

Non-detriment Finding for Roseroots/*Rhodiola rosea*/North China

Summary

Please note that this is not a routine NDF, but the first thorough survey of new plantation for newly listed species.

It generally takes 3-4 years from germination to harvest for *Rhodiola rosea* in plantations. According to the current provisions of the Convention, in the years following the entry into force of the inclusion in February 2023, specimens obtained from verified cultivation may apply to specimens obtained before the Convention (pre-convention). This provides the CITES with a 3-4 year period to monitor whether the cultivation of *Rhodiola rosea* meets the requirements of artificially propagated specimens, significantly whether the establishment and maintenance of the 'cultivated parent stock' does not harm the survival of wild populations.

China Scientific Authority for CITES (CNSA), with the support of the China Management Authority for CITES (CNMA), in collaboration with a research team from Chongqing University, conducted NDFs for establishing and maintaining the 'cultivated parental stock' for artificially propagated specimens of *Rhodiola rosea* in North China. The specific NDFs use historical literature mining, farmland investigation, artificial individual measurement, community interviews, field population discovery, natural community investigation, and distribution models to analyse suitable habitats and estimate species resources.

It finds:

1. The intrinsic biological vulnerability of *Rhodiola rosea* is low-medium. The Chinese population of *Rhodiola rosea* var. *rosea* is assessed as vulnerable. Human activities such as illegal harvests for international trade, grazing disturbances, habitat fragmentation, and climate change threaten wild populations.
2. There is still a lack of overall estimation of the Chinese population. Compared with the estimation of historical resources inferred from sociological surveys and resident interviews, the population of the four counties studied declined by more than 90 % over two decades.
3. The risks of harvest and trade are Medium. As conservation propaganda and law enforcement are put in place, it is inferred that the pressure of illegal harvest and trade will decrease. Most of the discovered surviving populations in the study area are in protected areas, including nature reserves and Buddhist temples. The surviving individuals are small in number and age, making supporting large-scale commercial collection and trade, including considerable illegal trade, challenging.
4. Management and conservation measures are robust. Provincial-level competent departments and nature reserves have established population monitoring projects, promoted legal popularisation in rural areas, strengthened patrol inspections of protected areas, and carried out law enforcement actions. Temple monks also understand the importance of conservation and are committed to monitoring wild populations in the gardens.
5. Locals no longer rely on harvesting *Rhodiola* for income, but grazing, the primary source of income and food affects the recovery of *Rhodiola rosea* populations in the wild.
6. The planting area has been expanding yearly and now reaches more than 100 hectares. Cultivation operations produce relatively high yields of seeds and seedlings. This large-scale planting industry is still in the process of development and adjustment.

It is recommended that local governments, nature reserves and temples continue to monitor the existing wild populations and strengthen the protection publicity and law enforcement of plants. Seeds can be recruited from wild populations under the supervision of a protected area or temple and with permission to

maintain the cultivation quality. The collection rate of ripe fruits from wild populations of *Rhodiola rosea* in the study area is recommended to be 20%.

The CNSA recommends continuous monitoring until 2025 to ensure it does not harm currently small and scattered wild populations in North China.

1. Pre-NDF check

Taxonomy	
Class	Angiospermae
Order	Saxifragales
Family	Crassulaceae
Genus, species (or subspecies)	Rhodiola, <i>Rhodiola rosea</i>
Common name	Roseroot, Golden root
Synonyms (scientific)	
Notes	<i>e.g. lookalikes, taxon uncertainty, splits etc</i>

CITES Listing	Annexe, listing date, annotations
Appendix I	
Appendix II	23/Feb/2023, CoP 19, #2 All parts and derivatives except: a) seeds and pollen; and b) finished products packaged and ready for retail trade.
Appendix III	
Not listed	

Results and brief description of Legal Acquisition Findings	
summary	<p>The export application is a multi-batch export of extracts produced by one factory and exported by two trading companies. The companies reported that the specimens were derived from artificially propagated materials. In verifying the evidence of the chain of custody and process description provided by the companies, reference was made to the <i>Guidance for making legal acquisition findings</i> in Annex 1 and Table 1: Evidence of legality along the chain of custody for flora and fauna of Annex 3 <i>Rapid guide for the making of legal acquisition findings</i> to the Conf. 18.7(Rev. CoP19) on <i>Legal acquisition findings</i>. After further on-site inspections, it was recognised that the declared export specimen was <i>Rhodiola rosea</i> extract from farms of herbal planting cooperatives in Chongli District, Zhangjiakou City, Hebei Province.</p> <p>Plants are grown from seeds and are planted in a farmland environment that is intensively manipulated by human intervention for the purpose of plant production. It took a 3-4 year period of growth on the field from germination to harvest to accumulate the desired components. Cultivation operations produce relatively high yields of seeds and seedlings that can be sold to recover some of the cost of awaiting harvesting of adult plants.</p>



(LAF field inspection were conducted on reported to cultivation farms)

The 'cultivated parental stock' was established before China added *Rhodiola rosea* to Class II of the *List of China's National Key Protected Plants* in 2021 when the collection of the species was not subject to relevant provisions of CITES and national laws. As a result of discussions, the specimens are therefore considered as pre-convention, according to Res Conf.13.6 (Rev. CoP18).

Source	
Wild (W)	
Ranched (R)	
Bred in captivity (F)	
Captive-bred (C)	
Introduction from the Sea(X)	
Assisted production(Y)	
Artificially propagated	To determine whether the plantation meets the criteria for artificial propagation, with emphasis on the NDFs for establishing and maintaining the "cultivated parental stock".

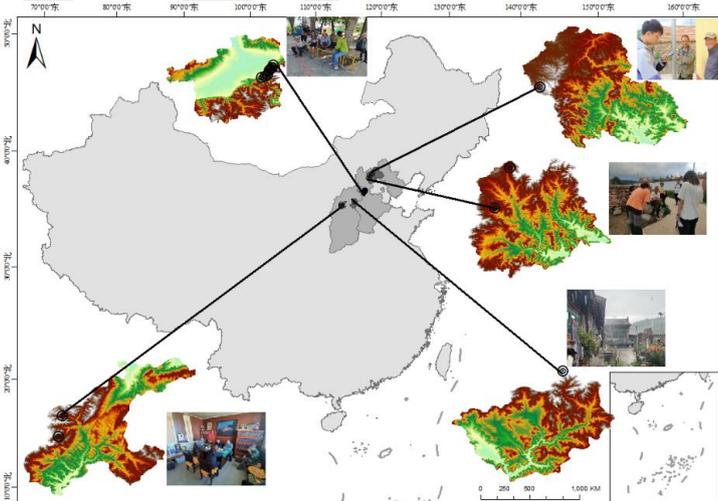
Purpose	
T, P, H, S, B, E, Q	T

Type of NDF	
General pre-export/annual NDF/Quota setting NDF, or Specific NDF on case-by-case application basis	A specific NDF for establishing and maintaining the 'cultivated parental stock' for artificially propagated specimens of <i>Rhodiola rosea</i> in North China.

Scope of NDF	
Population level(s): global, regional, country, or area (e.g. hunting concession)	The wild population of <i>Rhodiola rosea</i> in North China

Quantity of specimens on Application (relevant for case by case applications)	
N/A (for general or annual NDF)	NA
Term	Extracts
Quantity (units)	NA

Specimen description (age, sex, part or derivatives etc)	
	Rhodiola Rosea Extract with active ingredients: 3.1% of Rosavins and about 1.1% of Salidroside (HPLC methods); extraction rate: 38% (2.63kg raw material → 1kg final product), based on the detailed description of raw material testing, critical control points in the manufacturing process, equipment and instruments, inventory storage records and extracts tests by the processing company.

Harvest area for specimens	
Description of area	<p>The farms of the herbal plantation cooperative have a total of 106 hectares of <i>Rhodiola rosea</i> cultivation and are located in Chongli District, Zhangjiakou City, Hebei Province. From July to August 2023, the Endangered Species Scientific Commission of P.R. China (CNSA), with the support of provincial authorities, local governments, and nature reserve administrations, organized a research team from Chongqing University to conduct field visits to five counties where plantations may be affected.</p>  <p>(Field trips to carry out NDFs)</p> <p>The study area belongs to the Bashang Plateau and the northern mountainous area of North China, which is located at 38° 50' -42° 37' N, 110° 46' -119° 24'. Eight cities are distributed around the Yanshan-Yinshan Mountains in five provincial regions, including Beijing, Tianjin, Hebei, Shanxi and Inner Mongolia, with the region's total area being 164,600 km².</p>  <p>The plateau and the northern mountains of North China belong to the temperate continental monsoon climate, the transition zone between monsoon and continental climate. Controlled by dry and cold air, the northerly wind dominates in winter, and the southerly wind is prevalent in summer. Spring and autumn are the seasons of north-south wind conversion, and the terrain greatly influences the wind direction. The four</p>

seasons are characterised by windy weather in spring, cool summer, dry and pleasant autumn, cold winter and long duration.

The vegetation of the upper plateau and the mountainous area is mainly composed of deciduous broad-leaved forest, evergreen coniferous forest and alpine meadows. Wild *Rhodiola rosea* grows in forested, grassy, or rocky slopes at 1600-3100 m altitude in these areas.



(Habitats of *Rhodiola rosea* in the summer)

The study area is located in the ecotone between agriculture and animal husbandry. The agricultural planting is mainly wheat, potatoes, naked oats and other vegetables, and the animal husbandry is mainly cattle and sheep. The development of most areas is relatively slow, and the economic level is low. As of 2011, the social industry economy was 154 trillion yuan RMB, the total population was 31.78 million, and the population was relatively dense in the plain area.



(Local dwellings and townships)

The ecological environment is fragile, and soil erosion is severe. The region has implemented ecological governance since 1999, and the ecosystem has been improved to some extent. From 1990 to 2018, the average precipitation was 462.28mm, with a general downward trend of fluctuations, with a rate of change of 10.8mm/10yr. The annual average temperature was 8.97°C, with an overall upward trend of fluctuations,

	with an increase rate of 0.16°C/10yr. The interannual annual average of Fraction Vegetation Cover (FVC) is 57.65%, rising at a rate of 0.89%/yr. The trend indicates that human activities may benefit the increase of forest vegetation (Zhu, 2020).
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CITES regulatory background	New listing, trade suspensions or specific processes e.g. RST (inc details)
	New listing. Cultivated specimens may be considered pre-conventional.

2. Risk Evaluation

SPECIES BIOLOGY AND LIFE-HISTORY CHARACTERISTICS

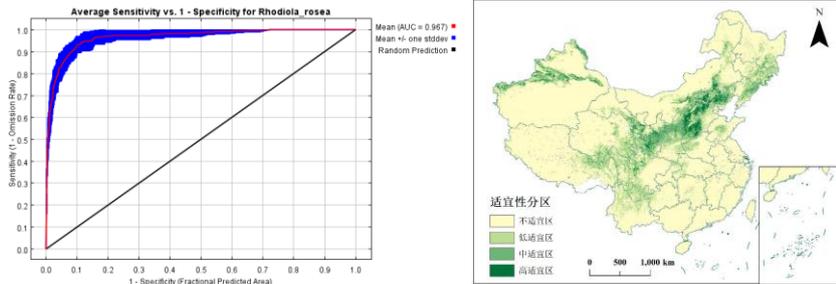
2.1 Level of intrinsic biological vulnerability of the species		
Median age at maturity	Low risk	Plants can bloom from the second year, but it generally takes 4-5 years to harvestable maturity in the wild.  (Artificial plants and wild plants during the breeding period)
	Medium	
	High	
	Unknown	
Maximum age/longevity	Low risk	A long-lived perennial, but maximum ages in wild populations have not been studied (Brinckmann, et al., 2021).
	Medium	
	High	
	Unknown	
Natural mortality rate (M)	Low	
	Medium	The seeds are small (ca. 2mm, 0.10-0.16g) winged at one end. The natural germinating rate of Rhodiola seed is low (5%-10%) (Tang, et al. 2002). Orthodox storage conditions keep 88 % viability following drying to mc's in equilibrium with 15 % RH and freezing for 139 days at -20C at RBG Kew (https://ser-sid.org/species/31581e8b-8bc5-44c0-b054-c8566d256eb2). Moist microhabitats are required for seed germination and seedling survival, but the local climate is semi-arid. Seedlings in the wild are distributed in patches and are easily foraged by cattle and sheep.

		 <p>(Fruits from cultivated plants and seeds from wild populations preserved in the Germplasm Bank of Wild Species of China.)</p>
	High	
	Unknown	
Maximum annual production of offspring (per mature female)	Low risk	<p><i>Rhodiola</i> had substantial rootstocks and annual flowering stems that developed from the axils of scaly radical leaves. Plants can have numerous flowering stems. The number of seeds per mature female plant of wild <i>Rhodiola rosea</i> is large. In addition to recruitment from seed, plants can resprout from the large rootstock.</p>  <p>(Plants and seed yields obtained from cultivation)</p>
	Medium	
	High	
	Unknown	
Behavioural factors	Low	
	Medium risk	A dioecious plant. Pollination may be reduced if the population density is too low and the male and female plants are far apart in the wild.
	High	
	Unknown	
Summary of intrinsic biological vulnerability		
<p>Low Low-medium risk <i>Rhodiola rosea</i> is a perennial with thick rhizomes and grows in a harsh and changeable natural environment. It occupies a wide disparate hypoarctic Eurasian–American circumboreal range in the northern hemisphere. The species is an herbaceous polycarpic plant and a dioecious species with separate female and male plants (Dorogina, et al. 2023). Low population densities, arid climates and grazing increase intrinsic vulnerability.</p>		
Medium		
High		
Unknown		

SPECIES DISTRIBUTION AND POPULATION STATUS

2.2 Distribution and population status		
Global distribution & trends	Low	
	Medium	It occupies a wide circumboreal range in the northern hemisphere from the low-Arctic to high-temperate regions of Asia, Europe, and North America. A sharp decline in the abundance of <i>R. rosea</i> in its natural habitat has occurred due to excessive harvesting of rhizomes (Brinckmann, 2021; Dorogina, et al. 2023).
	High	
	Unknown	
Estimated global population	Low	
	Medium	
	High	
	Unknown	Lack of estimates.
Regional distribution & population status (if appropriate)	Low	
	Medium	All available information relates to harvest areas in the Russian Federation. The Russian population is estimated to add up to more than 100 tonnes (CoP19 Prop. 45). The genetic variation within <i>Rhodiola rosea</i> in China was higher than that between populations, and there are some obstacles in the individual gene exchange among populations (Wang, et al., 2009).
	High	
	Unknown	
National distribution & trends	Low	
	Medium	
	High	Wild populations have been heavily harvested and sharply reduced.
	Unknown	The distribution was fragmented, and there was a lack of estimations.
Estimated targeted population (e.g. size classes)	Low	
	Medium	In the five counties studied, the total estimated reserves of potential whole plant dry products are about 24,900 kilograms according to the measured weight of the farms combined with predictions from the distribution model ¹ . However, the data reliability of the 5th county in the study area is low and does not meet the estimation requirements. For this reason, the study estimated data for only four counties in the study area (Jing et al., 2023). The same applies hereinafter.

¹ Fifteen transects and 45 field quadrats were set up in the main distribution areas of the four counties of the wild population of *Rhodiola rosea*, and the ecology, community, population and individual status were investigated. Potential distribution and suitable zoning analysis were identified based on MaxEnt species distribution model. According to the field population density and the biomass measured by artificial plants, combined with the area of high suitable area in the survey area, the potential resources of *Rhodiola rosea* were inferred.

	<p>High</p> <p>Unknown</p>	 <p>(Species distribution and environmental niche modelling)</p>
<p>Current population trend relative to historic abundance (global, regional and national)</p>	<p>Low</p> <p>Medium</p> <p>High</p> <p>Unknown</p>	<p>Sociological surveys and interviews² found that <i>Rhodiola rosea</i> was widely distributed on the mountains of the survey site 20 years ago, densely contiguous, and easy to obtain. Based on the interview records of residents in the survey area, it is conservatively estimated that the total historical <i>Rhodiola</i> resource reserves in the four counties are about 320,000 to 480,000 kg at that time (Jing et al., 2023).</p>  <p>(Sociological surveys and interviews)</p> <p>As a result, resource estimates have been reduced by more than 90% over two decades.</p>
<p>Summary of Distribution and population status</p>		
<p>Low</p>		
<p>Medium</p> <p>Medium-high risk</p> <p>The species occupies a wide circumboreal range in the northern hemisphere from the low-Arctic to high-temperate regions of Asia, Europe, and North America. There is still a lack of overall estimation of</p>		

² In the sociological survey and interviews, more than 100 residents have been involved in 10 villages in Fengning Manchu Autonomous County, Chicheng County and Yu County of Hebei Province, Lingying Temple in Wutai County of Shanxi Province and 2 villages in Ningwu County. The interview content includes harvest behavior (origin, time, habits, difficulty, volume of harvest), livelihood (income composition), trade (trade mode, trade path, purchase volume, price, acquisition time), protection awareness (policies and laws, changes in Rhodiola resources, threats), etc..

Chinese populations, but there is evidence of some obstacles in the individual gene exchange populations.

In the four counties studied, the total estimated reserves of potential whole plant dry products are about 24,900 kilograms according to the measured weight of the farms combined with predictions from the distribution model. Compared with the estimation of historical resources inferred from sociological surveys and resident interviews, the population has declined by more than 90 % over two decades.

High

Unknown

CONSERVATION STATUS & THREATS

2.3 Conservation status		
IUCN Red List (Global, regional)	Low	LC for Europe assessment (Chadburn, H. 2014)
	Medium	VU, NT
	High	CR, EN, DD
	Unknown	Not assessed & DD
National and local conservation status and trends	Low	LC for <i>Rhodiola rosea</i> var. <i>microphylla</i> in China (Ministry of Ecology and Environment of the P.R. China and Chines Academy of Sciences. 2023); in Class II of the List of China's National Key Protected Plants since 2021.
	Medium	VU B1ab(iii) for <i>Rhodiola rosea</i> var. <i>rosea</i> in China (Ministry of Ecology and Environment of the P.R. China and Chines Academy of Sciences. 2020; Huang, et al. 2022); in Class II of the List of China's National Key Protected Plants since 2021.
	High	
	Unknown	
2.4 Threats		
Threats and threat trends (including habitat loss, fragmentation and degradation, disease, invasive species, environmental change, pollution, climate change etc.)	Low	
	Medium	Harvest for international trade, grazing disturbances, habitat fragmentation, and climate change.
	High	
	Unknown	
Summary of conservation status and threats		
Low / Medium / High		
<p>Medium risk</p> <p>The Chinese population of <i>Rhodiola rosea</i> var. <i>rosea</i> is assessed as vulnerable based on the fragmentation of the species' range and inferred continuing decline in area, extent, and/or quality of habitats. Human activities such as illegal harvests for international trade, grazing disturbances, habitat fragmentation, and climate change threaten populations in the wild. The results of the regional assessments shall be updated after this study.</p>		

Since 2021, it has been included in Class II of the List of China's National Key Protected Plants.

2.5 Harvest and Trade overview

Harvest levels and trends- (including types of specimens)

Low

Medium

In the survey area, before the species was included in Class II of the List of China's National Key Protected Plants in 2021, the harvest level was high and driven by international trade. The wild population resources were estimated to have decreased by 90% over two decades. Nowadays, most of the discovered surviving populations in the study area are in protected areas, including nature reserves and Buddhist temples, protected by rangers or monks. No harvest of the whole plant is approved, and seed collection and specimen measurements are used only for scientific research or rescue breeding.



(One wild population of Wutai Mountain is preserved in the temple garden, and scientific surveys are carried out under the supervision of monks.)

After being included in the protection list, there was no legally approved harvest of whole plants for international trade as of the survey period. Occasionally, in remote mountainous areas, local people transplant the adult and harvest the seeds for cultivation.



(Before the species is protected, farmers transplant the adults to their backyards)

There is also illegal harvest recently, but due to the time limit of the harvesting season, these people will transplant all the plants to hidden places for temporary rearing. One case seized last year revealed that criminals sneaked into nature reserves to steal and transplant wild *Rhodiola* (See the case in the Enforcement of section 4).

	<p style="background-color: yellow; padding: 5px;">High</p> <p style="background-color: red; color: white; padding: 2px;">Unknown</p>	 <p>(Some transplant plants in batches from nature reserves, but not for sale)</p> <p>These types of specimens are whole plant, fruits, and seeds.</p>	
		Unknown	
<p>International trade levels and trends (including types of specimens)</p>	Low		
	<p style="background-color: red; color: white; padding: 2px;">High</p> <p style="background-color: red; color: white; padding: 2px;">Unknown</p>	<p>Before the inclusion of the Appendix II of the Convention, the volume of international trade was considerable. For example, eighty shipments of <i>Rhodiola</i> products from China to the United States of America in a single year were estimated to consist of 2464 kg of concentrated (CoP 19 Prop. 45).</p> <p>The types of specimens of <i>Rhodiola rosea</i> for international trade are mainly whole dried plants, dried rhizomes, and processed extracts.</p>  <p>(Cultivated specimens, whole plants, dried rhizomes and extracts.)</p>	
		High	
		Unknown	
<p>Summary of Harvest and Trade</p>			
<p>Low / Medium / High</p>			
<p>Medium</p> <p>Before the species was included in Class II in the List of China's National Key Protected Plants in 2021, the harvest level was relatively high, driven by international trade, and the wild population resources were estimated to have decreased by 90% over two decades. After being included in the protection list, there was no legally approved harvest of whole plants for international trade as of the survey period. Nowadays, most of the discovered surviving populations in the study area are in protected areas, including nature reserves and Buddhist temples, protected by rangers or monks. No harvest of the whole plant is approved, and seed collection and specimen measurements are used only for scientific research or rescue breeding.</p> <p>In remote mountainous areas, local people occasionally transplant wild individuals and harvest the seeds for cultivation. Some criminals still sneak into nature reserves to steal and transplant wild <i>Rhodiola</i>, which is protected by law.</p>			

Before the inclusion of the Appendix II of the Convention, the volume of international trade was hard to estimate but considerable. The types of specimens of *Rhodiola rosea* for international trade are mainly whole dried plants, dried rhizomes, and extracts.

3. Impact Evaluation

3.1 What is the severity of harvest pressure on the species concerned?

Factors: Magnitude of pressure Size/age/sex selectivity Offtake % of population at agreed spatial scale Illegal harvest (projected, estimated, inferred)	Low impact	<p>Local commercial plantations are well established and rarely need to harvest wild plants. However, in order to maintain the quality of cultivation, seeds can be recruited from wild populations under the supervision of a protected area or temple and with permission.</p> <p>In consultation with the Germplasm Bank of Wild Species of China, according to the Seed Conservation Standards of the Millennium Seed Bank Partnership (MSBP), it is recommended that the collection rate of ripe fruits from wild populations of <i>Rhodiola rosea</i> in the study area be 20%.</p>
	Medium	<p>After intensive harvest for international trade before the species' inclusion in the protection list, most of the discovered surviving populations in the study area are in protected areas. The surviving individuals are small in number and age.</p>  <p>(Most of the individuals found were seedlings or sub-adults)</p> <p>Illegal transplanting of adults may exist in rural communities in remote mountainous areas. Some criminals still sneak into nature reserves to steal and transplant wild <i>Rhodiola</i>. As conservation propaganda and law enforcement are put in place, it is inferred that the pressure will decrease.</p>
	High	
	Unknown	
	Level of confidence Low Medium High Medium confidence	
Reasoning Continued observation is still needed.		

After intensive harvest for international trade, most of the discovered surviving populations in the study area are in protected areas, including nature reserves and Buddhist temples. However, most of the surviving individuals are seedlings or sub-adults, and the population is seriously fragmented. Illegal transplanting of wild plants still exists. As conservation propaganda and law enforcement are put in place, it is inferred that the pressure will decrease.

Seeds can be recruited from wild populations under the supervision of a protected area or temple and with permission to maintain the quality of cultivation. The collection rate of ripe fruits from wild populations of *Rhodiola rosea* in the study area is recommended to be 20%.

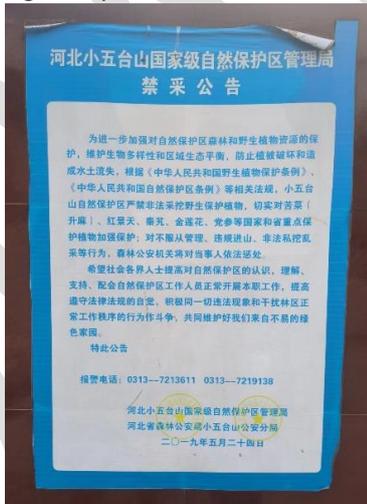
3.2 What is the severity of international trade pressure on the species concerned?

Magnitude of legal international trade	Low	<p>Prior to being listed for protection, harvests for international trade had a serious impact on species in the region. Local wild populations are no longer able to support legal international trade from wild sources. Locals avoided harvesting and selling <i>Rhodiola</i> and instead grew plants after it was protected.</p> <p>The planting area has been expanding yearly and now reaches more than 100 hectares. Cultivation operations produce relatively high yields of seeds and seedlings. This large-scale planting industry is still in the process of development and adjustment. Ongoing monitoring is required.</p>	
	Medium		
	High		
	Unknown		
	Level of confidence		
	Low	Medium	High
High confidence			
Magnitude of illegal trade (projected, estimated, inferred)	Low		
	Medium	<p>The surviving wild populations are mainly located in protected areas, and are small in number and age, making it difficult to support large-scale commercial collection and trade including considerable illegal trade.</p> <p>Illegal transplantation of adults may occur in rural communities in remote mountainous areas. There are criminals who sneak into nature reserves to steal <i>Rhodiola</i>. In one case seized in May 2022, more than 500 kilograms of wild <i>Rhodiola rosea</i> were poached and transplanted for further trafficking in Yu County, Hebei Province (the fifth county not included in the data in this case analysis).</p>	
	High		
	Unknown		
	Level of confidence		
	Low	Medium	High
Medium confidence			

Reasoning

The surviving wild populations are mainly located in protected areas and are small in number and age, making it challenging to support large-scale commercial collection and trade, including considerable illegal trade. Illegal transplantation of wild plants still exists. Locals avoided harvesting and selling *Rhodiola* and instead grew plants after it was protected. The planting area has been expanding yearly and now reaches more than 100 hectares. Cultivation operations produce relatively high yields of seeds and seedlings. This large-scale planting industry is still in the process of development and adjustment. Ongoing monitoring is required.

4. Factors that may mitigate impacts (e.g. management measures, monitoring)

National measures		National legislation, PA coverage etc
National legislation	Low	<p>The species concerned is listed in Class II of the List of China National Key Protected Plants in 2021. After intensive harvest for international trade, most of the discovered surviving populations in the study area are in protected areas, including nature reserves and Buddhist temples.</p> <p>The collection of wild plants is prohibited in nature reserves, as is the collection of protected plants that grow naturally. Temples have the right to protect their creatures from disturbance and killing.</p>
	Medium	
	High	
	Unknown	
		 <p>(A notice issued by the National Nature Reserve Administration prohibiting wild harvest in a mountain village)</p>  <p>(In response to the criminal chain of "illegal harvesting-trafficking-transplanting" of <i>Rhodiola rosea</i>, the Yu County Procuratorate organized a symposium on environmental resource protection)</p>

		procuratorial work. https://www.thepaper.cn/newsDetail_forward_22463023)
Quotas	Low	There is no quota for seed collection. In consultation with the Germplasm Bank of Wild Species of China, according to the Seed Conservation Standards of the Millennium Seed Bank Partnership (MSBP), it is recommended that the collection rate of ripe fruits from wild populations of <i>Rhodiola rosea</i> in the study area be 20%.
	Medium	
	High	
	Unknown	
Criteria (species/area)	Low	It is recommended that the collection rate of ripe fruits from wild populations of <i>Rhodiola rosea</i> in the study area be 20%.
	Medium	
	High	
	Unknown	
Monitoring	Low	Provincial authorities and protected areas have set up population monitoring projects. The species is one of the monitoring targets in the local area. Nature reserves have set up monitoring quadrats in the sample plots found in this expedition. Temple monks also understood the importance of preserving wild populations in their gardens and promised to monitor the plots.
	Medium	
	High	
	Unknown	
Licensing and regulation	Low	<i>Regulations of the People's Republic of China on the Protection of Wild Plants and Regulations of the People's Republic of China on Nature Reserves.</i>
	Medium	
	High	
	Unknown	
Governance and enforcement	Low	Provincial departments and nature reserves are ceasing legal popularisation and patrolling protected areas. Enforcement actions are carried out in national nature reserves. For example, in the case seized in May 2022, in Yu County, Hebei Province, nine convicts were arrested for illegally entering the national nature reserve to poach more than 500 kilograms of <i>Rhodiola</i> . Eight people were sentenced to fixed-term imprisonment ranging from six months to 11 months for the crime of endangering plants under national key protection, and each was fined concurrently. Among them, four people need to volunteer to publicise the protection of national key protected plants.
	Medium	
	High	
	Unknown	
Welfare	Low	NA
	Medium	
	High	
	Unknown	

International and regional measures		Other Conventions and agreements
	Low	
	Medium	
	High	
	Unknown	
	Low	
	Medium	
	High	
	Unknown	

	Level of confidence		
	Low	Medium	High
	High confidence		

6. Rural communities and livelihood impacts (in cases that need to be considered)

Factor		Indicator/metric	
Role in RC and livelihood (does harvest impact)	Low		
	Medium	<p>This species is not a traditional local medicinal herb and is harvested due to demand driven by international trade in recent decades. Before the development of local ecotourism, livelihood in the mountains was mainly grazing and herb gathering, and local villagers would go deep into the mountains to harvest <i>Rhodiola</i> to obtain high returns.</p> <p>Today, they do not rely on harvesting <i>Rhodiola</i> for income, but grazing, which is the primary source of income and food, affects the recovery of <i>Rhodiola rosea</i> populations in the wild.</p> <p>Local livestock like to eat the young leaves and stems at the tips of <i>Rhodiola rosea</i> stems. Repeated grazing of seedlings and flower stems by livestock leads to a decline in fertility and a slowdown in population growth.</p>	
			
		(Grazing cattle)	
	High		
	Unknown		
	Level of confidence		
	Low	Medium	High
	High confidence		
Impacts (Whether strict measures seriously harm communities and their livelihoods)	Low		
	Medium	<p>After the species were listed for protection and poaching cases were caught in the nature reserves, local people avoided harvesting and selling <i>Rhodiola</i> in favour of cultivating the plants. The planting area has been expanding yearly, reaching more than 100 hectares. The quality and quantity of parental stocks can be challenging.</p>	
	High		
	Unknown		
		Level of confidence	
	Low	Medium	High
	Medium confidence		

* Resulting in:

- reduction in the abundance of another native species;
- an increase in the abundance of a non-native species or over-abundance of another species;
- a reduction in a demographic rate in any life stage of another native species (e.g., germination, seed production, nest success, natal dispersal, etc.) that has the potential to decrease its abundance or otherwise reduce its viability;
- change in any ecosystem process or structural feature;
- change in the typical patterns of behaviour (e.g., social interactions, patterns of aggregation, movement) among individuals of the species being assessed or other species;
- change in genetic structure or variability of the population that indicates that one or more of the ecological functions of the species' are, or will become, impaired.

7. NON-DETRIMENT FINDING AND RELATED ADVICE

Conclusion and Decision

Conclusion: plantations in the study area were established after the population had been severely harvested, probably by preserving the fruits and seeds while selling the rhizomes. There are robust local conservation measures for wild populations, so the risk of illegal harvesting is relatively low. This large-scale planting industry is still in the process of development and adjustment. Seeds can be recruited from wild populations under the supervision of a protected area or temple and with permission to maintain the cultivation quality. The collection rate of ripe fruits from wild populations of *Rhodiola rosea* in the study area is recommended to be 20%.

The CNSA recommends continuous monitoring until 2025 and ensures that it does not harm North China's currently small and scattered wild populations.

Conditions/ Remedial Actions/Management Advice.

It is recommended that local governments, nature reserves and temples continue to monitor the existing wild populations, and strengthen the protection publicity and law enforcement of plants. Seeds can be recruited from wild populations under the supervision of a protected area or temple and with permission to maintain the cultivation quality. The collection rate of ripe fruits from wild populations of *Rhodiola rosea* in the study area is recommended to be 20%.

Needed – an evidence-based key to determine whether score is low, medium, or high. For example age at maturity, offspring, distribution etc (these will be taxa-specific). Likely to be a judgement call that will need explicit justification.

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