

**TERMS OF REFERENCE**  
**SERVICES FOR THE RESOURCE ASSESSMENT OF ECONOMICALLY VALUABLE MEDICINAL PLANT SPECIES**  
**AND ASSESSMENT OF THE CURRENT STATUS OF RARE MEDICINAL PLANT SPECIES IN THE PROJECT**  
**AREA "ALTAI"**

<b>Project title and number:</b>	"Conservation and sustainable management of key globally significant ecosystems for multiple benefits," 00101043
<b>Type of contract:</b>	Contract for the provision of services in the UNDP format
<b>Duty station</b>	Kazakhstan, with 2 trips to the East Kazakhstan region
<b>Period:</b>	16 months from the date of signing the contract, (tentatively August 2021 - November 2022).

**RATIONALE:**

Since 2018, a 5-year project of the Government of Republic of Kazakhstan and UNDP-GEF "Conservation and Sustainable Management of Key Globally Significant Ecosystems for Multiple Benefits" (hereinafter - the Project) is being implemented in the republic). The strategy of the Project is to comprehensively address the conservation and sustainable use of forest ecosystems in Kazakhstan by improving management approaches both within the system of protected areas and in adjacent landscapes for the sustainable use of high conservation value forests (HCVF).

One of the pilot areas of the Project is: East Kazakhstan region, forests of the Altai Mountains, Saur and Tarbagatai.

It is known that more than 1406 species of medicinal plants grow on the territory of Kazakhstan, of which 230 species are officially allowed for use by pharmaceutical organizations. According to scientific data, the largest number of medicinal plants grows in the southern (71%) and eastern (64%) regions of Kazakhstan.

According to scientific data, the medicinal flora of Kazakhstan Altai is represented by 783 species from 99 families, which is more than 50% of all medicinal plants of Kazakhstan. The richness of the flora is due to the natural-climatic and geomorphological conditions of the region, contributing to the formation of different ecological niches. Many species of medicinal plants forming commercial reserves can be harvested on the ridges of the Kazakhstan Altai to obtain phytopreparations with a wide range of pharmacological and therapeutic action. Such species include: white wolfberry, hollyhock, willow-herb, sanguine, Kuril tea, Ural licorice, common yarrow, Lobel's hellebore, and others. However, preparation of these species is possible only on the basis of complex inspection of natural stocks of raw materials with calculation of annually possible volumes of preparation that will allow to use resources of medicinal plants rationally.

Ridges of the Southern and Southwest Altai, characterized by a unique diversity of flora, vegetation and plant resources, belong to the regions of the Kazakhstan Altai that are promising for harvesting medicinal plant raw materials. Patent and information search showed that despite numerous works on assessment of medicinal flora of the region, stocks and distribution of many medicinal plants of resource importance are not taken into account.

It should be particularly noted that many medicinal plants of the Kazakhstan Altai are very rare species, harvesting of which is inadmissible. Of particular value are species listed in the Red Book of Kazakhstan, such as: *adonis vernalis*, *rhodiola rosea*, *evasive peony*, *rapticum saflorovidnyi* (maral root), small onion (ramson), which are currently subject to intensive collection and harvesting. For intensively

declining populations of rare medicinal plants it is necessary to take specific measures for their preservation.

Given the above, there is a need to study the resource potential and ecological safety of medicinal plants of the Kazakhstan part of the Altai, available to harvesters. As well as an assessment of the current state of populations of the most vulnerable rare medicinal plants subject to intensive harvesting.

In this regard, the Project plans to conduct a resource assessment of economically valuable medicinal plants and study the current state of populations of rare species of medicinal plants in the project area "Altai".

The planned study will cover 2 pilot areas of the "Altai" project area: Western and Southern Altai. Within the administrative boundaries, the Altai project area includes 6 administrative districts of East Kazakhstan region: Katon-Karagai; Kurchum; Zyryanovsky (Altai); Ridder town area, Shemonakhinsky and Glubokovsky.

This activity is included into 2021 AWP.

#### **PURPOSE OF WORK:**

1. Resource assessment of 8 economically valuable medicinal plant species in the project area "Altai";
2. Study and assessment of the current status of 4 rare species of medicinal plants in the project area "Altai".

#### **Research Area:**

The planned study will cover two sites in the Kazakhstan Altai:

##### **I. Western Altai:**

**Ranges:** Ivanovsky, Ulbinsky, Ubinsky, Listvyaga, Koksinsky, and Lineinsky;

**Administrative districts:** partially Zyryanovsky (Altai), Ridder district, Glubokovsky, Shemonakhinsky;

**Pilot forestries:** Zyryanovskoye, Ridder, Pikhtovskoye, Cheremshanskoye, Malo-Ubinskoye, Verkh-Ubinskoye, partially Ust-Kamenogorskoye Forestry and adjacent areas to the lands of the forest fund.

##### **II. Southern Altai:**

**Ranges:** Narymsky, Sarymsakty, Kurchumsky, Southern Altai, Azutau, Southern Altai Tarbagatai;

**Administrative districts:** Katon-Karagai and Kurchum;

**Pilot PAs and forestry farms:** Katon-Karagai SNNP, Bolshenarymskoye, Markakolskoye, Kurchumskoye Forestry and adjacent areas to the lands of the forest fund.

#### **Objects of research:**

Based on the results of a preliminary literature review and joint discussions with local partners, **eight (8) economically valuable and sought-after medicinal plant species** growing in the Kazakhstan Altai were selected for study, such as:

- great burnet *Sanguisorba officinalis* L.;
- Rosebay willowherb or fireweed, *Chamaenerion angustifolium* (L.) Scop.;
- Meadowsweet, *Filipendula ulmaria* (L.) Maxim.;
- Lobel's hellebore, *Veratrum lobelianum* Bernh.;
- common yarrow, *Achillea millefolium* L. ;
- Elecampane, *Inula helenium* L.;
- Aconite, *Aconitum leucostomum* Worosch;

- Bupleurum, *Bupleurum multinerve*.

To study the current state of populations, **4 species of rare medicinal plants**, which despite their protected status are in high demand among the local population and pharmaceutical companies and are subjected to illegal and intensive harvesting, such as:

- rhodiola rosea (golden root), *Rhodiola rosea* L.;
- Rhodiola quadripartite (red brush), *Rhodiola quadrifida* (Pall.);
- peony evasive (marian root peony), *Paeonia anomala* L.;
- chives (ramson), *Allium microdictyon* Prokh.

### **SCOPE OF WORK:**

#### **I. RESOURCE ASSESSMENT OF 8 ECONOMICALLY VALUABLE MEDICINAL PLANT SPECIES**

##### **1. Preparatory work:**

1) Review and analysis of the literature on the study of the current state and resources of the medicinal flora of the Kazakhstan Altai at the international and national level;

2) development of routes of expeditionary trips, covering the main places and areas of medicinal plants growth, definition of methods of assessment of medicinal plants stocks, preparation and specification of the calendar plan of field and desk work.

**2. Field research (field trips).** Organization and conduct of field work (field trips), covering the main places and areas of growth of medicinal plants.

The following is performed as part of the fieldwork (field trips):

- Determination of the locations of medicinal plants in the study area, the areas of thickets of medicinal plants;
- laying of registration sites, collection of herbarium material, carrying out swatting of plant material to determine the yield, counting the number of the studied species in the cenopopulation and measuring morphometric parameters;
- determination of raw material yield per unit area; projective species coverage, abundance according to the Drude scale, phenophase, operational and biological stocks of air-dry raw materials of medicinal plants in accordance with the available methods and instructions;
- Determination of geographical coordinates (using GPS) and mapping of medicinal plant growth areas in ArcGis;
- Determination of the influence of the main limiting factors (anthropogenic, biotic and abiotic) on the condition of medicinal plants.

**3. Desk review processing of materials.** Desk review processing should include:

- calculation of the size of the stock and possible volumes of annual procurement of medicinal raw materials, taking into account the period of optimal recovery for each species;
- drawing of map-schemes of medicinal plants growing within the boundaries of the pilot forestries and Katon-Karagay SNNP (with linking to the quarter grid of forest inventory materials) with displaying of information about the location of commercial massifs and exploitation reserves for each species. The scale will be determined and clarified as part of the work.

**4. Development of Practical Recommendations.** Based on the results of field and desk research, the development of Practical Recommendations for the sustainable use of 8 main species of medicinal plants containing:

- location and description of populations of medicinal plants suitable for harvesting;

- seasonal rhythm of development of medicinal plants in the studied region;
- description of medicinal properties, characteristics, phytochemical composition of active substances of medicinal plants (according to literature sources);
- operational and biological stock of air-dried raw materials of medicinal plants;
- possible volumes of annual harvesting of 8 economically valuable species of medicinal plants, taking into account the period of their optimal recovery in the context of the pilot SPAs (SNNPs) and the state forestry departments;
- the parts of plants used as medicinal raw materials and the timing (seasonality) of their procurement;
- A medium-term plan for the sustainable use of medicinal plant resources (for 2-3 years) for Katon-Karagai SNNP and 10 PI Forestry;
- algorithm (procedure) for the sustainable use of medicinal raw materials on forest lands and adjoining lands, from the permitting process to the harvesting process;
- Map-schemes of the locations of medicinal plants suitable for harvesting within the boundaries of pilot conservation institutions and adjacent territories.

## **II. RESEARCH AND ASSESSMENT OF THE MODERN STATUS OF 4 RARE SPECIES OF MEDICINE PLANTS IN THE "ALTAI" PROJECT AREA**

### **1. Preparatory work:**

1) Study, review and analysis of literary data on the study of the current state of rare species of medicinal plants of Kazakhstan Altai at the international and national level;

2) Determination of expeditionary routes, covering the main places and areas of growth of rare species, compilation and refinement of the schedule of field and desk work.

**2. Field research and cameral work.** Organization and conduct of field work, covering the main places and areas of growth of rare species of medicinal plants.

The following is performed as part of the fieldwork and cameral work:

- Locating rare medicinal plants, areas of population of rare species of medicinal plants, laying of registration sites;
- determination of geographical coordinates (using GPS) and mapping of areas of rare medicinal plant populations within the borders of KGU Forestry and Katon-Karagai SNNP (with linkage to the quarter grid of forest management materials) with display of information on their status. The scale will be defined and clarified as part of the work;
- Study of eco-biological features and phytocoenotic structure of rare medicinal plant populations, determination of their numbers and morphometric parameters;
- Determination of the main limiting factors (anthropogenic, biotic and abiotic) affecting the state of the population of rare species of medicinal plants;

**3. Development of practical recommendations.** Based on the results of field and desk research, development of practical recommendations for the conservation of rare species of medicinal plants, including:

- location and description of populations of rare species of medicinal plants;
- proposed conservation measures for each species studied;
- Map-schemes of the occurrence of rare plant species within the boundaries of pilot PAs and forestries.



### III. PRESENTATION AND AGREEMENT OF PRACTICAL RECOMMENDATIONS FOR THE SUSTAINABLE USE OF ECONOMICALLY VALUABLE SPECIES AND THE CONSERVATION OF RARE SPECIES OF MEDICINAL PLANTS.

Practical recommendations should be presented (online) at the regional level with the participation of the Department of Natural Resources and Regulation of the EKR, EK Regional Territorial Inspection of Forestry and Wildlife, pilot PAs and Forestries, leading pharmaceutical companies and other stakeholders. According to the results of the presentations finalized and agreed.

The final presentations should be submitted to the UNDP project, the Department of Natural Resources and Environmental Management of the East Kazakhstan Region, and the State Enterprise "Kazakh Forest Management Enterprise".

### IV. COMPILATION AND PUBLICATION OF AN ILLUSTRATED CATALOG OF ECONOMICALLY VALUABLE AND RARE MEDICINAL PLANTS OF THE KAZAKHSTAN ALTAI.

Based on the results of the work, development and publication of an illustrated catalog of economically valuable and rare medicinal plants of Kazakhstan Altai (hereinafter - the Catalogue).

1. Defining and agreeing with the UNDP project the structure and content of the Catalog. The Catalogue should be informative and reflect the results of the study as much as possible.

Recommended content for the Catalog:

- photo illustrations of each plant, in bloom;
- brief description of the species, map-scheme of distribution, current status;
- operational reserves of raw materials and recommended volumes of harvesting (for economically valuable species);
- recommended conservation measures (for rare species).

The detailed content of the Catalogue can be specified as part of the project.

2. The catalog must be published in Kazakh and Russian, with a total circulation of 500 copies. (not less than 80 pages, format A4). The publication should be distributed to partners and stakeholders at the local level.

### RESULT AND PAYMENT TERMS:

No.	Results	Period	Accountability and coordination of work	Payment in %
1.	<p>Field <u>trips</u> was carried out at the "Western Altai" site.</p> <p>A resource assessment of 8 selected promising species of medicinal plants in the study region was performed.</p> <p>The geographical distribution, phytocoenotic structure of populations and ecological and biological features of 4 selected species of rare medicinal plants in the study region were studied.</p> <p>A map-scheme of the growth of economically valuable and rare medicinal plants in the "Western Altai" area was drawn up.</p> <p><i>Submitted an interim report on the work</i></p>	20 weeks from the date of the contract	Project Manager	30%

	<i>performed.</i>			
2.	<p>The content of the draft Catalogue of economically valuable and rare medicinal plants of the Kazakhstan Altai was developed and agreed.</p> <p>Draft Recommendations on sustainable use of 8 medicinal plants surveyed and recommendations for the conservation of natural populations of 4 species of rare medicinal plants were presented.</p> <p><i>Presented an interim report on the work performed.</i></p>	40 weeks from the date of the contract	Project Manager	30%
3.	<p>Field <u>trips</u> on the "Southern Altai" site were carried out.</p> <p>Resource assessment of 8 selected promising medicinal plant species in the studied region was performed</p> <p>The geographical distribution, phytocoenotic structure of populations and ecological and biological characteristics of 4 selected rare medicinal plant species in the study area were studied.</p> <p>Schemes of growing of economically valuable and rare species of medicinal plants in the Southern Altai area were drawn up.</p> <p>Final versions practical recommendations for sustainable use of the 8 medicinal plants surveyed and recommendations for the conservation of natural populations of 4 species of rare medicinal plants were presented and agreed upon.</p> <p>Catalogue of economically valuable and rare medicinal plants of the Kazakhstan Altai was published and distributed among stakeholders.</p> <p><i>The final report on the completed work is presented.</i></p>	67 weeks from the date of the contract	Project Manager	40%
	<b>Total:</b>			<b>100 %</b>

**INTENDED TRIPS:**

The scope of work under this contract includes visits to East Kazakhstan region. The sequence and dates of the trips will be specified after the contract is signed. However, the number of days and destinations will remain unchanged. The planned number of travel days must include include days on the road. Travel costs should be included in the financial proposal.

Field trips will be carried out for two seasons in two geographical areas of the Kazakhstan Altai:

- at the "West Altai" site: 2021 field season;

- at the “South Altai” site: 2022 field season

Name of districts	Number of days	Target
<b>Field season 2021</b>		
Western Altai (5 people).  District of Ridder, Glubokovsky, Shemonakhinsky; partially Zyryanovsky (Altai) districts	20 days Jule-August	Conducting field work in the Western Altai area, covering the main sites and areas where medicinal plants grow: identifying the locations of research objects and assessing their current state, laying of survey sites, collecting field material, etc.
<b>Total:</b>	<b>20 days</b>	
<b>Field season 2022</b>		
South Altai (5 people).  Katon-Karagai and Kurchum districts	20 days June-July	Conducting field work in the Southern Altai area, covering the main sites and areas where medicinal plants grow: identifying the locations of research objects and assessing their current state, laying of survey sites, collecting field material, etc.
<b>Total:</b>	<b>20 days</b>	
<b>TOTAL:</b>	<b>40 days</b>	

**Note:** Travel dates can be postponed/cancelled by agreement. In this case, the costs of travel arrangements (tickets, travel expenses) and/or on-site arrangements will be deducted from the contract price.

#### **REPORTING REQUIREMENTS:**

1) Interim and final reports must be submitted electronically in MS Word format for Windows files, font: Times New Roman 12, within the terms specified above;

2) The reports will be coordinated with the project manager and expert on landscape planning and used as the basis for appropriate payments;

3) The final report with all appendices must be submitted in Russian electronically within the terms indicated above. A brief version of the final report in English should also be prepared;

4) Interim and final reports must be accompanied by supporting materials: photo material, schemes of field routes, map-schemes, protocols and letters of approval from the local executive authorities, etc.

#### **DURATION OF OPERATION:**

The total duration of work is 16 months from the date of the contract (presumably August 2021 to November 2022 )

#### **PAYMENT TERMS:**

Payment will be made in three tranches upon satisfactory completion of the relevant item of the Scope of Work in the Terms of Reference and authorization by the UNDP Biodiversity Conservation Project Manager upon submission of the Certificate of Completion.

#### **RESPONSIBILITY AND COORDINATION:**

- The Contractor is fully responsible for the accuracy and validity of the information provided and for the timely provision of the results of the work and reports;
- In the course of its work, the Contractor reports to the UNDP Biodiversity Project Manager and



the Project Expert on landscape planning;

- All actions related to the implementation of this work must be coordinated with the specified employees of the Project;
- Contractor provides materials of completed work to the Project (to the Project Manager) for comment and approval;
- The work must be performed in a quality and timely manner, in accordance with the requirements of the Terms of Reference and the Contract for provision of services;
- In the event of poor quality work by the Contractor, UNDP reserves the right to terminate the contract unilaterally;
- UNDP Project reserves the right to make changes in the Terms of Reference not more than 25% of the scope, not affecting the total scope of work and cost of services under the Contract.

#### **INTERACTION/COLLABORATION:**

A list of organizations with which the Contractor will work/interact/collaborate/meet in the course of the work:

- Department of Natural Resources and Environmental Management of the East Kazakhstan Region, the East Kazakhstan Region Forestry and Wildlife Department;
- Katon-Karagai SNNP, Ridder, Pikhtovsky, Cheremshansky, Verkh-Ubinsky, Malo-Ubinsky, Zyryanovsky, Ust-Kamenogorsky, Verkh-Ubinsky, Kurchumsky, Markakolsky PI forestry;
- responsible experts of the UNDP Forest Ecosystem Conservation Project;
- leading national pharmaceutical companies, etc.

#### **TRAVEL SCHEDULE:**

To perform the scope of work under this contract, trips to and within the East Kazakhstan Region are envisaged. A detailed schedule of work and dates of trips shall be pre-agreed with the Project Manager and the Expert on Landscape Planning. Travel costs should be included in the financial proposal.

\* Due to the current situation related to the spread of COVID-19 coronavirus infection and the possible resumption of free movement restrictions within Kazakhstan, the organization of travel/public events may be limited. In this case, the company should have all necessary resources to conduct discussions / works / presentations / events online / remotely using digital technology without any field trips. If the situation described above occurs, the amount of the offer budgeted for travel and event organization will be deducted from the contract.

**QUALIFICATION REQUIREMENTS** See Annex 2 to RFP-2021-034 for a list of all documents required to be submitted:

The service provider can be a company/organization that is duly registered and meets the following requirements:

1. Have civil legal capacity to enter into contracts (certificate of registration/re-registration, founding documents),
2. Have financial stability (certificate of absence of debts in tax authorities and serviced banks), audited financial statements for 2019-2020. If the company is exempt from audit - the certificate of confirmation from the executor, the profit and loss statement, the balance sheet for 2019-2020. VAT certificate if the company is a VAT payer;
3. Have at least 7 years of experience in the study and conservation of biodiversity, ecosystems, flora, natural resources, etc;
4. Have at least 5 years of experience in the development of practical recommendations/workshops (at least 2) on conservation of plant life, assessment of biodiversity and ecosystems;



5. Provide a list of services rendered over the last 3 (three) years in the required area to confirm the experience in items 3-4 (name of the Customer, the subject of services / works, the year of service and the total amount of services (if possible).
6. Positive feedback and recommendations from previous customers for the last 3 years (at least 3);
7. Availability of material and technical base (Internet connection, computers, office equipment, field clothing and equipment (tents, sleeping bags, herbarium nets, etc.), GPS ), provide written confirmation.
8. Existence of a methodology of execution and a work plan-schedule (must include a description of methods and procedures for carrying out the work, team composition and distribution of responsibilities);
9. Availability of experts with the necessary work experience and qualifications according to the table below, with provision of a detailed CV, documents confirming the expert's qualifications (diplomas, certificates of advanced training in the subject area, other certificates), and written confirmation from each employee that they will be available for the duration of the contract.
10. Own written declaration that the company is not on the UN Security Council list 1267/1989, UN Procurement Division list or other UN disqualification lists.

**Table. Requirements for the basic composition and qualifications of the group of experts involved in the implementation of the work under this terms of reference:**

No.	Group Members	Number of people.	Proposed term of participation in the project, months.	Min. acceptable level of education and field of study	Special skills/experience
1.	Team Leader	1	16	Higher education in biology, natural sciences	7 years of experience in ecology, biodiversity conservation, plant resources, etc.  5 years of experience in the implementation of projects on ecosystem conservation, biodiversity, development of scientific and practical recommendations in the field.
	Administrative and financial assistant, logistician	1	6	Higher education in economics, finance and other related sciences	3 years of experience in financial, organizational and administrative work 1 year of experience in organizing and supporting events
3.	Expert botanist	3	14	Higher education in biology (botany)	5 years of experience in botanical research  4 years of experience in research/projects in the study, evaluation, and conservation of plant life
4.	Laboratory technician for the collection and desk review	1	6	Higher education in biology (botany)	2 years of experience in botanical research  At least 2 years of experience in field research in the study and

	processing of materials				evaluation of flora and plant communities
5.	GIS Mapper	1	8	Higher education in geography/cartography	3 years of experience in thematic mapping/remote sensing  Proficiency in ArcGIS desktop 10x/QGIS/ satellite image processing and interpretation software ENVI 4x/PCI Geomatics/ERDAS Imagine
	<b>Total:</b>	<b>7</b>			

**Approved by:** *Talgat Kerteshev*

Talgat Kerteshev  
Project Manager  
Date: 08-Jun-2021

*Nuri Ozbagdatli*

**Nuri Ozbagdatli**  
Portfolio Manager  
Date: 08-Jun-2021