides a standardized framework for the characterization of climate, soil and terrain conditions relevant to forest production and it uses environmental matching procedures to identify land use specific limitations of prevailing climate, soil and terrain resources, for assumed management objectives.

In its simplest form, FAEZ contains three basic elements as sketched in Figure 1 below:

(i) Selected production systems with defined management objectives and species-specific environmental requirements and adaptability characteristics. These are termed Land Utilization Types;

(ii) Geo-referenced climate, soil, terrain and land cover data which are combined into a land resources database, and

(iii) Procedures for the calculation of potential biomass increments, and procedures for matching forest species environmental requirements with the respective environmental characteristics contained in the land resources database.

1.3 This Report

This report presents the FAEZ methodology and results of potential productivity for tree species in North, Central and East Asia under different assumptions of forest resources management and exploitation, namely: conservation forestry, traditional production forestry and biomass plantation forestry.

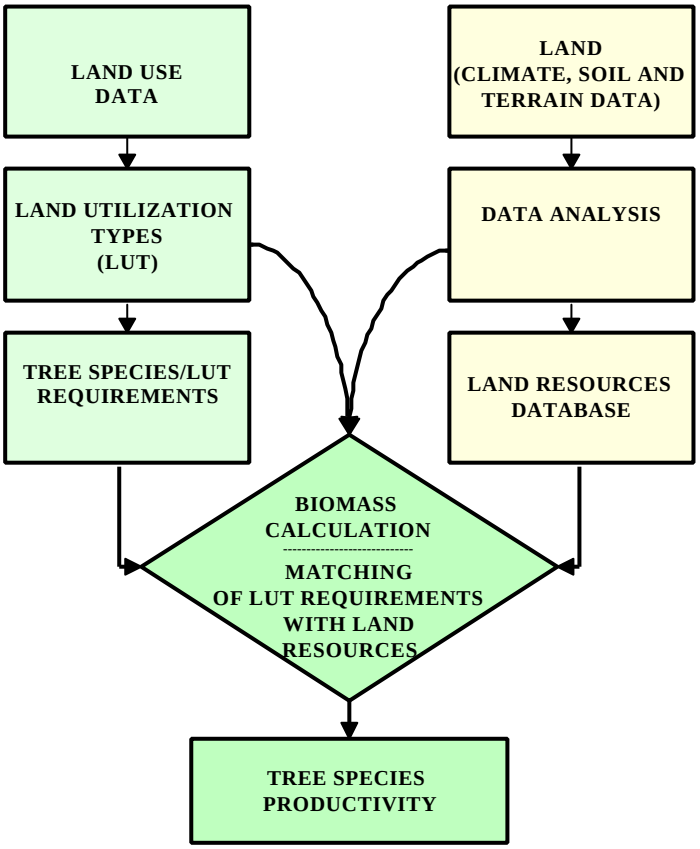


Figure 1 Conceptual framework of methodology

The report includes an inventory of ecological adaptability characteristics as well as an inventory of specific climate, soil and terrain requirements for 52 boreal and temperate forest tree species. It also provides the same details of the LUC-GIS database of climate, soil, terrain and vegetation covering China, Mongolia and former Soviet Union, which constitute the 'backbone' of the study.

Chapter 2 Methodology Overview

Figure 2 presents a schematic overview of the flow and integration as implemented. The figure is explained in Box 1.

The FAEZ procedures are implemented to operate on a GIS grid-cell database. For each grid-cell, first a climatic analysis is performed to derive climatic indicators relevant for matching climate conditions with thermal requirements of tree species. Then, for LUTs passing this thermal screen, a soil moisture balance is calculated and average annual biomass increments are estimated. Subsequently, these are adjusted for limitations due to soil and terrain conditions. The results are stored in a grid-cell LUT database, as input to scenario analysis, mapping and tabulation.

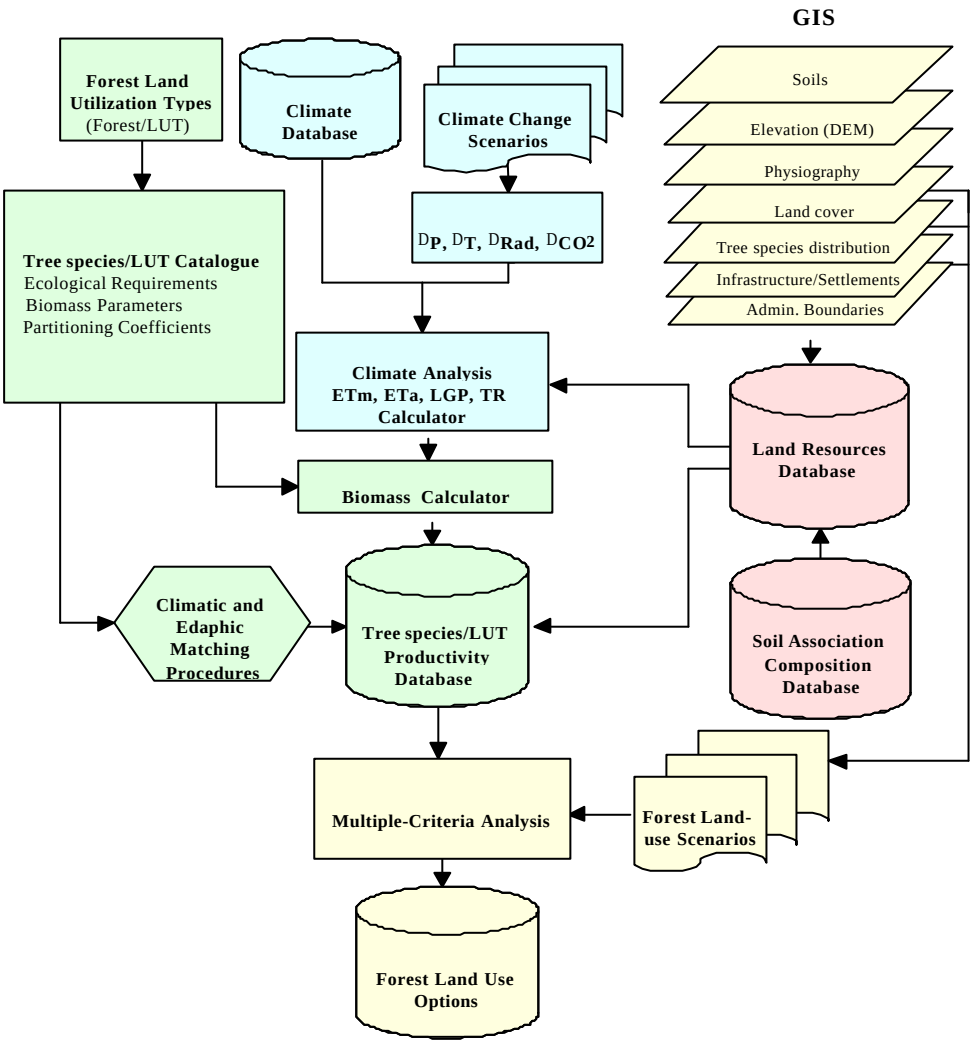


Figure 2 Productivity Assessment for Tree Species

Box 1

Forest Land UtilizationTypes (LUT)

The forest land utilization types include definitions and descriptions of 52 tree species. The LUT attributes include characteristics of the tree species and information on management practices, inputs and utilization of produce. The LUTs have been defined for three management objectives, i.e., *conservation forestry*, *traditional production forestry* and *biomass plantation forestry*.

Tree species/LUT catalogue

The tree species catalogue database provides a quantified description of LUTs including crop adaptability characteristics such as: rotation length, vegetation period, photosynthetic pathway, photosynthesis temperature relationships, maximum leaf area index, partitioning coefficients, and parameters describing ecological requirements.

Climate database

The climate database with a 5 km grid-cell size contains long-term averages of monthly mean climate parameters. For China the climatic database was expanded with historical data on precipitation and temperatures for the period 1958-1997.

Climate scenarios *(not implemented for this initial study)*

FAEZ has been set up to allow application of climate sensitivity tests and GCM based climate scenarios.

Land characteristics (GIS)

Soils, elevation (DEM), physiography, vegetation zones, present land use/cover and administrative divisions are kept as individual layers in the geographical information system:

- Soil and terrain data, from the Soil and Physiography database for North and Central Asia. (FAO/IIASA 1999), covering China, Mongolia, and the territory of the former Soviet Union
- Elevation data, from the GTOPO30 data set (EROS Data Center, 1998). Altitude differences of neighboring grid-cells were applied to compile a terrain slope/aspect distribution database in terms of seven average slope range classes.
- Land cover data was derived for China, from the 1:1,000.000 Land Use map of China (Wu Chuanjun, 1991); for the FSU from the IIASA/LUC Agricultural Regionalization and Land Categories databases (Stolbovoi *at al.*, 1997a, b), and for Mongolia from the Vegetation Distribution Inventory for Mongolia (Sitch and van Minnen, 1996).
- Infrastructure information has been derived from the Digital Chart of the World (DCW, 1993). It has been used to create an accessibility inventory for the territory of China, Mongolia and the FSU.
- Tree species distribution in China, derived from the Vegetation map of China, Institute of Botany, Chinese Academy of Sciences in Beijing. For the FSU, from the IIASA/LUC Vegetation database http://www.iiasa.ac.at/Research/LUC/GIS

Soil association composition database

The soil association composition database contains occurrences of soil units, soil phases, textures and terrain slope classes.

Land resources database (GIS)

The land resources database includes layers of the digital soil map of North and Central Asia, the slope distribution database, land cover layers, infrastructure and administrative areas and associated attribute databases.

Climate data analysis (ETo, ETa, LGP and TR calculation)

From basic climatic data, monthly reference evapotranspiration (ETo) is calculated according to Penman Monteith. A water-balance model provides estimations of actual evapotranspiration (ETa) and length of growing period (LGP). Temperature and elevation/aspect data are used for the characterization of thermal regimes (TR) as follows:

- Thermal climates, representing major latitudinal climatic zones;
- Winter and summer temperatures and extreme temperatures;
- Temperature growing periods (LGP_t), and

- Accumulated temperatures.

Tree species/LUT thermal requirements

Temperature requirements of individual tree species are matched with temperature regimes prevailing in individual grid-cells. For grid-cells with an optimum or sub-optimum match, biomass increment calculations are performed.

Biomass increment calculation

The FAEZ methodology for the calculation of potential biomass is based on the Chapman-Richard biomass increment model and the eco-physiological biomass and yield model of Kassam. It provides temperature and radiation limited biomass increments of individual tree species.

Climatic suitability

Climatic constraints cause direct or indirect losses in the biomass increment. Climatic constraints[1] are influenced by the following conditions:

- The variability and degree of water-stress during the growing period;
- Constraints indirectly related to climatic conditions (e.g., pests, diseases and invasion of unwanted species or weeds);
- The climatic factors which effect the efficiency of forestry operations and costs of production;
- The risk of occurrence of late and early frost, and
- The risk of forest fire (for conservation forestry).

The climatic constraints for individual tree species - by management objective – have been specified according to the prevailing temperature and moisture regimes.

Soil and terrain suitability

The edaphic suitability assessment is based on matching of soil and terrain requirements of tree species with prevailing soil and terrain conditions. These are management/input specific.

Tree species/LUT productivity database

The results of the matching of tree species/LUT-specific environmental requirements with prevailing climate, soil and terrain conditions is combined with quantified biomass increments. This data is stored in the tree species/LUT productivity database by grid-cell.

Forest Land Use Scenarios/Multiple criteria analysis *(not implemented for this initial study)*

Forest land-use scenarios are formulated on the basis of actual and desired land-use. These scenarios and the potential productivity for the Forest LUTs serve as input in the multiple criteria analysis tool, which in turn provides selection of individual grid-cells feasible for forest land-use alternatives.

1 At this stage of the methodology development, constraints indirectly related to climatic conditions such as pests, diseases, invasion of unwanted species or weeds and workability, have not been taken into account.

Chapter 3 Land Resources Database

The FAEZ methodology for the productivity assessments of forest species provides a framework for establishing a spatial inventory and database of land resources. The land resources inventory (LRI) includes components of climate, soils, landform, current land cover and accessibility. The individual LRI components are selected, defined and classified in a manner that is as much as possible matching available specifications of ecological requirements of tree species.

The climatic resources inventory is based on the Leemans and Cramer climate database (Leemans and Cramer, 1991), which was enhanced in IIASA/LUC with the help of the Potsdam Institute for Climate Impact Research (PIK). The database offers a spatial resolution of 5 km and contains monthly climate averages which allow quantification of each 5 km grid-cell in terms of thermal climates, summer-, winter- and extreme temperatures, temperature sums, various types of length of growing periods, moisture deficits and surpluses, etc.

The Soil and Physiography database for North and Central Asia (FAO/IIASA, 1999), covering China, Mongolia, and the territory of the former Soviet Union was used. This digital soil map presents soil associations in grid-cells of 5-km resolution. The composition of soil associations is described in terms of percentage occurrence of soil units, soil phases and textures.

Terrain slopes were derived from the GTOPO30 digital elevation data. From this DEM also a terrain-slope distribution database was compiled.

3.1 Climate Resources

3.1.1 Moisture regimes

Monthly totals of reference evapotranspiration (ET_0) are calculated for each grid-cell. A water-balance model, comparing moisture supply from rainfall/snow and storage in soils with potential evapotranspiration provides estimations of actual evapotranspiration (ET_a).

A general characterization of moisture conditions is achieved through the concept of *length of growing period* (LGP), i.e., the period during the year when both moisture availability and temperatures are adequate for plant growth.

The growing period continues beyond the rainy season because of moisture stored in the soil profile. The amount of soil moisture stored in the soil profile, and available to plants varies with depth of the soil profile, the soil physical characteristics, and the rooting pattern of the plant. Depletion of soil moisture reserves causes the actual evapotranspiration to fall short of the potential rate. Soil moisture storage capacity of soils (*Smax*) depends on soil physical and chemical characteristics, but above all on effective soil depth or volume (Fisher *et al.,* 2000). For tree species the maximum effective rooting depth has been assumed to range between 0.5 m and 2 m.

The Smax values presented in Table 1 were used to set limits to available soil moisture, enabling calculation of possible extension of the growing period beyond the end of the rainy season by soil unit, soil texture class, and soil phase. Plate 1 presents length of growing period zones in map form.

Table 1 Soil moisture storage capacity classes derived for FAO soil units and soil depth/volume limiting soil phases

Class	Smax (mm)	Soils with Lithic Phase (mm)	Soils with Petroferric and Duripan	Soils with Skeletic and Rudic Phases (Revised Legend '90)
1	225 mm	50 mm	115/50 mm	115 mm
2	185 mm	40 mm	90/40 mm	90 mm
3	150 mm	35 mm	75/35 mm	75 mm
4	115 mm	25 mm	55/25 mm	55 mm
5	50 mm	15 mm	35/15 mm	25 mm
6	15 mm	n.a.	n.a.	n.a.

3.1.2 Thermal regimes

Thermal regimes are quantified for each grid-cell in terms of four types of attributes, namely:

- Thermal climates, representing major latitudinal climatic zones;
- Winter and summer temperatures;
- Temperature growing periods (LGP_t), and
- Temperature sums

Thermal Climates

The thermal climates are obtained through classifying of monthly temperatures corrected to sea level (with an assumed lapse rate: 0.55°C/100m). The temperate and boreal belts have been subdivided according to continentality into three classes, namely: oceanic, sub-continental and continental. The subtropics have been subdivided into a summer and winter-rainfall type. Table 2 presents the thermal climate classification used for sub-tropical, temperate and boreal zones. The geographic distribution of the thermal climates is presented in Plate 2.

Table 2 Thermal climates

Thermal climate classification	
Subtropics: One or more months with monthly mean temperatures, corrected to sea level, below 18°C but above 5°C	**Subtropics Summer Rainfall** Northern hemisphere: rainfall in April - September ≥ rainfall in October - March Southern hemisphere: rainfall in October - March ≥ rainfall in April - September
	Subtropics Winter rainfall Northern hemisphere: rainfall in October - March ≥ rainfall in April - September Southern hemisphere: rainfall in April - September ≥ rainfall in October - March
Temperate: At least one month with monthly mean temperatures, corrected to sea level, below 5°C and four or more months above 10°C	**Oceanic Temperate:** Seasonality less than 20°C*
	Sub-continental Temperate: Seasonality 20-35°C*
	Continental Temperate: Seasonality more than 35°C*
Boreal: At least one month with monthly mean temperatures, corrected to sea level, below 5°C and more than one but less than four months above 10°C	**Oceanic Boreal:** Seasonality less than 20°C*
	Sub-continental Boreal: Seasonality 20-35°C*
	Continental Boreal: Seasonality more than 35°C*
Polar/Arctic: All months with monthly mean temperatures, corrected to sea level, below 10°C	

* Seasonality refers to the difference in mean temperature of the warmest and coldest month, respectively.

Winter and summer temperatures

Mean temperatures of the warmest and coldest months as well as minimum temperatures of the coldest month were determined. Plate 3, 4 and 5 present the respective isotherm maps.

Temperature growing periods and temperature sums

In addition to thermal climates and temperature extremes, temperature growing periods (LGP_t) have been calculated. For instance $LGP_{t=5}$ of 5°C, i.e., the number of days when mean daily temperature exceeds 5°C, represents the period with temperatures suitable for plant growth. Similarly $LGP_{t=10}$ of 10°C approximates the frost-free period. Lengths, beginning and ending dates of such periods are calculated for each grid-cell and are stored in the attribute database. Plate 6 and 7 present respectively maps of temperature growing periods ($LGP_{t=5}$) and frost-free periods ($LGP_{t=10}$). Accumulated temperatures have been calculated for base temperatures of 0, 5 and 10°C. Plate 8 and 9 present maps of temperature sums with base temperatures of respectively 5 and 10°C.

3.1.3 Aspect and terrain-slope effects on micro-climate

Many studies have shown how micro-climate and forest responses differ on north and south facing slopes. The solar geometry calculations provide a means for computing incident solar radiation to any combination of slope aspects each day of the year (Garnier and Ohmura, 1968 and Swift, 1976). From differences in computed solar radiation aspect related temperature differences can be inferred. For instance a south facing slope would be 1-2°C warmer than flat terrain. A north facing slope however might be 1-2°C cooler than flat terrain. On south facing slopes snow may melt 1-2 months earlier than adjacent north facing slopes of the same elevation.

The terrain slopes data derived from GTOP030 also provide information on aspect. With the help of procedures described by Warring and Running (1998), effects of slope/aspect combinations can be used to modify attributes of the climate database (including solar radiation, temperature, evapotranspiration and growing period parameters). Thus, the forest productivity assessment, in particular in high latitude zones, can take account of micro-climatic effects of prevailing aspect and terrain slope combinations.

3.2 Soil and Terrain Resources

The source of soil information used is the Soil and Physiography database for North and Central Asia (FAO/IIASA 1999), covering China, Mongolia, and territory of the former Soviet Union. This digital soil map presents soil associations in grid-cells of 5-km resolution. The composition of soil associations is described in terms of percentage occurrence of soil units, soil phases and textures. Therefore, each 5 km grid-cell is considered as consisting of several land units.

The soil units, classified according to the revised legend of the FAO/Unesco Soil Map of the World (FAO/Unesco/ISRIC, 1990), are defined in terms of measurable and observable properties of the soil itself. Many of these properties are relevant to the use and production potential of soils. Through linkage with the World Inventory of Soil Emissions Potential (WISE) soil profile database (Batjes *et. al.*, 1997) statistics on physical and chemical soil attributes by 'FAO'90' soil unit/topsoil texture combinations were derived for matching soil requirements of the tree species with soil characteristics (Table 3).

Table 3 List of soil attributes derived from WISE soil profile database

Profile identifiers
FAO-Unesco soil unit (1990 Legend)
Topsoil textural class
Attributes (for topsoil and subsoil)
Organic carbon
pH(H_2O)
Sum of exchangeable Ca, Mg, Na and K (TEB) ◊
Ratio of exchangeable Ca/Mg ◊
Ratio of exchangeable (Ca+Mg)/K ◊
Effective CEC†
CEC_{soil}
CEC_{clay} ◊
Base saturation (as %)
$CaCO_3$ content
Gypsum content
Exch. sodium percentage (ESP) ◊
Bulk density
Total porosity (as derived from bulk density) ◊
% sand
% silt
% clay
Available Water Capacity (AWC_1; from pF 2.0 to pF 4.2)
Available Water Capacity (AWC_2; from pF 2.5 to pF 4.2)

◊ Calculated from other measured soil properties.

† ECEC is defined as sum of exchangeable [Ca+Mg+K+Na]+ exchangeable [H+Al], after Van Reeuwijk (1993).

Two sources of geo-referenced terrain slopes are available for use: (i) terrain slopes indicated in the mapping unit expansion tables of the digital soil map, and (ii) terrain slopes derived from GTOPO30 data (EROS Data Center, 1998). The latter terrain-slope database has been generated with a rule-based algorithm to calculate slope distributions in terms of seven slope classes per 5 km grid-cell, based on neighborhood relationships among grid-cells in the 30 arc-second GTOPO30 database (Fischer *et al.* 2000).

Terrain slopes indicated in the digital soil map distinguish three broad slope classes as follows:

Class a: *level to undulating*, dominant slopes ranging between 0 and 8 percent;
Class b: *rolling to hilly*, dominant slopes ranging between 8 and 30 percent;
Class c: *steeply dissected to mountainous,* dominant slopes over 30 percent.

The terrain slopes of the digital soil map apply to the dominant soil unit of a soil association mapping unit. Where two slopes are indicated for a mapping unit (i.e., a/b or b/c), they apply each to 50 percent of the extent of the dominant soil unit. For all associated and included soils, default slope classes (Table 4) are assigned to the individual soil units (FAO, 1978-81) as follows:

Table 4 Default slope classes

Default slope class	Soil Units in FAO'90
a	Fluvisols, Gleysols, Histosols, Planosols, Solonchaks, Solonetz and Vertisols
a/b	Arenosols, Anthrosols, Chernozems, Ferralsols, Greyzems, Gypsisols, Kastanozems, Luvisols, Lixisols, Podzoluvisols, Phaeozems, Plinthosols, and Podzols
b	Acrisols, Alisols, Calcisols, Cambisols, Nitisols and Regosols
b/c	Andosols, and Lepthosols

The slope classes of the digital soil map are very broad and do not reflect the information contained in recent digital data sets. Hence, the above broad slope classes have been refined on the basis of knowledge about soil unit-slope relationships and information derived from GTOPO30. Slopes derived from the 30 arc-second DEM were allocated to soil units occurring within individual soil associations (Fisher *et al.,* 2000).

3.3 Seasonal Wet Sites

High groundwater levels, water-logging and flooding affect the distribution of tree species. These soil wetness conditions are restricted mainly to floodplain areas, water collecting sites and in some cases also to poorly drained flat terrain. Excessive soil wetness conditions are usually due to internal soil drainage characteristics or prolonged frozen condition of soils. In particular in continental temperate and boreal zones, poorly drained or frozen soils in flat terrain frequently become submerged or water-logged in early spring as a result of water accumulation from snowmelt.

Fluvisols and Gleysols

The flooding attributes of Fluvisols are generally controlled by external factors such as a river's flood regime which in turn is influenced by hydrological features of the catchment area and catchment/site relations, rather than by the amount of 'on site' precipitation. The flooding regime in arid and semi-arid zones is often erratic. In some years severe flash floods may occur, while in other years no floods may occur at all. In sub-humid and humid zones flooding is more regular but duration and depth of flooding may vary widely from year to year.

Gleysols are not directly affected by river flooding. These soils are however frequently situated in low-lying water collecting sites and when not artificially drained, Gleysols may be subject to water-logging or even inundation as a result of combinations of high groundwater tables and ponding rainwater. In sub-humid and humid areas Gleysols often remain wet for extensive periods, rendering them unsuitable for tree species sensitive to water-logging.

On the other hand, certain trees species which are tolerant to flooding, water-logging and high groundwater tables may perform well on residual soil moisture available on both, Fluvisols and Gleysols. Therefore, the separate suitability classification for water collecting sites does account for

specific tolerances to excess moisture (high groundwater tables, water-logging and flooding/inundation). Gleysols are mostly but not necessarily subjected to water-logging and inundation, as are the 'natural Fluvisols'. Therefore, Gleysols with terrain-slopes of less than 2% in the model are handled as Fluvisols.

Excess water due to snowmelt

Excessive wetness might however also occur in other soils. For example, in continental temperate and boreal areas, as result of snowmelt at the end of the winter period, large tracts of land tend to become waterlogged or ponded with water. Especially flat terrain with poorly drained soils may be affected by substantial periods of wet conditions (Fischer *et al.*, 2000). Depending on the amount of excess moisture from melted snow, the following assumptions were made for the period of waterlogged conditions[2] (Table 5).

Table 5 Post-winter period of water-logging due to snowmelt

Excess moisture from snowmelt (mm)	Length of period of water-logging (days)	
	Very poorly drained soils	Poorly/imperfectly drained soils
40	0	0
80	5	0
120	15	10
180	30	20
240	45	30

Note: Drainage classes are according to the FAO Guidelines for Soil Description. (FAO, 1990)

3.4 Land Cover and Accessibility

Prior to the actual productivity assessments, current occurrence of cultivated areas and forested areas and accessibility to infrastructure was inventoried and integrated in the basic land resources database. From data available in the IIASA LUC project, a GIS[3] coverage of agriculture and forest land for the territory of China, Mongolia and the former Soviet Union was compiled (Plate 12). This coverage has been used to mask or select areas, that are in use for cultivation, are under forest, or are under other permanent uses such as urban areas, mining areas etc.

Infrastructure information of the Digital Chart of the World (DCW, 1993) has been used to create an accessibility inventory for the territory of China, Mongolia and the FSU. With standard GIS procedures buffer zones[4] of 10 km around roads and railways were established, i.e., 5 km on each side (Plate 11). The coverage of buffer zones subsequently was converted into a 5km grid, which in turn served as a proxy for accessibility.

2 Periods of excessive rainfall may also lead to widespread waterlogging or even ponding during the vegetation period of trees. Therefore, levels of accumulated excess rainfall have been treated in a similar manner as wetness originating from snowmelt after the winter period.

3 The map showing cultivated areas and forested areas has been compiled from the land categories inventory of the FSU (Stolbovoi *et al.* 1997a), the 1:1,000,000 land use map of China (Wu Chuanjun, 1994) and Vegetation Distribution for Mongolia (Sitch and van Minnen, 1996). These three data sets were combined, a reclassification was applied featuring agriculture and forest, and was transferred to the 5km grid.

4 It has been assumed that a distance of 5km to nearest road or railway would facilitate sufficiently the accessibility required for forest management and logging operations.

Chapter 4 Potential Productivity Analysis

4.1 Land Utilization Types

The suitability of land for trees relates to the performance of the forestry system, which involves two components, the land unit and land utilization type. Land utilization types (LUTs) must be defined before the assessment of the suitability of land. Different LUTs have different requirements for land quality. If the quality of a land unit matches the land use requirement of a defined LUT, its suitability is high. Furthermore, selection and definition of LUTs guides the selection of land characteristics to be represented in the land resources inventory. These characteristics are then used as evaluation criteria in the suitability analysis (FAO, 1984).

In this study, covering boreal, temperate and subtropical part of China, Mongolia and the former Soviet Union, the data used for the definition of LUT includes tree species characteristics such as: rotation height, rotation length, achieved maximum production levels, temperature dependent rates of photosynthesis, partitioning coefficients, moisture stress related yield reduction coefficients, wood density coefficients, and CO_2 sequestration capacities. Further, parameters are included which describe ecological requirements of the individual tree species regarding radiation regimes, thermal regimes, moisture regimes and regarding soil and terrain conditions.

Three kinds of forest resources management and exploitation are assumed. The first type has as management objectives, nature conservation, bio-diversity preservation and limited selective extraction of individual trees, and/or environmental protection objectives such as stabilization of steep slopes, dunes or shifting sand and windbreaks/dust filters. This type is referred to as '*conservation forestry*'. The second type reflects traditional forestry, with main management objectives being maximizing quality and quantity of timber/wood/pulp production. This type is referred to as '*traditional production forestry*'. The third type captures the fully mechanized bio-fuel and pulpwood production for energy generation and industrial application of pulpwood. This type is characterized by short rotations of single stem or coppice systems and is referred to as '*biomass plantation forestry*'.

The LUT data compiled for this study comprises 36 deciduous tree species, 14 coniferous species and 2 deciduous coniferous species (larches).

Conservation forestry

This forestry type consists of mixed forest with multi-aged stands. The management is focused on preservation of a diversified ecosystem; it includes some basic measures for fire protection and extraction of selected dominant and co-dominant trees. Invasion of exotic species as well as occurrences of pests and diseases are monitored and minimized. Stands are generally tending towards climax conditions. Extraction takes place at sub-optimum rotation lengths, generally mature or over-mature individual trees.

Under unprotected conditions in arid and semi-arid environments (aridity index[5] of vegetation period P/PET < 0.5), forest fires occur at intervals as short as 15 years to about 60 years. These zones are dominated by fire-susceptible light coniferous tree species (such as larch and pine) and some small-leaved species (such as *Betula papyrifera*). In moderately dry boreal, temperate and subtropical-winter rainfall zones (aridity index 0.5 - 1.0), characterized by a mix of mainly dark and light coniferous tree species and some broad-leaved species, forest fire intervals occur roughly between 75 and 150 years. In sub-humid and humid zones (including subtropics with summer rainfall) dominated by broadleaved and dark coniferous forest species, occurrences of forest fires are rare (adapted from Shvidenko and Nilsson, 1995). The size of areas affected by individual forest fires in the majority of the incidents is typical less than 5 ha, but in extreme cases in particular in dry boreal environments fires may cover areas as large as 50,000–200,000 ha (Payette, 1992). It has been assumed that the conservation forest LUTs are affected by fire hazards at regular intervals (see Section 4.4).

---

5 Plate 12 presents the aridity index map (P/PET) covering China, Mongolia and the FSU

The LUT attributes listed in Table 6 form the basis for the tree species suitability assessment for conservation forestry.

Table 6 Conservation forestry LUTs

LUT Attributes	Conservation Forestry
Tree species considered	Birch, Poplar, Willow, Oak, Beech, Hornbeam, Ash, Alder, Lime, Maple, Robinia, Chestnut, Walnut, Larch, Spruce, Pine and Fir.
Produce	Wood for various purposes
Management objectives	Land conservation: Sand dune fixing, slope stabilization, wind break, pollution/dust filters, soil improvement; pest, disease and fire control measures; limited tree extraction.
Capital Intensity	Low
Labour Intensity	Low; nature conservation personnel
Power source	n.a.
Technology	No fertilizer; self-seeding; limited pest, disease control, no fire prevention measures
Productivity	Low
Environmental hazards	It is assumed that natural fires occur at intervals 15-60 years in dry boreal zones and at intervals between 75 and 150 years in moderately dry boreal, temperate and subtropical zones. No fire protection measures are assumed.
Environmental benefits	Stable forest eco-systems: preservation of bio-diversity; carbon dioxide sequestration in stem-wood, roots and soil.
Infrastructure requirement	Access to research information.
Scale of operation	Limited operations at small scales

Traditional production forestry

This type involves the control of forest composition, establishment and growth. Traditional planting/regeneration and harvest methods – clear-felling, seed-tree and shelter-wood in even-age management - are used for the planting/regeneration and subsequent growth of commercially important tree species. Harvest at age of maximum yield (optimum rotation length).

In the productivity assessment for traditional forestry, adequate measures and management are assumed which would prevent from production loss due to natural uncontrolled forest fires. Table 7 presents the main LUT attributes for traditional production forestry.

Table 7 Traditional production forestry LUTs

LUT Attributes	Traditional Production Forestry
Tree species considered	Birch, Poplar, Oak, Beech, Robinia, Larch, Spruce, Pine and Fir.
Produce	Timber/pulp
Management objectives	Commercial timber and pulp production: pure equal-aged stands; optimum rotation lengths; maximization of high quality timber production; clear fell and other clearing systems.
Capital Intensity	High
Labour Intensity	Medium; planting/seeding, maintenance and clearing
Power source	Mechanized
Technology	Good planting material; mechanized planting; start-off fertilizer; proper thinning; pest, disease and erosion control; mechanized clear felling and full fire prevention measures (which may occupy up to 10% of the forest production area).
Productivity	High
Environmental hazards	Soil erosion and nutrient leaching hazards; pest and diseases ; natural fire hazards are assumed minimized through adequate protection measures.
Environmental benefits	Carbon dioxide sequestration in stem wood, roots and soil
Infrastructure requirement	Adequate market accessibility; access to research information and advisory services.
Scale of operation	Large enterprises

Biomass plantation forestry

This special type of forestry is concerned with maximization of wood biomass output per hectare for energy production[6] from bio-fuel and for the pulp and paper industry. Highly productive pioneer species are grown as monoculture plantations in short rotations. In this assessment only a short duration rotation coppice (SRC) system with willow (e.g., *Salix viminalis*) and short duration rotation single stem (SRSS) systems with suitable poplar, alder and ash species are considered. It is assumed that for the SRC system the first harvest takes place after five years and subsequently every three years up to an age of 20-25 years and for SRSS systems 7-10 year rotations apply. Fertilization, annual weeding and mechanical harvesting are assumed. The density of SRC systems is assumed 2500 surviving stools per hectare (Leave area index = 4). Further, it is assumed that optimum harvest periods are selected and that all harvested biomass is utilized. Table 8 presents main LUT attributes for biomass plantation-forestry.

Table 8 Biomass plantation forestry LUTs

LUT Attributes	Biomass Plantation Forestry
Tree species considered	Selected Poplar, Alder, Ash and Willow species.
Produce	Bio-fuel/pulp
Management objectives	Commercial bio-fuel and pulp production; plantations of fast growing willow in short duration rotation coppice systems and Poplar, Alder and Ash species in short duration single stem rotations; maximizing above ground biomass yields; felling systems with "harvesters".
Capital Intensity	High
Labor Intensity	Low; mainly control of pest, disease and invasion of unwanted species.
Power source	Highly mechanized
Technology	Selected fully treated planting material; fully mechanized planting or coppicing; adequate use of fertilizer, pesticides; fully mechanized planting and clear felling and where required full fire prevention measures (which may occupy up to 10% of the biomass plantation area).
Productivity	Very High
Environmental hazards	Pollution due to fertilization, use of pesticides and chemical weed control.
Environmental benefits	Potential for groundwater quality improvement, e.g., through nitrate extraction by coppice tree crops; carbon dioxide sequestration in roots and soil.
Infrastructure requirement	Adequate pulp/paper industry and/or bio-energy production units or pellet/bricket production industry readily accessible. High level of advisory services and application of research findings.
Scale of operation	Medium and large enterprises

4.2 Ecological Requirements

The ecological requirements of the 52 selected tree species are presented in two parts, namely (a) quantified climate requirements and (b) semi-quantified soil requirements. Main sources used are: Song Zhaomin and Meng Ping (1993); Chartier (Ed.) (1995); Shugart (Ed.) (1992); Kruessmann (1972); Schmidt-Vogt. (1987); Schuett *et al.* (1999); Jansen *et al.* (1995), and Shvidenko *et al.*, (1996a, b).

As part of the climatic suitability analysis, temperature requirements of tree species are matched with actual temperature regimes in grid-cells. When the temperature characteristics in a particular grid-cell

6 Several tree species are currently used for forest biomass production systems. Examples apart from willow include: poplar, eucalyptus, black locust and selected conifers. These species are used in either short rotation coppice systems or in short rotation single stem systems. In boreal and temperate environments mainly willow and to some extent poplar systems are used. The short rotation willow, apart from production of biomass is also being used for purification (nitrate reduction) of groundwater (Perttu and Aronsson, 1995).

It is envisaged to compare potential productivity and energy efficiency of forests biomass production systems with energy crops, such as: rape, sunflower, sugar beet, sweet sorghum, wheat, cystle (*Cynara cardunculu*) and a C_4 perennial grass (*Miscanthus sinensis giganteus*). Recent research with this C_4 grass has shown that per annum dry matter yields of 20-25 t/ha are achievable.

match tree species temperature requirements in optimum or sub-optimum fashion, then this tree species is considered in the biomass increment calculations.

Thermal suitability is assessed through matching thermal requirements of individual tree species/LUTs with average thermal conditions in a particular grid-cell. The thermal conditions considered are; mean temperatures of the coldest and the warmest month, length of frost-free period, length of vegetation period, length of dormancy period and temperature sums during vegetation and frost-free period (Table 9). In case all conditions are met in an optimum fashion, the rating is S1 (optimal conditions). In case one or more conditions only meet range conditions, the rating is S2 (sub-optimal conditions). When one or more conditions fall outside the range conditions, the rating of that particular cell is not suitable.

The moisture suitability analysis is essentially based on the comparison of tree species specific drought tolerances with the moisture conditions during the respective vegetation period. For each of the tree species two thresholds have been set, one between optimum and sub-optimum conditions for growth (parameter κ) and one between sub-optimum growth and not suitable conditions (parameter λ). Further it is assumed that with increasingly dry conditions spacing of trees becomes wider. Therefore in such conditions gradually lower than optimum LAI values (parameter μ) are assumed see Table 11.

Climatic requirements of tree species were expressed in *optimum*, *range* and *not suitable* conditions as presented in Table 9 and include the following parameters:

(i) Mean temperatures of the coldest and the warmest month;
(ii) Minimum temperatures of the coldest month;
(iii) Frost-free period (days with mean temperature > 10^{o}C);
(iv) Periods of biological activity (days with Tmean > 5^{o}C);
(v) Dormancy periods;
(vi) Accumulated temperatures (base temperatures of 5^{o}C and 10^{o}C);
(vii) Length of growing periods (days);

Sources: Barnes *et al.*, (1998); Burschel and Huss, (1997); Chartier *et al.*, (1995); Chen, (1999); IIASA-LUC (1998a, b, c); Jansen *et al.*, (1995); (1968), Kassam, (1977); Köstler *et al.*, (1968), Krüssmann. (1972, 1983); Mitscherlich, (1975); Nikolov and Helmisaari, (1992); Perttu and Aronsson, (1995); Schmidt-Vogt, (1987); Schmidt, (1987, 1989); Schober, (1975); Schuett (1999) Shugart, (1992); Shvidenko *et al.*, (1996a, b); Stolbovoi *et al.*, (1997a); Woods and Hall, (1994).

All climatic parameters have been estimated/verified by overlaying species distribution maps and climatic maps.

.

Table 9 Climatic requirements

OPTIMUM CONDITIONS

Temperate and Boreal Deciduous Tree Species		Tmean Jan (°C)	Tmean July (°C)	Tmin Jan (°C)	LGPT 10°C (days)[7]	LGPT 5°C (days)	Dormancy break (days)	Tsum 10°C (ddays)	Tsum 5°C (ddays)	LGP (days)
Birch	*Betula pubescens*	>-40	12-20	-55	>75	>120	>105	>1000	>1400	>120
	Betula pendula	>-40	14-20	-50	>90	>135	>90	>1200	>1600	>135
	Betula verrucosa	>-40	12-16	-50	>90	>135	>90	>1200	>1600	>135
	Betula tortuosa	>-40	12-16	-55	>75	>120	>105	>1000	>1400	>120
	Betula platypphylla	>-30	14-23	-40	>90	>135	>90	>1200	>1600	>135
	Betula papyrifera	>-28	14-23	-40	>90	>135	>90	>1200	>1600	>135
Poplar	*Populus nigra*	>-30	15-30	-35	>120	>150	>30	>2400	>2800	>135
	Populus euramericana cv rob.	>-30	15-30	-35	>120	>150	>30	>2400	>2800	>135
	Populus alba	>-30	17-30	-35	>135	>165	>30	>3000	>3400	>150
	Populus tremula	>-35	16-26	-45	>90	>120	>75	>1600	>2000	>120
	Populus balsamiferas	>-35	15-26	-45	>90	>135	>60	>1800	>2200	>135
	Populus maximowiczii	>-35	15-26	-45	>90	>135	>60	>1800	>2200	>135
	Populus tomentosa	>-15	17-26	-20	>135	>165	>30	>3000	>3400	>150
	Populus euphraetica	>-20	20-30	-25	>135	>165	>30	>3000	>3400	>150
Willow	*Salix alba*	>-30	16-28	-35	>120	>150	>30	>1800	>2200	>135
	Salix viminalis	>-30	16-28	-35	>120	>150	>30	>1800	>2200	>135
Oak	*Quercus robur*	>-20	15-27	-25	>150	>180	0	>2000	>2400	>150
	Quercus petracea	>-5	15-28	-10	>165	>210	0	>2100	>2500	>150
	Quercus rubra	>-10	16-24	-15	>165	>210	>45	>2100	>2500	>180
	Quercus lanuginosa	>0	20-32	-5	>180	>240	>30	>3000	>3400	>180
	Quercus cerris	>-20	16-27	-25	>150	>180	0	>2000	>2400	>150
	Quercus acutissima	>-10	20-27	-15	>180	>225	>45	>3000	>3400	>180
	Quercus variablis	>-10	20-27	-15	>180	>225	>45	>3000	>3500	>150
	Quercus mongolica	>-30	16-20	-35	>120	>135	>150	>1800	>2100	>120
Beech	*Fagus sylvatica*	>-5	16-22	-10	>165	>210	>60	>2200	>2750	>180
Hornbeam	*Carpinus betulus*	>-20	16-25	-25	>150	>180	0	>2200	>2600	>150
Ash	*Fraxinus excelsior*	>-8	18-25	-15	>150	>180	0	>2000	>2500	>165
	Fraxinus mandshurica	>-30	16-24	-35	>150	>180	0	>2000	>2500	>165
Alder	*Alnus glutinosa*	>-20	16-24	-25	>150	>180	0	>2000	>2400	>165
Lime	*Tilia cordata*	>-25	14-22	-30	>135	>165	0	>1800	>2200	>135
Maple	*Acer plantanoides*	>-20	16-24	-30	>150	>180	0	>2000	>2400	>150
	Acer campestre	>-8	18-24	-15	>150	>180	0	>2000	>2500	>150
	Acer campbellii	>-15	15-24	-20	>135	>165	0	>2000	>2400	>150
Locust	*Robinia pseudoacacia*	>-10	16-27	-15	>165	>225	0	>2300	>2750	>135
Chestnut	*Castanea sativa*	>0	16-22	-1	>180	>225	>60	>2500	>3000	>195
Walnut	*Junglans regia*	>-20	16-24	-25	>150	>180	0	>2200	>2600	>150

7 All temperate and boreal deciduous tree species are confined to areas with winter temperatures at least for some time below 10°C. For optimum levels LGPT10 < 330 days has been used as cut off.

OPTIMUM CONDITIONS

Deciduous Coniferous Trees		Tmean Jan (^{o}C)	Tmean July (^{o}C)	Tmin Jan (^{o}C)	LGPT 10^{o}C (days)	LGPT 5 ^{o}C (days)	Dormancy break. (days)	Tsum 10 ^{o}C (ddays)	Tsum 5 ^{o}C (ddays)	LGP (days)
Larch	*Larix gmelinii*	> -45	12-20	-55	>75	>120	>165	>950	>1300	>120
	Larix sibirica	> -40	12-20	-45	>75	>120	>165	>1000	>1400	>120

OPTIMUM CONDITIONS

Coniferous Trees		Tmean Jan (^{o}C)	Tmean July (^{o}C)	Tmin Jan (^{o}C)	LGPT 10^{o}C (days)	LGPT 5 ^{o}C (days)	Dormancy break. (days)	Tsum 10 ^{o}C (ddays)	Tsum 5 ^{o}C (ddays)	LGP (days)
Spruce	*Picea abies*	>-20	14-18	-25	>105	>135	>105	>1150	>1600	>135
	Picea asperata	>-16	14-18	-20	>90	>150	>135	<1100	>1400	>150
	Picea ajanensiss	>-30	14-18	-35	>90	>135	>165	>1150	>1500	>135
	Picea obovata	>-35	13-18	-40	>75	>120	>195	>1000	>1350	>120
	Picea koreaiensis	>-20	14-18	-30	>120	>135	>165	>1150	>1600	>150
Pine	*Pinus sibirica*	>-35	14-20	-50	>75	>120	>180	>900	>1400	>120
	Pinus sylvestris	>-35	14-23	-50	>75	>120	>90	>1000	>1400	>120
	Pinus tabulaeformis	>-13	18-24	-22	>165	>180	>135	>2500	>3000	>165
	Pinus massoniana	>0	24-28	-5	>240	>270	0	>4000	>4500	>240
	Pinus yunnanensis	>0	16-22	-5	>195	>240	0	>4000	>4500	>180
	Pinus koreaiensis	>-20	14-18	-30	>120	>150	>165	>1150	>1600	>135
Fir	*Abies alba*	> -5	16-20	-20	>135	>180	>120	>2200	>2750	>165
	Abies sibirica	> -40	14-20	-45	>75	>120	>165	>950	>1400	>120
	Cunninghamia lanceolata	>4	24-28	-10	>255	>300	0	>4000	>4500	>270

Table 9 Continued

RANGE CONDITIONS

Temperate and Boreal Deciduous Tree Species		Tmean Jan (°C)	Tmean July (°C)	Tmin Jan (°C)	LGPT 10°C (days)8	LGPT 5 °C (days)	Dormancy break (days)	Tsum 10 °C (ddays)	Tsum 5 °C (ddays)	LGP (days)
Birch	*Betula pubescens*	>-45	10-23	-60	>60	>105	>90	>850	>1100	>105
	Betula pendula	>-45	12-23	-55	>75	>120	>75	>1000	>1250	>120
	Betula verrucosa	> -45	10-18	-55	>75	>120	>75	>1000	>1250	>120
	Betula tortuosa	>-45	10-18	-60	>60	>105	>90	>850	>1100	>105
	Betula platyphylla	>-35	12-26	-45	>75	>120	>75	>1000	>1250	>120
	Betula papyrifera	>-33	12-26	-45	>75	>120	>75	>1000	>1250	>120
Poplar	*Populus nigra*	>-35	14-33	-40	>105	>135	0	>2200	>2600	>120
	Populus euramericana cv rob.	>-35	12-33	-40	>105	>135	0	>2200	>2600	>120
	Populus alba	>-35	16-33	-40	>120	>150	0	>2300	>2800	>135
	Populus tremula	>-45	13-28	-55	>75	>105	>60	>1300	>1800	>105
	Populus balsamiferas	>-40	13-28	-55	>75	>120	>45	>1500	>1900	>120
	Populus maximowiczii	>-40	13-28	-55	>75	>120	>45	>1500	>1900	>120
	Populus tomentosa	>-20	16-33	-25	>120	>150	0	>2700	>3100	>135
	Populus euphraetica	>-30	18-33	-30	>120	>150	0	>2700	>3100	>135
Willow	*Salix alba*	> -35	15-30	-40	>105	>135	0	>1500	>1900	>120
	Salix viminalis	> -35	15-30	-40	>105	>135	0	>1500	>1900	>120
Oak	*Quercus robur*	>-25	14-29	-30	>120	>150	0	>1800	>2200	>135
	Quercus petracea	>-7	14-30	-12	>150	>195	0	>1900	>2350	>135
	Quercus rubra	>-12	15-26	-20	>150	>195	>30	>1900	>2400	>180
	Quercus lanuginosa	>-2	18-34	-10	>165	>225	0	>2800	>3200	>180
	Quercus cerris	>-25	15-29	-30	>135	>165	0	>1800	>2200	>150
	Quercus acutissima	>-12	18-29	-20	>165	>210	>30	>2800	>3200	>180
	Quercus variablis	>-12	18-29	-20	>165	>210	>30	>2800	>3300	>150
	Quercus mongolica	>-35	14-22	-40	>105	>120	>135	>1600	>1900	>105
Beech	*Fagus sylvatica*	>-7	14-25	-12	>150	>195	>45	>1900	>2400	>165
Hornbeam	*Carpinus betulus*	>-25	14-30	-30	>135	>165	0	>2000	>2400	>135
Ash	*Fraxinus excelsior*	> -15	16-30	-25	>135	>165	0	>1800	>2250	>150
	Fraxinus mandshurica	>-35	15-27	-40	>135	>165	0	>1800	>2250	>150
Alder	*Alnus glutinosa*	>-25	14-26	-30	>135	>165	0	>1800	>2200	>150
Lime	*Tilia cordata*	>-30	16-26	-35	>135	>165	0	>1600	>2000	>135
Maple	*Acer plantanoides*	>-25	14-25	-35	>120	>150	0	>1800	>2200	>135
	Acer campestre	>-13	16-25	-18	>120	>150	0	>1800	>2200	>135
	Acer campbellii	>-20	13-26	-25	>120	>150	0	>1800	>2200	>135
Locust	*Robinia pseudoacacia*	>-12	14-30	-18	>150	>210	0	>2100	>2500	>120
Chestnut	*Castanea sativa*	>-1	14-26	-3	>165	>210	>30	>2300	>2800	>180
Walnut	*Junglans regia*	>-15	14-26	-30	>135	>165	0	>2000	>2400	>135

8 All temperate and boreal deciduous tree species are confined to areas with winter temperatures at least for some time below 10°C. For range levels LGPT10 > 360 days has been used as cut off.

RANGE CONDITIONS

Deciduous Coniferous Trees		Tmean Jan (^{o}C)	Tmean July (^{o}C)	Tmin Jan (^{o}C)	LGPT 10^{o}C (days)	LGPT 5 ^{o}C (days)	Dormancy break. (days)	Tsum 10 ^{o}C (ddays)	Tsum 5 ^{o}C (ddays)	LGP (days)
Larch	*Larix gmelinii*	>-50	11-23	-60	>60	>105	>135	>800	>1000	>105
	Larix sibirica	>-45	11-23	-50	>60	>105	>135	>850	>1100	>105

RANGE CONDITIONS

Coniferous Trees		Tmean Jan (^{o}C)	Tmean July (^{o}C)	Tmin Jan (^{o}C)	LGPT 10^{o}C (days)	LGPT 5 ^{o}C (days)	Dormancy break. (days)	Tsum 10 ^{o}C (ddays)	Tsum 5 ^{o}C (ddays)	LGP (days)
Spruce	*Picea abies*	>-25	12-20	-30	>90	>120	>90	>1050	>1250	>120
	Picea asperata	>-18	12-20	-22	>75	>135	>120	<1050	>1300	>135
	Picea ajanensiss	>-35	12-20	-40	>75	>120	>150	>1000	>1200	>120
	Picea obovata	>-40	12-19	-45	>60	>105	>180	>900	>1150	>105
	Picea koreaiensis	>-25	12-20	-35	>105	>120	>150	>1050	>1250	>135
Pine	*Pinus sibirica*	>-45	12-23	-60	>60	>105	>165	>800	>1150	>105
	Pinus sylvestris	>-45	12-25	-60	>60	>105	>60	>850	>1100	>105
	Pinus tabulaeformis	>-15	16-26	-25	>150	>165	>120	>2300	>2800	>150
	Pinus massoniana	>-2	22-30	-8	>210	>240	0	>3750	>4000	>210
	Pinus yunnanensis	>-3	15-24	-8	>180	>225	0	>3750	>4000	>165
	Pinus koreaiensis	>-25	12-21	-35	>105	>135	>150	>1050	>1250	>120
Fir	*Abies alba*	>-8	14-23	-25	>120	>165	>90	>2000	>2500	>150
	Abies sibirica	>-45	12-23	>-50	>60	>105	>150	>850	>1100	>105
	Cunninghamia lanceolata	>0	22-30	>-15	>240	>270	0	>3750	>4250	>240

The soil suitability assessment is based on the comparison of soil requirements of tree species and prevailing soil conditions. The soil assessment also reflects constraints imposed by landform and other features that do not directly form a part of the soil but may have a significant influence on the use that can be made of the soil. Distinction is made between *internal* soil requirements of crop/LUTs, e.g., soil moisture regime, soil fertility, effective soil depth for root development, and other physical and chemical soil properties, and *external* requirements related to, e.g., soil slope, occurrence of flooding, and soil accessibility.

In order to safeguard that production be achievable on a sustainable basis, a terrain-slope suitability classification is applied which not only concerns workability and accessibility but also prevents intolerable levels of topsoil erosion and fertility loss. Depending on prevailing rainfall aggressivity, upper limits have been set to slope gradients for traditional production forestry and biomass forestry. Beyond these slope gradients land has been classified *not suitable* for tree production under these management objectives.

A number of soil characteristics affecting growth and production of tree species have been classified in terms of optimum, range and not suitable conditions for the 52 forest tree species considered (Table 10), including the following:

(i) Soil fertility;
(ii) Soil texture and structure;
(iii) Soil internal drainage;
(iv) Soil depth;
(v) Soil reaction;
(vi) Soil stoniness;
(vii) Soil salinity, and
(viii) Water-logging/flooding conditions.

4.3 Biomass Increment Calculation

The AEZ methodology for the calculation of potential biomass is based on two well established and robust models: the Chapman-Richard biomass increment model (e.g., see Nilsson, 1983), and a potential biomass model adapted from Kassam (1977) and Kassam *et al.* (1991). Details of the calculation procedures are presented below.

A generalized function for forest stand development

Many practical applications in forestry employ a biomass increment model suggested by Chapman-Richard, expressing stand development in terms of relative yield over relative age. The generalized function is of the form:

$$y(r) = a \cdot (1 - b^{-r})^{g}$$
$$r = t / R \qquad (1)$$
$$B(r) = y(r) \cdot B^{*}$$

where:

R … optimum rotation length[9]
t … age of stand
r … relative age, i.e., age expressed relative to optimum rotation length
y … relative yield, i.e., yield relative to biomass at age of maximum volume production
$B(r)$ … biomass at relative age r
B^{*} … biomass at age of maximum volume production
a, b, g parameters of Chapman-Richard function

9 Rotation length is taken as the age at 'maximum volume production', and is the point in time when annual increment is equal to the mean increment over the total period since establishment.

Table 10 Soil requirements

Deciduous Trees		Fertility	Texture/Structure		Drainage		Depth (cm)		Reaction (pH)		Water-logging/ Flooding	
			Optimum	*Range*	*Optimum*	*Range*	*Optimum*	*Marginal*	*Optimum*	*Range*	*Optimum*	*Marginal*
Birch	*Betula pubescens*	low	9-16	6-19	W-I	SE-VP	>100	>30	4.5-7.5	4.0-8.0	F1	F1/F2
	Betula pendula	low	10-16	9-20	W-MW	E-I	>100	>50	4.5-7.0	4.0-8.0	F0	F0/F1
	Betula verrucosa	low	10-16	9-20	W-MW	E-I	>100	>50	4.5-7.0	4.0-8.0	F0	F0/F1
	Betula tortuosa	low	9-16	6-19	W-I	SE-P	>100	>30	4.5-7.5	4.0-8.0	F0/F1	F1
	Betula platyphylla	low	10-16	9-19	W-MW	SE-I	>100	>50	4.5-7.5	4.0-8.0	F0	F0/F1
	Betula papyrifera	low	10-16	9-19	W-MW	SE-P	>100	>50	4.5-7.5	4.0-8.0	F0	F0/F1
Poplar	*Populus nigra*	high	9-15	5-19	W-MW	SE-P	>150	>75	6.5-7.5	5.5-8.5	F1	F1/F2
	Populus euramericana cv rob.	high	9-15	5-19	W-MW	SE-P	>150	>75	6.5-7.5	5.5-8.5	F1	F1/F2
	Populus alba	high	9-16	6-19	W-MW	SE-I	>150	>75	6.0-7.0	5.5-8.5	F0/F1	F1/F2
	Populus tremula	med./high	9-16	6-19	W-MW	SE-I	>150	>75	6.0-7.0	5.5-8.5	F0	F0/F1
	Populus balsamiferas	med./high	9-16	6-19	W-MW	SE-I	>150	>75	6.0-7.0	5.5-8.5	F0/F1	F1/F2
	Populus maximowiczii	med./high	9-16	6-19	W-MW	SE-I	>150	>75	6.0-7.0	5.5-8.5	F0/F1	F1/F2
	Populus tomentosa	high	9-15	5-19	W-MW	SE-P	>150	>75	6.5-7.5	5.5-8.5	F0/F1	F1
	Populus euphraetica	high	9-15	5-19	W-MW	SE-P	>150	>75	6.5-7.5	5.5-8.5	F0/F1	F1
Willow	*Salix alba*	high	9-16	5-20	W-I	SE-VP	>100	>50	5.0-7.5	4.5-8.5	F1	F2
	Salix viminalis	high	9-16	5-20	W-I	SE-VP	>100	>50	5.0-7.5	4.5-8.5	F1	F2
Oak	*Quercus robur*	medium	9-15	5-19	W-I	SE-P	>100	>50	5.5-7.5	4.5-8.5	F0/F1	F1
	Quercus petracea	medium	9-16	5-20	W-MW	E-I	>100	>50	5.0-7.0	4.0-8.0	F0	F0
	Quercus rubra	medium	9-15	5-19	W-MW	E-I	>150	>75	5.5-7.5	4.5-8.5	F0	F0
	Quercus lanuginosa	medium	9-15	5-19	W-I	SE-P	>100	>50	6.0-8.0	5.0-8.5	F0	F0/F1
	Quercus cerris	medium	9-15	6-17	W-MW	SE-I	>100	>50	5.5-7.5	4.5-8.0	F0	F0/F1
	Quercus acutissima	medium	9-16	6-19	W-MW	SE-I	>100	>50	5.5-7.5	4.5-8.0	F0	F0/F1
	Quercus variablis	medium	9-16	6-19	W-MW	SE-I	>100	>50	5.5-7.5	4.5-8.0	F0	F0/F1
	Quercus mongolica	medium	9-15	5-19	W-I	SE-P	>100	>50	5.5-7.5	4.5-8.5	F0	F0/F1
Beech	*Fagus sylvatica*	medium	9-15	6-16	W	SE-MW	>150	>75	5.5-7.5	5.0-8.5	F0	F0
Hornbeam	*Carpinus betulus*	medium	9-15	5-17	W-MW	SE-I	>100	>50	5.0-7.0	4.0-8.5	F0	F0/F1
Ash	*Fraxinus excelsior*	high	9-15	6-17	W-I	SE-P	>100	>30	5.8-7.5	4.5-8.5	F0/F1	F1/F2
	Fraxinus mandshurica	high	9-15	6-17	W-I	SE-P	>100	>30	5.8-7.5	4.5-8.4	F0/F1	F1/F2
Alder	*Alnus glutinosa*	high	9-15	5-19	W-I	SE-VP	>100	>30	5.0-7.0	4.5-8.5	F0/F1	F1/F2
Lime	*Tilia cordata*	medium	9-15	6-17	W-MW	SE-I	>150	>75	5.0-7.5	4.5-8.5	F0	F0/F1
Maple	*Acer plantanoides*	med./high	9-16	6-19	W-MW	SE-I	>100	>50	5.0-7.0	4.0-8.5	F0/F1	F1
	Acer campestre	med./high	9-16	6-19	W-MW	SE-I	>100	>50	5.5-7.5	4.0-8.5	F0/F1	F1
	Acer campbellii	med./high	9-16	6-19	W-MW	SE-I	>100	>50	5.5-7.5	4.0-8.5	F0/F1	F1
Black locust	*Robinia pseudoacacia*	medium	9-16	5-19	W-MW	SE-I	>150	>50	5.5-7.5	5.0-8.5	F0	F0
Chestnut	*Castanea sativa*	med/high	9-15	6-16	W	SE-MW	>150	>75	5.0-7.0	4.0-8.0	F0	F0
Walnut	*Junglans regia*	med/high	9-16	5-19	W	SE-MW	>150	>75	6.5-7.5	5.5-8.5	F0	F0

Deciduous Coniferous Trees		Fertility	Texture/Structure		Drainage		Depth (cm)		Reaction (pH)		Waterlogging/ Flooding	
			Optimum	*Range*	*Optimum*	*Range*	*Optimum*	*Marginal*	*Optimum*	*Range*	*Optimum*	*Marginal*
Larch	*Larix gmelinii*	**low**	9-16	6-20	W-MW	SE-I	>75	>30	5.0-7.5	4.5-8.5	F1	F1/F2
	Larix sibirica	**low/med**	9-16	6-19	W-MW	SE-I	>100	>50	5.0-7.0	4.5-8.0	F0/F1	F1/F2

Coniferous Trees		Fertility	Texture/Structure		Drainage		Depth (cm)		Reaction (pH)		Waterlogging/ Flooding	
			Optimum	*Range*	*Optimum*	*Range*	*Optimum*	*Marginal*	*Optimum*	*Range*	*Optimum*	*Marginal*
Spruce	*Picea abies*	medium	9-16	6-19	W-MW	SE-I	>100	>50	4.5-6.0	4.0-7.5	F0	F0
	Picea asperata	medium	9-16	6-19	W-MW	SE-I	>100	>50	4.5-6.0	4.0-7.5	F0	F0
	Picea ajanensiss	medium	9-16	6-19	W-MW	SE-I	>100	>50	4.5-6.0	4.0-7.5	F0	F0
	Picea obovata	medium	9-16	6-19	W-MW	SE-I	>100	>50	4.5-6.0	4.0-7.5	F0	F0
	Picea koreaiensis	medium	9-16	6-19	W-MW	SE-I	>100	>50	4.5-6.0	4.0-7.5	F0	F0
Pine	*Pinus sibirica*	low/med.	9-16	5-20	W-MW	SE-P	>100	>30	5.0-6.0	4.0-8.0	F0/F1	F1
	Pinus sylvestris	low	9-16	6-21	W-I	E-P	>100	>30	5.0-6.5	4.0-8.5	F1	F1/F2
	Pinus tabulaeformis	low/med.	9-16	6-19	W-MW	SE-I	>100	>30	5.0-6.5	4.0-8.5	F0	F0/F1
	Pinus massoniana	low/med.	9-16	6-19	W	SE-MW	>100	>30	5.0-6.5	4.0-8.5	F0	F0/F1
	Pinus yunnanensis	low/med.	9-16	6-19	W-MW	SE-I	>100	>30	5.0-6.5	4.0-8.5	F0	F0/F1
	Pinus koreaiensis	low/med.	9-16	6-20	W-MW	SE-I	>100	>30	5.0-6.5	4.0-8.5	F0/F1	F1
Fir	*Abies alba*	medium	9-16	5-18	W-MW	SE-P	>150	>75	4.5-7.5	4.0-8.5	F0	F0/F1
	Abies sibirica	medium	9-16	6-19	W	SE-I	>150	>75	4.5-7.0	4.0-8.0	F0	F0/F1
	Cunninghamia lanceolata	medium	9-16	6-19	W	SE-I	>100	>30	4.5-7.0	4.0-9.0	F0	F0/F1

TEXTURE/STRUCTURE	symbol	code	TEXTURE/STRUCTURE	symbol	code
massive clay	Cm	1	silt loam	SiL	12
massive silty clay	SiCm	2	sandy clay	SC	13
very fine clay, vertisol structure	C+60,v	3	loam	L	14
very fine clay, blocky structure	C+60,s	4	sandy clay loam	SCL	15
clay, vertisol structure	C-60,v	5	sandy loam	SL	16
clay, blocky structure	C-60,s	6	loamy fine sand	LfS	17
silty clay, blocky structure	SiCs	7	loamy sand	LS	18
clay, oxisol structure	Co	8	loamy coarse sand	LcS	19
silty clay loam	SiCL	9	fine sand	fS	20
clay loam	CL	10	sand	S	21
silt	Si	11	coarse sand	cS	22

DRAINAGE	Symbol
Excessively drained	E
Somewhat excessively drained	SE
Well	W
Moderately well drained	MW
Imperfectly drained	I
Poorly drained	P
Very poorly drained	VP
WATERLOGGING/FLOODING	
No flooding/waterlogging	F0
Occasional floods/waterlogging (short periods)	F1
Frequent floods/waterlogging (longer periods)	F2

According to the definitions of *y*, *r*, and *R*, the following conditions must hold:

$$y(0) = 0$$
$$y(1) = 1 \qquad (2)$$
$$\frac{dy}{dr}\Big|_{r=1} = 1$$

To fully specify the function, an additional condition is needed. Usually the relative standing biomass at 50% percent of the rotation length, i.e., *y*(0.5), is estimated at 38%, and this condition can be used to obtain the parameter values of the function. The tabulation below shows parameter values and derived properties of the Chapman-Richard function using a range of values for *y* (0.5):

***y*(0.5)**	*a*	*b*	*g*	r^*	$y(r^*)$	a_x
0.34	1.5052	10.189	3.9585	0.5927	0.4753	1.4764
0.36	1.5644	8.0876	3.3907	0.5840	0.4782	1.4182
0.38	1.6416	6.3581	2.8967	0.5749	0.4813	1.3601
0.40	1.7471	4.9385	2.4661	0.5651	0.4845	1.3018
0.42	1.9014	3.7781	2.0900	0.5546	0.4878	1.2431

In the above, r^* denotes the relative age at which the maximum growth occurs, and a_x the relative increment at the age of maximum growth,

$$a_x = \frac{dy}{dr}\Big|_{r=r^*} \qquad (3)$$

The rate of relative biomass increment $a(r)$ at relative age r can be derived from (1):

$$a(r) = \frac{dy}{dr} = a \cdot g \cdot \ln(b) \cdot b^{-r} \cdot (1 - b^{-r})^{g-1} \qquad (4)$$

In order to calculate biomass at age of maximum volume production B^*, we integrate the rate of net biomass production $b_n(t)$ over the entire rotation R:

$$B^* = \int_0^R b_n(t) \cdot dt = (b_n(r^*) / a_x) \cdot \int_0^R a(t/R) \cdot dt \approx R \cdot N \cdot b_{nx} / a_x \qquad (5)$$

where N denotes the length of the annual vegetation period (in days) and b_{nx} the daily rate of biomass production at the age of maximum growth $t^* = r^* \cdot R$ (averaged for that year). Following the ecophysiological principles of Kassam (1977) and Kassam *et al.* (1991), we calculate b_{nx} as the difference of maximum rate of gross biomass production b_{gm} and respiration losses s_m,

$$b_{nx} = b_{gm} - s_m \qquad (6)$$

Maximum rate of gross biomass production

The maximum rate of gross biomass production (b_{gm}) is related to the maximum net rate of CO_2 exchange of leaves (P_m), which is dependent on temperature, and the level of atmospheric CO_2 concentration. For estimating biomass production, relationships between temperature and rate of photosynthesis of forest tree species have been established. The forest tree species in subtropical, temperate and boreal climates considered in the study have the C_3 photosynthesis pathway, and rates of maximum photosynthesis (P_m) are in the range 5 – 20 kg CH_2O ha^{-1} hr^{-1} (Landsberg, 1986).

Species are classified according to productivity into three classes, namely class I: P_m = 5-10 kg CH_2O ha^{-1} hr^{-1}; class II: P_m = 10-15 kg CH_2O ha^{-1} hr^{-1}; and class III: P_m = 15-20 kg CH_2O ha^{-1} hr^{-1}. These classes of photosynthesis rates correspond to mean annual total biomass increments (including foliage, stem and roots) of < 10 t/ha, 10-15 t/ha and > 15 t/ha dry weight respectively, or annual wood

Table 11 Rotation and productivity characteristics

Tree Species		Rotation			Density (g/cm^3)	Dry Weight (t/ha)	Class	LAI	Drought Tolerance Parameters[10] ETa/ETo*100			
		Height (m)	Length (years)	Production (m^3/ha/yr)					k	l	m	Class
Birch	*Betula pubescens*	32	65	7.0	0.61	4.3	I	3.0	95	85	50	C
	Betula pendula	30	65	7.5	0.61	4.6	I	3.0	85	65	50	A
	Betula verrucosa	20	65	6.0	0.61	3.7	I	3.0	85	65	50	A
	Betula tortuosa	25	65	5.0	0.61	3.1	I	3.0	95	85	50	C
	Betula platyphylla	20	65	6.0	0.61	3.7	I	3.0	85	65	50	A
	Betula papyrifera	30	65	7.0	0.61	4.3	I	3.0	85	65	50	A
Poplar	*Populus nigra*	35	25	31.0	0.34	10.5	III	4.0	90	80	50	B
	Populus euramericana	35	25	31.0	0.34	10.5	III	4.0	90	80	50	B
	Populus alba	30	25	26.0	0.39	10.1	III	4.0	90	80	50	B
	Populus tremula	30	30	26.0	0.39	10.1	III	4.0	90	80	50	B
	Populus balsamiferas	30	30	26.0	0.39	10.1	III	4.0	90	80	50	B
	Populus maximowiczii	30	30	26.0	0.39	10.1	III	4.0	90	80	50	B
	Populus tomentosa	30	25	26.0	0.39	10.1	III	4.0	90	80	50	B
	Populus euphraetica	30	25	26.0	0.39	10.1	III	4.0	90	80	50	B
Willow	*Salix alba*	35	40	27.0	0.41	11.1	III	4.0	95	85	65	D
	Salix viminalis(SRC)	8	3-5/25	27.0	0.41	11.1	III	4.0	95	85	65	D
Oak	*Quercus robur*	30	75	9.0	0.85	7.7	II	4.5	85	65	50	A
	Quercus petraea	35	75	9.0	0.65	5.9	II	4.5	85	65	50	A
	Quercus rubra	25	45	9.3	0.70	6.5	II	5.0	90	80	50	B
	Quercus lanuginosa	20	40	9.0	0.65	5.9	II	4.5	85	65	50	A
	Quercus cerris	35	70	12.0	0.85	9.9	II	4.5	85	65	50	A
	Quercus acutissima	12	35	7.2	0.70	5.0	II	4.5	85	65	50	A
	Quercus variablis	25	70	9.0	0.65	5.9	II	4.5	85	65	50	A
	Quercus mongolica	30	75	9.0	0.85	7.7	II	4.5	85	65	50	A
Beech	*Fagus sylvatica*	36	85	12.0	0.68	8.2	II	5.5	95	85	50	C
Hornbeam	*Carpinus betulus*	27	70	11.0	0.78	8.6	II	5.0	90	80	50	B
Ash	*Fraxinus excelsior*	30	40	10.0	0.65	6.5	II	5.0	95	85	65	D
	Fraxinus mandshurica	30	40	10.0	0.65	6.5	II	5.0	95	85	65	D
Alder	*Alnus glutinosa*	23	60	12.0	0.55	6.6	II	5.0	95	85	65	D
Lime	*Tilia cordata*	30	65	11.0	0.54	5.9	II	5.0	95	85	50	C

10 ET_a/ET_o thresholds are as follows: κ represents the threshold value above which full biomass increments are assumed; λ represents the threshold below which **zero** biomass increments are assumed; μrepresents the relative LAI at λ (LAI at κ is assumed 100%). Class A-D represent different combinations of κ, λ and μ.

Tree Species		Rotation			Density (g/cm^3)	Dry Weight (t/ha)	Class	LAI	Drought Tolerance Parameters ETa/ETo*100			
		Height (m)	Length (years)	Production (m^3/ha/yr)					k	l	m	Class
Acer	*Acer plantanoides*	30	40	8.0	0.67	5.4	II	5.0	95	85	50	C
	Acer campestre	15	40	8.0	0.67	5.4	II	5.0	95	85	50	C
	Acer campbellii	20	40	8.0	0.59	4.7	I	5.0	95	85	50	C
Black locust	*Robinia pseudoacacia*	25	40	12.0	0.73	8.8	II	3.5	85	65	50	A
Chestnut	*Castanea sativa*	30	80	11.4.	0.63	7.2	II	5.0	90	80	50	B
Walnut	*Junglans regia*	30	100	8.0	0.64	5.1	II	5.0	90	80	50	B
Larch	*Larix qmelinii*	25	75	8.2	0.65	5.3	II	3.0	85	65	50	A
	Larix sibirica	27	75	13.0	0.65	8.5	II	3.5	85	65	50	A
Spruce	*Picea abies*	40	60	26.0	0.44	11.4	III	6.0	95	85	65	D
	Picea asperata	25	60	21.0	0.44	9.2	II	6.0	95	85	65	D
	Picea ajanensiss	30	60	26.0	0.44	11.4	III	6.0	95	85	65	D
	Picea obovata	30	60	26.0	0.44	11.4	III	6.0	95	85	65	D
	Picea koreaiensis	30	60	26.0	0.44	11.4	III	6.0	95	85	65	D
Pine	*Pinus sibirica*	30	60	10.5	0.51	5.4	II	3.5	90	85	50	B
	Pinus sylvestris	35	55	12.0	0.51	6.1	II	3.5	85	65	50	A
	Pinus tabulaeformis	25	55	9.0	0.43	3.8	I	3.5	90	80	50	B
	Pinus massoniana	24	60	9.0	0.43	3.8	I	3.5	90	80	50	B
	Pinus yunnanensis	15	60	6.0	0.43	2.6	I	3.5	90	80	50	B
	Pinus koreaiensis	25	40	12.0	0.44	5.3	I	3.5	90	80	50	B
Fir	*Abies alba*	40	90	26.0	0.45	11.7	III	6.0	90	80	50	B
	Abies sibirica	30	90	21.0	0.47	9.9	II	6.0	95	85	50	C
	Cunninghamia lanceolata	30	90	21.0	0.40	8.4	II	5.0	95	85	65	D

Class I: < 6.0 t/ha stem + branch wood biomass or < 10.0 t/ha total biomass ≈ Pm = 5-10 kg CH_2O $ha^{-1}hr^{-1}$
Class II: 6.0-9.0 t/ha stem + branch wood biomass or 10.0 –15.0 t/ha total biomass ≈ Pm = 10-15 kg CH_2O $ha^{-1}hr^{-1}$
Class III: > 9..0 t/ha stem + branch wood biomass or > 15.0 t/ha total biomass ≈ Pm = >15 kg CH_2O $ha^{-1}hr^{-1}$

Partitioning: Soil/LGP rating
VS: Stem+branch wood/leaves/roots = 60/20/20
S/MS: Stem+branch wood/leaves/roots = 50/20/30
mS: Stem+branch wood/leaves/roots = 40/20/40

biomass increments (stem and branch wood) of < 6 t/ha, 6-9 t/ha, and > 9 t/ha dry weight respectively. Table 11 presents rotation and productivity characteristics of selected deciduous and coniferous tree species (Jansen *et al.*, 1995).

For P_m = 20 kg ha^{-1} hr^{-1} and a maximum leaf area index LAI = 5, b_{gm} is calculated from the equation:

$$b_{gm} = F \times b_o + (1 - F)\, b_c \qquad (7)$$

where:

F = the fraction of the daytime the sky is clouded, $F = (A_c - 0.5\ R_g) / (0.8\ A_c)$, where A_c (or PAR) is the maximum active incoming short-wave radiation on clear days (de Wit, 1965), and R_g is incoming short-wave radiation (both are measured in cal cm^{-2} day^{-1})

b_o = gross dry matter production rate of a standard crop for a given location and time of the year on a completely overcast day, (kg ha^{-1} day^{-1}) (de Wit, 1965)

b_c = gross dry matter production rate of a standard crop for a given location and time of the year on a perfectly clear day, (kg ha^{-1} day^{-1}) (de Wit, 1965).

For values of *Pm* less than 20 kg ha^{-1} hr^{-1}, b_{gm} is then calculated according to:

$$b_{gm} = F\,(0.5 + 0.025\ P_m)\, b_o + (1 - F)\,(0.05\ P_m)\, b_c \qquad (8)$$

Relationships between temperature and rate of photosynthesis (kg CH_2O ha^{-1} hr^{-1}) for deciduous, coniferous and deciduous coniferous (larches) tree species by productivity classes are presented in Table 12. Table 13 shows estimated relationships between temperature regime and growth period for deciduous trees and larches.

Table 12 Relationships between temperature and rate of photosynthesis (Pm in kg CH_2O ha^{-1} hr^{-1}) for adaptability/productivity groups of boreal and temperate tree species

Adaptability/Productivity Class		Day-time Air Temperature (°C)									
		-5	0	5	10	15	20	25	30	35	40
Deciduous Trees											
I	Pm (max): 5-10 kg ha^{-1}hr^{-1}	0	0	0*	4.5	6.0	7.5	6.0	3.0	0.75	0
II	Pm (max): 10-15 kg ha^{-1}hr^{-1}	0	0	0*	7.5	10.0	12.5	10.0	5.0	1.5	0
III	Pm (max): 15-25 kg ha^{-1}hr^{-1}	0	0	0*	12.5	15.0	17.5	15.0	7.5	2.5	0
Deciduous Coniferous Trees											
I	Pm (max): 5-10 kg ha^{-1}hr^{-1}	0	0	0*	4.5	6.0	7.5	6.0	3.0	0.75	0
II	Pm (max): 10-15 kg ha^{-1}hr^{-1}	0	0	0*	7.5	10.0	12.5	10.0	5.0	1.5	0
III	Pm (max): 15-25 kg ha^{-1}hr^{-1}	0	0	0*	12.5	15.0	17.5	15.0	7.5	2.5	0
ConiferousTrees (clear days)											
I	Pm (max): 5-10 kg ha^{-1}hr^{-1}	0.5	1.0	2.0	4.5	6.0	7.5	6.0	3.0	0.75	0
II	Pm (max): 10-15 kg ha^{-1}hr^{-1}	1.0	2.0	4.0	7.5	10.0	12.5	10.0	5.0	1.5	0
III	Pm (max): 15-25 kg ha^{-1}hr^{-1}	1.5	3.0	6.0	12.5	15.0	17.5	15.0	7.5	2.5	0
ConiferousTrees (overcast days)											
I	Pm (max): 5-10 kg ha^{-1}hr^{-1}	0	0	0.75	4.5	6.0	7.5	6.0	3.0	0.75	0
II	Pm (max): 10-15 kg ha^{-1}hr^{-1}	0	0	1.5	7.5	10.0	12.5	10.0	5.0	1.5	0
III	Pm (max): 15-25 kg ha^{-1}hr^{-1}	0	0	2.5	12.5	15.0	17.5	15.0	7.5	2.5	0

* no leave/needle photosynthesis

Table 13 Growth periods for deciduous tree species

Tree Species		Growth Period[11]		
		Start Conditions[12]		End Conditions
Birch	*Betula pubescens*	III	Σ t=5 > 450	Tmean <10°C
	Betula pendula	III	Σ t=5 > 450	Tmean <10°C
	Betula verrucosa	III	Σ t=5 > 450	Tmean <10°C
	Betula tortuosa	III	Σ t=5 > 450	Tmean <10°C
	Betula platyphylla	III	Σ t=5 > 450	Tmean <10°C
	Betula papyrifera	III	Σ t=5 > 450	Tmean <10°C
Poplar	*Populus nigra*	II	Σ t=5 > 400	Tmean <10°C
	Populus euramericana cv rob.	II	Σ t=5 > 400	Tmean <10°C
	Populus alba	I	Σ t=5 > 350	Tmean <10°C
	Populus tremula	I	Σ t=5 > 350	Tmean <10°C
	Populus balsamiferas	II	Σ t=5 > 400	Tmean <10°C
	Populus maximowiczii	II	Σ t=5 > 400	Tmean <10°C
	Populus tomentosa	II	Σ t=5 > 400	Tmean <10°C
	Populus euphraetica	II	Σ t=5 > 400	Tmean <10°C
Willow	*Salix alba*	I	Σ t=5 > 350	Tmean <10°C
	Salix viminalis	I	Σ t=5 > 350	Tmean <10°C
Oak	*Quercus robur*	V	Σ t=5 > 650	Tmean <10°C
	Quercus petracea	V	Σ t=5 > 650	Tmean <10°C
	Quercus rubra	V	Σ t=5 > 650	Tmean <10°C
	Quercus lanuginosa	V	Σ t=5 > 650	Tmean <10°C
	Quercus cerris	V	Σ t=5 > 650	Tmean <10°C
	Quercus acutissima	V	Σ t=5 > 650	Tmean <10°C
	Quercus variablis	V	Σ t=5 > 650	Tmean <10°C
	Quercus mongolica	V	Σ t=5 > 650	Tmean <10°C
Beech	*Fagus sylvatica,,*	IV	Σ t=5 > 550	Tmean <10°C
Hornbeam	*Carpinus betulus*	IV	Σ t=5 > 550	Tmean <10°C
Ash	*Fraxinus excelsior*	III	Σ t=5 > 450	Tmean <10°C
	Fraxinus mandshurica	IV	Σ t=5 > 550	Tmean <10°C
Alder	*Alnus glutinosa*	III	Σ t=5 > 450	Tmean <10°C
Lime	*Tilia cordata*	V	Σ t=5 > 650	Tmean <10°C
Acer	*Acer plantanoides*	V	Σ t=5 > 650	Tmean <10°C
	Acer campestre	V	Σ t=5 > 650	Tmean <10°C
	Acer campbellii	V	Σ t=5 > 650	Tmean <10°C
Black locust	*Robinia pseudoacacia*	V	Σ t=5 > 650	Tmean <10°C
Chestnut	*Castanea sativa*	V	Σ t=5 > 650	Tmean <10°C
Walnut	*Junglans regia*	V	Σ t=5 > 650	Tmean <10°C
Larch	*Larix gmelinii*	II	Σ t=5 > 400	Tmean <10°C
	Larix sibirica	II	Σ t=5 > 400	Tmean <10°C

Maximum growth rate at actual LAI

The maximum rate of gross biomass production (b_{gm}) refers to a reference LAI of 5. When actual LAI deviates, adjustment of b_{gm} is achieved by means of a correction factor *L*, which equals the ratio of b_{gm} at actual LAI to b_{gm} at LAI of 5. As shown in Figure 3, the effect of LAI on b_{gm} is small when LAI is larger than 5 and a near complete ground cover or light interception is achieved.

11 Based on calculations for Bologna (Italy), Vienna (Austria), De Bilt (Netherlands), Stockholm (Sweden), Moscow (Russia), and Kiruna (Sweden).

12 Species-specific thresholds for meeting phenological requirements for bud burst and flushing have been related to temperature sums for mean temperatures exceeding 5°C (Barnes *et al.*, 1998).

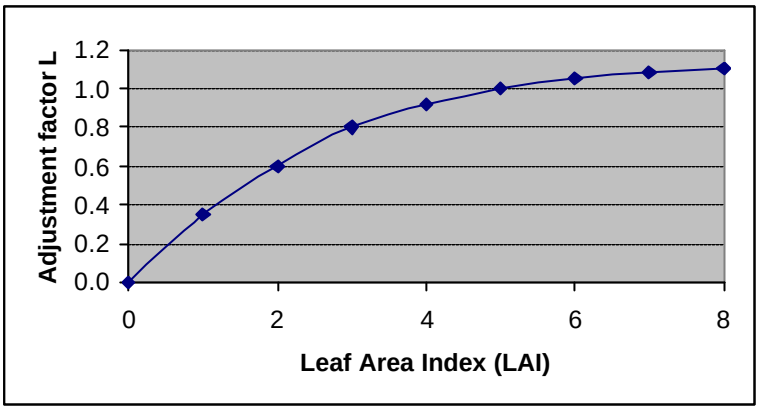


Figure 3 Relationship between leaf area index (LAI) and maximum growth rate as a fraction of the maximum growth rate at LAI of 5

The LAI of individual tree species/LUTs has been adjusted when moisture stress thresholds are exceeded (Table 11). In case (e = ETa/ETo*100) falls short of the species specific drought tolerance parameter κ, but is not less than parameter λ, the leaf area index has been adjusted proportionately to the values between 100% and minimum value μ corresponding to position of e with regard to drought tolerance parameters κ and λ. In case e falls short of λ then zero biomass increment (not suitable) is assumed. The adjusted LAI has been calculated as follows:

$$LAI_{adj} = \begin{cases} LAI & e \geq \kappa \\ LAI\left(\dfrac{e-\lambda}{\kappa-\lambda} + \mu \cdot \dfrac{\kappa-e}{\kappa-\lambda}\right) & \alpha \geq e \geq \lambda \\ not\ \ suitable & e < \lambda \end{cases} \quad (9)$$

where:

$e = ETa/ETo*100$

Respiration losses

To calculate the maximum rate of net biomass production (b_{nx}), the maximum rate of gross biomass production (b_{gm}) and the rate of respiration (s_m) are required. Here, growth respiration is considered a linear function of the rate of gross biomass production (McCree, 1974), and maintenance respiration a linear function of net biomass that has already been accumulated (B_m). When the rate of gross biomass production is b_{gm}, the respiration rate s_m is:

$$s_m = k\, b_{gm} + c\, B_m \quad (10)$$

where k and c are the proportionality constants for growth respiration and maintenance respiration respectively, and B_m is the net biomass accumulated at the time of maximum rate of net biomass production. For both legume and non-legume species k equals 0.28. However, c is temperature dependent and differs for the two species groups. At 30°C, factor C_{30} for a legume species equals 0.0283 and for a non-legume species 0.0108. The temperature dependence of C_t for both species groups is modeled with a quadratic function:

$$C_t = C_{30}\,(0.044+0.0019\,T+0.0010\,T^2). \quad (11)$$

Net average annual biomass increment

In order to characterize land productivity, we calculate average annual biomass increments achievable in the longer term. Net average annual biomass increment (B_a) is obtained from (5),

$$B_a = B^* / R = N \cdot b_{nx} / a_x \tag{12}$$

In our simulations it is assumed that the standing biomass at 50% rotation length is 38% of the standing biomass at 100% of the optimum rotation length. In this case, the Chapman-Richard function implies that the maximum rate of biomass increase occurs at a relative age r^* = 0.575, that the relative yield $y(r^*)$ at relative age r^* equals $y(r^*)$ = 0.481, and that the maximum relative biomass increase $a(r^*) = a_X$ =1.360.

Using (6), (9) and (10) and the parameter values presented above, we calculate the average net biomass production B_a:

$$B_a = ((1-k) \cdot b_{gm} \cdot L \cdot N / a_x) / (1 + N \cdot y(r^*) \cdot C_t / a_x) \tag{13}$$

and inserting parameter values we obtain,

$$B_a = (0.529 \cdot b_{gm} \cdot L \cdot N) / (1 + N \cdot 0.354 \cdot C_t) \tag{14}$$

where, as before:

b_{gm} = maximum rate of gross biomass production at leaf area index (LAI) of 5 (kg CH_2O $ha^{-1}day^{-1}$)

L = Maximum growth ratio, equal to the ratio of b_{gm} at actual LAI to b_{gm} at LAI of 5.

N = Length of growth period during the year (days)

C_t = Maintenance respiration

Partitioning of biomass

Potential average annual constraint-free wood biomass increment[13] (B_w) is calculated from B_a using the equation:

$$B_w = Hi_{wood} \, x \, B_a \tag{15}$$

where:

Hi_{wood} = harvest index, i.e., proportion of the net biomass of the species that is stem and branch wood (or in case of coppice systems shoots and twigs).

The partitioning coefficients (wood, branches, twigs and foliage, and roots) are species-specific and are also closely related to soil water availability and fertilization. Reference values for stem wood and branches equal 0.6, for twigs and foliage 0.2 and 0.2 for roots. With fertilization and irrigation the harvest index for wood biomass may increase at the expense of root biomass.

Thus, climate and tree species characteristics that apply in the computation of net biomass increments are: (a) heat and radiation regime over the vegetation period, (b) adaptability/productivity classes to determine applicable rates of photosynthesis, P_m, (c) length of vegetation period, (d) maximum leaf area index, and (e) partitioning coefficients.

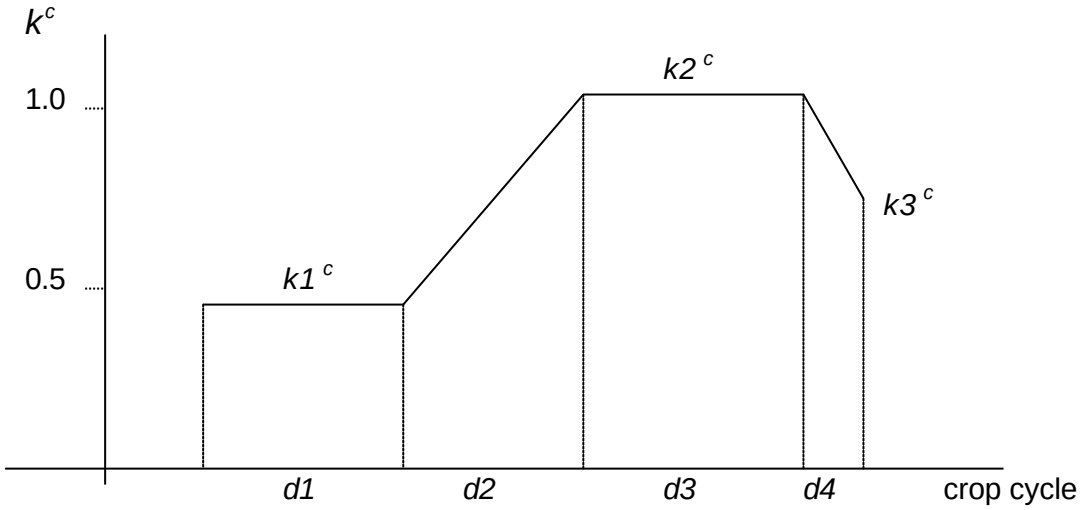
13 Similarly annual potential root biomass increment and annual foliage can be calculated by using the appropriate harvest indexes, Hi_{roots} and $Hi_{twigs\ and\ foliage}$, or in case of short rotation coppice systems $Hi_{shoots\ and\ twigs}$

Moisture limited biomass increments

The calculation of moisture limited biomass increments uses the procedures described in FAO (1992) and FAO (1998), known as the CROPWAT method. In this approach, the species-specific potential evapotranspiration ETo^c is related to reference evapotranspiration ETo as,

$$ETo^c = k^c \, x \, ETo \tag{16}$$

where k^c is calculated from a piecewise linear function as sketched below:



The function is parameterized by means of seven parameters. Four coefficients, *d1*, …, *d4*, relate to the characteristics of the seasonal leaf area development for deciduous tree species, denoting the length (in days) of four development stages, namely, leaf flushing, early stage, mid season stage, and late-season stage. Another three parameters, $k1^c, k2^c$ *and* $k3^c$, define relationship (16) for the individual stages. For non-deciduous tree species parameter $k2^c$ is used for the total period in which photosynthesis is possible.

Let $D_1, \ldots, D_4$ denote the days belonging to each of the four development stages,

$$D_1 = \{ j \mid 1 \le j \le d1 \},$$

$$D_2 = \{ j \mid d1 < j \le d1 + d2 \},$$

$$D_3 = \{ j \mid d1 + d2 < j \le d1 + d2 + d3 \}, \text{ and}$$

$$D_4 = \{ j \mid d1 + d2 + d3 < j \le d1 + d2 + d3 + d4 \},$$

then the value of k^c for a particular day j is defined by piecewise linear functions:

$$k_j^c = \begin{cases} k1^c & j \in D_1 \\ k1^c + (j - d1) \cdot \dfrac{k2^c - k1^c}{d2} & j \in D_2 \\ k2^c & j \in D_3 \\ k2^c + (j - (d1 + d2 + d3)) \cdot \dfrac{k3^c - k2^c}{d4} & j \in D_4 \end{cases} \tag{17}$$

Using (16) and (17), species-specific potential evapotranspiration over the four leaf area development stages, $TETo_k^c$, and the entire vegetation period, $TETo^c$ can be calculated:

$$TETo_k^c = \sum_{j \in D_k} k_j^c \cdot ETo_j \qquad k = 1, \ldots, 4 \tag{18}$$

$$d0 = d1 + d2 + d3 + d4$$
$$TETo^c = \sum_{j=1}^{d0} k_j^c \cdot ETo_j \tag{19}$$

Similarly, applying a species-specific soil water balance, actual evapotranspiration is calculated:

$$TETa_k^c = \sum_{j \in D_k} ETa_j^c \qquad k = 1, \ldots, 4 \tag{20}$$

$$TETa^c = \sum_{j=1}^{d0} ETa_j^c \tag{21}$$

where ETa^c is determined according to:

$$W_{j+1}^c = \min\left(W_j^c + P_j - ETa_j^c,\ Sa\right) \tag{22}$$

$$ETa_j^c = \begin{cases} ETo_j^c & if\ (W_j^c + P_j) \cdot d \geq Sa \cdot d \cdot (1 - p_j^c) \\ \rho_j \cdot ETo_j^c & else \end{cases} \tag{23}$$

with,

$$r_j = \frac{ETa_j^c}{ETo_j^c} = \frac{W_j^c + P_j}{Sa \cdot (1 - p_j^c)} \tag{24}$$

j number of day in year
Sa available soil moisture holding capacity (mm/m)
d rooting depth (m)
p_j^c soil water depletion fraction below which $ETa < ETo$
r_j actual evapotranspiration proportionality factor.

Sa and *d* are defined by the respective values of the soil units in individual grid-cells. The computation of water-limited biomass increment B_l is now easily obtained, following FAO (1979, 1992 and 1998):

$$1 - \frac{B_l}{B_a} = k^y \cdot \left(1 - \frac{ETa^c}{ETo^c}\right) \tag{25}$$

We evaluate (25) in two variants, first over the entire vegetation period and then according to individual growth stages. The more severe of the two conditions determines B_l. The respective reduction multipliers f_0 and f_1 are defined by,

$$f_0 = 1 - k_0^y \cdot \left(1 - \frac{TETa^c}{TETo^c}\right) \tag{26}$$

and

$$f_1 = \prod_{k=1}^{4} (1 - k_k^y \cdot (1 - \frac{TETa_k^c}{TETo_k^c})) \quad (27)$$

where the coefficient expressing the sensitivity of biomass increment to moisture deficit, k^y, are based on FAO (1992 and 1998).

Applying (26) and (27) to potential biomass increment from (15), we obtain the final results,

$$B_l = min(\ f_0, f_1\ ) \cdot B_a \quad (28)$$

4.4 Climate related Productivity Constraints

Climatic constraints may cause direct or indirect losses of biomass increments. These constraints are influenced by the following conditions:

- Constraints indirectly related to climatic conditions such as pests, diseases and invasion of unwanted species or weeds;
- Climatic factors which affect the efficiency of forestry operations and costs of production,
- Occurrence of late and early frost, and
- Forest fires.

The climatic constraints for individual tree species by management objective are specified for the temperature and moisture regimes in each grid-cell. In particular the climatic constraints are linked to: (i) length of thermal growing period ($LGP_{t=5}$), (ii) length of frost-free period ($LGP_{t=10}$), (iii) accumulated temperatures, (iv) length of moisture growing period (LGP), and (v) seasonal wetness.

Frost risks

Frost risks are accounted for in matching the early and late frost tolerance/sensitivity of individual tree species with prevailing periods during which mean daily temperatures exceed 10^oC. These periods are assumed to represent, by and large, the frost-free periods (Table 9).

Forest fire risks

Forests fire risk has been assumed to be related to the following main factors: (i) climate conditions (aridity and wind), forest species susceptibility to fire, and (iii) forest fire prevention measures (access roads and fire protection barriers). Forest species may be listed in decreasing order of fire-susceptibility as follows: (1) light coniferous species, (2) dark coniferous species and (3) broad-leaved species.

Table 14 presents the assumptions we have made for forest fire intervals for unprotected forest resources of respectively broad-leaved, dark coniferous and light coniferous tree species under three distinct aridity conditions (see also Section 4.1, conservation forestry and Plate 12, Aridity Index).

The tentative forest fire intervals presented in Table 14 are applied only for the suitability analysis of conservation forest LUTs. Traditional production forest and biomass plantation forest LUTs are assumed to require full fire protection by means of access roads and fire protection barriers. These measures, however, may take away between 5 and 10 % of potentially productive forest areas.

Table 14 Assumed forest fire intervals for conservation forestry LUTs

	Aridity Index Period (P/PET)		
	< 0.5	**0.5-1.0**	**>1.0**
Dominantly broadleaved forest	n.a.	>150 years	>150 years
Dominantly dark coniferous forests	n.a	100 years	>150 years
Dominantly light coniferous forests	25 years	50 years	>150 years

Indirect climatic constraints

At this stage of the model development, it has not been possible to implement in the climatic suitability assessment other climatically driven constraints such as pests and diseases, invasion of unwanted species or weeds, and limitations of workability and accessibility (due to excessive wetness), which may very well reduce annual biomass increments.

4.5 Soil and Terrain Suitability Analysis

Soil suitability

From the basic soil requirements of forest tree species, a number of soil characteristics have been established which relate to growth and biomass production. For the 52 forest tree species considered, optimal, sub-optimal and marginal/unsuitable levels of these soil characteristics have been established (Table 10).

Beyond critical ranges, tree species cannot be expected to grow satisfactorily and produce biomass. Soil suitability classifications are based on knowledge of requirements, prevailing soil conditions, and applied management. In other words, soil suitability classifications describe in broad terms to what extent soil conditions match tree species requirements under defined input and management circumstances.

Specifically for soil suitability evaluation purposes, a range of quantitative and qualitative attributes have been identified as being required for soil suitability assessments as follows:

(i) Information that can be inferred from the soil units of legends of the soil maps. This includes: soil drainage, soil depth, gravel content, electrical conductivity, exchangeable sodium percentage, calcium carbonate content and gypsum content.

(ii) Other attributes require quantitative data and are to be derived from soil profile databases. (see Section 3.2).

In Appendix III soil unit and soil phase suitability ratings are proposed for the 52 tree species considered. Two sets of ratings have been compiled. One set for natural soil conditions, excluding consideration of any inputs or specific soil management. This set of ratings has been used for the soil suitability assessment regarding conservation forestry LUTs (see Table 6). A second set of ratings was applied for traditional production forest and biomass plantation forestry LUTs (see Tables 7 and 8). These latter ratings assume inputs in terms of nutrients and specific management, in particular, in support of juvenile growth. The ratings presented for soil units and soil phases in Appendix III are the following:

S1	(1)	Optimal conditions
S2	(2)	Sub-optimal conditions
S1/S2	(3)	50% optimal and 50% sub-optimal conditions
S1/N	(4)	50% optimal and 50% not suitable conditions
S2/N	(5)	50% sub-optimal and 50% not suitable conditions
N	(6)	Not suitable conditions

Terrain suitability

Sustainable forest production on sloping land is concerned with the prevention of erosion of topsoil and decline of fertility. Usually this is achieved by combining special forest management and soil conservation measures. Slopes with tree stands that are providing inadequate soil protection and without sufficient soil conservation measures, may cause a considerable risk of accelerated soil erosion. In the short term such situation may lead to production losses due to erosion of topsoil. In the long term, this may result in truncation of the soil profile and consequently reduction of natural soil fertility and of available soil moisture.

The terrain-slope suitability rating used in the FAEZ model captures the factors described above, which influence production and sustainability. This is achieved through: (i) defining for the various forest/LUTs permissible slope ranges by setting maximum slope limits; (ii) for slopes within the permissible limits, accounting for likely yield reduction due to loss of topsoil, and (iii) distinguishing among forestry practices ranging from manual to highly mechanized management.

Ceteris paribus, i.e., under similar forest cover, soil erodibility and forestry and soil management, soil erosion hazards largely depend on amount and intensity of rainfall. Data on rainfall amount is available on a monthly basis in the 0.5 degree lat/long climate databases.

To account for clearly existing differences in both amount and within-year distribution of rainfall, use has been made of the modified Fournier index (*Fm*), which reflects the combined effect of rainfall amount and distribution (FAO/UNEP, 1977), as follows:

$$Fm = 12 \sum_{i=1}^{12} \frac{p_i^{\,2}}{Pann}$$

where:

p_i = precipitation of month i

$Pann$ = total annual precipitation

When precipitation is equally distributed during the year, i.e., in each month one-twelfth of the annual amount is received, then the value of *Fm* is equal to *Pann*. On the other extreme, when all precipitation is received within one month, the value of *Fm* amounts to twelve times *Pann*. Hence, *Fm* is sensitive to both total amount and distribution of rainfall and is limited to the range of $Pann \leq Fm \leq 12\ Pann$. The *Fm* index has been calculated for all 0.5 degree grid-cells of the climatic inventory. The results have been grouped in six classes, namely: *Fm* < 1300, 1300-1800, 1800-2200, 2200-2500, 2500-2700, and *Fm* > 2700.

Slope ratings are defined for the seven slope range classes used in the land resources database, namely: 0-2% flat, 2-5% gently sloping, 5-8 % undulating, 8-16% rolling, 16-30% hilly, 30-45% steep, and > 45% very steep. Three suitability-rating classes are employed:

S1	Optimal conditions
S2	Sub-optimal conditions
N	Not suitable conditions

Table 15 presents percentage distributions of terrain-slope ratings for the three forest management types (*conservation forestry*, *traditional production forestry* and *biomass forestry*) for six class ranges of the modified Fournier index Fm (Fm < 1300; 1300-1800; 1800-2200; 2200-2500; 2500-2700 and >2700).

.

Table 15 Terrain-slope ratings (Fm <1300)

Slope Gradient Classes	0-2 %			2-5%			5-8%			8-16%			16-30%			30-45%			> 45%		
Suitability Distribution (%)	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	N	N
Conservation Forestry	100			100			100			100			100			100			100		
Traditional Production Forestry	100			100			100			100			50	50			50	50			100
Biomass Forestry	100			100			75	25			50	50			100			100			100

(Fm: 1300-1800)

Slope Gradient Classes	0-2 %			2-5%			5-8%			8-16%			16-30%			30-45%			> 45%		
Suitability Distribution (%)	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	N	N
Conservation Forestry	100			100			100			100			100			100			100		
Traditional Production Forestry	100			100			100			100			50	50			50	50			100
Biomass Forestry	100			100			75	25			50	50			100			100			100

(Fm: 1800-2200)

Slope Gradient Classes	0-2 %			2-5%			5-8%			8-16%			16-30%			30-45%			> 45%		
Suitability Distribution (%)	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	N	N
Conservation Forestry	100			100			100			100			100			100			100		
Traditional Production Forestry	100			100			100			100			50	50			25	75			100
Biomass Forestry	100			100			75	25			25	75			100			100			100

(Fm: 2200-2500)

Slope Gradient Classes	0-2 %			2-5%			5-8%			8-16%			16-30%			30-45%			> 45%		
Suitability Distribution (%)	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	N	N
Conservation Forestry	100			100			100			100			100			100			100		
Traditional Production Forestry	100			100			100			100			50	50			25	75			100
Biomass Forestry	100			100			75	25			25	75			100			100			100

(Fm: 2500-2700)

Slope Gradient Classes	0-2 %			2-5%			5-8%			8-16%			16-30%			30-45%			> 45%		
Suitability Distribution (%)	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	N	N
Conservation Forestry	100			100			100			100			100			100			100		
Traditional Production Forestry	100			100			100			75	25		25	75				100			100
Biomass Forestry	100			100			50	50				100			100			100			100

(Fm >2700)

Slope Gradient Classes	0-2 %			2-5%			5-8%			8-16%			16-30%			30-45%			> 45%		
Suitability Distribution (%)	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	S2	N	S1	N	N
Conservation Forestry	100			100			100			100			100			100			100		
Traditional Production Forestry	100			100			100			75	25		25	75				100			100
Biomass Forestry	100			100			50	50				100			100			100			100

4.6 Suitability Analysis of Seasonal Wet Sites

For assessing the suitability of wetness prone soils, the tree species have been grouped according their tolerance to excess moisture and resulting poor oxygen supply to rooting systems (Shugart *et al.*, 1992):

Group I Tree species not tolerant to wetness
Group II Tree species somewhat tolerant to wetness
Group III Tree species tolerant to wetness
Group IV Tree species requiring wet conditions

Group I: *Fagus sylvatica, Quercus petracea, Q. rubra, Robinia pseudoacacia, Castanea sativa, Junglans regia, Picea abies, P. asperata, P. ajanensis, P. obovata* and *P. koreaiensis* are not tolerant to wetness and cannot be grown on seasonal wet soils. All Fluvisols, Gleysols and sites affected by water-logging (Table 5) due to snowmelt are considered ***not suitable*** (N).

Group II: *Betula tortuosa, Populus tomentosa, P. euphraetica, Quercus robur, Acer plantanoides, A. campestre, A. campbellii,, Pinus sibirica, P. koreaiensis* and to some extent *Betula pendula, B. verrucosa, B. platyphylla, B. papyrifera, Populus termula, Quercus lanuginose, Q. cerris, Q. acutissima, Q. variablis, Q. mongolica, Carpinus betulus,Tilia cordata, Pinus tabulaeformis,P. massoniana, P. yunnanensis, Abies alba, A. sibirica* and *Cunnninghamia lanceolata* are somewhat tolerant to wetness and benefit to some extent from high groundwater tables and extra residual moisture available in Fluvisols and Gleysols. In water collecting sites with less than 30 days LGP, it is assumed there is on the average insufficient water to grow successfully trees, especially since the contribution from rainfall is also almost non-existent. At LGPs longer than 120 days trees will grow irrespective additional water. It has been assumed that the Fluvisols/Gleysols are too wet in LGPs over 300 days. Table 16 presents suitability classes for the Group II tree species by length of growing period, accounting for differences in amounts of residual moisture and in periods with water-logging and inundation. Water-logging and inundation affect different parts of Fluvisols and Gleysols differently. Higher parts are much less affected than the lower parts. Areas affected by prolonged water-logging of more than 10 days as result of water from snowmelt (Table 5) are considered ***not suitable*** (N) for Group II tree species. Areas affected between 5 and 10 days are rated ***sub-optimal*** (S2).

Table 16 LGP suitability ratings for water collecting sites: Group II tree species

Suitability class	Distribution of suitability classes (%) for water-collecting sites by LGP class														
	0	1-29	30-59	60-89	90-119	120-149	150-179	180-209	210-239	240-269	270-299	300-329	330-364	365-	365+
VS					33	33	33	33	33						
S				33						33					
MS			33		33	33	33	33	33		33				
mS			33	33						33	33				
NS	100	100	34	34	34	34	34	34	34	34	34	100	100	100	100

Group III: *Populus alba, P. basamiferas, P. maximowiczii, Fraxinus excelsior , F. mandshurica, Alnus glutinosa, Larix sibirica* and *surely Betula pubescens, Populus nigra, P. euramericana, Larix gmelinii* and *Pinus sylvestris* are relatively tolerant to wet conditions. These species tolerate prolonged periods of water-logging and some inundation. Table 17 presents suitability classes for the Group III tree species by length of growing period, accounting for differences in amounts of residual moisture and for periods with waterlogging and inundation. Areas affected by snowmelt water are rated as

follows for Group III tree species. Water-logging periods of less than 10 days are considered to pose ***no constraint*** (S1) to growth of Group III tree species; periods between 10 and 30 days are considered ***sub-optimal*** (S2), and periods of more than 30 days ***not suitable*** (N).

Table 17 LGP suitability ratings for water collecting sites: Group III tree species

Suitability class	Distribution of suitability classes (%) for water-collecting sites by LGP class														
	0	**1-29**	**30-59**	**60-89**	**90-119**	**120-149**	**150-179**	**180-209**	**210-239**	**240-269**	**270-299**	**300-329**	**330-364**	**365-**	**365+**
VS					33	33	33	33	33	33	33				
S				33								33			
MS			33		33	33	33	33	33	33	33		33		
mS		33	33	33								33	33		
NS	100	67	34	34	34	34	34	34	34	34	34	34	34	100	100

Group IV: Willows, *Salix alba* and especially *Salix viminalis*, are adapted to wet conditions and tolerate prolonged periods of water-logging and inundation. Long periods of water-logging and/or inundation affect growth. Table 18 presents suitability classes for these tree species by length of growing period.

Table 18 LGP suitability ratings for water collecting sites : Group IV tree species

Suitability class	Distribution of suitability classes (%) for water-collecting sites by LGP class														
	0	**1-29**	**30-59**	**60-89**	**90-119**	**120-149**	**150-179**	**180-209**	**210-239**	**240-269**	**270-299**	**300-329**	**330-364**	**365-**	**365+**
VS					33	33	33	33	33	33	33	33	33		
S				33	33	33	33	33	33	33	33	33	33	33	
MS			33	33	34	34	34	34	34	34	34	34	34	33	33
mS			33	34										34	33
NS	100	100	34												34

Chapter 5 Preliminary Results of Potential Forest Productivity Assessment

This section describes preliminary results[14] of the FAEZ tree species productivity assessment. The study covers the territory of China, Mongolia and the former Soviet Union (FSU).

Estimations of land suitability/productivity were made involving 52 different tree species and for three assumed management objectives. For biomass plantation forestry and traditional production forestry, results are expressed in terms of annual biomass increments over optimum rotation periods for the *best* producing species. For conservation forestry only land suitability was determined. The basic six suitability classes used in the presentation of the results reflect the performance of the *best* adapted species in each land unit as follows:

Table 19 Suitability classification for conservation forestry

Symbol	Description	Percentage of maximum attainable annual growth for best adapted species
VS	Very Suitable	80-100
S	Suitable	60-80
MS	Moderately Suitable	40-60
mS	Marginally Suitable	20-40
VmS	Very Marginally Suitable	5-20
NS	Not Suitable	<5

The suitability/productivity assessments were carried out for 5 km grid-cells, by matching climate characteristics, calculating gross biomass increments, and subsequently, by matching soil and terrain characteristics of each grid-cell with ecological requirements of each considered tree species by management objective. The results were stored in a large database, containing a distribution of land suitability classes and attainable annual biomass increments by 5 km grid-cell for each of the 52 tree species.

For each grid-cell suitability results are also represented by a suitability index *SI*, reflecting the suitability make-up of a grid-cell in accordance with the definition of suitability classes, namely as:

$$SI = VS*0.9 + S*0.7 + MS*0.5 + mS*0.3 + VmS*0.1.$$

The grid-cell results have subsequently been aggregated by province for China, by individual state of the FSU (for Russia by oblast) and for Mongolia. Table A-1 in Appendix I presents a list of codes and names of the States of the FSU and the oblasts of Russia. (Plate 13 shows a map of the FSU[15] and Plate 14 of China with the boundaries of the various administrative divisions[16]).

Depending on management objectives different sub-sets of the 52 tree species were considered as follows:

(i) Biomass plantation forestry - Poplar, Alder, Ash and Willow species.
(ii) Traditional production forestry - Birch, Poplar, Oak, Beech, Robinia, Larch, Spruce, Pine and Fir species.
(iii) Conservation forest - all 52 species.

14 This is the first systematic forest productivity potential assessment in its kind and before publishing final results, substantial verification and validation of methodology and calculation procedures is required (see also disclaimer).

15 The codes in Table A-1 correspond with the codes used in Plate 13.

16 It should be noted that until recently Chengquing Province was a part of Sichuan Province. The results presented for the Sichuan Province include the territory of the new Province Chengquing.

From various data available in the IIASA LUC project, a GIS[17] coverage of agriculture and forest land in China, Mongolia and the States of the Former Soviet Union was compiled (Plate 12). This coverage was used to mask or select areas that are in use for cultivation, under forest or under other permanent use such as urban areas.

Also, a layer has been created to reflect accessibility[18]. It records the presence of roads and railroads and marks grid-cells as accessible, that fall at least partly within a 10 km buffer zone around roads and railroads (Plate 11). This coverage was used to mask non-accessible areas (see Section 3.4)

5.1 Assessment Scenarios

To demonstrate and test the application of FAEZ, a productivity analysis for the territory of China, Mongolia and the former Soviet Union has been carried out for seven scenarios, according to the following assumptions:

Scenario 1: All land is assessed for biomass plantation, traditional and conservation forestry LUTs regardless accessibility or other current uses.

Scenario 2: All accessible land is assessed for both biomass plantation and traditional production forestry LUTs.

Scenario 3: As in scenario 1, excluding grid-cells classified as dominantly cultivated land and urban areas.

Scenario 4: As in scenario 1, only for areas classified as currently under forest.

Scenario 5: As in scenario 2, excluding cultivated land and urban areas.

Scenario 6: As in scenario 2, only for areas currently under forest.

Scenario 7: As in scenario 3, excluding areas currently under forest.

Results aggregated by administrative units are presented in tabular form in the Appendix II. The results are organized by major LUTs: (i) Biomass plantation forestry (results have been provided separately for Willow (*Salix viminalis*) alone, and for the biomass plantation forestry species combined); (ii) Traditional production forestry (results for the traditional forestry species combined), and (iii) Conservation forestry (results for the conservation forestry species combined). Selected results as provided in the Appendix II are listed below:

Salix viminalis:

Table A2 All areas.
Table A3 Accessible areas.
Table A4 Accessible areas, excluding cultivated and urban areas.

Biomass plantation forestry:

Table A5 All areas.
Table A6 Accessible areas.
Table A7 Accessible areas, excluding cultivated and urban areas.

---

17 The map showing cultivated areas and forested areas has been compiled from the land categories and the agricultural regionalization inventories of the FSU (Stolbovoi *et al.*, 1997a, 1997b), the 1:1,000,000 land use map of China (Wu Chuanjun, 1991) and Vegetation Distribution for Mongolia (Sitch and van Minnen, 1996). These three inventories were combined, a reclassification was applied featuring areas with dominantly agriculture and forest, and was transferred to the 5km grid.

18 Based on existing infrastructure information of the Digital Chart of the World (DCW, 1993), an accessibility inventory has been created for the territory of the FSU, China and Mongolia. Standard GIS procedures were used to create buffer zones of 10 km around the roads and railways, i.e., 5 km on each side. The buffer coverage was then transferred to a 5 km grid, which in turn was used in this study as mask for accessibility.

Table A8 Accessible areas currently under forest.
Table A9 All areas, excluding cultivated areas, urban areas and areas currently under forest.

Traditional production forestry:

Table A10 All areas.
Table A11 Accessible areas.
Table A12 Accessible areas, excluding cultivated and urban areas.
Table A13 Accessible areas currently under forest.
Table A14 All areas, excluding cultivated areas, urban areas and areas currently under forest.

Conservation forestry:

Table A15 All areas.
Table A16 All areas, excluding cultivated and urban areas.
Table A17 All areas, excluding cultivated areas, urban areas and areas currently under forest.

The individual tables of Appendix II are organized as follows: The first data column (Total area) records how much land is assessed, given the scenario restrictions. For example, in Mongolia under scenario 1 (considering all the land) the total is 156,198 thousand hectares; under Scenario 2 (land that is accessible by road or railroad) the total is 63,130 thousand hectares; under Scenario 3 (land, excluding cultivated and urban areas) the total is 154,858 thousand hectares, under Scenario 4 (land currently under forest) the total is 7,058 thousand hectares, under Scenario 5 (land that is accessible by road or railroad, excluding cultivated and urban areas) the total is 62,805 thousand hectares, under Scenario 6 (land that is accessible by road or railroad and is currently under forest) the total is 1,163 thousand hectares, and finally under Scenario 7 (land that is neither under forest, nor cultivated or urban) the total is 147,800 thousand hectares.

The next group of nine columns presents extents of land variously suitable for tree growth (see for definition of the suitability classes Table 19). In the case of biomass plantation forestry and traditional forestry LUTs a further eight columns follow, presenting production (total annual biomass increments by suitability classes). Finally a last group of eight columns presents per hectare production following the same logic.

5.2 Results for Biomass Plantation Forestry

Table 20 provides extents of prime land for Willow considering respectively: all land, all accessible land, and all accessible land with the exclusion of cultivated and urban areas.

Results for Willow, which is assumed to be grown in short rotation coppice system (SRCS) with rather specific environmental requirements for growth and management, indicate that prime land (VS+S) is quite rare. Some areas exist in mainly the Baltic States, Byelorussia, Ukraine, and Russia. A rather large area is found in China. However, as can be seen in Table 20, when only areas are considered that are accessible and when excluding cultivated and urban areas, then in China, only less than 3 million hectares remain from approximate 12 million hectares of potential prime willow land.

Examples of selected results for Willow (*Salix viminalis*) are presented in map-form as follows:

Plate 15 Productivity of *Salix viminalis (t/ha biomass yield).*

Plate 16 Productivity of *Salix viminalis* in accessible areas, excluding cultivated and urban areas *(t/ha biomass yield).*

Table 21 presents results in the same format as Table 20, but now combined for all biomass plantation species considered (Poplar, Alder, Ash and Willow species). The pattern observed with the Willow only, remains in tact. Major tracts of potential prime land are found in Byelorussia, the Ukraina, Russia. The largest extents are found in China. However, when we confine to accessible areas and take away cultivated and urban areas, the extents generally reduce approximately three quarters. From this study it appears that seven of the countries investigated have virtually no potential prime land at all

for biomass plantation forestry. These countries are: Mongolia, Armenia, Azerbeijan, Kazakstan, Kirghiztan, Tajikistan and Turkmenistan.

Examples of selected results for the biomass plantation species combined are presented in map-form as follows:

Plate 17 Suitability index for biomass plantation forestry (excluding cultivated and urban areas).
Plate 18 Suitability index for biomass plantation forestry of current forest areas.
Plate 19 Suitability index for biomass plantation forestry in accessible areas (excluding cultivated and urban areas).

Table 20 Very suitable and suitable areas for biomass plantation with Willow (*Salix viminalis*)

	Total area (1)	VS+S Total areas (2)		Accessible areas (3)		VS+S Accessible areas (4)		VS+S Accessible areas, excluding cultivated land and urban areas	
	(000ha)	(000ha)	% of (1)	(000ha)	% of (1)	(000 ha)	% of (3)	(000 ha)	% of (4)
Mongolia	156,198	0	0	63,130	40	0	0	0	-
Armenia	2,690	0	0	2,025	75	0	0	0	-
Azerbaijan	7,868	0	0	6,095	77	0	0	0	-
Byelorussia	20,348	640	3	17,955	88	549	3	184	34
Estonia	3,938	137	3	3,365	73	112	3	74	66
Georgia	6,523	6	0	4,763	73	6	0	1	17
Kazakhstan	268,445	1	0	165,068	61	1	0	1	100
Kirghiztan	19,548	0	0	10,428	53	0	0	0	-
Latvia	6,313	284	4	5,573	88	245	4	91	37
Lithuania	6,420	582	9	6,018	94	543	9	176	32
Moldavia	3,000	16	1	2,848	95	15	1	1	7
Tajikistan	9,013	0	0	4,775	53	0	0	0	-
Turkmenistan	45,390	0	0	22,535	50	0	0	0	-
Ukraine	57,570	634	1	51,955	90	573	1	77	13
Russia	1,674,521	3,014	0	503,616	30	2.274	0	704	31
Russia West of Urals	389,947	1,353	0	244,894	63	1,173	0	158	13
Russia East of Urals	1,284,574	1,661	0	258,722	20	1,101	0	546	50
China	937,041	12,421	1	416,566	44	8,408	2	2,950	35

Table 21 Very suitable and suitable areas for biomass plantation Forestry

	Total area (1)	VS+S Total areas (2)		Accessible areas (3)		VS+S Accessible areas (4)		VS+S Accessible areas, excluding cultivated land and urban areas	
	(000ha)	(000ha)	% of (1)	(000ha)	% of (1)	(000 ha)	% of (3)	(000 ha)	% of (4)
Mongolia	156,198	0	0	63,130	40	0	0	0	-
Armenia	2,690	0	0	2,025	75	0	0	0	-
Azerbaijan	7,868	0	0	6,095	77	0	0	0	-
Byelorussia	20,348	6,048	30	17,955	88	5,375	30	1,589	30
Estonia	3,938	567	14	3,365	73	525	16	199	38
Georgia	6,523	114	2	4,763	73	97	2	12	12
Kazakhstan	268,445	5	0	165,068	61	4	0	3	75
Kirghiztan	19,548	0	0	10,428	53	0	0	0	-
Latvia	6,313	831	13	5,573	88	712	13	192	29
Lithuania	6,420	1893	29	6,018	94	1,757	29	876	50
Moldavia	3,000	190	6	2,848	95	182	6	14	8
Tajikistan	9,013	0	0	4,775	53	0	0	0	-
Turkmenistan	45,390	0	0	22,535	50	0	0	0	-
Ukraine	57,570	8,732	15	51,955	90	7,973	15	816	10
Russia	1,674,521	23,110	1	503,616	30	18,488	4	6259	3
Russia West of Urals	389,947	17,483	4	244,894	63	14,622	6	4515	31
Russia East of Urals	1,284,574	5,627	0	258,722	20	3,866	1	1744	45
China	937,041	39,729	4	416,566	44	27,362	7	10,415	38

5.3 Results for Traditional Production Forestry

Table 22 provides extents of prime land for traditional production forestry. To enable easy comparisons of results, Table 22 addresses the same categories as were provided for biomass plantation forestry in the Table 20 and 21, namely: all land, all accessible land and all accessible land with the exclusion of cultivated and urban land.

The results presented are based on all species considered for traditional production forestry combined, i.e., Birch, Poplar, Oak, Beech, Robinia; Larch, Spruce, Pine and Fir species. The relatively wide environmental tolerances of especially Pine, Spruce, Birch and Larch is the foremost reason for the large areas of prime land that we have estimated, about four times more than for the biomass plantation species. The slope limitations imposed for fully mechanized planting and harvesting assumed for the biomass plantation LUTs explains another part of the differences found. Countries with over one million hectares of potential prime land which is accessible and not already used for cultivation or urban purposes are: Byelorussia (more than 3 million), Lithuania (more than 1.4 million), Ukraine (more than 1.8 million), Russia (more than 68 million) and China (more than 46 million hectares).

Examples of selected results for the traditional production forestry species combined are presented in map-form as follows:

Plate 20 Suitability index for traditional production forestry (excluding cultivated and urban areas).
Plate 21 Suitability index for traditional production forestry of current forest areas.
Plate 22 Suitability index for traditional production forestry of accessible areas currently forested.

Table 22 Very suitable and suitable areas for traditional production forestry

	Total area (1)	VS+S Total areas (2)		Accessible areas (3)		VS+S Accessible areas (4)		VS+S Accessible areas, excluding cultivated land and urban areas	
	(000ha)	(000ha)	% of (1)	(000ha)	% of (1)	(000 ha)	% of (3)	(000 ha)	% of (4)
Mongolia	156,198	96	0	63,130	40	9	0	9	100
Armenia	2,690	53	2	2,025	75	47	2	39	87
Azerbaijan	7,868	63	1	6,095	77	49	1	45	92
Byelorussia	20,348	10,413	51	17,955	88	9,261	52	3,047	33
Estonia	3,938	1,735	44	3,365	73	1,543	46	547	37
Georgia	6,523	404	6	4,763	73	351	7	91	26
Kazakhstan	268,445	814	0	165,068	61	495	0	385	79
Kirghiztan	19,548	53	0	10,428	53	43	0	28	65
Latvia	6,313	2,226	35	5,573	88	1,951	35	609	31
Lithuania	6,420	2,900	45	6,018	94	2,719	45	1,479	54
Moldavia	3,000	805	27	2,848	95	778	27	26	3
Tajikistan	9,013	0	0	4,775	53	0	0	0	-
Turkmenistan	45,390	0	0	22,535	50	0	0	0	-
Ukraine	57,570	20,665	36	51,955	90	18,794	36	1,827	10
Russia	1,674,521	204,248	12	503,616	30	123,126	24	68,967	56
Russia West of Urals	389,947	113,377	29	244,894	63	84,497	35	40,271	48
Russia East of Urals	1,284,574	90,871	7	258,722	20	38,629	15	28,696	74
China	937,041	129,701	14	416,566	44	80,347	19	46,120	57

5.4 Results for Conservation Forestry

For the assessment of suitability for conservation forestry all 52 species considered in this study are used. The selection of tree species is based on criteria other then biomass production, as used for biomass plantation and traditional production forestry. For conservation forestry, the tree species with the best ecological adaptation (highest suitability index) has been selected irrespective of its productivity. The results are presented by suitability class (Appendix II Table A15-17 and Table 23).

Table 23 provides results in terms of extents of land that is at minimum marginally suitable for at least one species. The results are presented for (i) all areas; all areas, but excluding cultivated and urban areas, and (iii) all areas excluding cultivated and urban areas and areas currently already under forest. The fact, that no slope limitations are imposed when assessing suitability for conservation forestry, a large number of species spanning a wide range of ecological adaptability are considered, and all land with at least marginal suitability is reported, resulted in large extents of suitable land in the majority of countries investigated. Very large shares of potential suitable land (more than 70% of total area) were found in Byelorussia, the Baltic states, Moldavia and the Ukraine. Low shares (less than 10 %) were found in Mongolia, Kazakstan, Tajikistan, and Turkmenistan. When discounting land in cultivated or urban use or already under forest, then the highest shares (as percentage of total land) of land potentially suitable for conservation forest are found, in Armenia (16%), Azerbeijan (10%), Lithuania (21%) and China (11%). In absolute terms, the largest areas are found in the biggest countries, namely in Russia, more than 81 million, in particular in Russia east of the Urals with more than 65 million, and in China almost 100 million hectares.

An example in map form of suitability results for conservation forestry is presented in Plate 23: Suitability index for conservation forestry (excluding cultivated and urban areas).

Table 23 Areas suitable for conservation forestry

	Total area (1)	VS+S+MS+mS Total area		VS+S+MS+mS Excluding cultivated and urban areas		VS+S+MS+mS Excluding cultivated land, urban areas and areas currently under forest	
	(000ha)	(000ha)	% of (1))	(000 ha)	% of (1))	(000 ha)	% of (1))
Mongolia	156,198	8,843	6	8,774	6	8,074	5
Armenia	2,690	688	26	499	19	429	16
Azerbaijan	7,868	1,495	19	1,110	14	783	10
Byelorussia	20,348	19,061	94	7,014	34	1490	7
Estonia	3,938	2,742	70	1,069	27	261	7
Georgia	6,523	2,067	32	1,191	18	511	8
Kazakhstan	268,445	22,058	8	10,982	4	9,616	4
Kirghiztan	19,548	2,191	11	1,330	7	1,009	5
Latvia	6,313	5,708	90	2,056	33	198	3
Lithuania	6,420	5,853	91	2,986	47	1,365	21
Moldavia	3,000	2,596	86	89	3	6	0
Tajikistan	9,013	762	8	511	6	8	0
Turkmenistan	45,390	31	0	26	0	8	0
Ukraine	57,570	45,761	79	4,907	9	530	1
Russia	1,674,521	518,789	31	387,013	23	81,613	5
Russia West of Urals	389,947	240,535	62	1239,849	36	16,289	4
Russia East of Urals	1,284,574	278,245	22	247,164	19	65,324	5
China	937,041	374,584	40	248,019	26	99,412	11

Chapter 6 Concluding Remarks

This study confirms in quantitative manner the uneven distribution of potentials for tree growth and therefore to a large extent also the uneven distribution of the production potentials of renewable forest biomass resources within China, Mongolia and the FSU. The results indicate that the concentration of potential areas for the production of woody biomass is mainly located in the European part of the FSU and China.

The results obtained through this exercise, in absolute terms, should be treated in a conservative manner at appropriate aggregation levels, which are commensurate with the resolution of basic data and the scale of the study. Relative results, i.e., the comparison of absolute results at sub-national level in China and the FSU, are likely more robust, when noting that for the entire study area procedures and data were uniformly applied.

The study revealed that in order to obtain a more complete picture of potentials for forest production in particular of China, additional tree species should be included. In particular, species should be included that are specifically adapted to warm sub-tropical climate prevailing in Southeast China. It is expected that the FAEZ procedures and model parameters will be benefiting from scrutiny with further use.

Limitations

The FAEZ results presented are based on 5 km resolution environmental data sets of North, Central and East Asia. While representing the most recent data compilations for this territory, the quality and reliability of these datasets is known to be uneven across the region.

Also silvicultural data, such as data on environmental requirements of individual tree species, contain assumptions and generalizations necessary for the scale of the study. In particular, further work is required to quantify occurrence and severity of constraints indirectly related to climate conditions that

adversely affect growth and productivity of tree species. These constraints include impacts due to pests, diseases, invasion of unwanted species or weeds, workability, and forest fires.

Various types of land degradation may very well affect forest suitability and productivity. Land degradation information could not be considered in the present FAEZ assessment. In a future version soil degradation data available in the LUC-GIS database for North, Central and East Asia will be reviewed for use in FAEZ.

For the above reasons the results obtained from this first implementation of FAEZ should be treated in a conservative manner at appropriate aggregation levels, which are commensurate with the resolution of underlying basic data and the scale of the study.

Next steps

The compatibility of the FAEZ approach with the methods for agriculture (AEZ) allows for consistent integration of agriculture and forest sector assessments. It provides key inputs in region specific applications of the IIASA/FAO multi-criteria model analysis (MCMA) tool which is targeted to provide better assistance for decision making for rural development planning at national and regional levels. Applications using the North, Central and East Asian LUC-GIS data sets have been started. With the already initiated integration of pan-European data sets, also further FAEZ/AEZ/MCMA applications are becoming possible. For Europe the LUC project focus will be initially on countries envisaged for the EU eastward enlargement.

References:

Barnes, B.V., Zak, D. R., Denton, S. R. and Spurr, S. H., (1998): Forest Ecology. John Wiley & Sons, Inc., New York.

Batjes, N.H., Fischer, G., Nachtergaele, F. N., Stolbovoy, V. S., van Velthuizen H. T, (1997): Soil data derived from WISE for use in global and regional AEZ studies. FAO/IIASA/ISRIC. Report IR 97-025, IIASA, Laxenburg, Austria.

Burschel, P. and Huss, J. (1997): Grundriss des Waldbaus. Parey Buchverlag, Berlin

Chartier, Ph., Beenackers, A. A., and Grassi, G. (1995): Biomass for Energy, Environment, Agriculture and Industry (3 Volumes). Pergamon. Oxford.

Chen Cungen,(1999): Die Nadelwälder Chinas - Ökologische Grundlagen einer nachhaltigen Waldwirtschaft. Universität für Bodenkultur Wien - Gebirgswaldbau, Vienna.

DCW, (1993): Digital Chart of the World, Scale 1:1,000,000, Environmental Systems Research Institute (ESRI). Based on original U.S. Defense Mapping Agency, online version: http://www.maproom.psu.edu/dcw/

EROS Data Centre, (1998): Global 30 arc-second Digital Elevation Model.

FAO, (1976): A framework for land evaluation. Soils Bulletin 32, Rome.

FAO/UNEP, (1977): Assessing soil degradation. FAO Soils Bulletin 34, FAO, Rome.

FAO, (1978-81): Report on the Agro-Ecological Zones project. World Soil Resources Report 48, FAO, Rome.

FAO. (1979): Yield response to water. Irrigation and Drainage Paper 33. FAO, Rome

FAO (1984): Land evaluation for forestry. FAO Forestry Paper 48, Rome.

FAO/Unesco/ISRIC (1990). Revised Legend of the Soil Map of the World. World Soil Resources Report 60. FAO, Rome.

FAO. (1991): Fuel-wood productivity. (Technical Annex 6) Agro-ecological land resources assessment for agricultural development planning: A case study of Kenya. FAO/IIASA, Rome.

FAO. (1992): CROPWAT: A computer program for irrigation planning and management. FAO Irrigation and Drainage paper 46. FAO, Rome.

FAO, (1995): Digital Soil Map of the World and derived soil properties (Version 3.5). CD-ROM, FAO, Rome.

FAO, (1998): Crop Evapotranspiration: Guidelines for computing crop water requirements. FAO Irrigation and Drainage Paper 56, FAO, Rome

FAO/IIASA, (1999): Soil and terrain database for north and central Eurasia (Version 1.0) CD-ROM, FAO, Rome.

Fischer, G., van Velthuizen, H.T., and Nachtergaele, F.O., (2000): Global Agro-Ecological Zones assessment: Methodology and results. (IIASA Interim Report, IR-00-064, Laxenburg, (IIASA, FAO).

Garnier and Ohmura, (1968): A method of calculating the direct short-wave radiation income of slopes. Journal of Applied Meteorology, (7) 796-800.

IIASA-LUC GIS webpages: http://www.iiasa.ac.at/Research/LUC/

Jansen, J. J., Sevenster, J., and Faber, P.J. (1995): Opbrengst tabellen voor belangrijke boomsoorten in Nederland. IBN –Report 21.

Kassam, A.H., (1977): Net biomass and yield of crops. Consultant's Report Agro-Ecological Zones project. FAO, Rome.

Kassam, A.H., van Velthuizen H.T., Fischer G.W. and Shah M.M. (1991): Fuelwood Productivity. Technical Annex 6. Agro-ecological land resources assessment for agricultural development planning, A case study for Kenya: ALL-FAO/IIASA, Rome.

Köstler, J.MN., Brückner, E. & Bibelriether, H. (1968): Die Wurzeln der Waldbaüme. Parey Verlag, Hamburg.

Kruessmann, G. (1972): Handbuch der Lobgehölze (3 Volumes) Berlin.

Kruessmann, G. (1983): Handbuch der Nadelgehölze. Berlin.

Landsberg, J.J. (1986): Physiological ecology of forest production. London: Academic Press.

Leemans, R and Cramer, W. P., (1991). The IIASA database for mean monthly values of temperature, precipitation and cloudiness on a global terrestrial grid RR-91-18, Laxenburg.

McCree, K.J. (1974): Equations for the rate of dark respiration of white clover and grain sorghum as functions of dry weight, photosynthesis rate and temperature. In *Crop Science*, (14) 509-514.

Mitscherlich, G. von (1975): Wald, Wachstum und Umwelt. J.D. Sauerländers Verlag, Frankfurt am Main.

Nikolov, N. and Helmisaari, H. (1992): Silvics of the circumpolar boreal forest tree species. In: A systems analysis of the global boreal forest. Cambridge University Press, Cambridge.

Nilsson, N.E. (1983): An alley model for forest resources planning. Statistics in theory and practice. Swedish University of Agricultural Sciences, Department of Biometry and Forest Management, Umea, Sweden.

Payette, S. (1992): Fire as a controlling process in the North American boreal forest. In: A systems analysis of the global boreal forest. Cambridge University Press, Cambridge.

Perttu, K. L.and Aronsson, P.G. (1995). In: Chartier, Ph., Beenackers, A.A., and Grassi, G. (1995): Biomass for Energy, Environment, Agriculture and Industry (3 Volumes). Pergamon. Oxford.

Schmidt-Vogt, H. (1987): Die Fichte. Verlag Paul Parey, Hamburg.

Schmidt, P. (1987, 1989): Nederlandse boomsoorten I en II. LUW-Bosteelt & Bosecologie. Wageningen.

Schober, R. (Ed) (1975): Ertragstafeln wichtiger Baumarten bei verschiedenen Durchforstungen. Frankfurt am Main.

Schuett P. (Ed.), (1999): Enzyklopaedie der Holzgewächse: Handbuch und Atlas der Dendrologie. Landsberg am Lech.

Shugart, (Ed.), (1992): A systems analysis of the global boreal forest. Cambridge University Press, Cambridge.

Shvidenko, A. and Nilsson, S. (1995): Extent, distribution , and ecological role of fire in Russian forests. In: Fire, climate change, and carbon cycling in the boreal forests, Eric S. Kasischke and Brian J Stocks editors. Springer, New York.

Shvidenko, A., Venevsky, S., Raile, R., and Nilsson, S. (1996a): Dynamics of fully stocked stands in the territory of the former Soviet Union. IIASA, Laxenburg

Shvidenko, A., Venevsky, S., and Nilsson, S. (1996b): Increment and mortality for major forest species of northern Eurasia with variable growing stock. IIASA, Laxenburg.

Sitch, S. and van Minnen, J.G. (1996): Incorporating natural vegetation into the LUC project framework. IIASA, Laxenburg.

Song Zhaomin and Meng Ping (1993): Forest and Climate. In: Climate and Agriculture in China. Cheng Chunshu, (Ed). China Meteorological Press, Beijing.

Stolbovoi V., Fischer, G., Ovechkin, S., van Minnen, J., and Rojkova, S. (1997a): The IIASA/LUC-project digital georeferenced database for the Former Soviet Union. Volume 5: Land Categories, IIASA.

Stolbovoi, V., Fischer, G., Sheremet, B. and Rojkova, S. (1997b): The IIASA/LUC-project digital georeferenced database for the Former Soviet Union. Volume 6: Agricultural Regionalization, IIASA.

Swift, L.W. (1976): Algorithm for solar radiation on mountain slopes. *Water Resources Research* (12) 108-112.

Waring, R.H., and Running, S.W. (1998): Forest ecosystems: Analysis at multiple scales. Academic Press, San Diego.

Wiselius, S. I. (1994): Hout Vademecum. Stichting Centrum Hout, Almere, The Netherlands.

de Wit, C.T. (1965): Photosynthesis of leaf canopies. Agricultural Research Report 663. Centre for Agricultural Publications and Documentation, Wageningen, The Netherlands.

Woods, J., and Hall, D.O. (1994): Bio-energy for development, Technical and environmental dimensions. FAO, Rome.

Wu Chuanjun (1994): Land use of China. Sciences Press, Beijing, China (in Chinese).

PLATES

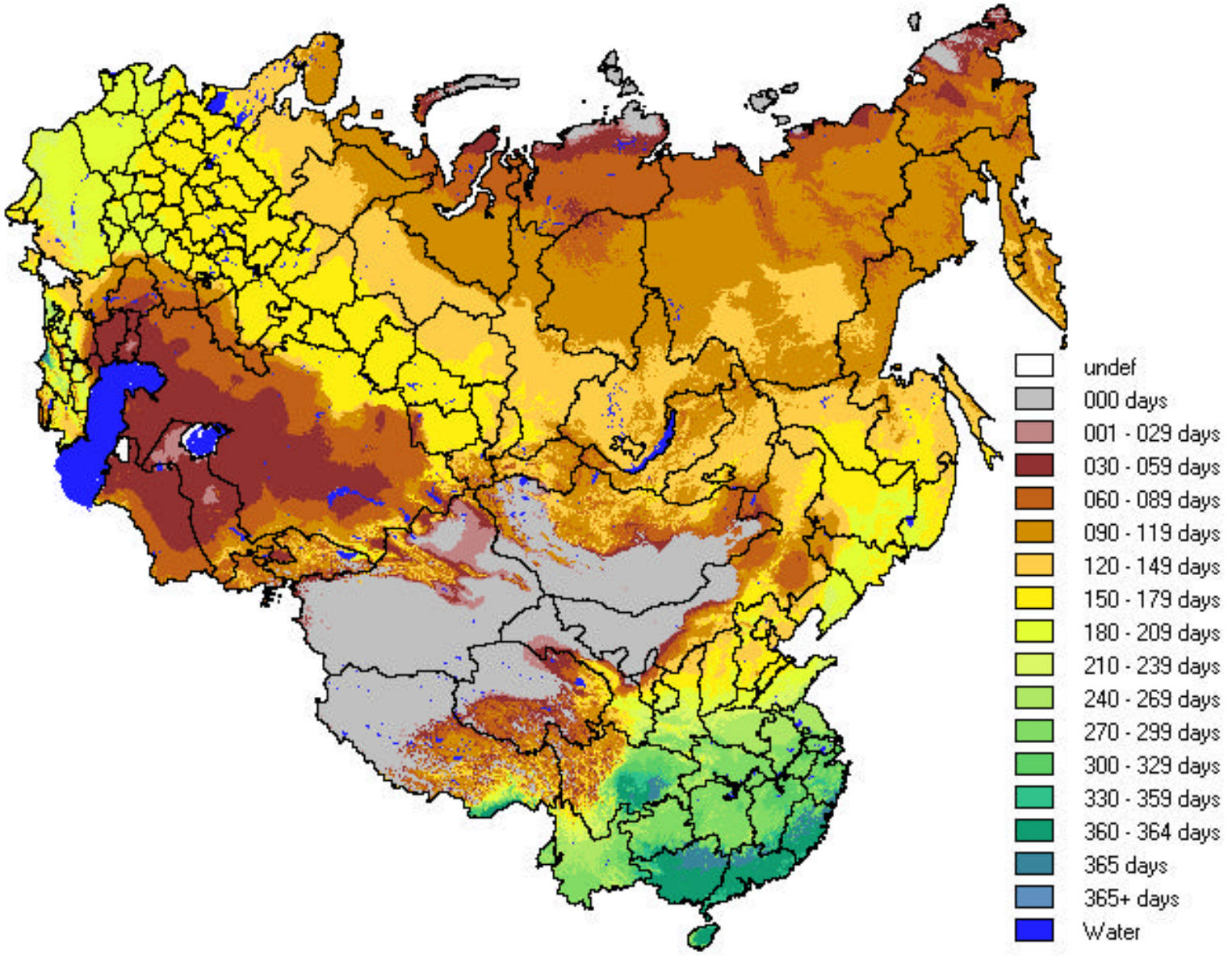


Plate 1 **Length of growing period**

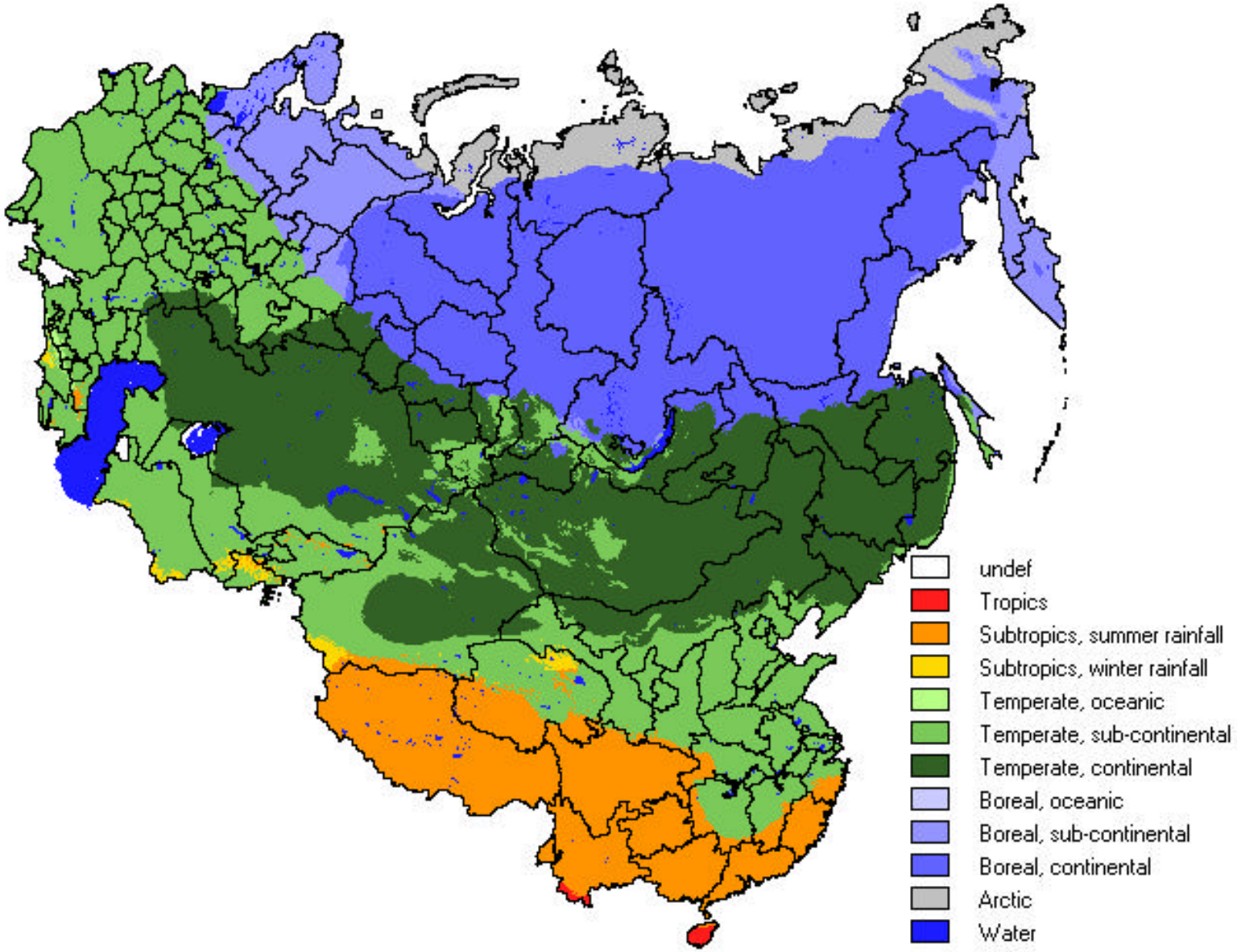


Plate 2 **Thermal climates**

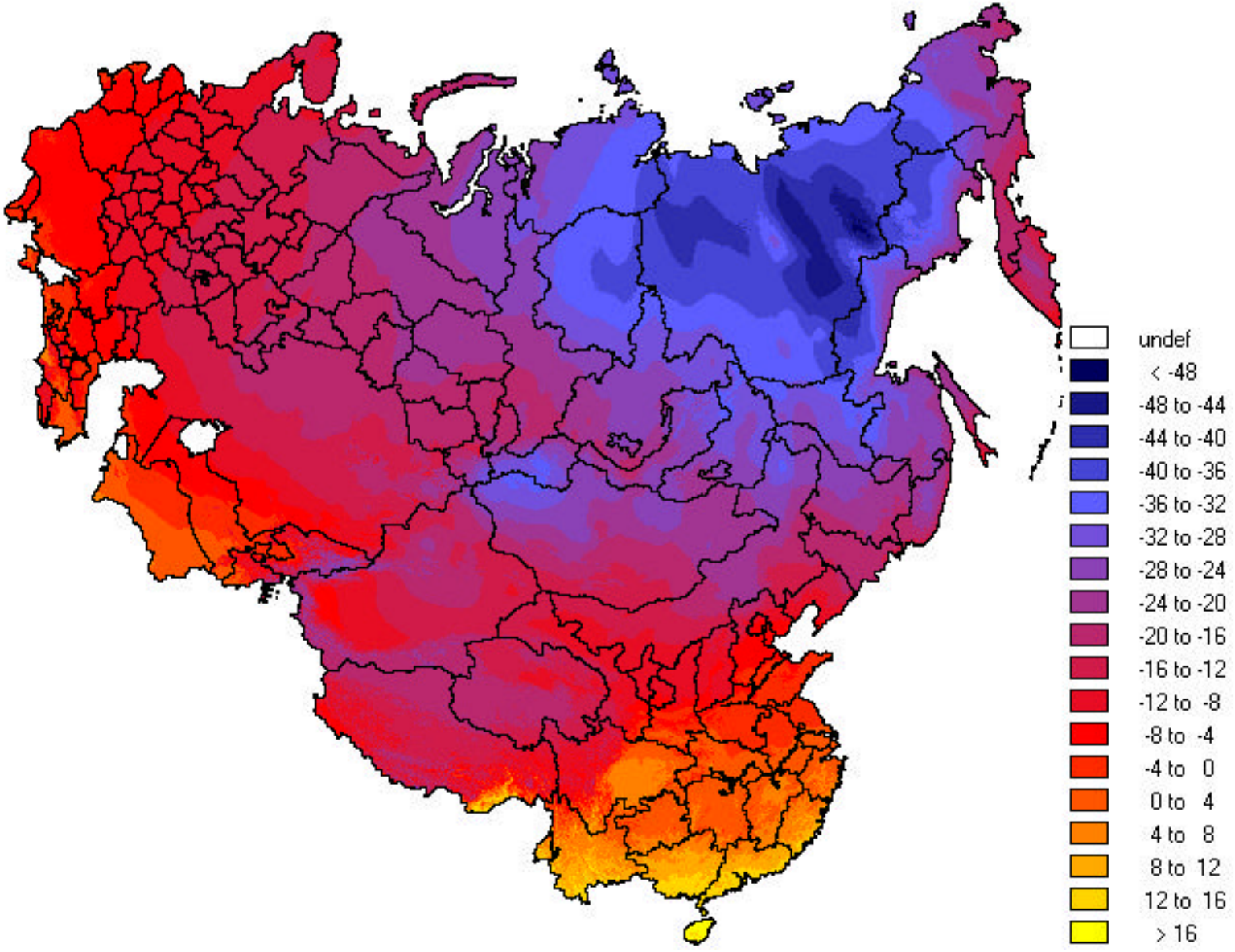


Plate 3 **Mean temperatures of coldest month**

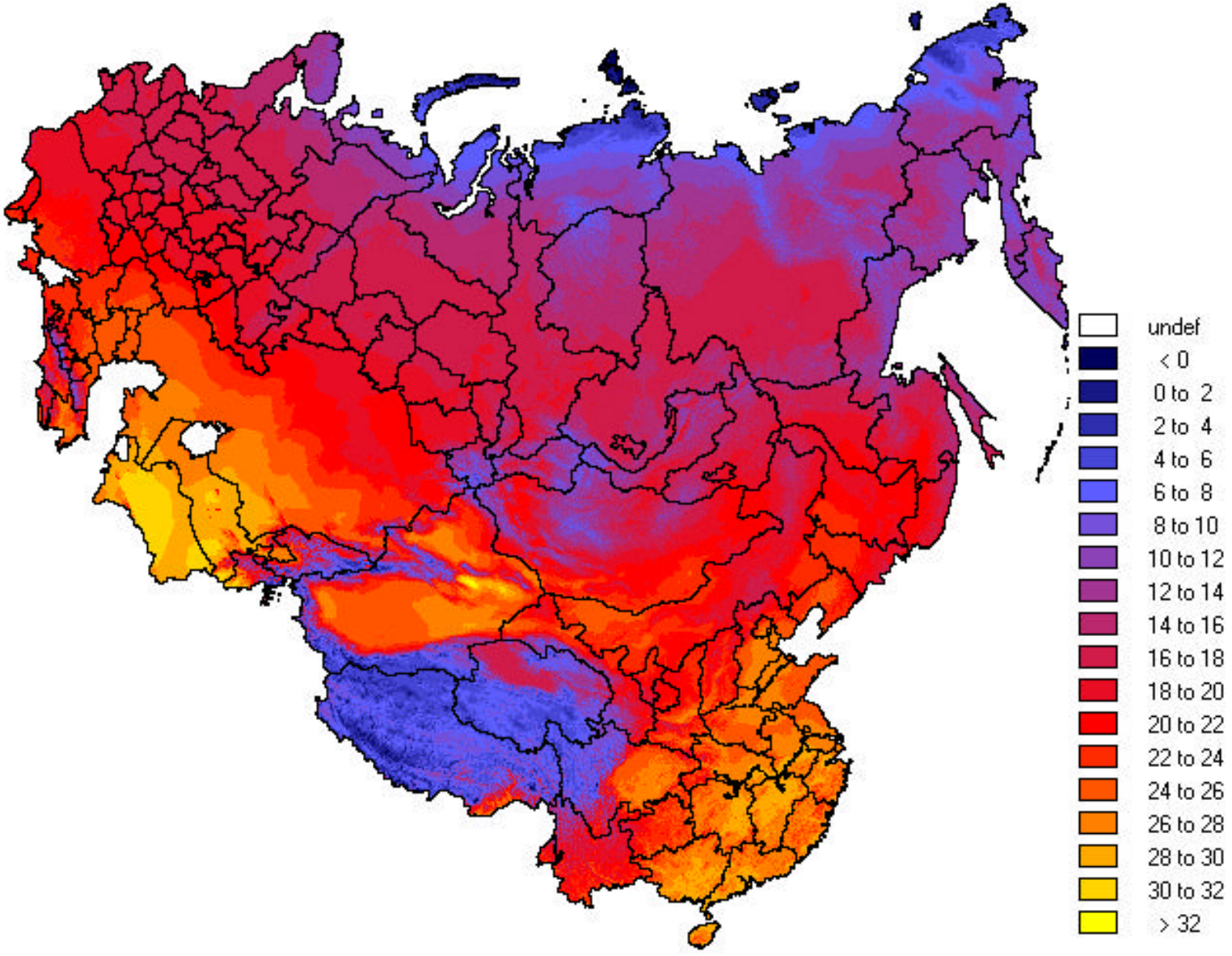


Plate 4 **Mean temperatures of warmest month**

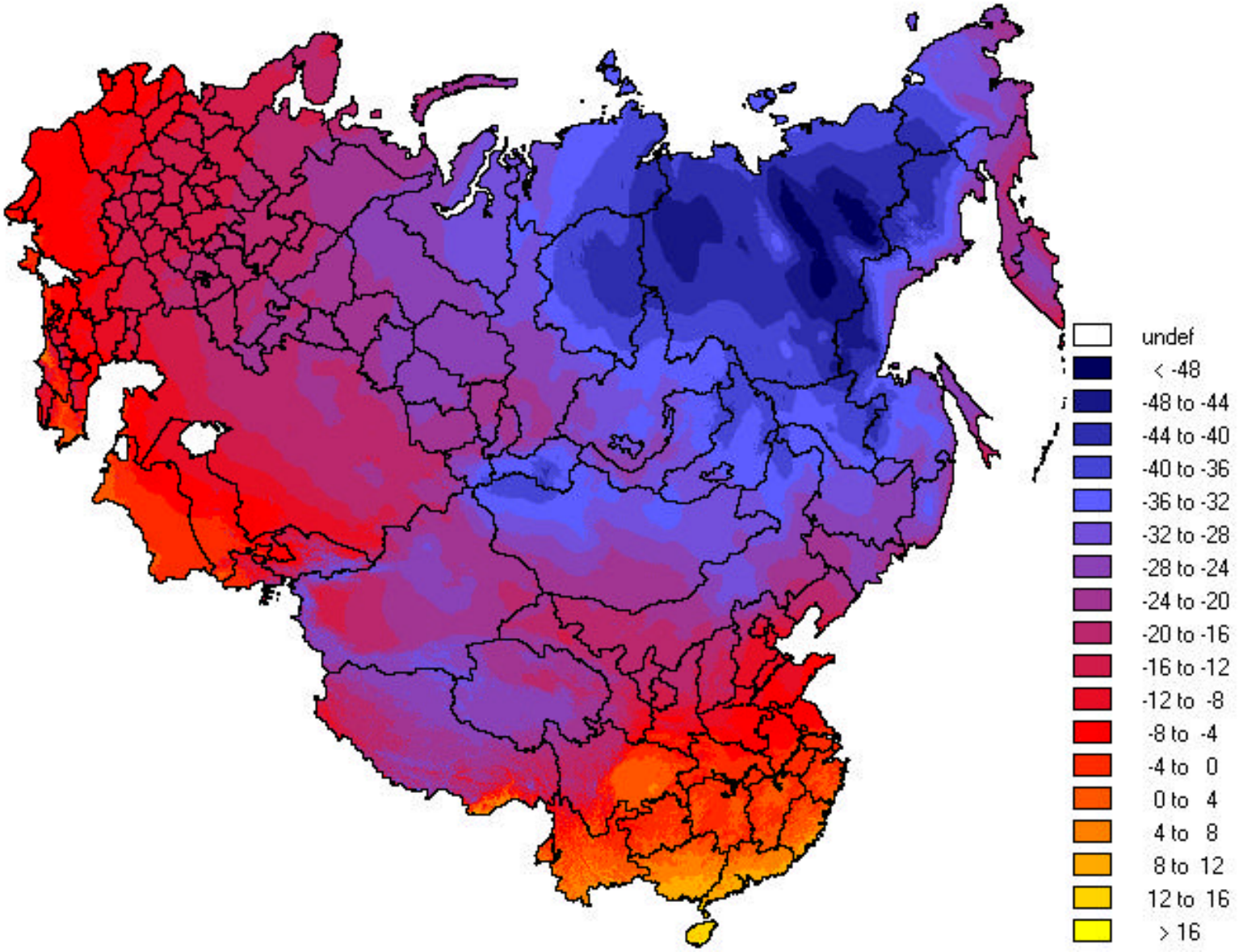


Plate 5 **Mean minimum temperatures of coldest month**

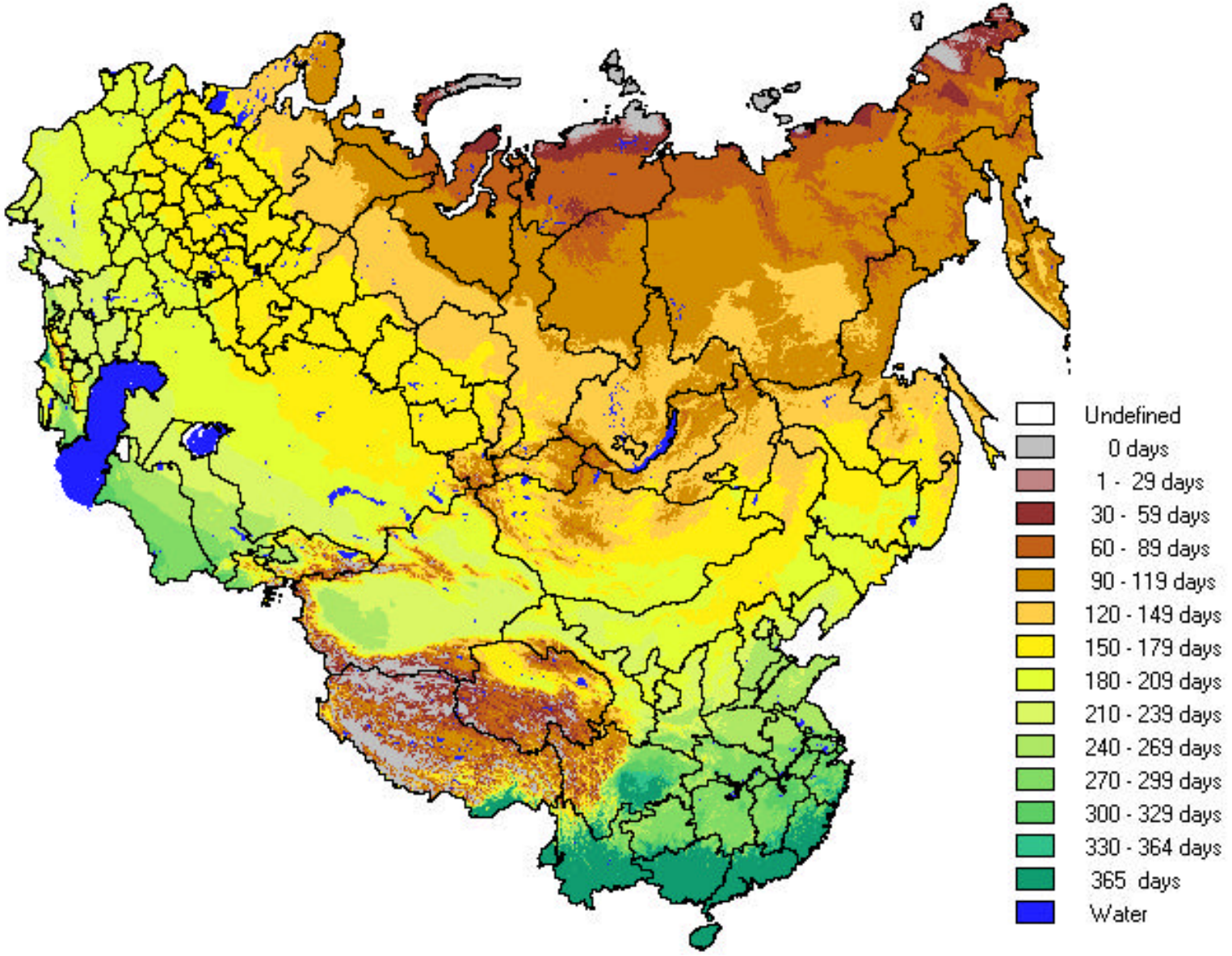


Plate 6 **Temperature growing periods (LGPt=5)**

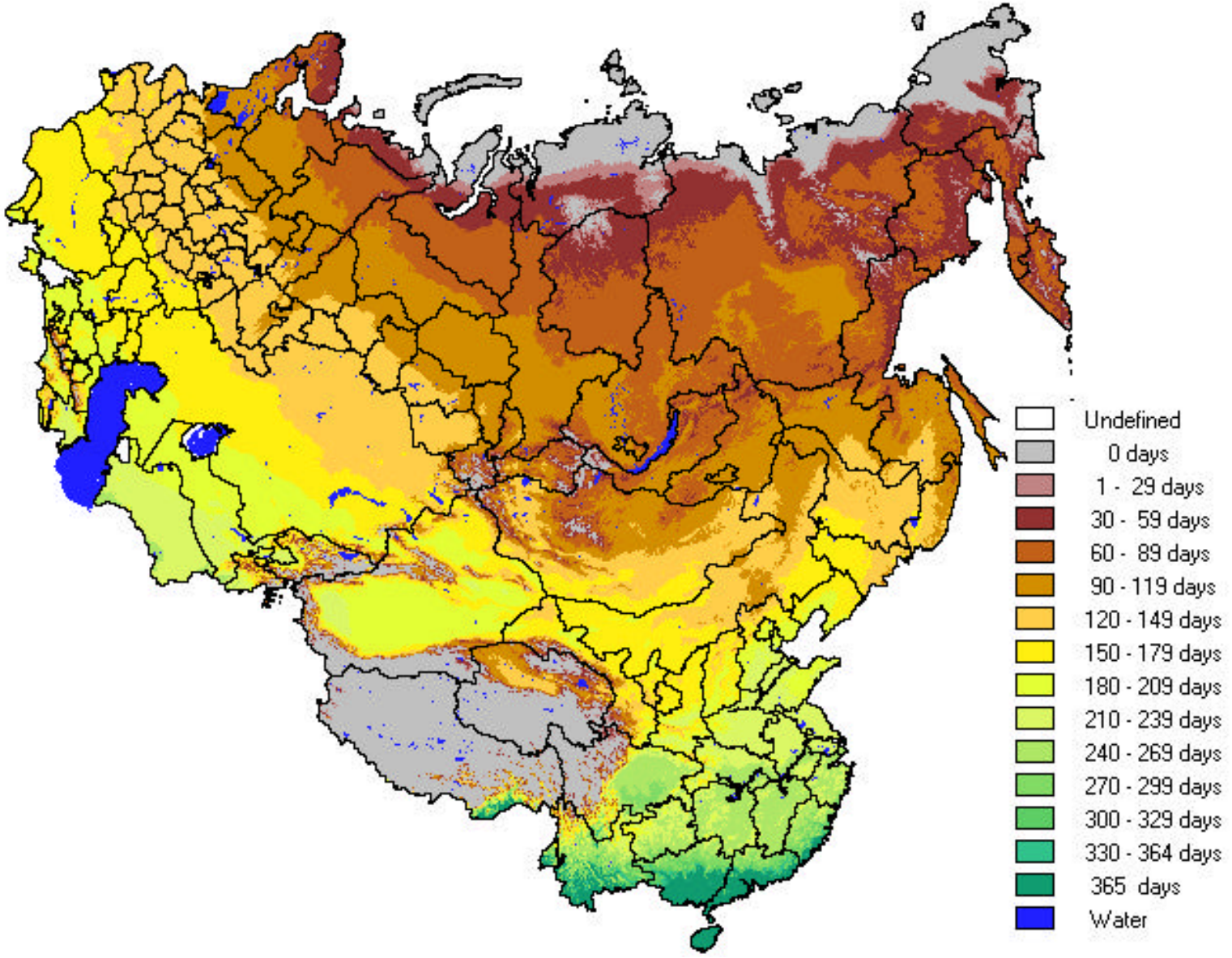


Plate 7 **Frost-free periods (LGPt=10)**

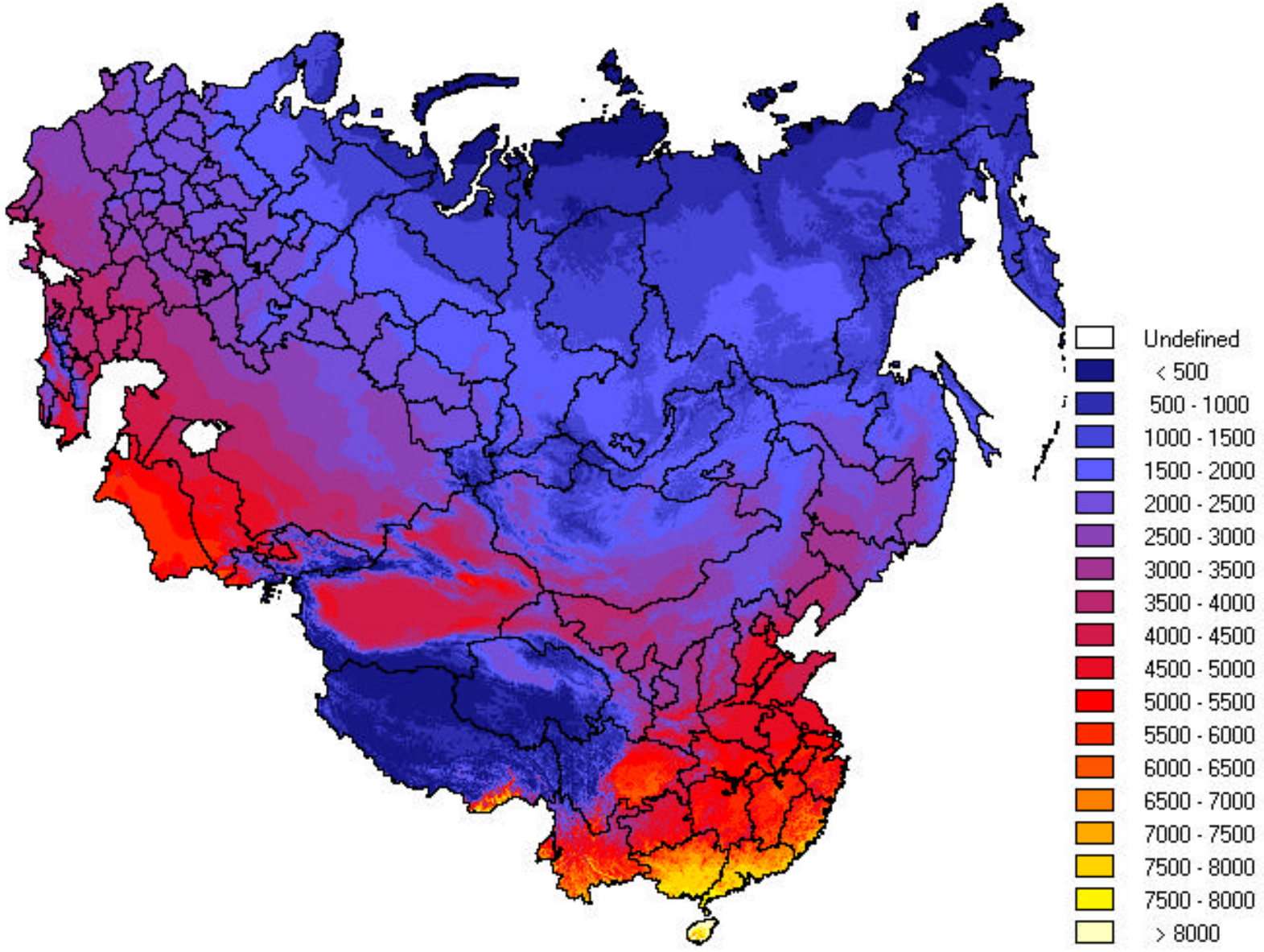


Plate 8 **Accumulated temperatures ($t > 5^{o}C$)**

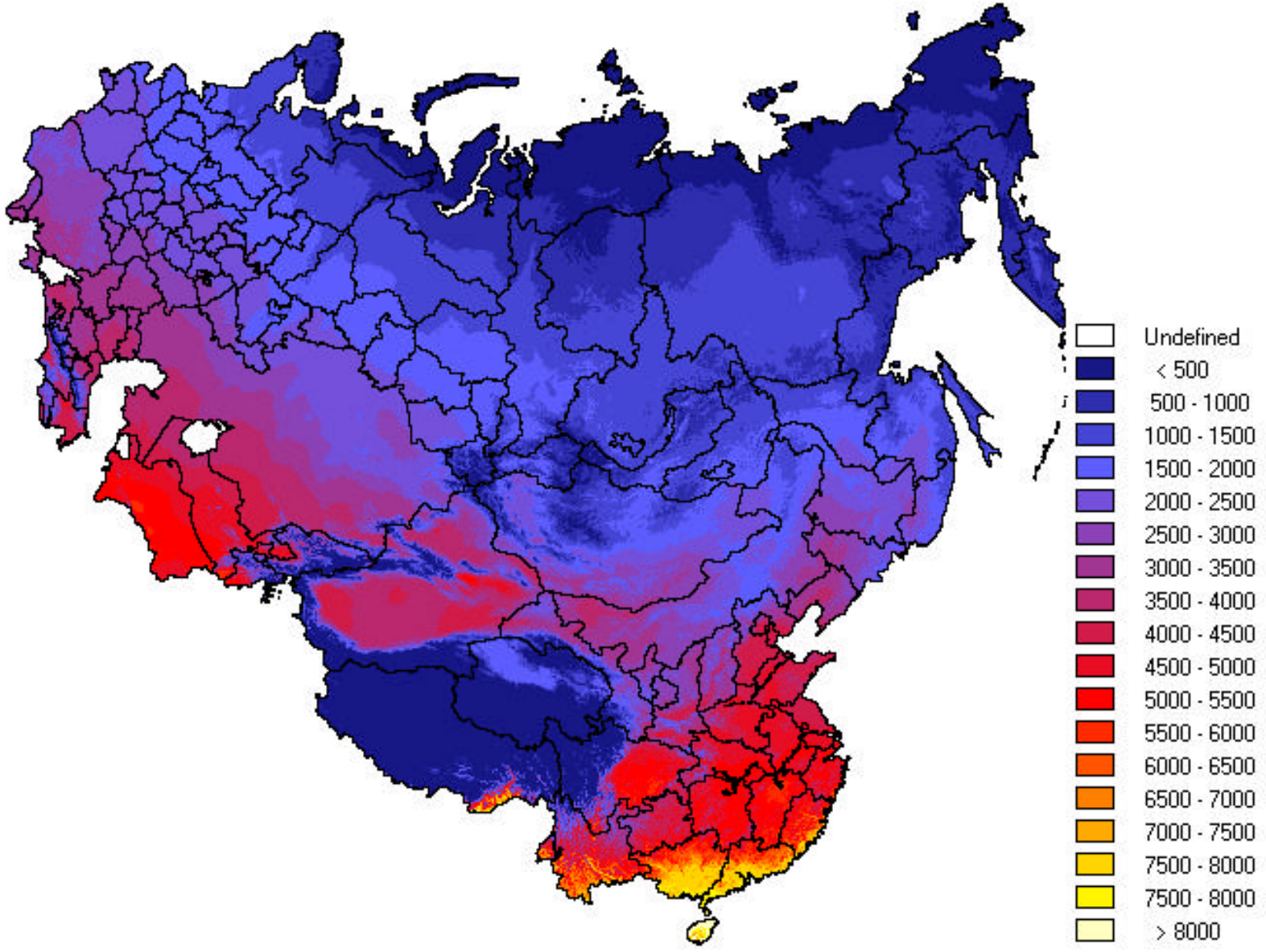


Plate 9 **Accumulated temperatures (t > 10°C)**

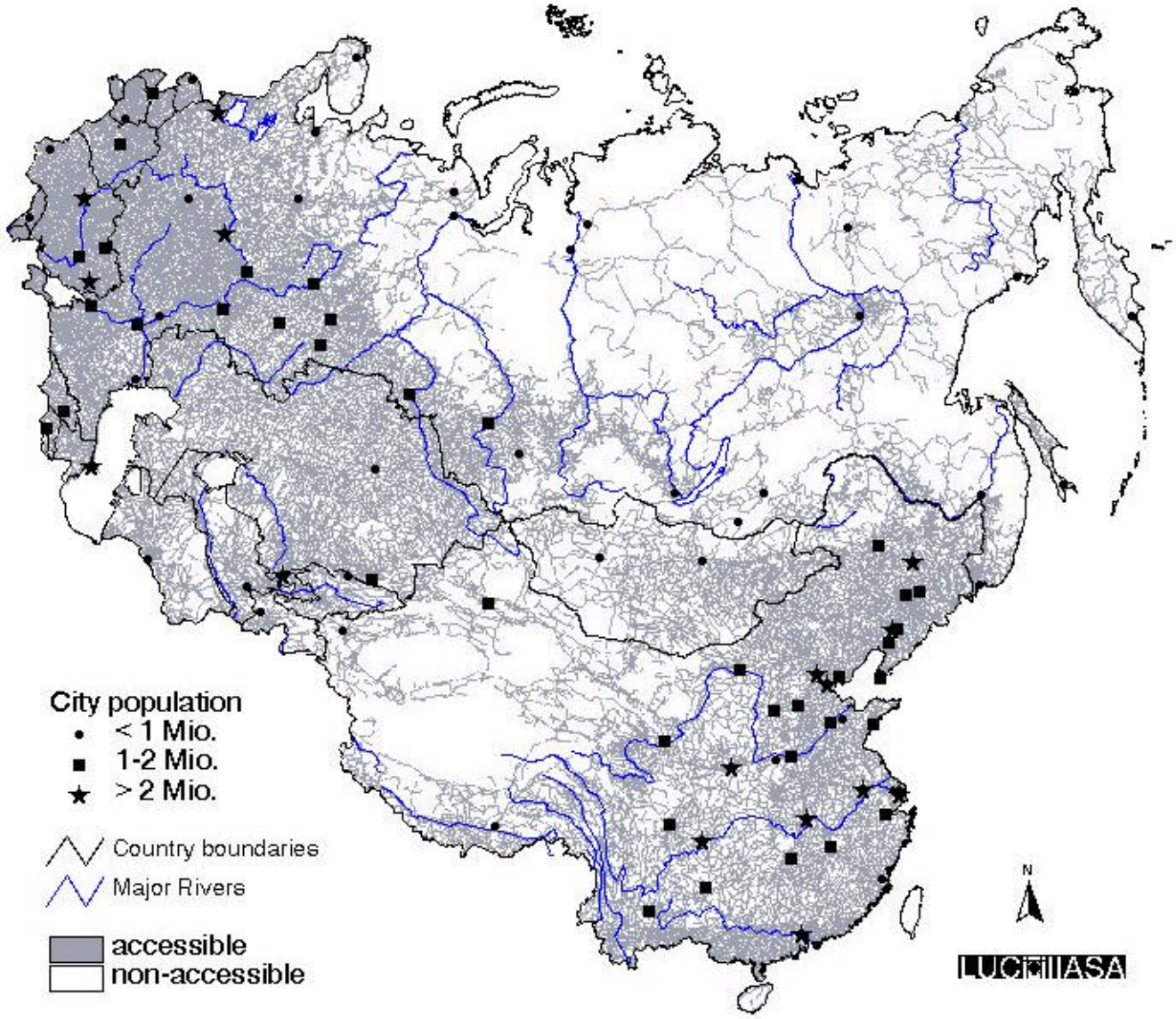


Plate 10 **Zones with accessibility to roads and railroads**

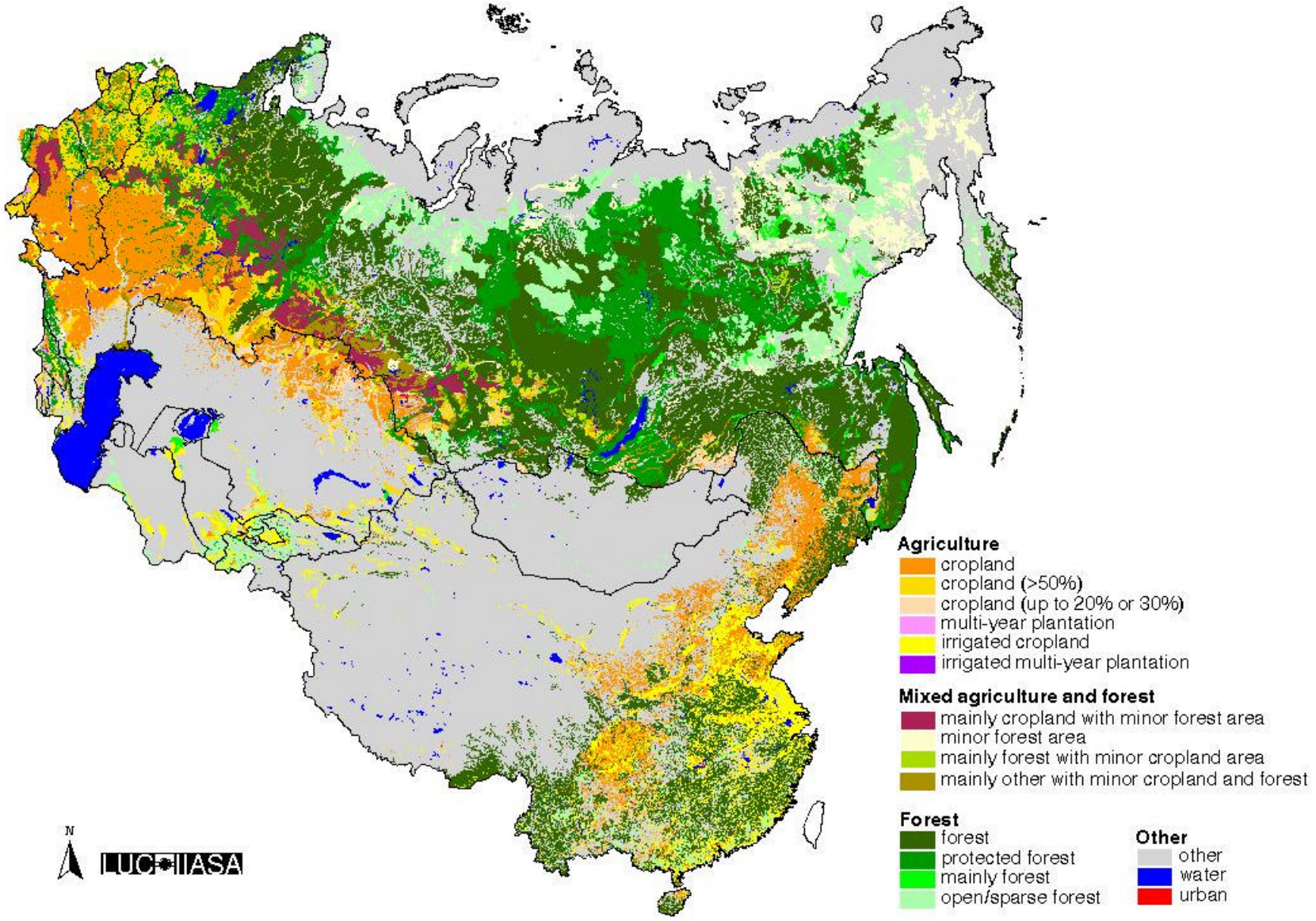


Plate 11 **Agriculture and forest land**

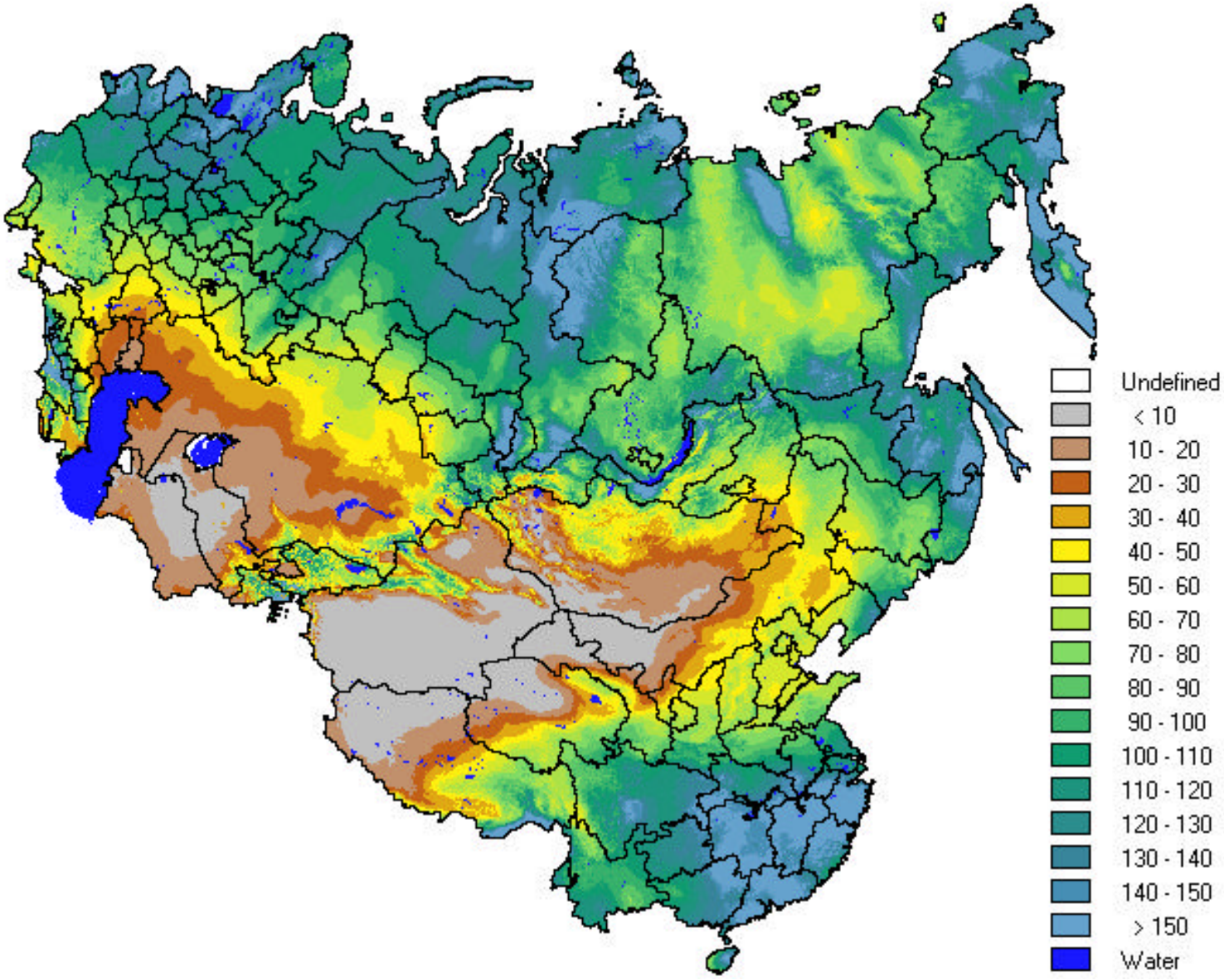


Plate 12 **Aridity index**

Plate 13 **States of the FSU and Oblasts within Rusia**

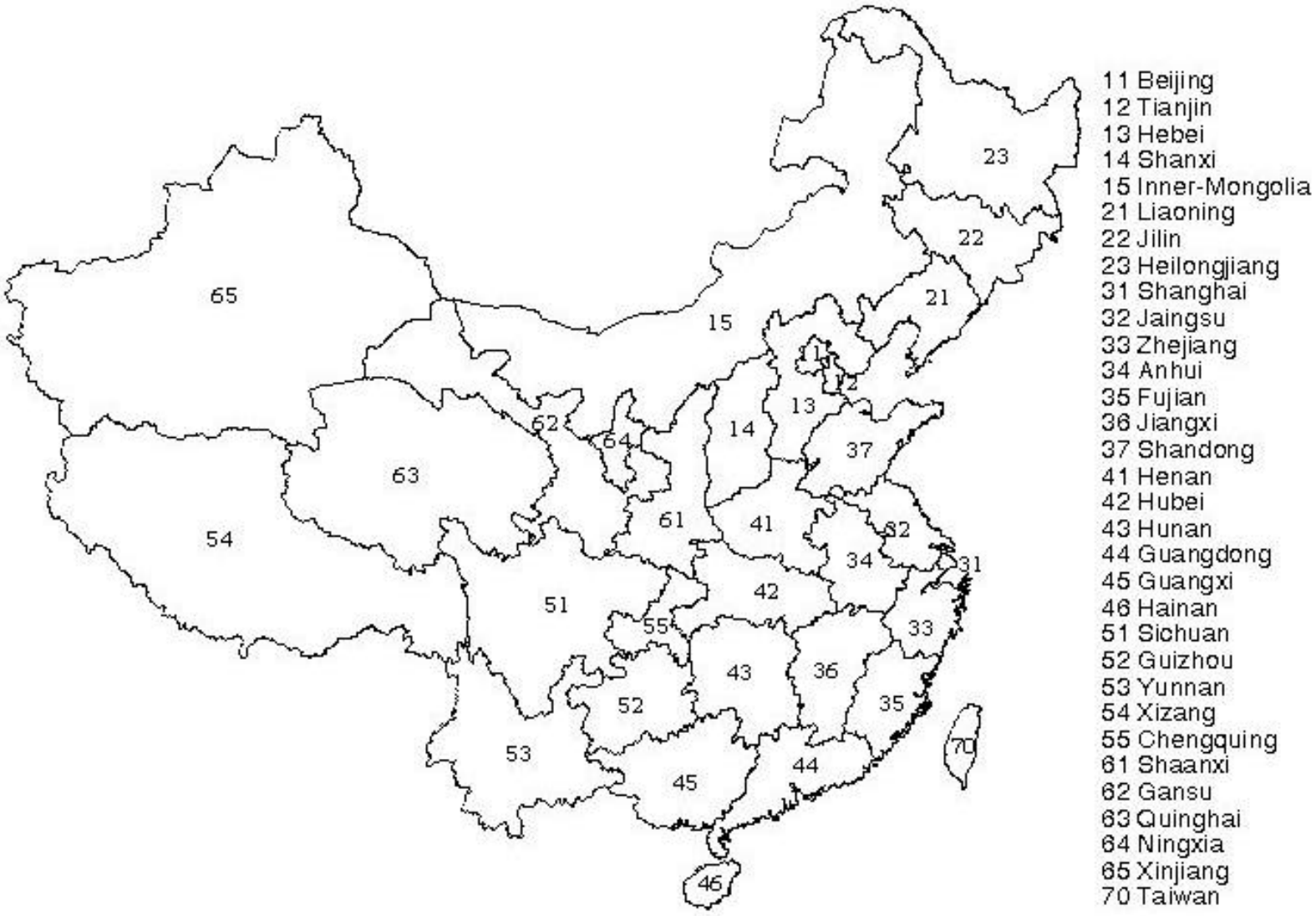


Plate 14 **Provinces of China**

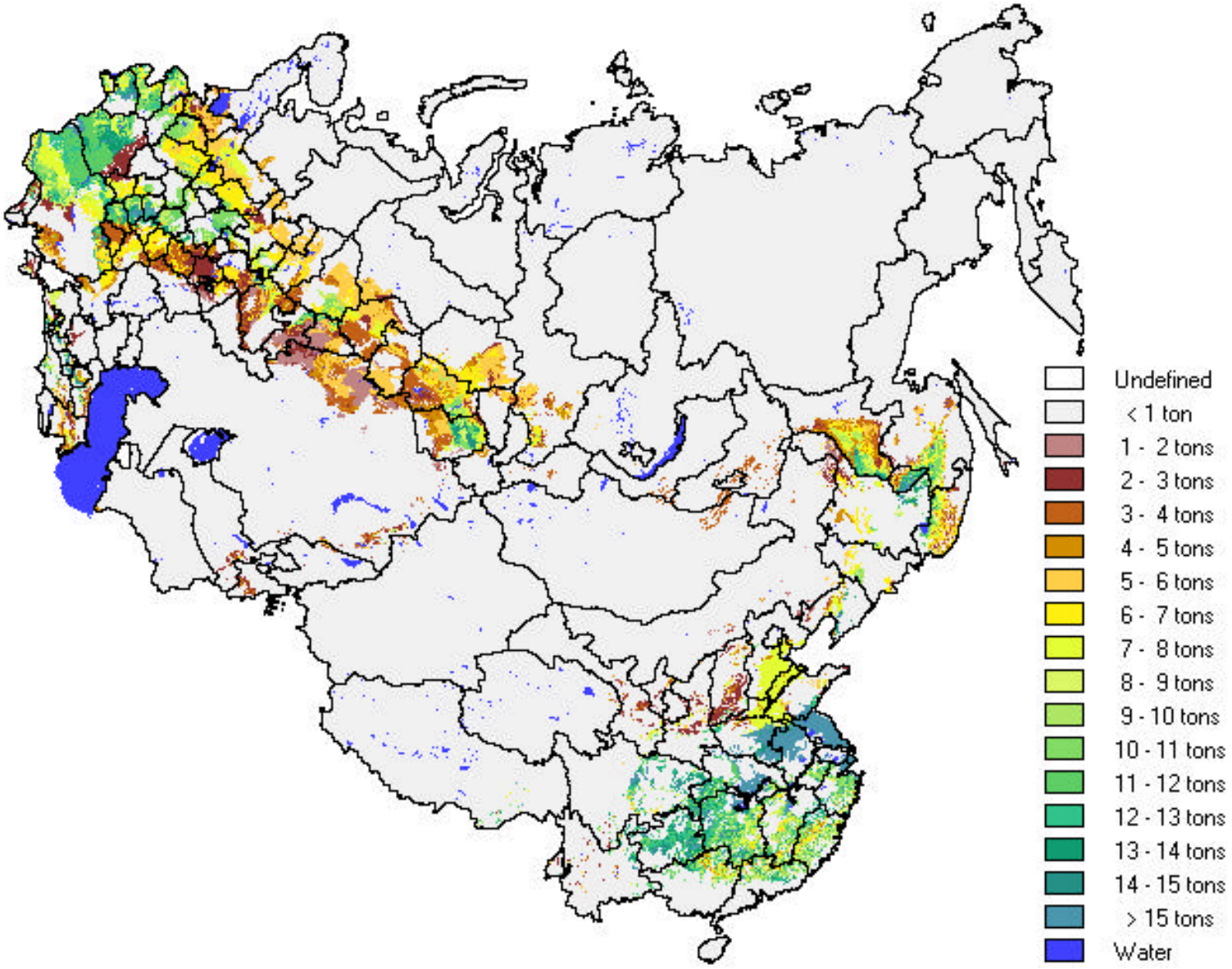


Plate 15 **Productivity of *Salix viminalis*** *(t/ha biomass yield)*

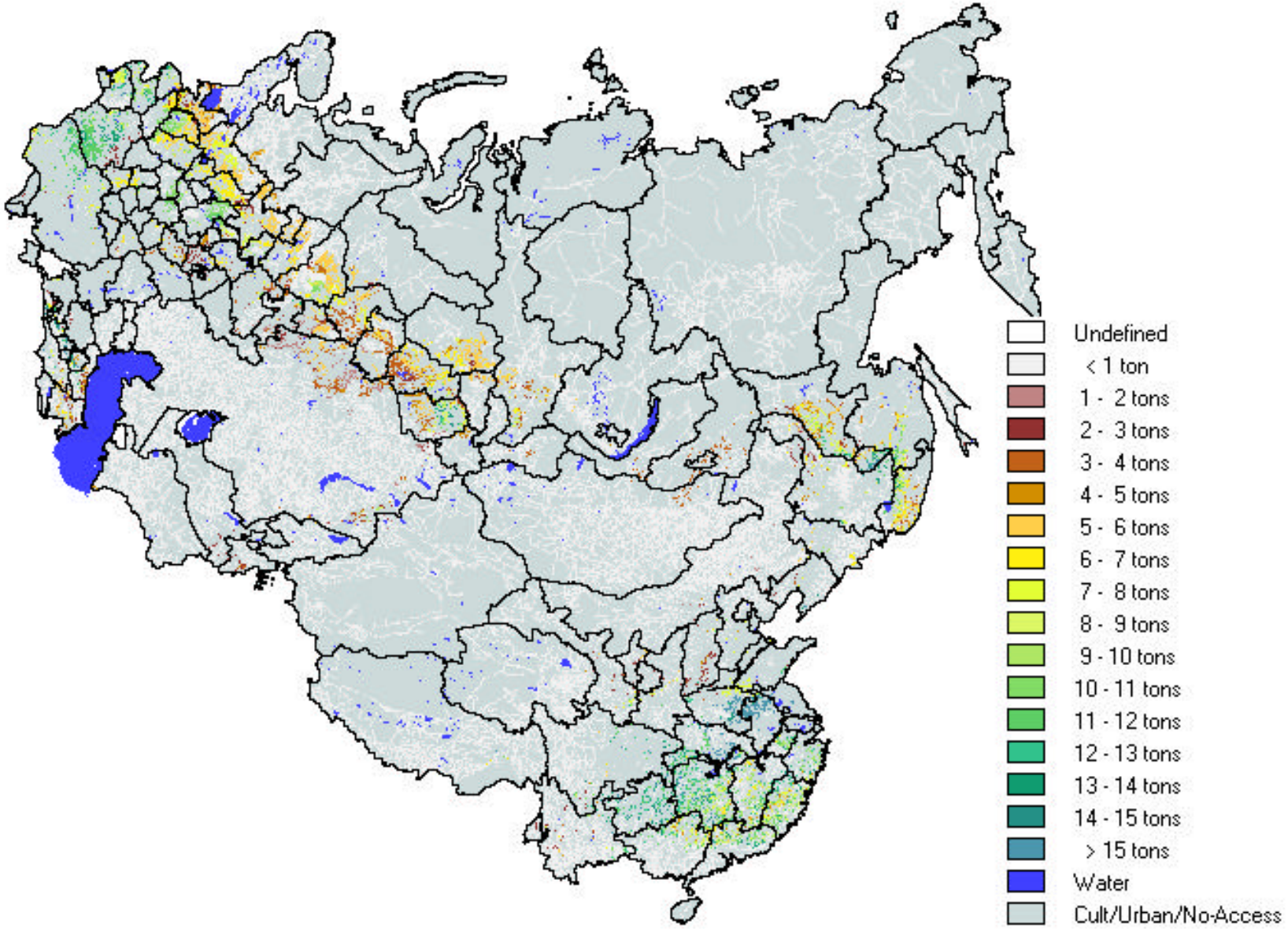


Plate 16 **Productivity of *Salix viminalis* in accessible areas, excluding cultivated and urban areas** *(t/ha biomass yield)*

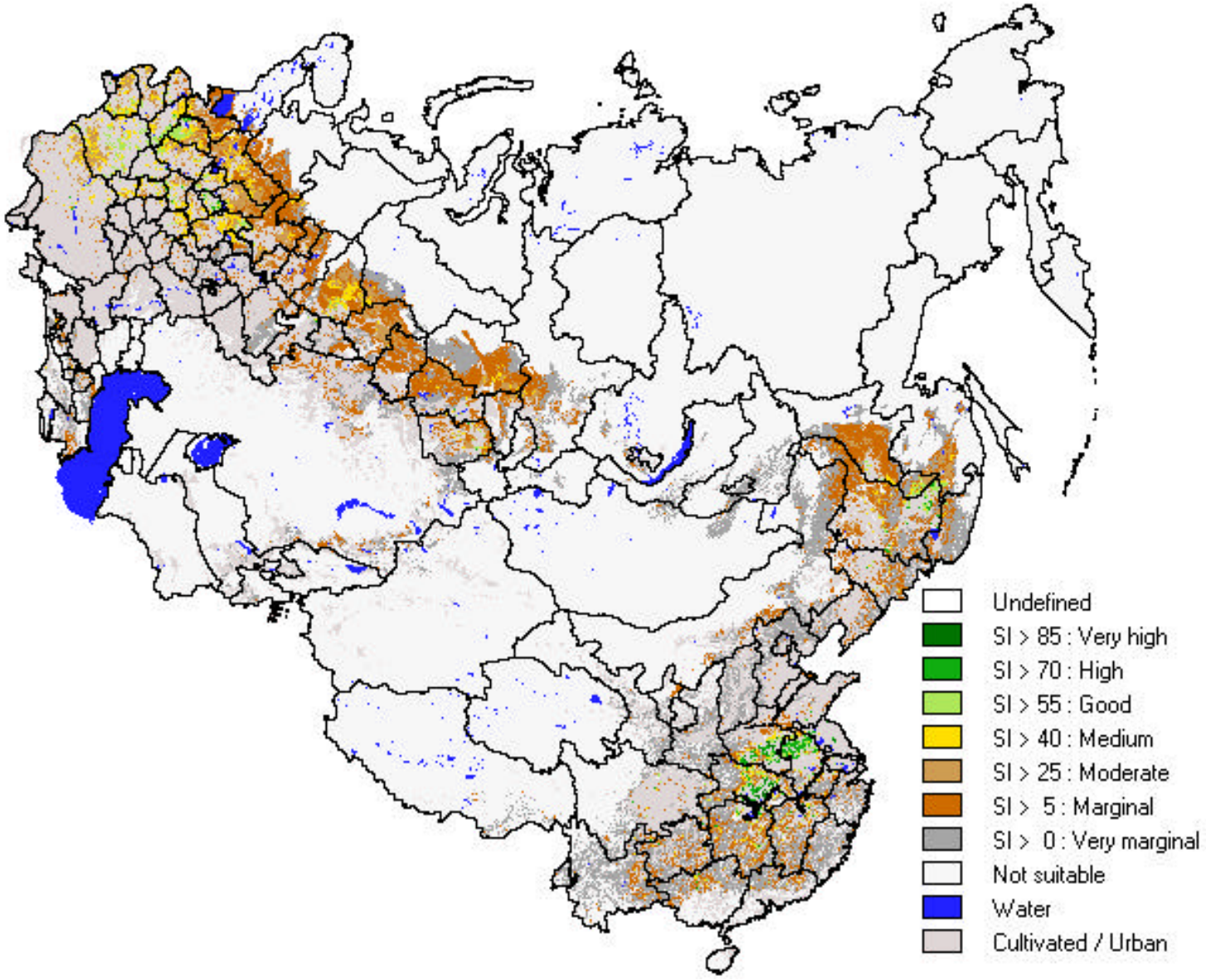


Plate 17 **Suitability index for biomass plantation forestry (excluding cultivated and urban areas)**

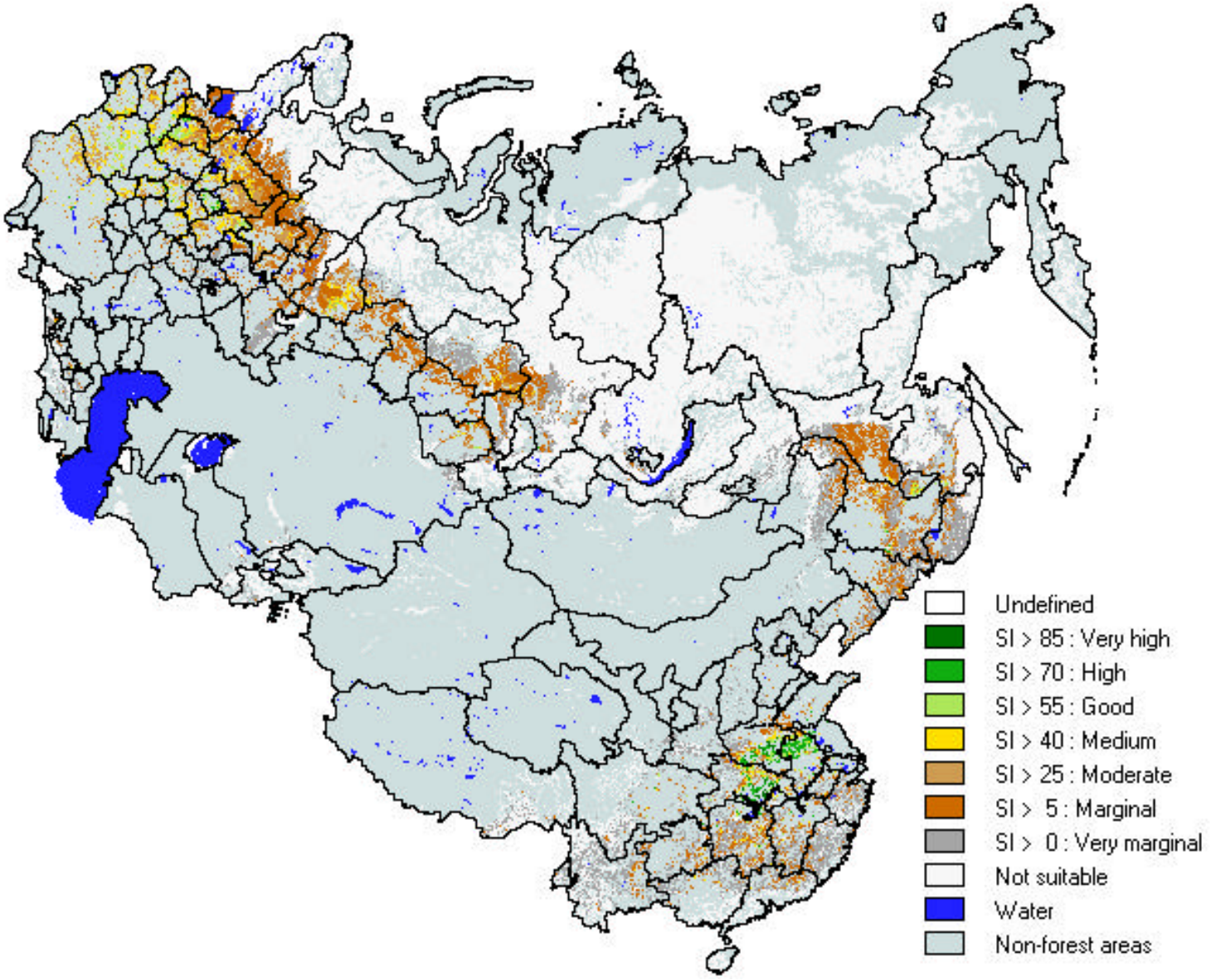


Plate 18 **Suitability index for biomass plantation forestry of current forest areas**

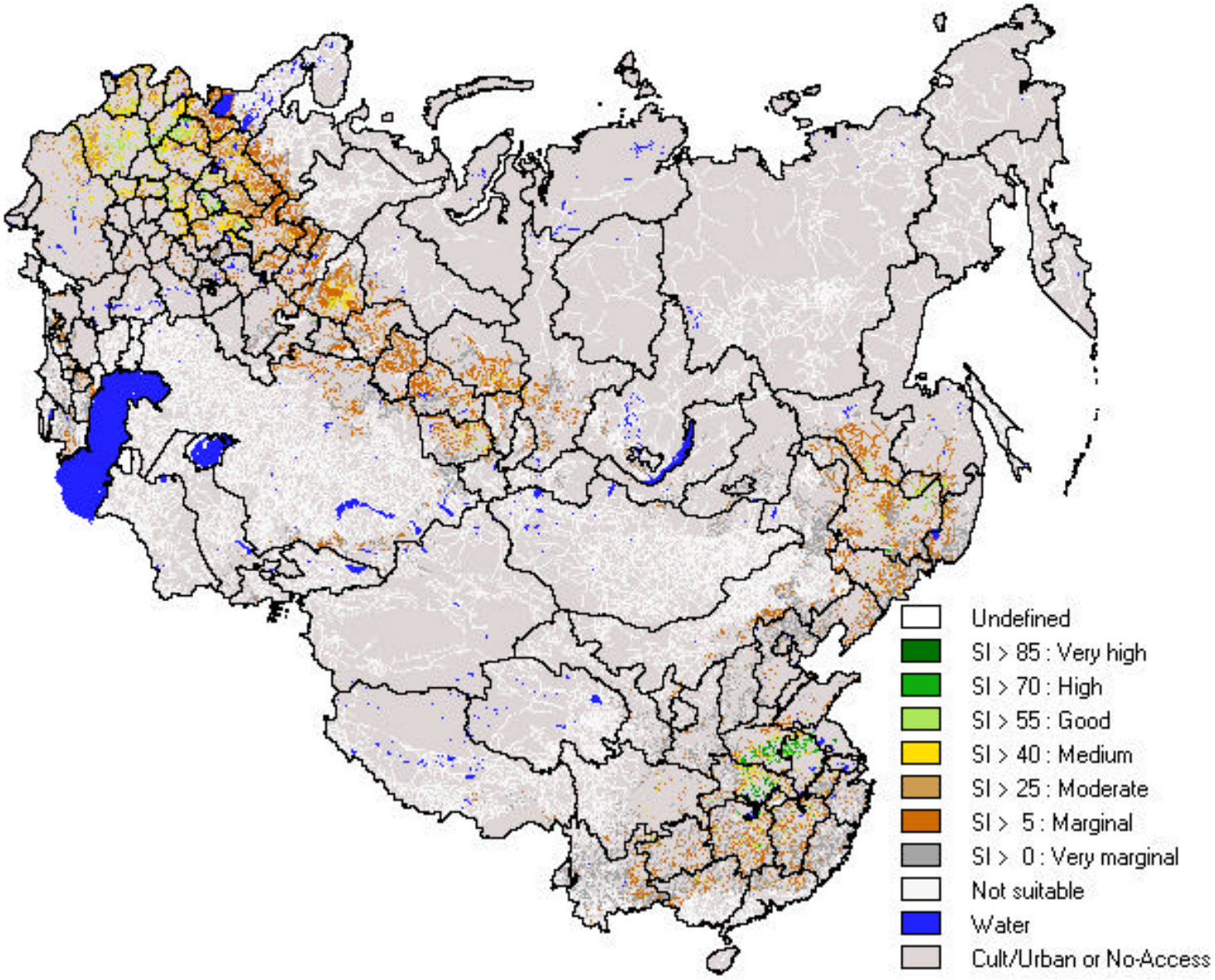


Plate 19 **Suitability index for biomass plantation forestry in accessible areas (excluding cultivated and urban areas)**

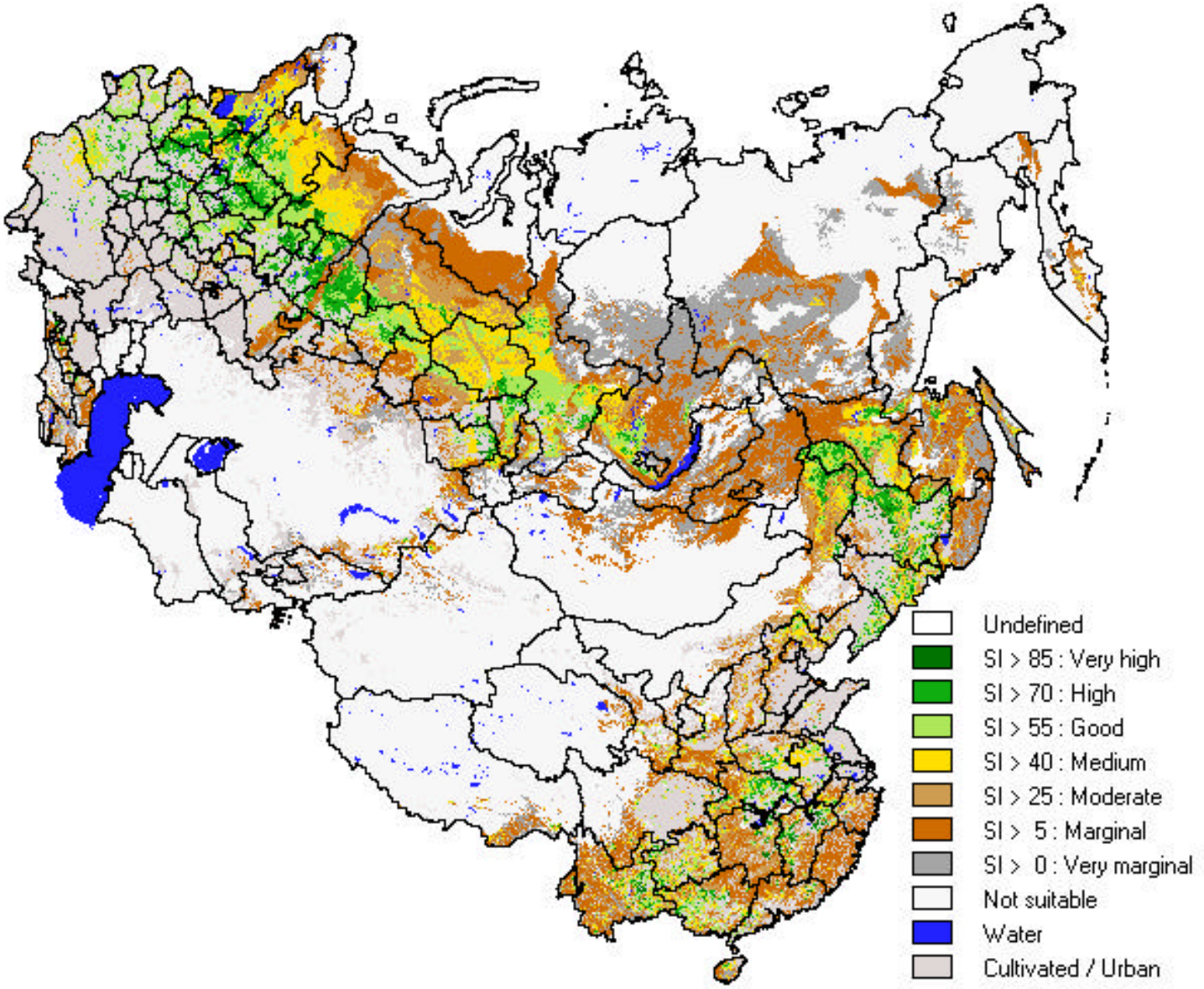


Plate 20 **Suitability index for traditional production forestry (excluding cultivated and urban areas)**

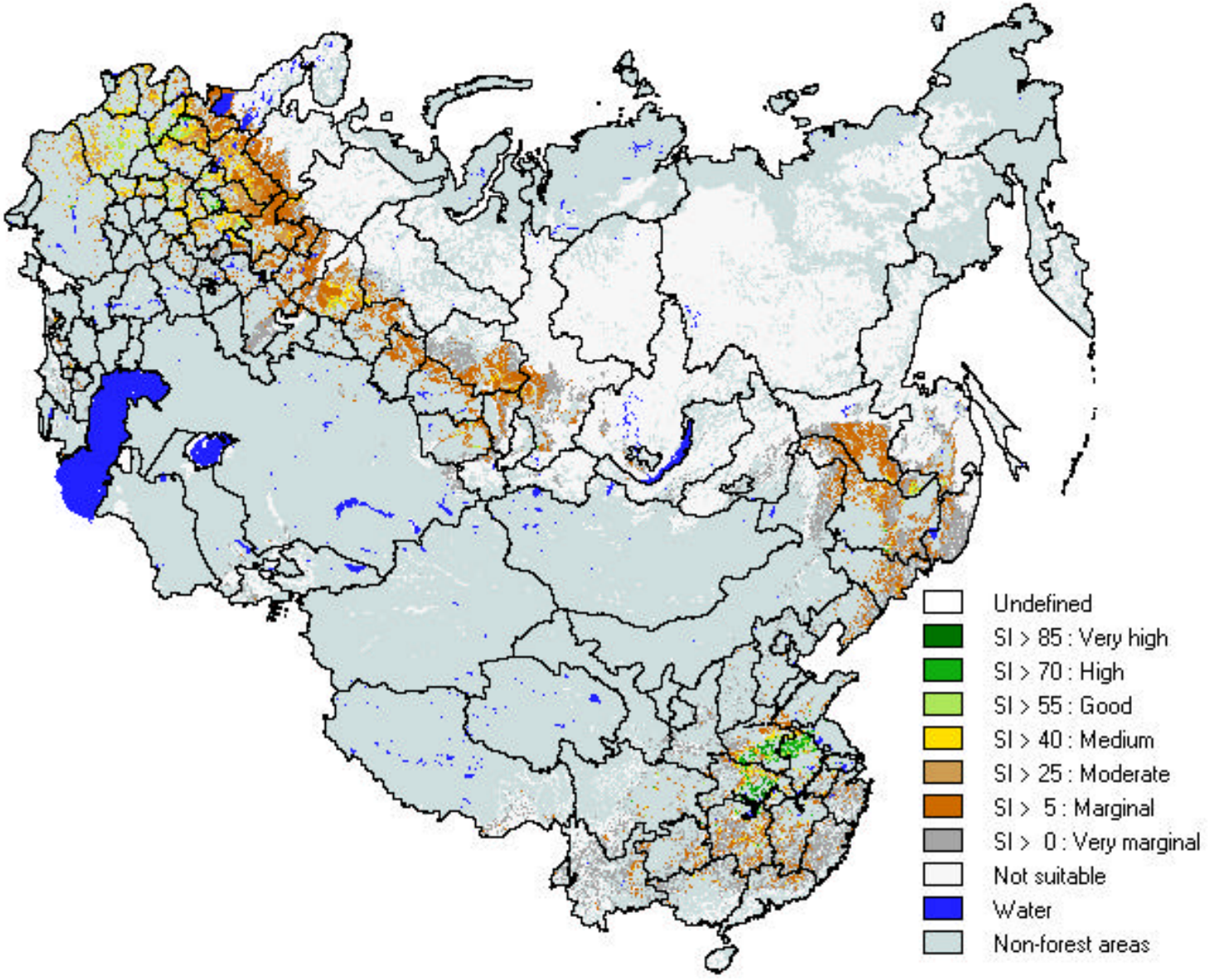


Plate 21 **Suitability index for traditional production forestry of current forest areas**

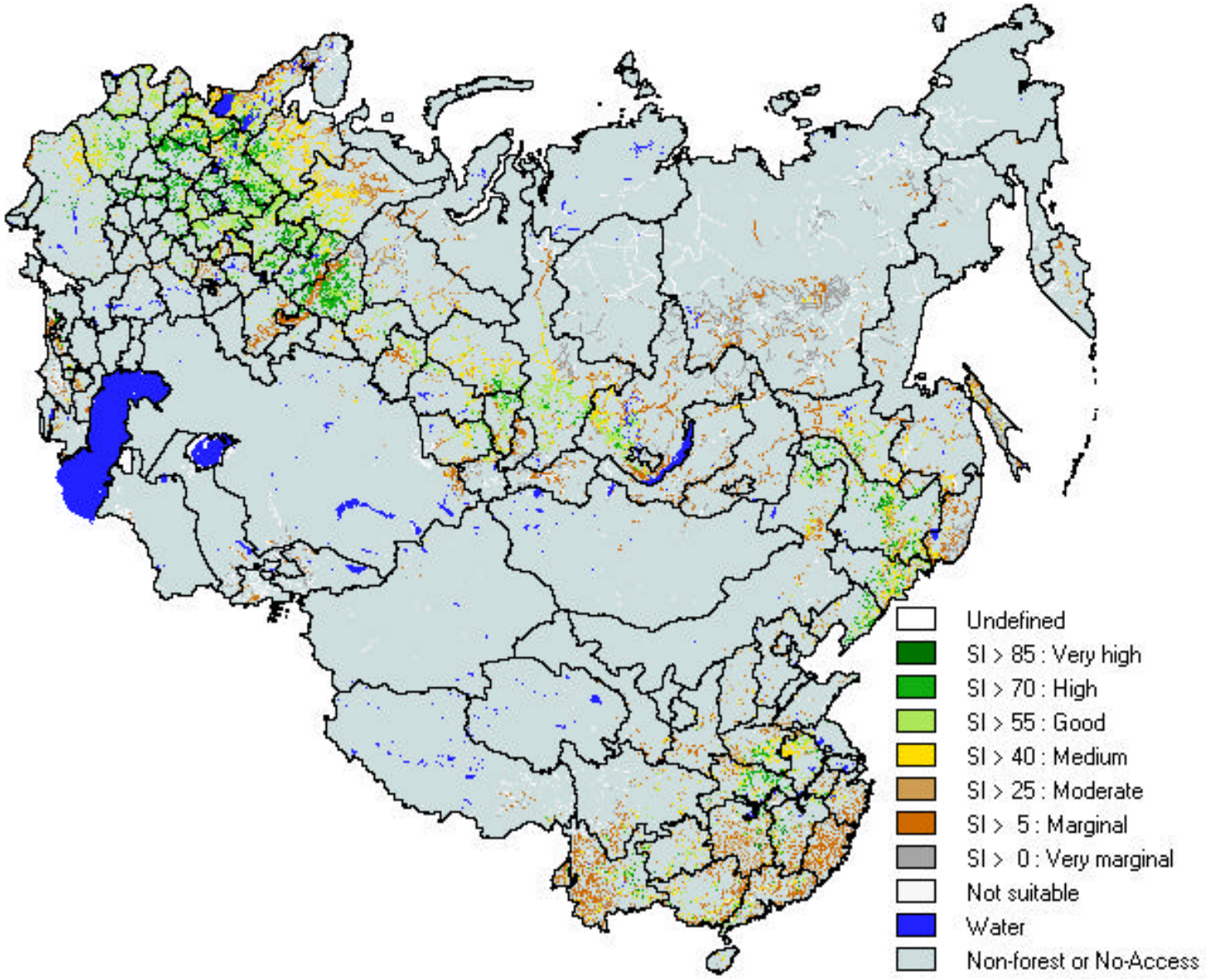


Plate 22 **Suitability index for traditional production forestry of accessible current forest areas**

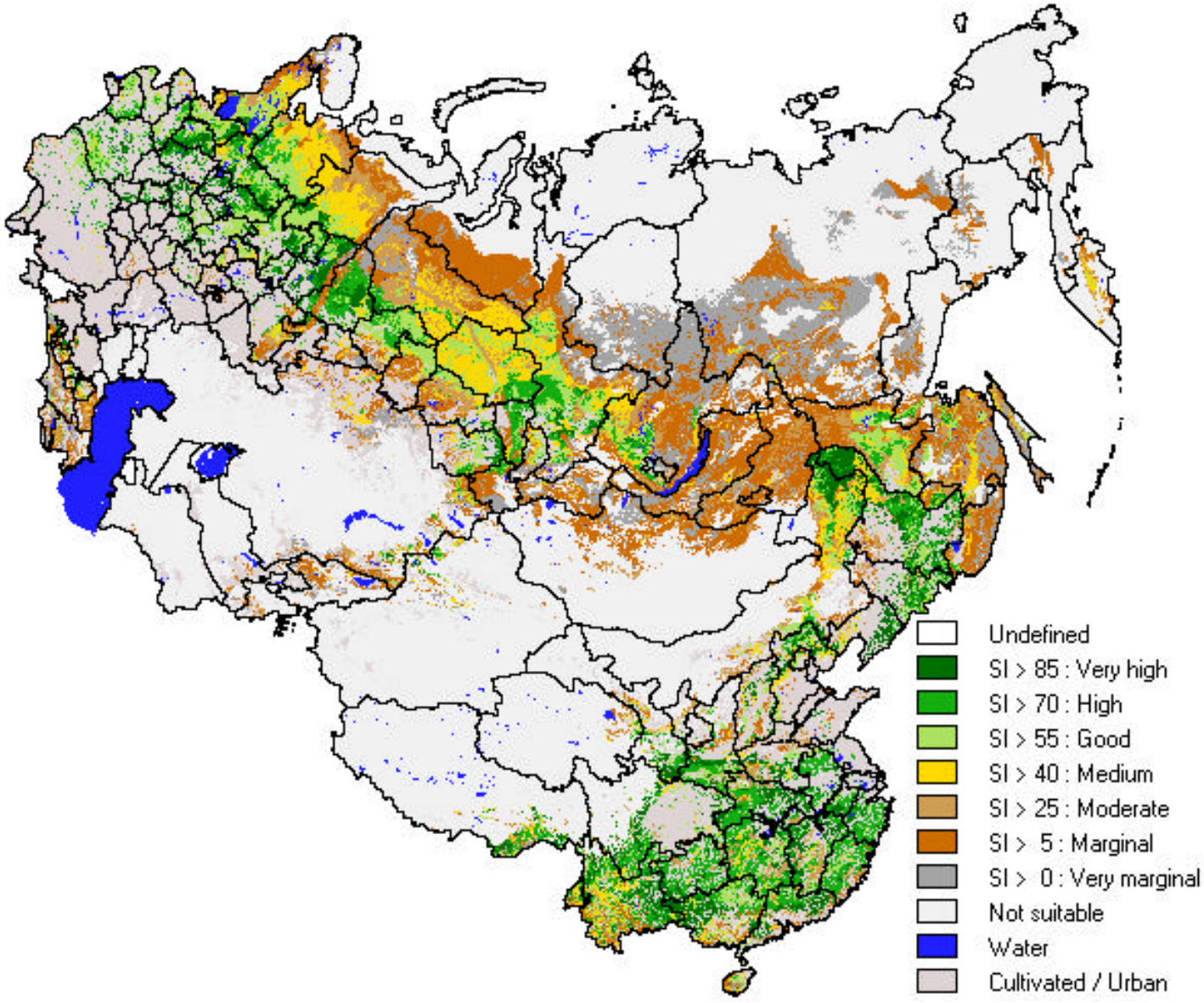


Plate 23 **Suitability index for conservation forestry in non-cultivated areas**

APPENDIX I

Table A-1 List of States of the FSU and Oblasts of Russia, respectively west and east of the Urals

Code	States of the FSU (excluding Russia)	Extents (000 ha)
11	**Armenia**	2690
12	**Azerbaijan**	7868
13	**Byelorussia**	20348
14	**Estonia**	3938
15	**Georgia**	6523
16	**Kazakhstan**	268445
17	**Kirghiztan**	19548
18	**Latvia**	6313
19	**Lithuania**	6420
20	**Moldavia**	3000
21	**Tajikistan**	9013
22	**Turkmenistan**	45390
23	**Ukraine**	57570
	Total	457066

Code	Oblasts in Russia (West of the Urals)	Extents (000 ha)
182	Daghestn Republic	5033
183	Kabardino-Balkarian Republic	1238
185	Kalmyk-Khalm-Tangch Republic	7510
186	Karelia Republic	18253
187	Komi Republic	41370
188	Mari-El Republic	2365
189	Mordovian SSR	2590
190	North-Ossetian SSR	778
191	Karachai-Cherkess Republic	1468
192	Tatarstan Republic	6663
194	Udmurt Republic	4150
196	Checheno-Ingush Republic	1930
197	Chuvash Republic	1808
	West of URAL Total	389947

Code	Oblasts in Russia (West of the Urals)	
103	Krasnodar Kray	7620
107	Stavropol Kray	6635
111	Arkhangelsk oblast	38190
112	Astrakhan oblast	4598
114	Belgorod oblast	2665
115	Bryansk oblast	3483
117	Vladimir oblast	2925
118	Volgograd oblast	11265
119	Vologda oblast	14628
120	Voronezh oblast	5195
122	Nizhni Novgorod oblast	7515
123	Nenets a.okr.	16858
124	Ivanovo oblast	2270
127	Kaliningrad oblast	1240
128	Tver oblast	8395
129	Kaluga oblast	2963
133	Kirov oblast	11930
134	Kostroma oblast	6000
136	Samara oblast	5118
138	Kursk oblast	3020
139	Komi-Permyak a.okr.	3280
141	Leningrad oblast	7500
142	Lipetsk oblast	2410
146	Moscow oblast	4665
147	Murmansk oblast	13960
149	Novgorod oblast	5450
153	Orenburg oblast	12418
154	Oryel oblast	2458
156	Penza oblast	4320
157	Perm oblast	12715
158	Pskov oblast	5568
160	Rostov oblast	10133
161	Ryazan oblast	3935
163	Saratov oblast	10375
166	Smolensk oblast	4943
168	Tambov oblast	3435
170	Tula oblast	2553
173	Ulyanovsk oblast	3690
178	Yaroslavl oblast	3260
179	Adigei Republic	775
180	Bashkortostan Republic	14435

Code	Oblasts in Russia (East of the Urals)	
101	Altai Kray	16653
102	Gorno-Altai Republic	9385
104	Krasnoyarsk Kray	71140
105	Primorski Kray	16338
106	Taymyr a.okr.	82285
108	Khabarovsk Kray	77545
110	Amur oblast	36283
116	Evenk a.okr	75673
121	Yevrey (Jewish) a.oblast	3700
125	Irkutsk oblast	76270
126	Ust-Orda Buryat a.okr.	2178
130	Kamchatka oblast	17045
131	Koryak a.okr.	28903
132	Kemerovo oblast	9500
135	Chukchi a.okr.	70770
137	Kurgan oblast	7110
144	Magadan oblast	45830
150	Novosibirsk oblast	17673
152	Omsk oblast	13980
164	Sakhalin oblast	8095
165	Sverdlovsk oblast	19273
167	Aga-Buryat a.okr.	1970
169	Tomsk oblast	31145
171	Tyumen oblast	15860
172	Khanty-Mansi a.okr.	53163
174	Yamalo-Nenets a.okr.	66588
175	Chelyabinsk oblast	8763
176	Chita oblast	41493
181	Buryat Republic	33533
193	Tuva Republic	17035
176	Chita oblast	6120
181	Buryat Republic	303275
193	Tuva Republic	9750
195	Khakass Republic	3595
198	Sakha (Yakutia) Republic	241375
	Russia East of Urals	1284574
	Russia	1674521
	Other States of the FSU	457066
	FSU	2131587

APPENDIX II

Potential Productivity for Forestry - Scenario results.

Salix viminalis:

Table A2 All areas.
Table A3 Accessible areas.
Table A4 Accessible areas, excluding cultivated and urban areas.

Biomass plantation forestry:

Table A5 All areas.
Table A6 Accessible areas.
Table A7 Accessible areas, excluding cultivated and urban areas.
Table A8 Accessible areas currently under forest.
Table A9 All areas, excluding cultivated areas, urban areas and areas currently under forest.

Traditional production forestry:

Table A10 All areas.
Table A11 Accessible areas.
Table A12 Accessible areas, excluding cultivated and urban areas.
Table A13 Accessible areas currently under forest..
Table A14 All areas, excluding cultivated areas, urban areas and areas currently under forest.

Conservation forestry:

Table A15 All areas.
Table A16 All areas, excluding cultivated and urban areas.
Table A17 All areas, excluding cultivated areas, urban areas and areas currently under forest.

APPENDIX II

Table A2 PRODUCTION POTENTIALS FOR BIOMASS PLANTATIONS WITH WILLOW (*Salix viminalis*) - ALL AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	156198	0	0	0	0	0	0	0	78	156119	0	0	1	0	0	0	1	250	0	0	1000	0	0	0	7026	3208
11	1	Armenia	12	2690	0	0	0	0	0	0	0	0	2690	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	Azerbaijan	12	7868	0	0	320	0	0	0	320	706	6274	0	0	2221	0	0	0	2221	1638	0	0	6941	0	0	9602	6945	2319
13	1	Byelorussia	12	20348	640	2410	3240	0	640	1770	830	393	16715	9391	28141	33345	0	9391	18750	5204	806	14673	11677	10292	0	14673	10595	6271	2050
14	1	Estonia	12	3938	137	598	938	0	137	461	340	186	2814	1670	5947	7987	0	1670	4277	2040	410	12190	9945	8515	0	12206	9275	5999	2203
15	1	Georgia	12	6523	6	62	141	1	5	56	79	85	6297	92	696	1233	12	80	604	537	196	15333	11226	8745	18634	15275	10802	6764	2317
16	1	Kazakhstan	12	268445	1	6	1907	0	1	5	1901	3428	263111	11	53	9723	0	11	42	9670	5881	11000	8833	5099	0	12247	9098	5088	1716
17	1	Kirghiztan	12	19548	0	0	85	0	0	0	85	103	19359	0	0	450	0	0	0	450	182	0	0	5294	0	0	0	5265	1773
18	1	Latvia	12	6313	284	1038	1860	0	284	754	822	273	4180	3669	10957	15621	0	3669	7288	4664	558	12919	10556	8398	0	12939	9665	5676	2041
19	1	Lithuania	12	6420	582	1288	2070	0	582	706	782	260	4090	7853	14766	19376	0	7853	6913	4610	524	13493	11464	9360	0	13482	9794	5898	2018
20	1	Moldavia	12	3000	16	54	93	1	15	38	39	42	2865	212	587	836	19	193	375	249	95	13250	10870	8989	16027	13180	9946	6424	2259
21	1	Tajikistan	12	9013	0	2	23	0	0	2	21	55	8935	0	16	139	0	0	16	123	110	0	8000	6043	0	0	8024	5829	2009
22	1	Turkmenistan	12	45390	0	0	1	0	0	0	1	1	45388	0	0	7	0	0	0	7	3	0	0	7000	0	0	0	6446	2131
23	1	Ukraine	12	57570	634	3059	5095	12	622	2425	2036	541	51930	9292	35231	48529	199	9093	25939	13298	1201	14656	11517	9525	16049	14607	10697	6531	2219
		FSU REPUBLICS		**457066**	**2300**	**8517**	**15773**	**14**	**2286**	**6217**	**7256**	**6073**	**434648**	**32190**	**96394**	**139467**	**230**	**31960**	**64204**	**43073**	**11604**	**13996**	**11318**	**8842**	**16429**	**13981**	**10327**	**5936**	**1911**
103	2	Krasnodar Kray	12	7620	26	42	651	12	14	16	609	298	6665	408	565	5038	212	196	157	4473	730	15692	13452	7739	18305	14278	10047	7345	2453
107	2	Stavropol Kray	12	6635	1	4	5	0	1	3	1	15	6615	10	41	47	0	10	31	6	34	10000	10250	9400	0	14653	10265	6298	2201
111	2	Arkhangelsk oblast	12	38190	0	0	152	0	0	0	152	25	37993	0	0	776	0	0	0	776	42	0	0	5105	0	0	0	5101	1703
112	2	Astrakhan oblast	12	4598	0	0	0	0	0	0	0	0	4597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	2665	3	9	223	0	3	6	214	369	2073	36	91	1411	0	36	55	1320	756	12000	10111	6327	0	12429	8884	6170	2049
115	2	Bryansk oblast	12	3483	0	127	367	0	0	127	240	86	3029	0	1293	2775	0	0	1293	1482	181	0	10181	7561	0	0	10151	6181	2098
117	2	Vladimir oblast	12	2925	0	186	233	0	0	186	47	0	2692	0	1754	2014	0	0	1754	260	0	0	9430	8644	0	0	9442	5500	0
118	2	Volgograd oblast	12	11265	0	0	16	0	0	0	16	9	11240	0	0	95	0	0	0	95	17	0	0	5938	0	0	0	5892	1818
119	2	Vologda oblast	12	14628	0	220	1768	0	0	220	1548	144	12715	0	1910	10214	0	0	1910	8304	319	0	8682	5777	0	0	8681	5364	2212
120	2	Voronezh oblast	12	5195	0	0	858	0	0	0	858	301	4036	0	0	5307	0	0	0	5307	617	0	0	6185	0	0	0	6188	2046
122	2	Nizhni Novgorod obla	12	7515	50	611	929	0	50	561	318	66	6520	679	6016	7876	0	679	5337	1860	135	13580	9846	8478	0	13653	9513	5844	2040
123	2	Nenets a.okr.	12	16858	0	0	0	0	0	0	0	0	16837	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2	Ivanovo oblast	12	2270	0	38	46	0	0	38	8	0	2225	0	349	392	0	0	349	43	0	0	9184	8522	0	0	9281	5604	0
127	2	Kaliningrad oblast	12	1240	29	198	368	0	29	169	170	18	855	417	2169	3221	0	417	1752	1052	37	14379	10955	8753	0	14354	10386	6207	2065
128	2	Tver oblast	12	8395	16	271	766	0	16	255	495	44	7585	201	2574	5337	0	201	2373	2763	95	12563	9498	6967	0	12440	9298	5585	2176
129	2	Kaluga oblast	12	2963	0	175	361	0	0	175	186	0	2602	0	1721	2832	0	0	1721	1111	0	0	9834	7845	0	0	9849	5973	0
133	2	Kirov oblast	12	11930	0	65	343	0	0	65	278	210	11376	3	688	2215	0	3	685	1527	408	3000	10585	6458	0	13358	10520	5482	1944
134	2	Kostroma oblast	12	6000	0	73	380	0	0	73	307	67	5554	0	684	2404	0	0	684	1720	125	0	9370	6326	0	0	9419	5611	1876
136	2	Samara oblast	12	5118	0	0	154	0	0	0	154	322	4641	0	0	904	0	0	0	904	597	0	0	5870	0	0	0	5861	1853
138	2	Kursk oblast	12	3020	231	794	1195	0	231	563	401	224	1600	3096	8556	10928	0	3096	5460	2372	444	13403	10776	9145	0	13391	9691	5913	1985
139	2	Komi-Permyak a.okr.	12	3280	0	0	142	0	0	0	142	31	3107	0	0	746	0	0	0	746	65	0	0	5254	0	0	0	5253	2078
141	2	Leningrad oblast	12	7500	0	70	1050	0	0	70	980	643	5806	0	613	5756	0	0	613	5143	1148	0	8757	5482	0	0	8727	5248	1785
142	2	Lipetsk oblast	12	2410	159	337	837	0	159	178	500	213	1360	2060	3754	6706	0	2060	1694	2952	415	12956	11139	8012	0	12965	9504	5900	1951
146	2	Moscow oblast	12	4665	0	348	470	0	0	348	122	0	4195	0	3335	4038	0	0	3335	703	0	0	9583	8591	0	0	9585	5779	1869
147	2	Murmansk oblast	12	13960	0	0	0	0	0	0	0	0	13960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	2	Novgorod oblast	12	5450	0	425	751	0	0	425	326	212	4488	0	3960	5784	0	0	3960	1824	404	0	9318	7702	0	0	9326	5594	1907
153	2	Orenburg oblast	12	12418	0	0	88	0	0	0	88	219	12110	0	0	460	0	0	0	460	382	0	0	5227	0	0	0	5235	1743
154	2	Oryel oblast	12	2458	263	793	1090	0	263	530	297	7	1361	3658	8991	10803	0	3658	5333	1812	14	13909	11338	9911	0	13885	10070	6107	1950
156	2	Penza oblast	12	4320	0	0	618	0	0	0	618	918	2784	0	0	3540	0	0	0	3540	1751	0	0	5728	0	0	0	5728	1907
157	2	Perm oblast	12	12715	0	53	467	0	0	53	414	221	12027	0	506	2813	0	0	506	2307	461	0	9547	6024	0	0	9630	5568	2087
158	2	Pskov oblast	12	5568	16	304	738	0	16	288	434	114	4716	207	2868	5222	0	207	2661	2354	211	12938	9434	7076	0	12873	9256	5428	1855
160	2	Rostov oblast	12	10133	0	0	196	0	0	0	196	117	9819	0	0	1200	0	0	0	1200	260	0	0	6122	0	0	0	6107	2228
161	2	Ryazan oblast	12	3935	166	915	1202	0	166	749	287	17	2716	2124	9442	11109	0	2124	7318	1667	34	12795	10319	9242	0	12772	9766	5816	2011
163	2	Saratov oblast	12	10375	0	0	88	0	0	0	88	154	10132	0	0	528	0	0	0	528	306	0	0	6000	0	0	0	5980	1978
166	2	Smolensk oblast	12	4943	0	0	0	0	0	0	0	27	4916	0	0	0	0	0	0	0	54	0	0	0	0	0	0	0	2004
168	2	Tambov oblast	12	3435	14	29	1306	0	14	15	1277	375	1753	172	334	7881	0	172	162	7547	738	12286	11517	6034	0	12165	10912	5907	1968
170	2	Tula oblast	12	2553	226	562	699	0	226	336	137	0	1853	3179	6550	7372	0	3179	3371	822	0	14066	11655	10546	0	14087	10024	5984	0
173	2	Ulyanovsk oblast	12	3690	0	0	141	0	0	0	141	573	2976	0	0	819	0	0	0	819	1086	0	0	5809	0	0	0	5809	1895
178	2	Yaroslavl oblast	12	3260	2	94	378	0	2	92	284	17	2864	29	870	2430	0	29	841	1560	33	14500	9255	6429	0	12453	9112	5491	1940
179	2	Adigei Republic	12	775	2	10	199	0	2	8	189	58	519	28	103	1489	0	28	75	1386	142	14000	10300	7482	0	13766	10003	7341	2459
180	2	Bashkortostan Reput	12	14435	0	263	1377	0	0	263	1114	1421	11636	4	2452	8560	0	4	2448	6108	2579	4000	9323	6216	0	12341	9297	5483	1815
182	2	Daghestn Republic	12	5033	1	3	33	0	1	2	30	48	4944	14	38	212	2	12	24	174	96	14000	12667	6424	17097	14108	10348	5721	2018
183	2	Kabardino-Balkarian I	12	1238	12	18	36	2	10	6	18	17	1184	170	235	351	36	134	65	116	38	14167	13056	9750	16679	13326	10766	6551	2187
185	2	Kalmyk-Khalm-Tangc	12	7510	0	0	0	0	0	0	0	0	7510	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2	Karelia Republic	12	18253	0	0	79	0	0	0	79	39	18126	0	0	390	0	0	0	390	80	0	0	4937	0	0	0	4927	2015
187	2	Komi Republic	12	41370	0	0	35	0	0	0	35	3	41332	0	0	179	0	0	0	179	5	0	0	5114	0	0	0	5124	1686
188	2	Mari-El Republic	12	2365	24	71	130	0	24	47	59	35	2200	333	852	1227	0	333	519	375	78	13875	12000	9438	0	13787	11020	6380	2247
189	2	Mordovian SSR	12	2590	44	145	397	0	44	101	252	323	1869	542	1601	3092	0	542	1059	1491	612	12318	11041	7788	0	12277	10435	5907	1892
190	2	North-Ossetian SSR	12	778	37	39	48	14	23	2	9	8	722	542	565	621	234	308	23	56	18	14649	14487	12938	17125	13405	10812	6478	2160
191	2	Karachai-Cherkess R	12	1468	20	27	28	6	14	7	1	1	1439	276	345	352	95	181	69	7	3	13800	12778	12571	16764	13271	10637	6258	2061
192	2	Tatarstan Republic	12	6663	0	91	687	0	0	91	596	558	5418	0	943	4308	0	0	943	3365	1032	0	10363	6271	0	0	10327	5649	1850
194	2	Udmurt Republic	12	4150	0	101	292	0	0	101	191	42	3815	0	932	1993	0	0	932	1061	94	0	9228	6825	0	0	9229	5549	2207
196	2	Checheno-Ingush Re	12	1930	11	13	75	2	9	2	62	50	1805	158	182	590	35	123	24	408	110	14364	14000	7867	17115	13792	10770	6578	2191
197	2	Chuvash Republic	12	1808	0	6	24	0	0	6	18	96	1688	0	67	175	0	0	67	108	183	0	11167	7292	0	0	12190	6138	1905
101	3	Altai Kray	12	16653	698	1532	2949	0	698	834	1417	529	13175	8894	16952	24546	0	8894	8058	7594	1095	12742	11065	8323	0	12751	9664	5359	2068

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used (short rotation coppice systems): VS conditions: shoots+twigs+leaves/stool+roots, 60/40; S and MS: 50/50; mS and VmS: 40/60

APPENDIX II

Table A2 PRODUCTION POTENTIALS FOR BIOMASS PLANTATIONS WITH WILLOW (*Salix viminalis*) - ALL AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
102	3	Gorno-Altai Republic	12	9385	0	3	44	0	0	3	41	21	9320	6	33	245	0	6	27	212	36	6000	11000	5568	0	12447	8975	5171	1718
104	3	Krasnoyarsk Kray	12	71140	31	202	1200	0	31	171	998	1022	68918	378	1806	7381	0	378	1428	5575	2222	12194	8941	6151	0	12036	8347	5588	2175
105	3	Primorski Kray	12	16338	111	359	720	0	111	248	361	177	15441	1615	4134	6346	0	1615	2519	2212	376	14550	11515	8814	0	14590	10170	6124	2123
106	3	Taymyr a.okr.	12	82285	0	0	0	0	0	0	0	0	82285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	77545	95	693	1305	0	95	598	612	530	75703	1260	7370	11293	0	1260	6110	3923	1268	13263	10635	8654	0	13221	10222	6415	2392
110	3	Amur oblast	12	36283	202	1168	3459	0	202	966	2291	1708	31116	2766	11846	24359	0	2766	9080	12513	3169	13693	10142	7042	0	13694	9396	5462	1856
116	3	Evenk a.okr	12	75673	0	0	0	0	0	0	0	0	75672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3	Yevrey (Jewish) a.ob	12	3700	334	732	984	0	334	398	252	72	2645	4676	8662	10142	0	4676	3986	1480	139	14000	11833	10307	0	14004	10008	5879	1942
125	3	Irkutsk oblast	12	76270	0	0	8	0	0	0	8	13	76250	0	0	57	0	0	0	57	33	0	0	7125	0	0	0	7570	2601
126	3	Ust-Orda Buryat a.ok	12	2178	0	0	0	0	0	0	0	0	2177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2980
130	3	Kamchatka oblast	12	17045	0	0	0	0	0	0	0	0	17022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	3	Koryak a.okr.	12	28903	0	0	0	0	0	0	0	0	28902	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	3	Kemerovo oblast	12	9500	0	25	413	0	0	25	388	309	8778	0	205	2150	0	0	205	1945	642	0	8200	5206	0	0	8178	5017	2077
135	3	Chukchi a.okr.	12	70770	0	0	0	0	0	0	0	0	70745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	7110	35	273	1228	0	35	238	955	913	4968	440	2807	7838	0	440	2367	5031	1533	12571	10282	6383	0	12435	9941	5270	1679
144	3	Magadan oblast	12	45830	0	0	0	0	0	0	0	0	45830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3	Novosibirsk oblast	12	17673	53	1024	3433	0	53	971	2409	1333	12907	653	9392	23239	0	653	8739	13847	2935	12321	9172	6769	0	12216	9004	5748	2202
152	3	Omsk oblast	12	13980	0	26	2470	0	0	26	2444	751	10759	0	221	12754	0	0	221	12533	2080	0	8500	5164	0	0	8516	5128	2769
164	3	Sakhalin oblast	12	8095	0	0	3	0	0	0	3	15	7984	0	0	23	0	0	0	23	35	0	0	7667	0	0	0	7059	2315
165	3	Sverdlovsk oblast	12	19273	16	872	2599	0	16	856	1727	595	16078	204	7935	17281	0	204	7731	9346	1132	12750	9100	6649	0	12535	9031	5411	1903
167	3	Aga-Buryat a.okr.	12	1970	0	0	0	0	0	0	0	8	1962	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	3172
169	3	Tomsk oblast	12	31145	0	143	1910	0	0	143	1767	856	28379	0	1167	10921	0	0	1167	9754	2025	0	8161	5718	0	0	8144	5520	2366
171	3	Tyumen oblast	12	15860	0	216	2999	0	0	216	2783	1415	11446	0	1922	16391	0	0	1922	14469	3902	0	8898	5465	0	0	8895	5200	2757
172	3	Khanty-Mansi a.okr.	12	53163	0	0	461	0	0	0	461	272	52429	0	0	2364	0	0	0	2364	696	0	0	5128	0	0	0	5132	2555
174	3	Yamalo-Nenets a.okr	12	66588	0	0	0	0	0	0	0	0	66580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	3	Chelyabinsk oblast	12	8763	81	336	738	0	81	255	402	1066	6959	1001	3408	5679	0	1001	2407	2271	1796	12358	10143	7695	0	12385	9425	5653	1685
176	3	Chita oblast	12	41493	0	0	0	0	0	0	0	130	41362	0	0	3	0	0	0	3	413	0	0	3000	0	0	0	7545	3181
181	3	Buryat Republic	12	33533	0	0	1	0	0	0	1	22	33509	0	0	7	0	0	0	7	70	0	0	7000	0	0	0	7601	3112
193	3	Tuva Republic	12	17035	0	0	0	0	0	0	0	9	17026	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	3315
195	3	Khakass Republic	12	6120	5	20	55	0	5	15	35	17	6048	61	189	387	0	61	128	198	38	12200	9450	7036	0	12145	8491	5612	2329
198	3	Sakha (Yakutia) Repu	12	303275	0	0	0	0	0	0	0	0	303257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RUSSIA WEST		**389947**	**1353**	**7530**	**22516**	**36**	**1317**	**6177**	**14986**	**8755**	**358600**	**18346**	**77949**	**164532**	**614**	**17732**	**59603**	**86583**	**16969**	**13559**	**10352**	**7307**	**17056**	**13464**	**9649**	**5778**	**1938**
		RUSSIA EAST		**1284574**	**1661**	**7624**	**26979**	**0**	**1661**	**5963**	**19355**	**11783**	**1245632**	**21954**	**78049**	**183406**	**0**	**21954**	**56095**	**105357**	**25688**	**13217**	**10237**	**6798**	**#DIV/0!**	**13217**	**9407**	**5443**	**2180**
		RUSSIA TOTAL		**1674521**	**3014**	**15154**	**49495**	**36**	**2978**	**12140**	**34341**	**20538**	**1604232**	**40300**	**155998**	**347938**	**614**	**39686**	**115698**	**191940**	**42657**	**13371**	**10294**	**7030**	**17056**	**13326**	**9530**	**5589**	**2077**
211	11	Beijing	12	1640	0	0	48	0	0	0	48	52	1540	0	0	311	0	0	0	311	113	0	0	6479	0	0	0	6492	2164
212	11	Tianjin	12	1125	0	0	228	0	0	0	228	247	650	0	0	1512	0	0	0	1512	545	0	0	6632	0	0	0	6617	2206
213	11	Hebei	12	18480	0	1	1681	0	0	1	1680	1768	15031	2	9	11371	0	2	7	11362	3983	2000	9000	6764	0	13300	9764	6762	2254
214	11	Shanxi	12	15783	1	6	179	0	1	5	173	575	15029	13	57	1147	0	13	44	1090	1283	13000	9500	6408	0	12967	9451	6305	2231
237	11	Shandong	12	14798	228	468	2099	15	213	240	1631	1693	11006	3610	6322	17484	269	3341	2712	11162	3848	15833	13509	8330	17762	15720	11287	6843	2274
241	11	Henan	12	16295	1606	2721	4207	535	1071	1115	1486	1153	10934	25467	37185	47122	9731	15736	11718	9937	2590	15857	13666	11201	18190	14686	10511	6688	2246
221	12	Liaoning	12	13863	105	218	678	10	95	113	460	462	12722	1568	2774	5775	179	1389	1206	3001	1001	14933	12725	8518	17845	14660	10636	6518	2169
222	12	Jilin	12	19145	8	38	625	0	8	30	587	136	18384	114	385	3721	0	114	271	3336	261	14250	10132	5954	0	13800	9146	5684	1919
223	12	Heilongjiang	12	44848	173	535	1577	0	173	362	1042	204	43067	2472	6211	11949	0	2472	3739	5738	432	14289	11609	7577	0	14328	10322	5507	2119
231	13	Shanghai	12	413	228	346	346	114	114	118	0	0	67	3729	4931	4933	2095	1634	1202	2	0	16355	14251	14257	18409	14317	10226	6103	0
232	13	Jiangsu	12	9290	3376	5233	5543	1573	1803	1857	310	100	3525	53869	72656	74695	28350	25519	18787	2039	226	15956	13884	13476	18028	14151	10117	6580	2268
233	13	Zhejiang	12	9250	523	983	1168	171	352	460	185	43	8040	8079	12687	13802	3126	4953	4608	1115	89	15447	12906	11817	18242	14086	10018	6038	2094
234	13	Anhui	12	13783	2324	3929	4478	976	1348	1605	549	97	9207	37620	54203	57728	18017	19603	16583	3525	218	16188	13796	12891	18458	14543	10331	6416	2248
236	14	Jiangxi	12	16663	243	801	1291	2	241	558	490	182	15189	3367	8871	11777	34	3333	5504	2906	359	13856	11075	9122	18484	13821	9862	5926	1979
242	14	Hubei	12	18168	1174	2186	2369	461	713	1012	183	16	15782	18334	28381	29454	8302	10032	10047	1073	31	15617	12983	12433	18002	14068	9923	5867	1944
243	14	Hunan	12	21050	1047	2519	3259	129	918	1472	740	92	17700	15268	29950	34332	2306	12962	14682	4382	180	14583	11890	10535	17941	14115	9977	5919	1966
235	15	Fujian	12	11995	66	193	309	1	65	127	116	36	11649	912	2177	2882	23	889	1265	705	79	13818	11280	9327	17043	13579	9971	6073	2195
244	15	Guangdong	12	16385	168	353	495	0	168	185	142	30	15861	2204	4001	4841	0	2204	1797	840	67	13119	11334	9780	0	13146	9731	5918	2241
245	15	Guangxi	12	23425	138	545	767	0	138	407	222	86	22573	1823	6094	7538	0	1823	4271	1444	190	13210	11182	9828	0	13222	10495	6515	2206
246	15	Hainan	12	2840	0	0	0	0	0	0	0	0	2840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	16	Sichuan	12	56143	498	1212	1581	97	401	714	369	181	54381	7738	15445	17886	1860	5878	7707	2441	405	15538	12743	11313	19143	14669	10797	6621	2229
252	16	Guizhou	12	17725	418	1076	1094	13	405	658	18	0	16630	6285	13313	13433	246	6039	7028	120	0	15036	12373	12279	19065	14918	10675	6500	2179
253	16	Yunnan	12	37325	92	203	225	3	89	111	22	40	37061	1348	2501	2649	49	1299	1153	148	92	14652	12320	11773	18500	14560	10412	6719	2312
215	17	Nei Mongol	12	115468	0	1	145	0	0	1	144	192	115130	0	12	819	0	0	12	807	403	0	12000	5648	0	0	10015	5594	2100
261	17	Shaanxi	12	20900	1	7	82	0	1	6	75	552	20267	13	70	564	0	13	57	494	1266	13000	10000	6878	0	13849	9946	6600	2295
262	17	Gansu	12	40580	0	4	31	0	0	4	27	85	40464	4	44	198	0	4	40	154	165	4000	11000	6387	0	13276	9838	5743	1933
264	17	Ningxia	12	5038	0	0	78	0	0	0	78	109	4850	0	0	400	0	0	0	400	184	0	0	5128	0	0	9021	5116	1691
265	17	Xinjiang	12	163355	0	0	1	0	0	0	1	4	163350	0	0	4	0	0	0	4	7	0	0	4000	0	0	8375	4807	1716
254	18	Xizang	12	119045	4	11	15	0	4	7	4	3	119027	57	128	153	2	55	71	25	6	14250	11636	10200	17020	14020	10048	6076	2230
263	18	Qinghai	12	72183	0	0	1	0	0	0	1	4	72177	0	0	4	0	0	0	4	10	0	0	4000	0	0	0	5391	2208
272	19	Hongkong	12	40	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**937041**	**12421**	**23589**	**34600**	**4100**	**8321**	**11168**	**11011**	**8142**	**894173**	**193896**	**308407**	**378484**	**74589**	**119307**	**114511**	**70077**	**18033**	**15610**	**13074**	**10939**	**18192**	**14338**	**10253**	**6364**	**2215**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used (short rotation coppice systems): VS conditions: shoots+twigs+leaves/stool+roots, 60/40; S and MS: 50/50; mS and VmS: 40/60

APPENDIX II

Table A3 PRODUCTION POTENTIALS FOR BIOMASS PLANTATIONS WITH WILLOW (*Salix viminalis*) - ACCESSIBLE AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	63130	0	0	0	0	0	0	0	46	63084	0	0	1	0	0	0	1	146	0	0	1000	0	0	0	6961	3206
11	1	Armenia	12	2025	0	0	0	0	0	0	0	0	2025	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	Azerbaijan	12	6095	0	0	230	0	0	0	230	524	4848	0	0	1581	0	0	0	1581	1212	0	0	6874	0	0	9602	6867	2313
13	1	Byelorussia	12	17955	549	2011	2741	0	549	1462	730	341	14873	8036	23504	28069	0	8036	15468	4565	699	14638	11688	10240	0	14646	10577	6256	2050
14	1	Estonia	12	3365	112	495	779	0	112	383	284	151	2434	1370	4912	6609	0	1370	3542	1697	334	12232	9923	8484	0	12190	9239	5982	2205
15	1	Georgia	12	4763	6	52	115	1	5	46	63	65	4582	85	578	1005	11	74	493	427	151	14167	11115	8739	18529	15248	10657	6757	2320
16	1	Kazakhstan	12	165068	1	4	1263	0	1	3	1259	2375	161429	9	38	6437	0	9	29	6399	4076	9000	9500	5097	0	12217	8967	5084	1716
17	1	Kirghiztan	12	10428	0	0	75	0	0	0	75	93	10260	0	0	393	0	0	0	393	165	0	0	5240	0	0	0	5251	1771
18	1	Latvia	12	5573	245	910	1650	0	245	665	740	243	3679	3165	9578	13768	0	3165	6413	4190	495	12918	10525	8344	0	12903	9644	5660	2033
19	1	Lithuania	12	6018	543	1199	1944	0	543	656	745	249	3824	7321	13745	18136	0	7321	6424	4391	502	13483	11464	9329	0	13485	9793	5894	2014
20	1	Moldavia	12	2848	15	51	88	1	14	36	37	39	2720	203	559	799	19	184	356	240	88	13533	10961	9080	16028	13205	9971	6425	2258
21	1	Tajikistan	12	4775	0	2	21	0	0	2	19	49	4706	0	12	122	0	0	12	110	98	0	6000	5810	0	0	8023	5850	2008
22	1	Turkmenistan	12	22535	0	0	1	0	0	0	1	1	22533	0	0	6	0	0	0	6	2	0	0	6000	0	0	0	6455	2130
23	1	Ukraine	12	51955	573	2747	4558	12	561	2174	1811	476	46921	8375	31607	43432	198	8177	23232	11825	1058	14616	11506	9529	16049	14579	10688	6528	2222
		FSU REPUBLICS		**303403**	**2044**	**7471**	**13465**	**14**	**2030**	**5427**	**5994**	**4606**	**284834**	**28564**	**84533**	**120357**	**228**	**28336**	**55969**	**35824**	**8880**	**13975**	**11315**	**8939**	**16286**	**13959**	**10313**	**5977**	**1928**
103	2	Krasnodar Kray	12	6715	25	40	589	12	13	15	549	259	5862	403	553	4585	212	191	150	4032	637	16120	13825	7784	18305	14301	10068	7349	2456
107	2	Stavropol Kray	12	5428	1	4	5	0	1	3	1	13	5410	9	36	41	0	9	27	5	29	9000	9000	8200	0	14583	10235	6335	2195
111	2	Arkhangelsk oblast	12	14210	0	0	94	0	0	0	94	16	14085	0	0	479	0	0	0	479	28	0	0	5096	0	0	0	5094	1703
112	2	Astrakhan oblast	12	2923	0	0	0	0	0	0	0	0	2922	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	2248	3	9	194	0	3	6	185	314	1739	36	91	1231	0	36	55	1140	644	12000	10111	6345	0	12429	8884	6169	2050
115	2	Bryansk oblast	12	3095	0	116	334	0	0	116	218	74	2686	0	1176	2526	0	0	1176	1350	156	0	10138	7563	0	0	10144	6178	2103
117	2	Vladimir oblast	12	2510	0	165	207	0	0	165	42	0	2303	0	1563	1791	0	0	1563	228	0	0	9473	8652	0	0	9451	5505	0
118	2	Volgograd oblast	12	9108	0	0	15	0	0	0	15	9	9084	0	0	89	0	0	0	89	16	0	0	5933	0	0	0	5897	1823
119	2	Vologda oblast	12	9155	0	137	1019	0	0	137	882	75	8061	0	1190	5895	0	0	1190	4705	163	0	8686	5785	0	0	8671	5337	2160
120	2	Voronezh oblast	12	4550	0	0	772	0	0	0	772	269	3509	0	0	4777	0	0	0	4777	552	0	0	6188	0	0	0	6189	2047
122	2	Nizhni Novgorod obl	12	6403	41	542	827	0	41	501	285	57	5519	556	5316	6982	0	556	4760	1666	115	13561	9808	8443	0	13577	9505	5840	2032
123	2	Nenets a.okr.	12	2583	0	0	0	0	0	0	0	0	2582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2	Ivanovo oblast	12	1875	0	25	31	0	0	25	6	0	1844	0	231	264	0	0	231	33	0	0	9240	8516	0	0	9285	5595	0
127	2	Kaliningrad oblast	12	1183	25	185	343	0	25	160	158	17	824	360	2017	2995	0	360	1657	978	34	14400	10903	8732	0	14341	10386	6209	2066
128	2	Tver oblast	12	6128	10	189	532	0	10	179	343	30	5566	126	1785	3704	0	126	1659	1919	65	12600	9444	6962	0	12427	9292	5586	2182
129	2	Kaluga oblast	12	2445	0	151	310	0	0	151	159	0	2135	0	1487	2436	0	0	1487	949	0	0	9848	7858	0	0	9847	5972	0
133	2	Kirov oblast	12	8750	0	46	251	0	0	46	205	148	8351	2	491	1612	0	2	489	1121	288	2000	10674	6422	0	13279	10541	5475	1949
134	2	Kostroma oblast	12	4263	0	38	258	0	0	38	220	42	3962	0	359	1592	0	0	359	1233	80	0	9447	6171	0	0	9445	5612	1879
136	2	Samara oblast	12	4408	0	0	144	0	0	0	144	292	3971	0	0	844	0	0	0	844	540	0	0	5861	0	0	0	5861	1847
138	2	Kursk oblast	12	2623	201	699	1057	0	201	498	358	196	1370	2693	7523	9640	0	2693	4830	2117	388	13398	10763	9120	0	13395	9698	5913	1984
139	2	Komi-Permyak a.okı	12	2220	0	0	101	0	0	0	101	25	2093	0	0	534	0	0	0	534	52	0	0	5287	0	0	0	5267	2064
141	2	Leningrad oblast	12	5678	0	49	741	0	0	49	692	459	4478	0	426	4062	0	0	426	3636	819	0	8694	5482	0	0	8719	5252	1786
142	2	Lipetsk oblast	12	2140	140	296	740	0	140	156	444	187	1213	1805	3289	5910	0	1805	1484	2621	364	12893	11111	7986	0	12925	9503	5902	1951
146	2	Moscow oblast	12	4130	0	322	433	0	0	322	111	0	3697	0	3088	3728	0	0	3088	640	0	0	9590	8610	0	0	9594	5780	1869
147	2	Murmansk oblast	12	4110	0	0	0	0	0	0	0	0	4110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	2	Novgorod oblast	12	3935	0	288	515	0	0	288	227	164	3257	0	2667	3924	0	0	2667	1257	308	0	9260	7619	0	0	9275	5551	1879
153	2	Orenburg oblast	12	8305	0	0	60	0	0	0	60	142	8102	0	0	316	0	0	0	316	248	0	0	5267	0	0	0	5224	1744
154	2	Oryel oblast	12	2018	222	663	901	0	222	441	238	5	1111	3072	7506	8958	0	3072	4434	1452	10	13838	11321	9942	0	13820	10050	6106	1950
156	2	Penza oblast	12	3893	0	0	550	0	0	0	550	830	2512	0	0	3154	0	0	0	3154	1583	0	0	5735	0	0	0	5731	1908
157	2	Perm oblast	12	8423	0	43	308	0	0	43	265	168	7947	0	413	1899	0	0	413	1486	345	0	9605	6166	0	0	9604	5617	2059
158	2	Pskov oblast	12	4508	12	235	596	0	12	223	361	103	3808	151	2211	4174	0	151	2060	1963	191	12583	9409	7003	0	12815	9254	5431	1848
160	2	Rostov oblast	12	8245	0	0	151	0	0	0	151	88	8006	0	0	928	0	0	0	928	195	0	0	6146	0	0	0	6136	2227
161	2	Ryazan oblast	12	3453	150	810	1070	0	150	660	260	16	2366	1917	8357	9868	0	1917	6440	1511	32	12780	10317	9222	0	12766	9757	5814	2014
163	2	Saratov oblast	12	8433	0	0	79	0	0	0	79	137	8217	0	0	474	0	0	0	474	270	0	0	6000	0	0	0	5977	1977
166	2	Smolensk oblast	12	4113	0	0	0	0	0	0	0	24	4089	0	0	0	0	0	0	0	47	0	0	0	0	0	0	0	2005
168	2	Tambov oblast	12	2905	5	16	1110	0	5	11	1094	318	1477	59	181	6650	0	59	122	6469	626	11800	11313	5991	0	12075	10993	5913	1970
170	2	Tula oblast	12	2283	201	500	624	0	201	299	124	0	1659	2831	5827	6567	0	2831	2996	740	0	14085	11654	10524	0	14087	10024	5982	0
173	2	Ulyanovsk oblast	12	3218	0	0	121	0	0	0	121	504	2592	0	0	705	0	0	0	705	957	0	0	5826	0	0	0	5810	1897
178	2	Yaroslavl oblast	12	2350	2	74	263	0	2	72	189	13	2073	24	684	1725	0	24	660	1041	26	12000	9243	6559	0	12453	9125	5507	1959
179	2	Adigei Republic	12	605	2	9	189	0	2	7	180	56	360	26	97	1417	0	26	71	1320	138	13000	10778	7497	0	13724	9997	7337	2459
180	2	Bashkortostan Repu	12	8983	0	190	969	0	0	190	779	967	7046	3	1768	6046	0	3	1765	4278	1758	3000	9305	6239	0	12352	9265	5494	1818
182	2	Daghestn Republic	12	3843	1	3	31	0	1	2	28	43	3762	13	30	188	2	11	17	158	86	13000	10000	6065	17097	14048	10296	5651	1997
183	2	Kabardino-Balkarian	12	898	10	16	33	2	8	6	17	17	848	141	201	313	30	111	60	112	37	14100	12563	9485	16646	13347	10782	6556	2187
185	2	Kalmyk-Khalm-Tang	12	4735	0	0	0	0	0	0	0	0	4735	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2	Karelia Republic	12	9165	0	0	59	0	0	0	59	29	9074	0	0	291	0	0	0	291	57	0	0	4932	0	0	0	4908	1954
187	2	Komi Republic	12	14183	0	0	19	0	0	0	19	2	14161	0	0	98	0	0	0	98	4	0	0	5158	0	0	0	5117	1689
188	2	Mari-El Republic	12	1575	18	50	88	0	18	32	38	19	1469	254	598	837	0	254	344	239	43	14111	11960	9511	0	13767	10896	6367	2286
189	2	Mordovian SSR	12	2315	42	136	362	0	42	94	226	289	1664	511	1494	2831	0	511	983	1337	547	12167	10985	7820	0	12288	10425	5918	1893
190	2	North-Ossetian SSR	12	608	35	37	46	13	22	2	9	8	554	516	537	593	227	289	21	56	18	14743	14514	12891	17137	13430	10791	6478	2160
191	2	Karachai-Cherkess I	12	1085	17	21	22	5	12	4	1	0	1062	255	298	302	91	164	43	4	1	15000	14190	13727	16785	13226	10588	6193	2072
192	2	Tatarstan Republic	12	5278	0	70	536	0	0	70	466	427	4315	0	714	3347	0	0	714	2633	790	0	10200	6244	0	0	10223	5654	1851
194	2	Udmurt Republic	12	3425	0	84	239	0	0	84	155	39	3147	0	780	1643	0	0	780	863	86	0	9286	6874	0	0	9274	5578	2195
196	2	Checheno-Ingush R	12	1555	10	12	74	2	8	2	62	50	1432	132	155	562	28	104	23	407	109	13200	12917	7595	17181	13875	10783	6578	2191

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used (short rotation coppice systems): VS conditions: 60/40; S and MS: 50/50; mS and VmS: 40/60.

APPENDIX II

Table A3 PRODUCTION POTENTIALS FOR BIOMASS PLANTATIONS WITH WILLOW (*Salix viminalis*) - ACCESSIBLE AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)									Average annual biomass yield (kg/ha)								
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
197	2	Chuvash Republic	12	1678	0	5	21	0	0	5	16	92	1565	0	57	156	0	0	57	99	174	0	11400	7429	0	0	12194	6093	1901
101	3	Altai Kray	12	11538	486	1036	2075	0	486	550	1039	342	9120	6202	11601	17158	0	6202	5399	5557	684	12761	11198	8269	0	12754	9809	5346	2003
102	3	Gorno-Altai Republic	12	2693	0	3	36	0	0	3	33	16	2640	6	33	203	0	6	27	170	28	6000	11000	5639	0	12447	8975	5198	1727
104	3	Krasnoyarsk Kray	12	16560	26	157	819	0	26	131	662	687	15055	309	1404	5094	0	309	1095	3690	1502	11885	8943	6220	0	12043	8384	5578	2186
105	3	Primorski Kray	12	7290	68	229	453	0	68	161	224	93	6744	988	2625	3996	0	988	1637	1371	199	14529	11463	8821	0	14439	10165	6134	2143
106	3	Taymyr a.okr.	12	2848	0	0	0	0	0	0	0	0	2847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	9013	45	250	429	0	45	205	179	76	8505	601	2600	3671	0	601	1999	1071	169	13356	10400	8557	0	13375	9735	5984	2229
110	3	Amur oblast	12	9438	142	630	1543	0	142	488	913	653	7241	1951	6659	11796	0	1951	4708	5137	1245	13739	10570	7645	0	13744	9639	5624	1906
116	3	Evenk a.okr	12	6140	0	0	0	0	0	0	0	0	6140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3	Yevrey (Jewish) a.ol	12	1545	189	408	534	0	189	219	126	29	982	2651	4839	5575	0	2651	2188	736	54	14026	11860	10440	0	14051	9995	5844	1866
125	3	Irkutsk oblast	12	17280	0	0	7	0	0	0	7	12	17261	0	0	54	0	0	0	54	32	0	0	7714	0	0	0	7559	2599
126	3	Ust-Orda Buryat a.o	12	1180	0	0	0	0	0	0	0	0	1180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2980
130	3	Kamchatka oblast	12	3853	0	0	0	0	0	0	0	0	3852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	3	Koryak a.okr.	12	5013	0	0	0	0	0	0	0	0	5012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	3	Kemerovo oblast	12	5290	0	15	280	0	0	15	265	210	4800	0	121	1454	0	0	121	1333	446	0	8067	5193	0	0	8152	5028	2118
135	3	Chukchi a.okr.	12	8158	0	0	0	0	0	0	0	0	8155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	5195	30	217	940	0	30	187	723	680	3575	368	2226	6026	0	368	1858	3800	1142	12267	10258	6411	0	12434	9941	5252	1680
144	3	Magadan oblast	12	9245	0	0	0	0	0	0	0	0	9245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3	Novosibirsk oblast	12	9910	32	678	1691	0	32	646	1013	732	7487	387	6195	12056	0	387	5808	5861	1542	12094	9137	7130	0	12210	8985	5784	2107
152	3	Omsk oblast	12	8545	0	17	1549	0	0	17	1532	582	6413	0	147	8047	0	0	147	7900	1626	0	8647	5195	0	0	8497	5155	2794
164	3	Sakhalin oblast	12	4795	0	0	3	0	0	0	3	13	4776	0	0	22	0	0	0	22	31	0	0	7333	0	0	0	7051	2303
165	3	Sverdlovsk oblast	12	12618	16	665	1813	0	16	649	1148	444	10361	204	6060	12344	0	204	5856	6284	844	12750	9113	6809	0	12535	9024	5475	1903
167	3	Aga-Buryat a.okr.	12	663	0	0	0	0	0	0	0	4	658	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	3162
169	3	Tomsk oblast	12	7415	0	55	795	0	0	55	740	474	6146	0	447	4638	0	0	447	4191	1096	0	8127	5834	0	0	8144	5665	2312
171	3	Tyumen oblast	12	7043	0	118	872	0	0	118	754	755	5416	0	1059	5140	0	0	1059	4081	2130	0	8975	5894	0	0	9011	5413	2822
172	3	Khanty-Mansi a.okr.	12	6830	0	0	34	0	0	0	34	51	6745	0	0	202	0	0	0	202	132	0	0	5941	0	0	0	5890	2599
174	3	Yamalo-Nenets a.ok	12	2680	0	0	0	0	0	0	0	0	2680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	3	Chelyabinsk oblast	12	6338	62	270	580	0	62	208	310	781	4977	765	2731	4486	0	765	1966	1755	1318	12339	10115	7734	0	12409	9453	5652	1688
176	3	Chita oblast	12	7850	0	0	0	0	0	0	0	93	7757	0	0	0	0	0	0	0	298	0	0	0	0	0	0	7090	3195
181	3	Buryat Republic	12	6650	0	0	1	0	0	0	1	16	6633	0	0	6	0	0	0	6	50	0	0	6000	0	0	0	7646	3114
193	3	Tuva Republic	12	5043	0	0	0	0	0	0	0	7	5035	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	3300
195	3	Khakass Republic	12	3093	5	18	50	0	5	13	32	14	3029	61	175	353	0	61	114	178	32	12200	9722	7060	0	12145	8501	5646	2362
198	3	Sakha (Yakutia) Rep	12	46970	0	0	0	0	0	0	0	0	46970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RUSSIA WEST		**244894**	**1173**	**6275**	**18033**	**34**	**1139**	**5102**	**11758**	**7032**	**219786**	**15895**	**65196**	**133683**	**590**	**15305**	**49301**	**68487**	**13656**	**13551**	**10390**	**7413**	**17353**	**13437**	**9663**	**5825**	**1942**
		RUSSIA EAST		**258722**	**1101**	**4766**	**14504**	**0**	**1101**	**3665**	**9738**	**6764**	**237437**	**14493**	**48922**	**102321**	**0**	**14493**	**34429**	**53399**	**14637**	**13163**	**10265**	**7055**	**#DIV/0!**	**13163**	**9394**	**5484**	**2164**
		RUSSIA TOTAL		**503616**	**2274**	**11041**	**32537**	**34**	**2240**	**8767**	**21496**	**13796**	**457223**	**30388**	**114118**	**236004**	**590**	**29798**	**83730**	**121886**	**28293**	**13363**	**10336**	**7253**	**17353**	**13303**	**9551**	**5670**	**2051**
211	11	Beijing	12	1385	0	0	40	0	0	0	40	43	1302	0	0	257	0	0	0	257	93	0	0	6425	0	0	0	6489	2163
212	11	Tianjin	12	863	0	0	180	0	0	0	180	194	488	0	0	1191	0	0	0	1191	428	0	0	6617	0	0	0	6614	2205
213	11	Hebei	12	13455	0	0	1302	0	0	0	1302	1365	10787	1	5	8814	0	1	4	8809	3078	1000	5000	6770	0	13295	9959	6764	2254
214	11	Shanxi	12	8953	0	1	123	0	0	1	122	442	8386	4	18	787	0	4	14	769	990	4000	18000	6398	0	13114	9611	6292	2237
237	11	Shandong	12	10518	167	341	1499	12	155	174	1158	1192	7826	2644	4604	12534	212	2432	1960	7930	2712	15832	13501	8362	17757	15649	11260	6847	2275
241	11	Henan	12	10775	1239	2095	3244	417	822	856	1149	907	6625	19631	28613	36296	7580	12051	8982	7683	2037	15844	13658	11189	18174	14658	10493	6689	2247
221	12	Liaoning	12	11258	98	203	605	10	88	105	402	401	10251	1465	2587	5211	170	1295	1122	2624	870	14949	12744	8613	17840	14723	10678	6522	2168
222	12	Jilin	12	14803	8	35	502	0	8	27	467	104	14196	114	363	3034	0	114	249	2671	200	14250	10371	6044	0	13800	9154	5720	1928
223	12	Heilongjiang	12	26983	90	294	1021	0	90	204	727	139	25822	1286	3396	7369	0	1286	2110	3973	294	14289	11551	7217	0	14247	10363	5461	2117
231	13	Shanghai	12	370	206	312	312	103	103	106	0	0	57	3376	4464	4466	1897	1479	1088	2	0	16388	14308	14314	18413	14320	10228	6104	0
232	13	Jiangsu	12	5798	2175	3385	3620	1003	1172	1210	235	80	2094	34731	47006	48567	18092	16639	12275	1561	182	15968	13887	13416	18030	14191	10148	6632	2269
233	13	Zhejiang	12	5938	380	707	841	123	257	327	134	37	5061	5862	9138	9948	2252	3610	3276	810	77	15426	12925	11829	18256	14074	10026	6055	2105
234	13	Anhui	12	9145	1710	2883	3311	709	1001	1173	428	76	5758	27656	39797	42557	13075	14581	12141	2760	171	16173	13804	12853	18448	14566	10352	6443	2251
236	14	Jiangxi	12	10700	141	515	830	1	140	374	315	127	9743	1957	5641	7503	22	1935	3684	1862	251	13879	10953	9040	18415	13799	9849	5919	1979
242	14	Hubei	12	9940	749	1368	1489	289	460	619	121	10	8441	11665	17803	18512	5204	6461	6138	709	20	15574	13014	12433	18003	14054	9918	5863	1943
243	14	Hunan	12	11740	612	1582	2115	41	571	970	533	65	9560	8798	18458	21609	738	8060	9660	3151	129	14376	11668	10217	17959	14124	9958	5912	1971
235	15	Fujian	12	8395	52	147	233	1	51	95	86	29	8132	711	1659	2185	22	689	948	526	63	13673	11286	9378	17056	13533	9970	6079	2196
244	15	Guangdong	12	12815	132	273	380	0	132	141	107	22	12413	1731	3101	3733	0	1731	1370	632	50	13114	11359	9824	0	13132	9741	5917	2236
245	15	Guangxi	12	15593	86	356	511	0	86	270	155	61	15021	1139	3994	5003	0	1139	2855	1009	135	13244	11219	9791	0	13289	10576	6514	2207
246	15	Hainan	12	700	0	0	0	0	0	0	0	0	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	16	Sichuan	12	26720	343	816	1072	79	264	473	256	122	25526	5415	10521	12213	1516	3899	5106	1692	270	15787	12893	11393	19149	14755	10802	6598	2217
252	16	Guizhou	12	8415	230	595	607	8	222	365	12	0	7808	3473	7377	7453	158	3315	3904	76	0	15100	12398	12278	19065	14939	10706	6470	0
253	16	Yunnan	12	23453	61	124	140	3	58	63	16	33	23279	887	1545	1652	47	840	658	107	77	14541	12460	11800	18569	14480	10387	6803	2309
215	17	Nei Mongol	12	56150	0	0	116	0	0	0	116	136	55898	0	2	639	0	0	2	637	276	0	2000	5509	0	0	9363	5496	2032
261	17	Shaanxi	12	8803	0	2	47	0	0	2	45	457	8298	3	24	322	0	3	21	298	1051	3000	12000	6851	0	14077	10219	6588	2300
262	17	Gansu	12	15968	0	2	17	0	0	2	15	47	15903	3	25	113	0	3	22	88	93	3000	12500	6647	0	13383	9876	5833	1964
264	17	Ningxia	12	2450	0	0	37	0	0	0	37	48	2365	0	0	192	0	0	0	192	82	0	0	5189	0	0	0	5162	1699
265	17	Xinjiang	12	32755	0	0	0	0	0	0	0	2	32753	0	0	2	0	0	0	2	3	0	0	2000	0	0	0	4957	1726
254	18	Xizang	12	29875	1	3	4	0	1	2	1	1	29870	14	30	38	2	12	16	8	2	14000	10000	9500	17020	13735	10093	6152	2254
263	18	Qinghai	12	21850	0	0	1	0	0	0	1	3	21846	0	0	3	0	0	0	3	7	0	0	3000	0	0	0	5324	2227
272	19	Hongkong	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**416566**	**8480**	**16039**	**24199**	**2799**	**5681**	**7559**	**8160**	**6143**	**386209**	**132566**	**210171**	**262203**	**50987**	**81579**	**77605**	**52032**	**13641**	**15633**	**13104**	**10835**	**18216**	**14360**	**10267**	**6376**	**2221**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used (short rotation coppice systems): VS conditions: 60/40; S and MS: 50/50; mS and VmS: 40/60.

APPENDIX II

Table A4 PRODUCTION POTENTIALS FOR BIOMASS PLANTATIONS WITH WILLOW (*Salix viminalis*) - ACCESSIBLE AREAS, EXCLUDING CULTIVATED AND URBAN AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	/S...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	62805	0	0	0	0	0	0	0	46	62759	0	0	1	0	0	0	1	146	0	0	1000	0	0	0	6961	3205
11	1	Armenia	12	1448	0	0	0	0	0	0	0	0	1447	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	Azerbaijan	12	4205	0	0	123	0	0	0	123	242	3472	0	0	834	0	0	0	834	549	0	0	6780	0	0	9602	6777	2270
13	1	Byelorussia	12	6503	184	866	1130	0	184	682	264	65	5307	2693	9951	11613	0	2693	7258	1662	135	14636	11491	10277	0	14667	10643	6288	2059
14	1	Estonia	12	1303	74	240	357	0	74	166	117	82	864	896	2442	3148	0	896	1546	706	176	12108	10175	8818	0	12130	9324	6039	2136
15	1	Georgia	12	3013	1	16	35	0	1	15	19	21	2957	10	170	305	2	8	160	135	50	10000	10625	8714	19111	14041	10982	6931	2360
16	1	Kazakhstan	12	134203	1	4	410	0	1	3	406	920	132872	9	37	2109	0	9	28	2072	1578	9000	9250	5144	0	12215	8977	5099	1714
17	1	Kirghiztan	12	8128	0	0	16	0	0	0	16	15	8096	0	0	83	0	0	0	83	28	0	0	5188	0	0	0	5287	1831
18	1	Latvia	12	1875	91	310	534	0	91	219	224	74	1267	1187	3301	4573	0	1187	2114	1272	152	13044	10648	8564	0	13022	9665	5689	2049
19	1	Lithuania	12	3013	176	396	795	0	176	220	399	144	2074	2372	4521	6869	0	2372	2149	2348	287	13477	11417	8640	0	13471	9781	5881	1995
20	1	Moldavia	12	93	1	2	3	0	1	1	1	2	88	10	23	32	0	10	13	9	4	10000	11500	10667	16377	15410	11041	6648	2283
21	1	Tajikistan	12	3495	0	1	10	0	0	1	9	18	3468	0	5	54	0	0	5	49	36	0	5000	5400	0	0	8039	5674	2021
22	1	Turkmenistan	12	20363	0	0	1	0	0	0	1	1	20361	0	0	6	0	0	0	6	2	0	0	6000	0	0	0	6455	2130
23	1	Ukraine	12	5253	77	407	603	1	76	330	196	30	4619	1154	4733	6008	21	1133	3579	1275	65	14987	11629	9964	15931	14931	10843	6497	2188
		FSU REPUBLICS		**192895**	**605**	**2242**	**4017**	**1**	**604**	**1637**	**1775**	**1614**	**186892**	**8331**	**25183**	**35634**	**23**	**8308**	**16852**	**10451**	**3062**	**13770**	**11232**	**8871**	**23000**	**13755**	**10294**	**5888**	**1897**
103	2	Krasnodar Kray	12	1820	14	26	104	6	8	12	78	82	1634	229	347	906	111	118	118	559	201	16357	13346	8712	19613	14655	9996	7165	2439
107	2	Stavropol Kray	12	805	1	4	4	0	1	3	0	3	799	9	35	36	0	9	26	1	7	9000	8750	9000	0	14583	10271	6144	2231
111	2	Arkhangelsk oblast	12	13708	0	0	77	0	0	0	77	14	13602	0	0	390	0	0	0	390	23	0	0	5065	0	0	0	5093	1702
112	2	Astrakhan oblast	12	2853	0	0	0	0	0	0	0	0	2852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	73	0	0	5	0	0	0	5	10	57	0	0	33	0	0	0	33	20	0	0	6600	0	0	0	6159	2048
115	2	Bryansk oblast	12	638	0	3	43	0	0	3	40	2	592	0	34	284	0	0	34	250	4	0	11333	6605	0	0	10327	6201	2112
117	2	Vladimir oblast	12	1008	0	86	96	0	0	86	10	0	912	0	821	876	0	0	821	55	0	0	9547	9125	0	0	9544	5544	0
118	2	Volgograd oblast	12	1703	0	0	0	0	0	0	0	0	1702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	2	Vologda oblast	12	7900	0	101	839	0	0	101	738	56	7004	0	874	4791	0	0	874	3917	120	0	8653	5710	0	0	8630	5309	2122
120	2	Voronezh oblast	12	473	0	0	59	0	0	0	59	19	394	0	0	372	0	0	0	372	40	0	0	6305	0	0	0	6256	2072
122	2	Nizhni Novgorod obl	12	3318	29	153	205	0	29	124	52	10	3102	395	1595	1906	0	395	1200	311	21	13621	10425	9298	0	13649	9708	5929	2034
123	2	Nenets a.okr.	12	2583	0	0	0	0	0	0	0	0	2582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2	Ivanovo oblast	12	848	0	6	8	0	0	6	2	0	840	0	52	61	0	0	52	9	0	0	8667	7625	0	0	9415	5627	0
127	2	Kaliningrad oblast	12	145	9	36	60	0	9	27	24	2	84	125	402	547	0	125	277	145	4	13889	11167	9117	0	14316	10314	6170	2062
128	2	Tver oblast	12	2598	2	58	192	0	2	56	134	6	2400	24	542	1281	0	24	518	739	12	12000	9345	6672	0	12408	9186	5532	2211
129	2	Kaluga oblast	12	1038	0	12	63	0	0	12	51	0	975	0	122	426	0	0	122	304	0	0	10167	6762	0	0	9874	6015	0
133	2	Kirov oblast	12	5758	0	30	202	0	0	30	172	95	5460	0	313	1239	0	0	313	926	184	0	10433	6134	0	0	10337	5387	1936
134	2	Kostroma oblast	12	3273	0	23	191	0	0	23	168	38	3044	0	216	1154	0	0	216	938	71	0	9391	6042	0	0	9296	5594	1857
136	2	Samara oblast	12	370	0	0	21	0	0	0	21	52	297	0	0	123	0	0	0	123	93	0	0	5857	0	0	0	5819	1777
138	2	Kursk oblast	12	80	7	26	36	0	7	19	10	1	43	88	275	336	0	88	187	61	2	12571	10577	9333	0	13409	9774	5946	2003
139	2	Komi-Permyak a.okr	12	1838	0	0	87	0	0	0	87	25	1725	0	0	461	0	0	0	461	52	0	0	5299	0	0	0	5283	2064
141	2	Leningrad oblast	12	4743	0	39	652	0	0	39	613	362	3728	0	345	3561	0	0	345	3216	646	0	8846	5462	0	0	8734	5246	1786
142	2	Lipetsk oblast	12	80	3	6	15	0	3	3	9	3	62	38	70	122	0	38	32	52	6	12667	11667	8133	0	13147	9340	5791	1932
146	2	Moscow oblast	12	2008	0	134	153	0	0	134	19	0	1854	0	1285	1395	0	0	1285	110	0	0	9590	9118	0	0	9595	5716	1860
147	2	Murmansk oblast	12	3965	0	0	0	0	0	0	0	0	3965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	2	Novgorod oblast	12	3273	0	238	432	0	0	238	194	147	2694	0	2189	3254	0	0	2189	1065	272	0	9197	7532	0	0	9213	5494	1850
153	2	Orenburg oblast	12	1840	0	0	1	0	0	0	1	2	1837	0	0	4	0	0	0	4	3	0	0	4000	0	0	0	5011	1641
154	2	Oryel oblast	12	53	2	8	16	0	2	6	8	0	35	35	100	150	0	35	65	50	0	17500	12500	9375	0	14258	10155	6087	0
156	2	Penza oblast	12	575	0	0	43	0	0	0	43	99	433	0	0	245	0	0	0	245	188	0	0	5698	0	0	0	5704	1901
157	2	Perm oblast	12	5435	0	16	155	0	0	16	139	73	5208	0	152	934	0	0	152	782	164	0	9500	6026	0	0	9704	5644	2254
158	2	Pskov oblast	12	2258	5	126	405	0	5	121	279	90	1763	63	1173	2673	0	63	1110	1500	165	12600	9310	6600	0	12699	9162	5383	1828
160	2	Rostov oblast	12	313	0	0	0	0	0	0	0	0	312	0	0	3	0	0	0	3	0	0	0	3000	0	0	0	6197	2061
161	2	Ryazan oblast	12	1050	0	161	186	0	0	161	25	0	863	0	1577	1722	0	0	1577	145	1	0	9795	9258	0	0	9795	5772	2359
163	2	Saratov oblast	12	845	0	0	6	0	0	0	6	10	830	0	0	35	0	0	0	35	19	0	0	5833	0	0	0	6016	1988
166	2	Smolensk oblast	12	563	0	0	0	0	0	0	0	2	560	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	1997
168	2	Tambov oblast	12	255	0	0	51	0	0	0	51	17	186	0	0	300	0	0	0	300	34	0	0	5882	0	0	0	5830	1953
170	2	Tula oblast	12	213	1	9	19	0	1	8	10	0	194	9	84	144	0	9	75	60	0	9000	9333	7579	0	13760	9929	6013	0
173	2	Ulyanovsk oblast	12	780	0	0	30	0	0	0	30	134	616	0	0	174	0	0	0	174	252	0	0	5800	0	0	0	5759	1888
178	2	Yaroslavl oblast	12	850	1	20	83	0	1	19	63	2	766	7	178	522	0	7	171	344	3	7000	8900	6289	0	12464	9012	5456	1903
179	2	Adigei Republic	12	225	2	9	13	0	2	7	4	2	210	26	97	122	0	26	71	25	6	13000	10778	9385	0	13724	9997	6543	2451
180	2	Bashkortostan Repu	12	3123	0	23	98	0	0	23	75	110	2914	0	216	627	0	0	216	411	200	0	9391	6398	0	0	9331	5480	1811
182	2	Daghestn Republic	12	3370	1	3	24	0	1	2	21	32	3307	13	30	150	2	11	17	120	65	13000	10000	6250	17097	14048	10308	5688	2001
183	2	Kabardino-Balkarian	12	555	10	16	16	2	8	6	0	0	539	141	201	204	30	111	60	3	1	14100	12563	12750	16646	13347	10782	6353	2178
185	2	Kalmyk-Khalm-Tang	12	3825	0	0	0	0	0	0	0	0	3825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2	Karelia Republic	12	8518	0	0	52	0	0	0	52	26	8437	0	0	255	0	0	0	255	50	0	0	4904	0	0	0	4908	1895
187	2	Komi Republic	12	14183	0	0	19	0	0	0	19	2	14161	0	0	98	0	0	0	98	4	0	0	5158	0	0	0	5117	1689
188	2	Mari-El Republic	12	943	14	38	66	0	14	24	28	14	863	190	457	635	0	190	267	178	32	13571	12026	9621	0	13768	10918	6422	2327
189	2	Mordovian SSR	12	593	12	32	62	0	12	20	30	38	492	153	349	527	0	153	196	178	71	12750	10906	8500	0	12250	9813	5867	1893
190	2	North-Ossetian SSR	12	405	21	22	24	9	12	1	2	2	378	318	324	339	153	165	6	15	5	15143	14727	14125	17124	13315	10655	6468	2158
191	2	Karachai-Cherkess F	12	895	14	18	19	4	10	4	1	0	876	195	237	241	65	130	42	4	1	13929	13167	12684	16753	13263	10582	6193	2017
192	2	Tatarstan Republic	12	540	0	3	54	0	0	3	51	35	452	0	28	316	0	0	28	288	64	0	9333	5852	0	0	11011	5686	1827
194	2	Udmurt Republic	12	1400	0	16	39	0	0	16	23	10	1351	0	164	300	0	0	164	136	22	0	10250	7692	0	0	10030	5898	2246
196	2	Checheno-Ingush R	12	1028	10	12	18	2	8	2	6	8	1002	132	155	195	28	104	23	40	19	13200	12917	10833	17181	13875	10783	6534	2202
197	2	Chuvash Republic	12	643	0	2	11	0	0	2	9	31	601	0	26	79	0	0	26	53	59	0	13000	7182	0	0	12181	6010	1908
101	3	Altai Kray	12	6125	170	434	1043	0	170	264	609	224	4858	2177	4821	8114	0	2177	2644	3293	442	12806	11108	7779	0	12832	10001	5409	1972

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used (short rotation coppice systems): VS conditions: shoots+twigs+leaves/stool+roots, 60/40; S and MS: 50/50; mS and VmS: 40/60.

APPENDIX II

Table A4 PRODUCTION POTENTIALS FOR BIOMASS PLANTATIONS WITH WILLOW (*Salix viminalis*) - ACCESSIBLE AREAS, EXCLUDING CULTIVATED AND URBAN AREAS

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	Average annual biomass increments (000tons) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	Average annual biomass yield (kg/ha) VS+S	VS...MS	/S...mS	VS	S	MS	mS	vmS
102	3	Gorno-Altai Republic	12	2668	0	3	36	0	0	3	33	16	2615	6	33	202	0	6	27	169	28	6000	11000	5611	0	12447	8975	5196	1726
104	3	Krasnoyarsk Kray	12	13728	19	78	433	0	19	59	355	393	12902	224	730	2737	0	224	506	2007	847	11789	9359	6321	0	12015	8552	5656	2157
105	3	Primorski Kray	12	6520	59	205	412	0	59	146	207	87	6021	847	2323	3588	0	847	1476	1265	188	14356	11332	8709	0	14381	10126	6119	2146
106	3	Taymyr a.okr.	12	2825	0	0	0	0	0	0	0	0	2825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	8873	40	216	386	0	40	176	170	74	8409	536	2258	3277	0	536	1722	1019	165	13400	10454	8490	0	13392	9764	5983	2225
110	3	Amur oblast	12	8108	78	423	1190	0	78	345	767	591	6327	1069	4332	8574	0	1069	3263	4242	1110	13705	10241	7205	0	13773	9463	5531	1877
116	3	Evenk a.okr	12	6128	0	0	0	0	0	0	0	0	6127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3	Yevrey (Jewish) a.ob	12	1450	163	354	471	0	163	191	117	29	949	2281	4181	4863	0	2281	1900	682	54	13994	11811	10325	0	13975	9938	5815	1863
125	3	Irkutsk oblast	12	16035	0	0	7	0	0	0	7	10	16018	0	0	51	0	0	0	51	27	0	0	7286	0	0	0	7588	2628
126	3	Ust-Orda Buryat a.ok	12	693	0	0	0	0	0	0	0	0	692	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	3	Kamchatka oblast	12	3853	0	0	0	0	0	0	0	0	3852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	3	Koryak a.okr.	12	5010	0	0	0	0	0	0	0	0	5010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	3	Kemerovo oblast	12	3498	0	3	134	0	0	3	131	107	3256	0	28	674	0	0	28	646	210	0	9333	5030	0	0	8136	4946	1961
135	3	Chukchi a.okr.	12	8158	0	0	0	0	0	0	0	0	8155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	2403	2	26	321	0	2	24	295	317	1765	26	258	1752	0	26	232	1494	529	13000	9923	5458	0	12600	9806	5066	1669
144	3	Magadan oblast	12	9245	0	0	0	0	0	0	0	0	9245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3	Novosibirsk oblast	12	6220	4	180	739	0	4	176	559	473	5008	46	1633	5063	0	46	1587	3430	1037	11500	9072	6851	0	12147	8993	6138	2194
152	3	Omsk oblast	12	5035	0	16	396	0	0	16	380	412	4228	0	132	2357	0	0	132	2225	1120	0	8250	5952	0	0	8498	5862	2722
164	3	Sakhalin oblast	12	4760	0	0	3	0	0	0	3	13	4741	0	0	22	0	0	0	22	31	0	0	7333	0	0	0	7051	2303
165	3	Sverdlovsk oblast	12	10428	1	323	1085	0	1	322	762	293	9049	9	2894	7030	0	9	2885	4136	566	9000	8960	6479	0	11896	8966	5427	1931
167	3	Aga-Buryat a.okr.	12	630	0	0	0	0	0	0	0	4	626	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	3157
169	3	Tomsk oblast	12	6968	0	48	717	0	0	48	669	415	5836	0	388	4162	0	0	388	3774	961	0	8083	5805	0	0	8121	5643	2315
171	3	Tyumen oblast	12	4585	0	67	651	0	0	67	584	467	3468	0	583	3739	0	0	583	3156	1333	0	8701	5743	0	0	8743	5404	2858
172	3	Khanty-Mansi a.okr.	12	6780	0	0	31	0	0	0	31	50	6700	0	0	180	0	0	0	180	129	0	0	5806	0	0	0	5866	2597
174	3	Yamalo-Nenets a.ok	12	2678	0	0	0	0	0	0	0	0	2677	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	3	Chelyabinsk oblast	12	2578	10	45	100	0	10	35	55	165	2312	123	499	811	0	123	376	312	276	12300	11089	8110	0	12303	10613	5667	1677
176	3	Chita oblast	12	7260	0	0	0	0	0	0	0	80	7180	0	0	0	0	0	0	0	256	0	0	0	0	0	0	7090	3202
181	3	Buryat Republic	12	6045	0	0	0	0	0	0	0	10	6035	0	0	1	0	0	0	1	33	0	0	1000	0	0	0	7548	3162
193	3	Tuva Republic	12	4778	0	0	0	0	0	0	0	6	4772	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	3300
195	3	Khakass Republic	12	2370	0	3	20	0	0	3	17	7	2344	0	28	109	0	0	28	81	15	0	9333	5450	0	0	9231	4888	2128
198	3	Sakha (Yakutia) Rep	12	46870	0	0	0	0	0	0	0	0	46870	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RUSSIA WEST		**122175**	**158**	**1515**	**5054**	**23**	**135**	**1357**	**3539**	**1666**	**115414**	**2190**	**15065**	**34548**	**389**	**1801**	**12875**	**19483**	**3210**	**13861**	**9944**	**6836**	**16913**	**13341**	**9488**	**5505**	**1927**
		RUSSIA EAST		**223305**	**546**	**2424**	**8175**	**0**	**546**	**1878**	**5751**	**4243**	**210872**	**7344**	**25121**	**57306**	**0**	**7344**	**17777**	**32185**	**9388**	**13451**	**10363**	**7010**	**#DIV/0!**	**13451**	**9466**	**5596**	**2213**
		RUSSIA TOTAL		**345480**	**704**	**3939**	**13229**	**23**	**681**	**3235**	**9290**	**5909**	**326286**	**9534**	**40186**	**91854**	**389**	**9145**	**30652**	**51668**	**12598**	**13543**	**10202**	**6943**	**16913**	**13429**	**9475**	**5562**	**2132**
211	11	Beijing	12	705	0	0	0	0	0	0	0	0	705	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
212	11	Tianjin	12	70	0	0	1	0	0	0	1	1	69	0	0	5	0	0	0	5	2	0	0	5000	0	0	0	6742	2247
213	11	Hebei	12	5220	0	0	39	0	0	0	39	40	5141	1	5	267	0	1	4	262	91	1000	5000	6846	0	13295	9959	6785	2262
214	11	Shanxi	12	3418	0	1	7	0	0	1	6	40	3370	4	16	54	0	4	12	38	91	4000	16000	7714	0	13287	9583	6358	2259
237	11	Shandong	12	1513	8	20	181	0	8	12	161	173	1159	114	236	1334	0	114	122	1098	394	14250	11800	7370	0	14878	10581	6826	2277
241	11	Henan	12	4635	501	856	1246	158	343	355	390	260	3129	7894	11634	14258	2847	5047	3740	2624	586	15756	13591	11443	18056	14718	10545	6724	2254
221	12	Liaoning	12	3945	3	5	40	0	3	2	35	45	3860	35	56	282	0	35	21	226	97	11667	11200	7050	0	13468	10263	6532	2151
222	12	Jilin	12	7378	0	7	73	0	0	7	66	13	7292	0	59	415	0	0	59	356	25	0	8429	5685	0	12582	9012	5428	1870
223	12	Heilongjiang	12	15713	34	108	268	0	34	74	160	47	15398	473	1225	2097	0	473	752	872	117	13912	11343	7825	0	13998	10127	5448	2505
231	13	Shanghai	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
232	13	Jiangsu	12	583	105	170	200	43	62	65	30	15	367	1669	2342	2543	779	890	673	201	35	15895	13776	12715	17967	14435	10349	6794	2272
233	13	Zhejiang	12	3165	33	77	108	2	31	44	31	6	3052	466	903	1090	39	427	437	187	13	14121	11727	10093	18456	14000	10046	6073	2096
234	13	Anhui	12	4535	952	1565	1800	393	559	613	235	59	2676	15381	21771	23331	7214	8167	6390	1560	135	16157	13911	12962	18356	14606	10429	6637	2278
236	14	Jiangxi	12	7530	54	234	385	1	53	180	151	69	7076	753	2535	3431	16	737	1782	896	137	13944	10833	8912	18424	13822	9884	5944	1991
242	14	Hubei	12	7245	495	865	937	185	310	370	72	2	6306	7686	11369	11794	3330	4356	3683	425	5	15527	13143	12587	18011	14062	9957	5876	1946
243	14	Hunan	12	9118	348	998	1362	7	341	650	364	45	7709	4977	11481	13639	127	4850	6504	2158	90	14302	11504	10014	18019	14201	10000	5932	1975
235	15	Fujian	12	6195	37	103	162	1	36	66	59	18	6014	511	1172	1533	19	492	661	361	39	13811	11379	9463	17046	13607	9982	6075	2201
244	15	Guangdong	12	7700	96	200	280	0	96	104	80	16	7404	1264	2269	2743	0	1264	1005	474	35	13167	11345	9796	0	13120	9702	5901	2228
245	15	Guangxi	12	11093	56	236	337	0	56	180	101	39	10716	741	2634	3294	0	741	1893	660	86	13232	11161	9774	0	13132	10510	6508	2198
246	15	Hainan	12	475	0	0	0	0	0	0	0	0	475	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	16	Sichuan	12	15890	47	108	124	2	45	61	16	11	15755	693	1338	1443	42	651	645	105	24	14745	12389	11637	19189	14444	10617	6670	2254
252	16	Guizhou	12	5543	134	360	369	6	128	226	9	0	5173	2022	4437	4493	120	1902	2415	56	0	15090	12325	12176	19077	14878	10667	6485	0
253	16	Yunnan	12	20278	46	92	102	1	45	46	10	25	20151	660	1133	1203	14	646	473	70	58	14348	12315	11794	17540	14456	10321	6774	2309
215	17	Nei Mongol	12	48138	0	0	62	0	0	0	62	65	48010	0	2	352	0	0	2	350	146	0	2000	5677	0	0	9363	5621	2253
261	17	Shaanxi	12	5088	0	2	41	0	0	2	39	25	5022	3	20	279	0	3	17	259	55	3000	10000	6805	0	14056	10192	6557	2239
262	17	Gansu	12	11770	0	2	10	0	0	2	8	17	11743	2	19	64	0	2	17	45	33	2000	9500	6400	0	13337	9894	5824	1933
264	17	Ningxia	12	1600	0	0	37	0	0	0	37	45	1519	0	0	189	0	0	0	189	76	0	0	5108	0	0	0	5169	1704
265	17	Xinjiang	12	28288	0	0	0	0	0	0	0	1	28286	0	0	1	0	0	0	1	2	0	0	1000	0	0	0	5275	1815
254	18	Xizang	12	29138	1	3	4	0	1	2	1	1	29133	14	30	38	2	12	16	8	2	14000	10000	9500	17020	13735	10093	6152	2254
263	18	Qinghai	12	20918	0	0	0	0	0	0	0	1	20916	0	0	1	0	0	0	1	3	0	0	1000	0	0	0	5522	1891
272	19	Hongkong	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**286887**	**2950**	**6012**	**8175**	**799**	**2151**	**3062**	**2163**	**1079**	**277626**	**45363**	**76686**	**90173**	**14549**	**30814**	**31323**	**13487**	**2377**	**15377**	**12755**	**11030**	**18209**	**14325**	**10230**	**6235**	**2203**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used (short rotation coppice systems): VS conditions: shoots+twigs+leaves/stool+roots, 60/40; S and MS: 50/50; mS and VmS: 40/60.

APPENDIX II

Table A5 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - ALL AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	156198	0	0	54	0	0	0	54	191	155953	0	0	235	0	0	0	235	510	0	0	4352	0	0	0	4390	2675
11	1	Armenia	12	2690	0	0	2	0	0	0	2	27	2661	0	0	11	0	0	0	11	50	0	0	5500	0	0	0	6099	1861
12	1	Azerbaijan	12	7868	0	0	520	0	0	0	520	780	6000	0	3	3584	0	0	3	3581	1812	0	3000	6892	0	12452	9047	6890	2323
13	1	Byelorussia	12	20348	6048	14103	15879	0	6048	8055	1776	505	3964	87097	171363	182486	0	87097	84266	11123	1035	14401	12151	11492	0	14401	10461	6263	2051
14	1	Estonia	12	3938	567	1362	1974	0	567	795	612	213	1751	7056	14445	17821	0	7056	7389	3376	455	12444	10606	9028	0	12444	9295	5518	2143
15	1	Georgia	12	6523	114	191	291	62	52	77	100	116	6115	1805	2618	3261	1088	717	813	643	254	15833	13707	11206	17540	13841	10492	6456	2185
16	1	Kazakhstan	12	268445	5	35	7645	0	5	30	7610	7285	253515	64	341	39862	0	64	277	39521	12653	12800	9743	5214	0	12661	9322	5193	1737
17	1	Kirghiztan	12	19548	0	4	198	0	0	4	194	167	19182	0	35	1309	0	0	35	1274	350	0	8750	6611	0	0	9246	6561	2093
18	1	Latvia	12	6313	831	2679	4480	0	831	1848	1801	429	1403	10950	28221	38357	0	10950	17271	10136	857	13177	10534	8562	0	13172	9347	5627	1995
19	1	Lithuania	12	6420	1893	3646	4431	0	1893	1753	785	506	1484	25982	43089	47735	0	25982	17107	4646	1015	13725	11818	10773	0	13726	9760	5921	2005
20	1	Moldavia	12	3000	190	276	394	77	113	86	118	257	2350	2706	3545	4332	1240	1466	839	787	588	14242	12844	10995	16200	13033	9760	6688	2290
21	1	Tajikistan	12	9013	0	5	56	0	0	5	51	79	8878	0	37	323	0	0	37	286	154	0	7400	5768	0	0	8098	5613	1955
22	1	Turkmenistan	12	45390	0	0	9	0	0	0	9	7	45374	0	0	56	0	0	0	56	15	0	0	6222	0	0	0	6427	2042
23	1	Ukraine	12	57570	8732	16809	22853	1215	7517	8077	6044	4315	30398	121860	207474	248112	19477	102383	85614	40638	9676	13956	12343	10857	16033	13619	10599	6723	2242
		FSU REPUBLICS		**457066**	**18380**	**39110**	**58732**	**1354**	**17026**	**20730**	**19622**	**14686**	**383075**	**257520**	**471171**	**587249**	**21805**	**235715**	**213651**	**116078**	**28914**	**14011**	**12047**	**9999**	**16104**	**13844**	**10306**	**5916**	**1969**
103	2	Krasnodar Kray	12	7620	67	101	3623	21	46	34	3522	1154	2836	1038	1371	26531	395	643	333	25160	2760	15493	13574	7323	18445	13947	9928	7145	2391
107	2	Stavropol Kray	12	6635	2	7	1479	0	2	5	1472	877	4279	32	77	9707	3	29	45	9630	1920	16000	11000	6563	15904	13155	9907	6540	2191
111	2	Arkhangelsk oblast	12	38190	0	386	2152	0	0	386	1766	1682	34336	0	3132	11814	0	0	3132	8682	2771	0	8114	5490	0	0	8124	4915	1648
112	2	Astrakhan oblast	12	4598	0	0	0	0	0	0	0	0	4597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	2665	43	114	439	0	43	71	325	349	1878	541	1207	3210	0	541	666	2003	720	12581	10588	7312	0	12523	9383	6168	2064
115	2	Bryansk oblast	12	3483	653	2406	2894	0	653	1753	488	53	535	9472	27680	30723	0	9472	18208	3043	110	14505	11505	10616	0	14496	10384	6237	2078
117	2	Vladimir oblast	12	2925	270	1858	2188	0	270	1588	330	255	483	3485	18690	20567	0	3485	15205	1877	481	12907	10059	9400	0	12909	9578	5690	1889
118	2	Volgograd oblast	12	11265	0	0	266	0	0	0	266	485	10514	0	0	1303	0	0	0	1303	853	0	0	4898	0	0	0	4896	1759
119	2	Vologda oblast	12	14628	0	3057	8810	0	0	3057	5753	1086	4733	0	26600	56463	0	0	26600	29863	1933	0	8701	6409	0	0	8702	5191	1781
120	2	Voronezh oblast	12	5195	6	33	977	0	6	27	944	808	3410	70	350	6179	0	70	280	5829	1657	11667	10606	6324	0	11749	10307	6177	2050
122	2	Nizhni Novgorod obl	12	7515	878	4394	5204	0	878	3516	810	264	2046	11729	45871	50609	0	11729	34142	4738	505	13359	10439	9725	0	13352	9709	5851	1912
123	2	Nenets a.okr.	12	16858	0	0	0	0	0	0	0	0	16837	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2	Ivanovo oblast	12	2270	1016	1859	1963	0	1016	843	104	58	249	13170	21063	21651	0	13170	7893	588	109	12963	11330	11030	0	12966	9364	5635	1866
127	2	Kaliningrad oblast	12	1240	541	808	978	0	541	267	170	18	243	7833	10599	11657	0	7833	2766	1058	37	14479	13118	11919	0	14479	10361	6207	2065
128	2	Tver oblast	12	8395	871	4235	6878	0	871	3364	2643	182	1335	10994	41842	56353	0	10994	30848	14511	346	12622	9880	8193	0	12616	9169	5490	1905
129	2	Kaluga oblast	12	2963	752	1885	2158	0	752	1133	273	50	754	10091	21170	22796	0	10091	11079	1626	98	13419	11231	10563	0	13428	9779	5952	1939
133	2	Kirov oblast	12	11930	602	2630	5742	0	602	2028	3112	2022	4167	7769	26015	42964	0	7769	18246	16949	3565	12905	9892	7482	0	12912	8998	5447	1763
134	2	Kostroma oblast	12	6000	113	1694	4215	0	113	1581	2521	514	1271	1446	15999	30129	0	1446	14553	14130	960	12796	9445	7148	0	12787	9208	5604	1868
136	2	Samara oblast	12	5118	0	0	377	0	0	0	377	720	4021	0	0	2117	0	0	0	2117	1340	0	0	5615	0	0	0	5613	1862
138	2	Kursk oblast	12	3020	636	1430	1754	0	636	794	324	79	1187	8802	16645	18566	0	8802	7843	1921	153	13840	11640	10585	0	13847	9873	5937	1943
139	2	Komi-Permyak a.okr	12	3280	0	474	1237	0	0	474	763	526	1517	0	3978	8009	0	0	3978	4031	893	0	8392	6475	0	0	8385	5285	1698
141	2	Leningrad oblast	12	7500	162	1071	3476	0	162	909	2405	1611	2412	1988	9726	22283	0	1988	7738	12557	2967	12272	9081	6411	0	12252	8513	5220	1841
142	2	Lipetsk oblast	12	2410	431	913	1339	0	431	482	426	230	841	5747	10485	13036	0	5747	4738	2551	451	13334	11484	9736	0	13332	9822	5984	1967
146	2	Moscow oblast	12	4665	1290	2832	3560	0	1290	1542	728	60	1045	16895	31419	35466	0	16895	14524	4047	112	13097	11094	9962	0	13096	9420	5557	1875
147	2	Murmansk oblast	12	13960	0	0	0	0	0	0	0	0	13960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	2	Novgorod oblast	12	5450	909	3053	4431	0	909	2144	1378	234	785	11486	30914	38395	0	11486	19428	7481	444	12636	10126	8665	0	12629	9062	5430	1895
153	2	Orenburg oblast	12	12418	0	0	160	0	0	0	160	435	11823	0	0	809	0	0	0	809	718	0	0	5056	0	0	0	5054	1653
154	2	Oryel oblast	12	2458	572	1375	1541	0	572	803	166	10	907	8228	16452	17463	0	8228	8224	1011	20	14385	11965	11332	0	14396	10242	6091	1917
156	2	Penza oblast	12	4320	15	175	1060	0	15	160	885	1151	2109	172	1862	7021	0	172	1690	5159	2214	11467	10640	6624	0	11707	10533	5831	1924
157	2	Perm oblast	12	12715	184	1587	3583	0	184	1403	1996	672	8461	2261	14663	25500	0	2261	12402	10837	1256	12288	9239	7117	0	12291	8840	5430	1870
158	2	Pskov oblast	12	5568	1525	3455	4142	0	1525	1930	687	109	1316	19783	37656	41463	0	19783	17873	3807	204	12972	10899	10010	0	12971	9261	5540	1868
160	2	Rostov oblast	12	10133	1	2	2058	0	1	1	2056	1708	6366	10	16	13152	0	10	6	13136	3600	10000	8000	6391	0	13689	9778	6387	2108
161	2	Ryazan oblast	12	3935	1015	2775	3054	0	1015	1760	279	46	834	13889	31128	32763	0	13889	17239	1635	98	13684	11217	10728	0	13680	9794	5853	2132
163	2	Saratov oblast	12	10375	0	0	561	0	0	0	561	808	9005	0	0	2848	0	0	0	2848	1534	0	0	5077	0	0	0	5075	1898
166	2	Smolensk oblast	12	4943	2330	3746	3826	0	2330	1416	80	126	990	30757	44087	44547	0	30757	13330	460	241	13200	11769	11643	0	13201	9415	5714	1904
168	2	Tambov oblast	12	3435	71	352	1598	0	71	281	1246	783	1055	891	3822	11276	0	891	2931	7454	1554	12549	10858	7056	0	12634	10437	5983	1986
170	2	Tula oblast	12	2553	733	1568	1671	0	733	835	103	0	881	10188	18498	19115	0	10188	8310	617	0	13899	11797	11439	0	13891	9953	5981	1596
173	2	Ulyanovsk oblast	12	3690	0	7	196	0	0	7	189	781	2712	0	75	1179	0	0	75	1104	1500	0	10714	6015	0	0	10221	5838	1920
178	2	Yaroslavl oblast	12	3260	477	1873	2723	0	477	1396	850	48	489	5986	18705	23365	0	5986	12719	4660	91	12549	9987	8581	0	12548	9112	5485	1889
179	2	Adigei Republic	12	775	13	24	229	2	11	11	205	97	450	180	294	1790	33	147	114	1496	240	13846	12250	7817	17694	14020	10096	7311	2469
180	2	Bashkortostan Repu	12	14435	318	1236	2732	0	318	918	1496	1360	10344	3959	12580	21144	0	3959	8621	8564	2503	12450	10178	7739	0	12461	9395	5725	1840
182	2	Daghestn Republic	12	5033	2	5	149	0	2	3	144	110	4764	33	66	948	5	28	33	882	237	16500	13200	6362	16963	13509	9897	6109	2145
183	2	Kabardino-Balkarian	12	1238	32	50	235	5	27	18	185	94	910	424	594	1801	78	346	170	1207	206	13250	11880	7664	16565	13003	9686	6543	2191
185	2	Kalmyk-Khalm-Tang	12	7510	0	0	162	0	0	0	162	38	7310	0	0	911	0	0	0	911	75	0	0	5623	0	0	0	5615	1965
186	2	Karelia Republic	12	18253	0	80	316	0	0	80	236	505	17424	0	639	1840	0	0	639	1201	900	0	7988	5823	0	0	8006	5088	1782
187	2	Komi Republic	12	41370	0	429	838	0	0	429	409	914	39619	0	3511	5567	0	0	3511	2056	1524	0	8184	6643	0	0	8191	5032	1668
188	2	Mari-El Republic	12	2365	158	724	1086	0	158	566	362	336	942	2010	7493	9757	0	2010	5483	2264	700	12722	10349	8984	0	12761	9680	6245	2081
189	2	Mordovian SSR	12	2590	228	788	1200	0	228	560	412	211	1178	2891	8226	10751	0	2891	5335	2525	423	12680	10439	8959	0	12663	9522	6130	2000
190	2	North-Ossetian SSR	12	778	112	128	187	42	70	16	59	23	567	1670	1831	2212	719	951	161	381	49	14911	14305	11829	17143	13590	9912	6413	2153
191	2	Karachai-Cherkess F	12	1468	23	29	56	6	17	6	27	36	1375	332	395	576	108	224	63	181	80	14435	13621	10286	16652	13044	10031	6686	2239
192	2	Tatarstan Republic	12	6663	155	425	1163	0	155	270	738	948	4552	1872	4515	8880	0	1872	2643	4365	1790	12077	10624	7635	0	12086	9781	5914	1889
194	2	Udmurt Republic	12	4150	220	1341	2155	0	220	1121	814	185	1811	2770	12912	17448	0	2770	10142	4536	378	12591	9629	8097	0	12609	9049	5573	2046
196	2	Checheno-Ingush R	12	1930	23	29	327	6	17	6	298	153	1450	323	382	2269	102	221	59	1887	334	14043	13172	6939	16811	13297	10217	6333	2174
197	2	Chuvash Republic	12	1808	34	129	222	0	34	95	93	278	1308	434	1329	1883	0	434	895	554	546	12765	10302	8482	0	12849	9417	5984	1960
101	3	Altai Kray	12	16653	1260	2580	5356	0	1260	1320	2776	1601	9696	15845	28121	42738	0	15845	12276	14617	2990	12575	10900	7979	0	12576	9298	5266	1868

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A5 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - ALL AREAS

ADM REG	NAME	LC	Total Extent	Suitable Areas (000ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	Average annual biomass increments (000tons) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	Average annual biomass yield (kg/ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
102	3 Gorno-Altai Republic	12	9385	1	19	62	0	1	18	43	16	9306	18	175	403	0	18	157	228	27	18000	9211	6500	0	12446	8624	5266	1710
104	3 Krasnoyarsk Kray	12	71140	58	883	2818	0	58	825	1935	2189	66132	696	7659	19138	0	696	6963	11479	5195	12000	8674	6791	0	11921	8438	5931	2373
105	3 Primorski Kray	12	16338	182	666	1600	5	177	484	934	361	14376	2614	7602	13411	87	2527	4988	5809	739	14363	11414	8382	16003	14319	10307	6216	2047
106	3 Taymyr a.okr.	12	82285	0	0	0	0	0	0	0	0	82285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3 Khabarovsk Kray	12	77545	316	1696	2624	0	316	1380	928	1060	73855	4218	17375	22935	0	4218	13157	5560	2353	13348	10245	8740	0	13360	9537	5991	2220
110	3 Amur oblast	12	36283	1041	2460	5533	0	1041	1419	3073	2471	28279	14043	27576	44161	0	14043	13533	16585	4490	13490	11210	7981	0	13493	9535	5398	1817
116	3 Evenk a.okr	12	75673	0	0	0	0	0	0	0	0	75672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3 Yevrey (Jewish) a.ob	12	3700	491	1248	1544	0	491	757	296	94	2061	6883	14366	16100	0	6883	7483	1734	181	14018	11511	10427	0	14009	9881	5858	1921
125	3 Irkutsk oblast	12	76270	0	0	117	0	0	0	117	227	75926	0	0	786	0	0	0	786	553	0	0	6718	0	0	0	6694	2439
126	3 Ust-Orda Buryat a.ok	12	2178	0	0	1	0	0	0	1	6	2170	0	0	9	0	0	0	9	15	0	0	9000	0	0	0	6013	2600
130	3 Kamchatka oblast	12	17045	0	0	0	0	0	0	0	0	17022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	3 Koryak a.okr.	12	28903	0	0	0	0	0	0	0	0	28902	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	3 Kemerovo oblast	12	9500	0	462	1289	0	0	462	827	405	7806	0	3763	8171	0	0	3763	4408	853	0	8145	6339	0	0	8141	5330	2105
135	3 Chukchi a.okr.	12	70770	0	0	0	0	0	0	0	0	70745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3 Kurgan oblast	12	7110	175	579	1602	0	175	404	1023	801	4707	2162	6175	11572	0	2162	4013	5397	1355	12354	10665	7223	0	12334	9938	5275	1691
144	3 Magadan oblast	12	45830	0	0	0	0	0	0	0	0	45830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3 Novosibirsk oblast	12	17673	937	2395	5777	0	937	1458	3382	1431	10465	11307	25682	42863	0	11307	14375	17181	2965	12067	10723	7420	0	12068	9857	5081	2073
152	3 Omsk oblast	12	13980	8	470	5675	0	8	462	5205	1234	7069	98	4584	30108	0	98	4486	25524	2445	12250	9753	5305	0	11631	9702	4903	1981
164	3 Sakhalin oblast	12	8095	0	5	17	0	0	5	12	30	7956	0	44	108	0	0	44	64	70	0	8800	6353	0	0	9207	5462	2305
165	3 Sverdlovsk oblast	12	19273	764	3734	8183	0	764	2970	4449	1067	10022	9267	35089	58479	0	9267	25822	23390	1946	12130	9397	7146	0	12132	8695	5257	1823
167	3 Aga-Buryat a.okr.	12	1970	0	0	6	0	0	0	6	39	1925	0	0	24	0	0	0	24	73	0	0	4000	0	0	0	4288	1874
169	3 Tomsk oblast	12	31145	4	1355	5405	0	4	1351	4050	2575	23165	42	11777	35349	0	42	11735	23572	5955	10500	8692	6540	0	11665	8685	5820	2313
171	3 Tyumen oblast	12	15860	112	775	5659	0	112	663	4884	1842	8359	1334	7652	33042	0	1334	6318	25390	4287	11911	9874	5839	0	11905	9530	5198	2327
172	3 Khanty-Mansi a.okr.	12	53163	0	426	1432	0	0	426	1006	839	50892	0	3466	8976	0	0	3466	5510	2029	0	8136	6268	0	0	8128	5478	2419
174	3 Yamalo-Nenets a.ok	12	66588	0	0	0	0	0	0	0	0	66580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	3 Chelyabinsk oblast	12	8763	269	640	1247	0	269	371	607	1263	6252	3359	6790	10076	0	3359	3431	3286	2131	12487	10609	8080	0	12471	9257	5410	1686
176	3 Chita oblast	12	41493	0	0	81	0	0	0	81	222	41189	0	1	367	0	0	1	366	515	0	1000	4531	0	0	8449	4488	2320
181	3 Buryat Republic	12	33533	0	0	32	0	0	0	32	120	33381	0	0	197	0	0	0	197	313	0	0	6156	0	0	0	6172	2614
193	3 Tuva Republic	12	17035	0	0	12	0	0	0	12	14	17009	0	0	54	0	0	0	54	37	0	0	4500	0	0	0	4471	2670
195	3 Khakass Republic	12	6120	9	108	299	0	9	99	191	201	5620	111	959	2031	0	111	848	1072	375	12333	8880	6793	0	11976	8554	5617	1868
198	3 Sakha (Yakutia) Rep	12	303275	0	0	0	0	0	0	0	0	303257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RUSSIA WEST		**389947**	**17483**	**57572**	**103370**	**82**	**17401**	**40089**	**45798**	**25282**	**261223**	**231651**	**606564**	**868806**	**1443**	**230208**	**374913**	**262242**	**48200**	**13250**	**10536**	**8405**	**17598**	**13230**	**9352**	**5726**	**1906**
	RUSSIA EAST		**1284574**	**5627**	**20501**	**56371**	**5**	**5622**	**14874**	**35870**	**20108**	**1207911**	**71997**	**208856**	**401098**	**87**	**71910**	**136859**	**192242**	**41892**	**12795**	**10188**	**7115**	**17400**	**12791**	**9201**	**5359**	**2083**
	RUSSIA TOTAL		**1674521**	**23110**	**78073**	**159741**	**87**	**23023**	**54963**	**81668**	**45390**	**1469134**	**303648**	**815420**	**1269904**	**1530**	**302118**	**511772**	**454484**	**90092**	**13139**	**10444**	**7950**	**17586**	**13122**	**9311**	**5565**	**1985**
211	11 Beijing	12	1640	0	1	202	0	0	1	201	237	1201	2	7	1318	0	2	5	1311	515	2000	7000	6525	16056	13330	9485	6510	2173
212	11 Tianjin	12	1125	0	0	270	0	0	0	270	267	588	0	0	1786	0	0	0	1786	590	0	0	6615	0	0	0	6622	2206
213	11 Hebei	12	18480	2	10	2735	0	2	8	2725	2856	12888	32	110	17989	2	30	78	17879	6263	16000	11000	6577	16089	13197	9468	6561	2193
214	11 Shanxi	12	15783	19	49	697	3	16	30	648	1083	14002	268	548	4865	51	217	280	4317	2395	14105	11184	6980	16928	13178	9468	6660	2211
237	11 Shandong	12	14798	878	1547	4100	270	608	669	2553	2459	8239	13382	20440	37969	4721	8661	7058	17529	5655	15241	13213	9261	17459	14255	10555	6867	2300
241	11 Henan	12	16295	4056	5763	7345	1418	2638	1707	1582	1222	7728	63478	81367	91814	25559	37919	17889	10447	2761	15650	14119	12500	18030	14373	10478	6604	2259
221	12 Liaoning	12	13863	1473	2012	3211	454	1019	539	1199	1123	9529	21601	27001	34814	7717	13884	5400	7813	2434	14665	13420	10842	17014	13624	10025	6517	2167
222	12 Jilin	12	19145	1787	3018	5756	430	1357	1231	2738	1093	12296	25223	37487	52640	6922	18301	12264	15153	1940	14115	12421	9145	16091	13483	9967	5534	1776
223	12 Heilongjiang	12	44848	4537	9806	15317	163	4374	5269	5511	1672	27858	64594	117328	148090	2540	62054	52734	30762	2953	14237	11965	9668	15570	14188	10008	5582	1766
231	13 Shanghai	12	413	267	385	385	151	116	118	0	0	28	4436	5638	5640	2782	1654	1202	2	0	16614	14644	14649	18378	14316	10226	6122	0
232	13 Jiangsu	12	9290	5320	7405	7679	2500	2820	2085	274	73	1415	85240	106428	108216	45074	40166	21188	1788	175	16023	14372	14092	18029	14245	10161	6516	2392
233	13 Zhejiang	12	9250	1049	1641	1869	326	723	592	228	42	7339	16098	22026	23401	5904	10194	5928	1375	89	15346	13422	12521	18104	14097	10019	6041	2094
234	13 Anhui	12	13783	5525	7975	8597	1980	3545	2450	622	61	5125	87550	112768	116689	36636	50914	25218	3921	139	15846	14140	13573	18499	14362	10294	6308	2269
236	14 Jiangxi	12	16663	2282	3195	3766	1105	1177	913	571	230	12667	36873	46068	49493	20186	16687	9195	3425	441	16158	14419	13142	18269	14179	10075	5994	1919
242	14 Hubei	12	18168	5040	6627	6818	2239	2801	1587	191	16	11334	79888	95842	96968	40409	39479	15954	1126	31	15851	14462	14222	18047	14097	10055	5884	1944
243	14 Hunan	12	21050	3006	4428	5126	1224	1782	1422	698	107	15816	47305	61681	65840	21998	25307	14376	4159	207	15737	13930	12844	17973	14204	10107	5955	1932
235	15 Fujian	12	11995	78	213	333	5	73	135	120	38	11623	1080	2436	3170	86	994	1356	734	84	13846	11437	9520	16661	13640	10016	6104	2191
244	15 Guangdong	12	16385	319	570	727	70	249	251	157	35	15623	4558	7022	7958	1219	3339	2464	936	77	14288	12319	10946	17436	13394	9810	5952	2209
245	15 Guangxi	12	23425	571	1157	1432	116	455	586	275	96	21897	8244	14417	16215	1980	6264	6173	1798	213	14438	12461	11323	17030	13772	10539	6539	2207
246	15 Hainan	12	2840	0	0	0	0	0	0	0	0	2840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	16 Sichuan	12	56143	1793	4348	5648	194	1599	2555	1300	197	50298	27044	54722	63359	3673	23371	27678	8637	439	15083	12586	11218	18963	14613	10833	6644	2230
252	16 Guizhou	12	17725	770	1730	1800	77	693	960	70	0	15924	11830	22017	22456	1481	10349	10187	439	1	15364	12727	12476	19339	14924	10615	6238	2194
253	16 Yunnan	12	37325	645	1016	1207	127	518	371	191	202	35916	9874	13668	14929	2341	7533	3794	1261	463	15309	13453	12369	18484	14544	10227	6610	2290
215	17 Nei Mongol	12	115468	105	517	2549	0	105	412	2032	3794	109124	1283	4996	15518	0	1283	3713	10522	7243	12219	9663	6088	0	12169	9008	5177	1909
261	17 Shaanxi	12	20900	156	332	1040	8	148	176	708	714	19146	2250	4023	8850	144	2106	1773	4827	1625	14423	12117	8510	17957	14201	10059	6823	2277
262	17 Gansu	12	40580	17	63	181	1	16	46	118	238	40161	231	674	1376	24	207	443	702	470	13588	10698	7602	16754	13317	9589	5952	1975
264	17 Ningxia	12	5038	0	0	129	0	0	0	129	198	4710	1	4	787	0	1	3	783	394	1000	4000	6101	0	12277	8964	6061	1987
265	17 Xinjiang	12	163355	0	1	23	0	0	1	22	72	163260	1	14	124	0	1	13	110	132	1000	14000	5391	0	12150	9222	5125	1829
254	18 Xizang	12	119045	34	52	108	9	25	18	56	32	118905	531	709	986	170	361	178	277	57	15618	13635	9130	18709	14376	9786	4971	1819
263	18 Qinghai	12	72183	0	0	4	0	0	0	4	16	72162	0	0	22	0	0	0	22	33	0	0	5500	0	0	0	5227	2047
272	19 Hongkong	12	40	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHINA TOTAL		**937041**	**39729**	**63861**	**89054**	**12870**	**26859**	**24132**	**25193**	**18173**	**829682**	**612897**	**859441**	**1013282**	**231619**	**381278**	**246544**	**153841**	**37819**	**15427**	**13458**	**11378**	**17997**	**14196**	**10216**	**6106**	**2081**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A6 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - ACCESSIBLE AREAS

ADM REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
			Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4 Mongolia	12	63130	0	0	34	0	0	0	34	97	63000	0	0	147	0	0	0	147	276	0	0	4324	0	0	0	4380	2851
11	1 Armenia	12	2025	0	0	2	0	0	0	2	26	1997	0	0	10	0	0	0	10	49	0	0	5000	0	0	0	6081	1857
12	1 Azerbaijan	12	6095	0	0	382	0	0	0	382	587	4633	0	1	2607	0	0	1	2606	1361	0	1000	6825	0	0	9297	6816	2317
13	1 Byelorussia	12	17955	5375	12434	14001	0	5375	7059	1567	449	3504	77379	151127	160928	0	77379	73748	9801	920	14396	12154	11494	0	14395	10447	6253	2049
14	1 Estonia	12	3365	525	1212	1729	0	525	687	517	176	1460	6534	12900	15745	0	6534	6366	2845	376	12446	10644	9106	0	12450	9266	5503	2136
15	1 Georgia	12	4763	97	163	245	52	45	66	82	93	4425	1536	2218	2742	917	619	682	524	200	15835	13607	11192	17597	13874	10369	6395	2158
16	1 Kazakhstan	12	165068	4	23	5149	0	4	19	5126	4977	154943	46	219	26817	0	46	173	26598	8694	11500	9522	5208	0	12717	9333	5189	1747
17	1 Kirghiztan	12	10428	0	3	172	0	0	3	169	150	10106	0	27	1135	0	0	27	1108	313	0	9000	6599	0	0	9213	6540	2092
18	1 Latvia	12	5573	712	2348	3938	0	712	1636	1590	381	1254	9365	24631	33565	0	9365	15266	8934	757	13153	10490	8523	0	13159	9331	5618	1989
19	1 Lithuania	12	6018	1757	3408	4151	0	1757	1651	743	475	1391	24113	40227	44623	0	24113	16114	4396	950	13724	11804	10750	0	13720	9757	5918	2002
20	1 Moldavia	12	2848	182	264	375	73	109	82	111	242	2230	2608	3408	4149	1185	1423	800	741	554	14330	12909	11064	16204	13033	9768	6688	2288
21	1 Tajikistan	12	4775	0	3	47	0	0	3	44	68	4660	0	28	275	0	0	28	247	133	0	9333	5851	0	0	8086	5643	1960
22	1 Turkmenistan	12	22535	0	0	7	0	0	0	7	6	22523	0	0	42	0	0	0	42	11	0	0	6000	0	0	0	6429	2033
23	1 Ukraine	12	51955	7973	15142	20602	1141	6832	7169	5460	3947	27407	111172	187047	223784	18294	92878	75875	36737	8858	13944	12353	10862	16037	13595	10584	6728	2244
	FSU REPUBLICS		**303403**	**16625**	**35000**	**50800**	**1266**	**15359**	**18375**	**15800**	**11577**	**240533**	**232753**	**421833**	**516422**	**20396**	**212357**	**189080**	**94589**	**23176**	**14000**	**12052**	**10166**	**16111**	**13826**	**10290**	**5987**	**2002**
103	2 Krasnodar Kray	12	6715	64	94	3245	21	43	30	3151	1029	2436	991	1291	23810	387	604	300	22519	2461	15484	13734	7337	18476	13984	9959	7147	2392
107	2 Stavropol Kray	12	5428	2	6	1178	0	2	4	1172	747	3503	27	71	7753	2	25	44	7682	1639	13500	11833	6581	16209	13296	9911	6556	2195
111	2 Arkhangelsk oblast	12	14210	0	196	1331	0	0	196	1135	1074	11790	0	1597	7182	0	0	1597	5585	1770	0	8148	5396	0	0	8148	4921	1648
112	2 Astrakhan oblast	12	2923	0	0	0	0	0	0	0	0	2922	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2 Belgorod oblast	12	2248	39	101	379	0	39	62	278	295	1572	495	1080	2795	0	495	585	1715	609	12692	10693	7375	0	12571	9369	6165	2063
115	2 Bryansk oblast	12	3095	557	2129	2570	0	557	1572	441	47	479	8080	24397	27145	0	8080	16317	2748	97	14506	11459	10562	0	14508	10381	6235	2080
117	2 Vladimir oblast	12	2510	223	1598	1884	0	223	1375	286	217	409	2888	16072	17703	0	2888	13184	1631	410	12951	10058	9396	0	12924	9591	5697	1891
118	2 Volgograd oblast	12	9108	0	0	223	0	0	0	223	411	8473	0	0	1098	0	0	0	1098	728	0	0	4924	0	0	0	4915	1770
119	2 Vologda oblast	12	9155	0	2048	5564	0	0	2048	3516	664	2928	0	17772	36017	0	0	17772	18245	1170	0	8678	6473	0	0	8679	5189	1763
120	2 Voronezh oblast	12	4550	5	31	873	0	5	26	842	703	2974	59	332	5545	0	59	273	5213	1444	11800	10710	6352	0	11742	10369	6189	2056
122	2 Nizhni Novgorod obl	12	6403	772	3720	4396	0	772	2948	676	214	1791	10302	38941	42902	0	10302	28639	3961	410	13345	10468	9759	0	13336	9713	5856	1916
123	2 Nenets a.okr.	12	2583	0	0	0	0	0	0	0	0	2582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2 Ivanovo oblast	12	1875	833	1542	1629	0	833	709	87	50	196	10796	17445	17938	0	10796	6649	493	93	12960	11313	11012	0	12963	9375	5639	1868
127	2 Kaliningrad oblast	12	1183	519	771	929	0	519	252	158	17	236	7519	10130	11113	0	7519	2611	983	34	14487	13139	11962	0	14480	10361	6210	2066
128	2 Tver oblast	12	6128	657	3128	5021	0	657	2471	1893	127	980	8284	30939	41332	0	8284	22655	10393	241	12609	9891	8232	0	12615	9168	5491	1905
129	2 Kaluga oblast	12	2445	617	1565	1795	0	617	948	230	38	612	8291	17567	18936	0	8291	9276	1369	74	13438	11225	10549	0	13435	9790	5956	1940
133	2 Kirov oblast	12	8750	462	1934	4144	0	462	1472	2210	1513	3093	5969	19222	31255	0	5969	13253	12033	2665	12920	9939	7542	0	12927	9005	5445	1761
134	2 Kostroma oblast	12	4263	67	1160	2968	0	67	1093	1808	365	930	850	10901	21040	0	850	10051	10139	683	12687	9397	7089	0	12731	9195	5609	1869
136	2 Samara oblast	12	4408	0	0	343	0	0	0	343	644	3420	0	0	1939	0	0	0	1939	1203	0	0	5653	0	0	0	5652	1867
138	2 Kursk oblast	12	2623	561	1261	1545	0	561	700	284	64	1013	7771	14678	16365	0	7771	6907	1687	125	13852	11640	10592	0	13839	9870	5933	1933
139	2 Komi-Permyak a.okı	12	2220	0	301	825	0	0	301	524	398	997	0	2546	5334	0	0	2546	2788	678	0	8458	6465	0	0	8462	5325	1704
141	2 Leningrad oblast	12	5678	124	793	2622	0	124	669	1829	1239	1817	1520	7235	16792	0	1520	5715	9557	2287	12258	9124	6404	0	12264	8550	5226	1845
142	2 Lipetsk oblast	12	2140	378	805	1187	0	378	427	382	207	746	5040	9236	11517	0	5040	4196	2281	407	13333	11473	9703	0	13336	9821	5976	1967
146	2 Moscow oblast	12	4130	1163	2543	3148	0	1163	1380	605	51	931	15259	28274	31642	0	15259	13015	3368	95	13120	11118	10051	0	13117	9433	5569	1883
147	2 Murmansk oblast	12	4110	0	0	0	0	0	0	0	0	4110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	2 Novgorod oblast	12	3935	685	2206	3188	0	685	1521	982	174	572	8650	22416	27740	0	8650	13766	5324	325	12628	10161	8701	0	12620	9048	5419	1871
153	2 Orenburg oblast	12	8305	0	0	117	0	0	0	117	297	7891	0	0	588	0	0	0	588	489	0	0	5026	0	0	0	5038	1647
154	2 Oryel oblast	12	2018	477	1138	1272	0	477	661	134	9	736	6864	13633	14448	0	6864	6769	815	18	14390	11980	11358	0	14377	10236	6086	1919
156	2 Penza oblast	12	3893	10	144	934	0	10	134	790	1043	1916	120	1528	6132	0	120	1408	4604	2004	12000	10611	6565	0	11672	10545	5826	1921
157	2 Perm oblast	12	8423	150	1194	2602	0	150	1044	1408	478	5343	1841	11080	18730	0	1841	9239	7650	891	12273	9280	7198	0	12296	8852	5433	1864
158	2 Pskov oblast	12	4508	1273	2852	3419	0	1273	1579	567	96	993	16513	31140	34276	0	16513	14627	3136	178	12972	10919	10025	0	12970	9262	5534	1858
160	2 Rostov oblast	12	8245	1	2	1698	0	1	1	1696	1413	5135	10	16	10877	0	10	6	10861	2990	10000	8000	6406	0	13689	9778	6405	2116
161	2 Ryazan oblast	12	3453	906	2432	2676	0	906	1526	244	40	736	12398	27355	28787	0	12398	14957	1432	85	13684	11248	10757	0	13688	9799	5861	2123
163	2 Saratov oblast	12	8433	0	0	495	0	0	0	495	703	7235	0	0	2512	0	0	0	2512	1331	0	0	5075	0	0	0	5078	1894
166	2 Smolensk oblast	12	4113	1935	3107	3169	0	1935	1172	62	109	834	25551	36588	36944	0	25551	11037	356	207	13205	11776	11658	0	13201	9416	5719	1905
168	2 Tambov oblast	12	2905	47	284	1350	0	47	237	1066	660	895	598	3075	9457	0	598	2477	6382	1311	12723	10827	7005	0	12596	10456	5989	1987
170	2 Tula oblast	12	2283	657	1403	1498	0	657	746	95	0	785	9130	16549	17115	0	9130	7419	566	0	13896	11795	11425	0	13889	9951	5980	1592
173	2 Ulyanovsk oblast	12	3218	0	7	171	0	0	7	164	691	2356	0	70	1029	0	0	70	959	1326	0	10000	6018	0	0	10225	5843	1919
178	2 Yaroslavl oblast	12	2350	395	1364	1947	0	395	969	583	40	363	4958	13792	16996	0	4958	8834	3204	75	12552	10111	8729	0	12551	9115	5493	1895
179	2 Adigei Republic	12	605	12	22	215	2	10	10	193	93	297	172	273	1686	31	141	101	1413	231	14333	12409	7842	17641	14020	10102	7319	2469
180	2 Bashkortostan Repu	12	8983	219	847	1869	0	219	628	1022	911	6203	2732	8662	14526	0	2732	5930	5864	1674	12475	10227	7772	0	12473	9438	5740	1838
182	2 Daghestn Republic	12	3843	2	4	142	0	2	2	138	103	3590	27	51	895	4	23	24	844	220	13500	12750	6303	16957	13487	9813	6125	2139
183	2 Kabardino-Balkarian	12	898	29	46	221	4	25	17	175	88	588	394	559	1705	72	322	165	1146	193	13586	12152	7715	16544	12990	9672	6543	2191
185	2 Kalmyk-Khalm-Tang	12	4735	0	0	148	0	0	0	148	35	4552	0	0	833	0	0	0	833	69	0	0	5628	0	0	0	5632	1977
186	2 Karelia Republic	12	9165	0	60	235	0	0	60	175	373	8554	0	481	1370	0	0	481	889	669	0	8017	5830	0	0	7992	5083	1791
187	2 Komi Republic	12	14183	0	147	321	0	0	147	174	579	13282	0	1212	2094	0	0	1212	882	963	0	8245	6523	0	0	8220	5069	1662
188	2 Mari-El Republic	12	1575	114	525	753	0	114	411	228	203	619	1445	5415	6840	0	1445	3970	1425	425	12675	10314	9084	0	12711	9656	6261	2090
189	2 Mordovian SSR	12	2315	208	712	1082	0	208	504	370	180	1053	2642	7434	9692	0	2642	4792	2258	358	12702	10441	8957	0	12683	9505	6108	1996
190	2 North-Ossetian SSR	12	608	109	125	184	41	68	16	59	23	399	1638	1798	2179	709	929	160	381	49	15028	14384	11842	17151	13607	9905	6413	2153
191	2 Karachai-Cherkess I	12	1085	21	25	50	6	15	4	25	31	1004	300	342	510	103	197	42	168	69	14286	13680	10200	16684	13041	9898	6702	2243
192	2 Tatarstan Republic	12	5278	94	286	891	0	94	192	605	781	3606	1138	3006	6552	0	1138	1868	3546	1470	12106	10510	7354	0	12110	9751	5861	1882
194	2 Udmurt Republic	12	3425	185	1100	1765	0	185	915	665	166	1494	2336	10633	14350	0	2336	8297	3717	340	12627	9666	8130	0	12617	9069	5594	2042
196	2 Checheno-Ingush R	12	1555	21	27	305	6	15	6	278	147	1104	287	345	2124	93	194	58	1779	321	13667	12778	6964	16820	13324	10216	6408	2180

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A6 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - ACCESSIBLE AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)								Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
197	2	Chuvash Republic	12	1678	29	115	200	0	29	86	85	263	1216	370	1181	1693	0	370	811	512	515	12759	10270	8465	0	12903	9470	6019	1962
101	3	Altai Kray	12	11538	860	1722	3816	0	860	862	2094	1203	6519	10843	18909	29931	0	10843	8066	11022	2255	12608	10981	7844	0	12609	9354	5264	1875
102	3	Gorno-Altai Republic	12	2693	1	17	49	0	1	16	32	9	2634	18	153	321	0	18	135	168	16	18000	9000	6551	0	12446	8661	5319	1720
104	3	Krasnoyarsk Kray	12	16560	50	596	1677	0	50	546	1081	945	13938	595	5243	11529	0	595	4648	6286	2190	11900	8797	6875	0	11911	8514	5813	2318
105	3	Primorski Kray	12	7290	121	453	1087	5	116	332	634	226	5978	1727	5140	9080	76	1651	3413	3940	468	14273	11347	8353	15996	14245	10294	6216	2072
106	3	Taymyr a.okr.	12	2848	0	0	0	0	0	0	0	0	2847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	9013	177	567	859	0	177	390	292	207	7945	2393	6096	7785	0	2393	3703	1689	431	13520	10751	9063	0	13550	9489	5791	2088
110	3	Amur oblast	12	9438	752	1522	2709	0	752	770	1187	941	5787	10222	17674	24234	0	10222	7452	6560	1745	13593	11612	8946	0	13595	9676	5527	1853
116	3	Evenk a.okr	12	6140	0	0	0	0	0	0	0	0	6140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3	Yevrey (Jewish) a.ol	12	1545	271	649	795	0	271	378	146	40	711	3810	7558	8409	0	3810	3748	851	74	14059	11646	10577	0	14069	9918	5839	1863
125	3	Irkutsk oblast	12	17280	0	0	80	0	0	0	80	161	17039	0	0	547	0	0	0	547	396	0	0	6838	0	0	0	6872	2462
126	3	Ust-Orda Buryat a.o	12	1180	0	0	1	0	0	0	1	4	1175	0	0	7	0	0	0	7	10	0	0	7000	0	0	0	5788	2654
130	3	Kamchatka oblast	12	3853	0	0	0	0	0	0	0	0	3852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	3	Koryak a.okr.	12	5013	0	0	0	0	0	0	0	0	5012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	3	Kemerovo oblast	12	5290	0	260	778	0	0	260	518	261	4251	0	2123	4875	0	0	2123	2752	557	0	8165	6266	0	0	8164	5314	2134
135	3	Chukchi a.okr.	12	8158	0	0	0	0	0	0	0	0	8155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	5195	138	450	1206	0	138	312	756	596	3392	1698	4797	8786	0	1698	3099	3989	1009	12304	10660	7285	0	12338	9926	5273	1692
144	3	Magadan oblast	12	9245	0	0	0	0	0	0	0	0	9245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3	Novosibirsk oblast	12	9910	617	1513	3072	0	617	896	1559	779	6059	7440	16173	24115	0	7440	8733	7942	1542	12058	10689	7850	0	12054	9750	5093	1979
152	3	Omsk oblast	12	8545	5	315	3600	0	5	310	3285	722	4223	61	3093	19196	0	61	3032	16103	1484	12200	9819	5332	0	11623	9767	4903	2056
164	3	Sakhalin oblast	12	4795	0	4	14	0	0	4	10	27	4751	0	40	97	0	0	40	57	63	0	10000	6929	0	0	9269	5518	2315
165	3	Sverdlovsk oblast	12	12618	589	2639	5730	0	589	2050	3091	799	6088	7144	25142	41494	0	7144	17998	16352	1453	12129	9527	7242	0	12137	8778	5290	1819
167	3	Aga-Buryat a.okr.	12	663	0	0	3	0	0	0	3	18	642	0	0	12	0	0	0	12	34	0	0	4000	0	0	0	4279	1920
169	3	Tomsk oblast	12	7415	4	773	2288	0	4	769	1515	928	4199	42	6735	15575	0	42	6693	8840	2127	10500	8713	6807	0	11665	8701	5836	2292
171	3	Tyumen oblast	12	7043	59	450	2323	0	59	391	1873	810	3909	711	4426	14288	0	711	3715	9862	1834	12051	9836	6151	0	12006	9508	5264	2264
172	3	Khanty-Mansi a.okr.	12	6830	0	123	289	0	0	123	166	164	6377	0	998	1988	0	0	998	990	389	0	8114	6879	0	0	8128	5955	2376
174	3	Yamalo-Nenets a.ok	12	2680	0	0	0	0	0	0	0	0	2680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	3	Chelyabinsk oblast	12	6338	214	509	974	0	214	295	465	920	4443	2671	5412	7938	0	2671	2741	2526	1554	12481	10633	8150	0	12470	9277	5432	1690
176	3	Chita oblast	12	7850	0	0	61	0	0	0	61	139	7651	0	0	266	0	0	0	266	318	0	0	4361	0	0	0	4384	2295
181	3	Buryat Republic	12	6650	0	0	23	0	0	0	23	86	6541	0	0	142	0	0	0	142	224	0	0	6174	0	0	0	6118	2607
193	3	Tuva Republic	12	5043	0	0	11	0	0	0	11	12	5020	0	0	48	0	0	0	48	31	0	0	4364	0	0	0	4457	2639
195	3	Khakass Republic	12	3093	8	98	247	0	8	90	149	160	2685	100	871	1707	0	100	771	836	297	12500	8888	6911	0	11995	8554	5609	1861
198	3	Sakha (Yakutia) Rep	12	46970	0	0	0	0	0	0	0	0	46970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RUSSIA WEST		**244894**	**14622**	**45900**	**80716**	**80**	**14542**	**31278**	**34816**	**19843**	**144291**	**194255**	**488360**	**689833**	**1401**	**192854**	**294105**	**201473**	**38119**	**13285**	**10640**	**8546**	**17513**	**13262**	**9403**	**5787**	**1921**
		RUSSIA EAST		**258722**	**3866**	**12660**	**31692**	**5**	**3861**	**8794**	**19032**	**10157**	**216858**	**49475**	**130583**	**232370**	**76**	**49399**	**81108**	**101787**	**20501**	**12797**	**10315**	**7332**	**15200**	**12794**	**9223**	**5348**	**2018**
		RUSSIA TOTAL		**503616**	**18488**	**58560**	**112408**	**85**	**18403**	**40072**	**53848**	**30000**	**361149**	**243730**	**618943**	**922203**	**1477**	**242253**	**375213**	**303260**	**58620**	**13183**	**10569**	**8204**	**17376**	**13164**	**9363**	**5632**	**1954**
211	11	Beijing	12	1385	0	0	179	0	0	0	179	214	992	1	4	1173	0	1	3	1169	464	1000	4000	6553	16056	13888	9518	6513	2174
212	11	Tianjin	12	863	0	0	216	0	0	0	216	211	435	0	0	1430	0	0	0	1430	466	0	0	6620	0	0	0	6619	2205
213	11	Hebei	12	13455	1	6	2164	0	1	5	2158	2266	9023	20	69	14214	1	19	49	14145	4967	20000	11500	6568	16051	13203	9531	6553	2192
214	11	Shanxi	12	8953	12	28	530	2	10	16	502	822	7600	169	323	3665	34	135	154	3342	1821	14083	11536	6915	16913	13154	9481	6654	2215
237	11	Shandong	12	10518	684	1169	3055	216	468	485	1886	1797	5665	10397	15515	28474	3772	6625	5118	12959	4138	15200	13272	9320	17455	14152	10554	6873	2302
241	11	Henan	12	10775	3059	4345	5574	1051	2008	1286	1229	949	4252	47796	61276	69389	18941	28855	13480	8113	2142	15625	14103	12449	18027	14367	10481	6600	2258
221	12	Liaoning	12	11258	1267	1741	2767	394	873	474	1026	976	7514	18624	23384	30069	6700	11924	4760	6685	2114	14699	13431	10867	16983	13651	10043	6518	2166
222	12	Jilin	12	14803	1641	2694	4813	405	1236	1053	2119	856	9135	23219	33710	45466	6518	16701	10491	11756	1525	14149	12513	9446	16091	13515	9962	5549	1782
223	12	Heilongjiang	12	26983	3003	6319	9944	131	2872	3316	3625	1111	15927	42771	76254	96425	2035	40736	33483	20171	1952	14243	12067	9697	15575	14185	10096	5565	1756
231	13	Shanghai	12	370	238	344	344	134	104	106	0	0	25	3953	5041	5043	2457	1496	1088	2	0	16609	14654	14660	18384	14319	10229	6123	0
232	13	Jiangsu	12	5798	3395	4753	4958	1555	1840	1358	205	60	776	54310	68163	69512	28030	26280	13853	1349	145	15997	14341	14020	18024	14283	10203	6569	2394
233	13	Zhejiang	12	5938	765	1177	1343	239	526	412	166	36	4559	11719	15856	16860	4310	7409	4137	1004	76	15319	13472	12554	18059	14091	10039	6058	2106
234	13	Anhui	12	9145	3838	5565	6044	1366	2472	1727	479	45	3057	60742	78554	81587	25243	35499	17812	3033	104	15826	14116	13499	18483	14360	10317	6334	2290
236	14	Jiangxi	12	10700	1599	2224	2592	770	829	625	368	172	7936	25805	32102	34306	14068	11737	6297	2204	329	16138	14434	13235	18261	14164	10076	5992	1913
242	14	Hubei	12	9940	3300	4335	4461	1406	1894	1035	126	10	5469	52084	62487	63228	25394	26690	10403	741	20	15783	14415	14174	18056	14094	10053	5881	1943
243	14	Hunan	12	11740	1759	2682	3184	567	1192	923	502	77	8479	27105	36431	39420	10195	16910	9326	2989	149	15409	13584	12381	17982	14187	10108	5949	1939
235	15	Fujian	12	8395	61	163	253	4	57	102	90	31	8111	849	1870	2419	75	774	1021	549	67	13918	11472	9561	16694	13589	10010	6109	2192
244	15	Guangdong	12	12815	254	447	566	57	197	193	119	26	12223	3635	5533	6244	991	2644	1898	711	58	14311	12378	11032	17476	13420	9838	5962	2203
245	15	Guangxi	12	15593	328	728	923	52	276	400	195	69	14600	4717	8958	10234	896	3821	4241	1276	153	14381	12305	11088	17117	13866	10603	6536	2207
246	15	Hainan	12	700	0	0	0	0	0	0	0	0	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	16	Sichuan	12	26720	1121	2733	3557	120	1001	1612	824	131	23032	16892	34325	39799	2292	14600	17433	5474	291	15069	12559	11189	19131	14582	10816	6640	2221
252	16	Guizhou	12	8415	434	961	995	46	388	527	34	0	7420	6677	12290	12504	888	5789	5613	214	0	15385	12789	12567	19433	14932	10648	6286	2137
253	16	Yunnan	12	23453	443	691	828	90	353	248	137	152	22473	6772	9309	10215	1654	5118	2537	906	349	15287	13472	12337	18298	14513	10248	6628	2294
215	17	Nei Mongol	12	56150	24	131	1448	0	24	107	1317	2500	52202	290	1258	7968	0	290	968	6710	4640	12083	9603	5503	0	12065	9078	5094	1856
261	17	Shaanxi	12	8803	113	215	771	5	108	102	556	517	7515	1625	2652	6465	82	1543	1027	3813	1185	14381	12335	8385	18214	14291	10104	6858	2292
262	17	Gansu	12	15968	11	40	115	1	10	29	75	145	15707	142	424	881	12	130	282	457	289	12909	10600	7661	16864	13390	9618	6057	1988
264	17	Ningxia	12	2450	0	0	56	0	0	0	56	86	2307	1	3	351	0	1	2	348	172	1000	3000	6268	0	12277	9055	6166	1996
265	17	Xinjiang	12	32755	0	1	13	0	0	1	12	33	32709	1	13	78	0	1	12	65	62	1000	13000	6000	0	12150	9167	5445	1880
254	18	Xizang	12	29875	12	19	64	2	10	7	45	24	29786	174	240	458	40	134	66	218	43	14500	12632	7156	17862	13968	9044	4828	1760
263	18	Qinghai	12	21850	0	0	4	0	0	0	4	13	21833	0	0	19	0	0	0	19	27	0	0	4750	0	0	0	5170	2052
272	19	Hongkong	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**416566**	**27362**	**43511**	**61761**	**8613**	**18749**	**16149**	**18250**	**13329**	**341462**	**420490**	**586044**	**697896**	**154628**	**265862**	**165554**	**111852**	**27748**	**15368**	**13469**	**11300**	**17953**	**14180**	**10252**	**6129**	**2082**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A7 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - ACCESSIBLE AREAS, EXCLUDING CULTIVATED AND URBAN AREAS

ADM REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
			Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4 Mongolia	12	62805	0	0	33	0	0	0	33	97	62675	0	0	147	0	0	0	147	276	0	0	4455	0	0	0	4380	2852
11	1 Armenia	12	1448	0	0	1	0	0	0	1	12	1434	0	0	9	0	0	0	9	23	0	0	9000	0	0	0	6168	1905
12	1 Azerbaijan	12	4205	0	0	202	0	0	0	202	273	3363	0	0	1354	0	0	0	1354	620	0	0	6703	0	0	8747	6704	2273
13	1 Byelorussia	12	6503	1589	4376	4974	0	1589	2787	598	147	1382	22964	52317	56092	0	22964	29353	3775	304	14452	11955	11277	0	14455	10533	6308	2069
14	1 Estonia	12	1303	199	475	690	0	199	276	215	89	524	2462	5023	6221	0	2462	2561	1198	186	12372	10575	9016	0	12366	9296	5560	2091
15	1 Georgia	12	3013	12	31	55	9	3	19	24	29	2928	206	405	560	159	47	199	155	65	17167	13065	10182	17423	13725	10645	6487	2227
16	1 Kazakhstan	12	134203	3	21	1908	0	3	18	1887	2091	130204	42	208	10020	0	42	166	9812	3677	14000	9905	5252	0	12727	9351	5200	1759
17	1 Kirghiztan	12	8128	0	2	41	0	0	2	39	30	8056	0	18	271	0	0	18	253	61	0	9000	6610	0	0	9297	6474	2016
18	1 Latvia	12	1875	192	704	1356	0	192	512	652	118	401	2507	7293	10936	0	2507	4786	3643	232	13057	10359	8065	0	13065	9346	5584	1970
19	1 Lithuania	12	3013	876	1719	2101	0	876	843	382	275	637	12012	20234	22488	0	12012	8222	2254	547	13712	11771	10703	0	13717	9756	5899	1989
20	1 Moldavia	12	93	14	15	18	10	4	1	3	9	66	204	219	239	154	50	15	20	20	14571	14600	13278	16161	13481	10511	6841	2288
21	1 Tajikistan	12	3495	0	2	19	0	0	2	17	20	3455	0	17	110	0	0	17	93	40	0	8500	5789	0	0	8105	5383	1969
22	1 Turkmenistan	12	20363	0	0	6	0	0	0	6	4	20352	0	0	40	0	0	0	40	9	0	0	6667	0	0	0	6467	2064
23	1 Ukraine	12	5253	816	2230	2665	76	740	1414	435	117	2470	11870	27156	29978	1219	10651	15286	2822	255	14547	12178	11249	15954	14403	10808	6489	2178
	FSU REPUBLICS		**192895**	**3701**	**9575**	**14036**	**95**	**3606**	**5874**	**4461**	**3214**	**175272**	**52267**	**112890**	**138318**	**1532**	**50735**	**60623**	**25428**	**6039**	**14122**	**11790**	**9855**	**16126**	**14070**	**10321**	**5700**	**1879**
103	2 Krasnodar Kray	12	1820	44	69	254	12	32	25	185	113	1452	674	925	2236	231	443	251	1311	273	15318	13406	8803	18921	13898	9862	7091	2406
107	2 Stavropol Kray	12	805	1	3	27	0	1	2	24	28	750	20	41	190	2	18	21	149	63	20000	13667	7037	16209	13342	10450	6287	2248
111	2 Arkhangelsk oblast	12	13708	0	188	1213	0	0	188	1025	1006	11473	0	1534	6578	0	0	1534	5044	1657	0	8160	5423	0	0	8147	4920	1647
112	2 Astrakhan oblast	12	2853	0	0	0	0	0	0	0	0	2852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2 Belgorod oblast	12	73	1	2	10	0	1	1	8	11	52	9	19	69	0	9	10	50	22	9000	9500	6900	0	12837	9348	6152	2050
115	2 Bryansk oblast	12	638	32	451	558	0	32	419	107	2	78	465	4789	5450	0	465	4324	661	4	14531	10619	9767	0	14519	10328	6199	2053
117	2 Vladimir oblast	12	1008	75	644	770	0	75	569	126	89	148	979	6438	7156	0	979	5459	718	169	13053	9997	9294	0	13076	9596	5677	1888
118	2 Volgograd oblast	12	1703	0	0	7	0	0	0	7	5	1691	0	0	34	0	0	0	34	8	0	0	4857	0	0	0	4790	1760
119	2 Vologda oblast	12	7900	0	1689	4785	0	0	1689	3096	589	2526	0	14614	30655	0	0	14614	16041	1029	0	8652	6406	0	0	8652	5181	1748
120	2 Voronezh oblast	12	473	0	0	64	0	0	0	64	79	329	0	0	403	0	0	0	403	164	0	0	6297	0	0	0	6249	2071
122	2 Nizhni Novgorod obl	12	3318	348	2026	2450	0	348	1678	424	165	703	4632	20969	23446	0	4632	16337	2477	313	13310	10350	9570	0	13328	9737	5849	1892
123	2 Nenets a.okr.	12	2583	0	0	0	0	0	0	0	0	2582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2 Ivanovo oblast	12	848	373	708	747	0	373	335	39	18	83	4849	8002	8222	0	4849	3153	220	33	13000	11302	11007	0	13009	9408	5645	1863
127	2 Kaliningrad oblast	12	145	56	96	120	0	56	40	24	2	23	812	1222	1368	0	812	410	146	4	14500	12729	11400	0	14509	10314	6170	2063
128	2 Tver oblast	12	2598	371	1357	2129	0	371	986	772	44	424	4699	13699	17925	0	4699	9000	4226	82	12666	10095	8419	0	12664	9124	5473	1865
129	2 Kaluga oblast	12	1038	253	655	759	0	253	402	104	15	264	3367	7290	7910	0	3367	3923	620	29	13308	11130	10422	0	13297	9768	5967	1933
133	2 Kirov oblast	12	5758	140	968	2481	0	140	828	1513	1258	2020	1796	9088	17213	0	1796	7292	8125	2183	12829	9388	6938	0	12875	8811	5371	1736
134	2 Kostroma oblast	12	3273	42	857	2333	0	42	815	1476	305	635	531	7987	16261	0	531	7456	8274	568	12643	9320	6970	0	12712	9144	5606	1866
136	2 Samara oblast	12	370	0	0	26	0	0	0	26	68	275	0	0	153	0	0	0	153	129	0	0	5885	0	0	0	5773	1902
138	2 Kursk oblast	12	80	17	39	47	0	17	22	8	1	33	236	453	500	0	236	217	47	2	13882	11615	10638	0	14162	10079	5947	2069
139	2 Komi-Permyak a.okı	12	1838	0	202	588	0	0	202	386	388	861	0	1700	3744	0	0	1700	2044	658	0	8416	6367	0	0	8420	5292	1695
141	2 Leningrad oblast	12	4743	115	705	2302	0	115	590	1597	1037	1404	1408	6442	14778	0	1408	5034	8336	1911	12243	9138	6420	0	12274	8536	5221	1842
142	2 Lipetsk oblast	12	80	10	19	26	0	10	9	7	20	34	129	218	260	0	129	89	42	39	12900	11474	10000	0	13470	9927	5774	1967
146	2 Moscow oblast	12	2008	521	1231	1548	0	521	710	317	33	427	6827	13525	15284	0	6827	6698	1759	62	13104	10987	9873	0	13106	9437	5541	1899
147	2 Murmansk oblast	12	3965	0	0	0	0	0	0	0	0	3965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	2 Novgorod oblast	12	3273	562	1800	2638	0	562	1238	838	149	485	7082	18271	22797	0	7082	11189	4526	275	12601	10151	8642	0	12604	9036	5403	1845
153	2 Orenburg oblast	12	1840	0	0	1	0	0	0	1	3	1836	0	0	5	0	0	0	5	5	0	0	5000	0	0	0	5195	1717
154	2 Oryel oblast	12	53	7	27	34	0	7	20	7	0	18	94	300	346	0	94	206	46	0	13429	11111	10176	0	14491	10208	6082	0
156	2 Penza oblast	12	575	0	12	90	0	0	12	78	143	342	0	131	574	0	0	131	443	273	0	10917	6378	0	0	10807	5702	1911
157	2 Perm oblast	12	5435	41	485	1236	0	41	444	751	341	3858	500	4379	8462	0	500	3879	4083	634	12195	9029	6846	0	12282	8735	5435	1859
158	2 Pskov oblast	12	2258	631	1496	1862	0	631	865	366	64	332	8154	16115	18125	0	8154	7961	2010	117	12922	10772	9734	0	12933	9204	5494	1834
160	2 Rostov oblast	12	313	0	0	21	0	0	0	21	20	271	0	0	125	0	0	0	125	37	0	0	5952	0	0	0	5841	1840
161	2 Ryazan oblast	12	1050	101	677	760	0	101	576	83	26	263	1394	7022	7508	0	1394	5628	486	56	13802	10372	9879	0	13739	9769	5827	2145
163	2 Saratov oblast	12	845	0	0	9	0	0	0	9	30	807	0	0	50	0	0	0	50	58	0	0	5556	0	0	0	5853	1965
166	2 Smolensk oblast	12	563	249	427	446	0	249	178	19	12	105	3262	4924	5033	0	3262	1662	109	22	13100	11532	11285	0	13095	9360	5667	1883
168	2 Tambov oblast	12	255	2	24	86	0	2	22	62	87	82	23	243	607	0	23	220	364	171	11500	10125	7058	0	12160	10056	5844	1969
170	2 Tula oblast	12	213	61	129	136	0	61	68	7	0	77	821	1480	1523	0	821	659	43	0	13459	11473	11199	0	13547	9752	6024	1575
173	2 Ulyanovsk oblast	12	780	0	1	42	0	0	1	41	176	561	0	8	246	0	0	8	238	337	0	8000	5857	0	0	10024	5765	1909
178	2 Yaroslavl oblast	12	850	140	511	718	0	140	371	207	5	127	1753	5117	6249	0	1753	3364	1132	8	12521	10014	8703	0	12548	9067	5455	1881
179	2 Adigei Republic	12	225	11	19	25	2	9	8	6	7	193	153	237	275	31	122	84	38	17	13909	12474	11000	17641	13932	10012	6161	2439
180	2 Bashkortostan Repu	12	3123	26	125	287	0	26	99	162	154	2682	322	1226	2141	0	322	904	915	275	12385	9808	7460	0	12593	9178	5638	1789
182	2 Daghestn Republic	12	3370	2	4	104	0	2	2	100	73	3185	27	51	653	4	23	24	602	157	13500	12750	6279	16957	13487	9817	6050	2132
183	2 Kabardino-Balkarian	12	555	24	30	36	4	20	6	6	5	515	333	391	428	72	261	58	37	10	13875	13033	11889	16547	13037	9940	6534	2199
185	2 Kalmyk-Khalm-Tang	12	3825	0	0	0	0	0	0	0	0	3825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2 Karelia Republic	12	8518	0	53	205	0	0	53	152	347	7963	0	424	1199	0	0	424	775	615	0	8000	5849	0	0	7971	5096	1776
187	2 Komi Republic	12	14183	0	147	321	0	0	147	174	579	13282	0	1212	2094	0	0	1212	882	963	0	8245	6523	0	0	8220	5069	1662
188	2 Mari-El Republic	12	943	53	345	527	0	53	292	182	119	297	680	3505	4646	0	680	2825	1141	260	12830	10159	8816	0	12956	9684	6266	2174
189	2 Mordovian SSR	12	593	43	233	308	0	43	190	75	33	253	547	2299	2731	0	547	1752	432	65	12721	9867	8867	0	12853	9237	5790	1985
190	2 North-Ossetian SSR	12	405	40	47	67	16	24	7	20	8	330	587	657	786	269	318	70	129	17	14675	13979	11731	17022	13459	9910	6408	2146
191	2 Karachai-Cherkess I	12	895	17	20	22	5	12	3	2	2	871	232	265	279	76	156	33	14	4	13647	13250	12682	16620	13030	10018	6369	2245
192	2 Tatarstan Republic	12	540	4	14	85	0	4	10	71	84	370	52	147	551	0	52	95	404	158	13000	10500	6482	0	12225	9382	5720	1870
194	2 Udmurt Republic	12	1400	77	451	749	0	77	374	298	99	552	970	4353	6020	0	970	3383	1667	200	12597	9652	8037	0	12639	9057	5592	2018
196	2 Checheno-Ingush R	12	1028	20	25	104	6	14	5	79	47	876	285	338	832	93	192	53	494	102	14250	13520	8000	16820	13331	10230	6226	2172

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A7 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - ACCESSIBLE AREAS, EXCLUDING CULTIVATED AND URBAN AREAS

ADM REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)									Average annual biomass yield (kg/ha)								
			Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
197	2 Chuvash Republic	12	643	5	29	66	0	5	24	37	135	441	65	298	508	0	65	233	210	270	13000	10276	7697	0	13090	9640	5602	2003
101	3 Altai Kray	12	6125	339	761	1787	0	339	422	1026	712	3626	4278	8243	13705	0	4278	3965	5462	1366	12619	10832	7669	0	12634	9394	5323	1917
102	3 Gorno-Altai Republic	12	2668	1	16	48	0	1	15	32	9	2610	18	152	320	0	18	134	168	16	18000	9500	6667	0	12446	8660	5319	1720
104	3 Krasnoyarsk Kray	12	13728	35	378	1016	0	35	343	638	657	12055	415	3336	7135	0	415	2921	3799	1537	11857	8825	7023	0	11901	8518	5956	2341
105	3 Primorski Kray	12	6520	105	373	831	5	100	268	458	168	5521	1489	4228	7049	76	1413	2739	2821	346	14181	11335	8483	15996	14153	10227	6161	2057
106	3 Taymyr a.okr.	12	2825	0	0	0	0	0	0	0	0	2825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3 Khabarovsk Kray	12	8873	165	505	783	0	165	340	278	202	7885	2235	5460	7071	0	2235	3225	1611	421	13545	10812	9031	0	13562	9488	5788	2089
110	3 Amur oblast	12	8108	323	813	1823	0	323	490	1010	850	5435	4382	9088	14589	0	4382	4706	5501	1553	13567	11178	8003	0	13556	9612	5447	1828
116	3 Evenk a.okr	12	6128	0	0	0	0	0	0	0	0	6127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3 Yevrey (Jewish) a.ol	12	1450	233	575	712	0	233	342	137	40	698	3266	6646	7439	0	3266	3380	793	74	14017	11558	10448	0	13993	9869	5812	1861
125	3 Irkutsk oblast	12	16035	0	0	64	0	0	0	64	134	15837	0	0	450	0	0	0	450	330	0	0	7031	0	0	0	6994	2466
126	3 Ust-Orda Buryat a.o	12	693	0	0	1	0	0	0	1	0	691	0	0	4	0	0	0	4	1	0	0	4000	0	0	0	5640	2128
130	3 Kamchatka oblast	12	3853	0	0	0	0	0	0	0	0	3852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	3 Koryak a.okr.	12	5010	0	0	0	0	0	0	0	0	5010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	3 Kemerovo oblast	12	3498	0	204	545	0	0	204	341	177	2776	0	1663	3453	0	0	1663	1790	362	0	8152	6336	0	0	8157	5252	2047
135	3 Chukchi a.okr.	12	8158	0	0	0	0	0	0	0	0	8155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3 Kurgan oblast	12	2403	20	76	442	0	20	56	366	296	1664	249	795	2653	0	249	546	1858	497	12450	10461	6002	0	12196	9701	5082	1680
144	3 Magadan oblast	12	9245	0	0	0	0	0	0	0	0	9245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3 Novosibirsk oblast	12	6220	156	692	1613	0	156	536	921	532	4075	1864	7328	12037	0	1864	5464	4709	1097	11949	10590	7462	0	11968	10195	5113	2062
152	3 Omsk oblast	12	5035	5	286	1647	0	5	281	1361	501	2887	61	2810	9507	0	61	2749	6697	1072	12200	9825	5772	0	11623	9801	4920	2140
164	3 Sakhalin oblast	12	4760	0	4	14	0	0	4	10	27	4716	0	40	97	0	0	40	57	63	0	10000	6929	0	0	9269	5518	2315
165	3 Sverdlovsk oblast	12	10428	284	1929	4442	0	284	1645	2513	672	5313	3419	17731	30939	0	3419	14312	13208	1217	12039	9192	6965	0	12034	8699	5257	1811
167	3 Aga-Buryat a.okr.	12	630	0	0	2	0	0	0	2	15	612	0	0	11	0	0	0	11	30	0	0	5500	0	0	0	4278	1990
169	3 Tomsk oblast	12	6968	2	696	2138	0	2	694	1442	838	3992	21	5978	14431	0	21	5957	8453	1910	10500	8589	6750	0	11680	8580	5861	2281
171	3 Tyumen oblast	12	4585	32	304	1675	0	32	272	1371	506	2403	388	2962	10132	0	388	2574	7170	1150	12125	9743	6049	0	11941	9449	5229	2273
172	3 Khanty-Mansi a.okr.	12	6780	0	116	275	0	0	116	159	161	6344	0	947	1898	0	0	947	951	383	0	8164	6902	0	0	8135	5973	2381
174	3 Yamalo-Nenets a.ok	12	2678	0	0	0	0	0	0	0	0	2677	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	3 Chelyabinsk oblast	12	2578	43	89	194	0	43	46	105	269	2115	534	951	1510	0	534	417	559	454	12419	10685	7784	0	12501	9065	5318	1690
176	3 Chita oblast	12	7260	0	0	56	0	0	0	56	116	7088	0	0	246	0	0	0	246	263	0	0	4393	0	0	0	4391	2267
181	3 Buryat Republic	12	6045	0	0	11	0	0	0	11	62	5971	0	0	62	0	0	0	62	166	0	0	5636	0	0	0	5512	2659
193	3 Tuva Republic	12	4778	0	0	9	0	0	0	9	10	4759	0	0	41	0	0	0	41	25	0	0	4556	0	0	0	4453	2577
195	3 Khakass Republic	12	2370	1	34	119	0	1	33	85	91	2159	12	298	782	0	12	286	484	170	12000	8765	6571	0	11743	8616	5671	1862
198	3 Sakha (Yakutia) Rep	12	46870	0	0	0	0	0	0	0	0	46870	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RUSSIA WEST		**122175**	**4515**	**19040**	**34229**	**45**	**4470**	**14525**	**15189**	**8024**	**79883**	**58769**	**192348**	**274628**	**778**	**57991**	**133579**	**82280**	**14508**	**13016**	**10102**	**8023**	**17289**	**12973**	**9196**	**5417**	**1808**
	RUSSIA EAST		**223305**	**1744**	**7851**	**20247**	**5**	**1739**	**6107**	**12396**	**7045**	**195993**	**22631**	**78656**	**145561**	**76**	**22555**	**56025**	**66905**	**14503**	**12976**	**10019**	**7189**	**15200**	**12970**	**9174**	**5397**	**2059**
	RUSSIA TOTAL		**345480**	**6259**	**26891**	**54476**	**50**	**6209**	**20632**	**27585**	**15069**	**275876**	**81400**	**271004**	**420189**	**854**	**80546**	**189604**	**149185**	**29011**	**13005**	**10078**	**7713**	**17080**	**12972**	**9190**	**5408**	**1925**
211	11 Beijing	12	705	0	0	14	0	0	0	14	30	661	1	4	95	0	1	3	91	66	1000	4000	6786	16056	13888	9610	6578	2193
212	11 Tianjin	12	70	0	0	2	0	0	0	2	2	66	0	0	10	0	0	0	10	5	0	0	5000	0	0	0	6674	2224
213	11 Hebei	12	5220	1	5	217	0	1	4	212	333	4670	18	61	1377	1	17	43	1316	697	18000	12200	6346	16051	13171	9511	6206	2096
214	11 Shanxi	12	3418	6	14	60	1	5	8	46	115	3242	87	165	466	20	67	78	301	255	14500	11786	7767	16856	13047	9395	6535	2216
237	11 Shandong	12	1513	65	123	288	20	45	58	165	209	1015	972	1602	2728	352	620	630	1126	482	14954	13024	9472	17342	13748	10889	6834	2307
241	11 Henan	12	4635	1596	2211	2585	517	1079	615	374	214	1836	24739	31189	33653	9273	15466	6450	2464	489	15501	14106	13019	17935	14335	10480	6594	2281
221	12 Liaoning	12	3945	226	273	380	57	169	47	107	191	3374	3212	3668	4372	978	2234	456	704	413	14212	13436	11505	17051	13219	9718	6557	2164
222	12 Jilin	12	7378	434	855	1531	94	340	421	676	281	5566	6053	10208	13830	1509	4544	4155	3622	468	13947	11939	9033	16073	13366	9880	5359	1664
223	12 Heilongjiang	12	15713	1108	2669	4317	51	1057	1561	1648	464	10932	15605	31068	40042	787	14818	15463	8974	785	14084	11640	9275	15579	14020	9905	5446	1691
231	13 Shanghai	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
232	13 Jiangsu	12	583	225	321	346	84	141	96	25	8	228	3525	4520	4688	1507	2018	995	168	19	15667	14081	13549	17933	14343	10339	6629	2302
233	13 Zhejiang	12	3165	77	138	180	16	61	61	42	6	2978	1149	1768	2022	284	865	619	254	13	14922	12812	11233	17717	14067	10078	6075	2094
234	13 Anhui	12	4535	1549	2348	2587	539	1010	799	239	32	1917	24405	32727	34284	9907	14498	8322	1557	76	15755	13938	13252	18369	14359	10420	6527	2389
236	14 Jiangxi	12	7530	796	1141	1328	353	443	345	187	87	6114	12722	16209	17335	6448	6274	3487	1126	169	15982	14206	13053	18251	14160	10109	6029	1928
242	14 Hubei	12	7245	2066	2769	2844	845	1221	703	75	2	4399	32477	39556	39998	15262	17215	7079	442	5	15720	14285	14064	18060	14103	10068	5893	1946
243	14 Hunan	12	9118	989	1629	1976	263	726	640	347	51	7090	15019	21511	23584	4740	10279	6492	2073	100	15186	13205	11935	17999	14165	10140	5972	1956
235	15 Fujian	12	6195	44	116	178	3	41	72	62	19	5998	617	1334	1711	57	560	717	377	42	14023	11500	9612	16613	13645	10021	6110	2195
244	15 Guangdong	12	7700	164	299	386	27	137	135	87	17	7298	2295	3610	4129	471	1824	1315	519	38	13994	12074	10697	17541	13361	9773	5940	2216
245	15 Guangxi	12	11093	244	511	635	41	203	267	124	44	10414	3508	6322	7133	710	2798	2814	811	97	14377	12372	11233	17175	13817	10548	6532	2200
246	15 Hainan	12	475	0	0	0	0	0	0	0	0	475	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	16 Sichuan	12	15890	184	358	399	13	171	174	41	18	15473	2742	4588	4863	241	2501	1846	275	40	14902	12816	12188	18984	14597	10597	6642	2261
252	16 Guizhou	12	5543	265	594	611	29	236	329	17	0	4931	4070	7562	7670	564	3506	3492	108	0	15358	12731	12553	19375	14846	10607	6292	2137
253	16 Yunnan	12	20278	305	478	569	59	246	173	91	115	19593	4654	6414	7011	1098	3556	1760	597	264	15259	13418	12322	18465	14465	10192	6568	2287
215	17 Nei Mongol	12	48138	22	116	923	0	22	94	807	1623	45592	264	1113	5247	0	264	849	4134	3121	12000	9595	5685	0	12084	9006	5122	1923
261	17 Shaanxi	12	5088	29	75	159	3	26	46	84	79	4850	418	880	1440	53	365	462	560	176	14414	11733	9057	18129	14169	10035	6679	2232
262	17 Gansu	12	11770	8	26	58	1	7	18	32	57	11656	98	268	459	11	87	170	191	113	12250	10308	7914	17084	13272	9553	5948	1988
264	17 Ningxia	12	1600	0	0	49	0	0	0	49	67	1483	1	3	310	0	1	2	307	136	1000	3000	6327	0	12277	9055	6231	2026
265	17 Xinjiang	12	28288	0	1	11	0	0	1	10	27	28249	1	13	66	0	1	12	53	51	1000	13000	6000	0	12150	9167	5354	1879
254	18 Xizang	12	29138	12	17	50	2	10	5	33	20	29067	174	226	387	40	134	52	161	35	14500	13294	7740	17862	13968	9417	4864	1750
263	18 Qinghai	12	20918	0	0	2	0	0	0	2	7	20909	0	0	11	0	0	0	11	14	0	0	5500	0	0	0	5196	1953
272	19 Hongkong	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHINA TOTAL		**286887**	**10415**	**17087**	**22685**	**3018**	**7397**	**6672**	**5598**	**4118**	**260076**	**158826**	**226589**	**258921**	**54313**	**104513**	**67763**	**32332**	**8169**	**15250**	**13261**	**11414**	**17996**	**14129**	**10156**	**5776**	**1984**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A8 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - ACCESSIBLE AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	1163	0	0	0	0	0	0	0	0	1162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4228	1861
11	1	Armenia	12	135	0	0	0	0	0	0	0	0	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1914
12	1	Azerbaijan	12	698	0	0	9	0	0	0	9	11	578	0	0	60	0	0	0	60	27	0	0	6667	0	0	8717	6968	2433
13	1	Byelorussia	12	5098	1405	3487	3940	0	1405	2082	453	126	1031	20235	42039	44883	0	20235	21804	2844	260	14402	12056	11392	0	14397	10474	6272	2057
14	1	Estonia	12	975	145	324	507	0	145	179	183	68	400	1813	3477	4469	0	1813	1664	992	136	12503	10731	8815	0	12468	9283	5425	2015
15	1	Georgia	12	1995	3	7	15	1	2	4	8	8	1971	49	90	139	21	28	41	49	18	16333	12857	9267	18057	13956	9797	6217	2139
16	1	Kazakhstan	12	4208	0	1	48	0	0	1	47	114	4045	0	13	258	0	0	13	245	200	0	13000	5375	0	12906	8937	5222	1749
17	1	Kirghiztan	12	2290	0	0	2	0	0	0	2	4	2284	0	0	10	0	0	0	10	7	0	0	5000	0	0	0	5349	1898
18	1	Latvia	12	1748	154	631	1261	0	154	477	630	109	377	2003	6455	9970	0	2003	4452	3515	215	13006	10230	7906	0	12992	9336	5577	1964
19	1	Lithuania	12	1605	561	945	1113	0	561	384	168	157	335	7731	11491	12478	0	7731	3760	987	311	13781	12160	11211	0	13780	9781	5887	1981
20	1	Moldavia	12	85	12	13	15	9	3	1	2	8	62	182	190	206	142	40	8	16	17	15167	14615	13733	16123	12881	10077	6886	2290
21	1	Tajikistan	12	2640	0	2	18	0	0	2	16	19	2603	0	17	103	0	0	17	86	37	0	8500	5722	0	0	8105	5367	1978
22	1	Turkmenistan	12	1198	0	0	1	0	0	0	1	3	1194	0	0	4	0	0	0	4	6	0	0	4000	0	0	0	6075	2016
23	1	Ukraine	12	4743	727	1988	2369	67	660	1261	381	98	2275	10645	24314	26781	1071	9574	13669	2467	211	14642	12230	11305	15963	14504	10839	6471	2159
		FSU REPUBLICS		**27418**	**3007**	**7398**	**9298**	**77**	**2930**	**4391**	**1900**	**725**	**17290**	**42658**	**88086**	**99361**	**1234**	**41424**	**45428**	**11275**	**1445**	**14186**	**11907**	**10686**	**16026**	**14138**	**10346**	**5934**	**1993**
103	2	Krasnodar Kray	12	1335	23	41	106	8	15	18	65	48	1181	361	544	998	151	210	183	454	117	15696	13268	9415	19591	14259	9973	7030	2431
107	2	Stavropol Kray	12	20	0	0	6	0	0	0	6	1	13	0	0	38	0	0	0	38	2	0	0	6333	0	0	0	6390	2169
111	2	Arkhangelsk oblast	12	11643	0	168	1161	0	0	168	993	801	9673	0	1369	6252	0	0	1369	4883	1321	0	8149	5385	0	0	8138	4918	1648
112	2	Astrakhan oblast	12	48	0	0	0	0	0	0	0	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	73	1	2	10	0	1	1	8	11	52	9	19	69	0	9	10	50	22	9000	9500	6900	0	12837	9348	6152	2050
115	2	Bryansk oblast	12	638	32	451	558	0	32	419	107	2	78	465	4789	5450	0	465	4324	661	4	14531	10619	9767	0	14519	10328	6199	2053
117	2	Vladimir oblast	12	995	73	633	758	0	73	560	125	89	148	959	6336	7044	0	959	5377	708	167	13137	10009	9293	0	13069	9596	5676	1888
118	2	Volgograd oblast	12	203	0	0	7	0	0	0	7	5	191	0	0	34	0	0	0	34	8	0	0	4857	0	0	0	4790	1760
119	2	Vologda oblast	12	7190	0	1585	4304	0	0	1585	2719	517	2369	0	13722	27801	0	0	13722	14079	904	0	8657	6459	0	0	8657	5178	1748
120	2	Voronezh oblast	12	245	0	0	37	0	0	0	37	51	157	0	0	229	0	0	0	229	106	0	0	6189	0	0	0	6276	2062
122	2	Nizhni Novgorod obl	12	3093	345	1894	2290	0	345	1549	396	142	662	4591	19674	21989	0	4591	15083	2315	268	13307	10388	9602	0	13322	9738	5851	1894
123	2	Nenets a.okr.	12	255	0	0	0	0	0	0	0	0	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2	Ivanovo oblast	12	823	371	687	723	0	371	316	36	17	82	4826	7801	8005	0	4826	2975	204	31	13008	11355	11072	0	13007	9401	5642	1861
127	2	Kaliningrad oblast	12	115	48	74	90	0	48	26	16	2	22	702	977	1078	0	702	275	101	4	14625	13203	11978	0	14541	10386	6201	2068
128	2	Tver oblast	12	2510	355	1310	2055	0	355	955	745	41	413	4500	13211	17289	0	4500	8711	4078	77	12676	10085	8413	0	12662	9121	5471	1866
129	2	Kaluga oblast	12	980	240	625	727	0	240	385	102	14	238	3190	6954	7566	0	3190	3764	612	28	13292	11126	10407	0	13290	9775	5969	1933
133	2	Kirov oblast	12	5580	140	961	2432	0	140	821	1471	1202	1947	1797	9031	16947	0	1797	7234	7916	2090	12836	9398	6968	0	12875	8815	5383	1739
134	2	Kostroma oblast	12	3073	37	810	2191	0	37	773	1381	286	596	476	7545	15278	0	476	7069	7733	533	12865	9315	6973	0	12726	9147	5601	1865
136	2	Samara oblast	12	365	0	0	26	0	0	0	26	68	271	0	0	153	0	0	0	153	129	0	0	5885	0	0	0	5773	1904
138	2	Kursk oblast	12	80	17	39	47	0	17	22	8	1	33	236	453	500	0	236	217	47	2	13882	11615	10638	0	14162	10079	5947	2069
139	2	Komi-Permyak a.okı	12	1720	0	192	550	0	0	192	358	345	824	0	1619	3514	0	0	1619	1895	583	0	8432	6389	0	0	8417	5290	1689
141	2	Leningrad oblast	12	4215	112	636	2004	0	112	524	1368	897	1314	1369	5842	12996	0	1369	4473	7154	1657	12223	9186	6485	0	12277	8540	5228	1847
142	2	Lipetsk oblast	12	80	10	19	26	0	10	9	7	20	34	129	218	260	0	129	89	42	39	12900	11474	10000	0	13470	9927	5774	1967
146	2	Moscow oblast	12	1835	470	1119	1421	0	470	649	302	29	385	6139	12246	13922	0	6139	6107	1676	55	13062	10944	9797	0	13064	9414	5546	1878
147	2	Murmansk oblast	12	2660	0	0	0	0	0	0	0	0	2660	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	2	Novgorod oblast	12	3133	536	1691	2508	0	536	1155	817	141	483	6750	17182	21596	0	6750	10432	4414	260	12593	10161	8611	0	12599	9030	5402	1846
153	2	Orenburg oblast	12	53	0	0	1	0	0	0	1	3	49	0	0	5	0	0	0	5	5	0	0	5000	0	0	0	5195	1717
154	2	Oryel oblast	12	53	7	27	34	0	7	20	7	0	18	94	300	346	0	94	206	46	0	13429	11111	10176	0	14491	10208	6082	0
156	2	Penza oblast	12	575	0	12	90	0	0	12	78	143	342	0	131	574	0	0	131	443	273	0	10917	6378	0	0	10807	5702	1911
157	2	Perm oblast	12	5190	41	466	1174	0	41	425	708	293	3723	505	4234	8073	0	505	3729	3839	547	12317	9086	6876	0	12280	8765	5422	1869
158	2	Pskov oblast	12	2053	586	1353	1684	0	586	767	331	54	315	7581	14650	16471	0	7581	7069	1821	100	12937	10828	9781	0	12945	9218	5504	1834
160	2	Rostov oblast	12	18	0	0	2	0	0	0	2	4	12	0	0	12	0	0	0	12	9	0	0	6000	0	0	0	6532	2177
161	2	Ryazan oblast	12	730	72	479	539	0	72	407	60	20	171	994	4966	5314	0	994	3972	348	43	13806	10367	9859	0	13747	9752	5815	2161
163	2	Saratov oblast	12	375	0	0	8	0	0	0	8	27	341	0	0	46	0	0	0	46	53	0	0	5750	0	0	0	6002	2011
166	2	Smolensk oblast	12	563	249	427	446	0	249	178	19	12	105	3262	4924	5033	0	3262	1662	109	22	13100	11532	11285	0	13095	9360	5667	1883
168	2	Tambov oblast	12	255	2	24	86	0	2	22	62	87	82	23	243	607	0	23	220	364	171	11500	10125	7058	0	12160	10056	5844	1969
170	2	Tula oblast	12	200	57	120	127	0	57	63	7	0	72	774	1393	1436	0	774	619	43	0	13579	11608	11307	0	13558	9764	6024	1575
173	2	Ulyanovsk oblast	12	763	0	1	42	0	0	1	41	175	546	0	8	246	0	0	8	238	334	0	8000	5857	0	0	10024	5765	1913
178	2	Yaroslavl oblast	12	783	125	469	664	0	125	344	195	4	115	1563	4681	5747	0	1563	3118	1066	8	12504	9981	8655	0	12548	9070	5459	1884
179	2	Adigei Republic	12	153	6	11	15	1	5	5	4	6	132	77	129	156	12	65	52	27	15	12833	11727	10400	17624	14030	10081	6316	2488
180	2	Bashkortostan Repu	12	2568	25	121	273	0	25	96	152	126	2168	318	1201	2060	0	318	883	859	225	12720	9926	7546	0	12600	9196	5637	1794
182	2	Daghestn Republic	12	240	0	0	6	0	0	0	6	7	228	1	1	39	0	1	0	38	15	1000	1000	6500	0	12360	0	6747	2218
183	2	Kabardino-Balkarian	12	165	15	20	24	3	12	5	4	4	138	199	250	276	44	155	51	26	8	13267	12500	11500	16608	13149	9863	6604	2207
185	2	Kalmyk-Khalm-Tang	12	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2	Karelia Republic	12	6885	0	53	195	0	0	53	142	322	6369	0	419	1144	0	0	419	725	575	0	7906	5867	0	0	7974	5116	1789
187	2	Komi Republic	12	10830	0	110	255	0	0	110	145	508	10068	0	909	1643	0	0	909	734	845	0	8264	6443	0	0	8268	5073	1664
188	2	Mari-El Republic	12	878	49	302	469	0	49	253	167	119	289	636	3076	4129	0	636	2440	1053	260	12980	10185	8804	0	12895	9658	6298	2174
189	2	Mordovian SSR	12	478	31	168	234	0	31	137	66	32	210	402	1669	2053	0	402	1267	384	64	12968	9935	8774	0	12793	9224	5795	1978
190	2	North-Ossetian SSR	12	135	12	12	23	3	9	0	11	3	109	173	174	242	52	121	1	68	7	14417	14500	10522	17058	13204	10691	6397	2141
191	2	Karachai-Cherkess I	12	473	11	12	13	3	8	1	1	0	459	163	176	180	54	109	13	4	0	14818	14667	13846	16622	12996	9979	5860	1870
192	2	Tatarstan Republic	12	533	4	14	84	0	4	10	70	83	365	52	146	544	0	52	94	398	156	13000	10429	6476	0	12225	9385	5725	1871
194	2	Udmurt Republic	12	1400	77	451	749	0	77	374	298	99	552	970	4353	6020	0	970	3383	1667	200	12597	9652	8037	0	12639	9057	5592	2018
196	2	Checheno-Ingush R	12	330	6	7	14	1	5	1	7	10	307	80	85	133	19	61	5	48	22	13333	12143	9500	17156	13399	10135	6606	2225

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A8 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - ACCESSIBLE AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)									Average annual biomass yield (kg/ha)								
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
197	2	Chuvash Republic	12	643	5	29	66	0	5	24	37	135	441	65	298	508	0	65	233	210	270	13000	10276	7697	0	13090	9640	5602	2003
101	3	Altai Kray	12	2920	175	386	728	0	175	211	342	401	1791	2193	4198	6076	0	2193	2005	1878	790	12531	10876	8346	0	12544	9508	5500	1968
102	3	Gorno-Altai Republic	12	1693	0	11	40	0	0	11	29	9	1645	0	91	243	0	0	91	152	15	0	8273	6075	0	12474	8581	5307	1718
104	3	Krasnoyarsk Kray	12	12555	17	259	729	0	17	242	470	544	11282	197	2225	5034	0	197	2028	2809	1270	11588	8591	6905	0	11923	8366	5978	2334
105	3	Primorski Kray	12	5300	48	191	434	5	43	143	243	116	4750	682	2152	3648	73	609	1470	1496	239	14208	11267	8406	16004	14177	10286	6151	2055
106	3	Taymyr a.okr.	12	988	0	0	0	0	0	0	0	0	987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	6658	109	290	456	0	109	181	166	132	6067	1473	3181	4131	0	1473	1708	950	267	13514	10969	9059	0	13531	9459	5711	2022
110	3	Amur oblast	12	6083	72	338	1041	0	72	266	703	628	4413	962	3471	7235	0	962	2509	3764	1126	13361	10269	6950	0	13320	9416	5352	1792
116	3	Evenk a.okr	12	5605	0	0	0	0	0	0	0	0	5605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3	Yevrey (Jewish) a.ol	12	750	99	213	266	0	99	114	53	25	459	1396	2531	2839	0	1396	1135	308	46	14101	11883	10673	0	14068	9974	5778	1844
125	3	Irkutsk oblast	12	14285	0	0	56	0	0	0	56	120	14109	0	0	394	0	0	0	394	299	0	0	7036	0	0	0	7045	2482
126	3	Ust-Orda Buryat a.o	12	413	0	0	0	0	0	0	0	0	412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2698
130	3	Kamchatka oblast	12	2035	0	0	0	0	0	0	0	0	2035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	3	Koryak a.okr.	12	873	0	0	0	0	0	0	0	0	872	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	3	Kemerovo oblast	12	2875	0	192	523	0	0	192	331	172	2181	0	1562	3300	0	0	1562	1738	353	0	8135	6310	0	0	8130	5257	2058
135	3	Chukchi a.okr.	12	2220	0	0	0	0	0	0	0	0	2220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	483	16	40	93	0	16	24	53	43	347	193	426	710	0	193	233	284	74	12063	10650	7634	0	12166	9694	5403	1734
144	3	Magadan oblast	12	2635	0	0	0	0	0	0	0	0	2635	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3	Novosibirsk oblast	12	1660	59	252	572	0	59	193	320	202	886	712	2600	4287	0	712	1888	1687	434	12068	10317	7495	0	12092	9786	5272	2148
152	3	Omsk oblast	12	1958	2	140	642	0	2	138	502	265	1051	24	1436	3935	0	24	1412	2499	545	12000	10257	6129	0	11603	10213	4980	2057
164	3	Sakhalin oblast	12	4178	0	4	14	0	0	4	10	27	4134	0	40	96	0	0	40	56	62	0	10000	6857	0	0	9269	5512	2313
165	3	Sverdlovsk oblast	12	9003	271	1620	3695	0	271	1349	2075	565	4743	3260	14931	25834	0	3260	11671	10903	1008	12030	9217	6992	0	12037	8651	5255	1785
167	3	Aga-Buryat a.okr.	12	155	0	0	0	0	0	0	0	1	154	0	0	1	0	0	0	1	3	0	0	1000	0	0	0	4296	2521
169	3	Tomsk oblast	12	4765	1	467	1450	0	1	466	983	578	2737	14	3914	9692	0	14	3900	5778	1321	14000	8381	6684	0	11692	8364	5876	2286
171	3	Tyumen oblast	12	1593	20	83	529	0	20	63	446	214	850	237	848	3242	0	237	611	2394	480	11850	10217	6129	0	12054	9633	5371	2246
172	3	Khanty-Mansi a.okr.	12	4878	0	99	201	0	0	99	102	68	4608	0	805	1397	0	0	805	592	152	0	8131	6950	0	0	8130	5804	2215
174	3	Yamalo-Nenets a.ok	12	1173	0	0	0	0	0	0	0	0	1172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	3	Chelyabinsk oblast	12	1520	8	37	115	0	8	29	78	53	1352	96	356	762	0	96	260	406	90	12000	9622	6626	0	12411	8941	5229	1698
176	3	Chita oblast	12	3128	0	0	4	0	0	0	4	18	3106	0	0	20	0	0	0	20	45	0	0	5000	0	0	0	5005	2537
181	3	Buryat Republic	12	3718	0	0	4	0	0	0	4	20	3693	0	0	27	0	0	0	27	49	0	0	6750	0	0	0	6038	2486
193	3	Tuva Republic	12	2858	0	0	8	0	0	0	8	8	2842	0	0	36	0	0	0	36	19	0	0	4500	0	0	0	4449	2508
195	3	Khakass Republic	12	1603	0	5	16	0	0	5	11	12	1575	0	41	114	0	0	41	73	24	0	8200	7125	0	0	8315	6351	2110
198	3	Sakha (Yakutia) Rep	12	33823	0	0	0	0	0	0	0	0	33822	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RUSSIA WEST		**90232**	**4190**	**17625**	**31354**	**19**	**4171**	**13435**	**13729**	**7006**	**51856**	**54431**	**177948**	**252045**	**332**	**54099**	**123517**	**74097**	**12634**	**12991**	**10096**	**8039**	**17474**	**12970**	**9194**	**5397**	**1803**
		RUSSIA EAST		**144384**	**897**	**4627**	**11616**	**5**	**892**	**3730**	**6989**	**4221**	**128535**	**11439**	**44808**	**83053**	**73**	**11366**	**33369**	**38245**	**8711**	**12753**	**9684**	**7150**	**14600**	**12742**	**8946**	**5472**	**2064**
		RUSSIA TOTAL		**234616**	**5087**	**22252**	**42970**	**24**	**5063**	**17165**	**20718**	**11227**	**180391**	**65870**	**222756**	**335098**	**405**	**65465**	**156886**	**112342**	**21345**	**12949**	**10011**	**7798**	**16875**	**12930**	**9140**	**5422**	**1901**
211	11	Beijing	12	158	0	0	5	0	0	0	5	10	142	0	1	35	0	0	1	34	23	0	1000	7000	16056	13452	9347	6513	2175
212	11	Tianjin	12	18	0	0	0	0	0	0	0	1	16	0	0	3	0	0	0	3	2	0	0	3000	0	0	0	6639	2215
213	11	Hebei	12	938	0	1	40	0	0	1	39	55	843	3	10	271	0	3	7	261	123	3000	10000	6775	0	13069	9677	6729	2236
214	11	Shanxi	12	695	0	2	11	0	0	2	9	23	660	7	25	85	1	6	18	60	51	7000	12500	7727	17484	13241	9406	6390	2175
237	11	Shandong	12	1170	43	93	232	12	31	50	139	179	760	619	1163	2112	202	417	544	949	412	14395	12505	9103	17286	13555	10931	6830	2311
241	11	Henan	12	4095	1566	2160	2492	512	1054	594	332	153	1450	24306	30542	32733	9190	15116	6236	2191	352	15521	14140	13135	17935	14347	10504	6590	2302
221	12	Liaoning	12	2870	199	240	293	51	148	41	53	98	2479	2837	3232	3580	872	1965	395	348	215	14256	13467	12218	17099	13258	9685	6595	2195
222	12	Jilin	12	5498	363	729	936	87	276	366	207	24	4537	5100	8711	9953	1404	3696	3611	1242	43	14050	11949	10634	16076	13379	9877	5986	1769
223	12	Heilongjiang	12	10550	473	1444	2114	43	430	971	670	109	8326	6645	16225	20112	676	5969	9580	3887	199	14049	11236	9514	15569	13874	9869	5803	1825
231	13	Shanghai	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
232	13	Jiangsu	12	395	160	233	255	50	110	73	22	8	132	2475	3234	3381	899	1576	759	147	19	15469	13880	13259	17906	14386	10392	6620	2306
233	13	Zhejiang	12	2828	70	125	160	15	55	55	35	6	2662	1033	1583	1799	263	770	550	216	12	14757	12664	11244	17677	14040	10087	6096	2106
234	13	Anhui	12	3683	1502	2261	2480	532	970	759	219	31	1172	23687	31603	33044	9763	13924	7916	1441	75	15770	13977	13324	18366	14362	10432	6573	2396
236	14	Jiangxi	12	4348	298	479	589	109	189	181	110	49	3710	4644	6471	7138	1974	2670	1827	667	96	15584	13509	12119	18181	14123	10104	6038	1963
242	14	Hubei	12	4985	1841	2431	2496	782	1059	590	65	2	2487	29030	34959	35344	14110	14920	5929	385	4	15769	14381	14160	18044	14092	10054	5883	1949
243	14	Hunan	12	6900	766	1265	1562	195	571	499	297	40	5298	11585	16645	18416	3507	8078	5060	1771	79	15124	13158	11790	17999	14153	10132	5972	1965
235	15	Fujian	12	5803	43	112	171	3	40	69	59	18	5613	597	1287	1649	56	541	690	362	40	13884	11491	9643	16607	13637	10020	6111	2193
244	15	Guangdong	12	6030	116	210	270	19	97	94	60	11	5748	1638	2557	2913	339	1299	919	356	25	14121	12176	10789	17455	13403	9743	5931	2232
245	15	Guangxi	12	6103	67	167	224	8	59	100	57	23	5856	968	2036	2405	135	833	1068	369	50	14448	12192	10737	17976	14238	10635	6433	2207
246	15	Hainan	12	260	0	0	0	0	0	0	0	0	260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	16	Sichuan	12	4970	127	255	293	8	119	128	38	15	4662	1894	3256	3510	154	1740	1362	254	34	14913	12769	11980	19066	14564	10678	6683	2267
252	16	Guizhou	12	2490	122	261	266	13	109	139	5	0	2222	1860	3325	3361	255	1605	1465	36	0	15246	12739	12635	18997	14681	10524	6493	2137
253	16	Yunnan	12	12718	127	197	248	26	101	70	51	74	12396	1947	2649	2983	482	1465	702	334	168	15331	13447	12028	18626	14539	10069	6543	2282
215	17	Nei Mongol	12	5360	13	63	155	0	13	50	92	137	5069	159	592	1081	0	159	433	489	257	12231	9397	6974	0	12053	8748	5335	1874
261	17	Shaanxi	12	1453	8	23	33	1	7	15	10	13	1407	114	262	322	13	101	148	60	29	14250	11391	9758	17258	13839	9923	6260	2228
262	17	Gansu	12	770	1	4	6	0	1	3	2	5	759	22	50	60	3	19	28	10	10	22000	12500	10000	17506	13118	9495	6092	2057
264	17	Ningxia	12	23	0	0	0	0	0	0	0	1	22	1	2	4	0	1	1	2	1	1000	2000	4000	0	12204	8717	6269	2118
265	17	Xinjiang	12	713	0	0	0	0	0	0	0	0	711	1	5	7	0	1	4	2	0	1000	5000	7000	0	12150	9075	6252	1977
254	18	Xizang	12	2808	11	15	19	2	9	4	4	2	2787	155	196	220	33	122	41	24	4	14091	13067	11579	17776	13933	9792	6122	2160
263	18	Qinghai	12	248	0	0	0	0	0	0	0	0	247	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2554
272	19	Hongkong	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**98880**	**7916**	**12770**	**15350**	**2468**	**5448**	**4854**	**2580**	**1087**	**82433**	**121327**	**170621**	**186521**	**44331**	**76996**	**49294**	**15900**	**2323**	**15327**	**13361**	**12151**	**17962**	**14133**	**10155**	**6163**	**2137**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A9 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - EXCLUDING CULTIVATED AREAS, URBAN AREAS AND AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	Average annual biomass increments (000tons) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	Average annual biomass yield (kg/ha) VS+S	VS...MS	/S...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	147800	0	0	53	0	0	0	53	190	147557	0	0	235	0	0	0	235	508	0	0	4434	0	0	0	4390	2677
11	1	Armenia	12	1788	0	0	2	0	0	0	2	12	1774	0	0	10	0	0	0	10	24	0	0	5000	0	0	0	6180	1913
12	1	Azerbaijan	12	4578	0	0	285	0	0	0	285	390	3595	0	0	1957	0	0	0	1957	895	0	0	6867	0	0	8791	6857	2297
13	1	Byelorussia	12	1680	209	1068	1244	0	209	859	176	24	412	3124	12327	13458	0	3124	9203	1131	52	14947	11542	10818	0	14920	10716	6428	2144
14	1	Estonia	12	370	58	165	207	0	58	107	42	26	137	701	1701	1959	0	701	1000	258	60	12086	10309	9464	0	12092	9324	6186	2303
15	1	Georgia	12	1515	12	34	58	10	2	22	24	30	1427	207	449	611	179	28	242	162	69	17250	13206	10534	17143	13212	11173	6769	2296
16	1	Kazakhstan	12	214330	5	30	2659	0	5	25	2629	2798	208873	60	298	13966	0	60	238	13668	4897	12000	9933	5252	0	12659	9368	5199	1750
17	1	Kirghiztan	12	12170	0	2	40	0	0	2	38	28	12102	0	18	266	0	0	18	248	57	0	9000	6650	0	0	9297	6536	2028
18	1	Latvia	12	210	60	115	152	0	60	55	37	17	41	805	1325	1540	0	805	520	215	34	13417	11522	10132	0	13386	9495	5824	2061
19	1	Lithuania	12	1463	336	807	1027	0	336	471	220	124	311	4580	9169	10467	0	4580	4589	1298	248	13631	11362	10192	0	13620	9736	5912	2001
20	1	Moldavia	12	10	2	3	5	1	1	1	2	2	4	22	29	44	12	10	7	15	4	11000	9667	8800	16649	16650	11117	6916	2290
21	1	Tajikistan	12	2655	0	0	2	0	0	0	2	5	2648	0	0	14	0	0	0	14	9	0	0	7000	0	0	0	5590	1866
22	1	Turkmenistan	12	40375	0	0	8	0	0	0	8	2	40366	0	0	49	0	0	0	49	4	0	0	6125	0	0	0	6500	2161
23	1	Ukraine	12	640	109	294	375	11	98	185	81	26	238	1521	3477	4019	181	1340	1956	542	60	13954	11827	10717	15892	13619	10582	6730	2285
		FSU REPUBLICS		**281784**	**791**	**2518**	**6064**	**22**	**769**	**1727**	**3546**	**3484**	**271928**	**11020**	**28793**	**48360**	**372**	**10648**	**17773**	**19567**	**6413**	**13932**	**11435**	**7975**	**16909**	**13847**	**10291**	**5518**	**1841**
103	2	Krasnodar Kray	12	625	24	33	174	5	19	9	141	78	373	347	429	1433	86	261	82	1004	187	14458	13000	8236	17750	13564	9561	7128	2389
107	2	Stavropol Kray	12	965	2	4	25	0	2	2	21	33	907	25	46	178	3	22	21	132	75	12500	11500	7120	15904	13148	10424	6324	2255
111	2	Arkhangelsk oblast	12	11818	0	33	89	0	0	33	56	308	11407	0	271	550	0	0	271	279	506	0	8212	6180	0	0	8188	4942	1642
112	2	Astrakhan oblast	12	4380	0	0	0	0	0	0	0	0	4380	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	2	Bryansk oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	2	Vladimir oblast	12	13	2	11	13	0	2	9	2	1	0	20	103	113	0	20	83	10	1	10000	9364	8692	0	13421	9586	5752	1917
118	2	Volgograd oblast	12	1890	0	0	0	0	0	0	0	0	1890	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	2	Vologda oblast	12	1253	0	157	842	0	0	157	685	129	282	0	1351	4915	0	0	1351	3564	226	0	8605	5837	0	0	8618	5205	1752
120	2	Voronezh oblast	12	258	0	0	32	0	0	0	32	35	191	0	0	193	0	0	0	193	71	0	0	6031	0	0	0	6083	2045
122	2	Nizhni Novgorod obl	12	298	3	179	217	0	3	176	38	29	51	48	1759	1980	0	48	1711	221	54	16000	9827	9124	0	13948	9705	5827	1876
123	2	Nenets a.okr.	12	15018	0	0	0	0	0	0	0	0	14997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2	Ivanovo oblast	12	25	2	21	24	0	2	19	3	1	1	24	203	219	0	24	179	16	1	12000	9667	9125	0	13284	9521	5689	1901
127	2	Kaliningrad oblast	12	30	8	21	28	0	8	13	7	0	1	110	245	290	0	110	135	45	1	13750	11667	10357	0	14311	10171	6102	2035
128	2	Tver oblast	12	118	19	61	97	0	19	42	36	4	17	244	628	828	0	244	384	200	8	12842	10295	8536	0	12716	9235	5545	1959
129	2	Kaluga oblast	12	65	14	32	33	0	14	18	1	1	30	194	372	380	0	194	178	8	1	13857	11625	11515	0	13421	9601	5811	1936
133	2	Kirov oblast	12	235	0	11	65	0	0	11	54	78	92	0	88	357	0	0	88	269	131	0	8000	5492	0	0	8426	5001	1677
134	2	Kostroma oblast	12	253	6	60	182	0	6	54	122	25	46	76	569	1259	0	76	493	690	47	12667	9483	6918	0	12615	9152	5667	1883
136	2	Samara oblast	12	5	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1532
138	2	Kursk oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	2	Komi-Permyak a.okr	12	170	0	15	63	0	0	15	48	56	52	0	124	377	0	0	124	253	97	0	8267	5984	0	0	8446	5278	1741
141	2	Leningrad oblast	12	800	8	99	466	0	8	91	367	194	141	92	863	2769	0	92	771	1906	349	11500	8717	5942	0	12162	8502	5197	1801
142	2	Lipetsk oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	2	Moscow oblast	12	193	55	122	144	0	55	67	22	4	45	737	1387	1506	0	737	650	119	8	13400	11369	10458	0	13493	9669	5445	2053
147	2	Murmansk oblast	12	6555	0	0	0	0	0	0	0	0	6555	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	2	Novgorod oblast	12	233	47	186	216	0	47	139	30	11	4	602	1872	2037	0	602	1270	165	20	12809	10065	9431	0	12726	9125	5437	1826
153	2	Orenburg oblast	12	2480	0	0	0	0	0	0	0	4	2476	0	0	1	0	0	0	1	5	0	0	1000	0	0	0	4024	1330
154	2	Oryel oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	2	Penza oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	2	Perm oblast	12	325	0	23	87	0	0	23	64	63	175	0	188	542	0	0	188	354	113	0	8174	6230	0	0	8118	5517	1796
158	2	Pskov oblast	12	265	58	195	234	0	58	137	39	10	20	747	1995	2206	0	747	1248	211	19	12879	10231	9427	0	12797	9102	5397	1833
160	2	Rostov oblast	12	453	0	0	27	0	0	0	27	25	400	0	0	150	0	0	0	150	42	0	0	5556	0	0	0	5509	1705
161	2	Ryazan oblast	12	405	35	259	290	0	35	224	31	7	108	475	2673	2857	0	475	2198	184	14	13571	10320	9852	0	13737	9809	5863	2102
163	2	Saratov oblast	12	615	0	0	1	0	0	0	1	3	611	0	0	4	0	0	0	4	5	0	0	4000	0	0	0	4662	1560
166	2	Smolensk oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	2	Tambov oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	2	Tula oblast	12	13	4	8	8	0	4	4	0	0	5	47	86	86	0	47	39	0	0	11750	10750	10750	0	13373	9566	0	0
173	2	Ulyanovsk oblast	12	18	0	0	0	0	0	0	0	2	16	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1528
178	2	Yaroslavl oblast	12	83	18	50	64	0	18	32	14	0	19	223	511	586	0	223	288	75	0	12389	10220	9156	0	12535	9008	5387	1821
179	2	Adigei Republic	12	103	6	9	11	1	5	3	2	1	90	85	120	130	21	64	35	10	2	14167	13333	11818	17733	13864	9921	5787	2149
180	2	Bashkortostan Repu	12	808	1	4	18	0	1	3	14	46	743	12	42	122	0	12	30	80	81	12000	10500	6778	0	12606	8636	5810	1771
182	2	Daghestn Republic	12	4188	2	5	105	0	2	3	100	73	4001	29	61	661	4	25	32	600	156	14500	12200	6295	16946	13562	9886	5991	2133
183	2	Kabardino-Balkarian	12	663	10	11	13	2	8	1	2	2	647	138	147	162	29	109	9	15	4	13800	13364	12462	16449	12861	10393	6351	2174
185	2	Kalmyk-Khalm-Tang	12	6183	0	0	0	0	0	0	0	0	6182	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2	Karelia Republic	12	3005	0	1	14	0	0	1	13	37	2947	0	5	69	0	0	5	64	61	0	5000	4929	0	0	7740	4859	1649
187	2	Komi Republic	12	8200	0	50	89	0	0	50	39	111	7999	0	408	606	0	0	408	198	180	0	8160	6809	0	0	8098	5012	1623
188	2	Mari-El Republic	12	100	5	61	83	0	5	56	22	1	16	70	627	755	0	70	557	128	2	14000	10279	9096	0	13938	9866	5956	2134
189	2	Mordovian SSR	12	125	11	69	78	0	11	58	9	1	46	145	683	736	0	145	538	53	2	13182	9899	9436	0	13025	9255	5717	2314
190	2	North-Ossetian SSR	12	378	28	35	44	13	15	7	9	4	329	419	488	548	219	200	69	60	10	14964	13943	12455	17003	13603	9901	6421	2151
191	2	Karachai-Cherkess F	12	623	5	8	10	1	4	3	2	2	609	81	112	126	24	57	31	14	5	16200	14000	12600	16574	13090	10028	6531	2218
192	2	Tatarstan Republic	12	8	0	0	1	0	0	0	1	1	5	0	1	7	0	0	1	6	2	0	1000	7000	0	0	9069	5427	1806
194	2	Udmurt Republic	12	3	0	0	1	0	0	0	1	0	1	0	4	9	0	0	4	5	0	0	4000	9000	0	0	8615	5168	0
196	2	Checheno-Ingush R	12	960	16	21	108	5	11	5	87	40	813	221	269	790	77	144	48	521	85	13813	12810	7315	16698	13242	10237	5968	2136
197	2	Chuvash Republic	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	3	Altai Kray	12	4503	238	574	1446	0	238	336	872	395	2661	3010	6124	10692	0	3010	3114	4568	729	12647	10669	7394	0	12672	9262	5236	1844

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be assumed: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A9 PRODUCTION POTENTIALS FOR BIOMASS PLANTATION FORESTRY SPECIES - EXCLUDING CULTIVATED AREAS, URBAN AREAS AND AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
102	3	Gorno-Altai Republic	12	4118	1	6	9	0	1	5	3	1	4107	18	61	78	0	18	43	17	2	18000	10167	8667	0	12446	8831	5367	1807
104	3	Krasnoyarsk Kray	12	5383	20	158	456	0	20	138	298	183	4744	240	1458	3220	0	240	1218	1762	429	12000	9228	7061	0	11896	8834	5910	2349
105	3	Primorski Kray	12	1490	76	222	487	0	76	146	265	63	940	1080	2565	4203	3	1077	1485	1638	130	14175	11544	8627	15826	14091	10163	6187	2060
106	3	Taymyr a.okr.	12	71523	0	0	0	0	0	0	0	0	71522	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	18580	147	1073	1543	0	147	926	470	582	16456	1951	10791	13685	0	1951	8840	2894	1358	13272	10057	8869	0	13308	9551	6157	2333
110	3	Amur oblast	12	6033	322	680	1416	0	322	358	736	508	4109	4350	7829	11841	0	4350	3479	4012	940	13509	11513	8362	0	13530	9727	5455	1849
116	3	Evenk a.okr	12	9323	0	0	0	0	0	0	0	0	9322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	3	Yevrey (Jewish) a.ob	12	1318	218	652	808	0	218	434	156	30	479	3039	7308	8229	0	3039	4269	921	62	13940	11209	10184	0	13941	9832	5903	2043
125	3	Irkutsk oblast	12	8388	0	0	21	0	0	0	21	24	8343	0	0	127	0	0	0	127	53	0	0	6048	0	0	0	6100	2233
126	3	Ust-Orda Buryat a.ok	12	350	0	0	1	0	0	0	1	0	349	0	0	4	0	0	0	4	1	0	0	4000	0	0	0	5726	1932
130	3	Kamchatka oblast	12	9120	0	0	0	0	0	0	0	0	9097	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	3	Koryak a.okr.	12	25808	0	0	0	0	0	0	0	0	25807	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	3	Kemerovo oblast	12	925	0	15	33	0	0	15	18	8	885	0	127	216	0	0	127	89	14	0	8467	6545	0	0	8583	5081	1683
135	3	Chukchi a.okr.	12	60873	0	0	0	0	0	0	0	0	60847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	2543	9	46	444	0	9	37	398	319	1781	108	461	2456	0	108	353	1995	531	12000	10022	5532	0	12346	9657	5017	1668
144	3	Magadan oblast	12	31205	0	0	0	0	0	0	0	0	31205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3	Novosibirsk oblast	12	8383	171	749	2300	0	171	578	1551	648	5434	2031	8084	15889	0	2031	6053	7805	1364	11877	10793	6908	0	11869	10469	5032	2106
152	3	Omsk oblast	12	5148	6	215	1722	0	6	209	1507	372	3054	71	2047	9410	0	71	1976	7363	801	11833	9521	5465	0	11643	9473	4884	2154
164	3	Sakhalin oblast	12	973	0	0	0	0	0	0	0	0	964	0	0	0	0	0	0	0	1	0	0	0	0	0	10655	7072	2488
165	3	Sverdlovsk oblast	12	2898	25	616	1503	0	25	591	887	183	1212	297	5407	10008	0	297	5110	4601	349	11880	8778	6659	0	12078	8641	5187	1908
167	3	Aga-Buryat a.okr.	12	1038	0	0	4	0	0	0	4	30	1004	0	0	18	0	0	0	18	56	0	0	4500	0	0	0	4275	1864
169	3	Tomsk oblast	12	10153	1	356	1717	0	1	355	1361	619	7816	7	3255	10956	0	7	3248	7701	1420	7000	9143	6381	0	11656	9138	5659	2293
171	3	Tyumen oblast	12	7145	36	421	3027	0	36	385	2606	720	3398	423	4052	17419	0	423	3629	13367	1698	11750	9625	5755	0	11743	9415	5130	2359
172	3	Khanty-Mansi a.okr.	12	20210	0	101	656	0	0	101	555	520	19034	0	819	3789	0	0	819	2970	1289	0	8109	5776	0	0	8103	5347	2480
174	3	Yamalo-Nenets a.ok	12	41490	0	0	0	0	0	0	0	0	41482	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	3	Chelyabinsk oblast	12	1518	42	62	99	0	42	20	37	287	1132	524	707	912	0	524	183	205	484	12476	11403	9212	0	12537	9231	5503	1687
176	3	Chita oblast	12	11328	0	0	63	0	0	0	63	137	11127	0	0	274	0	0	0	274	307	0	0	4349	0	0	0	4353	2237
181	3	Buryat Republic	12	10333	0	0	10	0	0	0	10	58	10264	0	0	53	0	0	0	53	160	0	0	5300	0	0	0	5390	2739
193	3	Tuva Republic	12	5498	0	0	1	0	0	0	1	2	5494	0	0	5	0	0	0	5	6	0	0	5000	0	0	0	4480	2814
195	3	Khakass Republic	12	1360	1	32	128	0	1	31	96	100	1131	12	286	815	0	12	274	529	183	12000	8938	6367	0	11743	8694	5497	1819
198	3	Sakha (Yakutia) Rep	12	107800	0	0	0	0	0	0	0	0	107782	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RUSSIA WEST		**75204**	**389**	**1854**	**3996**	**27**	**362**	**1465**	**2142**	**1420**	**69725**	**5211**	**18730**	**30537**	**463**	**4748**	**13519**	**11807**	**2575**	**13396**	**10102**	**7642**	**17148**	**13116**	**9228**	**5512**	**1813**
		RUSSIA EAST		**496758**	**1313**	**5978**	**17894**	**0**	**1313**	**4665**	**11916**	**5789**	**472982**	**17161**	**61381**	**124299**	**3**	**17158**	**44220**	**62918**	**12367**	**13068**	**10267**	**6946**	**15826**	**13068**	**9479**	**5280**	**2136**
		RUSSIA TOTAL		**571962**	**1702**	**7832**	**21890**	**27**	**1675**	**6130**	**14058**	**7209**	**542707**	**22372**	**80111**	**154836**	**466**	**21906**	**57739**	**74725**	**14942**	**13143**	**10228**	**7073**	**17139**	**13078**	**9419**	**5315**	**2073**
211	11	Beijing	12	673	0	0	9	0	0	0	9	21	642	1	5	64	0	1	4	59	46	1000	5000	7111	0	13636	9652	6611	2202
212	11	Tianjin	12	78	0	0	3	0	0	0	3	3	72	0	0	20	0	0	0	20	6	0	0	6667	0	0	0	6681	2231
213	11	Hebei	12	6618	2	8	241	0	2	6	233	369	6008	23	81	1500	1	22	58	1419	764	11500	10125	6224	15890	13178	9446	6095	2072
214	11	Shanxi	12	6105	11	25	86	2	9	14	61	165	5855	145	272	669	31	114	127	397	366	13182	10880	7779	16865	13092	9406	6514	2215
237	11	Shandong	12	515	28	38	69	10	18	10	31	36	410	425	528	740	175	250	103	212	82	15179	13895	10725	17425	14062	10473	6841	2281
241	11	Henan	12	1193	64	106	157	13	51	42	51	74	960	957	1373	1711	241	716	416	338	166	14953	12953	10898	18015	13904	9868	6588	2232
221	12	Liaoning	12	1468	34	44	125	8	26	10	81	116	1226	457	559	1094	127	330	102	535	249	13441	12705	8752	16640	12919	9806	6563	2146
222	12	Jilin	12	2573	84	150	816	7	77	66	666	344	1412	1140	1797	5194	115	1025	657	3397	568	13571	11980	6365	16022	13247	9900	5102	1654
223	12	Heilongjiang	12	9320	1190	2322	3871	8	1182	1132	1549	547	4902	16929	28129	36328	126	16803	11200	8199	913	14226	12114	9385	15638	14220	9898	5292	1669
231	13	Shanghai	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
232	13	Jiangsu	12	275	103	139	142	56	47	36	3	0	132	1669	2037	2060	1009	660	368	23	1	16204	14655	14507	17987	14134	10114	6626	2204
233	13	Zhejiang	12	500	10	19	26	2	8	9	7	1	473	144	230	274	31	113	86	44	2	14400	12105	10538	18282	14278	10024	5973	2004
234	13	Anhui	12	1465	79	141	168	15	64	62	27	1	1297	1191	1821	1983	273	918	630	162	1	15076	12915	11804	18504	14297	10181	6016	1958
236	14	Jiangxi	12	4710	684	910	1018	336	348	226	108	51	3641	11085	13372	14024	6149	4936	2287	652	96	16206	14695	13776	18285	14195	10120	6024	1884
242	14	Hubei	12	5280	357	558	573	95	262	201	15	2	4705	5458	7503	7595	1733	3725	2045	92	3	15289	13446	13255	18224	14220	10178	5973	1929
243	14	Hunan	12	4623	349	583	655	98	251	234	72	15	3953	5340	7727	8157	1769	3571	2387	430	29	15301	13254	12453	18019	14234	10199	6002	1901
235	15	Fujian	12	540	2	5	8	0	2	3	3	1	531	26	59	77	1	25	33	18	2	13000	11800	9625	16920	14071	10098	6140	2248
244	15	Guangdong	12	2330	62	116	152	11	51	54	36	8	2171	869	1395	1609	190	679	526	214	17	14016	12026	10586	17519	13243	9820	5958	2184
231	13	Shanghai	12	0	335	601	698	84	251	266	97	29	0	4813	7598	8243	1418	3395	2785	645	64	14367	12642	11809	16901	13550	10455	6622	2198
246	15	Hainan	12	848	0	0	0	0	0	0	0	0	847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	16	Sichuan	12	24765	127	217	227	24	103	90	10	5	24533	1937	2876	2938	441	1496	939	62	11	15252	13253	12943	18033	14566	10451	6310	2219
252	16	Guizhou	12	6493	273	632	659	27	246	359	27	0	5833	4212	8025	8194	531	3681	3813	169	0	15429	12698	12434	19585	14971	10620	6154	1851
253	16	Yunnan	12	11850	239	389	442	42	197	150	53	56	11351	3629	5167	5514	774	2855	1538	347	128	15184	13283	12475	18346	14456	10262	6536	2291
215	17	Nei Mongol	12	90058	40	188	1269	0	40	148	1081	2301	86489	483	1835	7412	0	483	1352	5577	4574	12075	9761	5841	0	12203	9160	5160	1988
261	17	Shaanxi	12	9673	34	93	218	3	31	59	125	138	9316	505	1095	1933	60	445	590	838	306	14853	11774	8867	18348	14223	10067	6687	2216
262	17	Gansu	12	31640	9	32	84	1	8	23	52	102	31454	115	339	645	13	102	224	306	200	12778	10594	7679	16708	13207	9543	5827	1964
264	17	Ningxia	12	3505	0	0	116	0	0	0	116	162	3227	0	1	706	0	0	1	705	326	0	1000	6086	0	12375	8930	6093	2007
265	17	Xinjiang	12	153305	0	1	20	0	0	1	19	65	153220	0	9	104	0	0	9	95	119	0	9000	5200	0	0	9291	5016	1824
254	18	Xizang	12	106460	1	3	37	0	1	2	34	22	106401	23	39	198	8	15	16	159	38	23000	13000	5351	18432	14368	8664	4746	1742
263	18	Qinghai	12	69645	0	0	2	0	0	0	2	9	69633	0	0	13	0	0	0	13	18	0	0	6500	0	0	0	5266	1958
272	19	Hongkong	12	10	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**556518**	**4117**	**7320**	**11891**	**842**	**3275**	**3203**	**4571**	**4643**	**540704**	**61576**	**93872**	**118999**	**15216**	**46360**	**32296**	**25127**	**9095**	**14957**	**12824**	**10007**	**18071**	**14156**	**10083**	**5497**	**1959**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be assumed: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A10 PRODUCTION POTENTIALS FOR TRADITIONAL PRODUCTION FORESTRY SPECIES - ALL AREAS

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	Average annual biomass increments (000tons) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	Average annual biomass yield (kg/ha) VS+S	VS...MS	VS/...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	156198	96	650	5229	8	88	554	4579	5638	145330	1027	4619	23866	132	895	3592	19247	8173	10698	7106	4564	16073	10168	6483	4203	1450
11	1	Armenia	12	2690	53	191	360	0	53	138	169	117	2213	542	1455	2093	0	542	913	638	165	10226	7618	5814	0	10158	6595	3783	1414
12	1	Azerbaijan	12	7868	63	187	771	0	63	124	584	1244	5285	713	1615	5413	6	707	902	3798	2744	11317	8636	7021	13864	11213	7292	6503	2207
13	1	Byelorussia	12	20348	10413	18076	18656	1799	8614	7663	580	0	1692	147391	232047	235731	25579	121812	84656	3684	0	14155	12837	12636	14216	14142	11048	6346	1836
14	1	Estonia	12	3938	1735	2274	2343	21	1714	539	69	6	1588	21485	26260	26553	291	21194	4775	293	7	12383	11548	11333	13899	12363	8862	4247	1132
15	1	Georgia	12	6523	404	692	984	187	217	288	292	325	5213	6869	9720	11526	3844	3025	2851	1806	722	17002	14046	11713	20564	13918	9901	6189	2221
16	1	Kazakhstan	12	268445	814	5280	19957	92	722	4466	14677	4837	243652	8305	44572	117061	1206	7099	36267	72489	7856	10203	8442	5866	13157	9832	8120	4939	1624
17	1	Kirghiztan	12	19548	53	320	1036	3	50	267	716	565	17947	561	2480	6087	52	509	1919	3607	952	10585	7750	5875	18465	10145	7187	5041	1685
18	1	Latvia	12	6313	2226	5111	5488	243	1983	2885	377	5	821	28869	55548	57707	3440	25429	26679	2159	7	12969	10868	10515	14178	12826	9249	5726	1567
19	1	Lithuania	12	6420	2900	5226	5490	214	2686	2326	264	0	929	41296	64719	66467	3118	38178	23423	1748	1	14240	12384	12107	14549	14213	10070	6626	1792
20	1	Moldavia	12	3000	805	1982	2476	112	693	1177	494	199	325	10947	21993	25154	1816	9131	11046	3161	429	13599	11096	10159	16189	13178	9386	6400	2153
21	1	Tajikistan	12	9013	0	32	343	0	0	32	311	403	8267	0	256	1895	0	0	256	1639	789	0	8000	5525	0	0	8137	5274	1956
22	1	Turkmenistan	12	45390	0	0	22	0	0	0	22	61	45307	0	0	0	0	0	0	139	124	0	0	6318	0	0	0	6192	2046
23	1	Ukraine	12	57570	20665	37624	44361	4756	15909	16959	6737	6155	7052	300582	473885	516445	82535	218047	173303	42560	13553	14545	12595	11642	17353	13706	10219	6317	2202
		FSU REPUBLICS		**457066**	**40131**	**76995**	**102287**	**7427**	**32704**	**36864**	**25292**	**13917**	**340291**	**567560**	**934550**	**1072271**	**121887**	**445673**	**366990**	**137721**	**27349**	**14143**	**12138**	**10483**	**16411**	**13627**	**9955**	**5445**	**1965**
103	2	Krasnodar Kray	12	7620	934	1885	4324	98	836	951	2439	1550	1739	12945	21930	38777	1847	11098	8985	16847	3615	13860	11634	8968	18938	13281	9446	6907	2333
107	2	Stavropol Kray	12	6635	202	745	3186	11	191	543	2441	709	2740	2283	7210	22067	169	2114	4927	14857	1436	11302	9678	6926	14743	11064	9072	6086	2026
111	2	Arkhangelsk oblast	12	38190	7175	19021	24637	1263	5912	11846	5616	1890	11643	98316	199001	224450	21817	76499	100685	25449	2352	13703	10462	9110	17276	12939	8499	4531	1245
112	2	Astrakhan oblast	12	4598	0	0	0	0	0	0	0	0	4597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	2665	385	1488	1644	80	305	1103	156	387	634	4175	14854	15675	1034	3141	10679	821	798	10844	9983	9535	12961	10307	9684	5256	2060
115	2	Bryansk oblast	12	3483	2836	3399	3429	1064	1772	563	30	0	54	34211	40258	40449	13995	20216	6047	191	0	12063	11844	11796	13151	11409	10748	6437	732
117	2	Vladimir oblast	12	2925	1352	2812	2871	139	1213	1460	59	0	54	17192	30069	30391	1992	15200	12877	322	0	12716	10693	10586	14362	12528	8821	5416	0
118	2	Volgograd oblast	12	11265	0	0	568	0	0	0	568	900	9797	0	0	2767	0	0	0	2767	1608	0	0	4871	0	0	0	4872	1787
119	2	Vologda oblast	12	14628	9568	11910	12538	1942	7626	2342	628	40	2049	132326	154034	156907	30871	101455	21708	2873	42	13830	12933	12515	15893	13303	9269	4578	1065
120	2	Voronezh oblast	12	5195	333	1221	2091	61	272	888	870	2473	629	3495	12161	16946	773	2722	8666	4785	5056	10495	9960	8104	12572	9992	9754	5498	2044
122	2	Nizhni Novgorod obl	12	7515	3760	7238	7387	436	3324	3478	149	0	128	46264	77813	78726	5450	40814	31549	913	0	12304	10751	10657	12509	12278	9071	6110	2035
123	2	Nenets a.okr.	12	16858	0	10	309	0	0	10	299	173	16355	0	61	1148	0	0	61	1087	193	0	6100	3715	0	0	5979	3640	1113
124	2	Ivanovo oblast	12	2270	1839	2248	2261	78	1761	409	13	0	10	26266	29936	30001	1111	25155	3670	65	0	14283	13317	13269	14261	14288	8981	5133	0
127	2	Kaliningrad oblast	12	1240	744	914	989	48	696	170	75	0	250	11404	13330	13824	616	10788	1926	494	0	15328	14584	13978	12793	15489	11301	6595	0
128	2	Tver oblast	12	8395	6947	7794	7912	841	6106	847	118	0	483	98389	106416	107037	11740	86649	8027	621	0	14163	13654	13528	13955	14190	9482	5260	1738
129	2	Kaluga oblast	12	2963	2235	2896	2934	129	2106	661	38	0	29	31306	37880	38104	1705	29601	6574	224	0	14007	13080	12987	13258	14053	9942	5967	0
133	2	Kirov oblast	12	11930	6322	11114	11569	1268	5054	4792	455	37	325	85168	126860	129141	20451	64717	41692	2281	49	13472	11414	11163	16132	12806	8700	5012	1338
134	2	Kostroma oblast	12	6000	4093	5719	5849	494	3599	1626	130	0	150	57413	73006	73629	8702	48711	15593	623	0	14027	12766	12588	17598	13535	9589	4790	1071
136	2	Samara oblast	12	5118	466	746	2033	0	466	280	1287	705	2379	4516	6317	12539	0	4516	1801	6222	1229	9691	8468	6168	0	9697	6421	4835	1743
138	2	Kursk oblast	12	3020	1724	2684	2714	298	1426	960	30	32	275	21668	32183	32368	3846	17822	10515	185	57	12568	11991	11926	12912	12501	10948	6249	1790
139	2	Komi-Permyak a.okr	12	3280	2045	3040	3128	995	1050	995	88	0	151	30284	39245	39700	16667	13617	8961	455	0	14809	12910	12692	16749	12964	9002	5191	1734
141	2	Leningrad oblast	12	7500	2520	6015	6306	915	1605	3495	291	75	1119	35762	67725	69055	15457	20305	31963	1330	79	14191	11259	10951	16894	12648	9146	4571	1049
142	2	Lipetsk oblast	12	2410	1601	2230	2351	376	1225	629	121	54	4	20823	27074	27733	4698	16125	6251	659	105	13006	12141	11796	12483	13162	9930	5442	1953
146	2	Moscow oblast	12	4665	3615	4394	4537	297	3318	779	143	0	128	51370	58346	59060	4244	47126	6976	714	0	14210	13279	13017	14286	14202	8958	5003	0
147	2	Murmansk oblast	12	13960	11	85	484	0	11	74	399	805	12671	118	565	2087	0	118	447	1522	1057	10727	6647	4312	0	10599	6069	3813	1314
149	2	Novgorod oblast	12	5450	3614	4758	4812	412	3202	1144	54	0	638	50163	61026	61289	5914	44249	10863	263	0	13880	12826	12737	14343	13820	9499	4901	1052
153	2	Orenburg oblast	12	12418	215	497	1212	0	215	282	715	324	10882	2119	4124	7254	0	2119	2005	3130	442	9856	8298	5985	0	9875	7109	4374	1366
154	2	Oryel oblast	12	2458	1882	2440	2454	160	1722	558	14	0	3	25019	30504	30607	2110	22909	5485	103	1	13294	12502	12472	13173	13301	9838	7497	1961
156	2	Penza oblast	12	4320	2347	3057	3983	8	2339	710	926	252	85	25840	31329	37048	101	25739	5489	5719	392	11010	10248	9302	12538	11002	7727	6178	1559
157	2	Perm oblast	12	12715	7867	9909	10428	2446	5421	2042	519	58	2229	111537	129833	132522	40468	71069	18296	2689	71	14178	13103	12708	16542	13110	8961	5179	1232
158	2	Pskov oblast	12	5568	3297	4650	4722	84	3213	1353	72	0	845	47016	59577	60029	1204	45812	12561	452	0	14260	12812	12713	14257	14260	9284	6246	0
160	2	Rostov oblast	12	10133	240	486	4322	1	239	246	3836	1728	4083	2588	5042	28759	8	2580	2454	23717	3671	10783	10374	6654	13501	10780	9976	6183	2124
161	2	Ryazan oblast	12	3935	2814	3831	3934	561	2253	1017	103	0	0	34653	43806	44415	6825	27828	9153	609	0	12314	11435	11290	12155	12352	8997	5894	918
163	2	Saratov oblast	12	10375	58	439	1688	0	58	381	1249	1660	7027	551	3658	9925	0	551	3107	6267	3137	9500	8333	5880	0	9514	8148	5018	1889
166	2	Smolensk oblast	12	4943	4353	4656	4692	33	4320	303	36	0	251	66018	69217	69477	488	65530	3199	260	0	15166	14866	14808	14767	15170	10544	7280	0
168	2	Tambov oblast	12	3435	1627	2662	2959	340	1287	1035	297	439	36	18130	27424	29361	3553	14577	9294	1937	867	11143	10302	9923	10439	11323	8975	6524	1976
170	2	Tula oblast	12	2553	2307	2530	2553	147	2160	223	23	0	0	32863	35029	35182	2407	30456	2166	153	0	14245	13845	13781	16425	14103	9696	6657	0
173	2	Ulyanovsk oblast	12	3690	431	1042	2300	0	431	611	1258	590	801	4170	7956	13292	0	4170	3786	5336	824	9675	7635	5779	0	9684	6199	4242	1396
178	2	Yaroslavl oblast	12	3260	2943	3064	3066	129	2814	121	2	0	194	41899	43069	43081	1797	40102	1170	12	0	14237	14056	14051	13936	14251	9674	5141	1701
179	2	Adigei Republic	12	775	233	445	480	18	215	212	35	7	288	3219	5574	5804	274	2945	2355	230	16	13815	12526	12092	14867	13717	11119	6586	2271
180	2	Bashkortostan Repu	12	14435	4401	7812	9920	395	4006	3411	2108	1073	3442	51219	78191	87618	6271	44948	26972	9427	1522	11638	10009	8832	15873	11220	7907	4473	1418
182	2	Daghestn Republic	12	5033	102	203	651	19	83	101	448	275	4099	1305	2285	5157	289	1016	980	2872	572	12794	11256	7922	15592	12277	9681	6405	2081
183	2	Kabardino-Balkarian	12	1238	215	480	620	48	167	265	140	5	612	3297	6140	7011	901	2396	2843	871	9	15335	12792	11308	18724	14330	10733	6205	1875
185	2	Kalmyk-Khalm-Tang	12	7510	0	0	171	0	0	0	171	61	7278	0	0	939	0	0	0	939	123	0	0	5491	0	0	0	5481	2023
186	2	Karelia Republic	12	18253	1768	8553	11568	449	1319	6785	3015	1915	4763	23597	82619	97140	7674	15923	59022	14521	3293	13347	9660	8397	17098	12075	8698	4816	1720
187	2	Komi Republic	12	41370	4193	15677	24599	1805	2388	11484	8922	5049	11721	60239	156813	199011	30796	29443	96574	42198	7623	14367	10003	8090	17060	12329	8409	4730	1510
188	2	Mari-El Republic	12	2365	839	1867	2157	14	825	1028	290	20	188	10066	18350	19628	171	9895	8284	1278	32	11998	9829	9100	12267	11995	8058	4403	1608
189	2	Mordovian SSR	12	2590	1652	2279	2508	216	1436	627	229	49	32	19731	25199	26477	2701	17030	5468	1278	46	11944	11057	10557	12517	11856	8715	5571	927
190	2	North-Ossetian SSR	12	778	261	303	388	94	167	42	85	2	386	4463	4956	5474	1754	2709	493	518	4	17100	16356	14108	18651	16200	11627	6076	2073
191	2	Karachai-Cherkess F	12	1468	179	431	486	52	127	252	55	12	969	2975	5615	5951	1070	1905	2640	336	24	16620	13028	12245	20409	14964	10478	6150	1979
192	2	Tatarstan Republic	12	6663	1635	3546	5061	0	1635	1911	1515	569	1033	18124	32830	39389	0	18124	14706	6559	837	11085	9258	7783	0	11086	7696	4329	1472
194	2	Udmurt Republic	12	4150	2583	3829	3896	414	2169	1246	67	0	253	33515	44551	44916	6786	26729	11036	365	0	12975	11635	11529	16387	12323	8854	5446	892
196	2	Checheno-Ingush R	12	1930	231	456	947	41	190	225	491	67	917	3345	5722	8705	722	2623	2377	2983	127	14481	12548	9192	17703	13828	10574	6081	1894
197	2	Chuvash Republic	12	1808	383	985	1321	15	368	602	336	383	105	4383	9129	10436	178	4205	4746	1307	635	11444	9268	7900	12256	11438	7885	3893	1656
101	3	Altai Kray	12	16653	4412	7984	10881	1051	3361	3572	2897	502	5271	53289	82472	96649	15002	38287	29183	14177	812	12078	10330	8882	14275	11393	8170	4894	1619

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A10 PRODUCTION POTENTIALS FOR TRADITIONAL PRODUCTION FORESTRY SPECIES - ALL AREAS

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	Average annual biomass increments (000tons) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	Average annual biomass yield (kg/ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
102	3	Gorno-Altai Republic	12	9385	424	698	987	85	339	274	289	178	8221	4647	6662	7923	1152	3495	2015	1261	251	10960	9544	8027	13600	10324	7356	4368	1411
104	3	Krasnoyarsk Kray	12	71140	14263	26294	33801	1820	12443	12031	7507	5666	31673	166263	259863	297361	24729	141534	93600	37498	8804	11657	9883	8797	13588	11374	7780	4995	1554
105	3	Primorski Kray	12	16338	812	2489	4109	182	630	1677	1620	1411	10817	9974	21550	29062	2609	7365	11576	7512	2510	12283	8658	7073	14322	11689	6903	4637	1779
106	3	Taymyr a.okr.	12	82285	0	0	0	0	0	0	0	0	82285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	77545	3368	7526	13225	209	3159	4158	5699	5535	58777	37803	69378	94819	3045	34758	31575	25441	8093	11224	9218	7170	14574	11002	7594	4464	1462
110	3	Amur oblast	12	36283	7656	11900	17451	1310	6346	4244	5551	3640	15192	83439	117977	143550	16471	66968	34538	25573	5382	10899	9914	8226	12578	10553	8137	4607	1479
116	3	Evenk a.okr	12	75673	5	285	776	0	5	280	491	3116	71780	55	2115	3889	0	55	2060	1774	4041	11000	7421	5012	0	10912	7363	3611	1297
121	3	Yevrey (Jewish) a.ob	12	3700	1025	1512	1944	189	836	487	432	179	1576	13043	16533	18760	2506	10537	3490	2227	316	12725	10935	9650	13227	12606	7165	5154	1762
125	3	Irkutsk oblast	12	76270	5183	11610	19239	52	5131	6427	7629	9058	47973	60383	108574	141938	590	59793	48191	33364	13721	11650	9352	7378	11289	11654	7498	4373	1515
126	3	Ust-Orda Buryat a.ok	12	2178	163	478	817	4	159	315	339	89	1272	1618	3978	5328	45	1573	2360	1350	122	9926	8322	6521	10956	9924	7481	3988	1373
130	3	Kamchatka oblast	12	17045	14	655	2238	0	14	641	1583	688	14097	127	5615	13344	0	127	5488	7729	1066	9071	8573	5962	0	9293	8564	4882	1550
131	3	Koryak a.okr.	12	28903	0	106	375	0	0	106	269	1027	27501	0	733	1714	0	0	733	981	1144	0	6915	4571	0	0	6915	3652	1114
132	3	Kemerovo oblast	12	9500	3251	4780	5728	609	2642	1529	948	763	3009	37436	48782	52798	7897	29539	11346	4016	1231	11515	10205	9218	12971	11182	7420	4237	1614
135	3	Chukchi a.okr.	12	70770	0	0	0	0	0	0	0	0	70745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	7110	1141	2746	3777	0	1141	1605	1031	548	2786	12266	24786	29844	0	12266	12520	5058	881	10750	9026	7902	0	10748	7802	4908	1610
144	3	Magadan oblast	12	45830	0	14	788	0	0	14	774	971	44071	0	103	3560	0	0	103	3457	1301	0	7357	4518	0	0	7148	4468	1340
150	3	Novosibirsk oblast	12	17673	4823	8223	10056	441	4382	3400	1833	759	6858	55212	82953	91906	5968	49244	27741	8953	1255	11448	10088	9139	13548	11238	8158	4885	1654
152	3	Omsk oblast	12	13980	2544	4996	8959	50	2494	2452	3963	716	4306	29662	50432	69202	667	28995	20770	18770	1213	11660	10094	7724	13333	11627	8472	4736	1693
164	3	Sakhalin oblast	12	8095	401	1379	2553	0	401	978	1174	371	5079	4975	12631	18865	0	4975	7656	6234	630	12406	9160	7389	0	12404	7828	5312	1698
165	3	Sverdlovsk oblast	12	19273	11247	13541	14567	2294	8953	2294	1026	164	4542	143652	162081	166728	35838	107814	18429	4647	243	12772	11970	11446	15625	12043	8032	4531	1477
167	3	Aga-Buryat a.okr.	12	1970	1	47	551	0	1	46	504	364	1055	8	272	2200	0	8	264	1928	508	8000	5787	3993	0	10828	5806	3822	1396
169	3	Tomsk oblast	12	31145	12538	20290	23730	996	11542	7752	3440	255	7160	146757	210286	228180	13701	133056	63529	17894	374	11705	10364	9616	13759	11528	8195	5202	1468
171	3	Tyumen oblast	12	15860	6649	10125	11624	271	6378	3476	1499	547	3690	71305	98059	105269	3687	67618	26754	7210	866	10724	9685	9056	13625	10602	7697	4810	1584
172	3	Khanty-Mansi a.okr.	12	53163	7884	18557	28595	508	7376	10673	10038	2810	21758	95007	182422	233572	7657	87350	87415	51150	5064	12051	9830	8168	15076	11843	8190	5096	1802
174	3	Yamalo-Nenets a.ok	12	66588	3	994	5413	0	3	991	4419	9713	51455	26	7228	30648	0	26	7202	23420	17735	8667	7272	5662	0	10441	7269	5300	1826
175	3	Chelyabinsk oblast	12	8763	1546	2866	4086	185	1361	1320	1220	1318	3359	17861	27843	32640	2760	15101	9982	4797	1996	11553	9715	7988	14956	11096	7564	3930	1514
176	3	Chita oblast	12	41493	150	1338	6939	0	150	1188	5601	7183	27371	1613	9826	33423	3	1610	8213	23597	10505	10753	7344	4817	10191	10738	6916	4213	1463
181	3	Buryat Republic	12	33533	192	1302	3348	7	185	1110	2046	4879	25305	2104	10430	19325	99	2005	8326	8895	7382	10958	8011	5772	14585	10809	7501	4347	1513
193	3	Tuva Republic	12	17035	29	294	1275	0	29	265	981	1161	14599	310	2205	6304	0	310	1895	4099	1634	10690	7500	4944	0	10737	7152	4178	1408
195	3	Khakass Republic	12	6120	812	1646	2489	97	715	834	843	281	3350	8596	14756	18386	1239	7357	6160	3630	384	10586	8965	7387	12719	10285	7386	4308	1367
198	3	Sakha (Yakutia) Rep	12	303275	335	2595	9193	0	335	2260	6598	13944	280120	3610	20620	49341	0	3610	17010	28721	19567	10776	7946	5367	0	10791	7526	4353	1403
		RUSSIA WEST		**389947**	**113377**	**190495**	**233949**	**18734**	**94643**	**77118**	**43454**	**24368**	**131553**	**1527738**	**2205842**	**2428478**	**291647**	**1236091**	**678104**	**222636**	**41944**	**13475**	**11580**	**10380**	**15568**	**13061**	**8793**	**5123**	**1721**
		RUSSIA EAST		**1284574**	**90871**	**167270**	**249514**	**10360**	**80511**	**76399**	**82244**	**77836**	**957053**	**1061041**	**1661165**	**2046528**	**145665**	**915376**	**600124**	**385363**	**119031**	**11676**	**9931**	**8202**	**14060**	**11370**	**7855**	**4686**	**1529**
		RUSSIA TOTAL		**1674521**	**204248**	**357765**	**483463**	**29094**	**175154**	**153517**	**125698**	**102204**	**1088606**	**2588779**	**3867007**	**4475006**	**437312**	**2151467**	**1278228**	**607999**	**160975**	**12675**	**10809**	**9256**	**15031**	**12283**	**8326**	**4837**	**1575**
211	11	Beijing	12	1640	124	559	899	2	122	435	340	25	717	1819	6502	8498	27	1792	4683	1996	42	14669	11631	9453	15020	14715	10772	5876	1654
212	11	Tianjin	12	1125	1	189	344	0	1	188	155	163	618	10	2230	3287	0	10	2220	1057	345	10000	11799	9555	0	15571	11812	6827	2108
213	11	Hebei	12	18480	1722	5257	9629	221	1501	3535	4372	1425	7426	19011	52507	78874	2262	16749	33496	26367	3145	11040	9988	8191	10219	11161	9477	6030	2207
214	11	Shanxi	12	15783	1175	3347	6426	166	1009	2172	3079	2666	6689	14291	35644	54265	2264	12027	21353	18621	5849	12163	10650	8445	13601	11918	9831	6047	2194
237	11	Shandong	12	14798	2761	5569	7154	60	2701	2808	1585	434	7209	43853	78520	89181	1081	42772	34667	10661	918	15883	14099	12466	17892	15835	12347	6727	2114
241	11	Henan	12	16295	5242	8039	9601	921	4321	2797	1562	459	6236	82960	115959	125507	16796	66164	32999	9548	1024	15826	14425	13072	18242	15313	11798	6113	2231
221	12	Liaoning	12	13863	5539	8396	10318	1961	3578	2857	1922	1093	2451	82253	113151	123739	31610	50643	30898	10588	2288	14850	13477	11993	16115	14153	10816	5509	2093
222	12	Jilin	12	19145	7179	10848	13664	2401	4778	3669	2816	746	4734	97235	134484	148854	34280	62955	37249	14370	1202	13544	12397	10894	14275	13175	10154	5104	1611
223	12	Heilongjiang	12	44848	23333	31468	36390	7318	16015	8135	4922	1729	6729	290819	364795	391420	99875	190944	73976	26625	2927	12464	11593	10756	13649	11923	9093	5410	1693
231	13	Shanghai	12	413	133	200	267	47	86	67	67	0	145	2100	2780	3191	866	1234	680	411	0	15789	13900	11951	18324	14271	10172	6156	0
232	13	Jiangsu	12	9290	3088	5622	5991	1081	2007	2534	369	10	3167	50970	76644	79077	19627	31343	25674	2433	25	16506	13633	13199	18150	15618	10132	6596	2574
233	13	Zhejiang	12	9250	2084	3451	3895	362	1722	1367	444	46	5310	29721	43525	46163	6024	23697	13804	2638	89	14262	12612	11852	16661	13758	10101	5939	1950
234	13	Anhui	12	13783	5761	8565	8754	1447	4314	2804	189	18	5011	90162	118890	120145	26329	63833	28728	1255	47	15650	13881	13725	18199	14797	10245	6638	2556
236	14	Jiangxi	12	16663	6560	8734	9466	1739	4821	2174	732	173	7024	97979	119869	124315	31714	66265	21890	4446	317	14936	13724	13133	18235	13745	10071	6077	1833
242	14	Hubei	12	18168	8153	11074	11417	1194	6959	2921	343	0	6751	124037	154164	156213	21526	102511	30127	2049	0	15214	13921	13682	18033	14731	10313	5976	1967
243	14	Hunan	12	21050	6962	9754	10374	1081	5881	2792	620	151	10525	102385	129897	133440	19499	82886	27512	3543	275	14706	13317	12863	18037	14094	9855	5717	1819
235	15	Fujian	12	11995	1040	2823	3439	24	1016	1783	616	125	8432	14454	31672	35325	421	14033	17218	3653	244	13898	11219	10272	17596	13817	9658	5932	1952
244	15	Guangdong	12	16385	3215	5659	6265	680	2535	2444	606	112	10008	46169	67977	71191	12473	33696	21808	3214	191	14360	12012	11363	18352	13295	8923	5299	1701
245	15	Guangxi	12	23425	6783	11806	12817	1857	4926	5023	1011	291	10316	108207	155793	161856	37304	70903	47586	6063	584	15953	13196	12628	20085	14392	9474	5996	2007
246	15	Hainan	12	2840	254	809	1288	43	211	555	479	288	1265	3106	7461	9619	672	2434	4355	2158	413	12228	9222	7468	15803	11531	7849	4505	1435
251	16	Sichuan	12	56143	8321	15387	17258	1341	6980	7066	1871	220	38665	124304	198423	210029	25037	99267	74119	11606	445	14939	12895	12170	18674	14222	10490	6204	2022
252	16	Guizhou	12	17725	6669	10450	11170	1029	5640	3781	720	1	6554	99243	136772	140715	19318	79925	37529	3943	2	14881	13088	12598	18778	14171	9925	5477	2158
253	16	Yunnan	12	37325	10034	12739	14145	3808	6226	2705	1406	1050	22130	180554	207062	214026	83284	97270	26508	6964	1693	17994	16254	15131	21870	15624	9798	4954	1612
215	17	Nei Mongol	12	115468	7666	13495	27397	1502	6164	5829	13902	5345	82725	89769	133185	200931	23323	66446	43416	67746	8813	11710	9869	7334	15532	10779	7448	4873	1649
261	17	Shaanxi	12	20900	2876	5180	6601	288	2588	2304	1421	812	13488	42230	65297	74146	5255	36975	23067	8849	1822	14684	12606	11233	18239	14290	10012	6228	2245
262	17	Gansu	12	40580	1766	3363	5288	460	1306	1597	1925	686	34605	24728	39865	50368	8186	16542	15137	10503	1243	14002	11854	9525	17781	12666	9476	5456	1812
264	17	Ningxia	12	5038	53	169	1069	6	47	116	900	210	3759	588	1520	6217	92	496	932	4697	348	11094	8994	5816	16261	10606	8053	5217	1655
265	17	Xinjiang	12	163355	202	537	1437	55	147	335	900	557	161362	2505	5031	9822	900	1605	2526	4791	947	12401	9369	6835	16385	10940	7550	5322	1700
254	18	Xizang	12	119045	934	1457	1821	318	616	523	364	178	117047	15090	19201	20824	6434	8656	4111	1623	280	16156	13178	11435	20240	14061	7864	4456	1579
263	18	Qinghai	12	72183	71	251	1166	4	67	180	915	513	70504	614	1947	6311	33	581	1333	4364	847	8648	7757	5413	9336	8612	7424	4770	1650
272	19	Hongkong	12	40	0	1	2	0	0	1	1	0	37	3	17	22	0	3	14	5	1	3000	17000	11000	0	14652	9684	5797	1906
		CHINA TOTAL		**937041**	**129701**	**205198**	**255752**	**31416**	**98285**	**75497**	**50554**	**19526**	**661639**	**1881169**	**2620784**	**2897571**	**536512**	**1344657**	**739615**	**276787**	**36366**	**14504**	**12772**	**11330**	**17078**	**13681**	**9797**	**5475**	**1862**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A11 PRODUCTION POTENTIALS FOR TRADITIONAL PRODUCTION FORESTRY SPECIES - ACCESSIBLE AREAS

ADM REG		NAME	LC	Total	Suitable Areas (000ha)								Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	63130	9	180	1864	1	8	171	1684	2063	59202	107	1173	8360	19	88	1066	7187	3128	11889	6517	4485	16456	10387	6245	4267	1516
11	1	Armenia	12	2025	47	169	317	0	47	122	148	100	1609	475	1280	1829	0	475	805	549	141	10106	7574	5770	0	10166	6614	3718	1411
12	1	Azerbaijan	12	6095	49	147	583	0	49	98	436	970	4049	553	1268	4072	5	548	715	2804	2142	11286	8626	6985	13868	11064	7319	6431	2209
13	1	Byelorussia	12	17955	9261	16011	16521	1539	7722	6750	510	0	1434	131196	205862	209099	21880	109316	74666	3237	0	14167	12858	12657	14221	14156	11062	6348	1852
14	1	Estonia	12	3365	1543	2015	2071	17	1526	472	56	4	1289	19312	23507	23745	236	19076	4195	238	5	12516	11666	11465	13935	12498	8883	4280	1080
15	1	Georgia	12	4763	351	600	832	161	190	249	232	249	3682	5968	8441	9879	3320	2648	2473	1438	549	17003	14068	11874	20598	13918	9942	6209	2208
16	1	Kazakhstan	12	165068	495	3439	13369	50	445	2944	9930	3235	148464	4993	29070	78215	636	4357	24077	49145	5315	10087	8453	5850	12730	9800	8180	4949	1643
17	1	Kirghiztan	12	10428	43	243	813	1	42	200	570	453	9160	457	1900	4840	27	430	1443	2940	776	10628	7819	5953	18657	10117	7228	5153	1712
18	1	Latvia	12	5573	1951	4495	4830	210	1741	2544	335	5	738	25315	48821	50728	2982	22333	23506	1907	7	12975	10861	10503	14172	12826	9240	5698	1567
19	1	Lithuania	12	6018	2719	4901	5151	205	2514	2182	250	0	867	38698	60645	62304	2980	35718	21947	1659	1	14232	12374	12096	14566	14206	10059	6646	1779
20	1	Moldavia	12	2848	778	1902	2358	109	669	1124	456	187	303	10585	21155	24078	1758	8827	10570	2923	402	13605	11123	10211	16190	13202	9400	6407	2154
21	1	Tajikistan	12	4775	0	23	252	0	0	23	229	303	4220	0	188	1406	0	0	188	1218	595	0	8174	5579	0	0	8135	5323	1961
22	1	Turkmenistan	12	22535	0	0	17	0	0	0	17	42	22476	0	0	103	0	0	0	103	86	0	0	6059	0	0	0	6174	2040
23	1	Ukraine	12	51955	18794	34066	40172	4337	14457	15272	6106	5619	6163	273206	429067	467786	75165	198041	155861	38719	12384	14537	12595	11645	17329	13698	10206	6341	2204
		FSU REPUBLICS		**303403**	**36031**	**68011**	**87286**	**6629**	**29402**	**31980**	**19275**	**11167**	**204454**	**510758**	**831204**	**938084**	**108989**	**401769**	**320446**	**106880**	**22403**	**14176**	**12222**	**10747**	**16441**	**13665**	**10020**	**5545**	**2006**
103	2	Krasnodar Kray	12	6715	873	1723	3898	89	784	850	2175	1387	1425	12113	20082	35099	1701	10412	7969	15017	3233	13875	11655	9004	19114	13281	9379	6903	2331
107	2	Stavropol Kray	12	5428	181	662	2645	9	172	481	1983	608	2175	2036	6440	18481	128	1908	4404	12041	1230	11249	9728	6987	14848	11115	9161	6071	2022
111	2	Arkhangelsk oblast	12	14210	3950	10047	12066	587	3363	6097	2019	589	1540	54082	106385	115643	10172	43910	52303	9258	729	13692	10589	9584	17317	13056	8579	4585	1238
112	2	Astrakhan oblast	12	2923	0	0	0	0	0	0	0	0	2922	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	2248	332	1259	1387	71	261	927	128	328	532	3616	12608	13282	926	2690	8992	674	677	10892	10014	9576	12970	10314	9703	5254	2061
115	2	Bryansk oblast	12	3095	2514	3024	3051	937	1577	510	27	0	44	30279	35769	35941	12299	17980	5490	172	0	12044	11828	11780	13123	11401	10756	6439	732
117	2	Vladimir oblast	12	2510	1149	2409	2462	123	1026	1260	53	0	49	14549	25632	25916	1766	12783	11083	284	0	12662	10640	10526	14367	12463	8799	5397	0
118	2	Volgograd oblast	12	9108	0	0	478	0	0	0	478	771	7859	0	0	2338	0	0	0	2338	1383	0	0	4891	0	0	0	4889	1795
119	2	Vologda oblast	12	9155	6169	7648	8044	1275	4894	1479	396	31	1080	85733	99495	101340	20293	65440	13762	1845	33	13897	13009	12598	15913	13372	9303	4658	1073
120	2	Voronezh oblast	12	4550	305	1074	1832	59	246	769	758	2173	546	3202	10648	14831	742	2460	7446	4183	4441	10498	9914	8096	12567	9988	9688	5520	2044
122	2	Nizhni Novgorod obl	12	6403	3229	6185	6307	379	2850	2956	122	0	94	39791	66602	67362	4739	35052	26811	760	0	12323	10768	10681	12488	12300	9069	6211	2035
123	2	Nenets a.okr.	12	2583	0	2	33	0	0	2	31	12	2537	0	11	121	0	0	11	110	12	0	5500	3667	0	0	5941	3551	1005
124	2	Ivanovo oblast	12	1875	1501	1858	1869	65	1436	357	11	0	6	21371	24559	24615	927	20444	3188	56	0	14238	13218	13170	14262	14238	8918	5181	0
127	2	Kaliningrad oblast	12	1183	711	880	946	46	665	169	66	0	238	10900	12803	13239	583	10317	1903	436	0	15331	14549	13995	12795	15521	11289	6597	0
128	2	Tver oblast	12	6128	5096	5704	5789	596	4500	608	85	0	338	72260	78015	78463	8314	63946	5755	448	0	14180	13677	13554	13955	14209	9462	5279	1644
129	2	Kaluga oblast	12	2445	1845	2389	2419	113	1732	544	30	0	25	25748	31138	31317	1500	24248	5390	179	0	13956	13034	12946	13250	14001	9901	5944	0
133	2	Kirov oblast	12	8750	4594	8139	8489	919	3675	3545	350	27	234	61874	92755	94514	14770	47104	30881	1759	37	13468	11396	11134	16079	12816	8711	5032	1351
134	2	Kostroma oblast	12	4263	2918	4072	4153	356	2562	1154	81	0	110	41020	52096	52480	6353	34667	11076	384	0	14058	12794	12637	17846	13533	9600	4729	1459
136	2	Samara oblast	12	4408	428	647	1785	0	428	219	1138	620	2003	4157	5594	11184	0	4157	1437	5590	1093	9713	8646	6266	0	9705	6577	4913	1762
138	2	Kursk oblast	12	2623	1509	2339	2362	267	1242	830	23	25	235	18964	27994	28139	3453	15511	9030	145	44	12567	11968	11913	12922	12487	10879	6232	1752
139	2	Komi-Permyak a.okı	12	2220	1339	2055	2117	614	725	716	62	0	102	19752	26244	26574	10296	9456	6492	330	0	14751	12771	12553	16767	13034	9068	5322	1850
141	2	Leningrad oblast	12	5678	1808	4526	4771	592	1216	2718	245	68	838	25466	50460	51592	9966	15500	24994	1132	72	14085	11149	10814	16823	12749	9195	4621	1057
142	2	Lipetsk oblast	12	2140	1419	1982	2091	323	1096	563	109	47	2	18403	23985	24581	4021	14382	5582	596	92	12969	12101	11756	12464	13128	9913	5460	1951
146	2	Moscow oblast	12	4130	3233	3897	4020	282	2951	664	123	0	110	45852	51813	52421	4031	41821	5961	608	0	14182	13296	13040	14295	14172	8981	4921	0
147	2	Murmansk oblast	12	4110	1	7	141	0	1	6	134	379	3590	12	52	564	0	12	40	512	492	12000	7429	4000	0	10588	6544	3810	1298
149	2	Novgorod oblast	12	3935	2630	3467	3506	293	2337	837	39	0	428	36529	44476	44669	4226	32303	7947	193	0	13889	12828	12741	14402	13821	9493	4899	1054
153	2	Orenburg oblast	12	8305	127	306	813	0	127	179	507	221	7270	1253	2552	4790	0	1253	1299	2238	305	9866	8340	5892	0	9883	7241	4412	1379
154	2	Oryel oblast	12	2018	1542	2003	2013	130	1412	461	10	0	3	20575	25113	25189	1712	18863	4538	76	1	13343	12538	12513	13138	13359	9838	7446	1961
156	2	Penza oblast	12	3893	2098	2727	3588	7	2091	629	861	226	79	23061	27892	33180	90	22971	4831	5288	347	10992	10228	9247	12529	10987	7680	6145	1539
157	2	Perm oblast	12	8423	5515	6988	7311	1692	3823	1473	323	23	1089	78036	91225	92930	28085	49951	13189	1705	26	14150	13055	12711	16603	13066	8956	5274	1155
158	2	Pskov oblast	12	4508	2737	3860	3916	64	2673	1123	56	0	591	39161	49604	49955	917	38244	10443	351	0	14308	12851	12757	14257	14308	9301	6222	0
160	2	Rostov oblast	12	8245	197	410	3568	1	196	213	3158	1459	3218	2136	4249	23869	8	2128	2113	19620	3115	10843	10363	6690	13501	10866	9932	6212	2134
161	2	Ryazan oblast	12	3453	2472	3362	3452	483	1989	890	90	0	0	30508	38530	39060	5854	24654	8022	530	0	12341	11460	11315	12129	12393	9009	5883	927
163	2	Saratov oblast	12	8433	53	381	1477	0	53	328	1096	1426	5529	509	3194	8695	0	509	2685	5501	2692	9604	8383	5887	0	9510	8180	5018	1889
166	2	Smolensk oblast	12	4113	3612	3870	3901	24	3588	258	31	0	211	54816	57538	57762	350	54466	2722	224	0	15176	14868	14807	14689	15179	10536	7225	0
168	2	Tambov oblast	12	2905	1354	2237	2487	275	1079	883	250	387	32	15045	23010	24634	2850	12195	7965	1624	765	11112	10286	9905	10375	11304	9021	6504	1977
170	2	Tula oblast	12	2283	2065	2262	2283	134	1931	197	21	0	0	29423	31334	31472	2229	27194	1911	138	0	14248	13852	13785	16588	14087	9706	6670	0
173	2	Ulyanovsk oblast	12	3218	374	923	2045	0	374	549	1122	541	631	3618	7018	11760	0	3618	3400	4742	757	9674	7603	5751	0	9666	6198	4224	1398
178	2	Yaroslavl oblast	12	2350	2123	2224	2226	96	2027	101	2	0	124	30238	31220	31231	1335	28903	982	11	0	14243	14038	14030	13948	14261	9678	5147	1626
179	2	Adigei Republic	12	605	214	414	445	15	199	200	31	6	154	2947	5172	5377	225	2722	2225	205	13	13771	12493	12083	14893	13670	11139	6541	2274
180	2	Bashkortostan Repu	12	8983	2954	5143	6378	248	2706	2189	1235	595	2010	34220	51629	57212	3917	30303	17409	5583	835	11584	10039	8970	15819	11198	7953	4520	1403
182	2	Daghestn Republic	12	3843	75	155	549	13	62	80	394	230	3056	962	1738	4270	197	765	776	2532	474	12827	11213	7778	15682	12404	9680	6419	2058
183	2	Kabardino-Balkarian	12	898	186	422	550	42	144	236	128	3	345	2853	5401	6193	787	2066	2548	792	5	15339	12799	11260	18653	14334	10781	6208	1878
185	2	Kalmyk-Khalm-Tang	12	4735	0	0	155	0	0	0	155	57	4523	0	0	854	0	0	0	854	115	0	0	5510	0	0	0	5510	2026
186	2	Karelia Republic	12	9165	1091	5218	7010	294	797	4127	1792	800	1352	14569	50558	58946	5053	9516	35989	8388	1387	13354	9689	8409	17178	11944	8719	4680	1733
187	2	Komi Republic	12	14183	1600	6811	9925	620	980	5211	3114	1270	2988	22676	66715	82099	10580	12096	44039	15384	2050	14173	9795	8272	17061	12344	8451	4941	1614
188	2	Mari-El Republic	12	1575	567	1253	1434	7	560	686	181	12	129	6803	12352	13150	90	6713	5549	798	19	11998	9858	9170	12246	11997	8088	4399	1548
189	2	Mordovian SSR	12	2315	1483	2033	2243	194	1289	550	210	45	27	17731	22527	23700	2424	15307	4796	1173	42	11956	11081	10566	12519	11872	8724	5593	922
190	2	North-Ossetian SSR	12	608	239	274	359	86	153	35	85	2	246	4073	4478	4992	1592	2481	405	514	4	17042	16343	13905	18476	16187	11531	6073	2079
191	2	Karachai-Cherkess I	12	1085	146	357	393	43	103	211	36	7	684	2517	4731	4957	937	1580	2214	226	13	17240	13252	12613	21572	15274	10485	6181	1941
192	2	Tatarstan Republic	12	5278	1293	2794	4027	0	1293	1501	1233	487	763	14176	25708	31062	0	14176	11532	5354	717	10964	9201	7713	0	10961	7682	4343	1472
194	2	Udmurt Republic	12	3425	2094	3162	3221	307	1787	1068	59	0	204	26845	36284	36604	4979	21866	9439	320	0	12820	11475	11364	16203	12236	8838	5451	867
196	2	Checheno-Ingush R	12	1555	197	404	861	37	160	207	457	62	631	2855	5056	7854	650	2205	2201	2798	118	14492	12515	9122	17465	13772	10613	6119	1909

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A11 PRODUCTION POTENTIALS FOR TRADITIONAL PRODUCTION FORESTRY SPECIES - ACCESSIBLE AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)								Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
197	2	Chuvash Republic	12	1678	355	915	1223	13	342	560	308	357	96	4074	8498	9700	163	3911	4424	1202	592	11476	9287	7931	12237	11423	7896	3903	1657
101	3	Altai Kray	12	11538	2831	5421	7500	570	2261	2590	2079	357	3680	34068	55250	65483	8126	25942	21182	10233	583	12034	10192	8731	14245	11474	8180	4922	1632
102	3	Gorno-Altai Republic	12	2693	236	375	540	54	182	139	165	96	2056	2643	3674	4403	747	1896	1031	729	136	11199	9797	8154	13800	10424	7425	4416	1410
104	3	Krasnoyarsk Kray	12	16560	5408	9155	10887	1015	4393	3747	1732	882	4790	60780	89313	97874	13365	47415	28533	8561	1399	11239	9756	8990	13174	10793	7615	4941	1586
105	3	Primorski Kray	12	7290	614	1776	2493	144	470	1162	717	684	4112	7535	15690	19077	2060	5475	8155	3387	1287	12272	8834	7652	14292	11640	7016	4722	1881
106	3	Taymyr a.okr.	12	2848	0	0	0	0	0	0	0	0	2847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	9013	677	1633	2497	31	646	956	864	701	5812	7830	15131	19062	386	7444	7301	3931	1019	11566	9266	7634	12611	11515	7639	4549	1454
110	3	Amur oblast	12	9438	2722	4256	6030	698	2024	1534	1774	564	2844	31122	43841	52429	8771	22351	12719	8588	883	11434	10301	8695	12571	11045	8290	4840	1567
116	3	Evenk a.okr	12	6140	1	9	34	0	1	8	25	197	5909	7	65	173	0	7	58	108	256	7000	7222	5088	0	10908	6966	4282	1298
121	3	Yevrey (Jewish) a.ol	12	1545	532	738	922	110	422	206	184	41	582	6712	8176	9142	1419	5293	1464	966	72	12617	11079	9915	12944	12550	7096	5251	1748
125	3	Irkutsk oblast	12	17280	2742	5472	7404	42	2700	2730	1932	1480	8394	31465	51898	60525	482	30983	20433	8627	2267	11475	9484	8175	11387	11474	7483	4465	1532
126	3	Ust-Orda Buryat a.o	12	1180	89	303	520	2	87	214	217	64	597	857	2455	3305	26	831	1598	850	90	9629	8102	6356	11122	9602	7477	3914	1418
130	3	Kamchatka oblast	12	3853	6	329	1056	0	6	323	727	260	2537	52	2844	6391	0	52	2792	3547	402	8667	8644	6052	0	9412	8652	4876	1545
131	3	Koryak a.okr.	12	5013	0	36	129	0	0	36	93	279	4604	0	249	617	0	0	249	368	318	0	6917	4783	0	0	6904	3936	1142
132	3	Kemerovo oblast	12	5290	1822	2608	3206	374	1448	786	598	571	1514	21065	26892	29423	4852	16213	5827	2531	933	11561	10311	9177	12985	11199	7415	4232	1634
135	3	Chukchi a.okr.	12	8158	0	0	0	0	0	0	0	0	8155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	5195	913	2087	2816	0	913	1174	729	390	1988	9828	18978	22540	0	9828	9150	3562	628	10765	9093	8004	0	10764	7793	4883	1607
144	3	Magadan oblast	12	9245	0	6	179	0	0	6	173	322	8744	0	42	935	0	0	42	893	429	0	7000	5223	0	0	7186	5151	1329
150	3	Novosibirsk oblast	12	9910	2322	4333	5490	298	2024	2011	1157	529	3892	26954	43470	49122	4073	22881	16516	5652	875	11608	10032	8948	13681	11303	8214	4886	1655
152	3	Omsk oblast	12	8545	995	2399	5242	30	965	1404	2843	531	2772	11691	23485	37016	408	11283	11794	13531	909	11750	9789	7061	13578	11697	8401	4759	1711
164	3	Sakhalin oblast	12	4795	329	979	1712	0	329	650	733	246	2834	4080	9144	12984	0	4080	5064	3840	424	12401	9340	7584	0	12406	7786	5238	1722
165	3	Sverdlovsk oblast	12	12618	7921	9631	10296	1723	6198	1710	665	42	2279	102482	116218	119262	27102	75380	13736	3044	67	12938	12067	11583	15733	12161	8031	4577	1581
167	3	Aga-Buryat a.okr.	12	663	0	14	160	0	0	14	146	120	382	0	81	633	0	0	81	552	167	0	5786	3956	0	0	5885	3770	1387
169	3	Tomsk oblast	12	7415	3301	4949	5733	367	2934	1648	784	119	1563	38493	52054	56089	4943	33550	13561	4035	207	11661	10518	9784	13483	11436	8228	5144	1737
171	3	Tyumen oblast	12	7043	1981	3911	4682	88	1893	1930	771	381	1979	20355	35373	39121	1243	19112	15018	3748	608	10275	9044	8356	14119	10097	7779	4863	1596
172	3	Khanty-Mansi a.okr.	12	6830	1188	2357	3360	62	1126	1169	1003	258	3212	14546	24261	29417	915	13631	9715	5156	459	12244	10293	8755	14786	12104	8311	5141	1782
174	3	Yamalo-Nenets a.ok	12	2680	0	38	166	0	0	38	128	335	2179	0	274	946	0	0	274	672	594	0	7211	5699	0	0	7288	5245	1774
175	3	Chelyabinsk oblast	12	6338	1184	2132	2994	141	1043	948	862	953	2390	13641	20824	24222	2086	11555	7183	3398	1446	11521	9767	8090	14762	11078	7577	3942	1517
176	3	Chita oblast	12	7850	52	590	1618	0	52	538	1028	1045	5187	526	4155	8540	2	524	3629	4385	1476	10115	7042	5278	9946	10105	6742	4266	1412
181	3	Buryat Republic	12	6650	93	574	1346	1	92	481	772	1048	4256	1015	4585	7951	14	1001	3570	3366	1589	10914	7988	5907	15405	10901	7425	4358	1515
193	3	Tuva Republic	12	5043	10	152	717	0	10	142	565	552	3774	104	1125	3508	0	104	1021	2383	792	10400	7401	4893	0	10396	7194	4221	1436
195	3	Khakass Republic	12	3093	591	1185	1691	81	510	594	506	151	1251	6242	10630	12829	1030	5212	4388	2199	208	10562	8970	7587	12712	10221	7393	4344	1383
198	3	Sakha (Yakutia) Rep	12	46970	69	737	2524	0	69	668	1787	2560	41886	727	5637	13103	0	727	4910	7466	3439	10536	7649	5191	0	10548	7353	4177	1343
		RUSSIA WEST		**244894**	**84497**	**136903**	**164514**	**12820**	**71677**	**52406**	**27611**	**15281**	**65047**	**1133389**	**1598982**	**1746203**	**196230**	**937159**	**465593**	**147221**	**27960**	**13413**	**11680**	**10614**	**15307**	**13075**	**8884**	**5332**	**1830**
		RUSSIA EAST		**258722**	**38629**	**68185**	**93944**	**5831**	**32798**	**29556**	**25759**	**15758**	**149001**	**454820**	**685814**	**806122**	**82050**	**372770**	**230994**	**120308**	**23962**	**11774**	**10058**	**8581**	**14071**	**11366**	**7815**	**4671**	**1521**
		RUSSIA TOTAL		**503616**	**123126**	**205088**	**258458**	**18651**	**104475**	**81962**	**53370**	**31039**	**214048**	**1588209**	**2284796**	**2552325**	**278280**	**1309929**	**696587**	**267529**	**51922**	**12899**	**11141**	**9875**	**14920**	**12538**	**8499**	**5013**	**1673**
211	11	Beijing	12	1385	99	478	785	1	98	379	307	24	576	1445	5508	7313	20	1425	4063	1805	39	14596	11523	9316	15139	14609	10716	5885	1650
212	11	Tianjin	12	863	1	149	270	0	1	148	121	122	470	10	1764	2597	0	10	1754	833	266	10000	11839	9619	0	15571	11842	6855	2182
213	11	Hebei	12	13455	1087	3641	7075	125	962	2554	3434	1082	5298	11781	35651	56228	1244	10537	23870	20577	2384	10838	9792	7947	9986	10957	9346	5992	2203
214	11	Shanxi	12	8953	510	1635	3609	73	437	1125	1974	1819	3525	6251	17327	29071	1017	5234	11076	11744	4015	12257	10598	8055	13842	11986	9849	5950	2207
237	11	Shandong	12	10518	2049	4099	5227	39	2010	2050	1128	280	5011	32490	57817	65346	697	31793	25327	7529	592	15857	14105	12502	17860	15821	12354	6676	2112
241	11	Henan	12	10775	3461	5456	6656	616	2845	1995	1200	323	3795	54631	78384	85686	11230	43401	23753	7302	724	15785	14367	12873	18219	15254	11904	6085	2241
221	12	Liaoning	12	11258	4462	6773	8391	1547	2915	2311	1618	931	1935	66413	91667	100575	24994	41419	25254	8908	1949	14884	13534	11986	16152	14211	10927	5505	2093
222	12	Jilin	12	14803	5980	8835	10920	1993	3987	2855	2085	525	3357	81215	110323	120916	28542	52673	29108	10593	855	13581	12487	11073	14323	13210	10196	5080	1627
223	12	Heilongjiang	12	26983	13741	18609	21713	4562	9179	4868	3104	1191	4078	170363	214584	231244	61174	109189	44221	16660	2008	12398	11531	10650	13409	11895	9085	5367	1685
231	13	Shanghai	12	370	119	176	238	41	78	57	62	0	131	1869	2447	2831	749	1120	578	384	0	15706	13903	11895	18332	14279	10176	6155	0
232	13	Jiangsu	12	5798	1986	3603	3885	672	1314	1617	282	8	1902	32825	49281	51144	12211	20614	16456	1863	20	16528	13678	13164	18163	15693	10174	6611	2579
233	13	Zhejiang	12	5938	1457	2363	2678	284	1173	906	315	34	3225	20915	30128	32008	4782	16133	9213	1880	68	14355	12750	11952	16823	13757	10164	5977	1962
234	13	Anhui	12	9145	3820	5757	5889	1045	2775	1937	132	16	3240	59783	79585	80466	19038	40745	19802	881	41	15650	13824	13664	18212	14684	10223	6695	2548
236	14	Jiangxi	12	10700	4523	5900	6352	1260	3263	1377	452	134	4214	67783	81693	84425	23002	44781	13910	2732	244	14986	13846	13291	18250	13725	10101	6040	1826
242	14	Hubei	12	9940	4956	6527	6691	719	4237	1571	164	0	3249	75292	91492	92503	12943	62349	16200	1011	0	15192	14017	13825	18010	14715	10312	6161	1945
243	14	Hunan	12	11740	4279	5731	6032	687	3592	1452	301	110	5598	62859	77187	78927	12393	50466	14328	1740	198	14690	13468	13085	18027	14050	9869	5781	1812
235	15	Fujian	12	8395	735	2022	2503	23	712	1287	481	100	5792	10204	22601	25439	402	9802	12397	2838	195	13883	11178	10163	17476	13770	9633	5898	1949
244	15	Guangdong	12	12815	2542	4481	4986	529	2013	1939	505	101	7729	36314	53442	56074	9699	26615	17128	2632	171	14286	11926	11246	18322	13224	8835	5215	1703
245	15	Guangxi	12	15593	4539	8335	9089	1105	3434	3796	754	227	6276	70262	105870	110349	21497	48765	35608	4479	450	15480	12702	12141	19462	14201	9380	5937	1981
246	15	Hainan	12	700	37	172	310	6	31	135	138	94	296	460	1535	2163	90	370	1075	628	137	12432	8924	6977	16065	11749	7959	4566	1460
251	16	Sichuan	12	26720	4349	8264	9420	585	3764	3915	1156	155	17145	64296	105383	112603	10836	53460	41087	7220	319	14784	12752	11954	18527	14204	10494	6243	2061
252	16	Guizhou	12	8415	3276	5106	5484	527	2749	1830	378	1	2930	48924	67036	69095	9775	39149	18112	2059	2	14934	13129	12599	18562	14242	9897	5443	2158
253	16	Yunnan	12	23453	6516	8229	9237	2605	3911	1713	1008	815	13400	119886	136939	141928	57607	62279	17053	4989	1317	18399	16641	15365	22115	15923	9956	4948	1615
215	17	Nei Mongol	12	56150	3113	5754	13545	607	2506	2641	7791	2863	39742	34229	52826	90709	9068	25161	18597	37883	4663	10996	9181	6697	14938	10041	7041	4863	1629
261	17	Shaanxi	12	8803	1328	2523	3253	155	1173	1195	730	553	4996	19682	31673	36437	2847	16835	11991	4764	1251	14821	12554	11201	18309	14353	10034	6529	2263
262	17	Gansu	12	15968	948	1886	2807	205	743	938	921	315	12845	12903	21953	27032	3485	9418	9050	5079	572	13611	11640	9630	16981	12670	9645	5514	1819
264	17	Ningxia	12	2450	30	70	446	5	25	40	376	95	1909	345	642	2592	79	266	297	1950	156	11500	9171	5812	16179	10725	7344	5191	1637
265	17	Xinjiang	12	32755	116	246	544	34	82	130	298	212	32000	1458	2455	4047	551	907	997	1592	367	12569	9980	7439	16315	11081	7690	5341	1731
254	18	Xizang	12	29875	239	418	574	77	162	179	156	100	29201	3503	4687	5352	1448	2055	1184	665	148	14657	11213	9324	18741	12725	6610	4272	1482
263	18	Qinghai	12	21850	49	154	872	2	47	105	718	415	20564	419	1179	4569	18	401	760	3390	696	8551	7656	5240	9331	8602	7232	4725	1680
272	19	Hongkong	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**416566**	**80347**	**127392**	**159481**	**20129**	**60218**	**47045**	**32089**	**12645**	**244429**	**1168810**	**1633059**	**1809669**	**341438**	**827372**	**464249**	**176610**	**23847**	**14547**	**12819**	**11347**	**16962**	**13740**	**9868**	**5504**	**1886**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A12 PRODUCTION POTENTIALS FOR TRADITIONAL PRODUCTION FORESTRY SPECIES - ACCESSIBLE AREAS, EXCLUDING CULTIVATED AND URBAN AREAS

ADM REG		NAME	LC	Total	Suitable Areas (000ha)								Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	62805	9	180	1857	1	8	171	1677	2042	58906	107	1173	8329	19	88	1066	7156	3102	11889	6517	4485	16456	10387	6245	4267	1519
11	1	Armenia	12	1448	39	113	202	0	39	74	89	60	1185	402	901	1243	0	402	499	342	84	10308	7973	6153	0	10225	6714	3849	1389
12	1	Azerbaijan	12	4205	45	115	358	0	45	70	243	532	2948	506	989	2489	3	503	483	1500	1151	11244	8600	6953	13888	11123	6945	6176	2164
13	1	Byelorussia	12	6503	3017	5716	5878	537	2480	2699	162	0	624	41984	71280	72260	7503	34481	29296	980	0	13916	12470	12293	13960	13904	10853	6059	2026
14	1	Estonia	12	1303	574	772	805	7	567	198	33	4	493	6992	8717	8854	95	6897	1725	137	4	12181	11291	10999	13609	12154	8705	4124	1081
15	1	Georgia	12	3013	91	197	321	19	72	106	124	132	2560	1281	2288	3043	348	933	1007	755	295	14077	11614	9480	18585	12881	9498	6113	2234
16	1	Kazakhstan	12	134203	385	1917	6245	41	344	1532	4328	1765	126193	3910	16332	37567	529	3381	12422	21235	2811	10156	8520	6016	12752	9832	8110	4906	1593
17	1	Kirghiztan	12	8128	28	125	343	1	27	97	218	229	7555	302	971	1935	27	275	669	964	350	10786	7768	5641	18657	10036	6918	4417	1527
18	1	Latvia	12	1875	609	1558	1700	59	550	949	142	2	172	7619	16358	17151	840	6779	8739	793	3	12511	10499	10089	14135	12321	9207	5577	1392
19	1	Lithuania	12	3013	1479	2573	2698	121	1358	1094	125	0	314	21255	32242	33082	1766	19489	10987	840	0	14371	12531	12262	14621	14348	10042	6714	1885
20	1	Moldavia	12	93	26	55	75	3	23	29	20	9	8	364	630	761	53	311	266	131	19	14000	11455	10147	16076	13744	9238	6417	2107
21	1	Tajikistan	12	3495	0	18	154	0	0	18	136	154	3188	0	144	853	0	0	144	709	302	0	8000	5539	0	0	8149	5225	1963
22	1	Turkmenistan	12	20363	0	0	14	0	0	0	14	37	20312	0	0	87	0	0	0	87	76	0	0	6214	0	0	0	6251	2051
23	1	Ukraine	12	5253	1827	3454	3943	434	1393	1627	489	62	1248	27236	45309	47875	7357	19879	18073	2566	133	14907	13118	12142	16951	14273	11108	5249	2135
		FSU REPUBLICS		**192895**	**8120**	**16613**	**22736**	**1222**	**6898**	**8493**	**6123**	**2986**	**166800**	**111851**	**196161**	**227200**	**18521**	**93330**	**84310**	**31039**	**5228**	**13775**	**11808**	**9993**	**15156**	**13530**	**9927**	**5069**	**1751**
103	2	Krasnodar Kray	12	1820	354	567	738	63	291	213	171	58	1024	5663	7945	9140	1296	4367	2282	1195	131	15997	14012	12385	20605	15031	10694	6989	2245
107	2	Stavropol Kray	12	805	51	164	224	7	44	113	60	13	568	660	1738	2100	106	554	1078	362	24	12941	10598	9375	15368	12455	9551	6027	1883
111	2	Arkhangelsk oblast	12	13708	3706	9635	11603	571	3135	5929	1968	585	1505	50772	101574	110598	9878	40894	50802	9024	725	13700	10542	9532	17305	13046	8569	4586	1238
112	2	Astrakhan oblast	12	2853	0	0	0	0	0	0	0	0	2852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	73	7	40	46	1	6	33	6	7	19	79	416	450	16	63	337	34	15	11286	10400	9783	13074	10785	10339	5296	2051
115	2	Bryansk oblast	12	638	573	632	635	223	350	59	3	0	3	6561	7136	7153	2849	3712	575	17	0	11450	11291	11265	12761	10610	9803	6539	0
117	2	Vladimir oblast	12	1008	428	953	980	44	384	525	27	0	28	5318	9965	10111	634	4684	4647	146	0	12425	10456	10317	14441	12189	8854	5467	0
118	2	Volgograd oblast	12	1703	0	0	10	0	0	0	10	9	1684	0	0	46	0	0	0	46	16	0	0	4600	0	0	0	4790	1731
119	2	Vologda oblast	12	7900	5368	6699	7061	1124	4244	1331	362	29	810	74799	87177	88871	17980	56819	12378	1694	31	13934	13013	12586	16004	13387	9301	4672	1076
120	2	Voronezh oblast	12	473	3	50	147	0	3	47	97	255	70	29	525	1066	0	29	496	541	515	9667	10500	7252	0	9473	10452	5550	2022
122	2	Nizhni Novgorod obl	12	3318	1525	3175	3243	86	1439	1650	68	0	74	19088	33794	34189	1094	17994	14706	395	0	12517	10644	10542	12648	12506	8910	5827	0
123	2	Nenets a.okr.	12	2583	0	2	33	0	0	2	31	12	2537	0	11	121	0	0	11	110	12	0	5500	3667	0	0	5941	3551	1005
124	2	Ivanovo oblast	12	848	683	840	847	26	657	157	7	0	1	9737	11148	11183	372	9365	1411	35	0	14256	13271	13203	14288	14263	8962	5244	0
127	2	Kaliningrad oblast	12	145	75	93	106	4	71	18	13	0	38	1139	1348	1436	57	1082	209	88	0	15187	14495	13547	12727	15231	11496	6580	0
128	2	Tver oblast	12	2598	2184	2423	2451	304	1880	239	28	0	146	30942	33226	33372	4240	26702	2284	146	0	14168	13713	13616	13946	14201	9555	5197	2446
129	2	Kaluga oblast	12	1038	807	1019	1031	45	762	212	12	0	6	11246	13341	13415	575	10671	2095	74	0	13936	13092	13012	12663	13999	9892	5982	0
133	2	Kirov oblast	12	5758	2811	5375	5578	693	2118	2564	203	11	167	38912	61237	62348	11554	27358	22325	1111	14	13843	11393	11177	16663	12914	8707	5469	1245
134	2	Kostroma oblast	12	3273	2202	3174	3234	326	1876	972	60	0	39	31032	40338	40611	5914	25118	9306	273	0	14093	12709	12558	18152	13391	9570	4571	1522
136	2	Samara oblast	12	370	81	105	174	0	81	24	69	65	130	795	954	1254	0	795	159	300	112	9815	9086	7207	0	9790	6588	4329	1716
138	2	Kursk oblast	12	80	48	70	71	5	43	22	1	1	7	619	846	856	73	546	227	10	2	12896	12086	12056	14068	12624	10105	7116	1906
139	2	Komi-Permyak a.okı	12	1838	1003	1703	1764	461	542	700	61	0	75	14702	21043	21364	7716	6986	6341	321	0	14658	12356	12111	16744	12900	9065	5298	1850
141	2	Leningrad oblast	12	4743	1587	3914	4103	540	1047	2327	189	37	602	22479	43980	44864	9112	13367	21501	884	39	14164	11237	10934	16863	12768	9242	4673	1042
142	2	Lipetsk oblast	12	80	33	58	79	8	25	25	21	1	0	430	648	767	93	337	218	119	1	13030	11172	9709	12358	13213	8582	5685	2073
146	2	Moscow oblast	12	2008	1553	1891	1955	145	1408	338	64	0	53	22118	25131	25464	2072	20046	3013	333	0	14242	13290	13025	14260	14241	8909	5228	0
147	2	Murmansk oblast	12	3965	1	7	134	0	1	6	127	366	3465	12	52	536	0	12	40	484	476	12000	7429	4000	0	10591	6544	3820	1298
149	2	Novgorod oblast	12	3273	2236	2910	2941	252	1984	674	31	0	331	31018	37372	37526	3634	27384	6354	154	0	13872	12843	12760	14449	13803	9426	4909	1057
153	2	Orenburg oblast	12	1840	2	6	18	0	2	4	12	6	1817	16	43	97	0	16	27	54	8	8000	7167	5389	0	9663	7315	4673	1295
154	2	Oryel oblast	12	53	41	51	52	7	34	10	1	0	0	497	590	595	98	399	93	5	0	12122	11569	11442	13029	11726	9359	6865	0
156	2	Penza oblast	12	575	243	384	521	6	237	141	137	35	19	2651	3653	4354	73	2578	1002	701	46	10909	9513	8357	12523	10885	7125	5107	1319
157	2	Perm oblast	12	5435	3331	4332	4587	1064	2267	1001	255	21	826	47580	56599	57944	17671	29909	9019	1345	25	14284	13065	12632	16604	13194	9006	5281	1165
158	2	Pskov oblast	12	2258	1392	2054	2071	42	1350	662	17	0	187	19810	25855	25955	594	19216	6045	100	0	14231	12588	12533	14200	14236	9125	5906	0
160	2	Rostov oblast	12	313	0	0	52	0	0	0	52	13	247	0	0	286	0	0	0	286	26	0	0	5500	0	0	0	5451	2030
161	2	Ryazan oblast	12	1050	575	995	1050	171	404	420	55	0	0	6428	10133	10455	2152	4276	3705	322	0	11179	10184	9957	12592	10573	8828	5867	920
163	2	Saratov oblast	12	845	0	18	50	0	0	18	32	66	729	0	154	323	0	0	154	169	126	0	8556	6460	0	0	8723	5222	1918
166	2	Smolensk oblast	12	563	509	535	538	1	508	26	3	0	24	7695	7969	7996	20	7675	274	27	0	15118	14895	14862	15190	15100	10557	8468	0
168	2	Tambov oblast	12	255	132	227	246	28	104	95	19	8	0	1496	2306	2424	310	1186	810	118	15	11333	10159	9854	11084	11368	8496	6100	1925
170	2	Tula oblast	12	213	188	208	212	14	174	20	4	0	0	2819	3015	3037	260	2559	196	22	0	14995	14495	14325	18108	14691	9582	6131	0
173	2	Ulyanovsk oblast	12	780	86	232	540	0	86	146	308	115	125	848	1686	2967	0	848	838	1281	148	9860	7267	5494	0	9878	5738	4157	1285
178	2	Yaroslavl oblast	12	850	799	811	811	19	780	12	0	0	38	11434	11555	11556	270	11164	121	1	0	14310	14248	14249	13933	14314	9743	5035	2447
179	2	Adigei Republic	12	225	69	105	119	3	66	36	14	4	101	1089	1479	1584	72	1017	390	105	10	15783	14086	13311	21025	15319	10853	7518	2467
180	2	Bashkortostan Repu	12	3123	467	972	1548	80	387	505	576	369	1206	5565	9262	11687	1237	4328	3697	2425	529	11916	9529	7550	15553	11172	7322	4209	1435
182	2	Daghestn Republic	12	3370	71	147	445	13	58	76	298	180	2738	916	1652	3553	196	720	736	1901	372	12901	11238	7984	15690	12510	9670	6376	2067
183	2	Kabardino-Balkarian	12	555	137	199	212	40	97	62	13	2	341	2215	2876	2952	759	1456	661	76	4	16168	14452	13925	18902	14966	10662	6042	1878
185	2	Kalmyk-Khalm-Tang	12	3825	0	0	0	0	0	0	0	0	3825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2	Karelia Republic	12	8518	994	4961	6703	275	719	3967	1742	790	1022	13328	47919	56085	4714	8614	34591	8166	1373	13408	9659	8367	17151	11975	8721	4688	1739
187	2	Komi Republic	12	14183	1600	6811	9925	620	980	5211	3114	1270	2988	22676	66715	82099	10580	12096	44039	15384	2050	14173	9795	8272	17061	12344	8451	4941	1614
188	2	Mari-El Republic	12	943	373	794	865	3	370	421	71	5	72	4490	7917	8231	41	4449	3427	314	7	12038	9971	9516	12240	12025	8133	4429	1468
189	2	Mordovian SSR	12	593	346	522	575	85	261	176	53	12	6	4071	5537	5810	1062	3009	1466	273	11	11766	10607	10104	12520	11540	8321	5155	865
190	2	North-Ossetian SSR	12	405	109	131	167	32	77	22	36	1	238	1895	2143	2364	634	1261	248	221	1	17385	16359	14156	19764	16384	11525	6113	2003
191	2	Karachai-Cherkess I	12	895	111	199	223	33	78	88	24	7	665	1907	2862	3002	704	1203	955	140	13	17180	14382	13462	21122	15422	10830	5787	1941
192	2	Tatarstan Republic	12	540	145	292	433	0	145	147	141	51	55	1553	2637	3245	0	1553	1084	608	79	10710	9031	7494	0	10717	7357	4299	1551
194	2	Udmurt Republic	12	1400	880	1300	1318	137	743	420	18	0	82	11245	14962	15061	2186	9059	3717	99	0	12778	11509	11427	15996	12197	8844	5371	924
196	2	Checheno-Ingush R	12	1028	176	300	455	37	139	124	155	21	551	2623	3980	4921	650	1973	1357	941	40	14903	13267	10815	17465	14202	10955	6058	1906

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A12 PRODUCTION POTENTIALS FOR TRADITIONAL PRODUCTION FORESTRY SPECIES - ACCESSIBLE AREAS, EXCLUDING CULTIVATED AND URBAN AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)								Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
197	2	Chuvash Republic	12	643	176	441	523	7	169	265	82	95	25	2085	4188	4498	83	2002	2103	310	159	11847	9497	8600	12444	11876	7931	3763	1680
101	3	Altai Kray	12	6125	1475	3067	4025	304	1171	1592	958	253	1847	17474	30268	34952	4392	13082	12794	4684	414	11847	9869	8684	14440	11169	8039	4891	1635
102	3	Gorno-Altai Republic	12	2668	235	373	532	54	181	138	159	87	2048	2629	3656	4360	742	1887	1027	704	120	11187	9802	8195	13798	10423	7423	4413	1384
104	3	Krasnoyarsk Kray	12	13728	3865	6961	8522	447	3418	3096	1561	858	4348	43831	67418	75109	6079	37752	23587	7691	1361	11340	9685	8814	13592	11046	7619	4928	1587
105	3	Primorski Kray	12	6520	486	1367	1963	122	364	881	596	668	3889	6085	12534	15432	1763	4322	6449	2898	1256	12521	9169	7861	14467	11877	7316	4861	1880
106	3	Taymyr a.okr.	12	2825	0	0	0	0	0	0	0	0	2825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	8873	644	1549	2401	30	614	905	852	699	5770	7422	14341	18214	375	7047	6919	3873	1017	11525	9258	7586	12570	11469	7649	4545	1454
110	3	Amur oblast	12	8108	2085	3449	5036	398	1687	1364	1587	559	2512	23064	34371	41954	4970	18094	11307	7583	875	11062	9965	8331	12472	10728	8288	4777	1566
116	3	Evenk a.okr	12	6128	1	9	34	0	1	8	25	197	5896	7	65	173	0	7	58	108	256	7000	7222	5088	0	10908	6966	4282	1298
121	3	Yevrey (Jewish) a.ol	12	1450	459	663	839	88	371	204	176	41	570	5787	7235	8152	1143	4644	1448	917	71	12608	10913	9716	12918	12529	7088	5213	1744
125	3	Irkutsk oblast	12	16035	2472	4800	6642	37	2435	2328	1842	1454	7939	28680	46091	54319	425	28255	17411	8228	2227	11602	9602	8178	11485	11606	7478	4468	1531
126	3	Ust-Orda Buryat a.o	12	693	41	117	252	1	40	76	135	43	398	412	993	1514	16	396	581	521	59	10049	8487	6008	11026	9955	7683	3851	1396
130	3	Kamchatka oblast	12	3853	6	329	1056	0	6	323	727	260	2537	52	2844	6391	0	52	2792	3547	402	8667	8644	6052	0	9412	8652	4876	1545
131	3	Koryak a.okr.	12	5010	0	36	129	0	0	36	93	279	4602	0	249	617	0	0	249	368	318	0	6917	4783	0	0	6904	3938	1142
132	3	Kemerovo oblast	12	3498	1405	2060	2445	257	1148	655	385	214	839	16440	21277	22954	3343	13097	4837	1677	338	11701	10329	9388	12991	11410	7388	4361	1581
135	3	Chukchi a.okr.	12	8158	0	0	0	0	0	0	0	0	8155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	2403	219	823	1211	0	219	604	388	233	959	2323	6993	8874	0	2323	4670	1881	370	10607	8497	7328	0	10612	7734	4844	1592
144	3	Magadan oblast	12	9245	0	6	179	0	0	6	173	322	8744	0	42	935	0	0	42	893	429	0	7000	5223	0	0	7186	5151	1329
150	3	Novosibirsk oblast	12	6220	1179	2676	3282	161	1018	1497	606	165	2773	13378	25647	28599	2167	11211	12269	2952	268	11347	9584	8714	13429	11007	8196	4873	1630
152	3	Omsk oblast	12	5035	864	2029	2949	27	837	1165	920	197	1889	10256	20066	24382	369	9887	9810	4316	340	11870	9890	8268	13574	11814	8419	4691	1725
164	3	Sakhalin oblast	12	4760	324	966	1695	0	324	642	729	246	2815	4028	9031	12854	0	4028	5003	3823	424	12432	9349	7583	0	12416	7791	5242	1722
165	3	Sverdlovsk oblast	12	10428	6302	7597	8185	1379	4923	1295	588	42	2201	82205	92474	95140	21857	60348	10269	2666	67	13044	12172	11624	15850	12259	7929	4536	1582
167	3	Aga-Buryat a.okr.	12	630	0	13	149	0	0	13	136	115	366	0	76	588	0	0	76	512	160	0	5846	3946	0	0	5970	3752	1392
169	3	Tomsk oblast	12	6968	3104	4652	5405	320	2784	1548	753	93	1469	36118	48858	52709	4298	31820	12740	3851	161	11636	10503	9752	13442	11428	8228	5114	1727
171	3	Tyumen oblast	12	4585	1500	2724	3177	70	1430	1224	453	227	1181	15426	24968	27178	995	14431	9542	2210	359	10284	9166	8555	14218	10093	7793	4877	1584
172	3	Khanty-Mansi a.okr.	12	6780	1170	2330	3329	60	1110	1160	999	257	3194	14323	23966	29102	895	13428	9643	5136	459	12242	10286	8742	14842	12100	8312	5144	1782
174	3	Yamalo-Nenets a.ok	12	2678	0	38	166	0	0	38	128	335	2177	0	274	946	0	0	274	672	594	0	7211	5699	0	0	7288	5245	1774
175	3	Chelyabinsk oblast	12	2578	314	624	1020	53	261	310	396	392	1164	3844	5986	7516	851	2993	2142	1530	601	12242	9593	7369	16014	11445	6904	3859	1532
176	3	Chita oblast	12	7260	51	519	1457	0	51	468	938	983	4819	517	3694	7707	2	515	3177	4013	1385	10137	7118	5290	9946	10135	6786	4276	1409
181	3	Buryat Republic	12	6045	66	489	1132	1	65	423	643	959	3955	716	3876	6666	14	702	3160	2790	1454	10848	7926	5889	15405	10882	7468	4342	1516
193	3	Tuva Republic	12	4778	10	137	628	0	10	127	491	492	3658	104	1016	3078	0	104	912	2062	702	10400	7416	4901	0	10458	7186	4202	1427
195	3	Khakass Republic	12	2370	350	711	1142	35	315	361	431	136	1092	3738	6410	8248	438	3300	2672	1838	185	10680	9015	7222	12641	10479	7397	4263	1361
198	3	Sakha (Yakutia) Rep	12	46870	69	737	2521	0	69	668	1784	2556	41793	727	5636	13096	0	727	4909	7460	3434	10536	7647	5195	0	10548	7353	4181	1343
		RUSSIA WEST		**122175**	**40271**	**72526**	**83447**	**7645**	**32626**	**32255**	**10921**	**4520**	**34161**	**555082**	**838632**	**891922**	**123631**	**431451**	**283550**	**53290**	**7155**	**13784**	**11563**	**10688**	**16171**	**13224**	**8791**	**4880**	**1583**
		RUSSIA EAST		**223305**	**28696**	**51851**	**71503**	**3844**	**24852**	**23155**	**19652**	**13362**	**138424**	**339586**	**520355**	**611759**	**55134**	**284452**	**180769**	**91404**	**20106**	**11834**	**10036**	**8556**	**14343**	**11446**	**7807**	**4651**	**1505**
		RUSSIA TOTAL		**345480**	**68967**	**124377**	**154950**	**11489**	**57478**	**55410**	**30573**	**17882**	**172585**	**894668**	**1358987**	**1503681**	**178765**	**715903**	**464319**	**144694**	**27261**	**12972**	**10926**	**9704**	**15560**	**12455**	**8380**	**4733**	**1524**
211	11	Beijing	12	705	78	250	361	1	77	172	111	17	326	1155	2846	3471	20	1135	1691	625	28	14808	11384	9615	15139	14710	9812	5630	1670
212	11	Tianjin	12	70	1	7	11	0	1	6	4	2	57	10	69	90	0	10	59	21	4	10000	9857	8182	0	15571	9706	5706	2032
213	11	Hebei	12	5220	877	2252	3359	104	773	1375	1107	192	1668	9673	21624	28078	1058	8615	11951	6454	393	11030	9602	8359	10148	11138	8692	5828	2052
214	11	Shanxi	12	3418	304	827	1339	46	258	523	512	567	1511	3771	9006	12124	629	3142	5235	3118	1247	12405	10890	9055	13816	12170	10005	6088	2199
237	11	Shandong	12	1513	223	484	645	5	218	261	161	30	837	3489	7085	7977	86	3403	3596	892	71	15646	14638	12367	17718	15585	13760	5551	2392
241	11	Henan	12	4635	1908	2490	2874	229	1679	582	384	100	1661	29716	36356	38888	4158	25558	6640	2532	214	15574	14601	13531	18131	15222	11416	6588	2142
221	12	Liaoning	12	3945	1768	2496	2953	724	1044	728	457	244	747	25908	33293	35774	11528	14380	7385	2481	474	14654	13339	12114	15914	13777	10143	5427	1943
222	12	Jilin	12	7378	2649	4172	5250	1091	1558	1523	1078	194	1933	35312	51043	56763	15223	20089	15731	5720	315	13330	12235	10812	13946	12897	10329	5304	1622
223	12	Heilongjiang	12	15713	7444	10527	12558	2469	4975	3083	2031	515	2639	92500	121196	132115	33390	59110	28696	10919	855	12426	11513	10520	13525	11882	9308	5376	1659
231	13	Shanghai	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
232	13	Jiangsu	12	583	222	325	360	20	202	103	35	1	222	3460	4540	4773	369	3091	1080	233	1	15586	13969	13258	18182	15319	10501	6570	2387
233	13	Zhejiang	12	3165	535	1007	1120	73	462	472	113	18	2026	7453	12119	12771	1134	6319	4666	652	34	13931	12035	11403	15477	13672	9879	5754	1888
234	13	Anhui	12	4535	1762	2792	2880	554	1208	1030	88	16	1639	27481	37988	38586	9950	17531	10507	598	41	15596	13606	13398	17968	14515	10204	6767	2548
236	14	Jiangxi	12	7530	2941	3975	4236	755	2186	1034	261	73	3221	43680	54191	55773	13772	29908	10511	1582	132	14852	13633	13166	18239	13682	10161	6068	1809
242	14	Hubei	12	7245	3471	4674	4814	447	3024	1203	140	0	2430	52628	65104	65965	8039	44589	12476	861	0	15162	13929	13703	17972	14745	10368	6146	1949
243	14	Hunan	12	9118	3055	4200	4424	439	2616	1145	224	71	4622	44663	55963	57202	7923	36740	11300	1239	131	14620	13325	12930	18054	14045	9866	5524	1831
235	15	Fujian	12	6195	554	1464	1793	9	545	910	329	63	4339	7681	16473	18420	167	7514	8792	1947	122	13865	11252	10273	18152	13775	9666	5923	1942
244	15	Guangdong	12	7700	1580	2677	2942	349	1231	1097	265	42	4716	22846	32739	34217	6463	16383	9893	1478	73	14459	12230	11631	18508	13312	9016	5572	1762
245	15	Guangxi	12	11093	3349	5761	6288	900	2449	2412	527	143	4663	52660	75455	78617	17690	34970	22795	3162	283	15724	13098	12503	19659	14279	9452	6001	1985
246	15	Hainan	12	475	29	107	212	5	24	78	105	71	193	356	965	1435	74	282	609	470	102	12276	9019	6769	15944	11712	7847	4472	1447
251	16	Sichuan	12	15890	1247	2021	2224	296	951	774	203	27	13638	19457	27434	28618	5711	13746	7977	1184	43	15603	13574	12868	19262	14447	10302	5848	1588
252	16	Guizhou	12	5543	2116	3336	3594	360	1756	1220	258	0	1949	31853	43987	45393	6742	25111	12134	1406	1	15053	13186	12630	18708	14303	9946	5456	2196
253	16	Yunnan	12	20278	5329	6730	7581	2101	3228	1401	851	684	12011	98036	111800	115925	46683	51353	13764	4125	1082	18397	16612	15292	22214	15908	9822	4847	1580
215	17	Nei Mongol	12	48138	2820	5108	10913	593	2227	2288	5805	2090	35134	31895	48267	76609	8941	22954	16372	28342	3411	11310	9449	7020	15069	10306	7156	4882	1632
261	17	Shaanxi	12	5088	874	1381	1650	113	761	507	269	81	3357	12999	18042	19610	2079	10920	5043	1568	180	14873	13064	11885	18460	14349	9940	5837	2211
262	17	Gansu	12	11770	606	1124	1623	144	462	518	499	170	9978	8653	13565	16289	2558	6095	4912	2724	305	14279	12069	10036	17822	13183	9491	5463	1796
264	17	Ningxia	12	1600	19	43	301	5	14	24	258	61	1238	236	409	1752	79	157	173	1343	101	12421	9512	5821	16179	11537	7225	5196	1658
265	17	Xinjiang	12	28288	101	227	510	23	78	126	283	208	27569	1239	2206	3716	376	863	967	1510	360	12267	9718	7286	16052	11028	7651	5342	1732
254	18	Xizang	12	29138	225	386	520	74	151	161	134	89	28529	3391	4469	5042	1416	1975	1078	573	135	15071	11578	9696	19215	13116	6693	4267	1510
263	18	Qinghai	12	20918	33	113	678	2	31	80	565	334	19906	283	863	3467	18	265	580	2604	534	8576	7637	5114	9331	8590	7244	4610	1599
272	19	Hongkong	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**286887**	**46120**	**70956**	**88013**	**11931**	**34189**	**24836**	**17057**	**6103**	**192759**	**672484**	**909097**	**999460**	**206276**	**466208**	**236613**	**90363**	**10672**	**14581**	**12812**	**11356**	**17289**	**13636**	**9527**	**5298**	**1749**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A13 PRODUCTION POTENTIALS FOR TRADITIOONAL PRODUCTION FORESTRY SPECIES - ACCESSIBLE AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
					VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	1163	0	9	50	0	0	9	41	99	1013	0	61	241	0	0	61	180	132	0	6778	4820	0	0	6871	4370	1337
11	1	Armenia	12	135	7	13	20	0	7	6	7	8	108	69	103	132	0	69	34	29	12	9857	7923	6600	0	10689	6221	3910	1585
12	1	Azerbaijan	12	698	19	41	78	0	19	22	37	58	462	228	366	571	3	225	138	205	124	12000	8927	7321	13925	12082	6243	5603	2141
13	1	Byelorussia	12	5098	2527	4565	4664	432	2095	2038	99	0	433	35440	57723	58344	6038	29402	22283	621	0	14025	12645	12509	13971	14033	10935	6272	2026
14	1	Estonia	12	975	417	592	621	7	410	175	29	4	350	5304	6820	6945	94	5210	1516	125	4	12719	11520	11184	13610	12706	8660	4274	1082
15	1	Georgia	12	1995	42	82	151	11	31	40	69	56	1789	621	1068	1519	193	428	447	451	124	14786	13024	10060	18070	13971	11126	6575	2200
16	1	Kazakhstan	12	4208	56	306	594	3	53	250	288	183	3431	492	2406	3714	28	464	1914	1308	295	8786	7863	6253	8726	8804	7657	4548	1612
17	1	Kirghiztan	12	2290	0	15	60	0	0	15	45	82	2148	3	111	290	0	3	108	179	127	3000	7400	4833	0	8795	7021	4011	1550
18	1	Latvia	12	1748	553	1450	1585	49	504	897	135	2	161	6850	15078	15829	684	6166	8228	751	3	12387	10399	9987	14084	12245	9172	5556	1392
19	1	Lithuania	12	1605	820	1369	1438	30	790	549	69	0	167	12095	17793	18241	431	11664	5698	448	0	14750	12997	12685	14552	14762	10375	6525	1401
20	1	Moldavia	12	85	25	51	71	3	22	26	20	6	8	342	585	712	41	301	243	127	13	13680	11471	10028	15923	13665	9236	6400	2047
21	1	Tajikistan	12	2640	0	18	151	0	0	18	133	151	2338	0	144	839	0	0	144	695	297	0	8000	5556	0	0	8149	5218	1965
22	1	Turkmenistan	12	1198	0	0	8	0	0	0	8	37	1153	0	0	48	0	0	0	48	76	0	0	6000	0	0	6066	2051
23	1	Ukraine	12	4743	1605	3085	3530	382	1223	1480	445	51	1161	24070	40563	42850	6528	17542	16493	2287	106	14997	13148	12139	17100	14341	11142	5134	2096
		FSU REPUBLICS		**27418**	**6071**	**11587**	**12971**	**917**	**5154**	**5516**	**1384**	**638**	**13709**	**85514**	**142760**	**150034**	**14040**	**71474**	**57246**	**7274**	**1181**	**14086**	**12321**	**11567**	**15311**	**13868**	**10378**	**5256**	**1851**
103	2	Krasnodar Kray	12	1335	242	392	452	31	211	150	60	24	858	3689	5272	5686	624	3065	1583	414	51	15244	13449	12580	20138	14493	10559	6912	2104
107	2	Stavropol Kray	12	20	0	2	11	0	0	2	9	0	9	0	19	71	0	0	19	52	1	0	9500	6455	0	0	7849	6147	2080
111	2	Arkhangelsk oblast	12	11643	3413	8289	9915	533	2880	4876	1626	477	1244	46953	88831	96296	9229	37724	41878	7465	599	13757	10717	9712	17320	13099	8588	4591	1257
112	2	Astrakhan oblast	12	48	0	0	0	0	0	0	0	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	73	7	40	46	1	6	33	6	7	19	79	416	450	16	63	337	34	15	11286	10400	9783	13074	10785	10339	5296	2051
115	2	Bryansk oblast	12	638	573	632	635	223	350	59	3	0	3	6561	7136	7153	2849	3712	575	17	0	11450	11291	11265	12761	10610	9803	6539	0
117	2	Vladimir oblast	12	995	425	942	969	43	382	517	27	0	26	5283	9857	10003	618	4665	4574	146	0	12431	10464	10323	14437	12196	8850	5467	0
118	2	Volgograd oblast	12	203	0	0	10	0	0	0	10	9	184	0	0	46	0	0	0	46	16	0	0	4600	0	0	0	4790	1731
119	2	Vologda oblast	12	7190	4952	6130	6480	1043	3909	1178	350	29	681	69578	80488	82128	16742	52836	10910	1640	31	14050	13130	12674	16046	13517	9261	4684	1076
120	2	Voronezh oblast	12	245	0	37	102	0	0	37	65	127	16	0	409	768	0	0	409	359	260	0	11054	7529	0	0	10938	5550	2044
122	2	Nizhni Novgorod obl	12	3093	1446	2967	3025	84	1362	1521	58	0	67	18154	31736	32078	1066	17088	13582	342	0	12555	10696	10604	12653	12542	8930	5876	0
123	2	Nenets a.okr.	12	255	0	2	25	0	0	2	23	11	220	0	10	91	0	0	10	81	11	0	5000	3640	0	0	5945	3565	1024
124	2	Ivanovo oblast	12	823	670	815	822	25	645	145	7	0	1	9582	10891	10926	355	9227	1309	35	0	14301	13363	13292	14296	14308	9002	5244	0
127	2	Kaliningrad oblast	12	115	67	77	86	4	63	10	9	0	28	1036	1145	1206	57	979	109	61	0	15463	14870	14023	12727	15499	11196	6663	0
128	2	Tver oblast	12	2510	2116	2344	2371	291	1825	228	27	0	138	29986	32159	32301	4065	25921	2173	142	0	14171	13720	13623	13945	14204	9526	5202	2448
129	2	Kaluga oblast	12	980	759	963	974	45	714	204	11	0	6	10527	12538	12603	575	9952	2011	65	0	13870	13020	12939	12663	13931	9870	6005	0
133	2	Kirov oblast	12	5580	2718	5214	5404	662	2056	2496	190	11	164	37622	59336	60377	11063	26559	21714	1041	14	13842	11380	11173	16711	12915	8699	5482	1245
134	2	Kostroma oblast	12	3073	2072	2980	3035	265	1807	908	55	0	37	29037	37687	37937	4765	24272	8650	250	0	14014	12647	12500	17963	13431	9531	4535	1327
136	2	Samara oblast	12	365	81	105	173	0	81	24	68	64	128	795	954	1251	0	795	159	297	110	9815	9086	7231	0	9790	6588	4342	1724
138	2	Kursk oblast	12	80	48	70	71	5	43	22	1	1	7	619	846	856	73	546	227	10	2	12896	12086	12056	14068	12624	10105	7116	1906
139	2	Komi-Permyak a.okr	12	1720	950	1595	1651	444	506	645	56	0	70	14016	19856	20149	7457	6559	5840	293	0	14754	12449	12204	16796	12975	9051	5266	1851
141	2	Leningrad oblast	12	4215	1421	3471	3635	494	927	2050	164	36	545	20223	39238	40001	8338	11885	19015	763	37	14232	11305	11004	16884	12825	9277	4659	1044
142	2	Lipetsk oblast	12	80	33	58	79	8	25	25	21	1	0	430	648	767	93	337	218	119	1	13030	11172	9709	12358	13213	8582	5685	2073
146	2	Moscow oblast	12	1835	1426	1727	1782	114	1312	301	55	0	51	20449	23126	23411	1639	18810	2677	285	0	14340	13391	13137	14333	14332	8886	5134	0
147	2	Murmansk oblast	12	2660	1	7	108	0	1	6	101	320	2231	11	51	441	0	11	40	390	420	11000	7286	4083	0	10592	6544	3860	1310
149	2	Novgorod oblast	12	3133	2157	2805	2836	243	1914	648	31	0	296	30041	36164	36317	3503	26538	6123	153	0	13927	12893	12806	14421	13864	9450	4908	1057
153	2	Orenburg oblast	12	53	2	6	18	0	2	4	12	6	30	16	43	97	0	16	27	54	8	8000	7167	5389	0	9663	7315	4673	1298
154	2	Oryel oblast	12	53	41	51	52	7	34	10	1	0	0	497	590	595	98	399	93	5	0	12122	11569	11442	13029	11726	9359	6865	0
156	2	Penza oblast	12	575	243	384	521	6	237	141	137	35	19	2651	3653	4354	73	2578	1002	701	46	10909	9513	8357	12523	10885	7125	5107	1319
157	2	Perm oblast	12	5190	3226	4123	4364	1007	2219	897	241	20	806	46046	54121	55381	16711	29335	8075	1260	24	14273	13127	12690	16598	13222	8999	5230	1174
158	2	Pskov oblast	12	2053	1290	1874	1885	33	1257	584	11	0	167	18434	23804	23874	467	17967	5370	70	0	14290	12702	12665	14186	14290	9193	6314	0
160	2	Rostov oblast	12	18	0	0	10	0	0	0	10	1	7	0	0	66	0	0	0	66	1	0	0	6600	0	0	0	6509	1837
161	2	Ryazan oblast	12	730	420	689	730	120	300	269	41	0	0	4708	7050	7291	1519	3189	2342	241	0	11210	10232	9988	12619	10627	8721	5868	912
163	2	Saratov oblast	12	375	0	18	42	0	0	18	24	62	272	0	154	285	0	0	154	131	121	0	8556	6786	0	0	8723	5554	1951
166	2	Smolensk oblast	12	563	509	535	538	1	508	26	3	0	24	7695	7969	7996	20	7675	274	27	0	15118	14895	14862	15190	15100	10557	8468	0
168	2	Tambov oblast	12	255	132	227	246	28	104	95	19	8	0	1496	2306	2424	310	1186	810	118	15	11333	10159	9854	11084	11368	8496	6100	1925
170	2	Tula oblast	12	200	177	197	200	14	163	20	3	0	0	2643	2831	2852	260	2383	188	21	0	14932	14371	14260	18108	14649	9561	6154	0
173	2	Ulyanovsk oblast	12	763	86	232	537	0	86	146	305	110	116	848	1686	2955	0	848	838	1269	141	9860	7267	5503	0	9878	5738	4166	1282
178	2	Yaroslavl oblast	12	783	740	752	752	15	725	12	0	0	30	10593	10708	10709	209	10384	115	1	0	14315	14239	14241	13960	14316	9771	5035	2457
179	2	Adigei Republic	12	153	35	59	70	1	34	24	11	3	79	544	808	895	29	515	264	87	9	15543	13695	12786	20912	15234	11104	7717	2516
180	2	Bashkortostan Repu	12	2568	435	894	1417	73	362	459	523	286	864	5325	8693	10899	1184	4141	3368	2206	426	12241	9724	7692	16271	11431	7343	4216	1487
182	2	Daghestn Republic	12	240	7	18	43	1	6	11	25	27	172	77	182	348	10	67	105	166	58	11000	10111	8093	16674	11996	9909	6595	2187
183	2	Kabardino-Balkarian	12	165	77	109	112	17	60	32	3	0	53	1250	1598	1615	333	917	348	17	0	16234	14661	14420	19758	15299	10802	5651	1923
185	2	Kalmyk-Khalm-Tang	12	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2	Karelia Republic	12	6885	840	3854	5299	267	573	3014	1445	731	856	11452	37880	44486	4588	6864	26428	6606	1274	13633	9829	8395	17159	11984	8769	4572	1744
187	2	Komi Republic	12	10830	1310	5528	8273	496	814	4218	2745	1054	1504	18515	54049	67594	8438	10077	35534	13545	1693	14134	9777	8170	17025	12380	8425	4934	1607
188	2	Mari-El Republic	12	878	346	739	809	3	343	393	70	5	64	4156	7346	7655	41	4115	3190	309	7	12012	9940	9462	12240	12012	8125	4413	1468
189	2	Mordovian SSR	12	478	265	408	459	64	201	143	51	12	6	3115	4310	4570	804	2311	1195	260	11	11755	10564	9956	12534	11473	8336	5134	865
190	2	North-Ossetian SSR	12	135	54	67	82	14	40	13	15	0	53	989	1144	1231	311	678	155	87	1	18315	17075	15012	22653	16906	12130	5968	2109
191	2	Karachai-Cherkess F	12	473	58	107	117	20	38	49	10	4	351	1064	1616	1675	445	619	552	59	8	18345	15103	14316	22430	16284	11194	5821	1944
192	2	Tatarstan Republic	12	533	141	287	428	0	141	146	141	51	54	1513	2584	3188	0	1513	1071	604	79	10730	9003	7449	0	10701	7347	4292	1551
194	2	Udmurt Republic	12	1400	880	1300	1318	137	743	420	18	0	82	11245	14962	15061	2186	9059	3717	99	0	12778	11509	11427	15996	12197	8844	5371	924
196	2	Checheno-Ingush R	12	330	77	127	135	14	63	50	8	4	190	1186	1752	1803	255	931	566	51	10	15403	13795	13356	18555	14715	11312	6385	2201
197	2	Chuvash Republic	12	643	176	441	523	7	169	265	82	95	25	2085	4188	4498	83	2002	2103	310	159	11847	9497	8600	12444	11876	7931	3763	1680
101	3	Altai Kray	12	2920	811	1677	1992	146	665	866	315	139	790	9379	16272	17761	2068	7311	6893	1489	224	11565	9703	8916	14147	11000	7964	4719	1619

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used:
VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A13 PRODUCTION POTENTIALS FOR TRADITIOONAL PRODUCTION FORESTRY SPECIES - ACCESSIBLE AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha)									Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
					VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
102	3	Gorno-Altai Republic	12	1693	202	322	455	43	159	120	133	53	1185	2237	3135	3738	590	1647	898	603	76	11074	9736	8215	13641	10384	7459	4545	1446
104	3	Krasnoyarsk Kray	12	12555	3368	6188	7646	324	3044	2820	1458	852	4057	38238	59651	66783	4445	33793	21413	7132	1352	11353	9640	8734	13706	11101	7592	4893	1587
105	3	Primorski Kray	12	5300	378	930	1360	113	265	552	430	604	3337	4703	8973	11128	1627	3076	4270	2155	1133	12442	9648	8182	14449	11622	7739	5008	1877
106	3	Taymyr a.okr.	12	988	0	0	0	0	0	0	0	0	987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	6658	471	1069	1777	17	454	598	708	529	4348	5302	9880	13121	207	5095	4578	3241	745	11257	9242	7384	11976	11234	7650	4576	1407
110	3	Amur oblast	12	6083	1370	2420	3629	183	1187	1050	1209	470	1983	14604	23233	28897	2231	12373	8629	5664	727	10660	9600	7963	12183	10427	8218	4684	1546
116	3	Evenk a.okr	12	5605	1	9	34	0	1	8	25	195	5376	7	65	173	0	7	58	108	253	7000	7222	5088	0	10908	6958	4282	1299
121	3	Yevrey (Jewish) a.ob	12	750	211	293	378	42	169	82	85	34	339	2655	3260	3691	551	2104	605	431	59	12583	11126	9765	13006	12465	7395	5093	1738
125	3	Irkutsk oblast	12	14285	2361	4557	6235	35	2326	2196	1678	1335	6716	27351	43739	51287	405	26946	16388	7548	2043	11584	9598	8226	11523	11586	7463	4498	1530
126	3	Ust-Orda Buryat a.ok	12	413	38	96	168	1	37	58	72	12	232	386	832	1131	16	370	446	299	15	10158	8667	6732	11026	9915	7722	4150	1277
130	3	Kamchatka oblast	12	2035	6	219	731	0	6	213	512	198	1106	52	1868	4394	0	52	1816	2526	297	8667	8530	6011	0	9405	8512	4933	1502
131	3	Koryak a.okr.	12	873	0	1	24	0	0	1	23	26	823	0	8	101	0	0	8	93	30	0	8000	4208	0	0	6754	4078	1185
132	3	Kemerovo oblast	12	2875	1342	1972	2241	242	1100	630	269	94	540	15747	20409	21577	3138	12609	4662	1168	148	11734	10349	9628	12973	11460	7401	4344	1573
135	3	Chukchi a.okr.	12	2220	0	0	0	0	0	0	0	0	2220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	483	65	300	366	0	65	235	66	9	107	713	2442	2785	0	713	1729	343	15	10969	8140	7609	0	11040	7348	5174	1618
144	3	Magadan oblast	12	2635	0	2	66	0	0	2	64	151	2418	0	16	354	0	0	16	338	195	0	8000	5364	0	0	7216	5276	1297
150	3	Novosibirsk oblast	12	1660	548	1118	1252	56	492	570	134	17	390	6219	10727	11387	755	5464	4508	660	30	11349	9595	9095	13414	11115	7904	4929	1688
152	3	Omsk oblast	12	1958	455	1056	1372	4	451	601	316	5	581	5330	10572	11974	49	5281	5242	1402	8	11714	10011	8727	12120	11703	8722	4439	1724
164	3	Sakhalin oblast	12	4178	273	824	1502	0	273	551	678	240	2433	3425	7720	11266	0	3425	4295	3546	414	12546	9369	7501	0	12528	7800	5229	1725
165	3	Sverdlovsk oblast	12	9003	5272	6409	6956	1146	4126	1137	547	41	2006	69231	78230	80695	18011	51220	8999	2465	65	13132	12206	11601	15718	12414	7917	4506	1584
167	3	Aga-Buryat a.okr.	12	155	0	5	22	0	0	5	17	32	102	0	30	85	0	0	30	55	44	0	6000	3864	0	0	6010	3300	1378
169	3	Tomsk oblast	12	4765	2145	3287	3726	212	1933	1142	439	76	963	24979	34378	36604	2814	22165	9399	2226	132	11645	10459	9824	13258	11469	8231	5074	1737
171	3	Tyumen oblast	12	1593	500	1081	1240	42	458	581	159	48	304	5505	10025	10831	623	4882	4520	806	71	11010	9274	8735	14911	10652	7775	5083	1461
172	3	Khanty-Mansi a.okr.	12	4878	727	1614	2284	40	687	887	670	148	2445	8921	16312	19796	585	8336	7391	3484	253	12271	10107	8667	14804	12141	8329	5197	1704
174	3	Yamalo-Nenets a.ok	12	1173	0	33	133	0	0	33	100	266	774	0	237	765	0	0	237	528	469	0	7182	5752	0	0	7304	5288	1762
175	3	Chelyabinsk oblast	12	1520	233	463	731	52	181	230	268	101	687	2875	4394	5498	839	2036	1519	1104	163	12339	9490	7521	16047	11253	6605	4120	1612
176	3	Chita oblast	12	3128	24	169	601	0	24	145	432	474	2052	273	1316	3194	2	271	1043	1878	687	11375	7787	5314	9946	11065	7184	4348	1451
181	3	Buryat Republic	12	3718	39	312	730	1	38	273	418	580	2407	426	2472	4296	14	412	2046	1824	867	10923	7923	5885	15405	10844	7482	4360	1494
193	3	Tuva Republic	12	2858	5	89	446	0	5	84	357	347	2064	53	658	2179	0	53	605	1521	504	10600	7393	4886	0	10615	7183	4262	1450
195	3	Khakass Republic	12	1603	115	243	568	19	96	128	325	112	922	1230	2135	3486	241	989	905	1351	148	10696	8786	6137	12546	10278	7085	4152	1323
198	3	Sakha (Yakutia) Rep	12	33823	50	629	2075	0	50	579	1446	2007	29741	530	4743	10847	0	530	4213	6104	2711	10600	7541	5227	0	10594	7282	4221	1351
		RUSSIA WEST		**90232**	**37144**	**64690**	**73677**	**6903**	**30241**	**27546**	**8987**	**3631**	**12902**	**512814**	**754840**	**797710**	**111501**	**401313**	**242026**	**42870**	**5659**	**13806**	**11669**	**10827**	**16153**	**13270**	**8786**	**4770**	**1559**
		RUSSIA EAST		**144384**	**21010**	**37387**	**50740**	**2718**	**18292**	**16377**	**13353**	**9195**	**84435**	**250371**	**377732**	**439824**	**39211**	**211160**	**127361**	**62092**	**13878**	**11917**	**10103**	**8668**	**14426**	**11544**	**7777**	**4650**	**1509**
		RUSSIA TOTAL		**234616**	**58154**	**102077**	**124417**	**9621**	**48533**	**43923**	**22340**	**12826**	**97337**	**763185**	**1132572**	**1237534**	**150712**	**612473**	**369387**	**104962**	**19537**	**13124**	**11095**	**9947**	**15665**	**12620**	**8410**	**4698**	**1523**
211	11	Beijing	12	158	18	60	90	1	17	42	30	4	63	273	716	901	15	258	443	185	6	15167	11933	10011	15430	14873	10449	6112	1704
212	11	Tianjin	12	18	1	5	8	0	1	4	3	1	9	9	46	61	0	9	37	15	2	9000	9200	7625	0	15586	9386	5616	1766
213	11	Hebei	12	938	169	396	536	29	140	227	140	37	365	1832	3828	4674	306	1526	1996	846	78	10840	9667	8720	10511	10887	8807	6038	2130
214	11	Shanxi	12	695	75	212	306	10	65	137	94	101	288	979	2306	2848	142	837	1327	542	225	13053	10877	9307	13921	12880	9697	5776	2228
237	11	Shandong	12	1170	161	384	531	1	160	223	147	10	628	2532	5683	6478	27	2505	3151	795	24	15727	14799	12200	18377	15611	14115	5392	2502
241	11	Henan	12	4095	1788	2268	2589	214	1574	480	321	68	1438	27870	33301	35396	3880	23990	5431	2095	144	15587	14683	13672	18137	15244	11309	6526	2128
221	12	Liaoning	12	2870	1476	1984	2223	620	856	508	239	116	531	21655	26808	28098	9881	11774	5153	1290	225	14671	13512	12640	15925	13763	10137	5408	1946
222	12	Jilin	12	5498	2393	3775	4302	1027	1366	1382	527	21	1174	31962	46279	49437	14347	17615	14317	3158	38	13356	12259	11492	13969	12897	10361	5987	1804
223	12	Heilongjiang	12	10550	5322	7741	8715	1896	3426	2419	974	98	1738	65988	89019	94657	25667	40321	23031	5638	169	12399	11500	10861	13541	11768	9523	5790	1731
231	13	Shanghai	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
232	13	Jiangsu	12	395	161	238	270	8	153	77	32	0	124	2496	3311	3521	139	2357	815	210	1	15503	13912	13041	18056	15373	10605	6501	2386
233	13	Zhejiang	12	2828	485	914	1009	68	417	429	95	15	1803	6747	10992	11538	1052	5695	4245	546	29	13911	12026	11435	15407	13670	9889	5761	1881
234	13	Anhui	12	3683	1483	2336	2422	532	951	853	86	16	1244	23532	32276	32857	9654	13878	8744	581	41	15868	13817	13566	18133	14590	10248	6796	2548
236	14	Jiangxi	12	4348	1457	2060	2219	329	1128	603	159	29	2099	21576	27739	28715	5988	15588	6163	976	52	14809	13466	12941	18202	13822	10214	6133	1802
242	14	Hubei	12	4985	2595	3445	3528	365	2230	850	83	0	1457	39429	48203	48738	6558	32871	8774	535	0	15194	13992	13815	17992	14740	10322	6416	1947
243	14	Hunan	12	6900	2350	3193	3347	331	2019	843	154	49	3504	34288	42681	43540	5970	28318	8393	859	88	14591	13367	13009	18060	14023	9958	5568	1804
235	15	Fujian	12	5803	526	1385	1688	9	517	859	303	55	4059	7287	15609	17411	158	7129	8322	1802	107	13854	11270	10315	18040	13780	9686	5944	1955
244	15	Guangdong	12	6030	1248	2083	2275	293	955	835	192	32	3723	18099	25588	26649	5449	12650	7489	1061	57	14502	12284	11714	18587	13245	8971	5540	1768
245	15	Guangxi	12	6103	1472	2743	3068	341	1131	1271	325	95	2940	21917	33603	35550	6489	15428	11686	1947	187	14889	12250	11587	19046	13643	9193	5987	1968
246	15	Hainan	12	260	18	62	116	3	15	44	54	35	108	234	580	830	55	179	346	250	52	13000	9355	7155	16032	11686	7887	4594	1491
251	16	Sichuan	12	4970	790	1307	1441	174	616	517	134	18	3511	12244	17580	18386	3372	8872	5336	806	29	15499	13451	12759	19435	14411	10313	5996	1568
252	16	Guizhou	12	2490	895	1462	1584	152	743	567	122	0	905	13480	19171	19837	2802	10678	5691	666	1	15061	13113	12523	18378	14369	10037	5454	2196
253	16	Yunnan	12	12718	3016	3852	4422	1219	1797	836	570	436	7860	54933	62815	65565	26803	28130	7882	2750	686	18214	16307	14827	21992	15656	9432	4820	1573
215	17	Nei Mongol	12	5360	1582	2535	3272	407	1175	953	737	487	1601	19308	26542	30179	6317	12991	7234	3637	840	12205	10470	9223	15513	11058	7592	4934	1727
261	17	Shaanxi	12	1453	325	497	541	39	286	172	44	21	891	4797	6460	6704	736	4061	1663	244	47	14760	12998	12392	18941	14198	9654	5579	2264
262	17	Gansu	12	770	131	223	268	25	106	92	45	6	496	1991	2809	3054	483	1508	818	245	13	15198	12596	11396	19395	14164	8909	5476	2146
264	17	Ningxia	12	23	6	7	11	3	3	1	4	2	8	88	99	122	50	38	11	23	4	14667	14143	11091	16686	11384	8483	5329	1792
265	17	Xinjiang	12	713	8	17	31	3	5	9	14	8	674	100	170	247	36	64	70	77	13	12500	10000	7968	14129	11808	8008	5334	1664
254	18	Xizang	12	2808	151	192	230	56	95	41	38	14	2563	2605	2967	3161	1165	1440	362	194	24	17252	15453	13743	20635	15152	8868	5127	1682
263	18	Qinghai	12	248	0	2	10	0	0	2	8	2	235	0	18	61	0	0	18	43	3	0	9000	6100	0	0	7688	5105	1479
272	19	Hongkong	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CHINA TOTAL		**98880**	**30102**	**45378**	**51052**	**8155**	**21947**	**15276**	**5674**	**1776**	**46039**	**438251**	**587199**	**619215**	**137541**	**300710**	**148948**	**32016**	**3185**	**14559**	**12940**	**12129**	**16866**	**13702**	**9750**	**5643**	**1793**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used:
VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A14 PRODUCTION POTENTIALS FOR TRADITIONAL PRODUCTION FORESTRY SPECIES - EXCLUDING CULTIVATED AREAS, URBAN AREAS AND AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)								Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
2	4	Mongolia	12	147800	81	569	4858	5	76	488	4289	4901	138043	829	3936	21943	77	752	3107	18007	7189	10235	6917	4517	16415	9925	6372	4199	1467
11	1	Armenia	12	1788	37	117	212	0	37	80	95	64	1512	375	913	1283	0	375	538	370	88	10135	7803	6052	0	10094	6742	3903	1374
12	1	Azerbaijan	12	4578	32	89	387	0	32	57	298	638	3244	335	735	2666	1	334	400	1931	1389	10469	8258	6889	13782	10439	7068	6471	2175
13	1	Byelorussia	12	1680	584	1356	1435	131	453	772	79	0	244	7712	15883	16342	1801	5911	8171	459	0	13205	11713	11388	13732	13047	10579	5782	0
14	1	Estonia	12	370	177	204	209	0	177	27	5	0	160	1894	2139	2156	2	1892	245	17	0	10701	10485	10316	13463	10702	8957	3295	1587
15	1	Georgia	12	1515	59	139	209	8	51	80	70	104	1201	777	1453	1841	160	617	676	388	236	13169	10453	8809	19101	12117	8460	5504	2270
16	1	Kazakhstan	12	214330	558	2478	8337	72	486	1920	5859	2385	203608	5880	21477	50198	982	4898	15597	28721	3760	10538	8667	6021	13568	10071	8122	4902	1577
17	1	Kirghiztan	12	12170	31	143	377	3	28	112	234	199	11594	340	1109	2124	52	288	769	1015	295	10968	7755	5634	18465	10138	6872	4339	1482
18	1	Latvia	12	210	90	180	191	17	73	90	11	0	19	1206	2101	2164	239	967	895	63	0	13400	11672	11330	14365	13163	9971	5946	0
19	1	Lithuania	12	1463	690	1254	1312	93	597	564	58	0	151	9600	15083	15488	1357	8243	5483	405	0	13913	12028	11805	14640	13815	9723	6925	2143
20	1	Moldavia	12	10	2	4	6	1	1	2	2	2	2	22	45	59	12	10	23	14	6	11000	11250	9833	16649	16650	9254	7059	2263
21	1	Tajikistan	12	2655	0	0	7	0	0	0	7	7	2641	0	0	38	0	0	0	38	14	0	0	5429	0	0	0	5589	1859
22	1	Turkmenistan	12	40375	0	0	8	0	0	0	8	0	40367	0	0	53	0	0	0	53	0	0	0	6625	0	0	0	6484	0
23	1	Ukraine	12	640	267	445	510	66	201	178	65	14	115	3867	5793	6220	1065	2802	1926	427	33	14483	13018	12196	16055	13935	10815	6543	2325
		FSU REPUBLICS		**281784**	**2527**	**6409**	**13200**	**391**	**2136**	**3882**	**6791**	**3413**	**264858**	**32008**	**66731**	**100632**	**5671**	**26337**	**34723**	**33901**	**5821**	**12666**	**10412**	**7624**	**14504**	**12330**	**8945**	**4992**	**1706**
103	2	Krasnodar Kray	12	625	126	203	336	36	90	77	133	37	252	2226	3082	4016	746	1480	856	934	88	17667	15182	11952	20913	16466	11089	7023	2348
107	2	Stavropol Kray	12	965	62	197	264	9	53	135	67	15	686	787	2053	2453	137	650	1266	400	27	12694	10421	9292	15287	12250	9349	5978	1852
111	2	Arkhangelsk oblast	12	11818	545	2210	3052	71	474	1665	842	272	8481	7094	21147	24865	1205	5889	14053	3718	315	13017	9569	8147	17050	12418	8442	4416	1156
112	2	Astrakhan oblast	12	4380	0	0	0	0	0	0	0	0	4380	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	2	Belgorod oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	2	Bryansk oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	2	Vladimir oblast	12	13	3	11	11	1	2	8	0	0	2	34	107	107	15	19	73	0	0	11333	9727	9727	14635	10635	9102	0	0
118	2	Volgograd oblast	12	1890	0	0	0	0	0	0	0	0	1890	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	2	Vologda oblast	12	1253	700	974	1000	117	583	274	26	0	252	8762	11358	11465	1815	6947	2596	107	0	12517	11661	11465	15467	11918	9463	4173	941
120	2	Voronezh oblast	12	258	4	15	58	0	4	11	43	139	60	38	131	368	0	38	93	237	277	9500	8733	6345	0	9470	8479	5442	1992
122	2	Nizhni Novgorod obl	12	298	109	277	289	5	104	168	12	0	9	1286	2757	2823	58	1228	1471	66	0	11798	9953	9768	12575	11836	8732	5505	0
123	2	Nenets a.okr.	12	15018	0	2	95	0	0	2	93	38	14865	0	14	346	0	0	14	332	41	0	7000	3642	0	0	6006	3584	1087
124	2	Ivanovo oblast	12	25	13	25	25	1	12	12	0	0	0	156	258	258	18	138	102	0	0	12000	10320	10320	14130	11781	8479	0	0
127	2	Kaliningrad oblast	12	30	8	16	20	0	8	8	4	0	10	103	203	229	0	103	100	26	0	12875	12688	11450	0	13078	11843	6398	0
128	2	Tver oblast	12	118	87	101	103	17	70	14	2	0	14	1220	1363	1374	240	980	143	11	0	14023	13495	13340	13988	14097	10030	5016	2433
129	2	Kaluga oblast	12	65	54	63	65	0	54	9	2	0	0	812	907	917	0	812	95	10	0	15037	14397	14108	0	15019	10404	5809	0
133	2	Kirov oblast	12	235	116	214	231	38	78	98	17	0	4	1583	2465	2556	595	988	882	91	0	13647	11519	11065	15670	12681	8983	5263	0
134	2	Kostroma oblast	12	253	155	240	247	67	88	85	7	0	6	2368	3217	3251	1271	1097	849	34	0	15277	13404	13162	18912	12460	10005	4888	1337
136	2	Samara oblast	12	5	0	0	1	0	0	0	1	1	3	0	0	3	0	0	0	3	2	0	0	3000	0	0	0	3373	1353
138	2	Kursk oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	2	Komi-Permyak a.okr	12	170	82	153	160	24	58	71	7	0	10	1046	1701	1742	362	684	655	41	0	12756	11118	10888	15360	11713	9229	5548	1833
141	2	Leningrad oblast	12	800	294	671	701	73	221	377	30	2	97	3926	7279	7421	1229	2697	3353	142	2	13354	10848	10586	16731	12216	8905	4680	981
142	2	Lipetsk oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	2	Moscow oblast	12	193	135	180	190	33	102	45	10	0	2	1779	2187	2247	461	1318	408	60	0	13178	12150	11826	13996	12949	9037	5830	0
147	2	Murmansk oblast	12	6555	0	38	166	0	0	38	128	140	6249	0	224	685	0	0	224	461	169	0	5895	4127	0	10485	5905	3595	1207
149	2	Novgorod oblast	12	233	128	176	176	12	116	48	0	0	55	1646	2080	2082	186	1460	434	2	0	12859	11818	11830	15179	12551	9010	4961	0
153	2	Orenburg oblast	12	2480	0	0	2	0	0	0	2	7	2471	0	0	7	0	0	0	7	9	0	0	3500	0	0	0	3041	1262
154	2	Oryel oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	2	Penza oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	2	Perm oblast	12	325	137	276	295	68	69	139	19	2	29	1947	3209	3321	1129	818	1262	112	2	14212	11627	11258	16634	11920	9093	6015	963
158	2	Pskov oblast	12	265	139	231	237	13	126	92	6	0	28	1848	2637	2667	188	1660	789	30	0	13295	11416	11253	14262	13190	8564	5148	0
160	2	Rostov oblast	12	453	0	0	64	0	0	0	64	14	374	0	0	327	0	0	0	327	28	0	0	5109	0	0	0	5070	1954
161	2	Ryazan oblast	12	405	207	390	406	70	137	183	16	0	0	2300	3944	4036	878	1422	1644	92	0	11111	10113	9941	12531	10398	9008	5874	923
163	2	Saratov oblast	12	615	0	0	9	0	0	0	9	4	602	0	0	37	0	0	0	37	6	0	0	4111	0	0	0	4316	1418
166	2	Smolensk oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	2	Tambov oblast	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	2	Tula oblast	12	13	11	12	12	0	11	1	0	0	0	175	183	184	0	175	8	1	0	15909	15250	15333	0	15282	10121	5773	0
173	2	Ulyanovsk oblast	12	18	0	0	4	0	0	0	4	5	9	0	0	12	0	0	0	12	7	0	0	3000	0	0	0	3366	1357
178	2	Yaroslavl oblast	12	83	68	69	69	4	64	1	0	0	13	978	985	985	61	917	7	0	0	14382	14275	14275	13841	14290	9238	0	2427
179	2	Adigei Republic	12	103	38	51	54	2	36	13	3	1	47	613	757	775	54	559	144	18	2	16132	14843	14352	21824	15712	10655	6632	2253
180	2	Bashkortostan Repu	12	808	42	112	191	10	32	70	79	121	496	319	819	1142	77	242	500	323	150	7595	7313	5979	7808	7516	7096	4095	1240
182	2	Daghestn Republic	12	4188	86	168	489	17	69	82	321	192	3499	1118	1905	3945	267	851	787	2040	398	13000	11339	8067	15533	12364	9611	6346	2076
183	2	Kabardino-Balkarian	12	663	69	106	121	24	45	37	15	3	538	1076	1453	1544	443	633	377	91	6	15594	13708	12760	18152	14084	10286	6009	1859
185	2	Kalmyk-Khalm-Tang	12	6183	0	0	0	0	0	0	0	0	6182	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186	2	Karelia Republic	12	3005	277	1885	2496	16	261	1608	611	175	327	3386	17177	20446	269	3117	13791	3269	292	12224	9112	8192	16820	11952	8578	5354	1669
187	2	Komi Republic	12	8200	433	1962	2891	168	265	1529	929	558	4751	6102	18889	23315	2899	3203	12787	4426	875	14092	9627	8065	17234	12077	8363	4765	1567
188	2	Mari-El Republic	12	100	40	84	87	0	40	44	3	0	13	490	852	866	0	490	362	14	0	12250	10143	9954	0	12223	8187	4973	1425
189	2	Mordovian SSR	12	125	87	123	125	24	63	36	2	0	0	1031	1326	1339	301	730	295	13	0	11851	10780	10712	12474	11654	8221	5615	0
190	2	North-Ossetian SSR	12	378	61	70	92	21	40	9	22	0	285	995	1091	1226	365	630	96	135	1	16311	15586	13326	17485	15665	10657	6208	1858
191	2	Karachai-Cherkess F	12	623	70	126	149	20	50	56	23	5	468	1066	1652	1788	348	718	586	136	11	15229	13111	12000	17789	14345	10407	5886	2074
192	2	Tatarstan Republic	12	8	4	6	7	0	4	2	1	0	2	40	53	57	0	40	13	4	0	10000	8833	8143	0	11375	8249	5651	0
194	2	Udmurt Republic	12	3	2	2	2	1	1	0	0	0	0	35	35	35	16	19	0	0	0	17500	17500	17500	18036	13928	0	1652	0
196	2	Checheno-Ingush R	12	960	109	190	360	24	85	81	170	21	578	1580	2441	3449	403	1177	861	1008	37	14495	12847	9581	16827	13767	10622	5920	1787
197	2	Chuvash Republic	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	3	Altai Kray	12	4503	1043	2026	2899	312	731	983	873	156	1447	12887	20882	25192	4596	8291	7995	4310	257	12356	10307	8690	14754	11335	8129	4937	1644

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A14 PRODUCTION POTENTIALS FOR TRADITIONAL PRODUCTION FORESTRY SPECIES - EXCLUDING CULTIVATED AREAS, URBAN AREAS AND AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)								Average annual biomass increments (000tons)								Average annual biomass yield (kg/ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS
102	3	Gorno-Altai Republic	12	4118	43	67	107	12	31	24	40	52	3958	497	671	824	173	324	174	153	69	11558	10015	7701	14257	10488	7170	3850	1322
104	3	Krasnoyarsk Kray	12	5383	1015	1889	2213	192	823	874	324	108	3061	11700	18715	20426	2607	9093	7015	1711	159	11527	9907	9230	13558	11052	8026	5286	1470
105	3	Primorski Kray	12	1490	138	535	737	10	128	397	202	78	674	1765	4354	5254	149	1616	2589	900	148	12790	8138	7129	14731	12642	6520	4449	1891
106	3	Taymyr a.okr.	12	71523	0	0	0	0	0	0	0	0	71522	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	3	Khabarovsk Kray	12	18580	1370	3011	4270	78	1292	1641	1259	797	13513	15421	27738	33171	1133	14288	12317	5433	1196	11256	9212	7768	14558	11057	7505	4315	1500
110	3	Amur oblast	12	6033	1923	2635	3401	344	1579	712	766	427	2204	21207	27162	30901	4405	16802	5955	3739	631	11028	10308	9086	12796	10641	8360	4879	1478
116	3	Evenk a.okr	12	9323	0	13	21	0	0	13	8	78	9223	3	103	135	0	3	100	32	98	3000	7923	6429	0	10843	7614	3734	1258
121	3	Yevrey (Jewish) a.ok	12	1318	398	656	822	70	328	258	166	16	481	5059	6834	7714	902	4157	1775	880	29	12711	10418	9384	12911	12673	6878	5316	1836
125	3	Irkutsk oblast	12	8388	196	402	700	2	194	206	298	439	7249	2411	4016	5212	20	2391	1605	1196	618	12301	9990	7446	10768	12318	7782	4018	1409
126	3	Ust-Orda Buryat a.ok	12	350	3	22	101	0	3	19	79	35	214	29	175	457	0	29	146	282	49	9667	7955	4525	0	10655	7680	3560	1406
130	3	Kamchatka oblast	12	9120	1	202	570	0	1	201	368	146	8381	10	1813	3551	0	10	1803	1738	224	10000	8975	6230	0	9315	8958	4729	1528
131	3	Koryak a.okr.	12	25808	0	103	309	0	0	103	206	935	24564	0	712	1455	0	0	712	743	1039	0	6913	4709	0	0	6937	3612	1111
132	3	Kemerovo oblast	12	925	109	153	307	21	88	44	154	150	468	1173	1486	2161	276	897	313	675	237	10761	9712	7039	13251	10168	7122	4379	1581
135	3	Chukchi a.okr.	12	60873	0	0	0	0	0	0	0	0	60847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	3	Kurgan oblast	12	2543	171	650	1096	0	171	479	446	285	1162	1779	5597	7754	0	1779	3818	2157	453	10404	8611	7075	0	10393	7968	4838	1591
144	3	Magadan oblast	12	31205	0	8	507	0	0	8	499	426	30272	0	57	2208	0	0	57	2151	591	0	7125	4355	0	0	7061	4309	1389
150	3	Novosibirsk oblast	12	8383	1697	3292	4116	193	1504	1595	824	216	4051	18985	32228	36232	2546	16439	13243	4004	350	11187	9790	8803	13209	10933	8302	4861	1621
152	3	Omsk oblast	12	5148	1099	2010	2860	37	1062	911	850	250	2038	12845	20282	24337	510	12335	7437	4055	425	11688	10091	8509	13620	11615	8166	4771	1701
164	3	Sakhalin oblast	12	973	60	211	282	0	60	151	71	21	661	713	1899	2285	0	713	1186	386	26	11883	9000	8103	0	11812	7839	5427	1204
165	3	Sverdlovsk oblast	12	2898	2048	2311	2383	354	1694	263	72	3	512	24987	27116	27498	5695	19292	2129	382	3	12201	11733	11539	16104	11388	8096	5269	1263
167	3	Aga-Buryat a.okr.	12	1038	0	20	300	0	0	20	280	184	554	0	114	1168	0	0	114	1054	255	0	5700	3893	0	0	5731	3764	1387
169	3	Tomsk oblast	12	10153	3887	6214	7499	249	3638	2327	1285	47	2607	45259	64153	70776	3410	41849	18894	6623	64	11644	10324	9438	13709	11502	8121	5153	1373
171	3	Tyumen oblast	12	7145	3328	4547	5145	118	3210	1219	598	272	1728	34691	44087	46836	1516	33175	9396	2749	439	10424	9696	9103	12884	10335	7708	4601	1610
172	3	Khanty-Mansi a.okr.	12	20210	3552	7511	11604	125	3427	3959	4093	1268	7338	42116	74285	94421	1877	40239	32169	20136	2345	11857	9890	8137	14973	11742	8124	4920	1850
174	3	Yamalo-Nenets a.ok	12	41490	0	324	2155	0	0	324	1831	2722	36605	2	2282	12157	0	2	2280	9875	4904	2000	7043	5641	0	10502	7032	5393	1802
175	3	Chelyabinsk oblast	12	1518	96	230	405	1	95	134	175	406	706	1123	2190	2781	12	1111	1067	591	610	11698	9522	6867	14062	11729	7941	3367	1502
176	3	Chita oblast	12	11328	37	526	1690	0	37	489	1164	1397	8241	358	3596	8450	0	358	3238	4854	1972	9676	6837	5000	0	9765	6621	4169	1412
181	3	Buryat Republic	12	10333	46	361	798	0	46	315	437	951	8584	508	2902	4806	0	508	2394	1904	1452	11043	8039	6023	0	11022	7607	4356	1528
193	3	Tuva Republic	12	5498	9	77	288	0	9	68	211	241	4968	97	586	1437	0	97	489	851	329	10778	7610	4990	0	10625	7191	4031	1362
195	3	Khakass Republic	12	1360	323	650	802	16	307	327	152	37	521	3468	5932	6625	205	3263	2464	693	56	10737	9126	8261	12745	10611	7546	4561	1515
198	3	Sakha (Yakutia) Rep	12	107800	57	297	1222	0	57	240	925	2483	104078	615	2426	6430	0	615	1811	4004	3275	10789	8168	5262	0	10775	7560	4329	1319
		RUSSIA WEST		**75204**	**4501**	**11629**	**15352**	**986**	**3515**	**7128**	**3723**	**1752**	**58039**	**59965**	**121941**	**140711**	**16036**	**43929**	**61976**	**18770**	**2745**	**13323**	**10486**	**9166**	**16264**	**12498**	**8695**	**5042**	**1567**
		RUSSIA EAST		**496758**	**22649**	**40953**	**59609**	**2134**	**20515**	**18304**	**18656**	**14626**	**422432**	**259708**	**404393**	**492654**	**30032**	**229676**	**144685**	**88261**	**22303**	**11467**	**9875**	**8265**	**14073**	**11196**	**7905**	**4731**	**1525**
		RUSSIA TOTAL		**571962**	**27150**	**52582**	**74961**	**3120**	**24030**	**25432**	**22379**	**16378**	**480471**	**319673**	**526334**	**633365**	**46068**	**273605**	**206661**	**107031**	**25048**	**11774**	**10010**	**8449**	**14765**	**11386**	**8126**	**4783**	**1529**
211	11	Beijing	12	673	76	228	315	0	76	152	87	14	343	1130	2612	3088	5	1125	1482	476	23	14868	11456	9803	14313	14787	9742	5487	1663
212	11	Tianjin	12	78	0	6	8	0	0	6	2	2	67	0	60	73	0	0	60	13	5	0	10000	9125	0	14859	9866	6197	2229
213	11	Hebei	12	6618	1154	2858	4219	141	1013	1704	1361	219	2178	12949	28039	36034	1441	11508	15090	7995	450	11221	9811	8541	10203	11360	8854	5872	2053
214	11	Shanxi	12	6105	620	1530	2412	91	529	910	882	806	2888	7519	16591	22095	1240	6279	9072	5504	1757	12127	10844	9160	13579	11881	9974	6243	2181
237	11	Shandong	12	515	94	144	161	8	86	50	17	24	330	1477	2058	2192	146	1331	581	134	54	15713	14292	13615	17753	15500	11588	7653	2300
241	11	Henan	12	1193	336	527	615	39	297	191	88	35	543	5231	7439	8029	713	4518	2208	590	76	15568	14116	13055	18190	15218	11551	6739	2182
221	12	Liaoning	12	1468	393	710	995	133	260	317	285	172	300	5709	8892	10466	2105	3604	3183	1574	340	14527	12524	10519	15807	13868	10041	5514	1978
222	12	Jilin	12	2573	309	482	1244	71	238	173	762	262	1067	4024	5743	9287	969	3055	1719	3544	417	13023	11915	7465	13594	12841	9954	4650	1590
223	12	Heilongjiang	12	9320	4243	5510	7186	1113	3130	1267	1676	630	1504	53039	63983	72506	15201	37838	10944	8523	1036	12500	11612	10090	13652	12088	8639	5086	1645
231	13	Shanghai	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
232	13	Jiangsu	12	275	85	129	132	24	61	44	3	0	143	1349	1795	1819	430	919	446	24	0	15871	13915	13780	18142	15034	10132	7231	2391
233	13	Zhejiang	12	500	71	135	159	8	63	64	24	3	338	999	1633	1769	129	870	634	136	6	14070	12096	11126	15711	13754	9888	5679	1915
234	13	Anhui	12	1465	478	766	772	36	442	288	6	0	693	6905	9796	9830	530	6375	2891	34	0	14446	12789	12733	14675	14408	10046	5975	2106
236	14	Jiangxi	12	4710	2077	2720	2865	574	1503	643	145	56	1789	30814	37241	38109	10473	20341	6427	868	103	14836	13692	13302	18258	13534	9998	5974	1819
242	14	Hubei	12	5280	1833	2647	2795	188	1645	814	148	0	2485	27755	36237	37083	3417	24338	8482	846	0	15142	13690	13268	18142	14799	10422	5702	1999
243	14	Hunan	12	4623	1293	1938	2111	165	1128	645	173	37	2474	18979	25217	26140	2989	15990	6238	923	67	14678	13012	12383	18085	14173	9668	5337	1810
235	15	Fujian	12	540	39	107	140	0	39	68	33	9	390	544	1186	1372	9	535	642	186	17	13949	11084	9800	20342	13740	9382	5699	1864
244	15	Guangdong	12	2330	469	829	922	91	378	360	93	10	1398	6793	10133	10670	1643	5150	3340	537	18	14484	12223	11573	18147	13624	9276	5766	1721
231	13	Shanghai	12	0	2878	4448	4712	906	1972	1570	264	66	0	47970	63429	65032	18493	29477	15459	1603	136	16668	14260	13801	20406	14951	9849	6074	2053
246	15	Hainan	12	848	74	232	389	14	60	158	157	102	355	939	2176	2868	228	711	1237	692	143	12689	9379	7373	15938	11809	7820	4397	1398
251	16	Sichuan	12	24765	1102	1685	1814	293	809	583	129	13	22937	17433	23478	24201	5551	11882	6045	723	22	15819	13934	13341	18953	14681	10366	5604	1646
252	16	Guizhou	12	6493	2527	3870	4129	424	2103	1343	259	0	2363	37950	51276	52698	8114	29836	13326	1422	0	15018	13250	12763	19129	14188	9922	5489	2088
253	16	Yunnan	12	11850	3392	4276	4670	1221	2171	884	394	320	6860	61786	70756	72686	27280	34506	8970	1930	508	18215	16547	15564	22338	15891	10152	4905	1590
215	17	Nei Mongol	12	90058	2530	5055	13926	392	2138	2525	8871	3039	73093	27205	45203	88316	5788	21417	17998	43113	4906	10753	8942	6342	14750	10018	7129	4860	1614
261	17	Shaanxi	12	9673	1152	1928	2539	114	1038	776	611	161	6972	16998	24842	28429	2047	14951	7844	3587	351	14755	12885	11197	17960	14405	10112	5867	2179
262	17	Gansu	12	31640	904	1656	2741	264	640	752	1085	425	28474	12831	19855	25718	4755	8076	7024	5863	760	14194	11990	9383	17979	12622	9346	5403	1789
264	17	Ningxia	12	3505	26	76	711	2	24	50	635	139	2655	297	669	3946	28	269	372	3277	227	11423	8803	5550	15353	11228	7399	5162	1636
265	17	Xinjiang	12	153305	160	468	1294	27	133	308	826	515	151495	1888	4208	8617	445	1443	2320	4409	880	11800	8991	6659	16235	10871	7538	5335	1708
254	18	Xizang	12	106460	129	312	459	32	97	183	147	98	105903	1660	2842	3437	530	1130	1182	595	150	12868	9109	7488	16636	11660	6444	4039	1533
263	18	Qinghai	12	69645	53	190	894	4	49	137	704	409	68343	452	1457	4733	33	419	1005	3276	645	8528	7668	5294	9336	8587	7363	4651	1578
272	19	Hongkong	12	10	0	0	0	0	0	0	0	0	9	0	3	4	0	0	3	1	0	0	3000	4000	0	14737	9654	5802	1917
		CHINA TOTAL		**556518**	**28497**	**45462**	**65329**	**6375**	**22122**	**16965**	**19867**	**7566**	**488389**	**412625**	**568849**	**671247**	**114732**	**297893**	**156224**	**102398**	**13097**	**14480**	**12513**	**10275**	**17997**	**13466**	**9209**	**5154**	**1731**

Note: Annual biomass increments and annual biomass yields refer to total biomass. The following partitioning may be used: VS conditions: stem+branchwood/twigs+leaves/roots, 60/20/20; S and MS: 50/20/30; mS and VmS: 40/20/40.

APPENDIX II

Table A15 SUITABLE AREAS FOR CONSERVATION FORESTRY - ALL AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS
2	4	Mongolia	12	156198	200	2622	8843	18	182	2422	6221	6549	140806
11	1	Armenia	12	2690	169	472	688	0	169	303	216	155	1847
12	1	Azerbaijan	12	7868	217	704	1495	14	203	487	791	1646	4159
13	1	Byelorussia	12	20348	15798	18694	19061	5742	10056	2896	367	13	1273
14	1	Estonia	12	3938	1929	2393	2742	440	1489	464	349	120	1075
15	1	Georgia	12	6523	738	1485	2067	374	364	747	582	593	3863
16	1	Kazakhstan	12	268445	3853	9596	22058	559	3294	5743	12462	4951	241435
17	1	Kirghiztan	12	19548	171	1010	2191	30	141	839	1181	710	16645
18	1	Latvia	12	6313	2826	5508	5708	773	2053	2682	200	85	519
19	1	Lithuania	12	6420	3505	5653	5853	1572	1933	2148	200	31	536
20	1	Moldavia	12	3000	1566	2398	2596	414	1152	832	198	224	180
21	1	Tajikistan	12	9013	0	86	762	0	0	86	676	512	7738
22	1	Turkmenistan	12	45390	0	0	31	0	0	0	31	127	45231
23	1	Ukraine	12	57570	29877	41613	45761	11343	18534	11736	4148	6864	4942
		FSU REPUBLICS		**457066**	**60649**	**89612**	**111013**	**21261**	**39388**	**28963**	**21401**	**16031**	**329443**
103	2	Krasnodar Kray	12	7620	1362	2408	4667	379	983	1046	2259	1770	1176
107	2	Stavropol Kray	12	6635	480	1475	3330	105	375	995	1855	647	2658
111	2	Arkhangelsk oblast	12	38190	7692	19696	24917	1909	5783	12004	5221	1742	11511
112	2	Astrakhan oblast	12	4598	0	0	0	0	0	0	0	0	4597
114	2	Belgorod oblast	12	2665	977	1565	1715	269	708	588	150	481	470
115	2	Bryansk oblast	12	3483	3315	3429	3431	1336	1979	114	2	0	51
117	2	Vladimir oblast	12	2925	1555	2866	2908	288	1267	1311	42	0	17
118	2	Volgograd oblast	12	11265	0	0	583	0	0	0	583	945	9737
119	2	Vologda oblast	12	14628	9938	12127	12928	3618	6320	2189	801	248	1452
120	2	Voronezh oblast	12	5195	676	1341	2157	264	412	665	816	2751	288
122	2	Nizhni Novgorod obl	12	7515	4852	7356	7430	1596	3256	2504	74	6	79
123	2	Nenets a.okr.	12	16858	0	15	309	0	0	15	294	177	16352
124	2	Ivanovo oblast	12	2270	1862	2251	2260	779	1083	389	9	0	10
127	2	Kaliningrad oblast	12	1240	765	954	1036	366	399	189	82	0	204
128	2	Tver oblast	12	8395	7253	7933	8173	3247	4006	680	240	53	170
129	2	Kaluga oblast	12	2963	2525	2935	2940	832	1693	410	5	0	22
133	2	Kirov oblast	12	11930	7552	11211	11601	3172	4380	3659	390	66	262
134	2	Kostroma oblast	12	6000	4324	5759	5851	1621	2703	1435	92	13	137
136	2	Samara oblast	12	5118	539	860	2164	0	539	321	1304	736	2216
138	2	Kursk oblast	12	3020	2683	2691	2740	1331	1352	8	49	12	267
139	2	Komi-Permyak a.okr	12	3280	2061	3046	3157	1310	751	985	111	0	123
141	2	Leningrad oblast	12	7500	3043	6125	6598	1321	1722	3082	473	373	528
142	2	Lipetsk oblast	12	2410	1989	2257	2354	1562	427	268	97	52	4
146	2	Moscow oblast	12	4665	4005	4445	4571	1703	2302	440	126	1	94
147	2	Murmansk oblast	12	13960	13	89	486	0	13	76	397	942	12532
149	2	Novgorod oblast	12	5450	4098	5076	5228	1491	2607	978	152	115	107
153	2	Orenburg oblast	12	12418	310	655	1323	21	289	345	668	332	10763
154	2	Oryel oblast	12	2458	2418	2454	2454	1435	983	36	0	0	3
156	2	Penza oblast	12	4320	2749	3725	4024	1591	1158	976	299	230	66
157	2	Perm oblast	12	12715	8602	10284	10613	5326	3276	1682	329	85	2016
158	2	Pskov oblast	12	5568	3419	4791	4886	1338	2081	1372	95	43	638
160	2	Rostov oblast	12	10133	361	847	4499	81	280	486	3652	1719	3915
161	2	Ryazan oblast	12	3935	3261	3886	3936	1704	1557	625	50	0	0
163	2	Saratov oblast	12	10375	177	529	1720	0	177	352	1191	1679	6977
166	2	Smolensk oblast	12	4943	4368	4734	4769	2129	2239	366	35	0	174
168	2	Tambov oblast	12	3435	2084	2788	2963	1304	780	704	175	438	34
170	2	Tula oblast	12	2553	2534	2552	2552	1748	786	18	0	0	0
173	2	Ulyanovsk oblast	12	3690	495	1593	2445	104	391	1098	852	542	704
178	2	Yaroslavl oblast	12	3260	2990	3090	3198	1440	1550	100	108	21	40
179	2	Adigei Republic	12	775	386	482	530	154	232	96	48	13	232
180	2	Bashkortostan Repu	12	14435	6688	9372	10807	2926	3762	2684	1435	1087	2540
182	2	Daghestn Republic	12	5033	196	411	1112	73	123	215	701	558	3356
183	2	Kabardino-Balkarian	12	1238	424	628	676	162	262	204	48	41	519
185	2	Kalmyk-Khalm-Tang	12	7510	0	0	172	0	0	0	172	61	7277
186	2	Karelia Republic	12	18253	2147	9008	11853	613	1534	6861	2845	1816	4575
187	2	Komi Republic	12	41370	4784	16384	25093	2135	2649	11600	8709	5070	11207
188	2	Mari-El Republic	12	2365	1136	1909	2191	260	876	773	282	36	138
189	2	Mordovian SSR	12	2590	1891	2469	2528	1373	518	578	59	42	20
190	2	North-Ossetian SSR	12	778	317	383	464	241	76	66	81	31	283
191	2	Karachai-Cherkess I	12	1468	388	524	588	159	229	136	64	72	807
192	2	Tatarstan Republic	12	6663	2707	4226	5195	1287	1420	1519	969	553	915
194	2	Udmurt Republic	12	4150	3375	3890	3897	1392	1983	515	7	13	240
196	2	Checheno-Ingush R	12	1930	441	671	1164	185	256	230	493	120	647
197	2	Chuvash Republic	12	1808	644	1079	1349	183	461	435	270	415	44
101	3	Altai Kray	12	16653	6373	9812	11393	3428	2945	3439	1581	492	4768

APPENDIX II

Table A15 SUITABLE AREAS FOR CONSERVATION FORESTRY - ALL AREAS

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS
102	3	Gorno-Altai Republic	12	9385	805	2050	2229	108	697	1245	179	236	6920
104	3	Krasnoyarsk Kray	12	71140	17169	29443	35569	4760	12409	12274	6126	6085	29485
105	3	Primorski Kray	12	16338	1118	3038	5214	334	784	1920	2176	2277	8847
106	3	Taymyr a.okr.	12	82285	0	0	0	0	0	0	0	0	82285
108	3	Khabarovsk Kray	12	77545	4712	8733	16880	898	3814	4021	8147	7809	52849
110	3	Amur oblast	12	36283	9068	13302	20282	2440	6628	4234	6980	4631	11370
116	3	Evenk a.okr	12	75673	5	372	888	0	5	367	516	3533	71251
121	3	Yevrey (Jewish) a.ot	12	3700	1189	1842	2211	607	582	653	369	436	1052
125	3	Irkutsk oblast	12	76270	7218	14469	22248	1324	5894	7251	7779	12324	41698
126	3	Ust-Orda Buryat a.o	12	2178	234	660	867	40	194	426	207	55	1254
130	3	Kamchatka oblast	12	17045	100	1122	2880	0	100	1022	1758	676	13467
131	3	Koryak a.okr.	12	28903	0	112	399	0	0	112	287	1105	27399
132	3	Kemerovo oblast	12	9500	4386	5429	6377	1043	3343	1043	948	639	2483
135	3	Chukchi a.okr.	12	70770	0	0	0	0	0	0	0	0	70745
137	3	Kurgan oblast	12	7110	1600	2907	3780	521	1079	1307	873	564	2767
144	3	Magadan oblast	12	45830	0	24	934	0	0	24	910	1154	43742
150	3	Novosibirsk oblast	12	17673	5423	8632	10062	2708	2715	3209	1430	880	6730
152	3	Omsk oblast	12	13980	3302	5265	8964	518	2784	1963	3699	721	4295
164	3	Sakhalin oblast	12	8095	743	1680	2758	5	738	937	1078	327	4918
165	3	Sverdlovsk oblast	12	19273	11885	13969	14649	5498	6387	2084	680	212	4412
167	3	Aga-Buryat a.okr.	12	1970	2	85	754	0	2	83	669	308	907
169	3	Tomsk oblast	12	31145	14606	21195	23760	3644	10962	6589	2565	228	7157
171	3	Tyumen oblast	12	15860	7486	10408	11635	1972	5514	2922	1227	578	3647
172	3	Khanty-Mansi a.okr.	12	53163	10264	18913	28719	1271	8993	8649	9806	2870	21573
174	3	Yamalo-Nenets a.ok	12	66588	20	1389	5425	0	20	1369	4036	9761	51393
175	3	Chelyabinsk oblast	12	8763	2130	3321	4408	741	1389	1191	1087	1226	3129
176	3	Chita oblast	12	41493	316	2685	12052	1	315	2369	9367	9019	20420
181	3	Buryat Republic	12	33533	393	3753	6916	17	376	3360	3163	7630	18987
193	3	Tuva Republic	12	17035	107	1519	2836	0	107	1412	1317	1547	12652
195	3	Khakass Republic	12	6120	1427	2358	3143	223	1204	931	785	194	2782
198	3	Sakha (Yakutia) Rep	12	303275	519	3407	10022	0	519	2888	6615	17029	276207
		RUSSIA WEST		**389947**	**132851**	**201274**	**240535**	**57863**	**74988**	**68423**	**39261**	**26147**	**123194**
		RUSSIA EAST		**1284574**	**112600**	**191894**	**278254**	**32101**	**80499**	**79294**	**86360**	**94546**	**911591**
		RUSSIA TOTAL		**1674521**	**245451**	**393168**	**518789**	**89964**	**155487**	**147717**	**125621**	**120693**	**1034785**
211	11	Beijing	12	1640	567	1007	1250	132	435	440	243	1	389
212	11	Tianjin	12	1125	32	236	349	0	32	204	113	241	534
213	11	Hebei	12	18480	5492	9646	12346	1505	3987	4154	2700	2009	4125
214	11	Shanxi	12	15783	4060	6841	9082	1284	2776	2781	2241	3488	3212
237	11	Shandong	12	14798	4302	6028	7478	1367	2935	1726	1450	1055	6266
241	11	Henan	12	16295	8121	10241	11638	2841	5280	2120	1397	508	4150
221	12	Liaoning	12	13863	7924	10430	11834	4073	3851	2506	1404	1070	958
222	12	Jilin	12	19145	10224	13564	15507	4915	5309	3340	1943	729	2909
223	12	Heilongjiang	12	44848	29796	36616	39425	15520	14276	6820	2809	1485	3938
231	13	Shanghai	12	413	268	386	386	134	134	118	0	0	27
232	13	Jiangsu	12	9290	5967	7879	8100	2763	3204	1912	221	8	1059
233	13	Zhejiang	12	9250	8052	9024	9130	1412	6640	972	106	34	85
234	13	Anhui	12	13783	10363	12888	13168	3236	7127	2525	280	16	600
236	14	Jiangxi	12	16663	12081	13834	14250	5343	6738	1753	416	185	2227
242	14	Hubei	12	18168	14944	16366	16377	4587	10357	1422	11	0	1792
243	14	Hunan	12	21050	16592	18304	18457	3249	13343	1712	153	162	2430
235	15	Fujian	12	11995	8176	9844	10204	319	7857	1668	360	133	1658
244	15	Guangdong	12	16385	8946	10638	11148	2116	6830	1692	510	191	5047
245	15	Guangxi	12	23425	14365	18651	19531	4051	10314	4286	880	393	3502
246	15	Hainan	12	2840	406	1104	1621	57	349	698	517	272	947
251	16	Sichuan	12	56143	22192	29588	31081	5293	16899	7396	1493	656	24405
252	16	Guizhou	12	17725	15884	16567	16568	2298	13586	683	1	0	1157
253	16	Yunnan	12	37325	21569	24627	27781	8730	12839	3058	3154	3940	5603
215	17	Nei Mongol	12	115468	12288	21631	33223	4364	7924	9343	11592	4104	78141
261	17	Shaanxi	12	20900	8512	11152	11750	1872	6640	2640	598	942	8208
262	17	Gansu	12	40580	5170	7637	9258	2006	3164	2467	1621	487	30835
264	17	Ningxia	12	5038	151	558	1388	45	106	407	830	33	3615
265	17	Xinjiang	12	163355	688	1616	3018	216	472	928	1402	900	159437
254	18	Xizang	12	119045	4931	5841	6944	1647	3284	910	1103	545	111557
263	18	Qinghai	12	72183	428	963	2290	41	387	535	1327	416	69476
272	19	Hongkong	12	40	0	1	2	0	0	1	1	0	37
		CHINA TOTAL		**937041**	**262491**	**333708**	**374584**	**85416**	**177075**	**71217**	**40876**	**24003**	**538326**

APPENDIX II

Table A16 SUITABLE AREAS FOR CONSERVATION FORESTRY - EXCLUDING CULTIVATED AND URBAN AREAS

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS
2	4	Mongolia	12	154858	200	2610	8774	18	182	2410	6164	6481	139602
11	1	Armenia	12	1965	138	353	499	0	138	215	146	110	1356
12	1	Azerbaijan	12	5588	199	608	1110	13	186	409	502	998	3062
13	1	Byelorussia	12	7628	5734	6878	7014	1862	3872	1144	136	11	603
14	1	Estonia	12	1508	699	936	1069	146	553	237	133	68	370
15	1	Georgia	12	4480	249	815	1191	66	183	566	376	387	2902
16	1	Kazakhstan	12	220903	2468	5543	10982	500	1968	3075	5439	2837	207083
17	1	Kirghiztan	12	16238	84	747	1330	20	64	663	583	538	14370
18	1	Latvia	12	2220	981	1966	2056	225	756	985	90	29	135
19	1	Lithuania	12	3205	1788	2915	2986	768	1020	1127	71	12	208
20	1	Moldavia	12	105	51	80	89	13	38	29	9	12	3
21	1	Tajikistan	12	7423	0	62	511	0	0	62	449	355	6556
22	1	Turkmenistan	12	42520	0	0	26	0	0	0	26	118	42376
23	1	Ukraine	12	6305	3667	4590	4907	1343	2324	923	317	112	1285
		FSU REPUBLICS		**320088**	**16058**	**25493**	**33770**	**4956**	**11102**	**9435**	**8277**	**5587**	**280309**
103	2	Krasnodar Kray	12	2158	595	854	1055	216	379	259	201	241	861
107	2	Stavropol Kray	12	988	147	255	293	59	88	108	38	14	681
111	2	Arkhangelsk oblast	12	37453	7292	19055	24231	1858	5434	11763	5176	1741	11460
112	2	Astrakhan oblast	12	4453	0	0	0	0	0	0	0	0	4452
114	2	Belgorod oblast	12	80	31	47	54	13	18	16	7	10	16
115	2	Bryansk oblast	12	718	680	713	713	271	409	33	0	0	4
117	2	Vladimir oblast	12	1175	602	1141	1166	101	501	539	25	0	10
118	2	Volgograd oblast	12	2173	0	0	23	0	0	0	23	20	2130
119	2	Vologda oblast	12	12483	8748	10714	11416	3150	5598	1966	702	228	838
120	2	Voronezh oblast	12	548	31	70	187	6	25	39	117	314	47
122	2	Nizhni Novgorod obl	12	4018	2130	3886	3946	489	1641	1756	60	5	67
123	2	Nenets a.okr.	12	16818	0	15	308	0	0	15	293	176	16314
124	2	Ivanovo oblast	12	1063	864	1054	1060	359	505	190	6	0	3
127	2	Kaliningrad oblast	12	160	91	116	135	40	51	25	19	0	25
128	2	Tver oblast	12	3450	3008	3271	3369	1311	1697	263	98	13	69
129	2	Kaluga oblast	12	1240	1051	1235	1236	375	676	184	1	0	5
133	2	Kirov oblast	12	7908	4440	7469	7673	1883	2557	3029	204	39	197
134	2	Kostroma oblast	12	4593	3269	4452	4531	1224	2045	1183	79	5	56
136	2	Samara oblast	12	445	102	137	209	0	102	35	72	81	155
138	2	Kursk oblast	12	90	80	80	82	35	45	0	2	0	7
139	2	Komi-Permyak a.okr	12	2813	1648	2617	2718	1047	601	969	101	0	95
141	2	Leningrad oblast	12	6358	2695	5372	5687	1221	1474	2677	315	288	383
142	2	Lipetsk oblast	12	98	45	72	96	33	12	27	24	1	0
146	2	Moscow oblast	12	2270	1917	2164	2232	835	1082	247	68	0	38
147	2	Murmansk oblast	12	13535	8	84	452	0	8	76	368	887	12196
149	2	Novgorod oblast	12	4568	3515	4288	4406	1290	2225	773	118	84	78
153	2	Orenburg oblast	12	2623	7	30	64	0	7	23	34	20	2538
154	2	Oryel oblast	12	63	61	62	62	20	41	1	0	0	0
156	2	Penza oblast	12	625	310	504	577	139	171	194	73	33	16
157	2	Perm oblast	12	8853	5586	6803	7057	3610	1976	1217	254	64	1731
158	2	Pskov oblast	12	2750	1735	2557	2616	659	1076	822	59	21	113
160	2	Rostov oblast	12	475	0	6	81	0	0	6	75	15	379
161	2	Ryazan oblast	12	1253	844	1219	1252	263	581	375	33	0	0
163	2	Saratov oblast	12	1033	12	26	55	0	12	14	29	79	899
166	2	Smolensk oblast	12	748	679	721	726	332	347	42	5	0	21
168	2	Tambov oblast	12	328	190	299	317	100	90	109	18	10	1
170	2	Tula oblast	12	238	234	238	238	105	129	4	0	0	0
173	2	Ulyanovsk oblast	12	848	114	404	631	32	82	290	227	107	109
178	2	Yaroslavl oblast	12	1320	1244	1262	1308	615	629	18	46	3	10
179	2	Adigei Republic	12	380	133	162	191	49	84	29	29	12	176
180	2	Bashkortostan Repu	12	5880	1450	2600	3637	416	1034	1150	1037	719	1524
182	2	Daghestn Republic	12	4543	187	374	987	70	117	187	613	490	3057
183	2	Kabardino-Balkarian	12	873	248	286	316	101	147	38	30	40	517
185	2	Kalmyk-Khalm-Tang	12	6185	0	0	0	0	0	0	0	0	6185
186	2	Karelia Republic	12	14833	1994	8553	11325	571	1423	6559	2772	1784	1716
187	2	Komi Republic	12	41370	4784	16384	25093	2135	2649	11600	8709	5070	11207
188	2	Mari-El Republic	12	1410	695	1210	1308	122	573	515	98	23	79
189	2	Mordovian SSR	12	673	434	646	659	255	179	212	13	10	4
190	2	North-Ossetian SSR	12	570	167	214	264	111	56	47	50	28	277
191	2	Karachai-Cherkess I	12	1255	243	323	385	112	131	80	62	72	797
192	2	Tatarstan Republic	12	678	271	455	562	108	163	184	107	54	62
194	2	Udmurt Republic	12	1678	1270	1576	1580	547	723	306	4	8	90
196	2	Checheno-Ingush R	12	1383	360	526	715	175	185	166	189	92	575
197	2	Chuvash Republic	12	688	261	494	565	33	228	233	71	110	12
101	3	Altai Kray	12	9045	3500	5553	6364	1593	1907	2053	811	345	2337

APPENDIX II

Table A16 SUITABLE AREAS FOR CONSERVATION FORESTRY - EXCLUDING CULTIVATED AND URBAN AREAS

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS
102	3	Gorno-Altai Republic	12	9330	802	2041	2213	107	695	1239	172	226	6891
104	3	Krasnoyarsk Kray	12	67158	14756	26286	32302	3717	11039	11530	6016	6067	28788
105	3	Primorski Kray	12	15145	893	2358	4386	292	601	1465	2028	2260	8499
106	3	Taymyr a.okr.	12	81188	0	0	0	0	0	0	0	0	81187
108	3	Khabarovsk Kray	12	77168	4596	8521	16623	892	3704	3925	8102	7795	52742
110	3	Amur oblast	12	34328	8205	12103	18838	2046	6159	3898	6735	4578	10911
116	3	Evenk a.okr	12	75635	5	372	888	0	5	367	516	3533	71214
121	3	Yevrey (Jewish) a.ot	12	3590	1107	1748	2109	556	551	641	361	436	1045
125	3	Irkutsk oblast	12	71560	6661	13381	21073	1224	5437	6720	7692	12248	38239
126	3	Ust-Orda Buryat a.o	12	1445	121	308	445	21	100	187	137	38	961
130	3	Kamchatka oblast	12	17018	100	1122	2877	0	100	1022	1755	676	13442
131	3	Koryak a.okr.	12	28898	0	112	398	0	0	112	286	1105	27394
132	3	Kemerovo oblast	12	7103	3736	4605	5237	814	2922	869	632	210	1654
135	3	Chukchi a.okr.	12	70690	0	0	0	0	0	0	0	0	70665
137	3	Kurgan oblast	12	3223	450	1161	1606	96	354	711	445	306	1311
144	3	Magadan oblast	12	45825	0	24	934	0	0	24	910	1154	43737
150	3	Novosibirsk oblast	12	12435	3674	6208	7089	1432	2242	2534	881	324	5022
152	3	Omsk oblast	12	9258	3046	4731	5945	501	2545	1685	1214	256	3058
164	3	Sakhalin oblast	12	8045	735	1661	2734	5	730	926	1073	327	4892
165	3	Sverdlovsk oblast	12	16690	9819	11492	12164	4456	5363	1673	672	189	4337
167	3	Aga-Buryat a.okr.	12	1873	2	83	715	0	2	81	632	294	865
169	3	Tomsk oblast	12	30583	14311	20800	23341	3538	10773	6489	2541	201	7040
171	3	Tyumen oblast	12	12890	6737	8955	9856	1833	4904	2218	901	370	2664
172	3	Khanty-Mansi a.okr.	12	53040	10224	18862	28659	1267	8957	8638	9797	2867	21515
174	3	Yamalo-Nenets a.ok	12	66395	20	1389	5424	0	20	1369	4035	9759	51204
175	3	Chelyabinsk oblast	12	3685	698	1267	1769	248	450	569	502	447	1469
176	3	Chita oblast	12	40300	293	2417	11612	1	292	2124	9195	8906	19782
181	3	Buryat Republic	12	32600	343	3589	6527	17	326	3246	2938	7503	18571
193	3	Tuva Republic	12	16665	106	1466	2663	0	106	1360	1197	1489	12513
195	3	Khakass Republic	12	5180	871	1652	2376	102	769	781	724	189	2616
198	3	Sakha (Yakutia) Rep	12	302708	519	3406	9997	0	519	2887	6591	17004	275689
		RUSSIA WEST		**235212**	**66502**	**117095**	**139849**	**26496**	**40006**	**50593**	**22754**	**13011**	**82282**
		RUSSIA EAST		**1230696**	**96330**	**167673**	**247164**	**24758**	**71572**	**71343**	**79491**	**91102**	**892254**
		RUSSIA TOTAL		**1465908**	**162832**	**284768**	**387013**	**51254**	**111578**	**121936**	**102245**	**104113**	**974536**
211	11	Beijing	12	878	411	660	755	127	284	249	95	0	122
212	11	Tianjin	12	95	1	14	19	0	1	13	5	2	74
213	11	Hebei	12	8108	4515	6520	7269	1348	3167	2005	749	98	741
214	11	Shanxi	12	7653	2768	4091	4718	921	1847	1323	627	1404	1530
237	11	Shandong	12	2360	692	815	1033	214	478	123	218	52	1274
241	11	Henan	12	7650	4257	5062	5519	1598	2659	805	457	161	1970
221	12	Liaoning	12	5388	3833	4538	4886	2057	1776	705	348	312	189
222	12	Jilin	12	10343	5407	7770	8637	2963	2444	2363	867	273	1434
223	12	Heilongjiang	12	29720	20083	25229	26946	10472	9611	5146	1717	615	2159
231	12	Shanghai	12	0	0	0	0	0	0	0	0	0	0
232	13	Jiangsu	12	830	508	616	653	208	300	108	37	1	176
233	13	Zhejiang	12	5480	5180	5442	5457	693	4487	262	15	7	15
234	13	Anhui	12	6878	5453	6457	6637	1542	3911	1004	180	16	224
236	14	Jiangxi	12	12195	9169	10322	10462	3732	5437	1153	140	112	1622
242	14	Hubei	12	13748	11470	12426	12434	3268	8202	956	8	0	1314
243	14	Hunan	12	16935	13397	14599	14696	2074	11323	1202	97	116	2123
235	15	Fujian	12	9233	6697	7845	8054	253	6444	1148	209	74	1105
244	15	Guangdong	12	10590	6893	7800	8068	1576	5317	907	268	109	2412
245	15	Guangxi	12	18013	11826	14679	15332	3401	8425	2853	653	254	2427
246	15	Hainan	12	2165	332	843	1268	52	280	511	425	230	666
251	16	Sichuan	12	37043	11199	12848	13543	3424	7775	1649	695	339	23159
252	16	Guizhou	12	11843	10698	11156	11157	1575	9123	458	1	0	686
253	16	Yunnan	12	32713	18462	21174	24021	7470	10992	2712	2847	3545	5146
215	17	Nei Mongol	12	104640	11638	19723	29102	4289	7349	8085	9379	3118	72420
261	17	Shaanxi	12	14298	6594	8167	8479	1450	5144	1573	312	212	5607
262	17	Gansu	12	33838	3759	5423	6515	1574	2185	1664	1092	347	26976
264	17	Ningxia	12	3550	79	267	937	40	39	188	670	23	2590
265	17	Xinjiang	12	156700	651	1563	2939	184	467	912	1376	891	152870
254	18	Xizang	12	116778	4794	5626	6681	1606	3188	832	1055	526	109571
263	18	Qinghai	12	70143	304	692	1800	29	275	388	1108	338	68004
272	19	Hongkong	12	33	0	1	2	0	0	1	1	0	31
		CHINA TOTAL		**749841**	**181070**	**222368**	**248019**	**58140**	**122930**	**41298**	**25651**	**13175**	**488637**

APPENDIX II

Table A 17 SUITABLE AREAS FOR CONSERVATION FORESTRY - EXCLUDING CULTIVATED AREAS, URBAN AREAS AND AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total	Suitable Areas (000ha)							
				Extent	VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS
2	4	Mongolia	12	147800	158	2239	8074	11	147	2081	5835	5259	134466
11	1	Armenia	12	1788	101	303	429	0	101	202	126	91	1268
12	1	Azerbaijan	12	4578	95	379	783	0	95	284	404	844	2643
13	1	Byelorussia	12	1680	1149	1427	1490	301	848	278	63	9	180
14	1	Estonia	12	370	178	220	261	22	156	42	41	25	84
15	1	Georgia	12	1515	126	393	511	29	97	267	118	180	824
16	1	Kazakhstan	12	214330	1891	4565	9616	414	1477	2674	5051	2536	202178
17	1	Kirghiztan	12	12170	82	566	1009	19	63	484	443	287	10874
18	1	Latvia	12	210	127	195	198	40	87	68	3	2	10
19	1	Lithuania	12	1463	786	1348	1365	336	450	562	17	7	89
20	1	Moldavia	12	10	2	5	6	1	1	3	1	3	1
21	1	Tajikistan	12	2655	0	0	8	0	0	0	8	7	2640
22	1	Turkmenistan	12	40375	0	0	8	0	0	0	8	1	40366
23	1	Ukraine	12	640	378	494	530	146	232	116	36	16	94
		FSU REPUBLICS		**281784**	**4915**	**9895**	**16214**	**1308**	**3607**	**4980**	**6319**	**4008**	**261251**
103	2	Krasnodar Kray	12	625	195	224	354	92	103	29	130	97	174
107	2	Stavropol Kray	12	965	147	251	278	59	88	104	27	14	672
111	2	Arkhangelsk oblast	12	11818	636	2261	3064	177	459	1625	803	268	8473
112	2	Astrakhan oblast	12	4380	0	0	0	0	0	0	0	0	4380
114	2	Belgorod oblast	12	0	0	0	0	0	0	0	0	0	0
115	2	Bryansk oblast	12	0	0	0	0	0	0	0	0	0	0
117	2	Vladimir oblast	12	13	9	12	13	1	8	3	1	0	0
118	2	Volgograd oblast	12	1890	0	0	0	0	0	0	0	0	1890
119	2	Vologda oblast	12	1253	772	981	1088	242	530	209	107	72	92
120	2	Voronezh oblast	12	258	5	18	58	0	5	13	40	156	42
122	2	Nizhni Novgorod obl	12	298	115	285	293	8	107	170	8	0	5
123	2	Nenets a.okr.	12	15018	0	3	95	0	0	3	92	39	14864
124	2	Ivanovo oblast	12	25	13	25	25	1	12	12	0	0	0
127	2	Kaliningrad oblast	12	30	13	21	28	4	9	8	7	0	1
128	2	Tver oblast	12	118	90	105	109	37	53	15	4	2	7
129	2	Kaluga oblast	12	65	61	65	65	26	35	4	0	0	0
133	2	Kirov oblast	12	235	123	215	232	57	66	92	17	0	4
134	2	Kostroma oblast	12	253	166	240	247	82	84	74	7	1	4
136	2	Samara oblast	12	5	0	0	1	0	0	0	1	2	2
138	2	Kursk oblast	12	0	0	0	0	0	0	0	0	0	0
139	2	Komi-Permyak a.okr	12	170	82	153	165	37	45	71	12	0	5
141	2	Leningrad oblast	12	800	393	682	730	152	241	289	48	57	14
142	2	Lipetsk oblast	12	0	0	0	0	0	0	0	0	0	0
146	2	Moscow oblast	12	193	162	183	192	62	100	21	9	0	1
147	2	Murmansk oblast	12	6555	0	38	166	0	0	38	128	146	6243
149	2	Novgorod oblast	12	233	161	222	225	36	125	61	3	7	1
153	2	Orenburg oblast	12	2480	0	0	2	0	0	0	2	7	2471
154	2	Oryel oblast	12	0	0	0	0	0	0	0	0	0	0
156	2	Penza oblast	12	0	0	0	0	0	0	0	0	0	0
157	2	Perm oblast	12	325	153	285	306	91	62	132	21	2	17
158	2	Pskov oblast	12	265	154	246	255	47	107	92	9	2	8
160	2	Rostov oblast	12	453	0	0	66	0	0	0	66	14	372
161	2	Ryazan oblast	12	405	276	398	405	78	198	122	7	0	0
163	2	Saratov oblast	12	615	0	0	10	0	0	0	10	3	601
166	2	Smolensk oblast	12	0	0	0	0	0	0	0	0	0	0
168	2	Tambov oblast	12	0	0	0	0	0	0	0	0	0	0
170	2	Tula oblast	12	13	13	13	13	6	7	0	0	0	0
173	2	Ulyanovsk oblast	12	18	0	0	5	0	0	0	5	6	6
178	2	Yaroslavl oblast	12	83	69	71	72	34	35	2	1	0	10
179	2	Adigei Republic	12	103	55	56	60	25	30	1	4	0	43
180	2	Bashkortostan Repu	12	808	88	162	219	21	67	74	57	136	452
182	2	Daghestn Republic	12	4188	160	325	890	62	98	165	565	414	2876
183	2	Kabardino-Balkarian	12	663	109	137	162	43	66	28	25	37	465
185	2	Kalmyk-Khalm-Tang	12	6183	0	0	0	0	0	0	0	0	6182
186	2	Karelia Republic	12	3005	354	1949	2510	21	333	1595	561	178	310
187	2	Komi Republic	12	8200	485	2116	2915	202	283	1631	799	590	4695
188	2	Mari-El Republic	12	100	45	85	91	5	40	40	6	0	8
189	2	Mordovian SSR	12	125	87	124	124	52	35	37	0	0	0
190	2	North-Ossetian SSR	12	378	74	99	123	61	13	25	24	25	229
191	2	Karachai-Cherkess I	12	623	116	164	192	55	61	48	28	20	411
192	2	Tatarstan Republic	12	8	6	6	6	4	2	0	0	0	2
194	2	Udmurt Republic	12	3	3	3	3	2	1	0	0	0	0
196	2	Checheno-Ingush R	12	960	194	290	432	111	83	96	142	74	454
197	2	Chuvash Republic	12	0	0	0	0	0	0	0	0	0	0
101	3	Altai Kray	12	4503	1706	2590	3081	848	858	884	491	143	1279

APPENDIX II

Table A 17 SUITABLE AREAS FOR CONSERVATION FORESTRY - EXCLUDING CULTIVATED AREAS, URBAN AREAS AND AREAS CURRENTLY UNDER FOREST

ADM	REG	NAME	LC	Total Extent	Suitable Areas (000ha) VS+S	VS...MS	VS...mS	VS	S	MS	mS	vmS	NS
102	3	Gorno-Altai Republic	12	4118	73	505	531	14	59	432	26	77	3510
104	3	Krasnoyarsk Kray	12	5383	1143	2033	2252	393	750	890	219	123	3008
105	3	Primorski Kray	12	1490	172	637	836	39	133	465	199	156	498
106	3	Taymyr a.okr.	12	71523	0	0	0	0	0	0	0	0	71522
108	3	Khabarovsk Kray	12	18580	1718	3326	4563	342	1376	1608	1237	1238	12780
110	3	Amur oblast	12	6033	2153	2831	3777	722	1431	678	946	606	1650
116	3	Evenk a.okr	12	9323	0	16	26	0	0	16	10	78	9219
121	3	Yevrey (Jewish) a.ot	12	1318	422	800	941	203	219	378	141	34	342
125	3	Irkutsk oblast	12	8388	240	718	1026	47	193	478	308	847	6514
126	3	Ust-Orda Buryat a.o	12	350	7	57	115	0	7	50	58	29	207
130	3	Kamchatka oblast	12	9120	23	303	725	0	23	280	422	185	8188
131	3	Koryak a.okr.	12	25808	0	108	320	0	0	108	212	1018	24469
132	3	Kemerovo oblast	12	925	161	178	365	23	138	17	187	135	425
135	3	Chukchi a.okr.	12	60873	0	0	0	0	0	0	0	0	60847
137	3	Kurgan oblast	12	2543	306	743	1098	53	253	437	355	289	1156
144	3	Magadan oblast	12	31205	0	12	580	0	0	12	568	522	30104
150	3	Novosibirsk oblast	12	8383	2004	3435	4116	890	1114	1431	681	269	3997
152	3	Omsk oblast	12	5148	1392	2144	2863	303	1089	752	719	250	2034
164	3	Sakhalin oblast	12	973	103	247	291	0	103	144	44	23	651
165	3	Sverdlovsk oblast	12	2898	2113	2330	2383	950	1163	217	53	3	511
167	3	Aga-Buryat a.okr.	12	1038	0	35	377	0	0	35	342	178	482
169	3	Tomsk oblast	12	10153	4322	6465	7502	870	3452	2143	1037	44	2606
171	3	Tyumen oblast	12	7145	3643	4625	5151	959	2684	982	526	287	1707
172	3	Khanty-Mansi a.okr.	12	20210	4702	7701	11633	445	4257	2999	3932	1308	7269
174	3	Yamalo-Nenets a.ok	12	41490	3	470	2159	0	3	467	1689	2728	36596
175	3	Chelyabinsk oblast	12	1518	131	247	412	71	60	116	165	409	696
176	3	Chita oblast	12	11328	95	1275	2832	0	95	1180	1557	1718	6778
181	3	Buryat Republic	12	10333	95	1557	2162	1	94	1462	605	1298	6873
193	3	Tuva Republic	12	5498	30	655	929	0	30	625	274	306	4263
195	3	Khakass Republic	12	1360	590	781	892	71	519	191	111	19	449
198	3	Sakha (Yakutia) Rep	12	107800	68	490	1386	0	68	422	896	3205	103191
		RUSSIA WEST		**75204**	**5584**	**12513**	**16289**	**1993**	**3591**	**6929**	**3776**	**2369**	**56486**
		RUSSIA EAST		**496758**	**27415**	**47314**	**65324**	**7244**	**20171**	**19899**	**18010**	**17525**	**413821**
		RUSSIA TOTAL		**571962**	**32999**	**59827**	**81613**	**9237**	**23762**	**26828**	**21786**	**19894**	**470307**
211	11	Beijing	12	673	306	492	559	91	215	186	67	0	112
212	11	Tianjin	12	78	0	7	9	0	0	7	2	2	66
213	11	Hebei	12	6618	3653	5338	5960	1044	2609	1685	622	74	583
214	11	Shanxi	12	6105	2109	3169	3662	689	1420	1060	493	1140	1304
237	11	Shandong	12	515	134	172	187	64	70	38	15	31	298
241	11	Henan	12	1193	605	734	770	231	374	129	36	43	381
221	12	Liaoning	12	1468	660	992	1196	310	350	332	204	162	109
222	12	Jilin	12	2573	409	523	1262	183	226	114	739	266	1044
223	12	Heilongjiang	12	9320	5090	6140	7502	2793	2297	1050	1362	592	1226
231	12	Shanghai	12	0	0	0	0	0	0	0	0	0	0
232	13	Jiangsu	12	275	130	161	164	62	68	31	3	0	110
233	13	Zhejiang	12	500	452	494	499	40	412	42	5	0	0
234	13	Anhui	12	1465	1376	1433	1433	290	1086	57	0	0	32
236	14	Jiangxi	12	4710	3742	4086	4144	1864	1878	344	58	51	515
242	14	Hubei	12	5280	4486	4792	4792	1037	3449	306	0	0	488
243	14	Hunan	12	4623	3732	3962	3977	548	3184	230	15	37	609
235	15	Fujian	12	540	318	364	393	10	308	46	29	12	134
244	15	Guangdong	12	2330	1551	1798	1848	288	1263	247	50	17	465
245	15	Guangxi	12	7725	5589	6737	6941	1862	3727	1148	204	56	727
246	15	Hainan	12	848	112	299	460	17	95	187	161	100	287
251	16	Sichuan	12	24765	4528	5088	5387	1413	3115	560	299	145	19233
252	16	Guizhou	12	6493	5934	6160	6160	861	5073	226	0	0	332
253	16	Yunnan	12	11850	7041	7855	8793	2692	4349	814	938	1228	1830
215	17	Nei Mongol	12	90058	4421	9652	16697	1223	3198	5231	7045	2284	71076
261	17	Shaanxi	12	9673	3452	4524	4828	708	2744	1072	304	129	4717
262	17	Gansu	12	31640	2690	4038	5062	1096	1594	1348	1024	318	26259
264	17	Ningxia	12	3505	66	246	896	30	36	180	650	23	2585
265	17	Xinjiang	12	153305	578	1385	2632	152	426	807	1247	791	149882
254	18	Xizang	12	106460	679	1001	1458	295	384	322	457	252	104751
263	18	Qinghai	12	69645	298	664	1741	29	269	366	1077	334	67570
272	19	Hongkong	12	10	0	0	0	0	0	0	0	0	9
		CHINA TOTAL		**564243**	**64141**	**82306**	**99412**	**19922**	**44219**	**18165**	**17106**	**8087**	**456734**

APPENDIX III

Soil Suitability Ratings

Table A18 **FAO '90 SOIL UNIT RATINGS FOR TREE SPECIES IN BOREAL, TEMPERATE AND SUBTROPICAL CLIMATES**

Input Level	IL	FAO '90 Soil Units SU	SEQ	Birch (Bi) 1 *Betula pubescens*	2 *Betula pendula*	3 *Betula verrucosa*	4 *Betula tortuosa*	5 *Betula Platypphylla*	6 *Betula papyrifera*	Poplar (Po) 1 *Populus nigra*	2 *Populus euramericana*	3 *Polpulus alba*	4 *Populus tremula*	5 *Populus balsamiferas*	6 *Populus maximowiczii*	7 *Populus tomentosa*	8 *Populus euphraetica*	Willow (Wi) 1 *Salix alba*	2 *Salix viminalis (plantation*	Oak (Oa) 1 *Quercus robur*	2 *Quercus petraeea*	3 *Quercus rubra*	4 *Quercus lanuginosa*	5 *Quercus cerris*	6 *Quercus acutissima*	7 *Quercus variablis*	8 *Quercus mongolica*
SL	H	AC	001	4	4	4	4	4	4	6	6	2	2	2	2	2	2	2	4	2	2	2	6	2	2	2	2
SL	H	ACf	002	4	4	4	4	4	4	4	4	6	6	6	6	4	4	6	4	6	2	6	6	2	2	2	6
SL	H	ACg	003	4	4	4	4	4	4	6	6	6	4	6	6	6	6	2	2	6	4	4	6	6	6	6	6
SL	H	ACh	004	4	4	4	4	4	4	6	6	2	2	2	2	6	6	2	4	2	2	2	6	2	2	2	2
SL	H	ACp	005	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	ACu	006	4	4	4	4	4	4	6	6	2	2	2	2	6	6	2	4	2	2	2	6	2	2	2	2
SL	H	AL	007	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	4	3	3	3	2	3	3	3	3
SL	H	ALf	008	2	2	2	2	2	2	6	6	6	6	6	6	6	6	2	4	6	2	6	6	2	2	2	6
SL	H	ALg	009	2	6	6	3	6	6	2	2	6	4	6	6	6	6	2	2	6	4	4	6	6	6	6	6
SL	H	ALh	010	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	4	3	3	3	2	3	3	3	3
SL	H	ALj	011	2	6	6	2	6	6	2	2	6	4	6	6	6	6	2	2	4	4	4	4	4	4	4	4
SL	H	ALp	012	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	ALu	013	1	1	1	1	1	1	6	6	2	2	2	2	6	6	1	4	2	2	2	2	2	2	2	2
SL	H	AN	014	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1
SL	H	ANg	015	3	6	6	3	6	6	2	2	6	4	6	6	6	6	3	3	6	4	4	6	6	6	6	6
SL	H	ANh	016	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1
SL	H	ANi	017	6	6	6	6	4	4	4	4	4	4	4	4	4	4	6	4	4	4	4	4	4	4	4	4
SL	H	ANm	018	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1	1
SL	H	ANu	019	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	4	1	1	1	1	1	1	1	1
SL	H	ANz	020	4	6	6	4	6	6	4	4	4	4	4	4	4	4	6	4	4	4	4	4	4	4	4	4
SL	H	AR	021	6	2	2	6	2	2	2	2	2	2	2	2	2	2	2	4	2	2	2	2	6	2	2	2
SL	H	ARa	022	6	2	2	6	2	2	6	6	6	6	6	6	6	6	2	4	6	2	6	6	6	2	2	6
SL	H	ARb	023	2	3	3	2	3	3	2	2	2	2	2	2	2	2	3	4	2	2	2	2	6	2	2	2
SL	H	ARc	024	6	2	2	6	2	2	2	2	2	2	2	2	2	2	2	4	2	2	2	2	6	2	2	2
SL	H	ARg	025	2	6	6	2	6	6	6	6	6	4	6	6	6	6	2	2	6	4	4	6	4	6	6	6
SL	H	ARh	026	2	3	3	2	3	3	2	2	2	2	2	2	2	2	3	4	2	2	2	2	6	2	2	2
SL	H	ARl	027	3	1	1	3	1	1	2	2	2	2	2	2	2	2	3	4	3	3	3	3	2	3	3	3
SL	H	ARo	028	4	4	4	4	4	4	4	4	6	6	6	6	4	4	6	4	6	2	6	4	6	2	2	6
SL	H	AT	029	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1	1
SL	H	ATa	030	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1	1
SL	H	ATc	031	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1
SL	H	ATf	032	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	6	1	1	1	3	1	1	1	1
SL	H	ATu	033	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1	1
SL	H	CH	034	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3
SL	H	CHg	035	2	6	6	2	6	6	2	2	6	4	6	6	6	6	2	2	6	4	4	6	6	6	6	6
SL	H	CHh	036	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3
SL	H	CHk	037	6	6	6	6	6	6	6	6	6	6	6	6	6	6	2	4	2	2	2	2	6	6	6	2
SL	H	CHl	038	2	2	2	2	2	2	3	3	3	3	3	3	3	3	2	4	2	2	2	2	2	2	2	2
SL	H	CHw	039	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3
SL	H	CL	040	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2
SL	H	CLh	041	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2
SL	H	CLl	042	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2
SL	H	CLp	043	6	2	2	6	2	2	6	6	6	6	6	6	6	6	6	4	2	2	2	2	2	2	2	2
SL	H	CM	044	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1
SL	H	CMc	045	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1
SL	H	CMd	046	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	3	1	1	1	1
SL	H	CMe	047	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1
SL	H	CMg	048	3	6	6	3	6	6	2	2	6	4	6	6	6	6	3	2	6	4	4	6	6	6	6	6
SL	H	CMi	049	2	6	6	2	6	6	4	4	4	4	4	4	4	4	6	4	4	4	4	4	4	4	4	4
SL	H	CMo	050	2	2	2	2	2	2	6	6	6	6	6	6	6	6	2	4	6	6	6	4	6	6	6	6
SL	H	CMu	051	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	6	1	1	1	1	1	1	1	1
SL	H	CMv	052	6	4	4	6	4	4	6	6	6	6	6	6	6	6	6	4	6	6	6	6	4	4	4	6
SL	H	CMx	053	1	1	1	1	1	1	3	3	1	1	1	1	3	3	1	4	1	1	1	1	1	1	1	1
SL	H	FL	054	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1

Input Level	IL	FAO '90 Soil Units SU	SEQ	Beech Be	Hornbeam Ho	Ash (As) 1 *Fraxinus excelsior*	2 *Fraxinus mandshurica*	Alder Al	Lime Li	Maple (Ma) 1 *Acer plantanoides*	2 *Acer campestre*	3 *Acer campbelii*	Black locust Bl	Chestnut Ch	Wallnut Wa	Larch (La) 1 *Larix gmelinii*	2 *Larix sibirica*	Spruce (Sp) 1 *Picea abies*	2 *Picea asperata*	3 *Picea ajanensis*	4 *Picea obovata*	5 *Picea koreaiensis*	Pine (Pi) 1 *Pinus sibirica*	2 *Pinus sylvestris*	3 *Pinus tabulaeformis*	4 *Pinus massoniana*	5 *Pinus yunnanensis*	6 *Pinus koreaiensis*	Fir (Fi) 1 *Abies alba*	2 *Abies sibirica*	3 *Cunninghamia lanceolata*
SL	H	AC	001	2	2	6	6	6	2	2	6	6	2	2	6	3	3	2	2	2	2	2	3	3	3	3	3	3	3	3	3
SL	H	ACf	002	6	6	4	4	4	6	4	4	4	4	6	4	2	2	6	6	6	6	6	2	2	2	2	2	2	2	2	2
SL	H	ACg	003	4	6	6	6	6	6	6	6	6	6	4	4	6	6	4	4	4	4	4	2	3	2	6	2	2	2	6	6
SL	H	ACh	004	2	2	6	6	6	2	2	6	6	2	2	6	3	3	2	2	2	2	2	3	3	3	3	3	3	3	3	3
SL	H	ACp	005	4	4	4	4	4	4	4	4	4	4	4	4	6	6	4	4	4	4	4	6	6	6	6	6	6	6	6	6
SL	H	ACu	006	2	2	6	6	6	2	2	6	6	2	2	6	3	3	2	2	2	2	2	3	3	3	3	3	3	3	3	3
SL	H	AL	007	2	3	6	6	6	3	2	2	2	2	3	6	1	1	3	3	3	3	3	1	1	1	1	1	1	1	1	1
SL	H	ALf	008	6	6	4	4	4	6	4	4	4	4	6	6	2	2	6	6	6	6	6	2	2	2	2	2	2	2	2	2
SL	H	ALg	009	4	6	6	6	6	6	6	6	6	6	4	4	3	3	4	4	4	4	4	2	3	2	6	2	2	3	2	2
SL	H	ALh	010	2	3	6	6	6	3	2	6	6	2	3	6	3	3	3	3	3	3	3	1	1	1	1	1	1	3	3	3
SL	H	ALj	011	4	4	6	6	6	4	4	4	4	4	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	4	4
SL	H	ALp	012	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	ALu	013	2	2	6	6	6	2	2	6	6	2	2	6	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1
SL	H	AN	014	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	ANg	015	4	6	3	3	3	6	6	6	6	6	4	4	6	6	4	4	4	4	4	2	3	2	6	2	2	2	6	6
SL	H	ANh	016	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	ANi	017	4	4	4	4	4	4	4	4	4	4	4	4	2	6	4	4	6	6	4	6	4	4	4	4	4	4	4	4
SL	H	ANm	018	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	ANu	019	1	1	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	ANz	020	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	4	4	4
SL	H	AR	021	4	2	2	2	2	2	2	2	2	2	2	4	3	2	6	6	6	6	6	2	3	2	2	2	3	6	2	2
SL	H	ARa	022	4	6	6	6	6	6	6	6	6	6	6	4	3	2	6	6	6	6	6	2	3	2	2	2	3	6	2	2
SL	H	ARb	023	4	2	2	2	2	2	2	2	2	2	2	4	3	2	6	6	6	6	6	2	3	2	2	2	3	6	2	2
SL	H	ARc	024	4	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	2	2	2	2	2	2	6	6	2
SL	H	ARg	025	4	6	2	2	2	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	6	6
SL	H	ARh	026	4	2	2	2	2	2	2	2	2	2	2	4	3	2	6	6	6	6	6	2	3	2	2	2	2	6	2	2
SL	H	ARl	027	4	2	2	2	2	2	2	2	2	2	2	4	3	3	6	6	6	6	6	3	3	3	3	3	3	2	3	3
SL	H	ARo	028	4	6	6	6	6	6	6	6	6	4	6	4	2	6	4	4	4	4	4	2	2	2	2	2	2	6	2	2
SL	H	AT	029	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	ATa	030	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	ATc	031	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	ATf	032	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	ATu	033	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	CH	034	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2
SL	H	CHg	035	4	6	3	3	3	6	6	6	6	6	4	4	6	6	4	4	4	4	4	2	3	2	6	2	2	2	6	6
SL	H	CHh	036	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2
SL	H	CHk	037	2	2	3	3	3	2	2	2	2	2	2	2	4	4	4	4	4	4	4	2	2	2	2	2	2	2	4	2
SL	H	CHl	038	2	2	3	3	3	2	2	2	2	2	2	2	6	6	4	4	4	4	4	2	2	2	2	2	2	6	6	6
SL	H	CHw	039	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	2
SL	H	CL	040	2	2	3	3	3	2	2	2	2	2	2	2	4	4	4	4	4	4	4	6	2	2	2	2	2	2	4	2
SL	H	CLh	041	2	2	3	3	3	2	2	2	2	2	2	2	4	4	4	4	4	4	4	6	2	2	2	2	2	2	4	2
SL	H	CLl	042	2	2	3	3	3	2	2	2	2	2	2	2	4	4	4	4	4	4	4	6	2	2	2	2	2	2	4	2
SL	H	CLp	043	6	2	2	2	2	2	2	2	2	2	2	6	4	4	4	4	4	4	4	6	2	2	2	2	2	2	4	2
SL	H	CM	044	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	CMc	045	1	1	1	1	1	1	1	1	1	1	3	1	4	4	4	4	4	4	4	2	3	3	3	3	3	3	6	3
SL	H	CMd	046	1	1	1	1	1	1	1	3	3	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	CMe	047	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	CMg	048	4	6	3	3	3	6	6	6	6	6	4	4	6	6	4	4	4	4	4	2	3	2	6	2	2	2	6	6
SL	H	CMi	049	4	4	4	4	4	4	4	4	4	4	4	4	2	6	4	4	4	6	4	6	4	4	4	4	4	4	4	4
SL	H	CMo	050	6	6	4	4	4	6	6	6	6	4	6	6	2	2	6	6	6	6	6	2	2	2	2	2	2	2	2	2
SL	H	CMu	051	1	1	3	3	3	1	1	3	3	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	CMv	052	4	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	4	4
SL	H	CMx	053	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	FL	054	4	1	1	1	1	1	1	1	1	1	4	4	1	1	4	4	4	4	4	1	1	1	4	1	1	1	1	1

Table A18 **FAO '90 SOIL UNIT RATINGS FOR TREE SPECIES IN BOREAL, TEMPERATE AND SUBTROPICAL CLIMATES**

	Input Level IL	*FAO '90 Soil Units* SU	SEQ	Birch (Bi) 1 *Betula pubescens*	2 *Betula pendula*	3 *Betula verrucosa*	4 *Betula tortuosa*	5 *Betula Platypphylla*	6 *Betula papyrifera*	Poplar (Po) 1 *Populus nigra*	2 *Populus euramericana*	3 *Polpulus alba*	4 *Populus tremula*	5 *Populus balsamiferas*	6 *Populus maximowiczii*	7 *Populus tomentosa*	8 *Populus euphraetica*	Willow (Wi) 1 *Salix alba*	2 *Salix viminalis (plantation*	Oak (Oa) 1 *Quercus robur*	2 *Quercus petraeea*	3 *Quercus rubra*	4 *Quercus lanuginosa*	5 *Quercus cerris*	6 *Quercus acutissima*	7 *Quercus variablis*	8 *Quercus mongolica*	Beech Be	Hornbeam Ho	Ash (As) 1 *Fraxinus excelsior*	2 *Fraxinus mandshurica*	Alder Al	Lime Li	Maple (Ma) 1 *Acer plantanoides*	2 *Acer campestre*	3 *Acer campbelii*	Black locust Bl	Chestnut Ch	Wallnut Wa	Larch (La) 1 *Larix gmelinii*	2 *Larix sibirica*	Spruce (Sp) 1 *Picea abies*	2 *Picea asperata*	3 *Picea ajanensis*	4 *Picea obovata*	5 *Picea koreaiensis*	Pine (Pi) 1 *Pinus sibirica*	2 *Pinus sylvestris*	3 *Pinus tabulaeformis*	4 *Pinus massoniana*	5 *Pinus yunnanensis*	6 *Pinus koreaiensis*	Fir (Fi) 1 *Abies alba*	2 *Abies sibirica*	3 *Cunninghamia lanceolata*
SL	H	FLc	055	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	4	4	4	4	4	4	4	4	4	3	3	3	4	3	3	1	6	1
SL	H	FLd	056	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	3	3	3	3	1	4	1	1	1	1	1	1	1	1	1	4	4	1	1	4	4	4	4	4	1	1	1	4	1	1	1	1	1
SL	H	FLe	057	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	4	4	1	1	4	4	4	4	4	1	1	1	4	1	1	1	1	1
SL	H	FLm	058	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	4	4	1	1	4	4	4	4	4	1	1	1	4	1	1	1	1	1
SL	H	FLs	059	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	6	6	4	6	6	4	4	4
SL	H	FLt	060	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	FLu	061	1	1	1	1	1	1	3	3	1	1	1	1	3	3	1	1	1	4	4	3	1	1	1	1	4	1	3	3	3	1	1	1	1	1	4	4	1	1	4	4	4	4	4	3	3	3	4	3	3	1	1	1
SL	H	FR	062	4	4	4	4	4	4	6	6	2	2	2	2	6	6	6	6	6	2	6	4	2	2	2	6	6	6	6	6	6	6	6	4	4	6	6	4	4	4	4	6	4	4	4	6	6	6	6	6	6	2	6	2
SL	H	FRg	063	4	4	4	4	4	4	6	6	6	6	6	6	4	4	6	6	4	4	4	4	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	4	4
SL	H	FRh	064	4	4	4	4	4	4	6	6	2	2	2	2	6	6	6	6	6	2	6	4	2	2	2	6	6	6	6	6	6	6	6	4	4	6	6	4	4	4	4	6	4	4	4	6	6	6	6	6	6	2	6	2
SL	H	FRp	065	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	FRr	066	4	4	4	4	4	4	6	6	2	2	2	2	6	6	6	6	6	2	6	4	2	2	2	6	6	6	6	6	6	6	6	4	4	6	6	4	4	4	4	6	4	4	4	6	6	6	6	6	6	2	6	2
SL	H	FRu	067	4	4	4	4	4	4	6	6	2	2	2	2	6	6	6	6	6	2	6	4	2	2	2	6	6	6	6	6	6	6	6	4	4	6	6	4	4	4	4	6	4	4	4	6	6	6	6	6	6	2	6	2
SL	H	FRx	068	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	6	6	6	6	6	6	6	6	6	6	4	4	6	6	4	4	4	4	6	4	4	4	6	6	6	6	6	6	6	6	6
SL	H	GL	069	3	6	6	3	6	6	2	2	6	4	6	6	6	6	3	3	6	4	4	6	6	6	6	6	4	6	2	2	2	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	6	6
SL	H	GLa	070	3	6	6	3	6	6	2	2	6	4	6	6	6	6	3	3	6	4	4	4	6	6	6	6	4	6	2	2	2	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	6	6
SL	H	GLd	071	3	6	6	3	6	6	6	6	6	4	6	6	6	6	3	3	6	4	4	4	6	6	6	6	4	6	2	2	2	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	6	6
SL	H	GLe	072	3	6	6	3	6	6	6	6	6	4	6	6	6	6	3	3	6	4	4	6	6	6	6	6	4	6	2	2	2	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	6	6
SL	H	GLi	073	2	6	6	2	6	6	4	4	4	4	4	4	4	4	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	4	4	4	4	4	4	6	4	4	4	4	4	4	4	4
SL	H	GLk	074	2	6	6	2	6	6	2	2	6	4	6	6	6	6	3	3	6	4	4	6	4	4	4	6	4	6	2	2	2	6	6	6	6	6	4	4	4	4	4	4	4	4	4	6	2	6	4	6	6	6	4	6
SL	H	GLm	075	3	6	6	3	6	6	2	2	6	4	6	6	6	6	3	3	6	4	4	6	6	6	6	6	4	6	2	2	2	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	6	6
SL	H	GLt	076	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	GLu	077	3	6	6	3	6	6	6	6	6	4	6	6	6	6	3	3	6	4	4	4	6	6	6	6	4	6	2	2	2	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	6	6
SL	H	GR	078	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	GRg	079	3	6	6	3	6	6	2	2	6	4	6	6	6	6	3	2	6	4	4	6	6	6	6	6	4	6	3	3	3	6	6	6	6	6	4	4	6	6	4	4	4	4	4	2	3	2	6	2	2	6	6	6
SL	H	GRh	080	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	GY	081	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	GYh	082	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	GYk	083	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	GYl	084	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	GYp	085	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	HS	086	2	4	4	2	4	4	4	4	4	4	4	4	4	4	2	6	6	6	6	6	6	6	6	6	4	4	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	2	4	4	4
SL	H	HSf	087	2	4	4	2	4	4	4	4	4	4	4	4	4	4	2	6	6	6	6	4	6	6	6	6	4	4	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	2	4	4	4
SL	H	HSi	088	6	4	4	6	4	4	4	4	4	4	4	4	4	4	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	4	4	4	4	4	4	6	4	4	4	4	4	4	4	4
SL	H	HSl	089	2	4	4	2	4	4	4	4	4	4	4	4	4	4	2	2	6	6	6	6	6	6	6	6	4	4	2	2	2	4	4	4	4	4	4	4	6	6	6	6	6	6	6	2	2	2	2	2	2	6	6	6
SL	H	HSs	090	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	HSt	091	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	KS	092	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	KSh	093	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	KSk	094	2	2	2	2	2	2	3	3	2	2	2	2	3	3	1	4	3	3	3	1	2	2	2	3	2	3	3	3	3	3	3	3	3	2	2	2	4	4	4	4	4	4	4	2	3	3	3	3	3	1	4	1
SL	H	KSl	095	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	2	3	1	1	1	3	3	3	3	2	2	2	6	6	6	6	6	6	6	3	3	3	3	3	3	6	6	6
SL	H	KSy	096	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	LP	097	6	6	6	6	6	6	4	4	4	4	4	4	4	4	6	4	6	6	6	6	6	6	6	6	4	6	6	6	6	6	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	6
SL	H	LPd	098	6	6	6	6	6	6	4	4	4	4	4	4	4	4	6	4	6	6	6	4	6	6	6	6	4	6	6	6	6	6	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	6
SL	H	LPe	099	6	6	6	6	6	6	4	4	4	4	4	4	4	4	6	4	6	6	6	6	6	6	6	6	4	6	6	6	6	6	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	6
SL	H	LPi	100	4	4	4	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	LPk	101	6	6	6	6	6	6	4	4	4	4	4	4	4	4	6	4	6	6	6	6	6	6	6	6	4	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	6	6	6	6	4	4	6
SL	H	LPm	102	6	6	6	6	6	6	4	4	4	4	4	4	4	4	6	4	6	6	6	4	6	6	6	6	4	6	6	6	6	6	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	6
SL	H	LPq	103	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	LPu	104	6	6	6	6	6	6	4	4	4	4	4	4	4	4	6	4	6	6	6	4	6	6	6	6	4	6	6	6	6	6	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	6
SL	H	LV	105	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	H	LVa	106	3	1	1	3	1	1	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
SL	H	LVf	107	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	4	6	2	6	4	2	2	2	6	6	6	6	6	6	6	6	6	6	4	6	4	2	2	6	6	6	6	6	2	2	2	2	2	2	2	2	2
SL	H	LVg	108	3	6	6	3	6	6	2	2	6	4	6	6	6	6	3	2	6	4	4	6	6	6	6	6	4	6	3	3	3	6	6	6	6	6	4	4	6	6	4	4	4	4	4	2	3	2	6	2	2	2	6	6

Table A18 **FAO '90 SOIL UNIT RATINGS FOR TREE SPECIES IN BOREAL, TEMPERATE AND SUBTROPICAL CLIMATES**

	Input Level	FAO '90 Soil Units		Birch	Betula pubescens	Betula pendula	Betula verrucosa	Betula tortuosa	Betula Platypphylla	Betula papyrifera	Poplar	Populus nigra	Populus euramericana	Polpulus alba	Populus tremula	Populus balsamiferas	Populus maximowiczii	Populus tomentosa	Populus euphraetica	Willow	Salix alba	Salix viminalis (plantation	Oak	Quercus robur	Quercus petraeea	Quercus rubra	Quercus lanuginosa	Quercus cerris	Quercus acutissima	Quercus variablis	Quercus mongolica	Beech	Hornbeam	Ash	Fraxinus excelsior	Fraxinus mandshurica	Alder	Lime	Maple	Acer plantanoides	Acer campestre	Acer campbelii	Black locust	Chestnut	Wallnut	Larch	Larix gmelinii	Larix sibirica	Spruce	Picea abies	Picea asperata	Picea ajanensis	Picea obovata	Picea koreaiensis	Pine	Pinus sibirica	Pinus sylvestris	Pinus tabulaeformis	Pinus massoniana	Pinus yunnanensis	Pinus koreaiensis	Fir	Abies alba	Abies sibirica	Cunninghamia lanceolata
	IL	SU	SEQ	Bi	1	2	3	4	5	6	Po	1	2	3	4	5	6	7	8	Wi	1	2	Oa	1	2	3	4	5	6	7	8	Be	Ho	As	1	2	Al	Li	Ma	1	2	3	Bl	Ch	Wa	La	1	2	Sp	1	2	3	4	5	Pi	1	2	3	4	5	6	Fi	1	2	3
SL	H	LVh	109		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	4		1	1	1	3	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	LVj	110		2	6	6	2	6	6		2	2	6	4	6	6	6	6		3	6		4	4	4	4	4	4	4	4	4	4		2	2	2	4		4	4	4	4	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		4	4	4
SL	H	LVk	111		3	2	2	3	2	2		1	1	1	1	1	1	1	1		1	4		1	1	1	1	2	2	2	1	2	1		1	1	1	1		1	1	1	1	2	2		6	6		4	4	4	4	4		2	3	3	3	3	3		1	6	1
SL	H	LVv	112		2	6	6	2	6	6		2	2	6	6	6	6	2	2		2	4		6	6	6	6	4	4	4	6	4	6		6	6	6	6		6	6	6	6	4	4		4	4		4	4	4	4	4		6	6	6	6	6	6		6	4	4
SL	H	LVx	113		1	1	1	1	1	1		3	3	1	1	1	1	3	3		1	4		1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	LX	114		1	1	1	1	1	1		3	3	3	3	3	3	3	3		1	4		1	1	1	1	1	1	1	1	3	1		3	3	3	1		1	1	1	3	3	3		1	1		3	3	3	3	3		1	1	1	1	1	1		1	1	1
SL	H	LXa	115		3	1	1	3	1	1		3	3	3	3	3	3	3	3		3	4		3	3	3	3	3	3	3	3	2	3		2	2	2	3		3	2	2	2	2	2		3	3		2	2	2	2	2		3	3	3	3	3	3		3	3	3
SL	H	LXf	116		4	4	4	4	4	4		6	6	6	6	6	6	6	6		4	4		6	2	6	4	2	2	2	6	6	6		4	4	4	6		6	6	6	4	6	4		2	2		6	6	6	6	6		2	2	2	2	2	2		2	2	2
SL	H	LXg	117		3	6	6	3	6	6		2	2	6	4	6	6	6	6		3	2		6	4	4	6	6	6	6	6	4	6		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		2	3	2	6	2	2		2	6	6
SL	H	LXh	118		1	1	1	1	1	1		3	3	3	3	3	3	3	3		1	4		1	1	1	1	1	1	1	1	3	3		3	3	3	3		3	2	2	3	3	3		1	1		3	3	3	3	3		1	1	1	1	1	1		1	1	1
SL	H	LXj	119		2	6	6	2	6	6		2	2	6	4	6	6	6	6		2	6		4	4	4	4	4	4	4	4	4	4		2	2	2	4		4	4	4	4	4	4		6	6		4	4	4	4	4		6	2	6	4	2	2		4	4	4
SL	H	LXp	120		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	H	NT	121		4	4	4	4	4	4		3	3	1	1	1	1	3	3		1	4		1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	NTh	122		4	4	4	4	4	4		3	3	1	1	1	1	3	3		1	4		1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	NTr	123		4	4	4	4	4	4		1	1	1	1	1	1	1	1		1	4		1	1	1	3	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	NTu	124		4	4	4	4	4	4		3	3	1	1	1	1	3	3		1	6		1	1	1	3	1	1	1	1	3	1		3	3	3	1		1	1	1	3	3	3		3	3		3	3	3	3	3		1	1	1	1	1	1		3	3	3
SL	H	PD	125		1	1	1	1	1	1		3	3	1	1	1	1	3	3		1	4		1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	PDd	126		1	1	1	1	1	1		2	2	2	2	2	2	2	2		1	4		1	1	1	3	1	1	1	1	3	1		1	1	1	1		1	1	1	1	3	3		1	1		3	3	3	3	3		1	1	1	1	1	1		1	1	1
SL	H	PDe	127		1	1	1	1	1	1		3	3	1	1	1	1	3	3		1	4		1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	PDg	128		3	6	6	3	6	6		2	2	6	4	6	6	6	6		3	2		6	4	4	6	6	6	6	6	4	6		3	3	3	6		6	6	6	6	4	4		6	6		4	4	4	4	4		2	3	2	6	2	2		2	6	6
SL	H	PDi	129		2	6	6	2	6	6		4	4	4	4	4	4	4	4		6	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		2	6		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	H	PDj	130		2	6	6	2	6	6		6	6	6	4	6	6	6	6		2	6		4	4	4	4	4	4	4	4	4	4		2	2	2	4		4	4	4	4	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		4	4	4
SL	H	PH	131		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	4		1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	PHc	132		2	2	2	2	2	2		1	1	3	3	3	3	1	1		2	4		1	1	1	1	1	1	1	1	2	2		3	3	3	2		3	3	3	2	2	2		6	6		2	2	2	2	2		1	1	1	1	1	1		6	6	6
SL	H	PHg	133		2	6	6	2	6	6		2	2	6	4	6	6	6	6		2	2		6	4	4	6	6	6	6	6	4	6		3	3	3	6		6	6	6	6	4	4		6	6		4	4	4	4	4		2	3	2	6	2	2		2	6	6
SL	H	PHh	134		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	4		1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	H	PHj	135		2	6	6	2	6	6		2	2	6	4	6	6	6	6		2	6		4	4	4	4	4	4	4	4	4	4		2	2	2	4		4	4	4	4	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		4	4	4
SL	H	PHl	136		1	1	1	1	1	1		2	2	2	2	2	2	2	2		1	4		1	1	1	1	1	1	1	1	2	2		3	3	3	3		3	3	3	2	2	2		2	2		2	2	2	2	2		1	1	1	1	1	1		1	2	1
SL	H	PL	137		2	6	6	2	6	6		6	6	6	6	6	6	6	6		2	4		6	6	6	6	6	6	6	6	4	2		2	2	2	6		6	6	6	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2
SL	H	PLd	138		2	6	6	2	6	6		6	6	6	6	6	6	6	6		2	4		6	6	6	6	6	6	6	6	4	2		2	2	2	6		6	6	6	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2
SL	H	PLe	139		2	6	6	2	6	6		2	2	6	6	6	6	6	6		2	4		6	6	6	6	6	6	6	6	4	2		2	2	2	6		6	6	6	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2
SL	H	PLi	140		6	4	4	6	4	4		4	4	4	4	4	4	4	4		6	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		2	6		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	H	PLm	141		2	6	6	2	6	6		6	6	6	6	6	6	6	6		2	6		6	6	6	6	6	6	6	6	4	2		2	2	2	6		6	6	6	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2
SL	H	PLu	142		2	6	6	2	6	6		6	6	6	6	6	6	6	6		2	4		6	6	6	6	6	6	6	6	4	2		2	2	2	6		6	6	6	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2
SL	H	PT	143		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	H	PTa	144		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	H	PTd	145		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	H	PTe	146		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	H	PTu	147		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	H	PZ	148		2	3	3	2	3	3		2	2	2	2	2	2	2	2		2	4		2	3	2	6	2	3	3	2	6	2		6	6	6	2		2	6	6	2	2	6		2	2		2	2	2	2	2		3	3	3	3	3	3		2	2	2
SL	H	PZb	149		2	3	3	2	3	3		2	2	2	2	2	2	2	2		2	4		2	3	2	6	2	3	3	2	6	2		6	6	6	2		2	6	6	2	2	6		2	2		2	2	2	2	2		3	3	3	3	3	3		2	2	2
SL	H	PZc	150		3	3	3	3	3	3		2	2	2	2	2	2	2	2		2	4		2	3	2	6	2	3	3	2	6	2		6	6	6	2		2	6	6	2	2	6		2	2		2	2	2	2	2		3	3	3	3	3	3		2	2	2
SL	H	PZf	151		2	6	6	2	6	6		4	4	6	6	6	6	4	4		6	4		6	2	6	4	4	2	2	6	4	6		4	4	4	6		4	4	4	4	4	4		6	6		6	6	6	6	6		2	2	2	2	2	2		6	6	6
SL	H	PZg	152		2	6	6	2	6	6		6	6	4	4	4	4	4	4		2	2		6	4	4	4	4	6	6	6	4	6		6	6	6	6		4	6	6	6	4	4		4	4		4	4	4	4	4		6	2	6	4	6	6		6	4	4
SL	H	PZh	153		2	3	3	2	3	3		2	2	2	2	2	2	2	2		2	4		2	3	2	6	2	3	3	2	6	2		6	6	6	2		2	6	6	2	2	6		2	2		2	2	2	2	2		3	3	3	3	3	3		2	2	2
SL	H	PZi	154		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		2	6		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	H	RG	155		1	1	1	1	1	1		3	3	3	3	3	3	3	3		1	4		1	1	1	1	3	1	1	1	2	1		1	1	1	1		1	1	1	1	1	2		1	3		1	1	1	1	1		3	1	3	3	3	1		3	1	1
SL	H	RGc	156		3	3	3	3	3	3		3	3	3	3	3	3	3	3		3	4		1	1	1	1	3	1	1	1	2	1		1	1	1	1		1	1	1	1	2	2		4	4		4	4	4	4	4		2	3	2	2	2	3		3	4	1
SL	H	RGd	157		1	1	1	1	1	1		2	2	2	2	2	2	2	2		1	4		1	1	1	3	3	1	1	1	2	1		1	1	1	1		1	3	3	1	1	2		1	3		1	1	1	1	1		3	1	3	3	3	1		3	1	1
SL	H	RGe	158		1	1	1	1	1	1		3	3	1	1	1	1	3	3		1	4		1	1	1	1	3	1	1	1	2	1		1	1	1	1		1	1	1	1	1	2		1	3		1	1	1	1	1		3	1	3	3	3	1		3	1	1
SL	H	RGi	159		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		2	6		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	H	RGu	160		1	1	1	1	1	1		2	2	3	3	3	3	2	2		1	4		1	1	1	3	3	1	1	1	2	1		3	3	3	1		3	3	3	3	2	2		1	3		2	2	2	2	2		3	1	3	3	3	1		3	1	1
SL	H	RGy	161		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	H	SC	162		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4

Table A18 **FAO '90 SOIL UNIT RATINGS FOR TREE SPECIES IN BOREAL, TEMPERATE AND SUBTROPICAL CLIMATES**

	Input Level IL	FAO '90 Soil Units SU	SEQ	Birch Bi 1 *Betula pubescens*	2 *Betula pendula*	3 *Betula verrucosa*	4 *Betula tortuosa*	5 *Betula Platypphylla*	6 *Betula papyrifera*	Poplar Po 1 *Populus nigra*	2 *Populus euramericana*	3 *Polpulus alba*	4 *Populus tremula*	5 *Populus balsamiferas*	6 *Populus maximowiczii*	7 *Populus tomentosa*	8 *Populus euphraetica*	Willow Wi 1 *Salix alba*	2 *Salix viminalis (plantation*	Oak Oa 1 *Quercus robur*	2 *Quercus petraeea*	3 *Quercus rubra*	4 *Quercus lanuginosa*	5 *Quercus cerris*	6 *Quercus acutissima*	7 *Quercus variablis*	8 *Quercus mongolica*	Beech Be	Hornbeam Ho	Ash As 1 *Fraxinus excelsior*	2 *Fraxinus mandshurica*	Alder Al	Lime Li	Maple Ma 1 *Acer plantanoides*	2 *Acer campestre*	3 *Acer campbelii*	Black locust Bl	Chestnut Ch	Wallnut Wa	Larch La 1 *Larix gmelinii*	2 *Larix sibirica*	Spruce Sp 1 *Picea abies*	2 *Picea asperata*	3 *Picea ajanensis*	4 *Picea obovata*	5 *Picea koreaiensis*	Pine Pi 1 *Pinus sibirica*	2 *Pinus sylvestris*	3 *Pinus tabulaeformis*	4 *Pinus massoniana*	5 *Pinus yunnanensis*	6 *Pinus koreaiensis*	Fir Fi 1 *Abies alba*	2 *Abies sibirica*	3 *Cunninghamia lanceolata*
SL	H	SCg	163	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SCh	164	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SCl	165	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SCk	166	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SCm	167	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SCn	168	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SCy	169	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SN	170	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SNg	171	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SNh	172	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SNj	173	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SNk	174	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SNm	175	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	SNy	176	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	H	VR	177	6	6	6	6	6	6	2	2	6	6	6	6	2	2	2	4	6	6	6	6	4	4	4	6	4	6	6	6	6	4	4	4	4	6	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	4	4
SL	H	VRd	178	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	6	6	4	4	4	4	6	4	6	6	6	6	4	4	4	4	6	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	4	4
SL	H	VRe	179	6	6	6	6	6	6	2	2	6	6	6	6	2	2	2	4	6	6	6	6	4	4	4	6	4	6	6	6	6	4	4	4	4	6	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	4	4
SL	H	VRk	180	4	4	4	4	4	4	2	2	6	6	6	6	2	2	2	4	6	6	6	6	4	4	4	6	4	6	6	6	6	4	4	4	4	6	4	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	4	4
SL	H	VRy	181	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	L	AC	001	4	4	4	4	4	4	6	6	2	2	2	2	6	6	6	6	6	2	6	4	2	2	2	6	2	2	6	6	6	2	2	6	6	2	2	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
SL	L	ACf	002	4	4	4	4	4	4	4	4	6	6	6	6	4	4	6	6	6	6	6	4	6	6	6	6	6	6	4	4	4	6	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
SL	L	ACg	003	4	4	4	4	4	4	6	6	4	4	4	4	4	4	6	6	4	4	6	4	6	6	6	6	4	6	6	6	6	6	6	6	6	6	4	4	6	6	4	4	4	4	4	2	3	2	6	2	2	2	6	6
SL	L	ACh	004	4	4	4	4	4	4	6	6	2	2	2	2	6	6	6	6	6	2	6	4	2	2	2	6	2	2	6	6	6	2	2	6	6	2	2	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
SL	L	ACp	005	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	6	4	4	4	4	4	6	6	6	6	6	6	6	6	6
SL	L	ACu	006	4	4	4	4	4	4	6	6	2	2	2	2	6	6	6	6	6	2	6	4	2	2	2	6	2	2	6	6	6	2	2	6	6	2	2	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
SL	L	AL	007	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	3	2	2	3	3	3	2	2	2	6	6	6	2	2	6	6	2	2	6	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	2
SL	L	ALf	008	6	6	6	6	6	6	6	6	6	6	6	6	6	6	2	2	6	6	6	6	6	6	6	6	6	6	4	4	4	6	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
SL	L	ALg	009	2	6	6	2	6	6	2	2	6	4	6	6	6	6	2	2	4	4	6	6	6	6	6	6	4	6	6	6	6	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	2	6	6
SL	L	ALh	010	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	3	2	2	3	3	3	2	2	2	6	6	6	2	2	6	6	2	2	6	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	2
SL	L	ALj	011	2	6	6	2	6	6	2	2	6	4	6	6	6	6	2	2	4	4	4	4	4	4	4	4	4	4	6	6	6	4	4	4	4	4	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	4	4	4
SL	L	ALp	012	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	L	ALu	013	2	2	2	2	2	2	6	6	2	2	2	2	6	6	3	3	2	3	2	6	3	3	3	2	2	2	6	6	6	2	2	6	6	2	2	6	3	3	2	2	2	2	2	3	3	3	3	3	3	3	3	3
SL	L	AN	014	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	L	ANg	015	3	6	6	3	6	6	2	2	6	4	6	6	2	2	3	3	4	4	6	6	6	6	6	6	4	6	3	3	3	6	6	6	6	6	4	4	6	6	4	4	4	4	4	2	3	2	6	2	2	2	6	6
SL	L	ANh	016	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	L	ANi	017	6	6	6	6	6	6	4	4	4	4	4	4	4	4	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	6	4	4	6	6	4	6	4	4	4	4	4	4	4	4
SL	L	ANm	018	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	L	ANu	019	3	3	3	3	3	3	2	2	3	3	3	3	2	2	1	1	1	1	1	1	1	1	1	1	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
SL	L	ANz	020	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SL	L	AR	021	2	2	2	2	2	2	6	6	6	6	6	6	6	6	2	2	2	2	2	2	6	2	2	2	4	2	2	2	2	2	2	2	2	2	2	4	3	2	6	6	6	6	6	2	3	2	2	2	3	6	2	2
SL	L	ARa	022	6	2	2	6	2	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	6	6	6	4	6	6	6	6	6	6	6	6	6	6	4	3	2	6	6	6	6	6	2	3	2	2	2	3	6	2	2
SL	L	ARb	023	2	2	2	2	2	2	6	6	6	6	6	6	6	6	3	3	2	3	2	2	2	3	3	2	4	2	2	2	2	2	2	2	2	2	2	4	3	2	6	6	6	6	6	2	3	2	2	2	3	6	2	2
SL	L	ARc	024	6	2	2	6	2	2	6	6	6	6	6	6	6	6	2	2	2	3	2	2	2	3	3	2	4	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	6	2	2	2	2	2	6	6	2
SL	L	ARg	025	2	6	6	2	6	6	6	6	4	4	4	4	4	4	2	2	4	4	6	6	4	6	6	6	4	6	2	2	2	6	6	6	6	6	4	4	6	6	4	4	4	4	4	6	2	6	4	6	6	6	6	6
SL	L	ARh	026	2	2	2	2	2	2	6	6	6	6	6	6	6	6	3	3	2	2	2	2	6	2	2	2	4	2	2	2	2	2	2	2	2	2	2	4	3	2	6	6	6	6	6	2	3	2	2	2	3	6	2	2
SL	L	ARl	027	2	2	2	2	2	2	6	6	6	6	6	6	6	6	3	3	3	3	3	3	2	3	3	3	4	2	2	2	2	2	2	2	2	2	2	4	3	2	6	6	6	6	6	3	3	3	3	3	3	6	2	2
SL	L	ARo	028	4	4	4	4	4	4	4	4	6	6	6	6	4	4	6	6	4	6	4	4	4	6	6	4	4	6	6	6	6	6	6	6	6	4	6	4	2	6	4	4	4	4	4	2	2	2	2	2	2	6	6	6
SL	L	AT	029	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	L	ATa	030	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	L	ATc	031	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	L	ATf	032	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SL	L	ATu	033	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table A18 **FAO '90 SOIL UNIT RATINGS FOR TREE SPECIES IN BOREAL, TEMPERATE AND SUBTROPICAL CLIMATES**

	Input Level	FAO '90 Soil Units		Birch	Betula pubescens	Betula pendula	Betula verrucosa	Betula tortuosa	Betula Platypphylla	Betula papyrifera	Poplar	Populus nigra	Populus euramericana	Polpulus alba	Populus tremula	Populus balsamiferas	Populus maximowiczii	Populus tomentosa	Populus euphraetica	Willow	Salix alba	Salix viminalis (plantation	Oak	Quercus robur	Quercus petraeea	Quercus rubra	Quercus lanuginosa	Quercus cerris	Quercus acutissima	Quercus variablis	Quercus mongolica	Beech	Hornbeam
	IL	**SU**	**SEQ**	**Bi**	1	2	3	4	5	6	**Po**	1	2	3	4	5	6	7	8	**Wi**	1	2	**Oa**	1	2	3	4	5	6	7	8	**Be**	**Ho**
SL	**L**	**CH**	**034**		3	3	3	3	3	3		3	3	3	3	3	3	3	3		3	3		3	3	3	3	3	3	3	3	3	3
SL	**L**	**CHg**	**035**		3	6	6	3	6	6		2	2	6	4	6	6	6	6		2	2		4	4	6	6	6	6	6	6	4	6
SL	**L**	**CHh**	**036**		3	3	3	3	3	3		3	3	3	3	3	3	3	3		3	3		3	3	3	3	3	3	3	3	3	3
SL	**L**	**CHk**	**037**		6	6	6	6	6	6		6	6	6	6	6	6	6	6		2	2		6	6	6	6	6	6	6	6	2	2
SL	**L**	**CHl**	**038**		2	2	2	2	2	2		3	3	3	3	3	3	3	3		2	2		2	2	2	2	2	2	2	2	2	2
SL	**L**	**CHw**	**039**		3	3	3	3	3	3		3	3	3	3	3	3	3	3		3	3		3	3	3	3	3	3	3	3	3	3
SL	**L**	**CL**	**040**		2	2	2	2	2	2		2	2	2	2	2	2	2	2		2	2		2	2	2	2	2	2	2	2	2	2
SL	**L**	**CLh**	**041**		2	2	2	2	2	2		2	2	2	2	2	2	2	2		2	2		2	2	2	2	2	2	2	2	2	2
SL	**L**	**CLl**	**042**		2	2	2	2	2	2		2	2	2	2	2	2	2	2		2	2		2	2	2	2	2	2	2	2	2	2
SL	**L**	**CLp**	**043**		2	2	2	2	2	2		6	6	6	6	6	6	6	6		6	6		2	2	2	2	2	2	2	2	6	2
SL	**L**	**CM**	**044**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1
SL	**L**	**CMc**	**045**		3	3	3	3	3	3		3	3	3	3	3	3	3	3		1	1		1	1	1	1	1	1	1	1	1	1
SL	**L**	**CMd**	**046**		3	3	3	3	3	3		2	2	2	2	2	2	2	2		3	3		3	3	3	2	3	3	3	3	3	3
SL	**L**	**CMe**	**047**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1
SL	**L**	**CMg**	**048**		3	6	6	3	6	6		2	2	6	4	6	6	6	6		3	3		6	4	4	6	6	6	6	6	4	6
SL	**L**	**CMi**	**049**		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	6		4	4	4	4	4	4	4	4	4	4
SL	**L**	**CMo**	**050**		2	2	2	2	2	2		6	6	6	6	6	6	6	6		2	2		6	6	6	4	6	6	6	6	6	6
SL	**L**	**CMu**	**051**		3	3	3	3	3	3		2	2	2	2	2	2	2	2		3	3		3	3	3	3	3	3	3	3	3	3
SL	**L**	**CMv**	**052**		6	4	4	6	4	4		2	2	6	6	6	6	2	2		6	6		6	6	6	6	4	4	4	6	4	6
SL	**L**	**CMx**	**053**		1	1	1	1	1	1		3	3	1	1	1	1	3	3		1	1		1	1	1	3	1	1	1	1	1	1
SL	**L**	**FL**	**054**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	4	4	1	1	1	1	1	4	1
SL	**L**	**FLc**	**055**		3	3	3	3	3	3		3	3	3	3	3	3	3	3		1	1		1	4	4	1	3	3	3	1	4	1
SL	**L**	**FLd**	**056**		2	2	2	2	2	2		2	2	2	2	2	2	2	2		3	3		1	4	4	3	3	3	3	1	4	3
SL	**L**	**FLe**	**057**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	4	4	1	1	1	1	1	4	1
SL	**L**	**FLm**	**058**		3	3	3	3	3	3		3	3	3	3	3	3	3	3		1	1		1	4	4	1	1	1	1	1	4	3
SL	**L**	**FLs**	**059**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**FLt**	**060**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**FLu**	**061**		3	3	3	3	3	3		2	2	2	2	2	2	2	2		3	3		3	4	4	3	3	3	3	3	4	3
SL	**L**	**FR**	**062**		4	4	4	4	4	4		6	6	2	2	2	2	6	6		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**FRg**	**063**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**FRh**	**064**		4	4	4	4	4	4		6	6	2	2	2	2	6	6		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**FRp**	**065**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**FRr**	**066**		4	4	4	4	4	4		6	6	2	2	2	2	6	6		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**FRu**	**067**		4	4	4	4	4	4		6	6	2	2	2	2	6	6		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**FRx**	**068**		4	4	4	4	4	4		6	6	6	6	6	6	6	6		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**GL**	**069**		2	4	4	2	4	4		2	2	6	4	6	6	6	6		3	3		6	4	4	6	6	6	6	6	4	6
SL	**L**	**GLa**	**070**		2	4	4	2	4	4		2	2	6	4	6	6	6	6		3	3		6	4	4	4	6	6	6	6	4	6
SL	**L**	**GLd**	**071**		6	4	4	6	4	4		6	6	6	4	6	6	6	6		2	2		6	4	4	4	6	6	6	6	4	6
SL	**L**	**GLe**	**072**		2	4	4	2	4	4		2	2	6	4	6	6	6	6		3	3		6	4	4	6	6	6	6	6	4	6
SL	**L**	**GLi**	**073**		6	4	4	6	4	4		4	4	4	4	4	4	4	4		6	6		4	4	4	4	4	4	4	4	4	4
SL	**L**	**GLk**	**074**		2	4	4	2	4	4		2	2	6	4	6	6	6	6		3	3		6	4	4	6	4	4	4	6	4	6
SL	**L**	**GLm**	**075**		2	4	4	2	4	4		2	2	6	4	6	6	6	6		3	3		6	4	4	6	6	6	6	6	4	6
SL	**L**	**GLt**	**076**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**GLu**	**077**		2	4	4	2	4	4		6	6	6	4	6	6	6	6		2	2		6	4	4	4	4	4	4	6	4	6
SL	**L**	**GR**	**078**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1
SL	**L**	**GRg**	**079**		2	6	6	2	6	6		6	6	6	4	6	6	6	6		3	3		6	4	4	6	6	6	6	6	4	6
SL	**L**	**GRh**	**080**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1
SL	**L**	**GY**	**081**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**GYh**	**082**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**GYk**	**083**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**GYl**	**084**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**GYp**	**085**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	**L**	**HS**	**086**		2	4	4	2	4	4		4	4	4	4	4	4	4	4		2	2		4	4	4	4	4	4	4	4	4	4
SL	**L**	**HSf**	**087**		2	4	4	2	4	4		4	4	4	4	4	4	4	4		2	2		4	4	4	4	4	4	4	4	4	4

	Input Level	FAO '90 Soil Units		Ash	Fraxinus excelsior	Fraxinus mandshurica	Alder	Lime	Maple	Acer plantanoides	Acer campestre	Acer campbelii	Black locust	Chestnut	Wallnut	Larch	Larix gmelinii	Larix sibirica	Spruce	Picea abies	Picea asperata	Picea ajanensis	Picea obovata	Picea koreaiensis	Pine	Pinus sibirica	Pinus sylvestris	Pinus tabulaeformis	Pinus massoniana	Pinus yunnanensis	Pinus koreaiensis	Fir	Abies alba	Abies sibirica	Cunninghamia lanceolata
	IL	**SU**	**SEQ**	**As**	1	2	**Al**	**Li**	**Ma**	1	2	3	**Bl**	**Ch**	**Wa**	**La**	1	2	**Sp**	1	2	3	4	5	**Pi**	1	2	3	4	5	6	**Fi**	1	2	3
SL	**L**	**CH**	**034**		3	3	3	3		3	3	3	3	3	3		2	2		2	2	2	2	2		1	1	1	1	1	1		2	2	2
SL	**L**	**CHg**	**035**		3	3	3	6		6	6	6	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		2	6	6
SL	**L**	**CHh**	**036**		3	3	3	3		3	3	3	3	3	3		2	2		2	2	2	2	2		1	1	1	1	1	1		2	2	2
SL	**L**	**CHk**	**037**		3	3	3	2		2	2	2	2	2	2		4	4		4	4	4	4	4		2	2	2	2	2	2		2	4	2
SL	**L**	**CHl**	**038**		3	3	3	2		2	2	2	2	2	2		6	6		4	4	4	4	4		2	2	2	2	2	2		6	6	6
SL	**L**	**CHw**	**039**		3	3	3	3		3	3	3	3	3	3		2	2		2	2	2	2	2		3	3	3	3	3	3		2	2	2
SL	**L**	**CL**	**040**		3	3	3	2		2	2	2	2	2	2		4	4		4	4	4	4	4		6	2	2	2	2	2		2	4	2
SL	**L**	**CLh**	**041**		3	3	3	2		2	2	2	2	2	2		4	4		4	4	4	4	4		6	2	2	2	2	2		2	4	2
SL	**L**	**CLl**	**042**		3	3	3	2		2	2	2	2	2	2		4	4		4	4	4	4	4		6	2	2	2	2	2		2	4	2
SL	**L**	**CLp**	**043**		2	2	2	2		2	2	2	2	2	6		4	4		4	4	4	4	4		6	2	2	2	2	2		2	4	2
SL	**L**	**CM**	**044**		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	**L**	**CMc**	**045**		1	1	1	1		1	1	1	1	3	1		4	4		4	4	4	4	4		2	3	3	3	3	3		1	6	1
SL	**L**	**CMd**	**046**		3	3	3	3		3	2	2	3	3	2		3	3		3	3	3	3	3		3	3	3	3	3	3		3	3	3
SL	**L**	**CMe**	**047**		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	**L**	**CMg**	**048**		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		2	3	2	6	2	2		2	6	6
SL	**L**	**CMi**	**049**		4	4	4	4		4	4	4	4	4	4		2	6		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	**L**	**CMo**	**050**		4	4	4	6		6	6	6	4	6	6		6	6		6	6	6	6	6		2	2	2	2	2	2		6	6	6
SL	**L**	**CMu**	**051**		2	2	2	3		3	2	2	3	3	2		3	3		3	3	3	3	3		3	3	3	3	3	3		3	3	3
SL	**L**	**CMv**	**052**		6	6	6	6		6	6	6	6	4	4		4	4		4	4	4	4	4		6	6	6	6	6	6		6	4	4
SL	**L**	**CMx**	**053**		1	1	1	1		1	1	1	1	1	3		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	**L**	**FL**	**054**		1	1	1	1		1	1	1	1	4	4		1	1		4	4	4	4	4		1	1	1	4	1	1		1	1	1
SL	**L**	**FLc**	**055**		1	1	1	1		1	1	1	1	4	4		4	4		4	4	4	4	4		3	1	1	4	1	1		1	6	1
SL	**L**	**FLd**	**056**		3	3	3	3		3	3	3	3	4	4		3	3		4	4	4	4	4		3	3	3	4	3	3		3	3	3
SL	**L**	**FLe**	**057**		1	1	1	1		1	1	1	1	4	4		1	1		4	4	4	4	4		1	1	1	4	1	1		1	1	1
SL	**L**	**FLm**	**058**		3	3	3	3		3	3	3	3	4	4		3	3		4	4	4	4	4		3	3	3	4	3	3		3	3	3
SL	**L**	**FLs**	**059**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		6	6	6	4	6	6		4	4	4
SL	**L**	**FLt**	**060**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	**L**	**FLu**	**061**		2	2	2	3		3	3	3	3	4	4		3	3		4	4	4	4	4		3	3	3	4	3	3		3	3	3
SL	**L**	**FR**	**062**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	2	4		2	4	2
SL	**L**	**FRg**	**063**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	6	4		6	4	4
SL	**L**	**FRh**	**064**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	2	4		2	4	2
SL	**L**	**FRp**	**065**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	**L**	**FRr**	**066**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	2	4		2	4	2
SL	**L**	**FRu**	**067**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	2	4		2	4	2
SL	**L**	**FRx**	**068**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	6	4		6	4	6
SL	**L**	**GL**	**069**		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		6	6	6
SL	**L**	**GLa**	**070**		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		6	6	6
SL	**L**	**GLd**	**071**		6	6	6	6		6	6	6	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		6	6	6
SL	**L**	**GLe**	**072**		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		6	6	6
SL	**L**	**GLi**	**073**		4	4	4	4		4	4	4	4	4	4		6	4		4	4	4	4	4		6	4	4	4	4	4		4	4	4
SL	**L**	**GLk**	**074**		2	2	2	6		6	6	6	6	4	4		4	4		4	4	4	4	4		4	6	6	4	6	6		6	4	6
SL	**L**	**GLm**	**075**		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		6	6	6
SL	**L**	**GLt**	**076**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	**L**	**GLu**	**077**		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		6	6	6
SL	**L**	**GR**	**078**		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	**L**	**GRg**	**079**		3	3	3	6		6	6	6	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		2	6	6
SL	**L**	**GRh**	**080**		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	**L**	**GY**	**081**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	**L**	**GYh**	**082**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	**L**	**GYk**	**083**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	**L**	**GYl**	**084**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	**L**	**GYp**	**085**		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	**L**	**HS**	**086**		2	2	2	4		4	4	4	4	4	4		4	4		4	4	4	4	4		2	2	2	2	2	2		4	4	4
SL	**L**	**HSf**	**087**		2	2	2	4		4	4	4	4	4	4		4	4		4	4	4	4	4		2	2	2	2	2	2		4	4	4

Table A18 **FAO '90 SOIL UNIT RATINGS FOR TREE SPECIES IN BOREAL, TEMPERATE AND SUBTROPICAL CLIMATES**

	Input Level IL	FAO '90 Soil Units SU	SEQ	Birch Bi	Betula pubescens 1	Betula pendula 2	Betula verrucosa 3	Betula tortuosa 4	Betula Platypphylla 5	Betula papyrifera 6	Poplar Po	Populus nigra 1	Populus euramericana 2	Polpulus alba 3	Populus tremula 4	Populus balsamiferas 5	Populus maximowiczii 6	Populus tomentosa 7	Populus euphraetica 8	Willow Wi	Salix alba 1	Salix viminalis (plantation 2	Oak Oa	Quercus robur 1	Quercus petraeea 2	Quercus rubra 3	Quercus lanuginosa 4	Quercus cerris 5	Quercus acutissima 6	Quercus variablis 7	Quercus mongolica 8	Beech Be	Hornbeam Ho
SL	L	HSi	088		6	4	4	6	4	4		4	4	4	4	4	4	4	4		6	6		4	4	4	4	4	4	4	4	4	4
SL	L	HSl	089		3	4	4	3	4	4		4	4	4	4	4	4	4	4		2	2		4	4	4	4	4	4	4	4	4	4
SL	L	HSs	090		4	4	4	4	4	4		4	4	4	4	4	4	4	4		2	2		4	4	4	4	4	4	4	4	4	4
SL	L	HSt	091		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	L	KS	092		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1
SL	L	KSh	093		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1
SL	L	KSk	094		2	2	2	2	2	2		2	2	2	2	2	2	2	2		1	1		3	3	3	1	6	6	6	3	2	2
SL	L	KSl	095		2	2	2	2	2	2		2	2	2	2	2	2	2	2		1	1		1	1	1	1	1	1	1	1	2	2
SL	L	KSy	096		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	L	LP	097		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	6		6	6	6	4	6	6	6	6	4	6
SL	L	LPd	098		6	4	4	6	4	4		4	4	4	4	4	4	4	4		4	4		6	6	6	4	6	6	6	6	4	6
SL	L	LPe	099		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	6		6	6	6	6	6	6	6	6	4	6
SL	L	LPi	100		4	4	4	4	4	4		4	4	4	4	4	4	4	4		6	6		4	4	4	4	4	4	4	4	4	4
SL	L	LPk	101		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	6		6	6	6	6	4	4	4	6	4	6
SL	L	LPm	102		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	6		6	6	6	4	6	6	6	6	4	6
SL	L	LPq	103		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	L	LPu	104		6	6	6	6	6	6		4	4	4	4	4	4	4	4		4	4		6	6	6	4	6	6	6	6	4	6
SL	L	LV	105		1	1	1	1	1	1		3	3	1	1	1	1	3	3		1	1		1	1	1	1	1	1	1	1	1	1
SL	L	LVa	106		3	3	3	3	3	3		2	2	2	2	2	2	2	2		3	3		3	3	3	2	3	3	3	3	3	3
SL	L	LVf	107		4	4	4	4	4	4		6	6	6	6	6	6	6	6		6	6		6	2	6	4	2	2	2	6	6	6
SL	L	LVg	108		3	6	6	3	6	6		2	2	6	4	6	6	6	6		3	3		6	4	4	6	6	6	6	6	4	6
SL	L	LVh	109		1	1	1	1	1	1		3	3	1	1	1	1	3	3		1	1		1	1	1	3	1	1	1	1	1	1
SL	L	LVj	110		2	6	6	2	6	6		2	2	6	4	6	6	6	6		3	3		4	4	4	4	4	4	4	4	4	4
SL	L	LVk	111		2	2	2	2	2	2		3	3	3	3	3	3	3	3		1	1		1	1	1	1	1	1	1	1	2	1
SL	L	LVv	112		6	6	6	6	6	6		6	6	6	6	6	6	6	6		2	2		6	6	6	6	4	4	4	6	4	6
SL	L	LVx	113		1	1	1	1	1	1		3	3	1	1	1	1	3	3		1	1		1	1	1	3	1	1	1	1	1	1
SL	L	LX	114		3	3	3	3	3	3		2	2	3	3	3	3	2	2		3	3		3	3	3	3	3	3	3	3	2	3
SL	L	LXa	115		2	2	2	2	2	2		2	2	2	2	2	2	2	2		2	2		3	3	3	3	3	3	3	3	2	2
SL	L	LXf	116		4	4	4	4	4	4		4	4	6	6	6	6	4	4		4	4		6	2	6	4	2	2	2	6	6	6
SL	L	LXg	117		2	6	6	2	6	6		2	2	6	4	6	6	6	6		2	2		6	4	4	6	6	6	6	6	4	6
SL	L	LXh	118		3	3	3	3	3	3		3	3	3	3	3	3	3	3		3	3		3	3	3	3	3	3	3	3	2	3
SL	L	LXj	119		2	6	6	2	6	6		2	2	6	44	6	6	6	6		2	2		4	4	4	4	4	4	4	4	4	4
SL	L	LXp	120		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4	4	4
SL	L	NT	121		4	4	4	4	4	4		3	3	1	1	1	1	3	3		1	1		1	1	1	1	1	1	1	1	1	1
SL	L	NTh	122		4	4	4	4	4	4		3	3	1	1	1	1	3	3		3	3		1	1	1	1	1	1	1	1	1	1
SL	L	NTr	123		4	4	4	4	4	4		1	1	1	1	1	1	1	1		1	1		1	1	1	3	1	1	1	1	1	1
SL	L	NTu	124		4	4	4	4	4	4		2	2	2	2	2	2	2	2		3	3		3	3	3	2	3	3	3	3	2	3
SL	L	PD	125		1	1	1	1	1	1		2	2	1	1	1	1	2	2		1	1		1	1	1	1	1	1	1	1	1	1
SL	L	PDd	126		3	3	3	3	3	3		2	2	2	2	2	2	2	2		3	3		3	1	3	2	1	1	1	3	2	3
SL	L	PDe	127		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1
SL	L	PDg	128		2	6	6	2	6	6		2	2	6	4	6	6	6	6		3	3		6	4	4	6	6	6	6	6	4	6
SL	L	PDi	129		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	6		4	4	4	4	4	4	4	4	4	4
SL	L	PDj	130		2	6	6	2	6	6		2	2	6	4	6	6	6	6		2	2		4	4	4	4	4	4	4	4	4	4
SL	L	PH	131		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1
SL	L	PHc	132		2	2	2	2	2	2		1	1	3	3	3	3	1	1		2	2		1	1	1	1	1	1	1	1	2	2
SL	L	PHg	133		3	6	6	3	6	6		2	2	6	4	6	6	6	6		2	2		6	4	4	6	6	6	6	6	4	6
SL	L	PHh	134		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	3	1	1	1	1	1	1
SL	L	PHj	135		2	6	6	2	6	6		2	2	6	4	6	6	6	6		2	2		4	4	4	4	4	4	4	4	4	4
SL	L	PHl	136		1	1	1	1	1	1		2	2	2	2	2	2	2	2		1	1		1	1	1	1	1	1	1	1	2	2
SL	L	PL	137		2	6	6	2	6	6		6	6	6	4	6	6	6	6		2	2		4	4	4	4	4	4	4	4	6	2
SL	L	PLd	138		2	6	6	2	6	6		6	6	6	4	6	6	6	6		6	6		4	4	4	4	4	4	4	4	6	6
SL	L	PLe	139		2	6	6	2	6	6		6	6	6	4	6	6	6	6		2	2		4	4	4	4	4	4	4	4	6	2
SL	L	PLi	140		6	4	4	6	4	4		4	4	4	4	4	4	4	4		6	6		4	4	4	4	4	4	4	4	4	4
SL	L	PLm	141		2	6	6	2	6	6		6	6	6	4	6	6	6	6		2	2		4	4	4	4	4	4	4	4	6	2

	Input Level IL	FAO '90 Soil Units SU	SEQ	Ash As	Fraxinus excelsior 1	Fraxinus mandshurica 2	Alder Al	Lime Li	Maple Ma	Acer plantanoides 1	Acer campestre 2	Acer campbelii 3	Black locust Bl	Chestnut Ch	Wallnut Wa	Larch La	Larix gmelinii 1	Larix sibirica 2	Spruce Sp	Picea abies 1	Picea asperata 2	Picea ajanensis 3	Picea obovata 4	Picea koreaiensis 5	Pine Pi	Pinus sibirica 1	Pinus sylvestris 2	Pinus tabulaeformis 3	Pinus massoniana 4	Pinus yunnanensis 5	Pinus koreaiensis 6	Fir Fi	Abies alba 1	Abies sibirica 2	Cunninghamia lanceolata 3
SL	L	HSi	088		4	4	4	4		4	4	4	4	4	4		6	4		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	L	HSl	089		2	2	2	4		4	4	4	4	4	4		6	6		6	6	6	6	6		3	3	3	3	3	3		6	6	6
SL	L	HSs	090		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	HSt	091		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	KS	092		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	KSh	093		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	KSk	094		3	3	3	2		2	2	2	2	2	2		4	4		4	4	4	4	4		2	3	3	3	3	3		1	4	1
SL	L	KSl	095		3	3	3	2		2	2	2	2	2	2		6	6		4	4	4	4	4		3	3	3	3	3	3		6	6	6
SL	L	KSy	096		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	LP	097		6	6	6	6		4	4	4	4	4	4		6	6		6	6	6	6	6		6	6	6	6	6	6		4	4	6
SL	L	LPd	098		6	6	6	6		4	4	4	4	4	4		6	6		6	6	6	6	6		6	6	6	6	6	6		4	4	6
SL	L	LPe	099		6	6	6	6		4	4	4	4	4	4		6	6		6	6	6	6	6		6	6	6	6	6	6		4	4	6
SL	L	LPi	100		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	LPk	101		6	6	6	6		4	4	4	4	4	4		4	4		4	4	4	4	4		4	6	6	6	6	6		4	4	6
SL	L	LPm	102		6	6	6	6		4	4	4	4	4	4		6	6		6	6	6	6	6		6	6	6	6	6	6		4	4	6
SL	L	LPq	103		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	LPu	104		6	6	6	6		4	4	4	4	4	4		6	6		6	6	6	6	6		6	6	6	6	6	6		4	4	6
SL	L	LV	105		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	LVa	106		3	3	3	3		3	3	3	3	2	3		2	2		2	2	2	2	2		3	3	3	3	3	3		2	2	2
SL	L	LVf	107		4	4	4	6		6	6	6	4	6	6		6	6		6	6	6	6	6		2	2	2	2	2	2		6	6	6
SL	L	LVg	108		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		2	3	2	6	2	2		2	6	6
SL	L	LVh	109		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	LVj	110		2	2	2	4		4	4	4	4	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		4	4	4
SL	L	LVk	111		1	1	1	1		1	1	1	1	2	2		6	6		4	4	4	4	4		6	2	2	2	2	2		1	6	1
SL	L	LVv	112		6	6	6	6		6	6	6	6	4	4		4	4		4	4	4	4	4		6	6	6	6	6	6		6	4	4
SL	L	LVx	113		1	1	1	1		1	1	1	1	1	3		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	LX	114		2	2	2	3		3	3	3	2	2	2		3	3		2	2	2	2	2		3	3	3	3	3	3		3	3	3
SL	L	LXa	115		2	2	2	2		2	2	2	2	2	2		3	3		2	2	2	2	2		2	2	2	2	2	2		3	3	3
SL	L	LXf	116		4	4	4	6		6	4	4	4	6	6		6	6		6	6	6	6	6		6	6	6	6	6	6		6	6	6
SL	L	LXg	117		2	2	2	6		6	4	4	6	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		2	6	6
SL	L	LXh	118		2	2	2	3		3	2	2	3	2	2		3	3		2	2	2	2	2		3	3	3	3	3	3		3	3	3
SL	L	LXj	119		2	2	2	4		4	4	4	4	4	4		6	6		4	4	4	4	4		6	2	6	6	6	6		4	4	4
SL	L	LXp	120		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	NT	121		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	NTh	122		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	NTr	123		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	NTu	124		2	2	2	3		3	3	3	3	2	2		2	2		2	2	2	2	2		1	1	1	1	1	1		2	2	2
SL	L	PD	125		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	PDd	126		2	2	2	3		3	2	2	3	2	2		3	3		2	2	2	2	2		3	3	3	3	3	3		3	3	3
SL	L	PDe	127		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	PDg	128		2	2	2	6		6	6	6	6	4	4		6	6		4	4	4	4	4		2	3	2	6	2	2		2	6	6
SL	L	PDi	129		4	4	4	4		4	4	4	4	4	4		2	6		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	L	PDj	130		2	2	2	4		4	4	4	4	4	4		6	6		4	4	4	4	4		6	2	6	4	6	6		4	4	4
SL	L	PH	131		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	PHc	132		2	2	2	2		3	3	3	2	2	2		4	4		2	2	2	2	2		2	1	1	1	1	1		4	4	4
SL	L	PHg	133		3	3	3	6		6	6	6	6	4	4		6	6		4	4	4	4	4		2	3	2	6	2	2		6	6	6
SL	L	PHh	134		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
SL	L	PHj	135		2	2	2	4		4	4	4	4	4	4		4	4		4	4	4	4	4		6	2	6	4	6	6		4	4	4
SL	L	PHl	136		2	2	2	2		3	3	3	2	2	2		2	2		2	2	2	2	2		1	1	1	1	1	1		1	2	1
SL	L	PL	137		2	2	2	2		4	4	4	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2
SL	L	PLd	138		6	6	6	6		4	4	4	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	6
SL	L	PLe	139		2	2	2	2		4	4	4	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2
SL	L	PLi	140		4	4	4	4		4	4	4	4	4	4		6	4		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	L	PLm	141		2	2	2	2		4	4	4	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2

Table A18 **FAO '90 SOIL UNIT RATINGS FOR TREE SPECIES IN BOREAL, TEMPERATE AND SUBTROPICAL CLIMATES**

	Input Level IL	*FAO '90 Soil Units* SU	SEQ	**Birch** Bi	*Betula pubescens* 1	*Betula pendula* 2	*Betula verrucosa* 3	*Betula tortuosa* 4	*Betula Platypphylla* 5	*Betula papyrifera* 6	**Poplar** Po	*Populus nigra* 1	*Populus euramericana* 2	*Polpulus alba* 3	*Populus tremula* 4	*Populus balsamiferas* 5	*Populus maximowiczii* 6	*Populus tomentosa* 7	*Populus euphraetica* 8	**Willow** Wi	*Salix alba* 1	*Salix viminalis (plantation* 2	**Oak** Oa	*Quercus robur* 1	*Quercus petraeea* 2	*Quercus rubra* 3	*Quercus lanuginosa* 4	*Quercus cerris* 5	*Quercus acutissima* 6	*Quercus variablis* 7	*Quercus mongolica* 8
SL	L	PLu	142		2	6	6	2	6	6		4	4	6	4	6	6	4	4		2	2		4	4	4	4	4	4	4	4
SL	L	PT	143		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	PTa	144		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	PTd	145		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	PTe	146		4	4	4	4	4	4		6	6	6	6	6	6	6	6		4	4		4	4	4	4	4	4	4	4
SL	L	PTu	147		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	PZ	148		6	2	2	6	2	2		2	2	2	2	2	2	2	2		2	2		2	2	2	6	6	2	2	2
SL	L	PZb	149		6	2	2	6	2	2		2	2	2	2	2	2	2	2		2	2		2	3	2	6	2	3	3	2
SL	L	PZc	150		6	2	2	6	2	2		2	2	2	2	2	2	2	2		2	2		2	3	2	6	6	3	3	2
SL	L	PZf	151		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	6		6	2	6	4	6	2	2	6
SL	L	PZg	152		6	4	4	6	4	4		2	2	6	4	6	6	6	6		2	2		6	4	4	4	4	6	6	6
SL	L	PZh	153		6	2	2	6	2	2		2	2	2	2	2	2	2	2		2	2		2	2	2	6	6	2	2	2
SL	L	PZi	154		6	4	4	6	4	4		4	4	4	4	4	4	4	4		6	6		4	4	4	4	4	4	4	4
SL	L	RG	155		1	1	1	1	1	1		3	3	3	3	3	3	3	3		1	1		1	1	1	1	3	1	1	1
SL	L	RGc	156		2	2	2	2	2	2		3	3	2	2	2	2	3	3		3	3		1	1	1	1	3	1	1	1
SL	L	RGd	157		2	3	3	2	3	3		2	2	2	2	2	2	2	2		3	3		3	3	3	2	2	3	3	3
SL	L	RGe	158		3	1	1	3	1	1		3	3	3	3	3	3	3	3		1	1		1	1	1	1	3	1	1	1
SL	L	RGi	159		6	6	6	6	6	6		4	4	4	4	4	4	4	4		6	6		4	4	4	4	4	4	4	4
SL	L	RGu	160		2	3	3	2	3	3		2	2	2	2	2	2	2	2		3	3		3	3	3	2	2	3	3	3
SL	L	RGy	161		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SC	162		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SCg	163		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SCh	164		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SCl	165		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SCk	166		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SCm	167		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SCn	168		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SCy	169		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SN	170		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SNg	171		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SNh	172		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SNj	173		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SNk	174		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SNm	175		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	SNy	176		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
SL	L	VR	177		6	4	4	6	4	4		2	2	6	6	6	6	2	2		6	6		6	6	6	6	4	4	4	6
SL	L	VRd	178		4	4	4	4	4	4		6	6	6	6	6	6	6	6		6	6		6	6	6	4	4	4	4	6
SL	L	VRe	179		6	4	4	6	4	4		2	2	6	6	6	6	2	2		6	6		6	6	6	6	4	4	4	6
SL	L	VRk	180		4	4	4	4	4	4		2	2	6	6	6	6	2	2		6	6		6	6	6	6	4	4	4	6
SL	L	VRy	181		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4

	Input Level IL	*FAO '90 Soil Units* SU	SEQ	**Beech** Be	**Hornbeam** Ho	**Ash** As	*Fraxinus excelsior* 1	*Fraxinus mandshurica* 2	**Alder** Al	**Lime** Li	**Maple** Ma	*Acer plantanoides* 1	*Acer campestre* 2	*Acer campbelii* 3	**Black locust** Bl	**Chestnut** Ch	**Wallnut** Wa	**Larch** La	*Larix gmelinii* 1	*Larix sibirica* 2	**Spruce** Sp	*Picea abies* 1	*Picea asperata* 2	*Picea ajanensis* 3	*Picea obovata* 4	*Picea koreaiensis* 5	**Pine** Pi	*Pinus sibirica* 1	*Pinus sylvestris* 2	*Pinus tabulaeformis* 3	*Pinus massoniana* 4	*Pinus yunnanensis* 5	*Pinus koreaiensis* 6	**Fir** Fi	*Abies alba* 1	*Abies sibirica* 2	*Cunninghamia lanceolata* 3
SL	L	PLu	142	6	6		6	6	6	6		4	4	4	6	6	4		6	6		6	6	6	6	6		2	2	6	4	6	6		6	6	2
SL	L	PT	143	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	PTa	144	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	PTd	145	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	PTe	146	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	PTu	147	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	PZ	148	6	2		6	6	6	2		2	6	6	2	2	6		2	2		2	2	2	2	2		2	2	2	2	2	2		2	2	2
SL	L	PZb	149	6	2		6	6	6	2		2	6	6	2	2	6		2	2		2	2	2	2	2		2	2	2	2	2	2		2	2	2
SL	L	PZc	150	6	2		6	6	6	2		2	6	6	2	2	6		2	2		2	2	2	2	2		2	2	2	2	2	2		2	2	2
SL	L	PZf	151	4	6		4	4	4	6		4	4	4	4	4	4		6	6		6	6	6	6	6		6	6	6	6	6	6		6	6	6
SL	L	PZg	152	4	6		6	6	6	6		4	4	4	6	4	4		4	4		4	4	4	4	4		6	2	6	4	6	6		6	4	4
SL	L	PZh	153	6	2		6	6	6	2		2	6	6	2	2	6		2	2		2	2	2	2	2		2	2	2	2	2	2		2	2	2
SL	L	PZi	154	4	4		4	4	4	4		4	4	4	4	4	4		2	6		4	4	6	6	6		6	4	4	4	4	4		4	4	4
SL	L	RG	155	2	1		1	1	1	1		1	3	3	1	1	2		1	3		1	1	1	1	1		3	1	3	3	3	1		3	1	1
SL	L	RGc	156	2	1		1	1	1	1		1	3	3	1	2	2		4	4		4	4	4	4	4		6	2	2	2	2	2		3	4	1
SL	L	RGd	157	2	3		2	2	2	3		3	2	2	3	2	2		3	2		2	2	2	2	2		2	3	2	2	2	3		2	3	3
SL	L	RGe	158	2	1		1	1	1	1		1	1	1	1	1	2		1	3		1	1	1	1	1		3	1	3	3	3	1		3	1	1
SL	L	RGi	159	4	4		4	4	4	4		4	4	4	4	4	4		2	6		4	4	6	6	4		6	4	4	4	4	4		4	4	4
SL	L	RGu	160	2	3		2	2	2	3		3	2	2	3	2	2		3	2		2	2	2	2	2		2	3	2	2	2	3		2	3	3
SL	L	RGy	161	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SC	162	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SCg	163	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SCh	164	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SCl	165	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SCk	166	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SCm	167	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SCn	168	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SCy	169	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SN	170	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SNg	171	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SNh	172	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SNj	173	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SNk	174	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SNm	175	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	SNy	176	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
SL	L	VR	177	4	6		6	6	6	4		4	4	4	6	4	4		4	4		4	4	4	4	4		6	6	6	6	6	6		6	4	4
SL	L	VRd	178	4	6		6	6	6	4		4	4	4	6	4	4		4	4		4	4	4	4	4		6	6	6	6	6	6		6	4	4
SL	L	VRe	179	4	6		6	6	6	4		4	4	4	6	4	4		4	4		4	4	4	4	4		6	6	6	6	6	6		6	4	4
SL	L	VRk	180	4	6		6	6	6	4		4	4	4	6	4	4		4	4		4	4	4	4	4		4	6	6	6	6	6		6	4	4
SL	L	VRy	181	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4

Table A19 **FAO '90 SOIL PHASE RATINGS FOR BOREAL, TEMPERATE AND SUBTROPICAL TREE SPECIES**

	Input Level	*FAO '90 Soil Phases*		**Birch**	*Betula pubescens*	*Betula pendula*	*Betula verrucosa*	*Betula tortuosa*	*Betula Platypphylla*	*Betula papyrifera*	**Poplar**	*Populus nigra*	*Populus euramericana*	*Polpulus alba*	*Populus tremula*	*Populus balsamiferas*	*Populus maximowiczii*	*Populus tomentosa*	*Populus euphraetica*	**Willow**	*Salix alba*	*Salix viminalis (plantation)*	**Oak**	*Quercus robur*	*Quercus petraeea*	*Quercus rubra*	*Quercus lanuginosa*	*Quercus cerris*	*Quercus acutissima*	*Quercus variablis*	*Quercus mongolica*
	IL	**SP**	**SEQ**	**Bi**	1	2	3	4	5	6	**Po**	1	2	3	4	5	6	7	8	**Wi**	**1**	**2**	**Oa**	1	2	3	4	5	6	7	8
PH	**H**	**Anthraquic**	**001**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1
PH	**H**	**Duripan**	**002**		1	3	3	1	3	3		2	2	2	2	2	2	2	2		3	3		3	3	6	3	3	3	3	3
PH	**H**	**Fragipan**	**003**		1	1	1	1	1	1		3	3	3	3	3	3	3	3		3	3		3	3	2	3	3	3	3	3
PH	**H**	**Gelundic**	**004**		2	2	2	2	6	6		6	6	6	2	6	6	6	6		2	4		4	4	4	4	4	4	4	4
PH	**H**	**Gigai**	**005**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	3		1	1	1	1	1	1	1	1
PH	**H**	**Inundic**	**006**		1	3	3	1	3	3		1	1	1	2	1	1	3	3		1	1		3	4	4	2	2	2	2	2
PH	**H**	**Lithic**	**007**		2	6	6	2	6	6		4	4	4	4	4	4	4	4		6	4		6	6	4	6	6	6	6	6
PH	**H**	**Petroferric**	**008**		3	2	2	3	2	2		6	6	6	6	6	6	6	6		2	2		2	6	4	6	6	6	6	6
PH	**H**	**Phreatic**	**009**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1
PH	**H**	**Placic**	**010**		3	2	2	3	2	2		6	6	6	6	6	6	6	6		3	3		2	6	6	6	6	6	6	6
PH	**H**	**Rudic**	**011**		3	2	2	3	2	2		2	2	2	2	2	2	2	2		2	2		2	2	6	2	2	2	2	2
PH	**H**	**Salic**	**012**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	6		4	4	4	4	4	4	4	4
PH	**H**	**Skelectic**	**013**		3	2	2	3	2	2		2	2	2	2	2	2	2	2		2	6		2	2	6	2	2	2	2	2
PH	**H**	**Sodic**	**014**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	6		4	4	4	4	4	4	4	4
PH	**H**	**Takyric**	**015**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**H**	**Yermic**	**016**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**H**	**Desert**	**017**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**H**	**Gobi**	**018**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**H**	**Cultivation**	**019**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1
PH	**L**	**Anthraquic**	**001**		3	2	2	3	2	2		3	3	2	6	2	2	2	2		1	1		2	6	6	2	6	6	6	6
PH	**L**	**Duripan**	**002**		3	2	2	3	2	2		6	6	6	6	6	6	6	6		2	2		2	2	4	2	2	2	2	2
PH	**L**	**Fragipan**	**003**		1	3	3	1	3	3		2	2	2	2	2	2	2	2		2	2		2	2	6	2	2	2	2	2
PH	**L**	**Gelundic**	**004**		2	2	2	2	6	6		6	6	6	2	6	6	6	6		2	2		4	4	4	4	4	4	4	4
PH	**L**	**Gigai**	**005**		3	3	3	3	3	3		3	3	3	3	3	3	3	3		3	3		3	3	3	3	3	3	3	3
PH	**L**	**Inundic**	**006**		1	3	3	1	3	3		1	1	1	2	1	1	3	3		1	1		3	4	4	2	2	2	2	2
PH	**L**	**Lithic**	**007**		2	6	6	2	6	6		4	4	4	4	4	4	4	4		6	6		6	6	4	6	6	6	6	6
PH	**L**	**Petroferric**	**008**		3	2	2	3	2	2		6	6	6	6	6	6	6	6		2	2		2	6	4	6	6	6	6	6
PH	**L**	**Phreatic**	**009**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	3	3	1	1	1	1	1
PH	**L**	**Placic**	**010**		3	2	2	3	2	2		6	6	6	6	6	6	6	6		3	3		2	6	6	6	6	6	6	6
PH	**L**	**Rudic**	**011**		3	2	2	3	2	2		2	2	2	2	2	2	2	2		2	2		2	2	6	2	2	2	2	2
PH	**L**	**Salic**	**012**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**L**	**Skelectic**	**013**		3	2	2	3	2	2		2	2	2	2	2	2	2	2		2	2		2	2	6	2	2	2	2	2
PH	**L**	**Sodic**	**014**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**L**	**Takyric**	**015**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**L**	**Yermic**	**016**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**H**	**Desert**	**017**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**H**	**Gobi**	**018**		4	4	4	4	4	4		4	4	4	4	4	4	4	4		4	4		4	4	4	4	4	4	4	4
PH	**H**	**Cultivation**	**019**		1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1

	Input Level	*FAO '90 Soil Phases*		**Beech**	**Hornbeam**	**Ash**	*Fraxinus excelsior*	*Fraxinus mandshurica*	**Alder**	**Lime**	**Maple**	*Acer plantanoides*	*Acer campestre*	*Acer campbelii*	**Black locust**	**Chestnut**	**Wallnut**	**Larch**	*Larix gmelinii*	*Larix sibirica*	**Spruce**	*Picea abies*	*Picea asperata*	*Picea ajanensis*	*Picea obovata*	*Picea koreaiensis*	**Pine**	*Pinus sibirica*	*Pinus sylvestris*	*Pinus tabulaeformis*	*Pinus massoniana*	*Pinus yunnanensis*	*Pinus koreaiensis*	**Fir**	*Abies alba*	*Abies sibirica*	*Cunninghamia lanceolata*
	IL	**SP**	**SEQ**	**Be**	**Ho**	**As**	1	2	**Al**	**Li**	**Ma**	1	2	3	**Bl**	**Ch**	**Wa**	**La**	1	2	**Sp**	1	2	3	4	5	**Pi**	1	2	3	4	5	6	**Fi**	1	2	3
PH	**H**	**Anthraquic**	**001**	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
PH	**H**	**Duripan**	**002**	2	3		1	1	1	2		3	3	3	2	3	2		1	3		2	2	2	2	2		3	3	3	3	3	3		2	2	3
PH	**H**	**Fragipan**	**003**	2	3		1	1	1	2		3	3	3	3	3	2		1	1		2	2	2	2	2		1	1	1	1	1	1		2	2	3
PH	**H**	**Gelundic**	**004**	4	4		4	4	4	4		4	4	4	6	6	4		2	2		4	4	4	4	4		2	2	4	4	4	6		4	6	4
PH	**H**	**Gigai**	**005**	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
PH	**H**	**Inundic**	**006**	4	2		1	1	1	4		2	2	2	2	4	4		1	1		4	4	4	4	4		1	1	2	6	2	2		4	4	4
PH	**H**	**Lithic**	**007**	4	6		6	6	6	4		6	6	6	6	6	4		2	6		4	4	4	4	4		6	6	6	6	6	6		4	4	6
PH	**H**	**Petroferric**	**008**	6	6		2	2	2	6		6	6	6	6	6	6		2	6		6	6	6	6	6		6	6	6	6	6	6		6	6	2
PH	**H**	**Phreatic**	**009**	1	1		1	1	1	3		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
PH	**H**	**Placic**	**010**	6	6		3	3	3	6		6	6	6	6	6	6		3	3		6	6	6	6	6		3	3	2	6	2	2		6	6	6
PH	**H**	**Rudic**	**011**	6	2		2	2	2	6		2	2	2	2	2	6		3	2		6	6	6	6	6		2	2	2	2	2	2		2	2	2
PH	**H**	**Salic**	**012**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	6	4	4	4	4		4	4	4
PH	**H**	**Skelectic**	**013**	6	2		2	2	2	6		2	2	2	2	6	6		3	2		6	6	6	6	6		2	3	2	2	2	2		2	2	2
PH	**H**	**Sodic**	**014**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	6	4	4	4	4		4	4	4
PH	**H**	**Takyric**	**015**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
PH	**H**	**Yermic**	**016**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
PH	**H**	**Desert**	**017**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
PH	**H**	**Gobi**	**018**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
PH	**H**	**Cultivation**	**019**	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1
PH	**L**	**Anthraquic**	**001**	4	6		3	3	3	6		6	6	6	6	4	4		3	2		4	4	4	4	4		2	3	6	6	6	6		6	6	4
PH	**L**	**Duripan**	**002**	6	2		3	3	3	6		2	2	2	6	2	6		3	2		6	6	6	6	6		2	2	2	2	2	2		6	6	2
PH	**L**	**Fragipan**	**003**	6	2		3	3	3	6		2	2	2	2	2	6		1	3		6	6	6	6	6		3	3	3	3	3	3		6	6	2
PH	**L**	**Gelundic**	**004**	4	4		4	4	4	4		4	4	4	6	6	4		2	2		4	4	4	4	4		2	2	4	4	4	6		4	6	4
PH	**L**	**Gigai**	**005**	3	3		3	3	3	3		3	3	3	3	3	3		3	3		3	3	3	3	3		3	3	3	3	3	3		3	3	3
PH	**L**	**Inundic**	**006**	4	2		1	1	1	4		2	2	2	2	4	4		1	1		4	4	4	4	4		1	1	2	6	2	2		4	4	4
PH	**L**	**Lithic**	**007**	4	6		6	6	6	4		6	6	6	6	6	4		2	6		4	4	4	4	4		6	6	6	6	6	6		4	4	6
PH	**L**	**Petroferric**	**008**	6	6		2	2	2	6		6	6	6	6	6	6		2	6		6	6	6	6	6		6	6	6	6	6	6		6	6	2
PH	**L**	**Phreatic**	**009**	3	1		1	1	1	3		1	1	1	3	3	3		1	1		3	3	3	3	3		1	1	1	1	1	1		1	1	1
PH	**L**	**Placic**	**010**	6	6		3	3	3	6		6	6	6	6	6	6		3	3		6	6	6	6	6		3	3	2	6	2	2		6	6	6
PH	**L**	**Rudic**	**011**	6	2		2	2	2	6		2	2	2	2	2	6		3	2		6	6	6	6	6		2	2	2	2	2	2		2	2	2
PH	**L**	**Salic**	**012**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	6	4	4	4	4		4	4	4
PH	**L**	**Skelectic**	**013**	6	2		2	2	2	6		2	2	2	2	6	6		3	2		6	6	6	6	6		2	3	2	2	2	2		2	2	2
PH	**L**	**Sodic**	**014**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	6	4	4	4	4		4	4	4
PH	**L**	**Takyric**	**015**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
PH	**L**	**Yermic**	**016**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
PH	**H**	**Desert**	**017**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
PH	**H**	**Gobi**	**018**	4	4		4	4	4	4		4	4	4	4	4	4		4	4		4	4	4	4	4		4	4	4	4	4	4		4	4	4
PH	**H**	**Cultivation**	**019**	1	1		1	1	1	1		1	1	1	1	1	1		1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1