

Federal Research Center «Krasnoyarsk Scientific Center SB RAS»  
V. N. Sukachev Institute of Forest SB RAS

ISSN 2312-2099

# Siberian Journal of Forest Science



Number 4  
July–August 2024



Siberian Branch  
Russian Academy of Sciences  
Novosibirsk

FEDERAL RESEARCH CENTER KRASNOYARSK SCIENTIFIC CENTER  
RUSSIAN ACADEMY OF SCIENCES, SIBERIAN BRANCH  
V. N. SUKACHEV INSTITUTE OF FOREST  
RUSSIAN ACADEMY OF SCIENCES, SIBERIAN BRANCH

## **Siberian Journal of Forest Science**

Number 4 July – August 2024

Peer-reviewed Scientific Journal. Established January 2014

**Founder:** Federal Research Center Krasnoyarsk Scientific Center, Russian Academy of Sciences, Siberian Branch  
Published bimonthly, 6 times per year  
ISSN 2312-2099 (Online)

### **Editor-in-Chief**

Alexander A. Onuchin  
onuchin@ksc.krasn.ru

### **Associate Editors-in-Chief**

Igor M. Danilin, Tamara S. Sedel'nikova  
danilin@ksc.krasn.ru, tss@ksc.krasn.ru

### **Managing Editor**

Larisa N. Skripal'shchikova  
lara@ksc.krasn.ru

### **Associate Editors**

Galina F. Antonova (RF), Natalia E. Antonova (RF), Stanislav P. Arefyev (RF), Sezgin Ayan (Turkey), Vladimir F. Baginskiy (Belarus), Eugene V. Banaev (RF), Yuri N. Baranchikov (RF), Kirsten Barrett (UK), Sergei A. Bartalev (RF), Sergei M. Bebiya (Abkhazia), Alexander I. Belyaev (RF), Vera E. Benkova (RF), Kapitolina S. Bobkova (RF), Jiquan Chen (USA), Tumen N. Chimitdorzhiev (RF), Chimidnyam Dorjsuren (Mongolia), Chultem Dugarjav (Mongolia), Alexey A. Dymov (RF), Steve Eubanks (USA), Svetlana Yu. Evgrafova (RF), Sergey N. Goroshkevich (RF), Irina D. Grodnitskaya (RF), Andrei N. Gromtsev (RF), Georg Guggenberger (Germany), Alexander P. Isaev (RF), Galina A. Ivanova (RF), Vladislav N. Kalaev (RF), Olga V. Kalugina (RF), Vyacheslav I. Kharuk (RF), Alexander V. Kirdeyanov (RF), Natal'ya I. Kirichenko (RF), Alexander P. Kovalev (RF), Yuri N. Krasnoshchekov (RF), Konstantin V. Krutovsky (RF, Germany), Alexander M. Kryshen (RF), Konstantin N. Kulik (RF), Andrei N. Kupriyanov (RF), Qinglin Li (Canada), Sune Linder (Sweden), Sergei R. Loskutov (RF), Tatyana A. Moskalyuk (RF), Elena N. Muratova (RF), Sergei V. Osipov (RF), Igor N. Pavlov (RF), Heli Peltola (Finland), Viliam Pichler (Slovakia), Alexander V. Pimenov (RF), Anatoly S. Prokushkin (RF), Olga A. Shapchenkova (RF), Dmitriy G. Schepaschenko (RF, Austria), Christiane Schmullius (Germany), Olga V. Shergina (RF), Alexander S. Shshikin (RF), Svetlana D. Shlotgauer (RF), Anatoly Z. Shvidenko (RF, Austria), Vladimir A. Sokolov (RF), Vladimir V. Soldatov (RF), Vladislav G. Soukhovolsky (RF), Ge Sun (USA), Vyacheslav V. Tarakanov (RF), Alexander N. Tashev (Bulgaria), Elena E. Timoshok (RF), Josef Urban (Czechia), Vladimir V. Usenya (Belarus), Vladimir A. Usoltsev (RF), Eugene A. Vaganov (RF), Viktor I. Voronin (RF), Chuankuan Wang (China), Adam X. Wei (Canada), Yulay A. Yanbaev (RF), Vasily T. Yarmishko (RF)

### **Leading Editor**

Tat'yana A. Nikitina

### **Scientific Editor**

Kseniya A. Kryukova

### **Technical Editor**

Tat'yana R. Pantyukhina

### *Address for journal office:*

Russian Federation, 660036, Krasnoyarsk, Akademgorodok, 50/28  
Federal Research Center Krasnoyarsk Scientific Center, Russian Academy of Sciences, Siberian Branch  
V. N. Sukachev Institute of Forest, Russian Academy of Sciences, Siberian Branch  
Editorial office for the Siberian Journal of Forest Science  
Phones: +7 (391) 249-4639; +7 (391) 290-5516; E-mail: lara@ksc.krasn.ru; Web: sibjforsci.com; сибирскийлеснойжурнал.рф

Novosibirsk  
Siberian Branch of the Russian Academy of Sciences



### **The main topics of the journal**

Forest science, forestry, forest planning, forest inventory  
Structure, dynamics and functioning of forest ecosystems  
Forest ecosystem functions and their change under global and regional climate processes and anthropogenic impact  
Forest geography, ecology and typology  
Forest landscape ecology  
Forest genetics, selection, breeding and introduction, dendrology  
Forest resource science, botany, ethnobotany  
Silviculture, forest crops  
Physiology and biochemistry of forest plants  
Biotechnology, wood science, chemical processing of wood and non-wood forest products  
Dendrochronology  
Forest hydrology  
Forest fire research  
Forest entomology, forest zoological complexes  
Forest phytocenology  
Forest soil science  
Forest health, microbiology, mycology and pathogens  
Forest melioration and restoration  
Forest policy, economics, management and legislation  
Remote sensing and GIS methods applicable for evaluation of biosphere functions of forests.

*Sibirskij Lesnoj Zurnal* (Siberian Journal of Forest Science) is a multidisciplinary peer-reviewed periodical scientific journal covering a wide range of forest science, forestry, forest management, forest inventory, genetics and breeding, forest ecology and economy issues, and representing the science of complex patterns of the structure, function and development of forest ecosystems and the use of forest resources by man.

*Sibirskij Lesnoj Zurnal* (Siberian Journal of Forest Science) ISSN 2312–2099 (Online)) is published by the Siberian Branch of the Russian Academy of Sciences in Russian and in English.

*Sibirskij Lesnoj Zurnal* (Siberian Journal of Forest Science) is included to Russian national system of scientific citation eLibrary.ru, the list of scientific periodicals of the Higher Certification Commission, Ministry of Education and Science of the Russian Federation, is indexing in international scientific databases: Ulrichsweb (Global Serials Directory), Directory of Open Access Journals (DOAJ), AGRIS, CABI Forest Science Database, is prepared to be included to the international databases of scientific periodicals: Academic Journals Database, Springer, Scopus, Web of Science. Full-text articles posted online on the journal's website: sibjforsci.com (in English); сибирскийлеснойжурнал.рф (in Russian).

*Sibirskij Lesnoj Zurnal* (Siberian Journal of Forest Science) publishes scientific papers under the headings: «Summarizing Articles», «Research Articles», «Reports», «Short Communications», «News, Views & Events», and «Book Reviews», aimed at understanding the laws and regularities of forest nature. It covers a variety of topics related to problems of biological diversity at all levels of its organization – population, species, ecosystem, including – articles on anthropogenic and technogenic transformation of forest ecosystems. The journal is not limited to the problems of Siberian forests; it accepts and publishes high quality scientific papers from different regions of the world, representing general scientific interest.

*Sibirskij Lesnoj Zurnal* (Siberian Journal of Forest Science) is registered by Federal Service for Supervision of Communications, Information Technologies, and Mass Media (Roskomnadzor) of the Russian Federation.

Certificate of registration of the mass media:

Periodical online edition – EL No. FS 77-70737 on 15 August, 2017

Novosibirsk  
Siberian Branch of the Russian Academy of Sciences  
Prospekt Akademika Lavrent'eva, 17, Novosibirsk, 630090 Russian Federation

## CONTENTS

### RESEARCH ARTICLES

<i>G. V. Kuznetsova</i> Vegetative and Seed Progeny of Rare Forms of the Siberian Stone Pine in Krasnoyarsk Forest-Steppe .....	3
<i>E. E. Timoshok, Timoshok E. N., Gureeva I. I.</i> Composition, Structure and Ecological Features of High-Mountain Old-Growth Siberian Stone Pine Forests of the North Chuya Range .....	11
<i>D. A. Polosukhina, D. V. Trusov, S. V. Titov, A. S. Prokushkin</i> Fractional Composition of Phytomass and Photosynthetic Pigments of the Shrub Layer Mixed Forest in the Middle Taiga Subzone .....	23
<i>S. O. Vyukhin, A. A. Grigoriev, D. S. Balakin, A. S. Timofeev, P. A. Moiseev</i> Structure and Dynamics of Cenopopulations of Shrub Alder in Forest-Mountain Tundra Ecotone in the Western Part of the Putorana Plateau .....	38
<i>E. F. Tropina, A. A. Knorre, M. G. Erunova, M. K. Tselikhin</i> Variability of Snow Cover Moisture Reserve in the Foothills of the Eastern Sayan with the Background of Climate Shifts .....	48
<i>T. P. Orekhova</i> Reproduction of Korean Poplar <i>in vitro</i> .....	61
<i>A. V. Lebedev</i> Dynamic Model of Growth of Pine Tree Stands in the European part of Russia According to Repeated Observations .....	72
<i>L. V. Zarubina, S. S. Makarov, I. B. Kuznetsova</i> The Influence of Structural Differentiation of Trees and Selective Logging on Physiological Processes of Scots Pine .....	84
<i>V. O. Kornienko, V. N. Kalaev</i> Viability of Pedunculate Oak in the City of Donetsk .....	95
<i>E. R. Bukhanov, K. A. Afanasova, V. V. Vagner, M. N. Volochaev, V. I. Nikitina, S. A. Pyatina, A. D. Shefer, Shabanov V. F.</i> The Influence of Foliar Fertilizing on the Structural and Optical Properties of Wheat .....	107