April 2020

ewcp

Conserving Ethiopian Wolves

Annual Report

Prepared by Jorgelina Marino, Girma Eshete, Eric Bedin, Claudio Sillero-Zubiri and EWCP Team

Contents

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Securing a future for Ethiopian wolves and the Afroalpine ecosystem for everyone and for generations to come

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Our vision is to secure Ethiopian wolf populations and habitats across their present distribution, and to extend the species range, stressing its role as a flagship for the conservation of the Afroalpine ecosystem on which present and future generations of Ethiopians also depend.

Thank you

In early March, as we were wrapping up the dry season, it became clear that the coronavirus outbreak was turning into a rampant pandemic, bringing an unprecedented situation to us all.

Ethiopia has a few thousand confirmed Covid-19 cases at the time of writing. Government directives are in place to minimise the transmission of the virus and protect the population. Fortunately, everyone at EWCP is well in health and mind, and our chief focus right now is our wellbeing and that of our families and friends.

We have adapted our work plans and activities to follow recommendations issued by the Ethiopian government, the University of Oxford, and our sponsors. Our field teams have been able to continue to monitor the wolves and threats, adhering to clear hygiene and social distancing guidelines, but activities involving the community have been put on hold. Others, including myself, are working from home and on hand to provide all necessary logistical work to the field teams.

We want to reach out to you, friends, supporters and partners, that are undergoing equally difficult times, to share our stories in this annual report. We hope you enjoy some of the successes, and enhance your appreciation of the challenges the wolves face.

Our love for the wolves and the people and nature of the Ethiopian highlands will prevail. We will come out stronger at the other end of this impasse, more determined than ever in our efforts to protect wildlife. There is so much to do, so much at stake.

We are thinking of you. Stay safe. And reach out to us with your news and messages, by email, Twitter, Facebook or Instagram.

Prof Claudio Sillero
Founder and Director

HIGHLIGHTS

• Every wolf and every wolf population counts: good news to celebrate from a growing team of EWCP Monitors and Wolf Ambassadors working across Ethiopia; intentional fires in wolf habitat and disease have been a concern this year. Page5

• A population revival in Delanta. A new pack is recolonising these remote mountains. Page 6

• Packs are breeding well in the Bale Mountains in the aftermath of the longest and most widespread outbreak ever recorded. A tragic combination of rabies and distemper spill-overs killed at least 88 wolves this year. Page 7

• The toolbox to prevent wolves dying from disease includes several intervention options. Sophisticated models lend strength to the importance of preventive wolf vaccination. Page 9

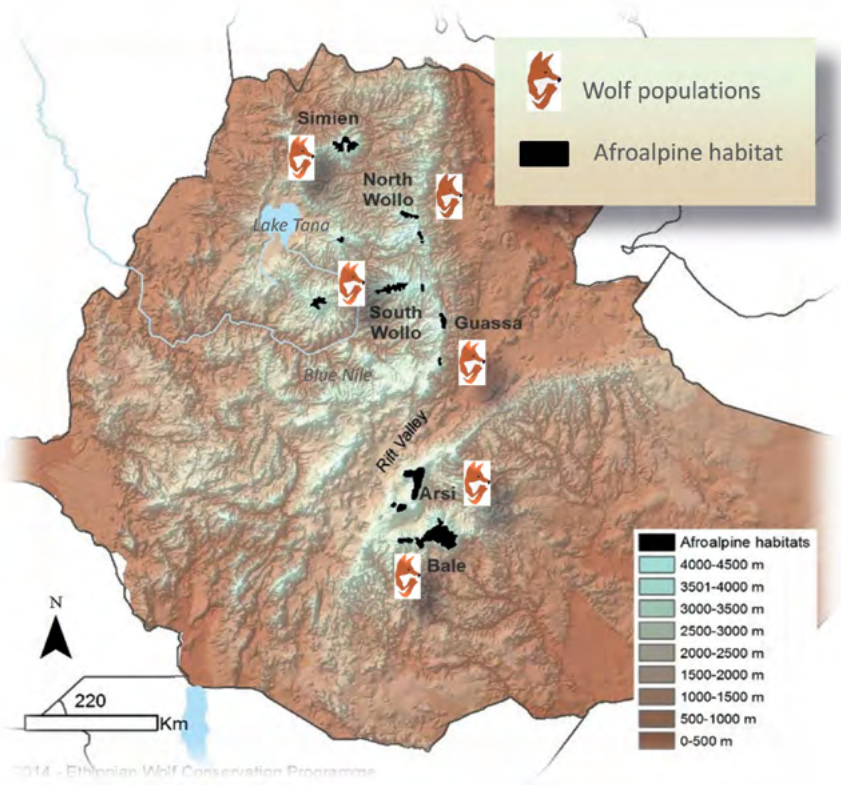
• A newly built field lab in the Bale Mountains will make diagnoses of disease in wolves faster and contribute to build local capacity for disease surveillance. Page 12

• After many years of applications, research and field trials, the oral rabies vaccine is approved for wide distribution and 22 wolf families are now protected. Page 13

• Many good news, and some challenges, from this year's assessment of alternative livelihoods initiatives: Guassa Gardens, Highland Honey and Saving Fuel-Saving Wolves; clear signs that they are indeed sustainable. Page15

• Risk and feasibility assessment of translocating wolves back to the Gaysay Grasslands, in the fringes of the Bale Mountains; tolerant and supportive local communities make us optimistic. Page 17

• Changing is hard. Living With Wolves is our concept for a new project using principles from behavioural and social sciences to address old and emerging threats to the wolves, with benefits for all. Page 18



The Ethiopian Wolf Conservation Programme (EWCP) is a partnership between the University of Oxford's Wildlife Conservation Research Unit (WildCRU) and the Born Free Foundation. EWCP operates under agreements between the WildCRU and the Ethiopian Wildlife Conservation Authority (EWCA), Oromia Forest and Wildlife Enterprise (OFWE) and Amhara's Environment, Forest and Wildlife Protection and Development Authority (EFWPDA), and with the support and cooperation of local authorities across Ethiopia.

MONITORING & RESEARCH

Understanding animal behaviour and what makes populations tick is a cornerstone for the successful conservation of endangered species.

This year:

92 wolf packs monitored; over 3,600 man-days observing wolves across 6 wolf populations in 28 sites; more than 4,000 sightings of wolves or groups of wolves; 190 records of threats (fire, new crops, new settlements, harvesting, livestock predation)

Team:

Monitoring Officers Alo Hussein, Getachew Assefa and Mengistu Birhan, *14 Monitors and 16 Wolf Ambassadors* deployed across Ethiopia; *Research Officer* Dr Girma Eshete

The big picture: wolf news from across their range

The Ethiopian wolf is the rarest canid in the world and the most threatened carnivore in Africa. Since 1987 we have monitored, studied and protected the wolves of the Bale Mountains, over half of the global population. In 2019 Bale wolves suffered the most devastating outbreak ever, but good breeding brings early signs of recovery (see page 7). This event reveals the vulnerability of these animals, and explains why we believe that "every wolf and every population count".

To ensure a more permanent presence everywhere, this year the monitoring teams led by Girma Eshete in the northern highlands increased to a total of 7 Monitors and 11 Wolf Ambassadors. Our short-term objective is to build the capacity of this team and a produce strong baseline knowledge that will allow us to estimate the size of wolf populations, quantify threats, and measure the impact of conservation actions.

In the Simien Mountains the monitors confirmed four packs breeding this year, with a combined total of 10 pups, compared with only 2 last year! Adding to the 20 wolves known to live in this particular area. And the good news does not stop there; the brand-new puppies discovered in Delanta have a very special meaning for conservation, since our last wolf record there dates back to 2017 (see page 6). In total, we have closely monitored 31 packs, with at least 80 wolves, across the five remnant populations in the northern highlands.

The waning of the Delanta population was a sad reminder that habitat loss can cause extinction, as small populations become less resilient to other threats including disease. With over 80% of all Afroalpine habitats now under some form of protection, new encroachment has generally been reduced, with some exceptions.

Another risk to the wolves is fire, and this year there were more fires affecting wolf habitat in the Simien and Arsi Mountains than normal. With a continuous presence in the field, EWCP was able to raise the alert for incipient fires and continue monitoring the affected packs. One den in Simien was unfortunately affected by the fires, but the pups survived and seem to be thriving.

Wolves were reportedly involved in livestock predation, but we are unaware of any retaliatory persecution this year. A wolf carcass found in Menz might be an exception. The wolf tested negative for disease, and raptor carcasses nearby indicated poisoning. In the Arsi Mountains a wolf was run over by a vehicle while crossing a road. After this sad incident EWCP installed road signs warning drivers about wildlife, especially wolves.

Ethiopian wolves face an array of challenges, big and small; some are national, others more localised. Yet, all wolf populations continue to hang on to survival. Work by EWCP and our partners is increasingly able to address these problems with new and old tricks (see "the new vision" page 18).

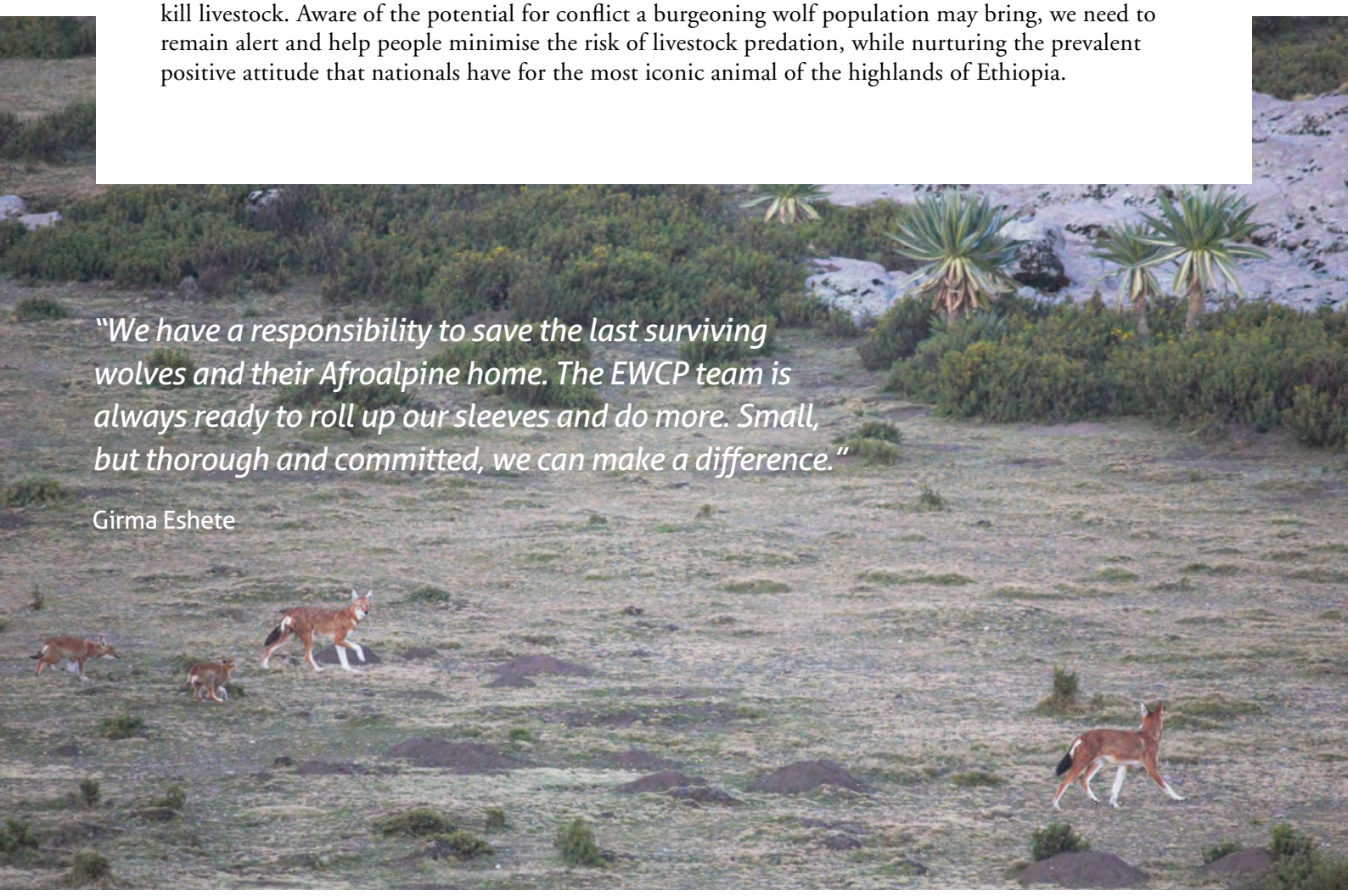
▶ Jorgelina and Girma learning about the local wolf packs in Simien from Wolf Ambassador Melkamu and Monitors Jejaw and Andualem. ©Eric Bedin

"Addis Tesfa", new hope for wolves in Delanta

Addis Tesfa, or New Hope in Amharic, is the name given to a new wolf family recolonising the rolling hills of Delanta in the northern highlands. When in November 2019 the local Wolf Ambassador called us to report sightings of an adult wolf, it had been close to three years since the last wolf had been spotted there. Then, last January, our team discovered a healthy wolf pair with bright black tails, *Atsew* and *Wotetie* (Emperor and Milky), with a litter of six playful puppies. The best news this year!

Delanta's recent history is a sad reminder of the precarious state of small populations, perching on the verge of extinction. In 2016 three packs were living in this small Afroalpine range, *Keywasha*, *Sokolo* and *Kembeh*, when a devastating epizootic wiped them out. EWCP Monitors and Wolf Ambassadors remained alert and eventually concluded the population was extinct. We are uncertain of the origin of the new founders. In time, genetic analyses will reveal the full story.

How best to safeguard the Addis Tesfa wolves? We are keeping a close eye on them and also asked 34 local shepherds and farmers for their views on the return of the wolves to Delanta. Almost everyone remembered the wolves, and some were aware that diseases and habitat loss had caused them to disappear. People recognise the need to protect the wolves in Delanta, because they are beautiful, bring good luck, are endemic or might attract tourists, and many felt happy to see them back. While some believed that people and wolves can coexist, a third also considered the wolves dangerous because they kill livestock. Aware of the potential for conflict a burgeoning wolf population may bring, we need to remain alert and help people minimise the risk of livestock predation, while nurturing the prevalent positive attitude that nationals have for the most iconic animal of the highlands of Ethiopia.



"We have a responsibility to save the last surviving wolves and their Afroalpine home. The EWCP team is always ready to roll up our sleeves and do more. Small, but thorough and committed, we can make a difference."

Girma Eshete

▶ Two playful Addis Tesfa pups enjoying themselves under the careful attention of Atsew and Wotetie. ©Fekadu Lema

Double whammy: concurrent spill-overs devastate wolf population in Bale, but not everything is bad news

After a very successful breeding season last year, the wolf density in the Bale Mountains was at a high. Although intuitively this would seem like a good thing, population peaks like this always leave the team feeling a bit uneasy, waiting for disease to strike and spread through the population. Unfortunately, this year their unease was well founded.

The Bale wolves experienced an unusual, protracted, double-whammy outbreak. It started with Canine Distemper Virus (CDV) racing through the population, but rabies followed soon afterwards. One poor wolf tested positive for both viruses. The outbreaks spread through multiple sub-populations, when usually they are contained within one area – this may have contributed to the large number of deaths. Between March and October 2019, the team found 55 carcasses and observed another 5 wolves with advanced symptoms, across 19 different packs. This protracted chain of deaths was taking a physical and mental toll on the monitoring and veterinary teams, as carcasses can be hard to locate and the post-mortems strenuous. However, if they had not persisted, we might not have discovered the rabies outbreak that followed the initial spread of CDV. Thanks to the huge efforts of the field team, 20 carcasses were sampled (others were too old to diagnose), of which 12 tested positive for CDV and 8 for rabies.

As a response to the outbreaks, the CDV trial vaccination was extended to cover 4 additional packs (with the dual benefits of increasing sampling size for the immune response assessment, and protecting more wolves from disease) and 17 packs were targeted by oral vaccination against rabies.

Disease hit hardest in the three core populations in Bale: namely Web Valley, Sanetti Plateau and Morebawa East. In total, 88 wolves died or disappeared from the 18 focal packs that the monitors attentively observe every year, with local densities dropping by a whopping 60%. We estimate that currently there are 250 wolves (1 year or older) living across the Bale Mountains.

Now that the outbreaks have subsided, we are pleased to report that despite these losses, the affected packs are relatively stable (we know of only one pack collapsing as a result of the outbreak) and seem to be bouncing back. The monitors counted 48 new puppies in the three core areas this year! Several wolves have been encountered outside their usual territories, possibly dispersing after disease impacted the social dynamics in their own packs. Interestingly, both male and female wolves seem to be "pack swapping", a behaviour typically restricted to females. With time, we should be able to tease apart which of these moves are temporary and which more permanent. As a silver lining of these catastrophic few months, the mixing up of genes triggered by social instability will be good news for the Bale population in the long-term.

Web Valley

pack	group size	adult males	adult females	sub-adults	pups
Alando	**4**	2	1	1	
Bowman	**2**	1	1		**3**
Mckenna	**3**	2	1		**4**
Habale	**5**	2	1	2	
Megity	**3**	2	1		**5**
Megity 3	**1**	1			
Tarura	**10**	3	4	3	**4**
Hangafo	**3**	2	1		**4**
Total	*31*				*20*

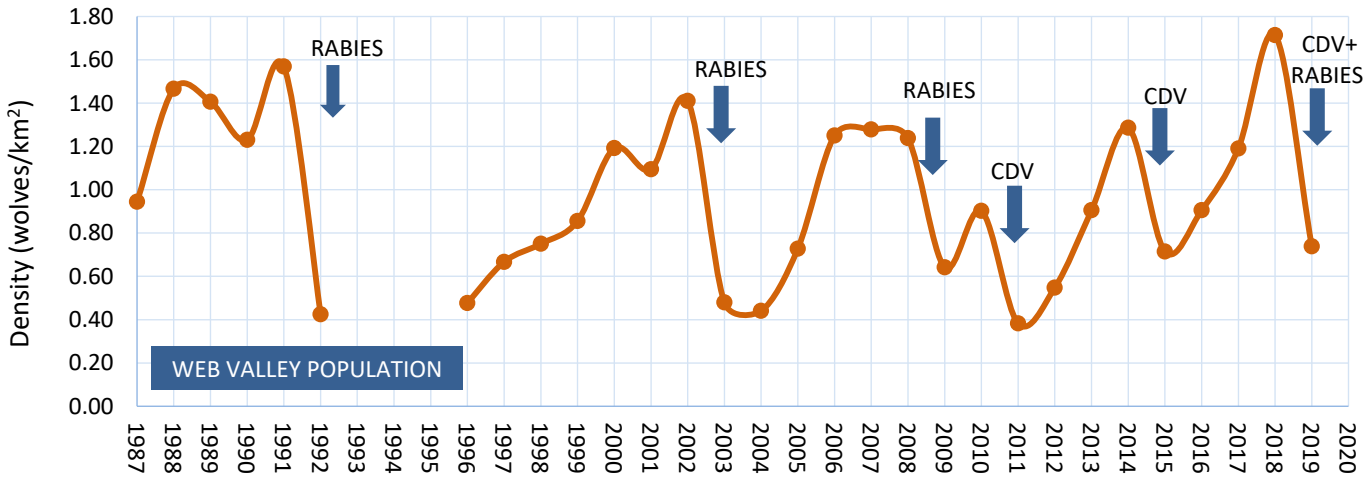
Sanetti Plateau

pack	group size	adult males	adult females	sub-adults	pups
Bagadasa	**3**	1	1	1	**4**
Garba Gurracha	**3**	2	1		**3**
Batu	**3**	2	1		
BBC	**3**	2	1		**3**
BBC2	**3**	1	1	1	
Total	*15*				*10*

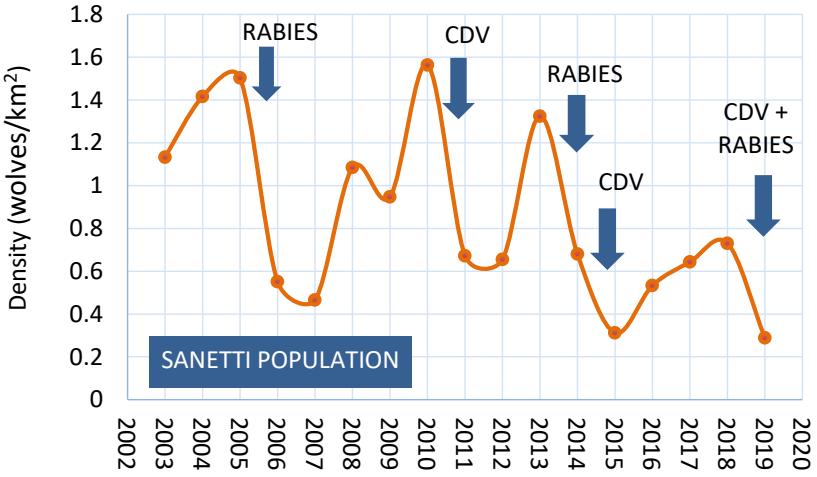
East Morabawa

pack	group size	adult males	adult females	sub-adults	pups
Genale	**3**	1	1	1	**5**
Gata	**2**	1	1		**5**
Osole	**2**	1	1		**4**
Huke	**6**	2	2	2	**2**
Weshema	**4**	2	1	1	**2**
Fulbana	**4**	2	1	1	
Total	*21*				*18*

▶ Throughout the breeding season EWCP Monitors visit our 19 focal packs repeatedly, delivering the exceptional information shown in this table. In turn, these data inform our disease control.



These time series, tracking our focal populations, reveal a marked drop in wolf density from combined outbreaks of distemper and rabies. Back to back outbreaks are taking a toll on the Sanetti packs.



Research Collaborations

Addis Ababa University - *Neospora caninum* and other wolf endoparasites
Animal & Plant Health Agency – GOV.UK - Immune response to CDV vaccine
Ethiopian Public Health Institute - Rabies diagnostics in wolves and dogs
Madawalabu University - Socio ecological conditions for wolf reintroductions
Mekelle University - Large Carnivore Survey of Ethiopia
Oslo University/Addis Ababa University - African wolf ecology and competition
Phillip University Marburg, Germany - Climate monitoring in the Bale Mountains
Rollins College, USA - Measuring cortisol in claws and hair to assess stress in wolves
University of South Bohemia, Czech Republic - Giant molerat physiology and ecology
University of Veterinary Medicine Vienna - Wolf handling from EWCP long-term data
Wondo Genet School of Forestry - Domestic dog and Ethiopian wolf interactions

▶ One of the descendants of Tarura pack founder female, the TAR02, explores the beauty spot around Fincha Habera earlier this year, hoping to start a new pack of her own. ©Eric Bedin

Meet Tarura, a pack with history and a story to tell

Meet the Tarura family. The EWCP Monitors closely follow over 20 packs in the Bale Mountains, but some of them occupy a special place in our hearts. This is the case of Tarura, a pack whose lineage and history in the green plains of the Web Valley we know in intimate detail. In late 2010, there were only three wolf packs left in the Web Valley, survivors of devastating rabies and CDV outbreaks. Tarura, led by a young female, had established territory at the western edge of the valley, delimited to the north by smooth hills and cliffs and to the south by the tumultuous Web River. Because of its location, with easy access from our camp and dramatic landscapes, this pack eventually became the focus of much attention, from researchers trialling vaccines, to filmmakers, and international awareness campaigns.

That young female, now known as TAR02, has persisted as the dominant female for the past ten years, easily recognised by her compact body and a red tag on her right ear, acquired when captured for vaccination. TAR02 survived three more outbreaks and raised litters every year. This December, as an 11 year-old, TAR02 gave birth to a litter of four! Also, one of her sons (TAR07) and her daughter (TAR10) founded a pack of their own, Hangefo, in 2016.

Tarura survived this year's outbreaks, and, with 10 members, is the largest pack in the Web Valley. One of the females was observed exploring the Fincha Habera waterfall, looking for a new territory of her own (photo) to continue a wolf lineage started so many years ago.

ONE HEALTH

Managing diseases, with benefits for people, domestic animals and wildlife

This year:

44 communities reached by disease awareness campaigns in and around the Bale Mountains National Park, where 3,200 dogs were vaccinated (reaching 93% coverage); 17 packs vaccinated against rabies orally, 558 vaccines delivered, 85% consumed; 4 packs vaccinated against CDV; 32 wolves captured in 4 packs to measure immune response.

Team:

Vet Team Leader Muktar Abute and *Vet Team Officer* Haji Usman, *Community Team Leader* Mustafa Dule, *Vet Officers* Kebede Wolde and Abubaker Hussein, *Vet Assistants* Kassim Kedir and Mama Abdi

Integrated disease management: thinking strategically with help from modelling

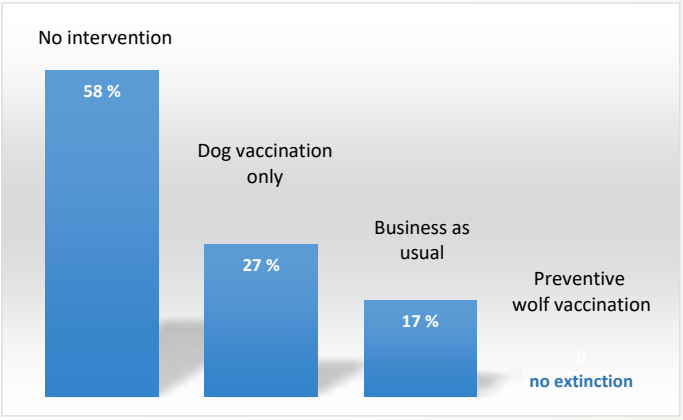
In 2017 a group of key stakeholders gathered to conduct a 5-year progress review of the National Action Plan for Ethiopian wolf conservation. Crucial to this plan is an integrated disease management that EWCP champions, to control the transmission of rabies and canine distemper virus (CDV) from domestic dogs to the wolves. The stakeholders acknowledged major advances in this regard, and promoted, as a top priority, the preventive oral vaccination of wolves, with formal support from relevant bodies, including the Ethiopian Wildlife Conservation Authority.

The plan contemplates various types of intervention, including: a) controlling disease in reservoir dog populations, b) reducing dog-wolf contact, c) vaccinating wolves as a preventative measure and d), as a last resort, emergency vaccination of wolves in response to an epizootic. To help us make strategic decisions, graduate student James Foley used state-of-the art modelling techniques, and EWCP's wealth of empirical data, to simulate all possible management scenarios. This year James completed his doctoral thesis and benefitting from his work, we can assess the impact of vaccination and plan for the future.

Predictive modelling offers a way to answer a key question: What would have happened if we had not intervened? The results are reassuring. If we compare "no intervention" versus current disease management ("business as usual"), the models indicate that the probability of the Bale population going extinct over 30 years drops from 60% to 17%, as a direct result of EWCP's dog vaccination and emergency wolf vaccination. If we minimise contacts between dogs and wolves, this single action can also have a pronounced effect. The potential impact of effective enforcement of current Bale Mountains National Park regulations (i.e. keeping fewer dogs and away from wolf range) is undeniable.

What we have long suspected, that pro-actively vaccinating wolves would be the most effective way to prevent outbreaks is supported by the models. Because no matter how hard we try, attaining and maintaining the required level of dog vaccination coverage around wolf range is virtually impossible. Because this nevertheless reduces rabies incidence in the landscape, with additional health benefits for livestock and humans, dog vaccinations will remain a very important tool in our kit.

A holistic approach, that is also flexible and realistic, is bound to be a better option. As we add preventive oral vaccination of wolves to the mix (see page 13), and start to understand the level of protection that this might provide, these models will keep assisting us to gauge the relative cost-effectiveness of each option and, with our partners, to fine-tune an integrated plan based on the best-informed decisions we can have.



▶ Percentage of times Bale wolf population goes extinct over a 30-year period, out of 100 model runs, under different management scenarios. EWCP's routine dog vaccination and reactive vaccination of wolves ("business as usual") reduced extinction chance in models by around two thirds with respect to "no intervention". Vaccinating dogs only already diminished this risk by half, but preventive vaccination of wolves is the way to go.

More and quicker diagnoses

Timely and efficient diagnoses can save populations of endangered species under threat from infectious diseases. For this reason, disease surveillance is a key part of our approach to save Ethiopian wolves. Detecting infections swiftly will facilitate fast and adequate reactions to outbreaks of rabies or CDV among wolves, and so we should strive for more and quicker diagnoses.

Aware of the need to build in-country capacity, this year EWCP continued training local vets and building disease alert networks across the highlands as part of the One Health project (boosted by a 3-year grant from the IUCN SOS African Wildlife Initiative). As a way to enhance diagnostic capacity, we built a field laboratory in Dinsho, that has just been finished.

The lab is equipped to store vaccines and veterinary products and to perform basic interventions such as post-mortems and will also serve as a clinic to treat injured wolves and other wildlife. Conveniently located next to the Bale Mountains National Park HQ, the facilities will function as a training centre and contribute to better integration among partners and stakeholders in the Bale region. We are grateful to our colleagues at Ensessa Kotteh wildlife rescue animal centre (thanks Bereket!) outside Addis Ababa for assistance customising the lab out of a shipping container.

Looking ahead, we have purchased rabies and CDV field-testing kits that can potentially revolutionise the way we diagnose these diseases. Our aim is to reduce the gap between the time a wolf carcass is detected and a diagnosis is made by half, from our current baseline of four weeks, having all samples collected in Bale preliminary tested in the field lab, and subsequently double checked by diagnosis in the EPHI labs in Addis Ababa and APHA in the UK.

▶ Our new field lab-wildlife clinic, customized out of a shipping container, is gently placed on a concrete platform, power, water and sewage connected and a roof built. ©Eric Bedin

Monitoring and veterinary staff set up camera traps next to baits delivered in the territory of Habele pack, Web Valley.

Oral rabies vaccination is here to stay

Over 20 years ago we dreamed of an oral vaccine to protect Ethiopian wolves from the devastating death caused by rabies. Oral vaccines had already been used successfully to control and eradicate diseases in wildlife in many other countries, but this was going to be a first for Ethiopia and for such an endangered species. Not surprisingly, the wildlife authorities reacted with caution, but trusted EWCP to go ahead with a trial.

From experiments on bait preferences, to testing delivery methods and measuring antibody responses, this has been a long but successful process. By mid-2018 we were ready to kick-start a nation-wide deployment of rabies oral vaccines. Over the past year, amidst the most serious outbreak ever among wolves in Bale, we made substantial progress, vaccinating 17 more packs, to make a total of 22 protected families in the Bale Mountains so far. Next, the vaccination campaigns will move to the neighbouring Arsi Mountains.

In the process, we fine-tuned a vaccine delivery method that aims at protecting as many wolves as possible within a given pack, while also checking that the target species is consuming the baits. We target one pack with baits at a time, over two days. Within the pack territory, baits are set in 20 sites with a camera trap next to each. These are deployed in late afternoon and checked the following day, when any missing bait is replaced.

Today we can say that the hard work is paying off, as the results are encouraging. We are documenting high bait uptake and from camera trap photos confirmed that wolves consume the vast majority of baits. The cameras also bring nice surprises, with portraits of elusive birds and mammals, such as the superb wild cat and, unexpectedly at these high altitudes, honey badgers.

The vet and monitoring teams worked tirelessly to capture as many wolves as possible from five of the vaccinated packs, to monitor antibody levels. Preliminary results confirmed seroconversion in some animals and indicated that over half of the wolves sampled had some immune response. A superb result!

Click to Watch video

BIODIVERSITY FRIENDLY FUTURES

Building a future where wolves and people in the Afroalpine highlands coexist

Team:
Team Leaders Dr Girma Eshete, Umer Ibrahim and Fekadu Lema; *Community officers* Mengistu Birhan and Ashebir Ambessa

This year:
165 households benefitted financially from alternative livelihoods and reduced pressure on natural resources; "Highland Honey": 74 honey producers sold 1,600kg for over $10,000; "Guassa Gardens": 71 households harvested 478 grass bundles and sold 325 for $3,300; "Saving Fuel, Saving Wolves": 20 women in 4 cooperatives produced and sold 891 fuel-saving stoves earning $5,100; Community-based management: 41 *kebeles* continued managing grasslands within a national park.

Biodiversity Friendly Futures: Are our alternative livelihoods initiatives working?

Creating a Biodiversity Friendly Future for people and wolves in the highlands of Ethiopia is the motto of this project, which addresses the loss and deterioration of Afroalpine ecosystems. Ethiopian wolves evolved in this unique habitat, and cannot survive without it. Environmental degradation compromises highland sources of pasture, water, firewood, building materials and medicinal plants, affecting local communities. Working with these communities, the project sponsors sustainable livelihoods and communal approaches to natural resource management to build a future where wolves and people coexist.
We started by piloting alternative livelihoods in 2014 with support from the Critical Ecosystem Partnership, and replicated the most successful models with another three-year grant by Fondation Segré. Today we are delighted to announce new funding from the IUCN SOS African Wildlife Initiative to scale this project up. In preparation, we devoted last year to supervising and assessing the ongoing livelihood initiatives, so that we learn from our mistakes and successes. Increasing or stable prices, sustained demand for products, and positive environmental impacts or behavioural change, are all signs that these alternative livelihoods are indeed sustainable. Our three main initiatives are summarised below.

▶ Ato Mesay, a honey producer in Ajibar (South Wollo), jumped at the opportunity to transfer his colonies to the modern beehives provided by EWCP. ©Fekadu Lema

• "Highland Honey" - The cooperatives of honey producers in the Arsi Mountains have been a great success, with steadily increasing harvests that can both supplement household consumption and bring substantial revenues, due to a strong local market (see box page 14). The beneficiaries of this initiative have self-organised to patrol the Erica forests and moorlands (the main sources of flowers for bees, and an integral part of the Ethiopian wolf habitat) daily and regularly join park scouts patrols. After widespread manmade fires in Erica vegetation in the Arsi Mountains, this initiative has potential to achieve a significant conservation impact. We have nevertheless identified issues affecting honey producers in other project sites that need our attention, including spells of cold weather leading to mortality in bee colonies and lower honey prices.

▶ Women cooperative demonstrating their stoves in a local market

• **"Saving Fuel, Saving Wolves"**- This initiative trains and equips local women who form cooperatives to produce and commercialise fuel-saving stoves in highland markets. In addition to the direct financial benefit (see box page 14), the cascading environmental and socioeconomic effects are potentially huge. Over the years, 2,400 households have acquired fuel-saving stoves in the project sites. They have seen their demand for firewood halved, freeing precious time for women to spend on activities other than collecting firewood in the mountains, and additional health benefits from reduced smoke emissions. Some cooperatives, however, faced problems this year, from shortages of key building materials, to depleted markets in areas where large NGOs started to distribute stoves freely or at highly subsidized prices; we are working to find solutions.

"Working with the community and improving their awareness is a timely and much needed remedy to save the wolves in Abune Yosef from local extinction" Dessiew Gelaw

• **"Guassa gardens"**- The native *Festuca* grass known as guassa is highly appreciated for its qualities for weaving, rope-making, as thatching material, and as fodder, and thus has a strong local market. The local farmers that have been growing guassa around their households and in small plots next to the wolf range, had to wait two years or more for the first harvest, but their efforts are paying off (see box page 14). We consulted 54 of them in the Delanta range to learn what this initiative means for them and for the wolves. People reported good harvests that significantly supplement their household incomes, and most of them (90%) believe that the guassa gardens are also good habitat for wildlife, protect against soil erosion, provide additional fodder for their livestock and material for thatching. All of them believed that their guassa gardens had a high or very high impact on reducing wild harvest in Afroalpine areas and many want to expand the plantations.

We are looking forward to continuing and improving this work, inspired by the 2019 IPBES Global Assessment Report on Biodiversity & Ecosystem Services, revealing that trends in habitat loss and deterioration have been less severe, or avoided in areas held or managed by indigenous peoples and local communities.

CONSERVATION TRANSLOCATIONS

Assisting movement of wolves to boost declining populations and recreate old ones

▶ Jorgelina, MSc student Shimelis and Community Officer Mustafa, assess the quality of habitats for wolves in the Gaysay Grasslands, as part of a reintroduction risk assessment. ©Eric Bedin

On their mountaintops, the last wolf populations are, at their own peril, disconnected from each other. Assisting the movement of wolves, to replicate the natural dispersal that once kept them interlinked will help build the resilience of these populations. This is the goal of EWCP's 'Conservation Translocations', a project started this year assessing the feasibility and risks of bringing the wolves back to Gaysay on the fringes of Bale Mountains National Park. This small heaven of grasslands and Artemisia heaths, where majestic mountain nyalas reign, was inhabited by wolves up until 2010.

Shimelis Wondimu, MSc student at Madawabalu University and the EWCP team conducted ecological and socioeconomic surveys in Gaysay. Talking to local farmers (168 households interviewed) we learnt that everyone knew the wolves and threats they faced. While 20% acknowledged wolves would prey on livestock, most expressed overwhelmingly positive views about the possibility of the wolves returning. Crucially, the communities did not see wolf reintroduction as a potential conflict over livestock predation or access to resources. They valued the park for providing environmental protection, such as clean water, but perceived access to its grazing lands as its main benefit.

This raises the possibility that a newly introduced wolves might collide with current land uses. Such concern was also raised by the park staff and conservation organisations consulted, which were otherwise largely supportive of the idea. Interestingly, the communities believed that it was their responsibility to protect the wolves if they came back, revealing a sense of pride and willingness to engage, but also possibly a lack of trust for the authorities. Only a minority considered tourism revenues important, whilst most professionals thought that the wolves would add recreational value to Gaysay, being conveniently located at the park gates and accessible from the main road.

This level of tolerance and interest give us hope for a return of wolves to Gaysay, with results of concomitant habitat surveys also indicating suitable ecological conditions. All challenging journeys start with a small step, and the one we have just taken fills us with optimism.

A VISION FOR THE FUTURE

Strategy for change: Living with Wolves

Our brains do not like change very much. When it comes to changing our own behaviour for the good of the environment, we are all too aware of how challenging this can be. Not surprisingly, behavioural change and social marketing are tools that conservationists are increasingly using to instil change. During a recent strategic planning exercise, their relevance to EWCP became apparent, inspiring our concept for the Living with Wolves project.

As the lives of people and wolves become more closely intertwined, conflicts are emerging that were not addressed efficiently by our more traditional awareness and education campaigns. For example, shepherds (typically children) repeatedly chase wolves away and in doing so interfere with their time-consuming foraging, as well as access to shelter and breeding sites; shepherds block dens with stones, tourists get increasingly close to denning sites to see pups and, occasionally, wolves are poisoned, run over, or hunted for their skins (a rare but potentially serious threat). Other forms of disturbance also arise from competition with, and disease transmission by, domestic dogs, due to poor dog husbandry and health care; open rubbish bins in tourist areas attract these animals, creating hotspots for disease transmission and aggressive interactions.

A common thread across these issues is the need to change specific behaviours in specific groups of people, to ensure that wolves survive and breed the best they can. With this goal in mind, we will develop behaviour-centred approaches supported by experts and tools from behavioural and social science. We will listen, to understand the motivations and barriers to behaviour change in the target groups, and then design approaches to promote the desired behaviour.

We are looking forward to starting this new journey. A year from now, we hope to have good stories to tell from some of the planned campaigns, such as *Wolf Friendly Tourism, Shepherd Wolf Guardians, Happy Dogs-Happy Wolves* and *Keeping Livestock Safe*.

▶ Children interact with the wolves more frequently than most, as they spend long hours in the mountains guarding the family's herd

ewcp NEWS & OUTPUTS

Afroalpine protection expanded

Opening celebration of the newly extended Borena-Sayint Worehimeno National Park, in Mekane Selam. During the opening remarks Ato Kumara Wakjira, General Director of the Ethiopian Wildlife Conservation Authority, and Dr Belayneh Ayele, General Director of Amhara's Environment, Forest and Wildlife Protection and Development Authority, acknowledged EWCP's efforts to include more wolf habitat into the protected area, while respecting local bylaws with positive impacts on Afroalpine conservation.

Joining forces to expand community conservation area

With the support of Rainforest Trust and Wildlife Conservation Network, we are working with the Afromontane Biodiversity Conservation in Ethiopia (ABCE), a new NGO established by our colleague and friend Dr Anagaw Atickem, to incorporate neighbouring Anaz into The Menz-Guassa Community Conservation Area. ABCE and EWCP are committed to conserving the Afroalpine ecosystem and its species whilst improving the welfare and livelihoods of its people.

One Health partners

EWCP participates in One Health partners' meetings as a non-voting member. Last November Girma Eshete and Eric Bedin attended a workshop in Addis Ababa to validate a 5-year zoonosis management plan. On that occasion EWCP stressed the important role of wildlife and environmental protection in mitigating the risks of zoonosis.

Walking with wolves 40,000 years ago

An exciting discovery was recently made in the Bale Mountains, home to the largest Ethiopian wolf population. Researchers visited the Fincha Habera rock shelter at the edge of the Web Valley, and found evidence of human occupation dating as far back as 47,000 years ago! This makes it the world's oldest occupation of a residential site at high elevation. It seems that just like the wolves, Bale's early occupants relied heavily on endemic giant mole rats as a food source – a fascinating glimpse into the past of Ethiopia's mountains.

Empowering our database

Dr Beth Preston has joined us at Oxford. After working for the Banded Mongoose Research Project in Uganda Beth recently completed her PhD at Exeter University. She will be managing and studying our long-term sets of demographic and behavioural data. We are delighted to count on her support for the wolves!

Partnering with Swarovski Optik

The best binoculars in the world to spot the rarest canids! During a visit to their factory in Absam, Austria, we learnt how these amazing optics are manufactured and agreed the lease of their amazing binoculars for our Monitors.

ewcp NEWS & OUTPUTS

EWCP meets UK Secretary State

During a visit to Born Free Ensessa Kotteh rescue centre Fekadu Lema met Alok Sharma, UK Secretary of State for International Development and explained EWCP's mission to protect Ethiopian wolves while promoting the livelihoods of those sharing the land with wildlife.

New road signs go up

Ethiopia is developing rapidly, with an ambitious road building plan across the country to link even the smallest settlements. Many new roads are crossing Afroalpine habitat, opening access to wolf habitat and increasing threats to their survival. EWCP is tackling an increase in road kills and bush fires by installing road signs in Bale, Arsi and Borena national parks.

Wildlife Partners Coordination

The Ethiopian Wildlife Conservation Authority holds quarterly meetings with all conservation partners working in the country to share news and to better coordinate their actions. Whenever their working plans allows, Girma Eshete and Eric Bedin participate in this useful forum.

Badger surprise While distributing oral rabies vaccine to the wolves, we were surprised by several nocturnal visitors showing an interest on the baits at 3,500m of altitude, including zorilla, wild cat, and caracal. Honey badgers are rarely seen in Afroalpine areas; the previous record is held by badgers observed by Claudio in 1989 on the Sanetti Plateau at 4,050m!

New horses

On the recommendation of Vet Officer Muktar Abute three EWCP horses merited retirement and joined the 'retiree' herd. So this year we acquired four new horses to support the work of the vet team. Our hardy horses are essential for the work our teams carry out in rugged terrain and extreme weather. They are valued and well looked after by the team.

Austrian vet lends a hand

Clara Buxbaum, a veterinary student from Vienna, joined the EWCP vet team in March 2020 to assist with canine distemper vaccine trials. She met with Muktar, Eric and the team and spent a week in the Bale Mountains recapturing vaccinated wolves and collecting samples. Clara described the team as extremely welcoming, with their care for the wolves evident in their work, and said she would love to return to Bale in the future.

Popular articles & news

The Guardian, Oct 2019. Last wolves in Africa: the fragile wildlife of Ethiopia's ravaged parks.

Swarovski Optik Blog, March 2020. Roaming the roof of Africa: the Ethiopian wolf.

WCN blog, March 2020. Recovering grasslands, recovering wolves.

Born Free blog. Conservation Update: Ethiopian Wolf Conservation Programme.

Scientific Publications

Foley CJ and Sillero Zubiri C. 2020. Open-source, low-cost modular GPS collars for monitoring and tracking wildlife. *Methods Ecology and Evolution* 11: 553– 558. doi.org

Gutema TM, Atickem A, Tsegaye D, Bekele A, Sillero-Zubiri C, Marino J, Kasso M, Venkataraman VV, Fashing PJ and Stenseth NC. 2019. Foraging ecology of African wolves (*Canis lupaster*) and its implications for the conservation of Ethiopian wolves (*Canis simensis*). *Royal Society of Open Science*. doi.org

Hrouzková E, Bernasová E and Šklíba J. 2020. Eavesdropping on a heterospecific alarm call in the giant root-rat (*Tachyorytes macrocephalus*), an important prey of the Ethiopian wolf (*Canis simensis*). J of Ethology 38: 121–124. doi.org

Macdonald DW, Campbell LAD, Kamler JF, Marino J, Werhahn G and Sillero-Zubiri C. 2019. Monogamy: Cause, consequence, or corollary of success in wild canids? *Frontiers in Ecology and Evolution* 7:341. doi.org

Ossendorf, G et al. 2019. Middle Stone Age foragers resided in high elevations of the glaciated Bale Mountains, Ethiopia. *Science* 365: 583-587. doi.org

Šklíba J, Vlasatá T, Lövy M, Hrouzková E, Meheretu Y, Sillero Zubiri C and Šumbera R. 2020. The giant that makes do with little: small and easy to leave home ranges found in the giant root rat. *Journal of Zoology*, 310: 64-70. doi.org

Estifanos TK, Polyakov M, Pandit R, Hailu A and Burton M. 2020. Managing conflicts between local land use and the protection of the Ethiopian wolf: Residents' preferences for conservation program design features. *Ecological Economics* 169. doi.org

Estifanos T, Polyakov M, Pandit R, Hailu A and Burton, M. 2019. What are tourists willing to pay for securing the survival of a flagship species? The case of protection of the Ethiopian wolf. *Tourism Economics* doi.org

Theses

Derbe Deksios. 2019. Abundance of rodents under different land management system in Simien Mountains National Park, North Ethiopia. MSc Thesis, Addis Ababa University, Ethiopia.

Girma Ayalew. 2019. Surveillance for *Neospora caninum* and other endoparasites of Ethiopian wolf (*Canis simensis*) and domestic dogs (*Canis lupus familiaris*) in the Bale Mountains National Park, Ethiopia. MSc Thesis, Addis Ababa University, Ethiopia.

James Foley. 2020. Integrating individual behaviour into simulations of disease management in Ethiopian wolves. DPhil thesis. University of Oxford, UK.

Shimelis Wondimu. 2020. Assessment of habitat suitability, social and institutional consideration for a reintroduction of Ethiopian wolves in Gaysay Grasslands, Bale Mountains National Park. MSc in Range Ecology and Biodiversity, Madawalabu University, Robe, Ethiopia.

Tsyon Gizaw, 2019. Interaction between free-ranging domestic dogs and Ethiopian wolves in the Bale Mountains National Park. PG Diploma in International Wildlife Conservation Practice, University of Oxford, UK.

Pathways conference

In February, our Monitoring Officer Mengistu Birhan had the opportunity to meet other conservationists and develop his skills during a Pathways Africa conference in Limuru, Kenya. He was supported by a WCN scholarship. Mengistu learnt about the issues and successes experienced by other projects, and expanded his network while having fun.

Conferences

Birhan M, Marino J, Lema F, Tesfaye A and Eshete G. February 2020. Afroalpine gold: Festuca grasses drive grass-root Conservation. Pathways Kenya 2020 Conference, Limuru, Kenya.

Foley J, Marino J, Abute M, Bedin E, Sillero-Zubiri C. February 2019. Disease management in Ethiopian wolves, from camp to computer to conservation – Student Conference for Conservation Science, Cambridge, UK.

Foley J. Marino J, Bedin E, Abute M, Sillero-Zubiri C. July 2019. Domestic dogs as a vector of disease to the Ethiopian wolf. Modelling informs management – 29th International Congress for Conservation Biology, Kuala Lumpur, Malaysia.

Foley J. Marino J, Bedin E, Abute M, Sillero-Zubiri C. October 2019. Disease management in the Ethiopian wolf, Africa's most endangered carnivore – 17th Annual Ecology and Evolution of Infectious Diseases Conference, Princeton, USA.

Marino J, Abute M, Foley J, Perry L, Gizaw T and Sillero-Zubiri C. July 2019. A tale of wolves and dogs: Cultural & ecological dimensions of Ethiopian wolf-dog conflict. 29th International Congress for Conservation Biology, Kuala Lumpur, Malaysia.

Sillero-Zubiri C, Marino J, Bauer H, Ebu E, Bedin E. February 2020. Managing disease in Ethiopian wolves, Africa's most threatened carnivore. Presentation at the IUCN-SOS side event at the 13th Conference of Parties to the Convention on Migratory Species (CMP-CoP13), Gandhinagar, India.

Reports

Bedin E, Ebu E, Abute M, Hussein A, Marino J and Sillero-Zubiri C. 2019. CDV outbreak in Ethiopian wolves in Bale Mountains National Park: Current situation and proposed actions. EWCP report to Ethiopian Wildlife Conservation Authority.

EWCP. 2019. Safety and efficacy of a Canine Distemper Virus vaccine in Ethiopian wolves. EWCP report.

EWCP. 2019. Livelihood protocols: Guassa Gardens, honey producers and fuel-saving stove cooperatives. EWCP report.

Marino J, Eshete G. 2019. Natural resource management systems in Borena Sayint Worehimeno National Park. EWCP report.

Zebene W, Eshete G and Marino J. 2019. Assessment of Borena Saynt Worehimenu National Park tourism potential. EWCP Report.

Meetings

Fekadu Lema. May 2019. Workshop organised by GIZ on small-scale hydroelectric power energy to improve livelihoods. Dessie, South Wollo, Ethiopia.

Fekadu Lema. August 2019. Stakeholder meeting and visit at Born Free "Ensessa Kotteh" with UK Ministry of International Development and Ambassador organised by DFID. Holeta, Ethiopia.

Fekadu Lema and Abebaw Abiye. October 2019. Final validation workshop on BSWNP GMP. Mekane Selam, South Wollo, Ethiopia.

Getachew Asefa. June 2019. Stakeholder engagement workshop on SMNP GMP organised by AWF. Debark, North Gondar, Ethiopia.

Getachew Asefa. February 2020. Practical training on fire ecology, management and protection organised by UNESCO. SMNP, North Gondar, Ethiopia.

Girma Eshete. May 2019. GIZ final workshop by ECO-consulting Company on ecological monitoring system for EWCA. EWCA meeting hall, Addis Ababa, Ethiopia.

Girma Eshete. August 2019. Final Stakeholder consultation meeting on BSWNP GMP to decide validation workshop organised by GIZ. Jakaranda Hotel, Bahir Dar, Ethiopia.

Girma Eshete. September 2019. EWCA annual wardens meeting. Oromia Region, Yabello, Ethiopia.

Girma Eshete and Eric Bedin. September 2019. Zoonotic Disease prioritisation workshop, organised by National One Health steering committee and CDC. Addis Ababa, Ethiopia.

Ethiopians at Oxford University

Supported by EWCP Tsyon Asfaw graduated last year from Oxford's Postgraduate Diploma in International Conservation Practice. Fikirte Erda (2010), Girma Eshete (2012) and Gebeyehu Kassa (2016) are also among the 100 international alumni of this prestigious course run by WildCRU. Congratulations Tsyon!

THANK YOU

EWCP is deeply grateful for the support it has received over the programme's life time. We are thankful for every gift, since each contributes to the future of the Ethiopian wolf.

Here we list our major donors since the Programme began:

Lifetime donations - Founder's Circle: $100,000 and above

The Born Free Foundation
Wildlife Conservation Network
IUCN Save Our Species
The Tapeats Fund
CGMK Foundation
Fondation Segré
Horne Family Charitable Trust
African Wildlife Foundation
The Critical Ecosystem Partnership Fund

Lifetime donations - Directors' Circle: $50,000 - $100,000

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UK Wolf Conservation Trust
US Fish & Wildlife Service

Lifetime donations - Conservation Visionaries - $20,000 - $49,999

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Donations 2017-2020

The following individuals and organizations contributed financially to the mission of EWCP in the last three years to 31st March 2020:

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Benefactors

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Bill Unger
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Wolf Watchers

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Other donors that have given generously in the past include:

Akiko Yamazaki and Jerry Yang, BBC Wildlife Conservation Fund, Bern Thies Foundation, Bosack & Kruger Foundation, CEPA - Conservation des Espèces et des Populations Animales, Conservation International, Environmental Systems Research (ESRI), Ethiopian Wildlife & Natural History Society, Giant Steps Foundation, IBREAM, IDEA WILD, IFMP-GTZ project in Adaba-Dodola, International Fund for Animal Welfare, J.R.S. Biodiversity Foundation, John Aspinall Foundation, Journeys by Design, Kuoni Travel, The Lawrence Bowman Family Foundation, Mohamed Bin Zayed Species Conservation Fund, Morris Animal Foundation, National Geographic Film & Television, The Oppenheimers, Richard Arthur, Rock & Blues, Stiftung Artenschutz, Stephen Gold, Taiwan Council of Agriculture and Forest Bureau, The Wellcome Trust, Wildlife Conservation Society, World Society for the Protection of Animals, Zoologische Gesellschaft für Arten-und Population, Zoological Society London, Zynga.

The EWCP Team

Claudio Sillero, Founder & Executive Director, UK
Jorgelina Marino, Science Director, UK
Eric Bedin, Field Director, Bale
Girma Eshete, Amhara Coordinator

Operations
Edriss Ebu, Manager South, Bale
Fekadu Lema, Manager Amhara, Bahir Dar
Beth Preston, Research Assistant, UK
Fikre Getachew, Administration Assistant, Bale
Tagele Whieb, Logistics, Bahir Dar

Vet Team
Muktar Abute, Vet Team Leader
Mustafa Dule, Community Team Leader
Haji Usman, Vet Officer, Bale
Kebede Wolde, Vet Officer, Bale
Abubaker Hussein, Vet Officer, Bale
Kassim Kedir, Vet Assistant, Bale
Mama Abdi, Vet Assistant, Bale

Monitoring Team
Alo Hussein, Monitoring Team Leader
Abdi Samune, Monitor
Antennah Girma, Monitor
Hamza Mama, Monitor
Ibrahim Muhammed, Monitor
Seid Naasiroo, Monitor
Sultan Kedir, Monitor
Sultan Washo, Monitor

Arsi Team
Umer Ibrahim, Arsi Team Leader
Ashebir Ambessa, Monitor
Fayisa Gudata, Monitor

Amhara Team
Getachew Assefa, Simien Team Leader
Mengistu Birhan, Monitoring Officer, Wollo/Shoa
Andualem Ambachew, Monitor, Simien
Jejaw Mequanenent, Monitor, Simien
Dessiew Gelaw, Monitor, North Wollo
Abebaw Abiye, Monitor, South Wollo
Talageta Wolde-Selassie, Monitor, Guassa-Menz

Bale Team
Wegayehu Worku, Museum & House Keeper
Kamer Tura, Research Building Guard
Nuru Burka, Research Building Guard
Foziya Djemal, Guard & Store Keeper
Hussein Wakayo, Sodota Camp Guard
Adishu Sheyemo, Sodota Camp Guard
Hussein Abdulmanan, Sanetti Camp Guard
Gobe Ahamed, Sanetti Camp Guard
Ibrahim Nure, Sanetti Guard
Jara Kasim, Sanetti Guard
Kassim Biftu, Horse Manager
Umer Wally, Horse Stables Guard
Aklilu Getahun, Horse Stables Guard
Jeber Turke, Horse Stables Guard

EWCP children graduate from University

These children were not even born when their parents joined EWCP... Congratulations to Redwan Edris (Business Management, Rift Valley University), Munteha Alo (Applied Physics, Wachamo University) and Abdurahman Alo (Computer Sciences, Ambo University) for their achievements. And to Edris and Alo for the hard work supporting their families and putting their puppies through university. You make us proud!


Redwan Edris


Munteha Alo


Abdurahman Alo

...and new babies arrive!

Happy families, happy team. This could be our slogan. Melal, Yebakel and Ferehan, welcome to the world. And congratulations to proud dads Hamza, Antenah and Muktar. Instil your love of nature to them and maybe, one day, they will become the next generation of champions protecting the environment.

Wolf Ambassadors

Asrat Asefa, Guaint, Simien
Melkamu Signa, Adilemlem, Simien

Tesfa Milashu, Aboi Gara, North Wollo
Endris Ahimiye, Tenta, South Wollo
Esubalew Milashu, Delanta, South Wollo
Limenew Arega, Golati, South Wollo
Wasiye Teshome, Mekidella, South Wollo
Wubye Deresse, Tinchel Mega, South Wollo
Zeru Melaku, Belechuma, South Wollo

Shewa Yirga, Kirkir, Menz
Tsegaye Wolde, Anaz, Menz

Abduljeber Edo, Chalalaka, Arsi
Abduraman Kesir, North Galama, Arsi
Adam Gudeta, Kaka, Arsi
Ahmed Hussein, North Galama, Arsi
Mudesir Tikse, North Galama, Arsi
Muhamed Abubaker, South Galama, Arsi

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Dr Zelealem Tefera, Ethiopian Wildlife Conservation Think Tank
Prof Rosie Woodroffe, IUCN SSC Canid Specialist Group

Help EWCP

The Ethiopian Wolf Conservation Programme is a WildCRU (University of Oxford) endeavour to help protect these endangered wolves and the Afroalpine habitats they inhabit. It works under an agreement with Ethiopia's Wildlife Conservation Authority and Regional Governments, with the aegis of the IUCN SSC Canid Specialist Group and Wildlife Health Working Group.

Ethiopian wolves are only found in a handful of scattered mountains in Ethiopia and are threatened by loss of highland habitats, disease and persecution. The most threatened carnivore in Africa, and the world's rarest canid, these long-legged charismatic animals need your help.

Informed by sound research, the Ethiopian Wolf Conservation Programme targets the greatest threats to the survival of Ethiopian wolves and their Afroalpine habitat. We promote this charismatic species as a flagship, thereby protecting many of the Ethiopia's highland endemics and natural resources.

If you or your organisation is interested in helping to fund our activities contact us. You can donate to EWCP specifically through the following organisations:

Contact Us

Ethiopian Wolf Conservation Programme
PO Box 215, Robe, Bale, Ethiopia
Tel: +251 221 190923
info@ethiopianwolf.org
www.ethiopianwolf.org link to

@Kykebero

Instagram.com/kykebero

facebook.com/ewolves

Wildlife Conservation Research Unit
Tubney House, Tubney OX13 5QL, UK
Tel: +44 1865 611113/120
www.wildcru.org

How to Donate

In the United States

Online or cheque donations (tax deductible) may be sent via:
https://donate.wildnet.org/

Wildlife Conservation Network
209 Mississippi Street
San Francisco, CA 94107 USA
Tel: +1 415 202 6380
donate@wildnet.org

Tax Exempt ID #30-0108469
Please specify the donation is for 'Ethiopian wolves' in the 'Designation' field.

In the United Kingdom

Online or cheque donations may be sent via:
www.bornfree.org.uk/adopt-a-wolf

The Born Free Foundation
Broadlands Business Campus
Langhurstwood Road
Horsham RH12 4QP
Tel: +44 1403 240170
info@bornfree.org.uk

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We can also receive donations via Paypal
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No donation is too small!

"For 30 years I have been happy to work for EWCP. We not only protect the wolves but also help the community to learn and care about the natural resources and create job opportunities for locals."

Edris Ebu

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With the support of IUCN Save Our Species, co-funded by the European Union