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Internship Report on the Release and Preparation Processes  
of the Peruvian Spider Monkey (*Ateles chamek*)

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Emma Anouk Viebahn

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## Kawsay biological station

The hosting institution is KAWSAY, a research station located in Madre de Dios, Peru. It was founded in 2017 by Raúl de Bello Santa Cruz, who also serves as its director, while Stephanie Riofrio Guarderas coordinates its operations.

Mr. Bello is primarily committed to conservation and rainforest preservation. Given the continuous loss of rainforest area due to climate change and economic pressures, restoring and conserving these ecosystems plays a crucial role. Ongoing studies conducted at KAWSAY are presented in various South American countries to raise awareness and foster interdisciplinary discourse. The term KAWSAY originates from Quechua, meaning "life in harmony with the universe and humanity."

The station's mission and potential can be derived from this meaning, with a strong emphasis on conservation and the restoration of functional ecosystems. The area, previously affected by illegal hunting and deforestation, is now protected through human presence, deterring poachers. Over the years, KAWSAY has successfully facilitated various research projects, particularly engaging young researchers in long-term studies and collaborations with external scientists. Researchers are introduced to the Amazon ecosystem and seasonal tropical forests, learning research methodologies and developing their own studies.

KAWSAY's in-house research includes for example Camera trap projects at collpas (clay licks) and image analysis, Phenology transects to document changes in vegetation over time. Studies on tree species such as Shihuahuaco (*Dipteryx* sp.) and Lupuna (*Ceiba pentandra*) are also part of Kawsay. When it comes more to Animals there are Mammal transects and the release and monitoring of wild mammals.

Everyone has the possibility to do research for their on study. When I was there here where projects on the abundance of strangler figs (*Ficus* sp.), insect diversity in forests and plantations, and Frogs at night.

In the coming years, KAWSAY aims to expand its infrastructure, investing in equipment to accommodate more researchers from around the world and support additional scientific projects.

## Introduction

Tropical rainforests, such as the Amazon, are among the most biodiverse and ecologically significant ecosystems on Earth. However, they face increasing pressure from wildfires, deforestation, and the expansion of plantation agriculture. These severe interventions not only destroy valuable forest ecosystems but also threaten their function as global carbon sinks and biodiversity hotspots (Köhl, 2023, p.199). In addition to these obvious threats, less apparent factors also influence rainforest stability and regeneration. One such issue is the illegal wildlife trade, particularly involving primates (Norconk, 2019, p.1).

A survey conducted in Peru revealed that approximately 40% of the population reported having kept a wild animal as a pet, with the actual number likely being significantly higher. Reports indicate at least 2,070 documented cases of illegal primate trade in Peru, involving nearly 7,000 animals (Shanee, 2017, p.1). This phenomenon has devastating consequences not only for animal welfare but also for the diversity of local rainforest ecosystems. From a forestry science perspective, the capture and removal of animals from their natural habitat disrupts key ecological processes such as seed dispersal and natural forest regeneration (Whitworth, 2019, p.1).

A lack of awareness among local communities plays a crucial role in this issue. In addition to widespread ignorance regarding the illegality of wildlife ownership, social media exacerbates the problem by popularizing videos of wild animals in human environments. These viral images encourage people to keep wild animals as pets (Raúl Bello, 05.09.24).

To counteract this trend, rehabilitation centers, in collaboration with KAWSAY, work to reintroduce captive wild animals into their natural habitats. However, the complex process of rehabilitation and rewilding requires substantial resources, trained personnel, and effective public outreach.

This internship report explores the significance of *Ateles chamek*, the Peruvian spider monkey, as a keystone species in rainforest dynamics and provides an in-depth look at the complexities of its rewilding process. The report not only examines the challenges and setbacks encountered during rehabilitation but also discusses the broader role of such programs in preserving rainforest ecosystems. From a forestry science perspective, it becomes evident that the protection and restoration of fauna are essential components of sustainable forest management, as flora and fauna are intricately interconnected.

The focus of this report is therefore on the link between wildlife management and forest ecosystems in the protection of tropical rainforests.

## Ecological Importance of *Ateles chamek*

The conservation and restoration of tropical forests are central to forestry science efforts, given their critical role in biodiversity conservation and carbon sequestration (Brasseur, 2023, p.199). A key component of forest ecology is seed dispersal, which is essential for forest regeneration and structural diversity. Spider monkeys (*Ateles* sp.) play a pivotal role in dispersing large-seeded tree species, which are crucial for carbon storage and climate regulation (Whitworth, 2019, p.1).

One particularly remarkable ability of spider monkeys is their capacity to ingest seeds up to four centimeters in diameter and excrete them intact. This endozoochorous seed dispersal ensures that seeds can germinate in distant areas, preserving genetic diversity and spatial heterogeneity within the forest (Xia, 2018, p.3).

In the absence of these primates, tropical rainforests risk becoming increasingly homogenous, which would significantly alter the characteristics of a species-rich primary forest (Whitworth, 2019, p.12).

Spider monkeys are highly adapted to an arboreal lifestyle and move with exceptional efficiency through the upper canopy layers. Their long limbs enable extensive leaps, allowing them to cover home ranges averaging 64 hectares, thereby ensuring the dispersal of seeds over large distances (Takahashi, 2008, p.12).

As ecosystem engineers, spider monkeys influence biotic and abiotic resources, enhancing nutrient availability for other plant species (Whitworth, 2019, p.12). From a forestry science perspective, they are therefore essential for the long-term stability and productivity of tropical forests. However, due to their low reproductive rates and high juvenile mortality, they are particularly vulnerable to disturbances.

Anthropogenic pressures such as hunting and habitat destruction have severe impacts on their populations. Killing females with offspring or capturing juveniles for the pet trade negatively affects reproduction and population dynamics (Shanee, 2009, p.450; Norconk, 2019, p.2).

A decline in spider monkey populations would not only result in the loss of a species but would also have far-reaching consequences for the regeneration and structural integrity of tropical forests. Protecting this keystone species is therefore a fundamental prerequisite for the sustainable management and conservation of tropical tree populations.

## Release Process

In a lecture on the rehabilitation of *Ateles chamek*, Raúl Bello explained a three-stage checklist that must be fulfilled before a group of spider monkeys can be released into the wild. Mr. Bello, who has successfully released numerous groups, emphasized that these criteria are crucial for legitimizing a release both from a scientific and a conservation perspective.

### 1. *Group and Individual Behavior*

A central aspect is the social integration of the monkeys within the group. After a past influenced by human contact, the monkeys must first learn to accept conspecifics as social partners and integrate into a group. This requires a sufficiently long period in the rehabilitation center. The success of rewilding strongly depends on how long the individual has previously been in human care.

Particularly problematic are cases where a monkey joins the rehabilitation program after several years. Such individuals often lack fundamental skills such as climbing, jumping, or swinging, which significantly reduces their chances of survival in the wild (Raúl Bello, 05.09.24).

## *2. Health of the Animals*

The health of the individuals is the top priority. Before release, all monkeys undergo comprehensive health screenings, including tests for diseases such as hepatitis.

A release can only take place if all individuals in a group are confirmed to be healthy and free from transmissible diseases. This process may take months to years, depending on the development of the group and the individual animals (ibid.).

## *3. Approval by Government Authorities*

A final, often lengthy step is obtaining the necessary permits from the Peruvian authorities (ibid.). This bureaucratic process is often described as the "most nerve-racking" part of the entire release preparation.

After the release, ongoing support for the animals is crucial. Mr. Bello emphasized that the group must not simply be left to its own devices. Instead, monitoring is essential to ensure that the monkeys successfully adapt to the new conditions. If issues arise, such as severe injuries, group separations, or unsuccessful adaptation, the group may be recaptured for another release attempt if necessary. Supplementary feeding or minor interventions, such as wound treatment, are also part of post-release care. However, caution is required to minimize human-animal contact and prevent renewed dependence.

An important component of the rehabilitation process is the long-term observation of released monkey groups, even years after release. On several days, we woke up as early as 4:30 am to search for a previously released group and document their behavior. Biologist Stephanie Riofrio trained us to interpret the monkeys' vocalizations and facial expressions and taught us how to imitate their calls to locate them. Over several hours, we observed the group's daily behavior, recorded their interactions, identified their preferred feeding trees, mapped their home range, and noted whether they used latrines.

## **Innovative Approaches in Rewilding**

Monitoring provides critical insights for future releases. Based on the experiences of previous projects, such as those conducted by KAWSAY, the success rate of reintroductions has been steadily improved (Raúl Bello, 05.09.24). While initial attempts failed, a later release achieved a survival rate of 83%, which was considered a significant success. According to studies by KAWSAY, at least 79% of the females must survive the release for a group to be viable in the long term. Additionally, the presence of a male is essential to ensure the group's continued existence (ibid.).

During a lecture, biologist Paula Perico presented an innovative rehabilitation method from Bolivia: monkeys are equipped with safety harnesses, similar to those used in climbing parks, to practice climbing and jumping without risking serious injuries. Although this method may initially seem unusual, it could prove promising and is currently being further developed.

Biologist Anny Pulido from Colombia provided insights into the work of her rehabilitation center. She presented impressive images of primate rehabilitation and work with other

wildlife and explained the preparations required to successfully return these animals to the wild.

From a forestry science perspective, the next successful reintroduction of spider monkeys will not only contribute to species conservation but will also be crucial to the ecology of tropical forests. Their return to the wild supports the natural dynamics of the forest ecosystem and promotes the long-term stability and productivity of tropical forests.

At the same time, rehabilitation provides valuable insights into the adaptability of animal populations, which are essential for wildlife management and the sustainable governance of forests.

These presentations made it strikingly clear how complex yet fascinating the rewilding process is. The connection between wildlife rehabilitation and ecosystem restoration highlights the importance of interdisciplinary approaches in conservation.

## Conclusion and Outlook

My stay in Madre de Dios, Peru, was extremely enriching both professionally and personally. I had the opportunity to gain an in-depth introduction to the complex challenges of conservation and tropical ecology while independently planning, conducting, and completing a research project on agroforestry. Particularly impressive was the interdisciplinary exchange with researchers from around the world, which demonstrated the diversity of approaches and perspectives in rainforest conservation.

These experiences have reinforced my decision to pursue a scientific career with a focus on tropical ecology and agroforestry.

The importance of rewilding the *Ateles chamek* highlighted the immense complexity and the diverse challenges associated with the preservation of tropical ecosystems. Tropical forests are not solely composed of trees but represent a dynamic and highly diverse network of flora, fauna, and abiotic factors.

In this context, spider monkeys contribute to the regeneration and stability of tropical forests. Their reintroduction into their natural environment is therefore not only a contribution to species conservation but also crucial for maintaining the functionality and resilience of rainforest ecosystems.

Despite setbacks in the release of the monkey group, including the loss of individual animals, the collected data and observations provide a valuable foundation for future projects. In forestry research, it is essential to learn from such experiences to continuously improve rewilding strategies through interdisciplinary collaboration and to ensure the regeneration of disturbed forest areas while preventing future damage.

The coming decades will be critical in the fight against climate change, deforestation, and illegal wildlife trade. The role of forestry sciences will be central in this regard, as it not only provides technical solutions for sustainable management but also bridges ecology, economy, and society. My time in Madre de Dios has made it clear to me how crucial it is to connect local communities, scientific research, and political measures to safeguard the future of the tropics.

I see research gaps in compiling and comparing insights from different tropical regions and, despite regional differences, fostering the exchange of innovative methods in wildlife rehabilitation. Making these methods systematically accessible at a global level would significantly enhance the knowledge base on effective wildlife rehabilitation practices and associated conservation measures in a sustainable manner.

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