# Case study 1: *Hirudo medicinalis*

## Background Information

### Scientific and common names:

Class: Clitellata

Order: Arhynchobdellida

Family: Hirudinidae

Scientific name: *Hirudo medicinalis* Linnaeus, 1758

Common names: English: medicinal leech, European medicinal leech, northern medicinal leech; French: sangsue officinale, sangsue médicinale; Spanish: sanguijuela, sanguijuela medicinal del norte (UNEP-WCMC, 2023b).

### Distribution

*Hirudo medicinalis* is distributed throughout Europe and from Scandinavia south to the Mediterranean Sea, and from the British Isles east to beyond the Caspian Sea, possibly as far as the Altai Mountains in East Central Asia. In 2014, the IUCN assessed the species as being extant in the following countries: Austria, Belarus, Croatia, Czech Republic, France, Germany, Hungary, Latvia, Lithuania, Netherlands, Norway, Poland, Russian Federation, Slovenia, Sweden, Switzerland, Ukraine and United Kingdom (Utevsky et al., 2014). UNEP-WCMC (2023b) also includes the countries of Denmark, Finland, Luxembourg, Romania, Slovakia and Spain within the species’ distribution. UNEP-WCMC (2023b) further notes that the presence of *H. medicinalis* in Belgium, Estonia and Turkey is uncertain, and that the species is extinct in Ireland.

### Biological characteristics

#### General biological and life history characteristics

*Hirudo medicinalis* is a hermaphroditic annelid leech that has a flattened segmented body that is up to 20 centimeters in length. They have a paler ventral surface while the dorsal is darker with a variety of colours that differs between specimens and ranges from yellow to green, red, brown, and black. The dorsal surface may exhibit multiple dark spots (Sağlam, 2021). The species may predate on smaller invertebrates, but is best known as a temporary ectoparasite on fish, frogs, turtles, snakes and some mammals (Saglam, 2018). Like other freshwater leeches, *H. medicinalis* has suckers at either end of the body. They attach to their animal hosts with the anterior sucker and use their three jaws to create a Y-shaped incision through which the leech ingests blood. Elliott and Kutschera (2011) note that *H. medicinalis* amphibian larvae and juveniles are important food sources for young leeches as the leeches cannot pierce mammalian skin for their first two feedings.

#### Habitat types

The species is found in freshwater habitats such as ponds, floodplain pools, small lakes, swamps slow-moving streams. The species’ ecological requirements include abundant suitable hosts, silty water bottoms, submerged and emergent vegetation and sloping banks that allow gravid leeches to exit the water and lay their eggs in a sac called the cocoon (Sağlam, 2021; Utevsky et al., 2014). According to Elliott and Kutschera (2011), the optimal habitat should be a breeding site for frogs, toads and newts.

#### Role of the species in its ecosystem

Leeches are important biological components of the freshwater ecosystems in which they live and comprise an significant proportion of the diets of the fish living in those habitats (Saglam, 2018).

### Population

#### Global population size

As of 2014 the global population of *H. medicinalis* was not known. The loss of wetland habitats in Europe will likely impact populations and geographical ranges. Furthermore, the decline of amphibian populations and changes to traditional grazing practices—thereby reducing contact between leeches and livestock—may reduce the availability of suitable blood hosts. Nonetheless, *H. medicinalis* has experienced rapid population growth and range expansion [as of 2014], as is indicated by the low genetic diversity exhibited by the species (Utevsky et al., 2014).

#### Current Global population trends

Unknown.

### Conservation status

#### Global conservation status

In 2014 the IUCN assessed *H. medicinalis* as Near Threatened (Utevsky et al., 2014).

#### National conservation status for the case study country

In order to protect the medicinal leech species, Türkiye has been implementing changes in quotas with the approval of scientific organizations, taking into account the status of the population. In this framework, Türkiye's *H. medicinalis* export quota was reduced from 10 tons in 1996 to 7 tons in 1997. While this quota was applied as 6000 kg between 2005 and 2009, it was reduced to 2000 kg between 2010-2018 (Saglam, 2017), and finally to 1500 kg in 2023. Again, while the ban on catching of medicinal leech species was between April 15 and June 15 (Anonim, 1996), this ban was changed from March 1 to June 30 (Anonymous, 1997) and increased from two months to four months (Anonymous, 2016; Saglam, 2017). Finally, this ban has been implemented between March 15 and August 31 since 2023 (Anonymous, 2020)(Republic of Türkiye Ministry of Agriculture and Forestry, [https://sinop.tarimorman.gov.tr/Haber/631/Tibbi-Suluk-Av-Yasagi-Basladi#](https://sinop.tarimorman.gov.tr/Haber/631/Tibbi-Suluk-Av-Yasagi-Basladi)).

#### In addition, in wetlands with National Park status (e.g. Sultan Sazlığı, Kayseri, Türkiye), hunting of medicinal leeches is completely prohibited. In order to protect the leech species in such national parks, a Medical Leech Sub-Plan for the Sultan Reed National Park was prepared in 2019 (Sağlam et al., 2019)(unpublished report, in Turkish).

#### Main threats within the case study country

Climate change and global warming show their effects in the habitats of leeches in the most brutal way. It causes the wetlands and reeds, which constitute the habitat of leeches, to shrink and change their shape. For example, it is seen that there have been significant changes in Sultan Reedbed (Kayseri, Türkiye), which is the most important wetland area and is included in the RAMSAR list and has a significant amount of leeches since 1977 (Sönmez & Somuncu, 2016). Since these changes directly affect the marsh, which is the habitat of leeches, it is one of the most important factors that negatively affect the life of leeches. Especially in small wetlands, the situation is more serious. It is possible to see that some of the small wetlands in the Samsun region, which constitute an important part of the leech population, have completely dried up and there are no leeches in these areas where there were previously dense leeches (Saglam, 2011).

Foreign trade of leeches can be monitored within the scope of CITES. However, a system to monitor the use of leeches in the domestic market has not yet been developed. In recent years, there has been a significant increase in domestic consumption with the approval of the use of leeches in treatment within the scope of Traditional and Complementary Medicine Practices (GETAT) in Türkiye. Although the relevant GETAT regulation stipulates that leeches must be obtained from leech enterprises where leech production is carried out, the use of leeches collected among the public is still very popular (Anonymous, 2014a). The popularity of leech use has increased the demand in the domestic market. This situation causes an intensive collection to be encouraged during the periods when hunting bans are liberalised in the populations. This situation shows that *H. verbanan* populations will be negatively affected in the future, even if not at present. The fact that the annual quotas for Türkiye have not been fully filled and the increase in leech prices in the domestic market should also be evaluated within this framework. This is because the prices have increased as the decline in the populations in wetlands started to show itself (Saglam, 2017; Saglam, 2012; Saglam, 2011; Sağlam, 2014).

The trade of frozen leeches is also considered as an important threat factor. Because it is quite easy to trade frozen leeches as worms. In this case, procedures such as genetic identification (DNA barcoding) of the samples should be activated and identification should be provided, which is time-consuming. Therefore, authorising only live leech trade would have a significant impact on the conservation of leeches worldwide. The export and import of frozen leeches should be prohibited for the continuation of the leech's extinction. In this respect, the CITES authority should impose a ban on the export of frozen medical leeches as well as the quotas imposed on the export of medical leeches. Medical leeches should be traded live and the freezing and killing of leeches should be done by the pharmaceutical companies themselves.

In some of the habitats of medicinal leeches, there are predatory fish species (e.g Pike-Esox lucius etc.). These predatory fish species can also feed on leeches. This is one of the most important threats of leeches in natural environments (Sağlam et al., 2019; Sağlam et al., 2017) (*Unpublished report, in Turkish*).

## Some habitats of medicinal leeches are intertwined with agricultural areas. It is possible for pesticides applied in these agricultural areas to reach the habitats of leeches by surface runoff. This has a limiting effect and threat especially on the life of small leeches (Sağlam et al., 2019) (*Unpublished report- in Turkish*).

## **SPECIES MANAGEMENT**

### Management Measures

The Regulation on the Protection of Hunting and Wild Animals and Their Habitats in Türkiye and the Procedures and Principles for Controlling Pests determines the national policy for the protection of wildlife and programmes for the sustainable use of wildlife. It also includes the following definitions for species and populations at risk in Türkiye (Anonymous, 2005).

* Protected wild animal: Endangered, and threatened, or similar categories of species that are protected by international conventions to which Türkiye is a party and by the decisions of the Ministry or central hunting commission,
* Extinct species: A species in which the last individual has been definitively determined to have died,
* An extinct species in nature: A species that is known to live in populations in cultivated, maintained, zoos, except in its natural habitat,
* Critically endangered species: A species at high risk of extinction in the near future,
* Endangered species: A species at high but not critical risk of extinction in the near future,
* Sensitive species: A species that faces a high risk of extinction in the medium term in the wild but is not critically endangered or endangered,
* Threatened species: Species with a high probability of being classified as extinct, extinct in the wild, or critically endangered in the near future,
* Rare species: Species with small populations that are not currently endangered or vulnerable, but are at risk, and species with small populations that are rare in certain geographical areas or over a large area, are not included in one of the threat classifications, but are at risk,
* Species at low risk: Species that cannot be included in the classifications of extinct species, critically endangered species and endangered species when evaluated according to threat classifications,
* Species with insufficient data: Species for which there is no data on distribution and population status related to the above threat classifications and it is not possible to make an assessment,
* Endemic species: A species that is unique to a region, a local area or a particular ecological environment,

While the regulation on the protection of wetlands secures the lives of living creatures living in wetlands, it also secures the lives of leeches (Anonymous, 2014b).

Regulations that prohibit the hunting of leeches during their reproductive times include legal regulations for the reproduction of leeches and the continuation of their generations (Anonymous, 2020).

In order to control the hunting and export of leeches, every year in Türkiye, the Ministry of Agriculture and Forestry publishes a communiqué on leech export quota and the distribution of this quota to exporting companies (Anonymous, 2023).

### Within the framework of the Law No. 5199 on the Protection of Animals, it is based on the protection of endangered species and their habitats. Measures are taken to implement this

### (Anonymous, 2004)

### Monitoring system

### In order to monitor the harvest, those who will hunt leeches in Türkiye are required to obtain a leech collection permit and hunting licence from the Ministry of Agriculture and Forestry. The collection of those who do not obtain this document is completely prohibited. Despite this, the monitoring of leeches used domestically is not known. Since the leeches sent abroad are registered within the scope of CITES, the Ministry of Agriculture and Forestry obtains the certificate of origin of the wetland from which they were collected and ensures that they are monitored (Anonymous, 1971; Anonymous, 1995).

### Legal framework and law enforcement

Turkey became a party to the CITES Convention on 22 December 1996. In order to regulate the procedures and principles for controlling the international trade of animal and plant species covered by the Convention (CITES) by coordinating with the relevant institutions and organisations: Implementing Regulation dated 27.12.2001 and numbered 24623 was issued by the Ministry of Environment. According to the CITES Implementation Regulation, the management authorities for the issuance of permits and documents for the species included in the CITES documents are organised as follows (Anonymous, 2001).

General Directorate of Nature Conservation and National Parks is responsible for the protection, restoration and conservation of birds, mammals except marine mammals, reptiles, bivalves (both aquatic and terrestrial), and arthropods; it is also responsible for supporting sustainable development.

Directorate General of Fisheries and Aquaculture (BSGM) is in charge of carrying out transactions related to the trade of aquaculture products including terrestrial invertebrates, molluscs, plants found in seas and inland waters and their eggs, marine mammals and endangered species. In addition, BSGM also carries out duties such as ensuring the operation and development of aquaculture and aquaculture resources on the basis of sustainability, carrying out protection measures for this purpose, implementing regulations on hunting, aquaculture and marketing, collecting all kinds of information and documents related to aquaculture and developing a registration system for this information, monitoring, control and inspection and penal sanctions within the scope of the regulations introduced, issuing or having issued and inspecting certificates of origin and transport related to aquaculture, and ensuring the implementation of environmentally friendly production models.

## The Scientific and Technological Research Council of Türkiye (TUBITAK) acts as the scientific authority to issue permits and documents to the management authorities and to make the recommendations specified in the contract.

## Utilization and Trade

### Type of use

*Hirudo medicinalis* are used extensively in medicinal leech therapy (hirudotherapy) Medicinal to drain a haematomas (partially clotted blood) from wounds such as “black eyes, cauliflower ears, gum boils and minor ulcers (Elliott & Kutschera, 2011) and by reconstructive surgeons to remove stagnant blood when managing reattached limbs. Leeches may be used to remove pooling blood that can inhibit the inflow of oxygenated arterial blood and may be critical to saving the limbs. The saliva of leeches contains important biochemical substances that assist the healing process including anesthetic agents, anticoagulants, antiplatelet aggregation factors, antibiotics, anti-inflammatory substances, and blood- and lymph-circulation enhancing properties (Nair et al., 2022; Singh, 2009). In addition, Nair et al. (2022) reference medicinal leech therapy being used to treat cardiovascular, gynecological, dermatological, and other diseases and conditions.

### Harvest

#### Harvesting regime

#### Harvesting of wild specimens of H. verbana is prohibited, except for collection for valid and approved scientific purposes during the fishing ban periods (15 March-31 August) under the Fisheries Regulations (Anonymous, 2020).Harvest management/ control(quotas, seasons, permits, etc.)

In Turkey, medical leeches are free to be hunted except for the period between 15 March-31 August. During this free hunting period, the following rules must be followed (Anonymous, 2020).

1. It is obligatory for those who are going to harvest medicinal leeches to apply to the provincial directorate of Agriculture and Forest Ministry in the place where they will be harvested and obtain a water products licence for real persons.
2. It is obligatory to include the information on the species to be harvested in the licence certificates issued.
3. Persons engaged in leech harvest are required to issue "Special Product Certificate of Origin" for the products they harvest , submit the certificates of origin to the province/district directorate where the harvest is carried out and register them in the Aquaculture Information System (SUBIS).
4. The certificates of origin registered in SUBIS shall be approved and sealed by the provincial/district directorates with the note "Registered". The original of the approved document remains with the product and a copy remains with the provincial/district directorate that approved it.
5. The transport, sale, storage and processing of medicinal leeches without an approved Special Product Certificate of Origin is prohibited.

### According to the Communiqué on Foreign Trade of Endangered Species of Wild Animals and Plants in Türkiye, the Ministry of Agriculture and Forestry determines the export quota for medicinal leech every year within the framework of the "Communiqué on the allocation of the export quota for medicinal leech" issued in January or February of each year. Medical leech quotas in Türkiye have been reduced considerably over time and finally set as 1500 kg for the year 2023. In this communiqué, the names of the companies that can export leeches and the quota amounts that they can export in that year are listed (Anonymous, 2023). Leech quotas of companies that cannot fill their quota can be allocated to other companies that fill their quota and make additional requests in the last months of the same year (Sağlam, 2012).

### Legal and illegal trade levels

#### Legal trade

Data downloaded from the UNEP-WCMC CITES Trade Database showed that in the years 2017–2021, between 2,032,561–3,116,815 specimens of *H. medicinalis* were traded internationally (Table 11). An additional 28–6,032 kg of *H. medicinalis* were recorded by weight (Table 12) and up to 181 ml were traded by volume (Table 13).[[1]](#footnote-1)

More than 99% of the *H. medicinalis* traded in 2017–2021 were recorded as captive-bred. A small number were exported as confiscated or seized specimens, and the source of 3,000 live specimens traded in 2020 was not recorded. The only wild specimens recorded were 2,000 individual specimens exported from Romania to Switzerland in 2020, and 13 kg exported from Türkiye to the Republic of Korea (2 kg in 2018 and 11 kg in 2021) (Tables 11–13). Wild specimens accounted for approximately 0.1% of the individual specimens traded, and 0.2% of the specimens traded by weight (Tables 11 & 12). It is worth noting, however, that wild specimens accounted for 100% of the importer-reported quantities reported for 2018 and 2020 (Table 12).

Specimens of *H. medicinalis* were exported from a total of 14 different countries. Most were range States or adjacent to range States. Canada and the United States were notable exceptions (Tables 11–13). More than 92% of the individual specimens in trade were exported from three countries: Azerbaijan (46–57%), the Russian Federation (32–35%), and France (14%) (Table 11). Approximately 99% of the of the specimens traded by weight were exported from Lithuania (88%) and France (33%), and 100% of the specimens traded by volume were exported from the Russian Federation (according to importer reported data) (Tables 12 & 13).

#### Illegal trade

Unknown.

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Table 11. Hirudo medicinalis Exported as Individual Specimens, 2017–2021

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | Source | Term | Exporter | Importer | Importer reported quantity | Exporter reported quantity |
| 2017 | Captive-bred | Cosmetics | Ukraine | Latvia |  -  | 9,635  |
| Poland |  -  | 15,000  |
| Not recorded |  -  | 25,000  |
| Live | Canada | United States | 1,000 | - |
| France | United States | 83,600 | - |
| Lithuania | Switzerland | 6,000 | 9,000 |
| Republic of Korea | - | 2,000 |
| Romania | Switzerland | 16,500 | 10,500 |
| Russia | Switzerland | 1,000 | - |
| France | 60,000 | - |
| Medicine | Ukraine | Estonia | 25,000 | - |
| Subtotal | 193,100 | 71,135 |
| Confiscated/seized | Live | Russia | United States | 40 | - |
| Specimens | Germany | United States | 1 | - |
| Subtotal | 41 | 0 |
| **Total** | **193,141** | **71,135** |
| 2018 | Captive-bred | Cosmetics | Russia | Not recorded | - | 107,100 |
| Lithuania | - | 18,234 |
| Latvia | - | 52,140 |
| Russia | 120,840 | - |
| Ukraine | - | 8,180 |
| Ukraine | Estonia | - | 15,030 |
| Live | France | Switzerland | - | 10 |
| Republic of Korea | 2,000 | - |
| United States | 86,900 | - |
| United States | 8,800 | - |
| Lithuania | Switzerland | 7,000 | 8,500 |
| Republic of Korea | 4,000 | 1,500 |
| Poland | United States | - | 100 |
| Romania | Switzerland | 25,500 | 36,000 |
| Russia | Switzerland | 3,000 | 3,000 |
| Ukraine | Latvia | - | 2,250 |
| Medicine | Russia | Lithuania | 9,117 | - |
| Latvia | 21,802 | - |
| Ukraine | Estonia | 15,030 | - |
| Latvia | 2,250 | - |
| Subtotal | 306,239 | 252,044 |
| Confiscated/seized | Live | Netherlands  | United States | 16 | - |
| Medicine | Ukraine | United States | 65 | - |
| Subtotal | 81 | 0 |
| Wild | Live | Romania | Switzerland | 2,000 | - |
| Subtotal | 2,000 | 0 |
| **Total** | **308,320** | **252,044** |
| 2019 | Captive-bred | Cosmetics | Russia | Bulgaria | - | 1,620 |
| Not recorded | - | 145,850 |
| Lithuania | - | 97,095 |
| Latvia | - | 31,152 |
| Romania | - | 248 |
| Ukraine | - | 14,986 |
| Derivatives | Russia | Romania | 248 | - |
| Extract | Russia | Russia | 136,475 | - |
| Live | Azerbaijan | Uzbekistan | 55,000 | - |
| Germany | Switzerland | 1,500 | - |
| France | United States | 107,206 | - |
| Lithuania | Switzerland | 10,000 | 10,000 |
| Lithuania | Not recorded | - | 4,000 |
| Romania | Switzerland | 22,000 | 18,000 |
| Russia | Canada | - | 500 |
| Switzerland | - | 1,000 |
| Uzbekistan | - | 50,000 |
| United States | Canada | - | 1,000 |
| Medicine | Russia | Latvia | 4,000 | - |
| **Total** | **336,429** | **375,451** |

*Table 11 continued…*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | Source | Term | Exporter | Importer | Importer reported quantity | Exporter reported quantity |
| 2020 | Captive-bred | Cosmetics | Russia | **Bulgaria** | - | **1,368** |
| Estonia | - | 11,770 |
| Lithuania | - | 39,544 |
| Russia | - | 119,230 |
| Ukraine | - | 11,010 |
| Extract | Russia | Russia | 119,230 | - |
| Live | Azerbaijan | Belarus | - | 5,000 |
| Israel | - | 3,000 |
| Kazakhstan | - | 150,000 |
| Morocco | - | 2,000 |
| Russia | - | 20,000 |
| Uzbekistan | 300,000 | 99,000 |
| Lithuania | Republic of Korea | 1,000 | 1,000 |
| Switzerland | - | 5,000 |
| Romania | Moldova | 1,000 | 1,000 |
| Switzerland | - | 28,000 |
| Türkiye  | Republic of Korea | 2 | - |
| Uzbekistan | United States | - | 500 |
| Medicine | Ukraine | Estonia | 15,030 | - |
| Subtotal | 436,262 | 497,422 |
| Not recorded | Live | Azerbaijan | Israel | 3,000 | - |
| Subtotal | 3,000 | 0 |
| **Total** | **439,262** | **497,422** |
| 2021 | Captive-bred | Cosmetics | Russia | Bulgaria | - | 11,898 |
| Estonia | 11,270 | 29,604 |
| Lithuania | - | 81,064 |
| Latvia | 8,371 | 54,843 |
| Moldova | - | 16,196 |
| Romania | - | 6,592 |
| Russia | - | 33,770 |
| Suriname | - | 129,575 |
| Ukraine | - | 27,148 |
| Uzbekistan | - | 1,073 |
| Extract | Russia | Russia | 137,430 | - |
| Live | Azerbaijan | Belarus | - | 17,000 |
| Switzerland | - | 3,500 |
| Germany | 1,000 | 1,000 |
| Israel | - | 19,000 |
| KG | - | 50,000 |
| Kazakhstan | - | 860,000 |
| Russia | - | 155,000 |
| Türkiye  | - | 50,000 |
| Ukraine | - | 10,000 |
| Uzbekistan | 575,000 | 333,000 |
| Lithuania | Switzerland | - | 10,250 |
| United Kingdom | - | 250 |
| Romania | Switzerland | - | 20,000 |
| Medicine | Russia | Latvia | 22,338 | - |
| **Total** | **755,409** | **1,920,763** |
| **Grand total** | **2,032,561** | **3,116,815** |

Source: World Conservation Monitoring Centre (WCMC) CITES Trade Database.

Table 12. Hirudo medicinalis Exported by Weight, 2017–2021

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | Source | Term | Exporter | Importer | Importer reported quantity | Exporter reported quantity |
| 2017 | Captive-bred | Extract | Ukraine | Poland | 16 kg | - |
| **Total** | **16 kg** | **0** |
| 2018 | Wild | Live | Türkiye  | Republic of Korea | 2 kg | - |
| **Total** |  |  |  | **2 kg** | **0** |
| 2019 | Captive-bred | Cosmetics | Russia | Lithuania | 1 kg | - |
| Live | France | Republic of Korea | 2,000 kg | - |
| Lithuania | Republic of Korea | 4,000 kg | - |
| Subtotal |  |  | 6,001 kg | 0 |
| Confiscated/seized | Live | Bulgaria | United States | 2 kg | - |
| Subtotal | 2 kg | 0 |
| **Total** | **6,003 kg** | **0** |
| 2021 | Captive-bred | Live | Uzbekistan | Azerbaijan | - | 13 kg |
| Uzbekistan | United States | - | 15 kg |
| Subtotal |  |  |  | 28 kg |
| Wild | Live | Türkiye  | Republic of Korea | 11 kg | - |
| Subtotal | 11 kg | 0 |
| **Total** | **11 kg** | **28 kg** |
| **Grand total** | **6,0320 kg** | **28 kg** |

Source: World Conservation Monitoring Centre (WCMC) CITES Trade Database. No specimens were reported as traded by weight in 2020.

Table 13. Hirudo medicinalis Exported by Volume, 2017–2021

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Year* | Source | Term | Exporter | Importer | Importer reported quantity | Exporter reported quantity |
| 2017 | Captive-bred | Extract | Russia | Romania | 3,200 ml | - |
| 2019 | Captive-bred | Cosmetics | Russia | Lithuania | 20 ml | - |
| 2020 | Captive-bred | Cosmetics | Russia | Estonia | 4 ml | - |
| Lithuania | 26 ml | - |
| **Total** | **3,250** | **0** |
| 2021 | Captive-bred | Cosmetics | Russia | Estonia | 6 ml | - |
| Lithuania | 175 ml | - |
| **Total** | **181 ml** | **0** |

Source: World Conservation Monitoring Centre (WCMC) CITES Trade Database. No specimens were reported as traded by weight in 2018.

## Non-Detriment finding procedure

### Step 1: Identification

*Hirudo medicinalis* and the closely related *H. verbana* may readily be misidentified as one-another (Elliott & Kutschera, 2011). Siddall et al. (2007) note that in the past, taxonomic descriptions were based on colour pattern variations that were too variable to be reliable for identification to species. Siddall et al. (2007) further reported that, based on mitochondrial sequences and nuclear microsatellites, leeches marketed as *H. medicinalis* are actually *H. verbana*. It is not entirely clear what percentage of the leeches in trade were (or are) misidentified, or whether shipments may contain a mix of species. This would be especially problematic given the large numbers of specimens in trade and especially challenging for leeches traded as extacts and cosmetics. Given that almost all the leeches in trade are apparently captive-bred, this issue may have been resolved and the specimens in trade may be sourced from captive populations with confirmed taxonomy. Nonetheless, CITES Scientific Authorities should be cognisant of the problem and the need to confirm the identification of specimens in trade. This may require representative sampling and DNA analysis.

### Step 2: Evaluation

As discussed previously, almost all the specimens of *H. medicinalis* in legal trade in the years 2017–2021 were captive-bred. Generic guidance for confirming that specimens are truly captive-bred is provided in Resolution Conf. 10.16 (Rev CoP19) and Resolution Conf. 17.7 (Rev CoP19) (CITES, 1997, 2016). Guidance for applying CITES source codes is offered in Lyons, D., et al. (2017) and guidance for inspecting captive breeding facilities is discussed in Lyons, Jenkins, et al. (2017).

Exports of wild-caught specimens comprise a very small percentage of the total number of leeches in trade. But the numbers of wild-caught specimens might not be insignificant from a conservation point of view. For example, the impact of the 2018 import of 2,000 wild-caught *H. medicinalis* reported by Switzerland would depend on the size and health of the population or populations from which the animals were collected. Scientific Authorities should follow steps 2.1.1 through 2.3.7 of this guidance for any proposed trade in wild-caught specimens, along with the relevant generic guidance.

### Step 3: Conclusion

Based on the information presented in the draft *Guidance for undertaking Non-detriment Findings for Terrestrial Invertebrates*, almost all the reported trade in *H. medicinalis* consists of captive-bred animals and would not be detrimental to survival of the species in the wild. This would only apply to specimens that have been correctly and confidently identified to species.

However, the source of the parents should be considered when completing an NDF for trade in the species. If the breeding stock used in commercial leech farms are supplemented with specimens removed from the wild, then the Scientific Authority should consider the impact on wild populations and may find it informative to review Step 2.3 of this guidance.

As noted, exports of wild-caught specimens need to be assessed on a case-by-case basis and the risk the trade poses to wild populations carefully considered.

1. There were considerable differences between the numbers reported by exporting countries vs the numbers reported by importing countries. [↑](#footnote-ref-1)