# Preventive treatments of livestock at livestock-wildlife interface in Wakhan National Park in 2017-2019

By

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*Figure 1 - A local paraveterinarian vaccinates a sheep against peste des petits ruminants (PPR) to control for transmission of this disease from livestock to susceptible wildlife, Wakhan National Park, 2019.*

**خلاصه**

موسسه تحفظ حیات وحش افغانستان برای حمایت و بقای جمعیت با ارزش و حساس از دوناخنه های وحشی بین سالهای ۲۰۱۷ و ۲۰۱۹ کمپاین واکسیناسیون علیه بیماری طاعون نخشوار کننده های کوچک(پی پی آر) و کنترول بیماری گرک(جرب) در پارک ملی واخان راه اندازی نموده. که در نتیجه ۵۷۸۳۵ راس بز و گوسفند واکسن و ۱۴۲۷۱ راس بز و گوسفند تداوی گردید. بعد از واکسیناسیون در تست سیرولوژی تصادفی نشان داد که بیش از 84٪ از گوسفند و بز در واخان آنتی بادی تشخیص ونمایش داده شده است ( سیروکانورژن بعد از واکسناسیون موفق بوده است)، درتقابل تست اولی این عمل کمتر از 10٪ بوده است. درسال ۲۰۱۹ در پارک ملی واخان حیوانات وحشی حساس از سرایت و انتقال بیماری از حیوانات اهلی محفوظ شده اند.

## Summary

To support the survival of valuable populations of susceptible wild mountain ungulates WCS organized vaccination against peste des petits ruminants (PPR) and preventive treatment against sarcoptic mange of 57,835 and 14,271 sheep and goats, respectively, between 2017 and 2019 in Wakhan National Park. A random post-vaccination serological testing revealed that more than 84% of the sheep and goats in Wakhan displayed detectable antibodies against PPR (i.e. sero-conversion after successful vaccination) as opposed to less than 10% prior to the action. In 2019 susceptible wildlife in Wakhan National Park is safeguarded from PPR transmission from local livestock.

## Introduction

*Fondation Segré* supported financially a health project in Wakhan National Park aimed at reducing the risk of transmission of peste des petits ruminants (PPR) virus and the agent of sarcoptic mange from livestock to wildlife during a three-year period. This action would enable susceptible populations of wildlife to recover, safeguarded from these infectious agents. Annually the project intended (R. 1.2.9) to treat preventively at least 2,000 sheep and goats in the Big Pamir (adjacent or within the Marco Polo sheep - *Ovis ammon polii* – distribution range) against sarcoptic mange and vaccinate another 5,000 shoats in the Hindu Kush (center of urial – *Ovis vignei* - distribution) against PPR. In 2019 PPR vaccination also contributed at safeguarding livelihoods linked to rangeland through improved livestock husbandry under a project supported by the European Union. Livestock with their diseases increasingly encroach into wildlife habitats because of climate driven alterations of plant phenology. This action contributes to reduce the risk of ecosystem damage due to the increased risk of transmission of infectious agents from livestock to susceptible wildlife.

## Results

**Level of success of the action -** The project over achieved the proposed objectives by more than 100% for sarcoptic mange prevention and by more than 250% for PPR vaccination (Table 1). In addition, the action extended beyond the proposed two intervention areas to also protect Siberian ibex - *Capra sibirica* - potentially in contact with livestock in other parts of the Wakhan National Park (Fig. 1).

*Table 1- Summary of livestock preventive treatments against sarcoptic mange and peste des petits ruminants (PPR) in Wakhan National Park undertaken by WCS between 2017 and 2019.*

| Transmissible disease | Objectives (shoats) | Achieved (shoats) | Achievement % as per objectives |
|---|---|---|---|
| Sarcoptic mange | 6,000 | 14,271 | +137% |
| PPR | 15,000 | 57,835 | +252% |

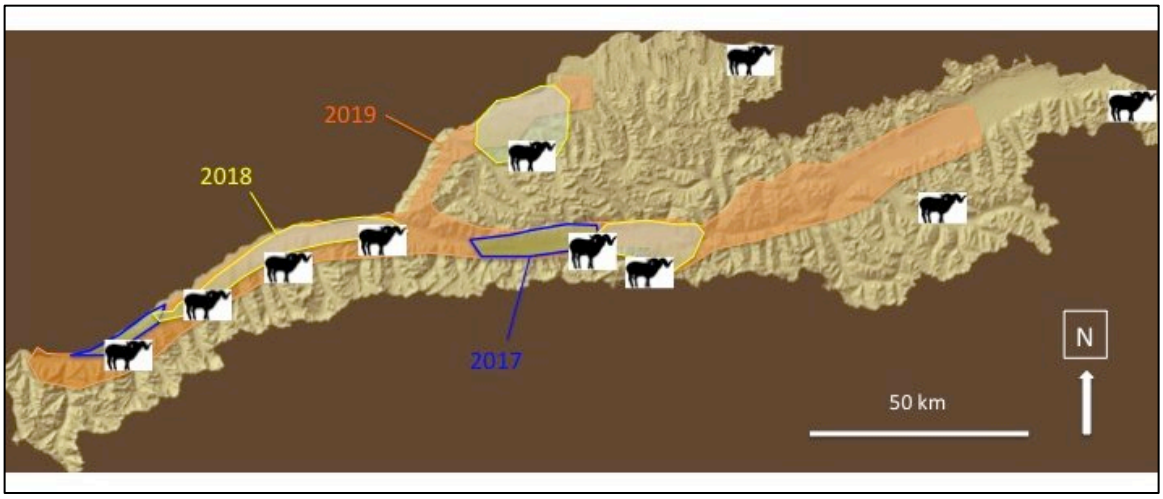


*Figure 2 - Geographical extent of PPR vaccination campaigns of sheep and goats carried out by WCS in 2017-2019. Wild sheep silhouettes symbolize the main wild ungulate populations in the Wakhan National Park, Badakhshan Province, Afghanistan.*

**Detail of the action** - Between 2017 and 2019 87,866 sheep and goats in Wakhan National Park were vaccinated against PPR, WCS implementing 65.8%

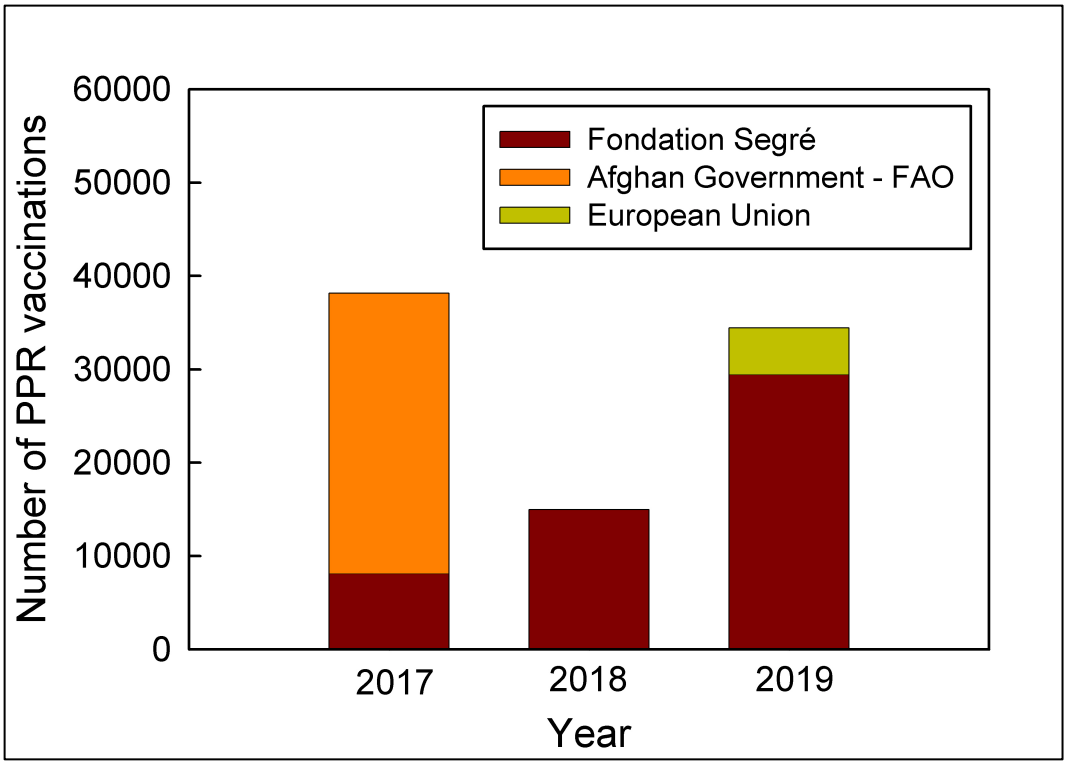


*Figure 3 - Number of PPR vaccinations delivered to sheep and goats in 2017, 2018, and 2019 under various sponsorships, Wakhan National Park, Badakhshan province, Afghanistan.*

of these vaccinations thanks to financial supports from *Fondation Segré* (60.1%) and the EU (5.7%), whereas the government supported 34.2% of vaccinations with FAO support (Fig. 2). All vaccination campaigns involved local paraveterinarians (N=8) trained by the Dutch Committee for Afghanistan under sponsorship of Agha Khan Foundation and WCS. The highest number of vaccinated animals was in Wakhan/Hindu Kush valleys (48,880), followed by Big Pamir (19,986), and Little Pamir (19,000).

The PPR vaccination effort supported by *Fondation Segré* increased almost linearly between 2017 and 2019 (Fig. 2). It also harmonized with other ongoing prophylactic investments. In 2017 the state veterinary authorities undertook a large-scale vaccination campaign in northeast Afghanistan as part of an effort to eradicate the disease, which included 30,031 vaccinations of sheep and goats in Wakhan District, 58.6% of them in Wakhan Valley, 30% in Little Pamir and 11.4% in Big Pamir. Also in 2019 the action benefitted from an investment granted by the EU to vaccinate 5,000 sheep and goats in the area (Fig. 2).

WCS vaccination effort focused in 2017 and 2018 at Wakhan and Hindu Kush

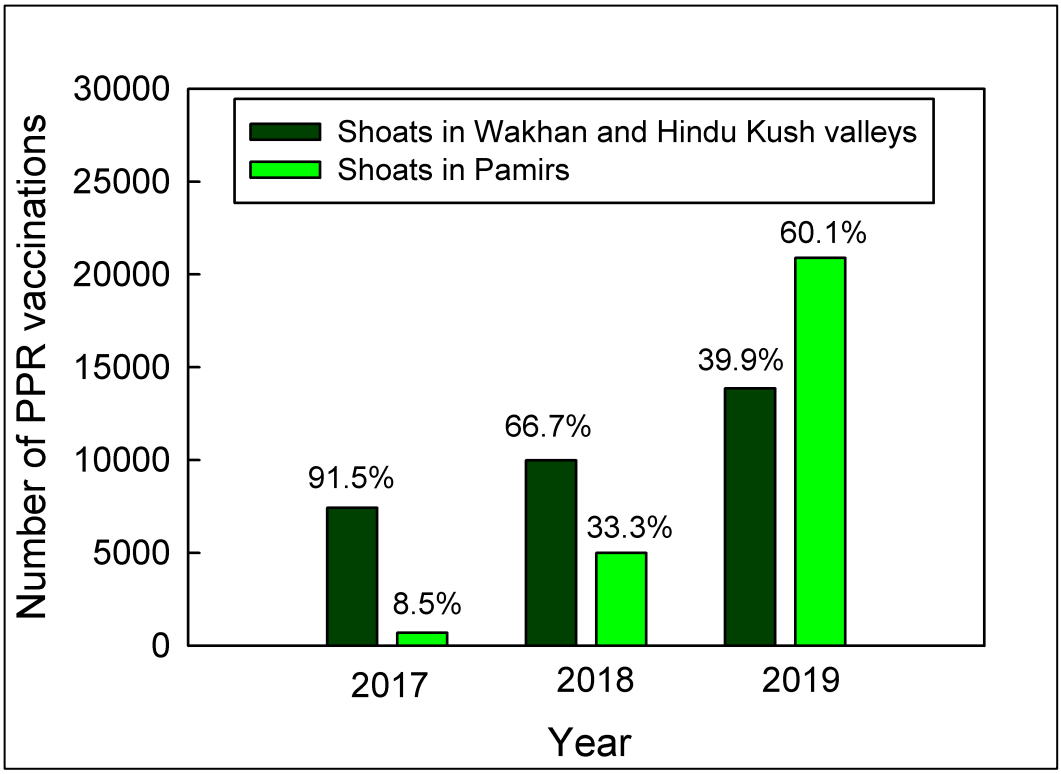


*Figure 4 - Proportion of sheep and goats (=shoats) vaccinated against PPR by WCS in Wakhan and Hindu Kush valleys versus Pamirs between 2017 and 2019, Wakhan National Park.*

valleys, in the areas used sympatrically by livestock and urial sheep (Fig. 2). Although vaccinations in urial habitat were implemented throughout the project, the vaccination investment was progressively increased in Pamirs (Fig. 3), in Marco Polo sheep and Siberian ibex habitats, to become the preponderant area receiving vaccinations in 2019.

The treatment against sarcoptic mange also increased linearly in intensity between 2017, 2018, and 2019, when respectively 2,159, 5,060 and 7,052 sheep and goats received the treatment. The treatment against mange was undertaken in villages of Wakhan Valley on animals grazing Big Pamir in May-October.

**Effectiveness of the PPR vaccination campaigns** – The effectiveness of the PPR vaccination effort was assessed by testing serologically (ELISA, IDVET, France) a random selection of 331 and 357 adult (i.e. >2year) sheep and goats, blood-sampled respectively before (October 2017) and after (October 2019) the vaccination campaigns. The comparison of prevalence of positive shoats showed a very significant increase ($P<0.001$) in October 2019 compared to October 2017 as a result of the vaccination efforts. The average prevalence of positive shoats to

PPR (i.e. vaccinated) was 87.9% (95%CI: 84.2%-90.9%) in October 2019 compared to 6.9% (95%CI: 4.7% - 10.2%) in October 2017 as a result of the combined vaccination efforts from this project and the government campaign carried out in summer 2017.

## Conclusions and steps forward

As of the end of 2019 the sheep and goat population of Wakhan is well vaccinated against PPR and the risk of spillover of PPR to susceptible wildlife appears currently under control. Additional PPR vaccination campaigns in Wakhan are scheduled for 2020—2022, aligned with efforts from the government to eradicate the disease in the country. Because of the unstable situation in Afghanistan and lack of national financial resources the role of WCS to support the efforts to protected wildlife in areas with valuable populations is well understood and approved by the government. WCS will remain in communication with State Veterinary Services to understand progresses in PPR eradication in Afghanistan, and the status of PPR in neighboring areas to Wakhan, in Tajikistan and Pakistan, and adjust the target vaccinations accordingly. Meanwhile WCS aims to develop in collaboration with the State Veterinary Services a continuous diseases surveillance system in domestic animals that have contact with valuable wildlife resources in Wakhan National Park.

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