

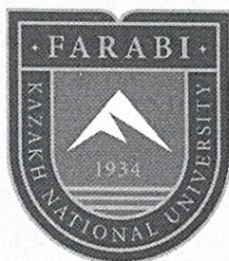
NJSC AL-FARABI KAZAKH NATIONAL UNIVERSITY

FACULTY OF BIOLOGY AND BIOTECHNOLOGY

APPROVED

Member of the Board – Vice-Rector for
scientific and innovative activities

NJSC «Al-Farabi KazNU»



**The University's policy on the conservation and sustainable management of lands,
including forests and wildlands**

Almaty 2024

Policy of Kazakh National University on the conservation and sustainable use of land, including forests and wildlands (SDG 15)

MAIN TASKS ACHIEVING THE SDGS

- **Providing quality education**
- **Promoting environmental awareness and responsible attitude towards nature.**
- **Promoting biodiversity conservation and environmental restoration**
- **Promoting the principles of a green economy**
- **Promoting rational waste disposal**

CAMPUS LANDSCAPING

Deforestation, land degradation in drylands and loss of biodiversity are a global problem. The UN calls on countries to conserve forests and biodiversity and use terrestrial ecosystems more rationally. Faculty of Biology and Biotechnology implements programs in the field of ecology, and also conducts research on the terrestrial ecosystem with the aim of further protecting it, restoring it and promoting its further rational use. The faculty is engaged in supporting ecosystems related to the university, deals with issues of their rational use, implements measures to stop the processes of land degradation and loss of biological diversity. Thus, the faculty of biology and biotechnology pursues a policy of preserving and restoring terrestrial ecosystems, in particular, adjacent to the university buildings and the park territory in the form of conducting surveys of green spaces (detailed survey of the main species of trees, shrubs and ground cover). Phytopathological and other surveys of plantings on the territory of the university are carried out annually with the aim of developing environmental protection measures. Also, measures are taken to identify and preserve plants at the university listed in the Red Book.

To improve the health of the plantings on the university's territory, selective sanitary felling of trees, stump crushing, and planting of young seedlings (Scots pine, prickly spruce, fir, thuja, apple trees) are carried out. Selective repairs of the road network are being carried out. Rest areas are being equipped at the intersections of park paths. Plantings are being made in an orderly manner to preserve the historical value of the garden and park landscape. Thus, two years ago, for the Day of Science Workers, the faculty organized planting of apple tree seedlings "Sivers". The event was held jointly with the ecological Association "ECOJER" and the Civil Initiative Movement "Alma Qala», whose founder is Erlan Stambekov, in his speech, expressed enormous gratitude to the university "for its support and provision of a location for planting fruit trees that are on the verge of extinction and are listed in the Red Book of Kazakhstan."



"Sivers" apple trees are distinguished by a variety of shapes, sizes, colors and tastes of fruits. From the main botanical garden of Almaty, they were transplanted to the mountainous area under the guidance of Doctor of Biological Sciences, professor, academician Aimak Zhangaliev. Experts note that the genetic fund of "Sivers" apples, preserved to this day in Kazakhstan, will increase the yield of other apple varieties and form a stable immunity to various diseases. Also, earlier, more than 160 Crimean pines and Altai firs were planted on the campus of KazNU.

GREENHOUSE

There is a greenhouse on the campus of Al-Farabi KazNU, where fruit and vegetable crops and ornamental plants are grown using innovative technologies.



The main purpose of the university greenhouse is to create conditions for conducting scientific research in the greenhouse complex in combination with the practice of theoretical knowledge of students majoring in Biology. In the greenhouse complex, various species and varieties of plants are grown and studied throughout the year. Also, the greenhouse complex is the most convenient place for conducting scientific research and experiments necessary for writing diploma and master's theses. In the complex, teachers can conduct field and practical seminars and workshops, helping to increase the interest of students in growing vegetable crops. In addition, it is possible to grow seedlings of ornamental plants necessary for landscaping the territory of our university. And also grow various vegetable crops and use them in the university canteen.

AGROBIOCENTER

The Faculty of Biology and Biotechnology oversees the activities agrobiocenter – the only center of our university that conducts agricultural scientific-technical and scientific-research work with industrial practice. The agrobiocenter was built in the Ili district of the Almaty region .



The agrobiocenter is primarily intended for field practices in biological disciplines and biology teaching methods. The main purpose of creating the agrobiocenter was to improve the quality of practical training of future specialists in biology and biotechnology . It is certainly impossible to imagine full-fledged training of future specialists in the field of biological and environmental education without educational field practices in botany, zoology, soil science and soil ecology, genetics, biotechnology, biology teaching methods conducted on the basis of the agrobiocenter . During these practices, the natural environment and natural objects in their natural surroundings are comprehensively used for educational and research purposes. Also, on the basis of the agrobiostation, agricultural crops of plants are grown annually : potatoes, cabbage, beets, pumpkin, corn , apples, which are then sold at a fair for students, and also to grow various flowers for the purpose of decorating the university territory.

WINTER GARDEN

The place belonging to the Kazakh National University named after Al-Farabi, the Faculty of Biology and Biotechnology - the winter garden. This garden is located on the fourth floor of the Palace of Students named after Omirbek Zholdasbekov. In the winter garden, research works of graduate and doctoral students are grown, festive events of students are held, and tropical ornamental plants are grown. Citrus fruits, tropical plants for introduction (avocado) are also grown. Along with ordinary plants, tropical plants play an important role in the winter garden. The presence in the winter garden of such exotic 50 species of plants as dracaena, shefflera, ficus, monostera, avocado.

Schefflera is an ornamental foliage plant. Its main external feature is its palmate leaves, there can be 7 or more of these "fingers".

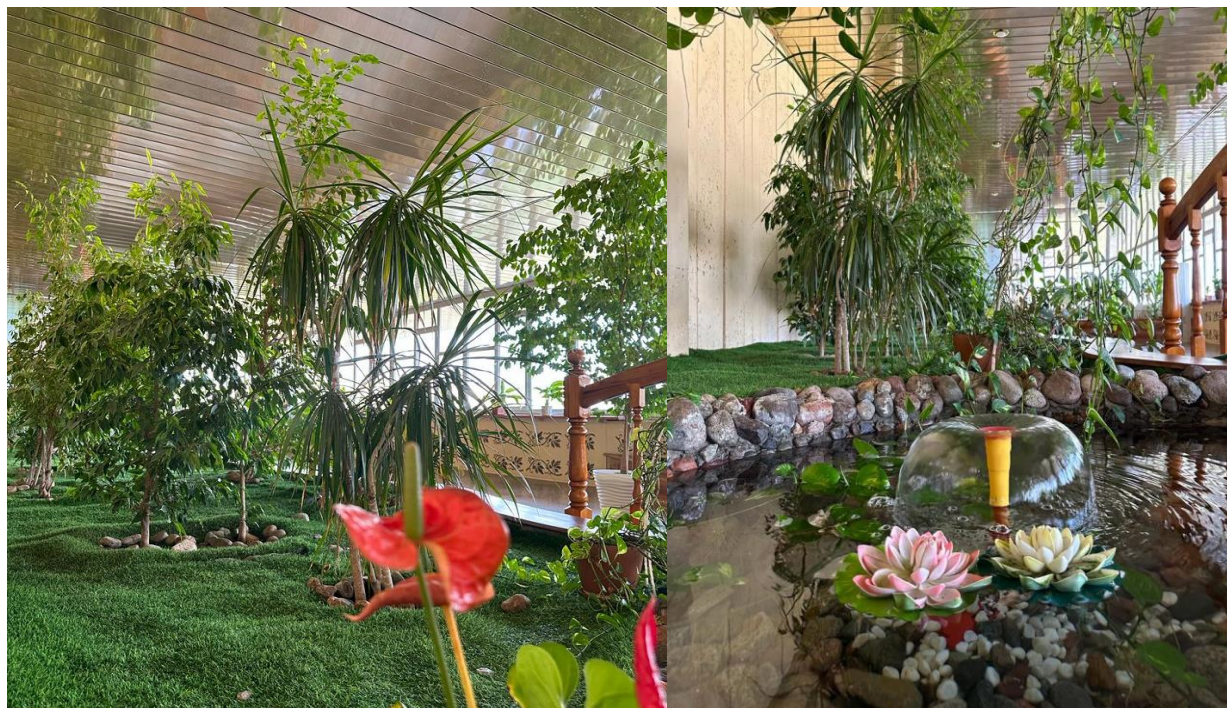
Dracaena are woody plants, less often shrubs. The tree-like form of the genus representatives is due to the secondary growth of the stem. Some species have been used since ancient times as a source of the so-called "dragon's blood". Some representatives of the genus are popular greenhouse and indoor plants.

Ficus belongs to the evergreen decorative-leaf species of plants of the Moraceae family. Indoor species of ficus are used as decorative plants for landscaping of premises. Leaves are alternate, less often opposite, serrated and lobed.

Monstera is an evergreen liana with large - up to 45 cm - carved leaves. Monsteras are unpretentious and even at home can grow up to several meters in length.

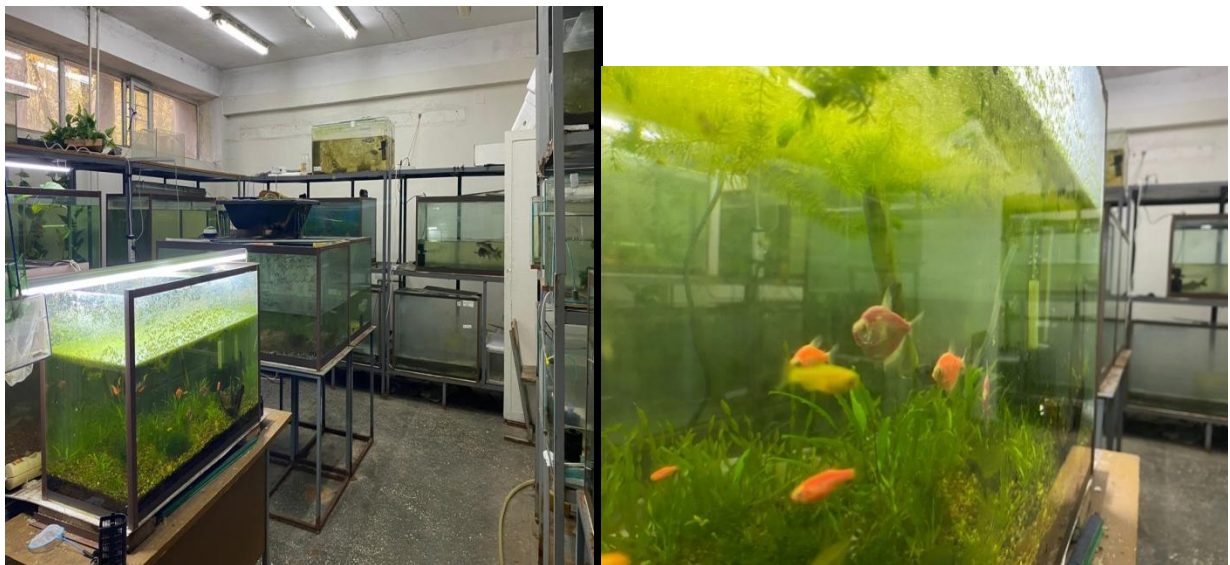
The leaves are pinnately dissected and perforated. Monstera alba is a large, brightly colored tropical flowering plant.

Avocado is a fast-growing tree, reaching a height of 20 m. The trunk is usually straight, heavily branched. The leaves are elliptical, reach 35 cm in length, and fall all year round. The flowers are inconspicuous, small, greenish, and are located in the leaf axils.



AQUARIUM LABORATORY

The Aquarium Laboratory of the Department of Biodiversity and Bioresources has existed at the Faculty of Biology and Biotechnology of Al-Farabi Kazakh National University since 1979, that is, for more than 40 years. During this time, extensive experience has been accumulated in keeping and breeding many species of aquarium fish, but work on keeping local species has begun relatively recently. The aquarium complex is equipped with systems of small aquariums that allow research with objects of warm-water and cold-water fish farming, as well as other objects of aquaculture in the following areas: assessment of the physiological state of organisms (growth rate, developmental features, nutritional status, behavioral reactions, resistance to adverse environmental factors, susceptibility to infectious agents, immunity indicators, etc.); assessment of growing conditions and development of optimal technologies for specific types of aquaculture. A feature and problem of keeping local species in aquariums is their exactingness to temperature and water purity.



Currently, the laboratory is working on methods for keeping in captivity 4 endemic fish species of the Balkhash basin that are in a threatened state: the Balkhash marinka *Schizothorax argentatus*, Semirechensk minnow *Phoxinus brachyurus* and Severtsov's loach *Triplophysa sewerzowi*.

Balkhash Until the mid-1970s, marinka was one of the most important objects of the fishery - up to three thousand tons of this fish were caught per year. The average weight of fish in the catch was about 1.5-2 kg, and the maximum was about 10 kg. Dried marinka meat (balyk) was valued on par with sturgeon. However, the irrational organization of the fishery and the introduction of alien fish species led to a rapid reduction in the number and range of this species. In recent years, the Balkhash Marinka is becoming less and less common in the vicinity of Almaty, where not only amateur fishermen but also poachers try to catch these fish. A small herd of this species has existed in the aquarium laboratory of the Department of Biodiversity and Bioresources for over 5 years.

The Semirechensk minnow is a small fish no more than 8 cm long, usually much smaller. This species was first described in 1912 by the great Soviet scientist Lev Semenovich Berg based on several specimens caught in springs near the village of Chilik. In the past, the Semirechensk minnow was widespread in the Balkhash basin, where it inhabited springs, small rivers and lakes. This species performs a very important ecosystem service, eating a large number of mosquito larvae. However, other information on its biology is extremely limited. We have managed to obtain offspring of this species in captivity, but it is too early to talk about sustainable reproduction.

The Severtsov's loach is one of the smallest fish in Central Asia. Adult fish rarely reach 5 cm in length. The species was discovered and described by the outstanding Soviet ichthyologist Georgy Vasilyevich Nikolsky in 1937 from the Ili River basin. The biology of this species has not been

studied at all. Due to the fact that the Severtsov's loach has become extremely rare in the wild, only a few specimens are kept in the aquarium laboratory. Observations in the aquarium should help to understand the biological characteristics of this species in order to develop recommendations for the effective conservation of its natural habitat.

The work on keeping native fish species in aquariums is not only of great practical and scientific importance, but also allows students to be involved in independent scientific work and fosters in them a caring attitude towards their native nature.

BIOBASE

The Educational and Scientific Biological Base (ESBB) was created as a special unit of the Faculty of Biology based on the Letter of KazSU (No. 27-740 dated 30.09.77) and the Order of the Ministry of Higher Professional Education and Sports Kazakh SSR (No. 5/1-21-536 of 12.07.78).

The educational and scientific biological base is an educational, auxiliary and scientific unit of the Faculty of Biology and Biotechnology of the Al-Farabi Kazakh National University.

The tasks of the UNBB are defined by the curricula of the departments and scientific laboratories of the faculty, according to the submitted applications and approved by the dean's office for the required number and types of laboratory animals for the academic year.

The staff of the UNBB are engaged in the maintenance, feeding and breeding of laboratory experimental animals, which is carried out in accordance with the Sanitary Norms and Rules approved by the Ministry of Health of the Republic of Kazakhstan and the Rectorate of the University. The main objectives of the biobase are aimed at strengthening the position of the University as a leading scientific and educational complex of the country, corresponding to international standards of scientific research based on the latest achievements in biology.

The main functions of the biobase include:

1-Provision of biomaterial for scientific research of a fundamental and applied nature in various areas of biomedicine.

2-Material and technical support for educational and scientific processes.

3-Equipping the UNBB with modern laboratory equipment, breeding laboratory animal breeds and using all resources for educational and research purposes.

SCIENTIFIC PROJECTS OF THE GF

The next step in achieving the 15 SDGs ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, including forests, wetlands, mountains and drylands, are studies within the framework of research projects with grant funding . On the basis of the Research Institute of Biology and Biotechnology Problems and the Research Institute of Ecology Problems operating under the Faculty of Biology and Biotechnology of the Al-Farabi Kazakh National University, scientific research is conducted in the field of protection, restoration and support of ecosystems.

Thus, within the framework of the project “ **INTRODUCTION OF PERENNIAL WHEAT INTO AGRICULTURE TO CONSERVE BIODIVERSITY AND SOIL FERTILITY IN THE SOUTH AND SOUTHEAST OF KAZAKHSTAN** ” (Head Doctor of Biological Sciences, Professor Kurmanbaeva M.S.), research is being conducted to develop agrobiological foundations for introducing perennial wheat into the agricultural culture of the south and southeast of Kazakhstan and to study its role in increasing the productivity of arable land, reducing greenhouse gas emissions, maintaining soil fertility and improving the environment.

. To determine the phenology of perennial wheat development, the features of growth and development of perennial wheat in the greenhouses of Al-Farabi Kazakh National University and M. Auezov South Kazakhstan State University , in various agroecological zones of the south in the city of Shymkent and in the Almaty region of the Karasai district of the southeast of Kazakhstan were studied. Seed germination was determined in laboratory, greenhouse and field conditions. The date of the beginning and full onset of the main phases of development in field conditions was determined. The morphological and anatomical features of perennial wheat were studied . Optimal

terms, methods and rates of sowing perennial wheat were developed. In the course of studying the features of yield formation and grain quality of perennial wheat, the productivity of perennial wheat was determined. The protein and gluten content in grain was determined. Based on the results obtained, a method for cultivating perennial wheat in Kazakhstan was developed.



A

B

C

Perennial wheat in the flowering phase, A, B - greenhouse of the Kazakh National University named after Al-Farabi, C - greenhouse of the South Kazakhstan University named after Mukhtar Auezov.



Development of perennial wheat in field conditions.



Measuring ears of perennial wheat, see



In the project **"COMPLEX STUDY OF BIORESOURCES OF COMMON REED (PRAGMITES AUSTRALIS), ITS ECOSYSTEM SIGNIFICANCE AND POTENTIAL FOR SUSTAINABLE USE IN BIOECONOMICS"** (Head - Doctor of Biological Sciences, Professor S.T. Nurtazin), the research is aimed at achieving SDG 12 "Responsible Consumption and Production" and SDG 15 "Conservation of Terrestrial Ecosystems". Based on the negative consequences of global economic growth on the environment, new approaches to obtaining materials and energy sources using renewable natural biological resources have been especially actively developed in recent decades. This direction, based on the use of renewable biomass as a raw material for production purposes, including feed for farm animals and poultry, biogas, etc., is called " bioeconomics ", the goals of which are the maximum preservation of the natural environment, ecosystems, biodiversity while simultaneously ensuring economic growth and employment of the population. The object of the research was the phytocenoses of the common reed (*Phragmites australis*), which has a high potential for biomass growth in the warm period of the year (on average 5-10 t/ha, and sometimes up to 30 t/ha). At the same time, reed usually grows in river floodplains, on soils with a high level of groundwater, in wetlands unsuitable or of little use for agricultural crops. It should be noted that Kazakhstan is one of the countries richest in natural resources of common reed in the world. Traditionally, a wide range of economic uses of reed has

recently expanded significantly. In particular, reed stems are used for the production of cardboard, chipboard, paper and packaging materials, in the synthetic and textile industries, as well as in the production of rugs, fences, thatched roofs and building materials. The leaves of young shoots are useful feed for livestock, as they contain 18-22% of crude protein. Reed is also successfully used for phytoremediation in aquatic ecosystems and cleaning of wastewater systems, hydroponic systems and wetlands. In recent years, many applications of common reed have emerged as various innovative types of composite building materials, raw materials for the production of cellulose and naturally degradable bioplastics, standardized solid fuel briquettes, pharmaceuticals and food additives, livestock feed pellets, etc. In addition to the above, reed beds provide a wide range of ecosystem services, such as carbon storage, water quality regulation, flood buffering, etc.

Currently, reed thickets occupy about 3 million hectares in Kazakhstan. Particularly large areas are noted on the rivers Ile, Shu, Irtysh, Syr Darya, Zhaiyk , as well as on lakes Balkhash , Tengiz, Zaysan, Sarykopa . Ecosystems based on reeds in Kazakhstan provide the greatest biodiversity. We have developed five types of feed concentrate based on common reed (*Phragmites australis*). The main ingredients in our feed concentrates were alfalfa, wheat, corn, sunflower cake, soybean meal, etc. The resulting feed concentrates had different indicators of edibility for animals (cattle, small cattle), nutritional value and cost price. A patent was obtained for compound feed pellets based on reed. Work continues on fine-tuning the technology of silaging reed in combination with various root crops and various types of dry reed mass for the manufacture of fuel pellets and disposable tableware (Fig. 3).



Reed ecosystems



Fuel pellets and disposable cane tableware

The productivity of the planet's green cover, on the resources of which the entire "food pyramid" of the biosphere is built, depends on the condition and fertility of the soils. Their quality is of particular importance for agricultural lands, which provide food for the growing population of the planet. The problem of protection and rational use of soils has two main directions: protection of fertility and preservation of productive territories for the needs of agricultural production. The population of the Earth is growing rapidly, and the satisfaction of food needs can be ensured either by increasing crop yields or by expanding agricultural territories. The reserve of lands suitable for agricultural development is almost exhausted. Expansion of arable land is possible mainly at the expense of lands located in the risk zone, where not only biological communities but also soils are easily destroyed. The effect of involving these lands in economic circulation is small, these lands are short-lived, they easily degrade, losing their natural fertility.

Project "ASSESSMENT INFLUENCES TECHNOGENIC WASTE ON PROPERTIES SOIL POKROV AND DEVELOPMENT METHOD OF REHABILITATION ECOLOGICALLY UNFAVORABLE INDUSTRIALLANDS"

(Head - Doctor of Biological Sciences, Professor Yesimsiitova Z. B.) is aimed at developing a domestic fertilizers « EcoSoil » vegetable origin of the received from rice husks, characterized by low density additions and high adsorption ability. The project plans to conduct an analysis of the ecology of the soil cover, assess the current physical and chemical state, problems and ways to solve them in the East Kazakhstan, North Kazakhstan and Zhambyl regions. Conducting research in the field of protecting rare and endangered plant species, including medicinal plants, is one of the priority tasks in implementing SDG 15.

As a result of regular anthropogenic impact, negative processes are developing in soils in many areas of the Republic of Kazakhstan, affecting the disturbance of the soil cover, compaction, chemical and biological pollution, and reduction of biodiversity. The increase in the man-made load on the environment leads to the emergence of zones with a critical environmental situation. These problems require the implementation of comprehensive monitoring of the state of the natural environment, conducting research that allows not only to identify and assess the danger of pollution, but also to establish trends and the rate of changes.



The importance of the problem of soil pollution with chemical elements is that soils are a natural accumulator of heavy metals in the environment and the main source of pollution. The study on the use of biochar from rice husk for the rehabilitation of soil covers is relevant in and a new direction of the field increasing crop productivity and obtaining environmentally friendly products at significantly lower costs.

Biochar based on rice husks, obtained by carbonization, has a more developed structure with a larger specific surface and porosity, which will increase its sorption properties. Due to its high porosity in combination with other physical and chemical properties, biochar helps to retain moisture and useful nutrients in the soil. The hypothesis of the study is that biochar obtained by the optimized method is a new bio- based porous material for the effective removal of heavy metals from soil cover, which helps to achieve sustainable development goals and improve circular economy policies.

Project Zhas galym on the topic " **STUDY OF THE STATE OF POPULATIONS AND INTRASPECIFIC PHENOTYPIC VARIABILITY OF RARE SPECIES OF MEDICINAL PLANTS FROM THE GENUS ADONIS L. IN NORTHERN KAZAKHSTAN** " (Project Manager PhD , Zhumagul M.Zh.) is aimed at and studying current state populations And intraspecific anatomical and morphological variability of rare species medicinal plants from genus *Adonis* in flora Northern Kazakhstan and development events By their conservation. As a result of processing the material of field studies, herbarium funds and literary sources, it was established that on the territory of Northern and Central Kazakhstan there is growth of 3 independent species of adonis in the volume accepted according to the international POWO database: *Adonis vernalis* L., *Adonis vologensis* Steven ex DC. and *Adonis villa* Ledeb .

Populations of *Adonis* were first studied *Adonis vernalis* L. At present, a critical revision of herbarium collections has been carried out in large domestic and foreign herbarium funds, including: Herbarium of the Institute of Botany and Phytointroduction ; Herbarium of the International Scientific and Production Holding " Phytochemistry ", Herbarium of the Astana Botanical Garden , Depository of Living Systems of Moscow State University "Noah's Ark" (MW) (Seregin , 2020 , Masaryk Herbarium University .



The obtained data allowed us to establish the species diversity and distribution of *Adonis* in Northern and Central Kazakhstan. Thus, 308 *Adonis* habitats in these regions were identified. The most common species in the region under study is *Adonis volgensis* Steven ex DC – 210 locations, *Adonis* is relatively less common *Adonis vernalis* L. – 80 locations. *Adonis* is very rare in the region under study. *Adonis vernalis* L. – 27 locations.

TRAINING OF HIGHLY QUALIFIED SPECIALISTS

The main contribution of the Faculty of Biology and Biotechnology of the Al-Farabi Kazakh National University to achieving SDG 15 " Preservation of terrestrial ecosystems " is the training of highly qualified specialists: biologists, zoologists, geobotanists of level training Master's degree And doctoral studies, competitive on domestic And international market work in the following educational programs: 7M05112 "Geobotany", "6B05102" - Biology, "6B05102" - Biology (Nish), "6B05108" - Biomedicine, "6B05109" - Neuroscience, "6B05103" - Biotechnology, "6B05103" - Biotechnology (Nish), 6B05110 - "Zoology", "6B05101" - Biological engineering, "6B05107" - Microbiology, "6B05105" - Genetics, "6B08401" - Fisheries and industrial fishing.

IN world practice Preparation specialists botanical profiles is determined tasks scientific And production activities And economic needs countries. IN KazNU name Al-Farabi, except recommendations domestic And foreign specialists based on from experience training of specialists in the field of geobotany, selection of directions and list disciplines is compiled taking into account the requests of the main employers for specialists and priority research V areas geobotany, defined National Academy sciences And Ministry education And sciences RK for the future and educational plans foreign countries.

Preparation specialists V areas botanists V Kazakhstan is carried out since 1934 at the Kazakh National University named after al-Farabi, on the basis of one of the oldest departments of the university, which does not lose its significance and relevance to this day. Specialists Geobotanists are in demand in akimats, in organizations, activity which connected With organization monitoring biological diversity of plants, in the system of the Ministries of Ecology and Health; research fellows in academic and industry scientific, ecological and nature conservation institutions, design organizations of biological and agricultural profile, in nature reserves, oil producing companies, in NGOs as design experts, agricultural melioration systems, utilities services And services engaged issues of preventing and combating desertification. IN their number RGP on PVC "Institute of Botany and Phytointroduction " of the Committee of Forestry and Wildlife of the Ministry of Ecology and Natural Resources of the Republic of Kazakhstan - basic customer, founder And direct active participant implementations highly qualified specialists .

In addition, the following scientific organizations are interested in geobotanist graduates: the Institute of Plant Biology and Biotechnology, the Institute of Plant Protection and Quarantine, National Parks, Botanical Gardens, Akimats all levels And etc. For over 80 years period preparations botanists, geobotanists, department has proven itself myself V quality reliable partner data organizations, introducing changes V training plan preparations specialists, according to requirements time And recommended employers specializations, And has huge authority V Kazakhstan And abroad .

Graduates of the OP “6B05110 Zoology”, will have knowledge and competencies in the field of fundamental and applied zoology and animal ecology and will work in the field of nature conservation as engineers, specialists of the 1st and 2nd categories, inspectors, zootechnicians, security engineers, senior inspectors, inspectors and assistant inspectors. During their studies, students will undergo practical training at nature reserves such as Aksu- Dzhabagly; Almaty; Alakol; West Altai; Karatau; Kurgaldzhinsky; Markakolsky, national parks (Ile-Alatau State National Nature Park; Altyn - Emel Park; Karkaraly State National Nature Park; Katon -Karagay National Park; Tarbagatai State National Nature Park) and zoological reserves (Tarbagatai Reserve, Lepsinsky Reserve, Kuludzhunsky Reserve, Andasaisky reserve, etc.). Applicants are also offered the OP “7M05118 Zoology”, where master's students can specialize in biodiversity conservation and take leading positions in relevant national organizations. Educational program “ 6B05102 Biology” also has expertise in the relevant field and trains specialists in environmental protection activities.



Students on their annual field training

Annual field training introduces students to various biotopes, allows them to master field research methods, learn how to work with identifiers, compile a list of species and know the characteristics of individual biotopes, and identify the main types of vertebrates and invertebrates in each biotope.

SUMMER SCHOOLS AND THEME EVENINGS

The faculty periodically organizes summer schools, thematic weeks and events dedicated to animal volunteering, responsible care for animals, and the preservation of their biodiversity. In 2019 and 2023, Associate Professor of the Department of Biodiversity and Bioresources N.Sh. Mamilov, together with the Institute of Zoology of the Ministry of Education and Science of the Republic of Kazakhstan and with the support of the German Academic Exchange Agency (DAAD), held summer schools for foreign and local students. All data obtained by students on the diversity and properties of wild animals and plants are considered from the point of view of biocentrism and ecosystem services. Therefore, this field practice is of great interest to ecologists, zoologists and botanists, as well as to students with a wider range of interests. When conducting field classes, the "do no harm" principle is observed, which is important for the formation of environmental awareness and understanding of young people. Thus, students learn information in two stages: theoretical analysis of the natural characteristics of the territory and the formation of practical skills. The content of the first stage is the students' acquisition of terms and concepts that express the essence and certain patterns of interaction between man and nature. The second stage is associated with the use of the above-mentioned terms and concepts in practical actions in the natural environment - excursions and individual classes. The proposed approach allows not only to gain new knowledge, but also to strengthen cultural ties between different nations. In 2023, we received 36 applications. We selected 15 participants whose specialty best matched the topic of our summer school. Of the 15 selected students, only 13 were able to take part in the summer school. All students arrived at the campus of Al-Farabi KazNU on August 16, then we conducted a tour of the zoological museum and an introductory lecture on the diversity of landscapes and wildlife in Kazakhstan. From August 17 to 29, the summer school was held at the ornithological station of the Institute of Zoology on the Chokpak pass (western Tien Shan). This pass is located between the Talas Alatau and Karatau mountain ranges, so birds are forced to make spring and autumn migrations here. At the ornithological station, students gained knowledge about the diversity of ecosystems, flora and fauna of the Western Tien Shan, mastered the skills of setting traps for birds and studying their morphological and biological features. The general direction of the summer school was to get acquainted with the flora and fauna, landscape features of the region, cultural values and mentality of the Kazakh people. In addition to lectures given by specialists from the university and the Institute of Zoology, a large share was made up of excursions and practical classes. However, the specifics of the station and its working environment presented the students with ornithological information in the greatest volume. After catching, the birds were delivered to the station, where, under the guidance of specialists, the students ringed them, determined their species, sex and age, and then measured the length of the wing, weight, and assessed the fat reserves. Lectures were given separately on the ringing station in general, on birds of prey, bee-eaters and pigeons, and on the species diversity of birds in Kazakhstan. The practical ornithological part included: bird identification, observation, capture and ringing. Bird observations were carried out during routes, on the pass itself, where they mainly monitored the flight of birds of prey, as well as on the Ters-Ashibulak reservoir, where the main object of observation was waterfowl and near-water birds. As a result, in two weeks about 1000 birds were caught and 53 species from 32 genera, 22 families and 9 orders were identified. The botanical part consisted of collecting and identifying plants typical of the steppes and foothills of Southern Kazakhstan.



Field research in the Ile River valley



A group of students from Germany at the Department of Biodiversity and Bioresources before leaving for an excursion

Thematic exhibition "BIOART" . The Department of Biodiversity and Bioresources of the Faculty of Biology and Biotechnology together with the Biological Museum of the Al-Farabi Kazakh National University held the first exhibition of creative works " BioART " in May 2023, dedicated to the integrity of a living organism and the environment.

The exhibition was attended by schoolchildren, students of art studios, students, master's degree students, doctoral students and teachers. In total, more than 100 works of art and sculptural

compositions were presented at the exhibition. In their works, the authors presented their view on biological diversity, showed how they imagine the planet in the future under favorable and unfavorable developments. In their works, they call on people to treat nature and its riches with care. The Grand Prix at the exhibition was awarded to 15-year-old participant of the competition Mikhail Zevako , representing the ARTstudio Star of David of the UNESCO Club, for his work “ The last dance of nature ” fully reflected the concept of the exhibition and showed all facets of the integrity of man and nature : the fragility of relationships and at the same time reliability and support.



In the exhibition "Bioart"



Handmade by 9th grade student Mikhail A Zevako ART studio " Star of David " of the UNESCO club " The last dance of nature »

The guests and participants of the exhibition visited the Biological Museum, a familiarization tour of the faculty was conducted for schoolchildren, heads of departments and teachers told about their work and scientific research. The exhibition was held in a relaxed and friendly atmosphere. All participants of the exhibition expressed a wish to continue holding this event, making it an annual event .

Participants and organizers of the thematic exhibition "Bioart"



Participants and visitors of the thematic exhibition "Bioart"

CONFERENCES AND ROUND TABLES

Holding annual round table conferences on the problem of conservation and sustainable use of lands, including forests and wild lands is a good tradition of KazNU. For example, in 2023-2024 alone, more than 6 large-scale conferences and round tables were held, where scientists from all over the world discussed effective approaches to the conservation of natural resources. On April 20, 2023, an INTERNATIONAL SCIENTIFIC AND PRACTICAL CONFERENCE was held within the framework of sustainable development, dedicated to the 70th anniversary of Doctor of Biological Sciences, Professor Tamara Minazhevna Shalakhmetova. The conference discussed the issues of preserving biodiversity and ecology. Air, soil and water pollution, conservation of plant and animal species are a relevant topic at the present time. In this regard, a large-scale conference in the field of bioecology was held. The conference discussed the issues of preserving biodiversity. Renowned scientist, Doctor of Biological Sciences, Professor, Corresponding Member of the National Academy of Sciences of the Higher School of Science Tamara Minazhevna After graduating from the Biology Department of the S.M. Kirov Kazakh National University, Shalakhmetova went through a professional and scientific path from a senior research intern to the dean of the biology department and, concurrently, the director of the State Research Institute of Ecology Problems of the RSE Al-Farabi Kazakh National University.

Tamara Minazhevna Shalakhmetova is a recognized scientist in the field of cell biology. In 2003, she was elected a member of the Russian International Society for Cell Biology (Institute of Cytology of the Russian Academy of Sciences, St. Petersburg). She was twice awarded a state scholarship by the Ministry of Education and Science of the Republic of Kazakhstan for outstanding achievements in science.

The event brought together leading scientists, public and government figures, representatives of the university's management, faculty, and others.

At the event, a congratulatory letter from the Chairman of the Board - Rector of Al-Farabi KazNU Zhanseit was read out Tuimebaeva with high praise for the achievements of Tamara Shalakhmetova and wishes for success in scientific and pedagogical activities.

During the plenary session of the conference, the following made presentations: Professor of the University of Illinois James Lee, Professor, Academician of the National Academy of Sciences of the Higher School of Economics Zulkhair Mansurov, Professor of the Department of Biology of Nazarbayev University Dos Sarbasov, professor, human microbiome laboratory, NLA, Nazarbayev University Almagul Kushugulova, professor, director of the Institute of Experimental Biology named after F.M. Mukhamedgalieva Yerzhan Toishibekov and others.

Within the framework of the Sustainable Development Goal-15, on September 22, 2023, at a high level, the Faculty of Biology and Biotechnology of the Kazakh National University named after Al-Farabi held an international scientific and practical conference "Problems of desertification of the territory of the Republic of Kazakhstan and ways to solve them", dedicated to the 80th anniversary of the candidate of biological sciences, associate professor Ametov Abibulla Ametovich.

At this conference, the Chairman of the Board - Rector of the Al-Farabi Kazakh National University Tuimebaev Zhanseit Kanseitovich congratulated the winner on the anniversary date of his 80th birthday and awarded him the "Al-Farabi Silver Medal".

Speakers from Turkey, Russia and many cities of Kazakhstan, in particular from Astana, Aktobe, Aktau, Shymkent and Turkestan, took an active part in the conference and made plenary reports. The event discussed issues of biodiversity conservation, reduction of natural pasture lands, that is, increase in desert and semi-desert zones. The Main Botanical Garden of Almaty, Director General of the Institute of Botany and Phytointroduction G. T. Sitpaeva and her teams congratulated Abibulla Ametovich and noted his contribution and merits in the field of botany. Also, congratulations to the hero of the day were sent by teachers and professors of universities in Almaty, Astana, Shymkent, Aktobe, Aktau.

At the international scientific and practical conference, a library exhibition of the author was organized and the textbook "Systematics of Higher Plants" in Volume III was presented. At the international scientific and practical conference, "Problems of Desertification and Ways to Solve It" were presented, current issues of increasing the number of geobotanists, as well as preparing passports of natural pasture lands were discussed.

Students, master's students, and doctoral students of the university spoke about their scientific work in sectional departments, as a result of which they took prizes and were awarded certificates.