WWF

LAC

Jaguar Strategy
2020-2030

Acknowledgements

Please cite this document as:
WWF. (2019). WWF Jaguar Strategy 2020-2030

Table of Contents

Acronyms

ACEAA — Asociación Boliviana para la Investigación y Conservación de Ecosistemas Andino Amazónicos (Bolivian   Association for Andean-Amazon Research and Conservation, Bolivia)

ANCJ — Alianza Nacional para la Conservacióndel Jaguar (National Alliance for JaguaConservation, Mexico)

CBD — Convention on Biological Diversity

CEIBA — Centro de Investigaciones del Bosque Atlántico (Atlantic Forest Research Centre, Misiones Argentina)

CENAP — Centro Nacional de Pesquisa eConservação de Mamíferos (National Centre for Mammal Research and Conservation, Brazil)

CONICET — Consejo Nacional de Investigaciones Científicas y Técnicas (National Council for Scientific and Technical Research, Argentina)

FSC — Forest Stewardship Council

FVSA — Fundación Vida Silvestre Argentina (Argentinian Wildlife Foundation, Argentina)

ICMBio — Instituto Chico Mendes de Conservação da Biodiversidade (Chico Mendes Institute for Biodiversity Conservation, Brazil)

IDS — Mamirauá Instituto de Desenvolvimento Sustentável Mamirauá (Mamirauá Sustainable Development Institute, Brazil)

INPA — Instituto Nacional de Pesquisa da Amazônia (Amazon National Research Institute, Brazil)

IPÊ — Instituto de Pesquisas Ecológicas (Ecological Research Institute, Brazil)

ITs — Indigenous Territories

IWT — Illegal Wildlife Trade

IUCN — International Union for Conservation of Nature

JCP — Jaguar Conservation Programme (WCS jaguar programme)

JCU — Jaguar Conservation Unit

JHC — Jaguar Human Conflict

JSF — Jaguar Strategic Framework

KEAs — Key Ecological Attributes

MAP — Madre de Dios-Acre-Pando trinational area on the borders of Peru, Brazil and Bolivia

NAPs — (Jaguar) National Action Plans

NTFPs — Non-Timber Forest Products

PAs — Protected Areas

PADDD — Protected Area Downsizing, Downgrading and Degazettement

RAPPAM — Rapid Assessment and Prioritization of Protected Area Management

RSPO — Roundtable on Sustainable Palm Oil

RTRS — Roundtable for Responsible Soy

SERNANP — Servicio Nacional de Áreas Naturales Protegidas (National Service of Protected Areas, Peru)

SINANPE — Sistema Nacional de Áreas Naturales Protegidas (National System of Protected Areas, Peru)

TRAFFIC — The wildlife trade monitoring network

UB-ERI — University of Belize Environmental Research Institute

UAM — Universidad Autónoma Metropolitana (Metropolitan Autonomous University, Mexico)

UNA — Universidad Nacional de Asunción (National University of Asunción, Paraguay)

UNAM — Universidad Nacional Autónoma de Mexico (National Autonomous University of Mexico)

UNDP — United Nations Development Programme

UNESCO — United Nations Education, Scientific and Cultural Organisation

WCS — Wildlife Conservation Society

WDPA — World Database on Protected Areas

WWF — World Wide Fund for Nature

PROLOGUES

The Americas are home to the great jaguar (*Panthera onca*), the largest cat in the continent and the third largest in the world after tigers and lions. The jaguar's extant range goes all the way from northern Mexico to northern Argentina across 18 countries. The jaguar's home is a place with an extraordinary biological diversity from lush moist tropical forests, savannas, gallery forests, foothills of mountain ranges and wetlands, to dry deciduous forests, mangroves, deserts and semi-desert areas, but is also highly threatened; according to the LPR (2018).

The extant jaguar range represents about 8.6% of the world's surface, but supports nearly 28% of the world's biodiversity and includes some high biodiversity areas. Jaguar habitat provides a considerable array of ecosystem services, e.g., the jaguar range provides around 9.8% of the world's commercial fisheries services, benefitting some 2.2 million people; and over 17% of the world's carbon storage and sequestration.

Asides from the biological diversity, the jaguar's range possesses a magnificent cultural richness. Where humans and jaguars have coexisted, this cat has been an important part of indigenous cultures and cosmologies. Jaguars populate the collective subconscious of Latin American peoples, both traditional and modern societies, a powerful symbol of their cultural identity as part of their mythology, traditions and beliefs.

Despite their ecological and cultural value, jaguars have lost approximately 50% of their original range and all across their current distribution, jaguar populations are declining. Jaguars are mostly threatened by habitat loss and fragmentation, human encroachment, decrease in their preys' populations, and direct killings derived from increasing conflict with humans, and recently to enter illegal markets.

WWF's Latin America and the Caribbean Secretariat (WWF LAC) has an evolving portfolio of 23 Transformational Initiatives, these initiatives are Transformational ideas and concepts generated by WWF LAC Country Offices recognizing that we face important conservation challenges and opportunities, where working together and with partners as cross-border or regional teams, these initiatives allows us to increase collaboration and capacity to shift the tide around issues of shared concern. "Jaguar" is one of the transformational initiatives that represent ambitious, large-scale multi-country efforts that aims to increase our conservation impact in the region. Jaguar and all 22 initiatives present unique opportunities to mobilize governments, partners and donors to support large-scale conservation efforts that capitalize on WWF's position as the most influential and credible conservation organization in these region.

With the aim of conserving jaguars and their habitats, and contributing to human communities' well-being, WWF LAC has supported countries to develop the "Jaguar Regional Strategy". WWF will work with partners to ensure jaguar populations are increasing or stable in 15 priority landscapes, thus contributing to achieving "a continental network of priority landscapes that ensures the permanence and recovery of jaguars, their habitats and the ecosystem services they provide, and delivers connectivity within and between jaguar priority areas, whilst also contributing to the sustainable development of people and communities coexisting with jaguars".

WWF has an opportunity in the delivery of the objectives identified in the Regional Jaguar Strategy through its focus on: governance and community-based approaches; collaborative partnerships for participatory jaguar conservation work in indigenous territories; engagement with the private sector for jaguar-friendly economic activities in productive areas; the ability to convene diverse stakeholders; the extensive expertise in planning and implementing large scale protected area systems; the experience in shaping markets; and the influence over the financial flows to sectors that fuel development, such as infrastructure and extractives.

Finally, this strategy is designed to make a measurable contribution to the delivery of the goals and objectives of the Jaguar 2030 Conservation Roadmap for the Americas, a multi-government plan to conserve jaguars

across their range supported by UNDP, Panthera, WCS and WWF. Together, we have a unique opportunity to reverse the trend and protect this apex predator throughout its range.

We would like to take the opportunity to thank everyone who has been involved in the development of this strategy and also thanks in advance to those who will walk with us through its implementation. And our extended gratitude to also thanks to all the external organizations that have provided their kind feedback to this strategy.

Roberto Troya,
Vicepresident, Regional Director WWF-LAC

Jaguar. Yaguareté. One who kills with one leap.

I've never seen a jaguar. Early on in my career as a biologist I explored her dry grassland and dense forest habitats from the Southwest of the United States, through Central America and down the South American continent as far as Argentina. But jaguars always evaded me. However, during those years, the Americas' biggest cat was still clawing its way back from near extinction due to intense persecution during the 20th century for its rosette embellished fur. Over a two-year period in the late 60s, for example, some 23,000 jaguar skins were imported to the United States; it wasn't until 1975 that CITES member states felt the situation merited banning of international trade in jaguars. Today, the number of jaguars is estimated at nearly 174,000 but numbers are declining once again.

As the third largest big cat, Jaguars are often overshadowed by their bigger Panthera kin – tigers and lions. But let's not underestimate jaguars – with the most powerful bite of all cats, they can take down prey three to four times their weight and usually do so with a crushing bite to the skull. Tigers and lions are more delicate, taking a deathly nip at the neck or a quick opening of the underbelly of their prey. Attention levels however, are less to do with eating styles and more to do with current levels of threat. The IUCN Red List of Threatened Species ranks tigers as Endangered, lions as Vulnerable and jaguars as Near-threatened. While this is due in part to the much lower global population estimates for tigers and lions relative to jaguars (global tiger numbers are in the thousands; lions are in the low tens of thousands), the threats faced by all three big cats are frighteningly similar – habitat degradation and loss, retaliatory killings due to livestock depredation or human-wildlife conflict and poaching for trade in body parts. For jaguars, these threats are dramatically increasing, threatening any recovery made since 1975.

Habitat loss, degradation and fragmentation and as well as retaliatory killings are issues that jaguar conservationists have been wrangling with for a number of years. Deforestation rates in Latin America are among the highest in the world and jaguar habitats are not exempt - jaguars have already lost nearly half of their once vast range to agriculture (driven by aggressive production of soy and oil palm), cattle ranching, infrastructure and urbanization.

Unfortunately, there is a chilling new increase in trade in body parts. Headless jaguar carcasses have been found in garbage dumps and shipments destined for China containing hundreds of jaguar canines fashioned into jewelry have been intercepted. As worrying, some Central American restaurants have been reported to have jaguar meat on their menus. But perhaps most disturbing, are reports that criminals are boiling down entire jaguar carcasses into a pasty substance – similar to tiger bone paste- ostensibly for use in Chinese medicine. Like many scenarios, when one resource is depleted, attention is driven elsewhere. What we saw in Asia with tigers, then in African with lions, we are now seeing with jaguars in the Americas.

All of these threats whether long-standing or recently emerging need immediate attention – and tackling them will require a coordinated approach. The Jaguar Strategic Framework (JSF), a regional framework spearheaded by WWF and agreed by 19 governments and conservation NGOs is a significant first step in coordinating the key interventions required for conserving jaguars at the range-level. This strategy outlines WWF's contribution to the JSF, providing a 10-year plan that prioritizes and guides our activities across the jaguars range.

This document clearly demonstrates the unique and crucial role WWF has to play in jaguar conservation. And it makes me proud to be part of an organization that works to complement, integrate and add value to the efforts of others who are passionately working to save the Americas' biggest and most beautiful cat. This is how we make a difference.

And maybe I'll see that jaguar in the wild one day.

Margaret Kinnaird
Practice Leader, Wildlife

1. EXECUTIVE SUMMARY

The jaguar is an iconic symbol of Latin America's wild and wonderful places, and ranges from Mexico to Argentina across 18 countries. Whilst mostly recognisable as the king of the jungles of Central and South America, jaguars occur in a diversity of biomes including dry forests, semi-deserts, mangroves, savannas, wetlands, and even the foothills of the mighty Andean mountain range.

As a top predator and umbrella species, jaguars in their natural environments both depend on and inadvertently safeguard numerous other co-occurring species. Healthy jaguar populations require large natural areas, functional habitats and abundance of prey; therefore, conserving jaguars safeguards biodiversity, maintains climate stabilising forests and wetlands, and enhances the livelihoods of people who depend on their resources.

However, all is not well for jaguars, their prey or their habitats. Despite faring better, so far, than the equally iconic African lion and Asian tiger, jaguars have already lost 49% of their distribution area to agriculture, cattle ranching, infrastructure and urbanisation. With strongholds in the Amazon region and in the vast Pantanal wetlands, numbers of jaguars and their prey are shrinking in most other regions (Mexico, Central America, and central and southern South America). Habitat loss, degradation and fragmentation due to expanding human and livestock populations, infrastructure and mineral exploitation lead to a decline in prey species, conflict with communities, farmers and ranchers, and increasingly to poaching for the illegal trade in jaguar parts.

Prior to the drafting of this strategy, WWF has conducted conservation work in areas where jaguars occur, including jaguar-focused conservation projects, however these are mostly at the site or landscape levels. This strategy aims to strategically scale up this work to have a range wide impact.

The WWF Jaguar Strategy builds on the Jaguar Strategic Framework (JSF), a regional framework developed by a group of 19 government and non-government organisations at a WWF-facilitated workshop in Bogotá, Colombia in February 2018, based on the Open Standards (PPMS) methodology. The JSF identified a set of key interventions required for conserving jaguars at the range-level, and provides a framework for the development of strategies and action plans at the range, landscape, national and sub-national levels.

This document aims to provide a cohesive overarching 10-year strategy that guides WWF's jaguar conservation activities across the jaguar's range, outlining WWF's contribution to the JSF, and seeking to complement and add value to the jaguar work of other conservation organisations and governments. WWF's presence in most jaguar range countries, and its ability to influence the driving forces of biodiversity loss (markets, finance and governance) at a transnational level give it a unique role in the collective efforts to conserve America's largest predator.

The vision of the WWF Jaguar Strategy for 2050 is to secure *"a continental network of priority landscapes that ensures the permanence and recovery of jaguars, their habitats and the ecosystem services they provide, and provides connectivity within and between jaguar priority areas, whilst also contributing to the sustainable development of people and communities coexisting with jaguars"*. We shall achieve this through two mutually reinforcing goals:

- Goal 1: By 2030, jaguar populations are either increasing or stable in all WWF priority jaguar landscapes, ensuring long term survival, connectivity and genetic flow
- Goal 2: By 2030, jaguar distribution, its prey base, suitable habitat and connectivity are either increasing or stable within all WWF priority jaguar landscapes.

The strategy covers work in 15 WWF priority landscapes, all of which are located in Jaguar Conservation Units (JCUs) – priority areas for jaguars defined by jaguar scientists over the last 20 years. Some WWF jaguar landscapes also overlap with or are contiguous to priority landscapes and jaguar corridor areas where other organisations are doing jaguar conservation work.

WWF's Jaguar Strategy defines five objectives, which it believes will secure the greatest impact from its investments in jaguar conservation, both within WWF jaguar landscapes and across the range:
1) Secure jaguar strongholds: protected areas and indigenous lands
2) Build connectivity: best practices and jaguar-friendly economic development
3) Stop jaguar killings: co-existence, attitude shift, law enforcement and trafficking disruption
4) Catalyse cooperation: country-level, range-wide and international political will
5) Create enabling conditions: science for evidence-based policies and decisions, public support and funding

Whilst these approaches are common to the jaguar conservation work of other organisations, WWF has a particular niche in the delivery of these objectives through its focus on governance and community-based approaches; collaborative partnerships for participatory jaguar conservation work in indigenous territories; engagement with the private sector for jaguar-friendly economic activities in productive areas such as FSC-certified forest concessions; an ability to convene diverse stakeholders in support of species conservation; its extensive expertise in planning and implementation of large scale protected area systems; its experience in shaping markets; and its influence over the financial flows to sectors that fuel development, such as infrastructure and extractives.

Finally, this strategy is designed to make a measurable contribution to the delivery of the goals and objectives of the Jaguar 2030 Conservation Roadmap for the Americas, a multi-government plan to conserve jaguars across their range supported by UNDP, Panthera, WCS and WWF.

2. INTRODUCTION

The jaguar (*Panthera onca*) is the largest feline in the Americas and the third largest cat in the world after tigers and lions. The top apex predator in the Neotropics, the jaguar keeps prey populations under control, helping to keep balanced and healthy ecosystems. Jaguars inhabit a wide diversity of distinctive biomes, from lush moist tropical forests, savannas, gallery forests, foothills of mountain ranges and wetlands, to dry deciduous forests, mangroves, deserts and semi-desert areas. Jaguars also populate the collective subconscious of Latin American peoples, both traditional and modern societies, a powerful symbol of their cultural identity as part of their mythology, traditions and beliefs.

Governments, NGOs and scientific communities in the 18 countries where jaguars are still found and from outside the region have all invested considerable technical expertise, financial resources, social and political capital towards stopping the decline in jaguar populations in Latin America. But despite the many conservation successes for jaguars across their range, still their populations continue to decline.

WWF's jaguar conservation work is relatively recent, having evolved over the last 10 years with a portfolio of projects focused on strategies such as community engagement work to reduce conflict with jaguars in the Atlantic Forest in Brazil, Argentina and Paraguay, best practice in cattle-ranching to prevent retaliatory killings of jaguars in the Pantanal in Brazil and Bolivia, jaguar density surveys in forest concessions and protected areas in Peru, studies on the illegal trade in jaguar parts in Suriname, and jaguar population surveys and monitoring in Colombia, Peru, Ecuador, Brazil, Suriname, Mexico and Central America. WWF associate organisation Fundación Vida Silvestre Argentina (FVSA) has had a long-standing programme of work to conserve jaguars in the Misiones region of northeastern Argentina, focusing on research, outreach, enforcement and advocacy.

However, similarly to other large cat conservation programmes around the world, WWF's jaguar conservation projects have developed independently, mostly at the site or landscape levels, and in many cases, in the absence of a range-wide vision and strategy. Often these projects lack the necessary transboundary and multi-institutional collaborative approaches required to ensure joined-up, range-wide conservation action.

This WWF Jaguar Strategy aims to articulate the organisation's strategic thinking for jaguar conservation at the range-wide level, including its vision for jaguars in the future, and the goals, strategies and objectives it aims to achieve over the next 5-10 years. The strategy identifies 15 landscapes for long-term jaguar conservation action, and defines key non-landscape-specific cross-cutting strategies. It is intended as a range-wide master plan from which targeted regional, national and transboundary strategies may emerge.

A major focus of the strategy is the critical need to safeguard core jaguar landscapes and to reduce the direct killing of jaguars, as well as to promote transboundary and international cooperation, and enhance the cultural value of jaguars in the region. Whilst these approaches are common to the jaguar conservation work of other organisations, WWF and its associate organisation FVSA have a particular niche in jaguar conservation through their focus on governance and community-based approaches; collaborative partnerships for jaguar work in indigenous territories; engagement with the private sector for jaguar-friendly economic activities in productive areas (e.g. FSC-certified forest concessions; RSPO-certified oil palm plantations); their ability to convene diverse stakeholders in support of jaguar conservation; their solid expertise in large-scale systematic planning of protected area systems (e.g. Brazil's ARPA programme, Peru's Natural Legacy Initiative and Heritage Colombia); and their work to influence sustainable finance for development, such as infrastructure and mining.

The strategy is intended to build on previous experience in jaguar conservation and complement the work of other organisations and government bodies to conserve jaguars, aiming at adding value to the existing body of work carried out by others to protect jaguars, their prey and their habitats. The strategy is aligned with the 'Jaguar Strategic Framework' (JSF)[1] and with the 'Jaguar 2030 Roadmap[2] .

---

[1] The 'Jaguar Strategic Framework' or JSF ('A Regional Strategic Framework for Conservation of the Jaguar Panthera onca in the Americas by 2030') was developed by a group of 19 government and non-government organisations at a WWF-facilitated workshop in Bogotá, Colombia in February 2018, and is based on the Open Standards methodology.

[2] The 'Jaguar 2030 – Conservation Roadmap for the Americas' (working draft, June 2019) is a multi-government plan to conserve jaguars supported by UNDP, Panthera, WCS and WWF.

3. THE STATE OF THE JAGUAR

3.1 Conservation status

The jaguar is listed as Near Threatened on IUCN's Red List (Quigley et al. 2017), with a decreasing population trend. The species will likely qualify for a Vulnerable (VU) IUCN threat classification in the near future (ibid) due to habitat loss and other significant and increasing threats.

Population status:

The total estimated population across its current range is approximately 173,000 jaguars (Jędrzejewski et al. 2018) – see Table 1.

Table 1: Estimated area inhabited and population size of jaguars in the countries of South and Central America (adapted from Jędrzejewski et al. 2018)

Country	Current jaguar range area (thousands km^2)	Mean estimated jaguar population
Brazil	4,583.6	86,834
Peru	739.6	22,210
Colombia	872.8	16,598
Bolivia	743.1	12,845
Venezuela	589.5	11,592
Guyana	208.8	4,356
Suriname	142.7	3,190
Ecuador	93.7	1,969
French Guiana	82.8	1,602
Paraguay	233.3	1,589
Argentina	76.1	314
Uruguay	0	0
Chile	0	0
Total South America	8,365.4	163,098
Mexico	339.1	4,343
Nicaragua	60.5	1,476
Honduras	49.1	1,218
Guatemala	43.1	1,013
Panama	43	869
Costa Rica	38.5	571
Belize	20.9	563
El Salvador	0	0
Total Central America	594.2	10,054
Total South and Central America	8,959.6	173,151

Geographic Range:

The jaguar historically ranged from the southwestern United States to southern Argentina (Guggisberg 1975). Currently jaguars occur in 18 Latin American countries[3] plus the USA, where they have been almost eliminated (less than 10 male jaguars have been seen in the southern USA since 1963), having been completely extirpated from Uruguay and El Salvador. Jaguars currently occupy 51% of their historic distribution, with a 20% decline of the jaguar's range over a period of only fourteen years (2002-2015).

An estimated 50% of jaguars live in Brazil alone (Jędrzejewski et al. 2018), which contains half of the Amazon basin, the single largest contiguous block of remaining jaguar habitat (Brazil also has large jaguar populations in the Pantanal wetlands). The Amazon portions of the other 8 countries that share the biome (Bolivia, Peru, Ecuador, Colombia, Venezuela, Guyana, Suriname and the overseas territory of French Guiana) have healthy populations of jaguars and, in some cases, high densities – Peru has the highest estimated jaguar density of all range countries (ibid). In contrast, virtually all other jaguar subpopulations outside of the Amazon are threatened because of their small size, isolation, deficient protection and the high human population density (de la Torre et al. 2017). Threatened sub-populations include those on the Mexican Pacific Coast, in the Mexico/Guatemala/Belize transboundary area known as Selva Maya, in parts of Central America, northern South America, the Atlantic Forests of Brazil, Argentina and Paraguay, and in the Brazilian Cerrado and Caatinga, all of which require urgent attention if we are to secure their survival and connectivity.

Conservation priorities:

In 1999, jaguar scientists from all 18 range countries identified the most important areas across the jaguars' range for the conservation of viable populations across its range. These areas, known as 'Jaguar Conservation Units' or JCUs[4] are characterised by having healthy jaguar populations, suitable habitat, and a stable and diverse prey base (Sanderson et al. 2002; Zeller 2007). Ninety JCUs, covering 1.9 million km2, were identified as being important to the long-term survival of jaguars. A few years later, least-cost corridors were mapped between them (Rabinowitz and Zeller 2010). Thus, core areas (JCUs) and corridors work together to maintain the viability of jaguar populations. In 2011, the many JCUs of the Amazon Biome were combined to form a small number of large JCUs that include much of the Brazilian Amazon and parts of Colombia, Ecuador, Venezuela, and the Guianas. The mapping of JCUs remains incomplete for areas of Peru and French Guiana, and are currently being updated.

Although range-wide planning exercises are instrumental in bringing attention to threats and conservation priorities of a wide-ranging species like the jaguar, their extensive geographic scope and coarse filter approach does not allow for attention to country or region-specific conservation needs for the species. The development of National Action Plans has provided good opportunities for performing a finer scale assessment of threats and conservation challenges unique to each country. Mexico, Honduras, Panama, Colombia, Ecuador, Paraguay, Argentina and Brazil (ICMBio 2013) have developed National Action Plans (NAPs) for jaguar conservation, however, not all are being effectively implemented (see Annex 1). At the time of writing (July 2019), Bolivia is close to completing a National Action Plan for jaguars.

---

[3] Mexico, Guatemala, Belize, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Suriname, the overseas territory of French Guiana, Brazil, Ecuador, Peru, Bolivia, Paraguay and Argentina

[4] JCUs were defined as either (Type I) areas with a stable prey community, currently known or believed to contain a population of resident jaguars large enough (at least 50 breeding individuals) to be potentially self-sustaining over the next 100 years, or (Type II) areas containing fewer jaguars but with adequate habitat and stable diverse prey base, such that jaguar populations in the area could increase if threats were alleviated (Sanderson et al. 2002)

Protected areas and connectivity:

Given increasing pressures on jaguar populations, national-level, ecoregion-specific and range-wide priority setting and planning exercises for jaguar conservation need to be undertaken at regular intervals, and indeed many range countries have yet to conduct initial prioritisation efforts. It has been estimated that 45% of the total jaguar population lives in protected areas and has the highest chances of survival (Jędrzejewski et al. 2018). However, the existence of protected areas [5] without considering connectivity doesn't assure jaguar survival. The rapid expansion of agriculture and cattle ranching is dividing jaguar habitat into progressively smaller fractions, especially outside protected areas (Olsoy et al. 2016). This human induced habitat fragmentation leads to isolated populations which in turn reduces exchange of genetic material by eliminating dispersal routes and can eventually contribute to extinction risk for a population (Frankham 2005). Habitat loss also increases access to previously inaccessible areas, escalating human jaguar conflict and poaching, and ultimately driving local extinctions. Therefore, corridors are crucial for maintaining dispersal opportunities, genetic viability, rescuing small inbred populations and ameliorating harmful effects of habitat fragmentation (Hilty et al. 2006).

A number of recent studies have assessed habitat use by jaguars in productive landscapes, critical for developing jaguar conservation strategies for areas outside protected areas. Large felids including jaguars are able to persist in landscapes with tree plantations, for example, provided large extents of natural forest remain amongst the plantations, connectivity with neighbouring protected areas is secured, and poaching is controlled (Paviolo et al. 2018). In agricultural landscapes, jaguar's preference for high forest cover, wetlands and areas near watercourses might support the use of riparian areas to establish corridors connecting priority areas for the species' conservation (Morato et al. 2018; Boron et al. 2018), thus connecting terrestrial and freshwater ecosystems. A recent study (Romero-Muñoz et al. 2018) points to the importance of areas along international borders (Argentina, Paraguay, Bolivia) as havens for jaguars and other wildlife in the Gran Chaco, and thus the urgent need for cross-border planning to prevent their imminent extinction in this region. Dispersal corridors have been included in jaguar conservation strategies as a crucial way of protecting jaguars and ensure connectivity in increasingly human-dominated landscapes (Rabinowitz and Zeller 2010).

Legal status:

The jaguar is listed under Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) so all international trade for commercial purposes is prohibited. The jaguar is protected under the national laws of all 18 range countries. In Argentina, jaguars were declared National Natural Monuments in 2001 (the highest conservation status in Argentinian wildlife legislation).

---

[5] As defined in the World Map of Protected Areas http://www.protectedplanet.net/ based on the IUCN classification of protected areas

3.2 Threats[6]

Regionally, jaguar populations are threatened by **habitat loss and fragmentation, decline of their natural prey, and pro-active or retaliatory killings** (Medellín et al. 2002, Paviolo et al. 2008, Foster et al. 2010a, Medellín et al. 2016, Ceballos et al. 2016, Nijhawan 2012). Jaguar killings are associated with **livestock depredation** (Zimmermann et al. 2005, Hoogesteijn and Hoogesteijn 2008, Quigley et al. 2015), **fear for human safety, competition for wild meat (jaguar prey species) with human hunters** (Jorgenson and Redford 1993, Foster et al. 2016), and **killing for trophies/ illegal trade in jaguar body parts** (Nuñez and Aliaga-Rossel 2017, Fraser 2018, Reuter et al. 2018). Other major threats include unsustainable logging, mining, infrastructure development, disease, increased frequency and severity of fires, and ecosystem changes due to climate change.

Habitat loss is reducing and isolating jaguar populations and their prey range wide (Olsoy et al. 2016, Medellín et al. 2002, Altrichter et al. 2006, Paviolo et al. 2008, Petracca et al. 2014, Medellín et al. 2016, de la Torre et al. 2017). Deforestation rates in Latin America are the highest in the world together with tropical Africa (Curtis et al. 2018, FAO and JRC 2012, D'Annunzio et al. 2015). The current contribution of agriculture to global deforestation varies by region, with industrial agriculture being responsible for 30% of deforestation in Africa and Asia, but close to 70% in Latin America. The most significant agricultural drivers of deforestation in Latin America include cattle ranching and expansion of soy (Hosonuma et al. 2012). Oil palm is expanding in the region and is an increasingly important driver of deforestation[7] . Fragmentation and displacement frequently leads to lowering of densities of jaguars and prey in leftover forest patches due to easier human access for poachers and increased conflict with livestock. Jaguar-livestock conflict is a serious threat to jaguar survival and reported throughout their range (Hoogesteijn and Hoogesteijn 2011, Quigley et al. 2015, de la Torre et al. 2016).

Defaunation is often overlooked as a key threat for jaguars and their prey, despite evidence that it causes negative impacts on species richness and diversity (Kurten 2013), leading to disturbances in ecosystem functioning, ecosystem services and human well-being (Galetti and Dirzo 2013). For example, the white-lipped peccary (*Tayassu pecari*), an important jaguar prey (e.g. Foster et al. 2010b), has been extirpated from 21% of its historical range during the past century and changed from NT to VU under the latest IUCN assessment (Altrichter et al. 2012, Keuroghlian et al. 2013). In Latin America, pressure on wildlife as a food source is on the increase (Harrison 2011, Constantino 2016, Robinson et al. 1999, Fa et al. 2002). Even in low population countries like Belize, 75% of the yearly offtake of jaguar prey species can be attributed to humans, while jaguars only account for 25% (Foster et al. 2016). Increases in human population and infrastructure leads to increased fragmentation for agriculture, industry and urbanization, making wildlife (including jaguars and their prey) more accessible for hunting.

There are documented jaguar population declines and habitat loss for most of the range countries (Ceballos et al. 2011, Costa et al. 2005, Payán et al. 2013b, Wallace et al. 2013, Espinosa et al. 2016,

---

[6] This section draws heavily on Quigley et al 2016 (the Panthera onca webpage of The IUCN Red List of Threatened Species 2017) https://www. iucnredlist.org/species/15953/123791436#threats and provides a generic description of the main threats to jaguars across the jaguar range. Annex 3 presents a short description of each WWF jaguar landscape, including the specific threats that are relevant to each landscape.

[7] Oil palm is usually planted on land previously cleared for grazing (Furumo and Aide 2017), however, there is increasing evidence that oil palm is pushing cattle ranching into forested areas ('displacement deforestation'), and recent studies have found that oil palm is directly replacing large areas of forest in Guatemala (Petén), Peru (Loreto) and in the Brazilian state of Pará (Ramankutty and Graesser 2017).

García-Anleu et al. 2016, González-Maya et al. 2016, Hoogesteijn et al. 2016, Maffei et al. 2016, Mora et al. 2016, Moreno et al. 2016, Payán et al. 2016, Olsoy et al. 2016, Chávez et al. 2016, de Azevedo et al. 2016, Di Bitetti et al. 2016, Díaz-Santos et al. 2016). Connectivity among jaguar populations is being lost at local and regional scales. For example, the connectivity of jaguar habitat between Honduras and Guatemala is almost gone; similar losses have been documented across the Chaco, Iguazu and Atlantic Forest, and between Tamaulipas and Veracruz (Haag et al. 2010, Rabinowitz and Zeller 2010, Medellín et al. 2016, Ceballos et al. 2011, Chávez et al. 2016). Isolated populations have fewer individuals and are more prone to local extinctions (Ceballos et al. 2016). Many jaguar populations require connectivity between core sites to survive in the long term and these connectivity corridors are most of the time outside protected areas, and therefore vulnerable to human impacts (Rabinowitz and Zeller 2010). Even in nominally protected areas, jaguars often suffer from human impacts such as illegal hunting (Quigley and Crawshaw Jr 1992, Medellín et al. 2002, Sollmann et al. 2008, Ceballos et al. 2011, Payán et al. 2013a, Petracca et al. 2014).

The vulnerability of the jaguar to population loss is demonstrated by its disappearance by the mid-1800s from Uruguay (Pereira-Garbero and Sappa 2016), El Salvador and by the mid-1900s from the south-western US (Johnson and Van Pelt 2016, U.S. Fish and Wildlife Service 2018). These countries were the first areas to show rapid human population increase with large scale land conversion. Retaliatory killing of the remaining exposed jaguars led to their extinction. These processes are now taking place on a continental scale and therefore there are few areas within the jaguar range that can be considered safe. With limited technological expansion in the region, the main source of income will be industrial agriculture (Quigley et al. 2017). With every (local) economic crisis, the last jaguar strongholds will be eroded further. Commercial hunting and trapping of jaguars for their skins declined drastically from the mid-1970s, when anti-fur campaigns and CITES controls progressively shut down international markets (Nowell and Jackson 1996). However, demand for jaguar paws, teeth and other products, has been growing recently, especially in local markets where canines are considered interesting jewellery. On top of this, jaguars are starting to be considered a replacement for tiger bone for traditional medicine purposes by Asian countries and the increasing Asian community in Latin America (Quigley et al. 2017).

Levels of threats to jaguar populations vary from country-to-country and from ecoregion to ecoregion, depending on factors such as type of land use, extent of habitat conversion, protected area coverage and cultural factors. Populations within countries, ecoregions and at the landscape level face different threats and varying levels of extinction risk.

3.3 Addressing the threats: WWF's and other organisation's work to date

Several organisations across the jaguar range have long-standing and reasonably well-resourced jaguar conservation programmes, such as the Wildlife Conservation Society (WCS), Panthera, Instituto Pró-Carnívoros (Brazil), IDS Mamirauá (Brazil), INPA (Brazil), Alexander von Humboldt Institute (Colombia), WWF, Conservation International and several Latin American universities and research institutions (both government non-government). Synergies amongst the work of these organisations, whilst occurring, need to be strengthened and actively promoted, so as to minimize the duplication of efforts and maximise the multiplicative effects that might result.

Range-wide jaguar conservation efforts

Amongst the organisations that work on jaguars at a range-wide level, WCS has focused on a sub-set of globally significant and strategically located JCUs in which a diverse array of locally tailored tools is used to 'hold ground', thus contributing to range-wide jaguar conservation, and complementing jaguar corridor strategies. The WCS Jaguar Conservation Programme (JCP), dating back to 1999, trained many of today's jaguar biologists. WCS usually works through a strong presence in range countries, focusing on 9 major landscapes (Figure 1):

1. Selva Maya including the Maya Biosphere Reserve (Guatemala)
2. La Moskitia of Mesoamerica (including biosphere reserves in Nicaragua and Honduras)
3. Magdalena region (Colombia)
4. Orinoco (Colombia)
5. Greater Yasuní Landscape (Ecuador)
6. Marañon Ucayali region (Peruvian Amazon - work not yet under implementation)
7. Greater Madidi-Tambopata Landscape (Bolivia, Peru)
8. Gran Chaco (Bolivia, Paraguay)
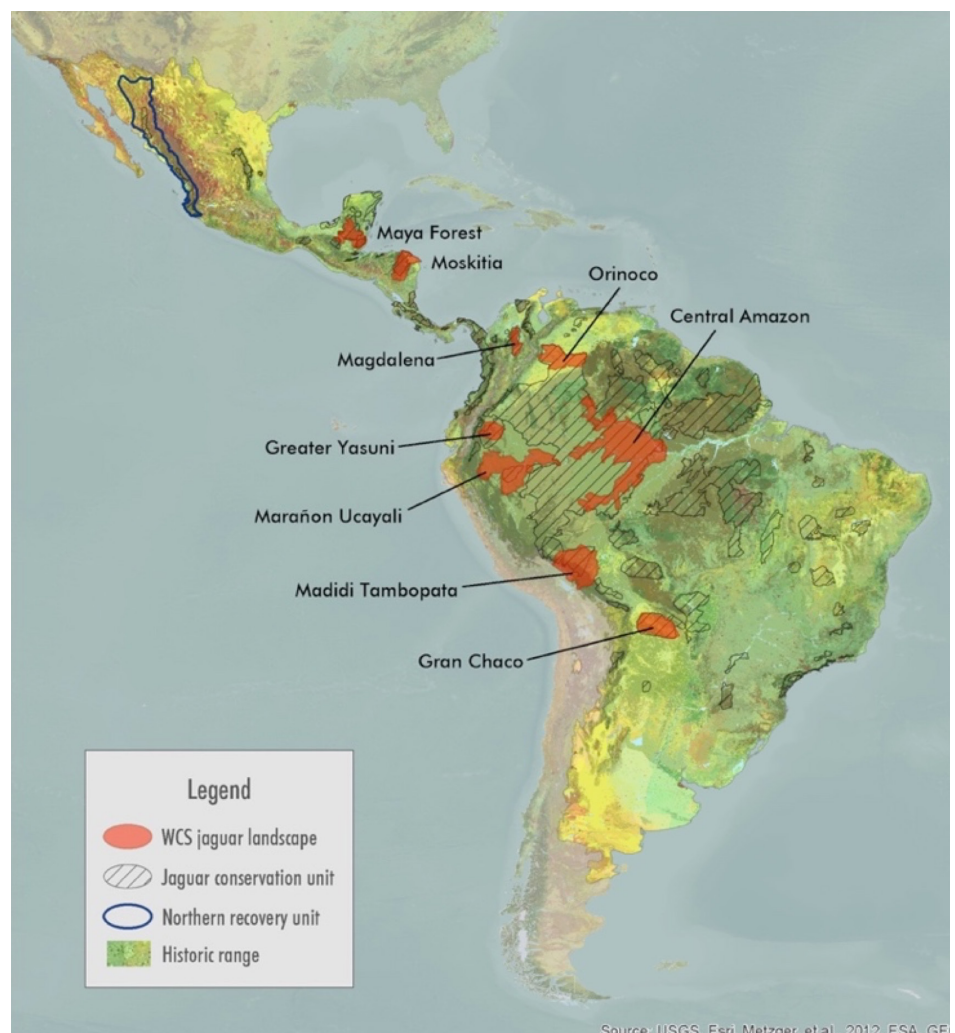9. Central Amazon (Amazonas State, Brasil) (the US-Mexico border is targeted as a recovery area)

Figure 1: Wildlife Conservation Society (WCS) nine priority landscapes

Panthera also works across the jaguar's range, having developed the Jaguar Corridor Initiative (Figure 2), which aims to preserve the genetic integrity of the jaguar by connecting core jaguar populations (JCUs) with corridors that cross human-dominated landscapes, from northern Mexico to Argentina. Panthera is working in 14 of the 18 jaguar range states (Mexico, Guatemala, Belize, Honduras, Nicaragua, Costa Rica, Panama, Guyana, Suriname, Colombia, Ecuador, Peru, Bolivia, Brazil) on protected areas, illegal wildlife trade, enforcement, corridors, livestock management, human-jaguar conflict, sustainable infrastructure, best agricultural practices, land use planning, and outreach.
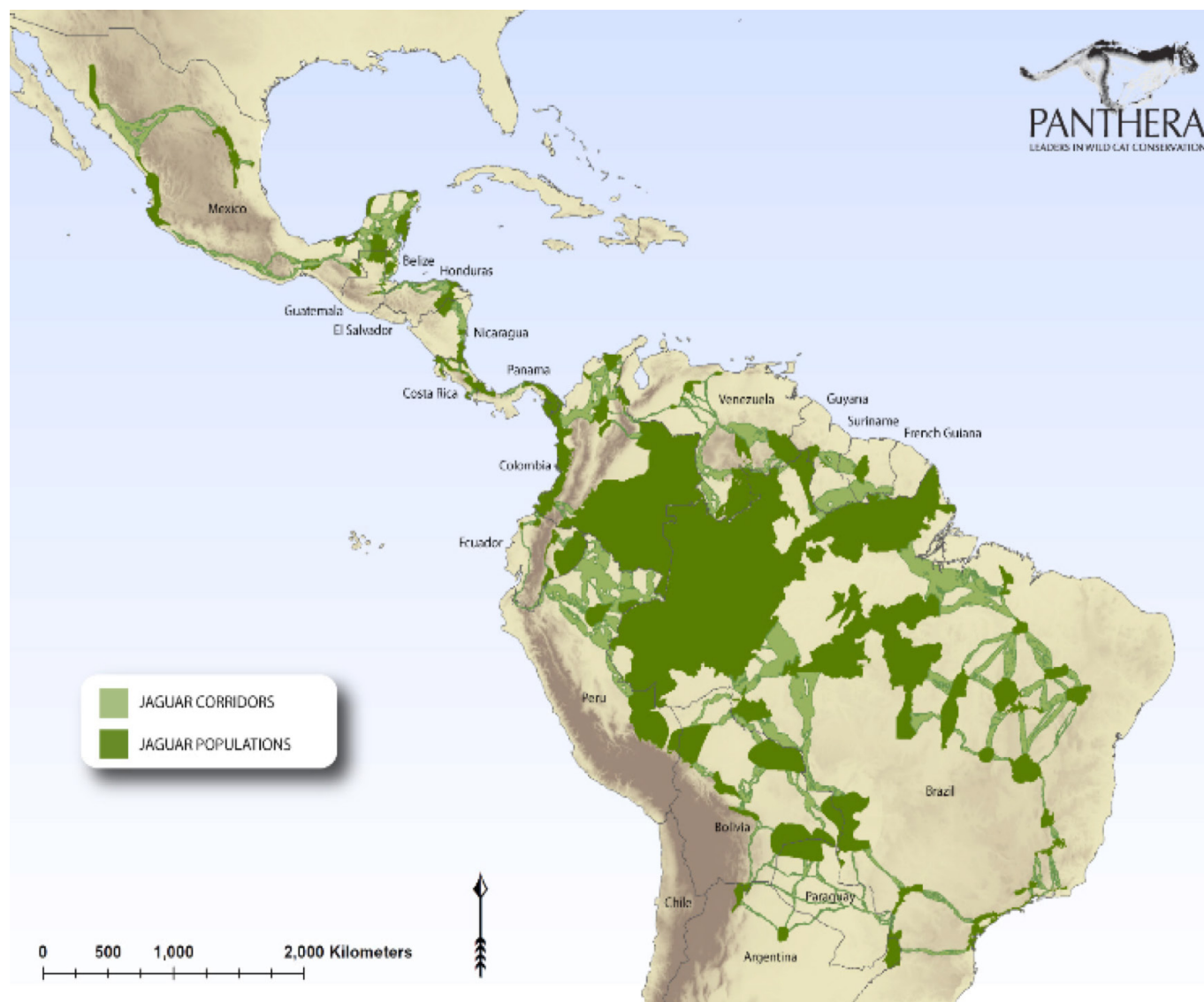

Figure 2: Jaguar Conservation Units (JCUs) and corridors (Panthera, 2017)

National or sub-national jaguar conservation efforts

In addition to organisations that support jaguar conservation at a range-wide level, others have well-developed jaguar conservation strategies at the national or sub-national levels, including:

- Government agencies such as ICMBio/CENAP (Brazil), CONICET (Argentina) and SERNANP (Peru). The governmental Wildlife Management and Conservation Commission in Guyana plans to develop a national-level jaguar conservation strategy in the near future
- Universities such as UNAM and UAM (both Mexico), UB-ERI (Belize), Universidad Nacional de Asunción-UNA (Paraguay), and Universidad Mayor de San Andrés (Bolivia)
- Indigenous organisations such as Cofan (Ecuador)
- San Diego Zoo's programme in Peru, and organisations such as Fundación Omacha (Colombia),

Pro-Natura, Natura and Biocenosis (all Mexico), CEIBA and Red Yaguareté (both Argentina), Conservation International (in Suriname), ACEAA (Bolivia), and IPÊ and Instituto Mamirauá (both Brazil).

WWF's jaguar conservation efforts

Several WWF country offices in Latin America have been working on jaguar conservation at the national and sub-national levels for several years, collaborating with other organisations such as Panthera, WCS and other local conservation organisations, universities and local / national governments. However, up until now, WWF did not have an over-arching range-wide strategy for the conservation of jaguars.

WWF country offices and WWF Associate organisation Fundación Vida Silvestre Argentina have been working with and through partner organisations in Argentina, Belize, Brazil, Colombia, Ecuador, Guatemala, Honduras, Peru and Suriname on jaguar conservation activities mostly at the sub-national level, but also in transboundary areas. WWF offices in Bolivia, French Guiana, Guyana, Mexico and Paraguay, whilst not directly implementing jaguar conservation work in recent years, have supported the jaguar work of other organisations through collaborative arrangements and grants.

WWF and FVSA jaguar conservation work has focused mainly on:
● protection of jaguar habitats and corridors (Mexico, Belize, Guatemala, Honduras, Colombia, Guyana, Suriname, Ecuador, Peru, Bolivia, Paraguay, Argentina, Brazil)
● population density surveys and monitoring of jaguars in protected areas, community-managed areas and forest concessions (Argentina, Brazil, Colombia, Ecuador, Honduras, Peru). Some WWF country offices are also monitoring jaguar prey species (Argentina, Ecuador, Peru).
● addressing human-jaguar conflict, in particular retaliatory killing of jaguars in cattle-ranching areas, through community outreach and awareness (Argentina, Belize, Brazil, Honduras, Peru).
● given the recent increase in certain areas in the poaching of jaguars specifically for the illegal trade in jaguar parts, some WWF country offices have conducted preliminary assessments of the state of the illegal trade in jaguar parts in their countries, for example Suriname and Peru. WWF-Bolivia is helping to strengthen the capacity of government enforcement agencies to effectively control the illegal trade in jaguar parts, through the provision of equipment and training.
● some WWF country offices are doing corridor design and implementation to enhance connectivity (Argentina, Ecuador, Colombia and Peru).
● FVSA has a long-standing jaguar conservation programme (since 2004) in the Misiones region of northeastern Argentina, focusing on research, outreach, enforcement and advocacy, with measurable increases in jaguar numbers in the critically threatened Misiones jaguar population.

Lack of resources (both funding and expertise) and of a range-wide integrated strategic approach to conserve this species has hampered the ability of some WWF country offices to design and implement effective jaguar conservation programmes.

Collaborative efforts for jaguar conservation

In recent years, a number of inter-institutional efforts have emerged aimed at increasing coordination and collaboration between organisations and institutions committed to jaguar conservation, such as the International Workshop for Jaguar Conservation in the Amazon (Quito, May 2014) organised by WWF, WCS, and Panthera. Important national-level coordination efforts have been undertaken, such as the Aliança Onça Pintada in Brazil (created in October 2014) and the Alianza Nacional para la Conservación

del Jaguar (ANCJ) (established in Mexico in 2014), which recently organised the International Symposium on the Ecology and Conservation of Jaguars and other Neotropical Felids (https://www.facebook.com/SimposioEcologiaConservacionJaguaryFelinos/?fref=mentions) in Cancun, Mexico, in June 2018.

In March 2018, a major inter-governmental jaguar conservation initiative was launched at the Jaguar 2030 High-Level Forum held in New York, convened by UNDP and co-hosted by the governments of the range countries. This initiative aims to promote a regional approach to jaguar conservation with a common vision for the future of the jaguar and its habitats, and the well-being and sustainable development of communities residing in jaguar habitats. A Jaguar 2030 Coordination Committee has been set up, which through the leadership of UNDP, range countries, WWF, WCS, and Panthera is working to a) produce a roadmap for the development of a Regional Jaguar and Habitat Conservation Plan, b) leverage finance from the GEF and other innovative financial mechanisms, and c) generate enthusiasm and commitment for range-wide jaguar conservation through engagement and advocacy at high-level regional and global events (e.g. CBD, etc). The roadmap has been drafted by the Coordination Committee ('Jaguar 2030 – Conservation Roadmap for the Americas', working draft June 2019).

Also in March 2018, WWF convened a group of 19 government and non-government organisations in Bogotá, Colombia with the aim of co-creating a broad strategic framework for jaguar conservation. The result of this effort was the 'Jaguar Strategic Framework 2030' (JSF)[8] . The JSF reflects the shared aspiration of the participating organisations to produce an 'umbrella' strategic framework for jaguar conservation at the regional scale that can be used as a common platform that unites all organisations and governments who are committed to jaguar conservation and allows them to speak with one voice on the key strategies and approaches needed to safeguard jaguar populations. The JSF provides a frame to guide the development of new strategies (range-wide, transboundary, national or sub-national) where these do not yet exist, whilst also being sufficiently generic to accommodate the specific organisational strategies, geographic priorities, programmes and institutional niches of organisations already working to protect jaguars, their prey and their habitats, and to support the communities that depend on the environmental services that conserved systems with jaguars provide. The JSF forms the conceptual basis for this WWF Jaguar Strategy.

There is widespread consensus between NGOs, academic institutions and many of the region's governments on the need for deepening regional collaboration that helps scale up local efforts around jaguar conservation and replicate best practices within and across the borders of range countries. Innovative approaches, including those in jaguar-livestock conflict, need to be identified, tested and rolled out to promote government and private sector partnerships. Such collaboration can serve as the foundation for a solid and sustained regional effort to secure the ecological health of jaguar landscapes across the species' range.

In the face of shrinking habitat, the increasing human-jaguar conflicts that it brings, and the emerging threat of trade-driven jaguar killings, it is key that organisations, research institutes and governments work in partnership to maximize the impact of their efforts to conserve this unique species across its range. The jaguar is a powerful symbol of Latin American cultural and historical identity, as well as a flagship species for conservation, sustainable development and human well-being in the region.

---

[8] 'A Regional Strategic Framework for Conservation of the Jaguar (*Panthera onca*) in the Americas by 2030', 10th December 2018, Bogotá, Colombia.

4. WWF's JAGUAR STRATEGY 2020-2030

The WWF Jaguar Strategy builds on the strategic elements defined in the JSF, thus defining WWF's specific contribution to that overarching strategy. The main elements of the JSF (scope, conservation targets, viability analysis, threat analysis, vision, goals, strategies) are summarised in **Annex 2.**

4.1 Scope and geographic focus (landscapes)

The scope of the WWF Jaguar Strategy is the same as the scope defined under the JSF, i.e. the jaguar's current area of distribution across 18 Latin American range countries, from northern Mexico and the border with the US (Arizona and New Mexico) to northern Argentina.

The range-wide scope defined for this strategy builds on the concept of umbrella species. The umbrella species concept suggests that conservation planning based on the needs of one species (e.g. habitat, area and connectivity) may benefit co-occurring species (Roberge and Angelstam 2004, Branton and Richardson 2011). Modelling by Thornton et al. (2016) showed that the network of JCUs and jaguar corridors outperformed random networks of protected areas in protecting high-quality habitat and securing large populations for co-occurring mammals.

Given this extensive scope, it is crucial for WWF to focus on those places where we have the best opportunity to deliver long-term viable populations of jaguars. As such, we have selected 15 WWF jaguar landscapes, where we believe we have the best chance of stabilising or increasing jaguar populations. In addition, via more systemic efforts we aim to have a positive impact on the global jaguar population.

4.1.1 Landscape selection process:

A participatory process[9] was conducted to define the WWF priority landscapes[10], using the following criteria for selection:

1. Jaguar conservation relevance: is the proposed landscape located within or in the proximity of the widely recognised Jaguar Conservation Units (JCUs) and/or jaguar corridors?

---

[9]12 WWF country offices were involved in the landscape selection process: WWF-Mexico, WWF-Guatemala/Mesoamerica (covering Guatemala, Belize and Honduras), WWF-Guianas/Guyana office, WWF-Guianas/Suriname office, WWF-Colombia, WWF-Ecuador, WWF-Peru, WWF-Bolivia, WWF-Paraguay, FVSA-Fundación Vida Silvestre Argentina, WWF-Brazil/São Paulo office (Atlantic Forest) and WWF-Brazil/Brasilia office (Brazilian Amazon and Pantanal). Collectively these WWF offices operate in 14 of the 18 jaguar range countries. A WWF Jaguar Advisory Group (JAG) comprised by representatives from WWF-Mexico, WWF-Colombia, WWF-Peru, WWF-UK and the WWF Wildlife Practice provided oversight of the strategy development process and on transboundary issues and range-wide connectivity.

[10]Information initially provided by WWF country offices on proposed priority areas for jaguar conservation was systematised to produce an initial long-list of 30 national-level landscapes (and sites within). As a second step, national-level landscapes located in border regions were merged into transboundary landscapes shared by two or three countries. Most offices proposed between 1-3 WWF jaguar landscapes; Brazil has a larger number of landscapes (6) given its extensive coverage of the jaguar's current range.

2. Connectivity: does the proposed landscape enhance connectivity of jaguar priority areas, either within the landscape itself or with other priority areas? The final list of WWF landscapes should enhance overall range-wide connectivity.

3. WWF capacity / existing partnerships: does the proposed landscape include areas where WWF currently conducts jaguar conservation work, either itself or through partnerships with others, or where WWF plans to work within the next 5 years? Landscapes should build on the strengths of existing WWF work / partnerships, or where there are opportunities for jaguar conservation in the near future.

4. Mosaics: does the proposed landscape include a range of different land-use types (PAs, forest concessions, community-managed reserves etc) that with effective land-use planning and best practice management could become a connected mosaic suitable for long term jaguar persistence?

5. Potential for impact: is there a strong potential for WWF to achieve impacts for jaguars in the proposed landscape within a reasonable time horizon?
practice management could become a connected mosaic suitable for long term jaguar persistence?

The 15 WWF jaguar landscapes outlined below are representative of the continuum of different landscape types within the jaguar range. In regions with high levels of habitat loss and fragmentation, such as Central America and the Atlantic Forest, WWF's work focuses on the remaining patches of habitat, mostly protected areas, with critical efforts to restore connectivity. In moderately converted or relatively intact regions, WWF works both inside and outside JCU/corridor areas. Some WWF offices and/or other organisations are currently conducting reviews of the JCUs originally proposed by Sanderson 2002 in their countries (and later refined by Zeller 2007), including Mexico, Brazil, Argentina and Peru. This strategy takes into account the changes proposed to JCUs by these countries.

4.1.2 WWF Jaguar Priority Landscapes

The 15 WWF Jaguar Landscapes identified in this strategy are located within 5 of the 7 Regions described in the Jaguar Strategic Framework (JSF):

- Region 1: Mexico, Guatemala and Belize
- Region 2: Central America (Honduras, Nicaragua, Costa Rica, western & central Panama)
- Region 4: Amazon (Guianas, Brazilian, Colombian, Venezuelan, Ecuadorian, Peruvian and Bolivian Amazon) and Yungas (Peruvian & Bolivian)
- Region 5: Chaco, Pantanal & Cerrado, and southern Andean Yungas (Argentinean & Bolivian)
- Region 6: Atlantic Forest (eastern Paraguay, northern Argentina, and southeast Brazil)

No landscapes were identified in JSF Region 3 (Northern South America: western Venezuela, eastern Panama, northern & western Colombia, western Ecuador) or JSF Region 7 (Caatinga: northeast Brazil). In JSF Region 2, there is one landscape in Honduras, but no landscapes in Nicaragua, Costa Rica or Panama. In JSF Region 4, no landscapes were identified in the Peruvian[11] and Bolivian Yungas, and in JSF Region 5, no landscapes were identified in the Cerrado or the Southern Andean Yungas (Argentinian and Bolivian).

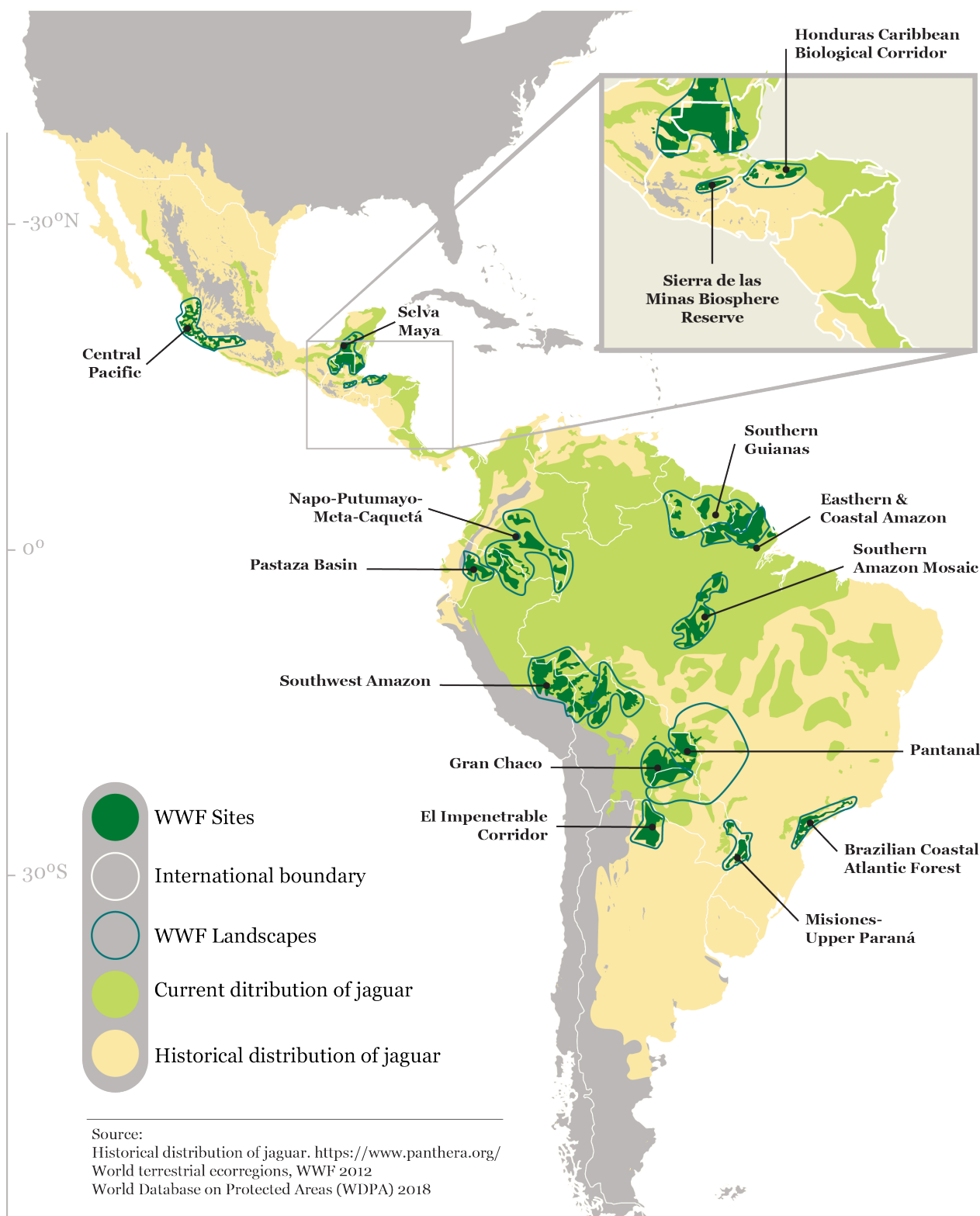Of the 15 WWF Jaguar Landscapes, 7 are transboundary and 8 are national-level (**Figure 3**):

1. SELVA MAYA (transboundary: Mexico, Guatemala, Belize) (part of JSF Region 1)
2. CENTRAL PACIFIC (national: Mexico) (part of JSF Region 1)
3. SIERRA DE LAS MINAS BIOSPHERE RESERVE (national: Guatemala) (part of JSF Region 1)
4. HONDURAS CARIBBEAN BIOLOGICAL CORRIDOR (national: Honduras) (part of JSF Region 2)
5. SOUTHERN GUIANAS (transboundary: Guyana, Suriname, French Guiana) (part of JSF Region 4)
6. SOUTHWEST AMAZON (transboundary: Brazil, Peru, Bolivia) (part of JSF Region 4)
7. EASTERN & COASTAL AMAZON (Amapá) (national: Brazil) (part of JSF Region 4)
8. SOUTHERN AMAZON MOSAIC (Tapajós) (national: Brazil) (part of JSF Region 4)
9. NAPO-PUTUMAYO-META-CAQUETÁ (transboundary: Colombia, Peru, Ecuador) (part of JSF Region 4)
10. PASTAZA BASIN (national: Ecuador) (part of JSF Region 4)
11. GRAN CHACO (transboundary: Bolivia, Paraguay, Argentina) (part of JSF Region 5)
12. EL IMPENETRABLE CORRIDOR (national: Argentina) (part of JSF Region 5)
13. PANTANAL (transboundary: Brazil, Bolivia, Paraguay) (part of JSF Region 5)
14. MISIONES-UPPER PARANÁ (transboundary: Argentina, Brazil, Paraguay) (part of JSF Region 6)
15. BRAZILIAN COASTAL ATLANTIC FOREST (national: Brazil) (part of JSF Region 6)

Both the transboundary and national-level landscapes listed above are critical for delivering jaguar conservation impact. Transboundary landscapes located along the borders of neighbouring countries enhance opportunities for greater collaboration between countries (governments and organisations) and provide synergies with existing transboundary 'programmes', such as Putumayo Tri-nacional (Colombia, Peru, Ecuador), Madre-de-Dios/Acre/Pando MAP (Peru, Brazil, Bolivia), Misiones-Upper Paraná

---

[11]Although no WWF landscapes were identified in the Peruvian Yungas, WWF-Peru is working alongside the government to influence the implementation of the GEF-funded 'National Parks: Peru's Natural Legacy Initiative' (the Peruvian equivalent of the successful Brazilian ARPA protected areas programme), in collaboration with the Moore Foundation and the Andes Amazon Fund (AAF). Work under the initiative includes biological monitoring of jaguars and other priority species in protected areas at the landscape level, including in the Peruvian Yungas.

Atlantic Forest EAP (Argentina, Brazil, Paraguay), and the Selva Maya (Guatemala, Mexico, Belize). However, national-level landscapes are often easier to manage and fundraise for.

A description and detailed map of each WWF jaguar landscape is in **Annex 3** including information on location and size of landscape, specific sites for jaguar conservation within landscapes, status of jaguar populations, relevant JCUs, prey base, threats, conservation efforts by others, and the added value of WWF working in the landscape.

Source:
Historical distribution of jaguar. https://www.panthera.org/
World terrestrial ecorregions, WWF 2012
World Database on Protected Areas (WDPA) 2018

4.2 Vision (2050) and Goals (2030)

The vision and goals of the WWF Jaguar Strategy 2020-2030 have been adapted from the vision statement and goals defined under the JSF, and represent WWF's 'niche' and specific role in delivering that framework.

WWF 2050 Vision for Jaguars

A continental network of priority landscapes that ensures the permanence and recovery of jaguars, their habitats and the ecosystem services they provide, and delivers connectivity within and between jaguar priority areas, whilst also contributing to the sustainable development of people and communities coexisting with jaguars.

WWF Jaguar 2030 Goals

The goals represent the desired future status of jaguars and their habitats over the long-term, and represent the ultimate impacts we hope to achieve.

The below goals in the WWF Jaguar Strategy 2020-2030 derive from the goals defined in the JSF – see Annex 2. The impact of WWF's jaguar conservation strategy will be measured at goal level in terms of population trends of jaguars, jaguar distribution (occupancy), and the availability and connectivity of suitable habitat (including prey) within WWF priority jaguar landscapes (see Section 5 – Implementation and Monitoring).

Goal 1: By 2030, jaguar populations are either increasing or stable in all WWF priority jaguar landscapes, ensuring long term survival, connectivity and genetic flow

Goal 2: By 2030, jaguar distribution, its prey base, suitable habitat[12] and connectivity are either increasing or stable within all WWF priority jaguar[13] landscapes.

---

[12] Given the diversity of habitats used by jaguars and of the variables that determine habitat suitability in each habitat (e.g. vegetation cover, water bodies, protection from poaching), specific metrics will need to developed for individual landscapes for measuring changes to suitable jaguar habitat

[13] Connectivity between sites within landscapes will be established through jaguar-friendly land use alternatives, habitat protection and restoration.

4.3 Objectives

The 5 JSF strategies (described in Annex 3) provide the basis for the identification of Objectives within WWF's Jaguar Strategy 2020-2030.

In order to address the broad range of threats facing jaguars across their geographic range, objectives need to be defined not only for on-the-ground conservation action within the 15 WWF jaguar landscapes, but also at non-landscape-specific (cross-cutting) levels, including at the country (national and sub-national), regional and international levels. This strategy aims to address multiple drivers affecting jaguars and their habitats by influencing behaviours, policy processes, and institutions at these multiple levels. WWF's diversity, global outreach, and extensive expertise in the drivers of biodiversity loss (e.g. finance, governance, markets) gives it unique potential to tackle drivers at multiple levels and maximise its effectiveness across a local to global spectrum.

On-the-ground interventions need to be supported by national and/or sub-national institutions (including at the state/departmental/provincial levels), particularly of those involved in land use planning, coherent and integrated environmental policies and legislations, positive incentives and appropriate financial mechanisms, effective policy implementation, and enforcement of wildlife protection legislation.

At the regional and international levels, these interventions need to be reinforced by international cooperation between range countries and with countries that create demand for jaguar parts, as well as by sufficient and sustained finance.

Using the JSF strategies as a starting point, and building on the approaches, strategies and targets defined in similar jaguar-focused strategic plans[14] , the following 5 objectives have been identified for the WWF Jaguar Strategy 2020-2030:

WWF Objective 1 – Secure jaguar strongholds: protected areas and indigenous lands

WWF Objective 2 – Build connectivity: best practices and jaguar-friendly economic development

WWF Objective 3 – Stop jaguar killings: co-existence, attitude shift, law enforcement and trafficking disruption

WWF Objective 4 – Catalyse cooperation: country-level, range-wide and international political will

WWF Objective 5 – Create enabling conditions: science for evidence-based policies and decisions, public support and funding

Objectives: in a nutshell descriptions
Whilst rooted in the strategic elements (strategies, results chains, theories of change, objectives) of the systematic conservation planning approach that underpins the JSF, the above Objectives also aim

---

[14] Approaches, strategies and targets in similar jaguar-focused strategic plans include the 'pathways' defined in the 2030 Jaguar Roadmap, and the targets defined within existing Jaguar National Action Plans. The strategies and interventions defined in WWF's lion conservation strategy were also a useful reference.

to reflect the role that WWF can fulfil in support of jaguar conservation, by adding value to the collective body of work currently carried out by government institutions and other organisations to protect jaguars, while at the same time drawing on WWF's core institutional strengths (ability to operate at both landscape and global levels; extensive global presence and networks; capacity to secure large-scale long-term funding):

Objective 1 – Secure Jaguar Strongholds[15] : Protected Areas and Indigenous and Community Conserved Areas (ICCAs)[16] - this objective aims to secure jaguar strongholds or source areas by a) strengthening the management effectiveness of existing protected areas through applying a holistic approach to management that reduces threats to jaguars; b) strengthening governance in ICCAs including participatory jaguar monitoring; c) stimulating indigenous; d) stimulating indigenous and traditional communities to maintain or recover the knowledge, cultural beliefs and mythology relating to jaguars; e) maximising opportunities for designation of new protected areas, indigenous lands and community conserved areas within landscapes, focusing new PAs and ICCAs in Key Biodiversity Areas (KBAs) to maximize overall biodiversity impacts; and f) preventing PADDD[17] and de-gazetting of protected areas and ICCAs through advocacy and communications.

This objective will be measured by:
- Ha of jaguar stronghold PAs / ICCAs within WWF jaguar landscapes (and trend over time)
- Number of stronghold PAs / ICCAs within WWF jaguar landscapes reaching management excellence (Conservation Assured certified)
- Number of PADDD events in WWF jaguar landscapes
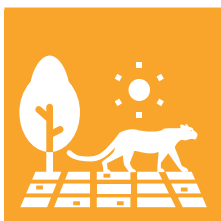
Objective 2 – Build Connectivity: Best Practices and Jaguar-friendly Economic Development – this objective aims to a) implement best practices to achieve jaguar-friendly agriculture and livestock production that reduce human-jaguar conflict; b) advocate for the development of financial mechanisms and incentives that reward farmers and local communities for their commitments to jaguar conservation; c) promote economic alternatives that enhance co-existence between jaguars and local communities/farmers as well as improving their livelihoods (e.g. sustainable timber and NTFP extraction, jaguar-focused ecotourism); and d) promote the creation of jaguar corridors within WWF landscapes through sustainable practices and restoration.

This objective will be measured by:
- Number of WWF Jaguar landscapes with measurably improved connectivity for jaguar and other   biodiversity

---

[15] Jaguar strongholds or source areas tend to be located within Jaguar Conservation Units (JCUs) that include national and sub-national protected areas, indigenous territories, and other land-based conservation areas (e.g. Ramsar sites, community-managed reserves, private reserves, wildlife management areas, UNESCO World Heritage Sites, Man & Biosphere Reserves), either within national/sub-national jurisdictions or forming transboundary mosaics between neighbouring countries.

[16] Indigenous and Community Conserved Areas (ICCAs) are defined by IUCN as 'natural and/or modified ecosystems containing significant biodiversity values and ecological services, voluntarily conserved by (sedentary and mobile) indigenous and local communities, through customary laws or other effective means.'

[17] PADDD stands for 'Protected Area Downsizing, Downgrading and Degazettement'

Objective 3 – Stop Jaguar Killings: Co-existence, Attitude Shift, Law Enforcement and Trafficking Disruption[18] - this objective aims to stop or reduce all types of jaguar killings – precautionary and retaliatory killings (due to fear for human safety and/or conflict with livestock) and poaching for economic gain (through the illegal trade in jaguar parts) – by a) implementing holistic approaches to human-jaguar co-existence such as SAFE systems; b) changing the negative perception of jaguars through uptake of coexistence tools[19] , promotion of forest/jaguar based livelihoods (see Strategic Action 2), and delivery of effective communications; and c) strengthening the capacity of institutions and authorities to enforce wildlife protection legislation and control the illegal trade in jaguar parts, especially in border areas.

This objective will be measured by:

- Number of WWF jaguar landscapes using the SAFE Systems approach
- Levels of HWC and retaliatory killing in WWF jaguar landscapes (or sites within those landscapes if data for the overall landscape is not available)
- Level of illegal trade in jaguar parts, measured by proxies such as effort-corrected seizures
  as necessary.
- Incidences of illegal activities in WWF jaguar landscapes

Objective 4 – Catalyse Cooperation: Country-level, Range-wide and International Political Will - this objective aims to a) build the will and motivation of governments of range countries to implement an inter-governmental agreement that recognises the role of jaguar conservation for maintaining neo-tropical biodiversity, climate stabilising forests and human-wellbeing, and helps to deliver the Jaguar 2030 Roadmap; b) urge destination countries to collaborate with source countries to restrict illegal trade flows of jaguar parts and curb international demand for jaguar, in compliance with national laws and international agreements; and c) increase large-scale and long-term finance.

This objective will be measured by:

- Existence and level of implementation of inter-government agreement
- Number of collaboration agreements and activities between source and destination countries
- Level of large-scale and long-term finance to WWF jaguar landscapes

Objective 5 – Create Enabling Conditions: Science for Evidence-based Policies and Decisions, Public Support and Funding – this objective underpins and reinforces the other four strategic actions and aims to create a supportive environment for jaguar conservation through a) strengthening WWF's convening role to bring together different stakeholders (governments, private sector, civil society) in support of

---

[18] Co-existence, attitude shift and enforcement are also key to reducing human-jaguar conflict, which is covered by Strategic Action 2, whilst the livelihoods element addessed in Strategic Action 2 is also relevant to addressing jaguar killings covered in Strategic Action 3. Rather than repeating objectives in different strategic actions, we have opted to make this somewhat artificial separation between these two strategic actions, but recognise the strong overlaps between them.

[19] Co-existence tools may include for example corrals and fences to keep livestock out of forest areas and other improved livestock management practices that reduce opportunities for jaguars to learn to eat beef and pork

jaguar conservation; b) supporting the development or update of national jaguar action plans; c) advocating for the development of evidence-based policies that recognise the wider role of jaguar conservation for maintaining ecosystems services and supporting livelihoods, and ensures jaguar conservation considerations are incorporated into development and land use planning processes; d) identify KBAs for all taxa and ecosystem types within WWF priority jaguar landscapes, ensure identified KBAs are approved for inclusion in the global KBA database and that corporates and investors take particular effort to avoid impacts on these sites[20] ; e) promote and support strategic multi-stakeholder land-use planning processes in each WWF jaguar landscape; f) building political will at the landscape, national and international levels – including the will of countries outside of range states whose cultural practices impact on jaguar conservation (see Objective 4); g) mobilising public support through inspirational media and educational programmes that build local and international support and foster behavioural change; and h) influence development projects (mining, infrastructure, agroindustry, cattle ranching, logging) and their financiers to adopt social and environmental safeguards that include jaguar conservation requirements.

This objective will be measured by:
- Number of national jaguar action plans in existence, and in effective implementation
- Number of policies and process incorporating the needs of jaguars
- Number of corporates and financial institutions adopting safeguards that strengthen jaguar conservation
- Level of public engagement in jaguar conservation (measured by proxies such as social media activity)

More detail on the milestones and activities leading towards delivery of each of the above objectives is available in Annex 4.

Theory of change

Even though jaguar conservation efforts have been carried out by various organizations and jaguar range governments for several years, the species continues to be endangered and faces increasing threats throughout its range. In order to ensure that jaguar populations are connected and increasing or stable in WWF jaguar landscapes across their range, WWF will adopt interventions at the local-landscape, national and international levels.

---

[20] Many corporates and investors are already accessing the KBA data (via IBAT) and using it in their decision making. KBA Business Guidelines are available here.
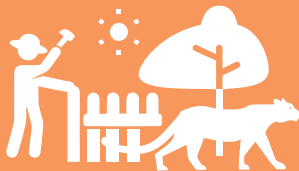
International

Promotion of long-term and large-scale finance for jaguar conservation and international cooperation.

National

Public and private sector engaged and mobilized; jaguar conservation mainstreamed across different sectors.
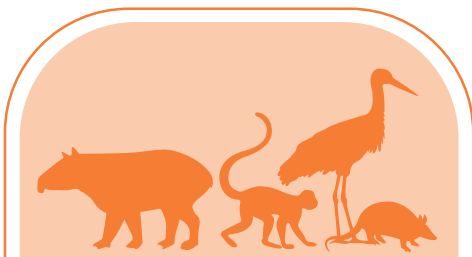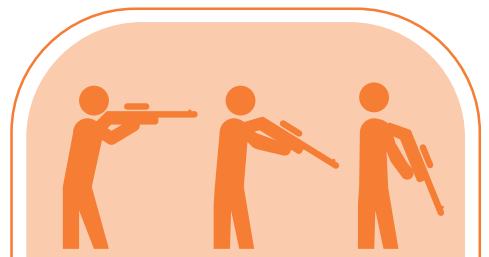
Local-landscape

Promotion of best practices in productive landscapes, and improved management in protected areas.

Increasing suitable habitats

Prey availability will increase

Killings (retaliatory and proactive) will be reduced.

Connected and increasing or stable populations throughout the species range.

4.4 Contribution of WWF Jaguar Strategy to WWF Global Goals and Outcomes

Delivering the goals, objectives and strategic actions of WWF Jaguar Strategy will directly contribute to achieving WWF's Goals and Outcomes. Given that jaguars are an umbrella species with extensive and wide-ranging habitat needs, their conservation results in safeguarding a broad representation of neotropical biodiversity and maintaining climate-stabilising forests and other ecosystems.

The WWF Jaguar Strategy is more closely and directly linked to the delivery of WWF's Wildlife and Forest Practices, as described in **Table 2** below. However, delivery of the strategy will also contribute to WWF's efforts to tackle three major drivers of biodiversity loss: Finance (WWF Jaguar Objective 4.4, 5.6, 5.7), Markets (WWF Jaguar Objectives 2.3, 4.2) and Governance (WWF Jaguar Objectives 2.2, 2.4, 3.1, 3.3, 3.4, 4.1, 4.2, 4.3, 5.2, 5.3, 5.6, 5.7)

Table 2 Contribution of WWF Jaguar Strategy to WWF Global Goals and Outcomes

WWF WILDLIFE PRACTICE	
GOAL: Wildlife thriving: the world's most threatened and ecologically, economically and culturally important species are secure in the wild	
WWF Wildlife Practice Outcomes (2030)	**Contribution of WWF Jaguar Strategy (2030)**
WP1 – Vital habitats conserved: By 2030, protected areas and community conserved areas of high biodiversity value cover at least 30% of the earth and are measurably improved in management and connectivity	By 2030 at least x million ha of protected areas, indigenous territories and community conserved areas within 15 WWF Jaguar Landscapes are effectively protected and managed (WWF Jaguar Milestones 1.1, 1.2, 1.3, 4.3, 4.4, 5.3, 5.6, 5.7)
WP2 – Overexploitation prevented: By 2030, illegal wildlife trade is eliminated and exploitation is reduced to sustainable levels for priority species	By 2030 poaching of jaguars for the illegal trade in jaguar parts and the killing of jaguar prey has been reduced and is close to zero (WWF Jaguar Milestones 3.3, 3.4, 4.1, 4.2, 4.4, 5.4, 5.5, 5.7)

WWF FORESTS PRACTICE

GOAL: A world enriched by extensive, resilient forest landscapes benefiting biodiversity, people and climate.

WWF Forest Practice Outcomes (2030)	Contribution of WWF Jaguar Strategy (2030)
FP1 – 50% of the world's forests are effectively protected or under improved management	By 2030, protected areas, indigenous territories and community conserved areas within 15 WWF Jaguar Landscapes (number of ha for each landscape to be defined) are effectively protected and managed (WWF Jaguar Milestones 1.1, 1.2, 1.3, 4.3, 4.4, 5.3, 5.6, 5.7)
FP2 – Deforestation has been halted	By 2030 the combined effects of best practices in productive activities (livestock, soy, oil palm, timber, tourism), production of 'jaguar-friendly' certified products, stronger law enforcement, inter-governmental agreements that recognise the wider benefits of jaguar conservation (maintaining climate-stabilising forests), and adoption of environmental safeguards by development projects and their financiers will help reduce deforestation (WWF Jaguar Milestones 2.1, 2.3, 3.3, 4.3, 5.3, 5.6)
FP3 – 350 million hectares of forest landscapes are restored	Same contribution as that to WP1 above: By 2030 protected areas, indigenous territories and community conserved areas within 15 WWF Jaguar Landscapes (number of ha for each landscape to be defined) are effectively protected and managed (WWF Jaguar Milestones 1.1, 1.2, 1.3, 4.3, 4.4, 5.3, 5.6, 5.7)

5. IMPLEMENTATION and MONITORING

Range-wide Coordination

Similarly to other WWF species-focused plans and strategies, coordination will require a small Jaguar Regional Core Team including one lead coordinator and staff time for communications and fundraising, as a minimum. In addition to network-wide coordination, the core team's remit would include responsibility for monitoring progress and evaluating the overall impact of WWF's jaguar conservation strategy. The core team would also coordinate fundraising efforts including proposal development, donor liaison, and donor reporting. Even before the strategy was completed, WWF has already been successful in securing jaguar funds for two key landscapes (Selva Maya and Atlantic Forest), and the aim is to continue to seek funding for all WWF jaguar landscapes. In addition, the regional coordination team will need to count on dedicated staff time for oversight and coordination of each of the 5 WWF Objectives (Secure jaguar strongholds; Build connectivity; Stop jaguar killings; Catalyse cooperation; Create enabling conditions). Similar to other large-scale WWF strategies (e.g. WWF's Amazon Freshwater Strategy), staff-time for Strategic Action coordination can be identified from within WWF country offices through cost-recovery mechanisms.

Implementation of WWF Jaguar Landscapes

Each WWF Jaguar Landscape will need a landscape-specific strategy that addresses the specific threats, maximises specific opportunities, is embedded in relevant country-level plans, and is aligned with WWF's jaguar Strategy 2020-2030. Implementation of national-level landscapes and cross-cutting policy and communications work at the national / sub-national levels would be coordinated by the relevant WWF country office, which would liaise with the WWF Jaguar Regional core team for inputs to the range-wide reporting processes. Implementation of transboundary-level landscapes will require the setting up of a small coordination team composed by one or two people from each participating country. Transboundary coordination teams can be chaired by one of the participating countries.

Governance

The WWF Jaguar Strategy is part of LAC's portfolio of Transformational Initiatives (TIs), which are ambitious, large-scale and mostly multi-country efforts – aimed at scaling up our conservation impact in the region. LAC promotes a governance scheme which enables country offices to take the lead in the TIs coordination and implementation, contributing to capacity building and ownership in the region. The portfolio of TIs is overseen by the LAC Management Team (which includes Heads

---

[21] WWF Jaguar Advisory Group to advise on composition of new Jaguar Steering Group. At the minimum, the steering group should include one representative of North/Central America, one representative of the Guianas countries, one representative of the Amazon-Andean countries, one representative of the southern jaguar range countries, one representative of WWF-Brazil, one representative of the WWF LAC, and one representative of the Wildlife Practice.

of Offices and regional staff) with the technical input of the LAC Conservation Cabinet (which includes all Conservation Directors). The Jaguar Initiative was developed jointly by all participating country offices in the LAC region, its coordination has been led by a Jaguar Range Office (WWF Mexico for the moment), and fosters strong coordination with key WWF supporting / donor offices (UK, Germany, Netherlands, US, Belgium, Switzerland, France), the WWF Wildlife Practice Core Team, and the Country Offices Unit (COU) regional staff. WWF's LAC Internal Advisory Board, comprised of representatives of major donor NOs, is another mechanism that can be activated to provide high-level strategic support as needed. Coordination with other Practices (e.g. Forests, Food, Freshwater) and collaboration with relevant ACAIs will be developed in the near future.

Environment and Social Safeguards

The WWF LAC countries involved in the WWF Jaguar Initiative are aligned and comply with the WWF Environmental and Social Safeguards Framework. Under this framework, WWF recognizes that people and nature are inextricably linked and that nature underpins the well-being and development of people, our societies and our economies. And in turn, nature depends on the sound stewardship of people, particularly local communities.

WWF Jaguar Strategy's vision is to create a future where jaguars and their habitats are recovered and sustainable development of people and communities coexisting with jaguars is achieved. In order to attain this ambitious vision, we must act together against the threats that the jaguar ecosystems face. The WWF Jaguar Strategy proposes to work at different levels, from global policy agreements and industry transformations to working directly with people, to support communities and countries sustainably manage the natural resources they depend on and protect those resources against emerging threats, in a way that's good for jaguars and nature alike.

As a founding member of the Conservation and Human Rights Initiative, WWF is committed to respect human rights and to promote rights within the scope of conservation initiatives. Our Environment and Social Safeguards approach converts this commitment into practical, project-level application with the aim of improving the impact and sustainability of our work to protect nature and the people who depend on it. These safeguards guide our work under the WWF Jaguar Initiative as we aim to partner with local rights holders and stakeholders to identify ways that our conservation work can help improve and protect their lives, rights and livelihoods because conservation benefits when people benefit from conservation.

Monitoring

The conservation impact of this strategy will be measured at the Goal level in terms of the numbers of jaguars within key landscapes, and the distribution of jaguars and their prey within functional and connected habitats. Indicators for the five objectives have also been defined below.

Once a conservation strategy has been designed, periodic updates are required to assess success and failure and adapt the plan to prioritize conservation action (Pressey, 2004). Systematic monitoring is essential for assessing the impact of the strategy, whilst also highly dependent on the timely availability of technical and financial resources.

The WWF jaguar coordinator will work with the country offices responsible for each priority landscape to coordinate the monitoring of progress towards achieving the strategy's goals and objectives, and the evaluation of landscape-level conservation impacts. Each landscape will need to develop its own monitoring plan with landscape-specific indicators and baselines. **Table 3** outlines the provisional

indicators for monitoring the implementation and impact of this strategy at the goal level.

For landscape or national level biological monitoring, jaguars are well-suited indicators, given their extensive home ranges and the large areas needed to sustain viable jaguar populations which often extend beyond the area covered by individual protected areas. Some countries are already monitoring biodiversity beyond individual protected areas. For example, the Peruvian protected area system (SINANPE) requires systemic landscape-level monitoring, and through discussions with WWF-Peru, are looking into using jaguars as a suitable species for monitoring at scale in the Peruvian Amazon.

Monitoring jaguar densities, distribution, habitat suitability (including prey abundance) and connectivity will likely involve extrapolation and liaison with partners, as we cannot do surveys in every site within every landscape.

Reliable monitoring of jaguar numbers and habitat in key sites within WWF landscapes is highly dependent on the existence of effective coordination and leadership for each landscape, and on the availability of sufficient and sustained technical and financial resources over the next 5 years (FY20-FY24).

Table 3 Impact indicators of the wwf jaguar strategy

Goals (2030)	Indicators	Means of Verification	2020 Baseline
Goal 1: By 2030, jaguar populations are either increasing or stable in all WWF priority jaguar landscapes, ensuring long term survival, connectivity and genetic flow	• Trends in jaguar densities or population size.	Survey reports of densities or population size of jaguars in key sites within WWF jaguar landscapes	Use existing baseline information in sites within each landscape and develop baselines for sites in remaining landscapes
Goal 2: By 2030, jaguar distribution, its prey base, suitable habitat and connectivity are either increasing or stable within all WWF priority jaguar landscapes	• distribution (occupancy) of jaguars within landscapes • size of suitable jaguar habitat for each landscape • abundance of prey and distribution • suitability of actual and potential corridor areas between sites	Survey reports of jaguar distribution, habitat suitability and connectivity, and prey	Use existing baseline information in sites within each landscape and develop baselines for sites in remaining landscapes

Reporting

The jaguar coordinator will collate office monitoring information and reports to produce an annual technical progress report on WWF's jaguar work. This report will outline delivery against the objectives within the landscapes defined in this strategy. Quantification of jaguar numbers and distribution, habitat suitability and connectivity, and jaguar prey base will take place half way through the strategy timeframe (2025) and again at the end (2030). Landscape coordinators will use a standardised template for reporting and provide annual technical progress reports by July 31st each year as follows

Content	Deadline
Technical progress report*	31st August 2020
Technical progress report**	31st August 2021
Technical progress report*	31st August 2022
Technical progress report*	31st August 2023
Technical progress report***	31st August 2024

* Activities and outcomes against the 5 Objectives for each priority jaguar landscape
** Same as *, but to include baseline figures within each priority landscape as per Table 1
*** Same as *, but to include trends in population and jaguar range figures

Fundraising

In terms of fundraising, the WWF jaguar core team will seek to attract funds both externally and internally in the WWF network, soliciting the support of the WWF fundraising community. The WWF Corporate Engagement Team is currently supporting WWF offices in Latin America to build their capacity for engaging corporates in WWF's jaguar conservation work.

6. COMMUNICATIONS

The purpose of communications within a strategy is to help resolve a problem:
- What do we want to change?
- Who will have to change if we are to achieve our objectives?
- When does change need to happen?

A stakeholder analysis is key to planning and implementing a communications strategy as applied to conservation programmes and plans. Far from just being a list of actors involved in or affected by the delivery of this strategy, the analysis of the stakeholders and actors affected by or driving the reduction of jaguar populations, their habitats and connectivity can help to identify the main elements of a communications strategy for jaguar conservation:

- Who are our target audiences? Federal governments? Local governments? Foreign governments? Farmers? Local communities? Authorities? The general public? The next generation?
- What are the priority issues that need to be communicated? Reduction in numbers of jaguars? Loss of habitat? Lack of cooperation between countries?
- Which solutions need to be highlighted to target audiences? The need for more research? Protected areas? The role of indigenous peoples? Coexistence? Curbing the illegal trade? Cultural identity?

A stakeholder analysis is especially relevant for the delivery of conservation strategies of large carnivores such as jaguars, as often they are at the centre of intense human-wildlife conflict and a source of much heated controversy. Research suggests that social, rather than economic, factors are important reasons for why humans kill jaguars, including fear (Palmera and Barrela, 2007) and group identity (Marchini and MacDonald, 2012). A recent study of the views and perceptions of institutional stakeholders on jaguar conservation issues in the Brazilian states of Goiás and Mato Grosso (Bredin et al. 2015) found that few studies focus on stakeholder attitudes towards jaguar conservation beyond quantifying livestock depredation. Even jaguar national action plans, where they exist, often fail to cover human values or the relationships between people and jaguars (ibid). The same study suggests that insights from other large carnivore conflict situations demonstrate the importance of the political landscape and stakeholder attitudes in carnivore conservation, and concludes that the differences between stakeholders' perspectives and their underlying motivations need to be considered for successful jaguar conservation strategies.

In the context of the WWF Jaguar Strategy, and given its scope, heterogeneity of jaguar habitats, and the diversity of threats at national and sub-national levels, it is recommended that in order to be meaningful, stakeholder analyses be conducted at the level of each individual landscape. Based on these analyses, WWF can design landscape-specific communications strategies that address the 'what' (what problem do we want to resolve in this landscape?), the 'who' (who needs to change, in order for our objectives to be achieved?) and the 'when' (best timings for rolling out communications actions), which might include:

- Communications needs of landscapes (for example, materials for environmental education and community awareness relating to human-jaguar conflict? Campaigns?) – to be defined by offices
- Advocacy communications at national, sub-national and international levels (including campaigns) – to be defined by offices (national/sub-national) and by a WWF Jaguar Strategy core team (international)
- Range-wide communications (including campaigns) at international meetings and global events – to be defined by a WWF Jaguar Strategy core team
- Coordination of jaguar communications to WWF network (jaguar webpage or e-newsletter; social and traditional media content, coordination of lessons learning) – to be carried out by WWF Jaguar Strategy core team

A key principle of landscape-specific communications strategies is 1) offices should share communications materials to maximise lessons learning and use of resources, and 2) they should inform adaptive management of strategies. Communications materials should also support fundraising.

Capacity for jaguar communications: it is recommended that a future jaguar core team include 1.0 or 0.5 FTE for jaguar communications (similar to WWF tiger core team).

7. REFERENCES

Altrichter, M., Boaglio, G., and P. Perovic. (2006). The decline of jaguars Panthera onca in the Argentine Chaco. Oryx, 40(3), 302-309.

Altrichter, M., Taber, A., Beck, H., Reyna-Hurtado, R., Lizarraga, L., Keuroghlian, A. and E.W. Sanderson. (2012). A report of range-wide declines for a key Neotropical ecosystem architect, the White-lipped Peccary. Oryx 46(1): 87-98.

Azevedo, F.C.C. and D.L. Murray. (2007). Spatial organization and food habits of jaguars (*Panthera onca*) in a floodplain forest. Biological Conservation 137: 391-402.

Boron, V., Xofis, P., Link, A., Payan, E. and J. Tzanopoulos. (2018). Conserving predators across agricultural landscapes in Colombia: Habitat use and space partitioning by jaguars, pumas, ocelots and jaguarundis. Oryx, 1-10.

Branton, M. and J. Richardson. (2011). Assessing the Value of the Umbrella-Species Concept for Conservation Planning with Meta-Analysis. Conservation biology 25: 9-20.
Bredin, Y.K., Linnell, J.D.C., Silveira, L., Tôrres, N.M., Jácomoc, A.A. and J.E. Swensona. (2015). Institutional stakeholders' views on jaguar conservation issues in central Brazil. Global Ecology and Conservation 3, 814–823.
Caro T. (2010). Conservation by proxy: indicator, umbrella, keystone, flagship, and other surrogate species. Island Press, Washington, D.C.

Cavalcante, S.M.C. and E.M. Gese. (2010). Kill rates and predation of Jaguars (*Panthera onca*) in the southern Pantanal. Journal of Mammalogy 91: 722-736.

Ceballos, G., Chávez, C., List, R., Zarza, H. and R. Medellín. (2011). Jaguar Conservation and Management in México: Case Studies and Perspectives. Alianza WWF-Telcel / Universidad Nacional Autónoma de México, México.

Ceballos, G., Zarza, H., Chávez, C., and J.F. González-Maya. (2016). Ecology and conservation in Jaguars in Mexico: State of Knowledge and Future Challenge. Pp. 273-289 in: Tropical Conservation: Perspectives on Local and Global Priorities (A.A. Aguirre and R. Sukumar, editors). Oxford University Press, New York, US

Chavez, A. (2009). Public policy and spatial variation in land use and cover in the southeastern Peruvian Amazon. Ph.D. Dissertation, University of Florida, Gainesville.

Chávez, C., Zarza, H., de la Torre, J.A., Medellín, R.A. and G. Ceballos. (2016). Distribución y estado de conservación del Jaguar en México. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Constantino, P.A.L. (2016). Deforestation and hunting effects on wildlife across Amazonian indigenous lands. *Ecology and Society*, 21(2).

Costa, L.P., Leite, Y.L.R., Mendes, S.L. and A.D. Ditchfield. (2005). Mammal conservation in Brazil. Conservation Biology 19: 672-679.

Curtis, P.G., Slay, C.M., Harris, N.L., Tyukavina, A. and M.C. Hansen. (2018). Classifying drivers of global forest loss, Science Vol. 361, Issue 6407, pp. 1108-1111

D'Annunzio, R., Sandker, M., Finegold, Y. and Z. Min. (2015). Projecting global forest area towards 2030. Forest Ecology and Management, Vol. 352, pp. 124-133

De Angelo, C., Paviolo, A., Wiegand, T., Kanagaraj, R. and M.S. Di Bitetti. (2013). Understanding species persistence for defining conservation actions: A management landscape for jaguars in the Atlantic Forest. Biological Conservation 159: 422-433.

de Azevedo, F.C.C., Gomes de Oliveira, T., de Paula, C.R., Bueno de Campos, C., Moraes Jr., E.A., Cavalcanti, S.M.C., et al. (2016). Estatus del Jaguar (*Panthera onca)* en Brasil. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

de la Torre, J.A., González-Maya, J. F., Zarza, H., Ceballos, G. and R.A. Medellín. (2017). The jaguar's spots are darker than they appear: assessing the global conservation status of the jaguar *Panthera onca*. Oryx.

de la Torre, J.A., Ceballos, G., Chavez, C., Zarza, H. and R.A. Medellín. (2016). Prioridades y recomendaciones. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Díaz-Santos, F., Polisar, J., Maffei, L. and F.G. Santos-Díaz. (2016). Avances en el conocimiento de los Jaguares en Nicaragua. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Di Bitetti, M.S., De Angelo, C., Quiroga, V., Altrichter, M., Paviolo, A., Cuyckens, G.A.E. and P.G. Perovic. (2016). Estado de conservación del Jaguar en Argentina. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Espinosa, S., Albuja, L., Tirira, D.G., Zapata-Río, G., Araguillin, E., Ultreras, V. and Andrew, N. (2016). Análisis del estado de conservación del Jaguar en el Ecuador. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Fa, J.E., Peres, C. and J. Meeuwig. (2002). Bushmeat Exploitation in Tropical Forests: an Intercontinental Comparison. Conservation Biology 16: 232-237

FAO & JRC. (2012). Global forest land-use change 1990–2005, by E.J. Lindquist, R. D'Annunzio, A. Gerrand, K. MacDicken, F. Achard, R. Beuchle, A. Brink, H.D. Eva, P. Mayaux, J. San-Miguel-Ayanz and H-J. Stibig. FAO Forestry Paper No. 169. Food and Agriculture Organization of the United Nations and European Commission Joint Research Centre. Rome, FAO.

Foster, R.J., Harmsen, B.J. and C.P. Doncaster. (2010a). Habitat use by sympatric jaguars and pumas across a gradient of human disturbance in Belize. Biotropica 42: 724-731.

Foster, R.J., Harmsen, B.J., Macdonald, D.W., Collins, J., Urbina, Y., Garcia, R. and C.P. Doncaster. (2016). Wild meat: a shared resource amongst people and predators. Oryx 5(1): 63-75.

Foster R.J., Harmsen, B.J., Valdes, B., Pomilla, C. and C.P. Doncaster. (2010b). Food habits of sympatric jaguars and pumas across a gradient of human disturbance. Journal of Zoology 280: 309-318.

Frankham, R. (2005). Stress and adaptation in conservation genetics. J Evol Biol. 18(4):750-5
Fraser, B. (2018). China's lust for jaguar fangs imperils big cats. Nature 555: 13-14.
Furumo, P.R and T.M. Aide (2017). Characterizing commercial oil palm expansion in Latin America: land use change and trade. Environmental Research Letters, Volume 12, Number 2

Galetti, M. and R. Dirzo. (2013). Special Issue: Defaunation's impact in terrestrial tropical ecosystems. Biological Conservtion, Volume 163, 1-130.

García-Anleu, R., McNab, R.B., Polisar, J., Ramos, V.H., Moreira, J., Ponce-Santizo, G., et al. (2016). Estatus del Jaguar en Guatemala, informe del año 2013. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

González-Maya, J.F., Bustamante, A., Moreno, R., Salom-Pérez, R., Tavares, R. and Schipper, J. (2016). Estado de conservación y prioridades para el Jaguar en Costa Rica. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Guggisberg. (1975). Cats of the World. Taplinger Publications Co., New York.

Haag, T., Santos, A.S., Sana, D.A., Morato, R.G., Cullen Jr, L., Crawshaw Jr, P.G., De Angelo, C., Di Bitetti, M.S., Salzano, F.M. and Eizirik, E. (2010). The effect of habitat fragmentation on the genetic structure of a top predator: loss of diversity and high differentiation among remnant populations of Atlantic Forest Jaguars (*Panthera onca*). Molecular Ecology 19(22): 4906-4921.

Hamilton, S.K., Sippel, S.J. and J.M. Melack. (1996). Inundation patterns in the Pantanal wetland of South American determined from passive microwave remote sensing. Archiv für Hydrobiologie 137: 1-23.

Harrison, R.D. (2011). Emptying the Forest: Hunting and the Extirpation of Wildlife from Tropical Nature Reserves. BioScience 61: 919–924.

Hilty, J.A., Lidicker Jr., W.Z. and A.M. Merenlender. (2006). Corridor Ecology: the Science and Practice of Linking Landscapes for Biodiversity Conservation. Island Press, Washington DC.

Hoogesteijn, R., Hoogesteijn, A., Tortaro, F.R., Rampin, L.E., Vilas Boas-Concone, H., May-Junior, J.A. and L. Sartorello. (2016). Conservación de jaguares (*Panthera onca*) fuera de áreas protegidas: turismo de observación de jaguares en propiedades privadas del Pantanal, Brasil. In: Payán-Garrido E, Lasso-Alcalá C, Castaño-Uribe C (eds) Conservación de grandes vertebrados en áreas no protegidas de Colombia, Venezuela y Brasil. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH), Bogota, pp. 259-274.

Hoogesteijn, R. and A. Hoogesteijn. (2008). Conflicts between cattle ranching and large predators in Venezuela: could use of water buffalo facilitate felid conservation? Oryx 42: 132.

Hoogesteijn, R. and A Hoogesteijn. (2011). Estrategias anti-depredación para fincas ganaderas en Latinoamérica: una guía. Campo Grande: Panthera.

Hosonuma, N., Herold, M., De Sy, V., De Fries, R.S., Brockhaus, M., Verchot, L., Angelsen, A. and E. Romijn. (2012). Environ. Res. Lett. 7 044009

ICMBio. (2013). Plano de ação nacional para a conservação da onça-pintada / Arnaud Desdiez ... [et al.]; organizadores Rogério Cunha de Paula, Arnaud Desdiez, Sandra Cavalcanti. (Série Espécies Ameaçadas, 19). Brasília, Instituto Chico Mendes de Conservação da Biodiversidade, ICMBio, 2013. 384 p.

IUCN. (2018). The IUCN Red List of Threatened Species. Version 2018-1. www.iucnredlist.org. (Accessed: 06 September 2018).

Jędrzejewski, W., Robinson, H.S., Abarca, M., Zeller, K.A., Velasquez, G., Paemelaere, E.A.D., Goldberg, J.F., Payan, E., Hoogesteijn, R., Boede, E.O., Schmidt, K., Lampo, M., Viloria, A.L., Carreño, R., Robinson, N., Lukacs, P.M., Nowak, J.J., Salom-Pérez, R., Castañeda, F., Boron, V. and H. Quigley. (2018). Estimating large carnivore populations at global scale based on spatial predictions of density and distribution – Application to the jaguar (*Panthera onca*). PLoS ONE 13(3): e0194719.

Johnson, T. and Van Pelt, B. (2016). Jaguares en el Borde: Evaluación y Perspectivas Conservació del Jaguar Continental. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Jorgenson, J.P. and K.H. Redford. (1993). Humans and big cats as predators in the neotropics. In: Dunstone, N. and Gorman, M.L. (eds), Mammals as Predators, Clarendon Press, Oxford.

Junk, W. J., Nunes da Cunha, C., Wantzen, K. M., Petermann, P., Strüssmann, C., Marquez, M. I. and J. Adis. (2006). Biodiversity and its conservation in the Pantanal of Mato Grosso, Brazil. Aquatic Sciences 68: 278-309.

Keuroghlian, A., Desbiez, A., Reyna-Hurtado, R., Altrichter, M., Beck, H., Taber, A. and J.M.V. Fragoso. (2013). Tayassu pecari. The IUCN Red List of Threatened Species 2013. Available at: http://dx.doi.org/10.2305/IUCN.UK.2013-1.RLTS.T41778A44051115.en. (Accessed: 28 July 2019).

Kurten, E.L. (2013). Cascading effects of contemporaneous defaunation on tropical forest communities. Biological Conservation 163: 22-32.

Leme, E.M.C. (1997). *Canistrum* – Bromeliads of the Atlantic Forest, Salamandra, Rio de Janeiro, pp. 1-107.

Maffei, L., Rumiz, D., Arispe, R., Cuéllar, E. and A. Noss. (2016). Situación del Jaguar en Bolivia. In: eds R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Marchini, S. and D.W. Macdonald. (2012). Predicting ranchers' intention to kill jaguars: case studies in Amazonia and Pantanal. Biological Conservation 147: 213-221.

Marsik, M., Stevens, F. and J. Southworth (2011). Amazon deforestation: Rates and patterns of land cover change and fragmentation in Pando, northern Bolivia, 1986 to 2005. Progress in Physical Geography 35(3): 353-374

Martinez Parda, J., Paviolo, A., Saura, S. and C. De Angelo. (2017). Halting the isolation of jaguars: where to act locally to sustain connectivity in their southernmost population. Animal conservation, ZSL.

Medellín, R.A., Equihua, C., Chetkiewicz, C.B., Crawshaw, P.G., Rabinowitz, A.R., Redford, K.H. et al. (2002) El jaguar en el nuevo milenio. Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Wildlife Conservation Society, Mexico City, Mexico.

Medellín, R.A., de la Torre, J.A., Zarza, H., Chávez, C. and G. Ceballos. (2016). El jaguar en el siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de Mexico.

Mora, J.M., Polisar, J., Portillo, H. and C. Franklin. (2016) Estado del jaguar en Honduras. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Moraes Jr, E. (2012). The status of the jaguar in the Cerrado. CAT news Special:25-28.

Morato, R.G., Connette, G.M., Stabach, J.A., De Paula, R.C., Ferraz, K.M.P.M., Kantek, D.L.Z., Miyazaki, S.S., Pereira, T.D.C., Silva, L.C., Paviolo, A., De Angelo, C., Di Bitetti, M.S., Cruz, P., Lima, F., Cullen, L., Sana, D.A., Ramalho, E.E., Carvalho, M.M., da Silva, M.X., Moraes, M.D.F, Vogliottic, A., May Jr, J.A., Haberfeldo, M., Rampim, L., Sartorello, L.L., Araujo, G.R., Wittemyerr, G., Ribeiro, M.C. and P. Leimgruberb. (2018). Resource selection in an apex predator and variation in response to local landscape characteristics. Biological Conservation 228: 223-240 https://doi.org/10.1016/j.biocon.2018.10.022

Moreno, R., Bustamante, A., Méndez-Carvajal, P. and J. Moreno. (2016). Jaguares (Panthera onca) en Panamá, Estado Actual y Conservación. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Nijhawan, S.A. (2012). Conservation units, priority areas and dispersal corridors for jaguars in Brazil. Cat News Special Issue 7, 43-47.

Noss, A.J., Gardener, B., Maffei, L., Cuéllar, E., Montaño, R., Romero-Muñoz, A., Sollmann, R., O'Connell, A. F. and R. Altwegg. (2012). Comparison of density estimation methods for mammal populations with camera traps in the Kaa-Iya del Gran Chaco landscape. Animal Conservation 15: 527-535

Nowell, K. and P. Jackson. (1996). Wild Cats. Status Survey and Conservation Action Plan. IUCN/SSC Cat Specialist Group, Gland, Switzerland and Cambridge, UK.

Nuñez, M.A. and E. Aliaga-Rossel. (2017). Jaguar fangs trafficking by Chinese in Bolivia. CAT News 65: 50-55

Olsoy, P.J., Zeller, K.A., Hicke, J.A., Quigley, H.B., Rabinowitz, A.R. and D.H. Thornton. (2016). Quantifying the effects of deforestation and fragmentation on a range-wide conservation plan for jaguar. Biological Conservation 203: 8–16

Palmeira, F.B.L. and W. Barrella. (2007). Conflicts caused by predation on domestic livestock by large cats in quilombola communities in the Atlantic Forest. Biota Neotropica 7, 119–128.

Paviolo, A., Cruz, P., Iezzi, M.E., Pardo, J.M., Varela, D., De Angelo, C., ... and Arrabal, J.P. (2018). Barriers, corridors or suitable habitat? Effect of monoculture tree plantations on the habitat use and prey availability for jaguars and pumas in the Atlantic Forest. Forest Ecology and Management 430: 576–586.

Paviolo, A., De Angelo, C.D., Di Blanco, Y.E., and M.S. Di Bitetti. (2008). Jaguar *Panthera onca* population decline in the upper Paraná Atlantic forest of Argentina and Brazil. Oryx, 42(4), 554-561.

Paviolo, A., De Angelo, C., Ferraz, K.M., Morato, R.G., Pardo, J.M., Srbek-Araujo, A.C., ... and M.C. Velázquez. (2016). A biodiversity hotspot losing its top predator: The challenge of jaguar conservation in the Atlantic Forest of South America. Scientific Reports 6: 37147

Payán, E., Carbone, C., Homewood, K., Paemelaere, E., Quigley, H.B. and S. Durant. (2013a). Where will Jaguars roam? The importance of survival in unprotected lands. In: Ruiz-Garcia, M. and Shostell, J. (eds), Molecular Population genetics, Phylogenetics, Evolutionary Biology and Conservation of the Neotropical Carnivores, pp. 603-628. Nova Science, New York.

Payán, E., Castaño-Uribe, C., Gonzalez-Maya, J.F., Valderrama, C., Ruiz-Garcia, M. and C. Soto. (2013b). Distribución y estado de conservación del Jaguar en Colombia. In: Payán, E. and Castaño-Uribe, C (eds), Grandes Felinos de Colombia, pp. 23-36. Panthera Colombia, Fundación Herencia Ambiental Caribe, Conservación Internacional Colombia y Cat Specialist Group UICN/SSC, Bogotá.

Payán, E., Soto, C., Ruiz-García, M., Nijhawan, S., González-Maya, J.F., Valderrama, C. and C. Castaño-Uribe. (2016). Unidades de conservación, conectividad y calidad del hábitat de Jaguar en Colombia. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Pereira-Garbero, R. and A. Sappa. (2016). Historia del Jaguar en Uruguay y la Banda Oriental. In: R.A. Medellín, J.A. de la Torre, H. Zarza, C. Chávez and G. Ceballos (eds), El Jaguar en el Siglo XXI: La Perspectiva Continental, Fondo de Cultura Económica, Universidad Nacional Autónoma de México, Ciudad de México.

Petracca, L.S., Hernández-Potosme, S., Obando-Sampson, L., Salom-Pérez, R., Quigley, H. and H.S. Robinson. (2014). Agricultural encroachment and lack of enforcement threaten connectivity of range-wide jaguar (*Panthera onca*) corridor. Journal for Nature Conservation 22(5): 436-444.

Pressey, R.L. (2004). Conservation Planning and Biodiversity: Assembling the Best Data for the Job. Conservation Biology, 18: 1677-1681. doi:10.1111/j.1523-1739.2004.00434.x

Quigley, H.B. and P.G. Crawshaw Jr. (1992). A conservation plan for the Jaguar Panthera onca in the Pantanal region of Brazil. Biological Conservation 61: 149-157.

Quigley, H., Foster, R., Petracca, L., Payan, E., Salom, R. and B. Harmsen. (2017). Panthera onca (errata version published in 2018). The IUCN Red List of Threatened Species 2017: e.T15953A123791436. http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T15953A50658693.en. Downloaded on 11 May 2019.

Quigley, H., Hoogesteijn, R., Hoogesteijn, A., Foster, R., Payan, E., Corrales, D., Salom-Perez, R. and Y. Urbina. (2015). Observations and preliminary testing of Jaguar depredation reduction techniques in and between core Jaguar populations. PARKS 21.1: 63-72.

Quiroga, V.A., Boaglio, G.I., Noss, A.J. and M.S. Di Bitetti. (2013). Critical population status of the jaguar *Panthera onca* in the Argentine Chaco: camera-trap surveys suggest recent collapse and imminent regional extinction. Oryx 48: 141-148.

Rabinowitz, A. and Zeller, K.A. (2010). A range-wide model of landscape connectivity and conservation for the jaguar, *Panthera onca*. Biological Conservation 143: 939-945

Ramankutty, N. and J. Graesser. (2017). Latin American oil palm follows an unfamiliar route to avoid deforestation. Environmental Research Letters 12 041001

Reuter, A., Maffei, L., Polisar, J. and J. Radachowsky. (2018). Jaguar Hunting and Trafficking in Mesoamerica: Recent Observations. Wildlife Conservation Society, Bronx, New York.

Roberge J-M and P. Angelstam. (2004). Usefulness of the umbrella species concept as a conservation tool. Conservation Biology 18(1): 76-85. DOI: 10.1111/j.1523-1739.2004.00450.x

Robinson, J.G., Redford, K.H. and E.L. Bennett. (1999). Wildlife harvest in logged tropical forests. Science 284: 595-596.

Romero-Muñoz A., Torres R., Noss A.J. et al. (2018). Habitat loss and overhunting synergistically drive the extirpation of jaguars from the Gran Chaco. Divers Distrib. 00: 1-15. https://doi.org/10.1111/ddi.12843

Rumiz D.I., Polisar J y L. Maffei. (2012). Memoria del Taller "El futuro del jaguar en el Gran Chaco". SERNAP, PNANMI, Kaa, Santa Cruz de la Sierra

Sanderson, E.W., Redford, K.H., Chetkiewicz, C.L.B., Medellin, R.A., Rabinowitz, A.R., Robinson, J.G. and A.B. Taber. (2002). Planning to save a species: the jaguar as a model. Conservation Biology, 16(1), 58-72.

Santos, S.A., Pellegrin, A.O., Moraes, A.S., Barros, A.T. M., Comastri Filho, J.A., Sereno, J.R.B., Silva, R.A.M.S. and U.G.P. Abreu. (2002). Sistema de produção de gado de corte do Pantanal. Empresa Brasileira de Pesquisa Agropecuária. Sistemas de Produção 01. Embrapa Pantanal, Corumbá, MS, Brasil. Schiaffino, K., De Angelo, C., Di Bitetti, M., Paviolo, A., Jaramillo, M., Rinas, M., Bertrand, A.-S., Gil Y Carbó, G. and P. Cichero, (Eds.). (2011). Plan de Acción para la Conservación de la Población de Yaguareté (*Panthera onca*) del Corredor Verde de Misiones. Subcomisión Selva Paranaense. Puerto Iguazú: Ministerio de Ecología y Recursos Renovables de Misiones - Administración de Parques Nacionales - Instituto de Biología Subtropical - Fundación Vida Silvestre Argentina

Silva, J.M.C. and Dinnouti, A. 1999. Análise de representatividade das unidades de conservação federais de uso indireto na Floresta Atlântica e Campos Sulinos. In: Conservation International, editor, Workshop Avaliação e Ações Prioritárias para Conservação dos Biomas Floresta Atlântica e Campos Sulinos, São Paulo.

Soisalo, M.K. and Cavalcanti, S.M.C. (2006). Estimating the density of a jaguar population in the Brazilian Pantanal using camera-traps and capture-recapture sampling in combination with GPS radio-telemetry. Biological Conservation 129: 487-496.

Sollmann, R., Torres, N.M. and L. Silveira. (2008). Jaguar conservation in Brazil: the role of protected areas. Cat News 2: 15-20.

SOS Mata Atlântica e INPE. (2014). Atlas dos Remanescentes Florestais da Mata Atlântica, Período 2012-2013, Relatório Técnico, São Paulo. http://mapas.sosma.org.br/

Souza, C., Veríssimo, A., da Silva Costa, A., Reis, R.S., Balieiro, C. e J. Ribeiro. (2006). Dinâmica do desmatamento no estado do Acre. IMAZON, Belém, Brazil.

Taber, A.B., Novaro, A.J., Neris, N. and F.H. Colman. (1997). The food habits of sympatric jaguar and puma in the Paraguayan Chaco. Biotropica, 29(2):204-213.

Thornton, D., Zeller, K., Rondinini, C., Boitani, L., Crooks, K., Burdette, C., Rabinowitz, A. and H. Quigley. (2016). Assessing the umbrella value of a range-wide conservation network for jaguars (Panthera onca). Ecological Applications, 26: 1112–1124.

Tomas, W.M., Mourão, G., Campos, Z., Salis, S. e S.A. Santos. (2009). Intervenções humanas na paisagem e nos habitats do Pantanal. Embrapa Pantanal, Corumbá, MS, Brasil.

U.S. Fish and Wildlife Service. (2018). Jaguar Recovery Plan (Panthera onca). U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, New Mexico.

Wallace, R., Lopez-Strauss, H., Mercado, N. and Z. Porcel. (2013). Diversity, distribution and conservation of Bolivian carnivores. In: Ruiz-Garcia, M. and Shostell, J. (eds), Molecular Population Genetics, Evolutionary Biology and Biological Conservation of the Neotropical Carnivores, pp. 659-709. Nova Science , New York.

Wultsch, C., Caragiulo, A., Dias-Freedman, I., Quigley, H., Rabinowitz, A. and G. Amato. (2016).

Genetic Diversity and Population Structure of Mesoamerican Jaguars (Panthera onca): Implications for Conservation and Management. PLoS One 11(10): e0162377

Zeller, K.A. (2007). Jaguars in the New Millennium Data Set Update: The State of the Jaguar in 2006. Wildlife Conservation Society, Bronx, New York.

Zimmermann, A., Walpole, M. and N. Leader-Williams. (2005). Cattle ranchers' attitudes to conflicts with Jaguars in the Pantanal of Brazil. Oryx 39: 1-7.

ANNEX 1

Countries with jaguar National Action Plans (NAPs)

NAPs Status	Timeframe	Updated?	Progress
Mexico	2009-present	The jaguar is a priority species for the Mexican government, which has developed an Action Program for Jaguar Conservation (PACE for its Spanish acronym). The PACE presents a series of actions, strategies, goals and indicators for the recovery of the species and its habitat across the country. The PACE currently being updated (2018)	Authorities are conducting an evaluation to assess the impact of the Jaguar-PACE since its implementation; evaluation findings will inform adjustments to the programme going forward.
Honduras	2011-2021	Jaguar National Conservation Plan developed in 2011 by the National Institute for Conservation, Forests, Protected Areas and Wildlife (ICF). In need of an update. No coordination committee established	Only partly implemented due to lack of funds. Where NGOs take the lead, there has been progress (Panthera leads on research /monitoring and conflict resolution through agreements with dairy farmers, and WCS works on conflict with ranchers in the Río Plátano Biosphere Reserve, on the border with Nicaragua).
Panama	2011-?	Jaguar Conservation Action Plan published in 2011 by the National Environmental Authority; not time-bound	
Colombia	2006	'National Programme for the Conservation of Wild Cats' was produced in 2006	Plan not being implemented.
Ecuador	2014-2023	10-year National Action Plan for Jaguar Conservation has 5 lines of action: research, landscape connectivity, ex-situ management protocols, local community participation and building of local capacity / education. Plan to be updated in 2020	Evaluation of its effectiveness still pending

Paraguay	2017-2026	10 year jaguar management plan has five lines of action: scientific research, landscape connectivity, ex-situ management protocols, promote local community participation while building local capacity and education. Plan includes step-by-step guidance on using WCS's jaguar-cattle conflict mitigation tool	New government since August 2018
Argentina	2017-undetermined	Jaguars were declared National Natural Monuments (the highest conservation status in Argentina). The National Conservation Plan for the Natural Monument Jaguar was approved in 2017 and includes 8 objectives. The National Conservation Plan is implemented by a multi-stakeholder Management Committee, including government, NGOs and academia, however, no specific budget has been allocated.	The National Plan is complemented by a 3-year Operational Plan (2019 – 2021) focused on five strategies: reduce poaching and road-killings, conserve and connect jaguar habitat, promotion of good practices, legal instruments/law enforcement, and secure proper funding for implementation of the plan. The Operational Plan 2019-2021 is under implementation; it is dependent on stakeholders budgets.
Brazil	2012-2021	Jaguar National Action Plan (NAP) produced in 2012, and Implementation Committee established. NAP was updated to National Action Plan (PAN-Plano de Ação Nacional) for Large Cats in 2018-2022	

ANNEX 2

Jaguar Strategic Framework (JSF): summary

The Jaguar Strategic Framework[22] (JSF) was developed in 2018 by a group of 19 government and non-government organisations through an Open Standards planning process facilitated by WWF.

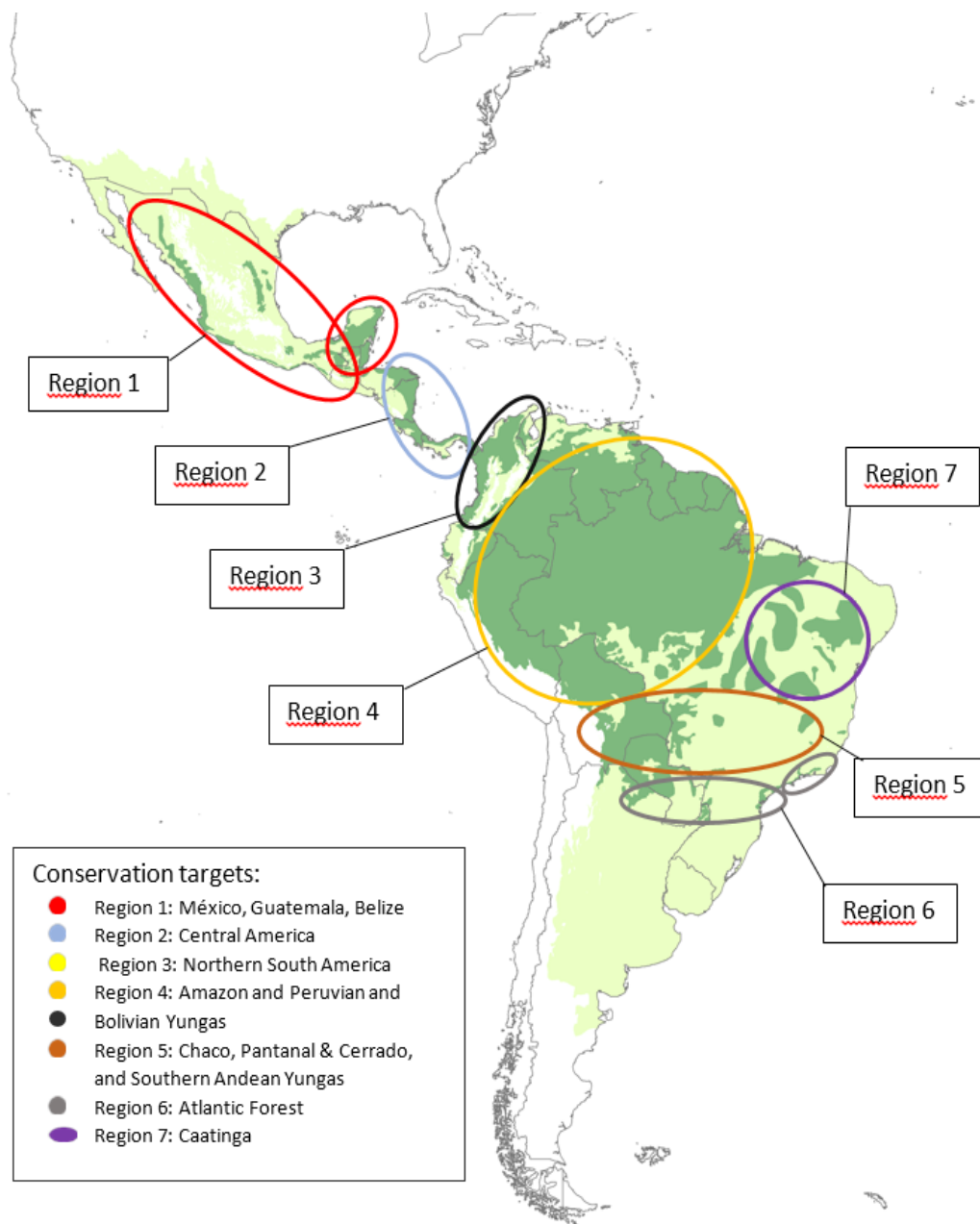The JSF broadly identifies 7 key macro-regions across the 18 range countries as key conservation targets:

Figure 4: Jaguar conservation targets (based on map adapted from Sanderson et al. 2002 and IUCN 2018)

[22]'A Regional Strategic Framework for Conservation of the Jaguar (Panthera onca) in the Americas by 2030', 10th December 2018, Bogotá, Colombia.

A brief description of these regions and the status of their jaguar populations can be found in the JSF document.

A viability analysis was carried out for the 7 macro-regions, producing overall ratings ranging from 'Poor' for Central America and the Atlantic Forest regions to 'Good' for the Amazon region, with the remaining 4 regions being rated as 'Fair'[23]. The analysis was based on 5 key Ecological Attributes (KEAs): population size, population density, abundance of prey, habitat quality-vegetation cover and habitat quality-connectivity.

The threat analysis carried out by the group for the 7 regions identified key threats (in order of severity) which were rated for each region[24] (Figure 5).

Threats / Targets	Region 1: Mexico, Guatemala and Belize	Region 2: Central America	Region 3: Northern South America	Region 4: Amazon	Region 5: Chaco, Pantanal-Cerrado	Region 6: Atlantic Forest	Region 7: Caatinga	Summary Ratings per Threat across all Regions
Human jaguar conflict	High	High	Low	Low	Medium	Very High	High	VERY HIGH
Increased frequency and severity of fires	High	Not specified	Medium	Medium	High	High	Very High	VERY HIGH
Agricultural expansion	High	High	High	High	High	Very High	Medium	VERY HIGH
Hunting of prey	High	High	Medium	Medium	Medium	Very High	High	VERY HIGH
Infrastructure building	High	Not specified	Medium	Medium	Medium	Very High	High	HIGH
Cattle-ranching expansion	High	High	Medium	Medium	High	High	Medium	HIGH
Trade driven poaching	Medium	Medium	Medium	Medium	Low	Medium	Low	MEDIUM
Mining	Low	Not specified	Medium	Medium	Low	Low	High	MEDIUM
Unsustainable Logging	Medium	Not specified	High	Medium	Medium	Low	Medium	MEDIUM
Disease	Low	Low	Low	Low	Low	Low	Low	LOW
Summary Ratings for all Threats per Region / Target	VERY HIGH	HIGH	HIGH	HIGH	HIGH	VERY HIGH	VERY HIGH	VERY HIGH

Figure 5: Summary results of the Threat Analysis for the jaguar conservation targets (Miradi)

[23] The viability ratings assigned in the analysis by the Miradi Viability Scoring System should be interpreted with caution, given the size and heterogeneity of the 7 conservation targets (regions). For example, jaguar population size or population density in the Amazon (Region 4) was assigned an overall rating of Good for the whole region, even though these same attributes, when assessed at a national or sub-national scale within this vast region, may potentially receive a lower rating (e.g. Fair or Poor), or the status of these attributes at a national or sub-national scale may not even be known. Finer scale analysis may yield different scores.

[24] Similarly to the viability analysis, threat ratings need to be interpreted with caution, given the size and heterogeneity of the 7 conservation targets (regions). The ratings assigned to the 3 threat rating criteria (scope, severity, irreversibility) for each target must be considered purely indicative, given that no single threat is 'Very High' (or any other point on the scale) for a particular criterion across an entire region / conservation target. A threat such as trade-driven poaching rated as 'Medium' for Region 4 (Amazon) may be 'Very High' in one part of the region (Bolivia, Peru, Suriname), 'Medium' in another (Brazilian Amazon) and 'Low' in another (Ecuador).

The JSF also includes a conceptual model for the framework to describe the relationships between the targets (regions), threats, opportunities and stakeholders, illustrating the cause-effect relationships that are assumed to exist with respect to the framework's scope.

The framework defined a Vision statement[25], three goals (2030)[26], and a set of objectives and indicative actions (activities) organised under 5 key strategies. These strategies were identified as being key for achieving successful conservation results for jaguar populations across the species' range, regardless of region or country:

JSF Strategy 1: Resilient and Connected Landscapes: aims to secure suitable habitat for healthy jaguar populations through effective public policies that strengthen protected areas, indigenous territories and community-managed areas, integrating them into land use plans that consider climate change and promote resilient and inter-connected landscapes.

JSF Strategy 2: Transboundary Cooperation for Jaguar Conservation: aims to secure an intergovernmental agreement that requires range countries to a) develop coherent national environmental legislation that enshrines their commitments under relevant international conventions to protect endangered species, and b) effectively implement integrated land use plans that recognise the role of jaguar conservation for human well-being and sustainable economic development, empower communities, promote transboundary collaboration and increase investments in conservation.

JSF Strategy 3: Best Practices and Economic Alternatives Compatible with Jaguar Conservation: aims to reduce the negative impacts of conventional agricultural and livestock production on jaguar habitats and their populations, whilst at the same time improving the livelihoods of communities that co-exist with jaguars, through a) promoting best practices amongst farmers and livestock producers, b) advocating for effective public policies, financial mechanisms and incentives for jaguar-friendly agriculture and livestock production, and c) building capacity for alternative productive activities (sustainable timber extraction, NTFPs, ecotourism).

JSF Strategy 4: Zero Poaching: aims to reduce or stop all killings of jaguars (pro-active or retaliatory killings in livestock production areas; poaching for the trade in jaguar body parts; or pre-emptively killings due to fear) through a) strengthening local capacities for enforcement of wildlife legislations, b) the promotion of best practices, c) changing the negative perception of jaguars through effective communication of co-existence tools, d) ensuring local livelihoods improve as a result of benefits and incentives that reward the protection of jaguars and their habitats, and e) curbing international demand for jaguar parts.

JSF Strategy 5: Cultural Value of Jaguar Conservation: aims to support long-term conservation of jaguars through actions that a) enhance the understanding by Latin American societies of the value and social benefits of the ecosystem services associated with the conservation of jaguars and their habi-

---

[25] JSF Vision: *A continental network of landscapes that ensures the permanence and recovery of jaguars, their habitats and the ecosystem services they provide, and that contributes to the sustainable development of the human communities coexisting with them.*

[26] The three JSF goals were derived from the viability assessment of the JSF conservation targets (the 7 regions) against 5 Key Ecological Attributes: Population size, Population density, Abundance of prey, Habitat quality/vegetation cover, and Habitat quality/Connectivity. The 3 JSF goals are:
  • JSF Goal 1: By 2030 jaguar numbers are either increasing or stable in priority landscapes in all seven Regions, ensuring healthy and genetically viable jaguar populations
  • JSF Goal 2: By 2030 good quality jaguar habitat cover (including healthy prey populations) and distribution is either expanding or stable, both across the range and within all priority landscapes
  • JSF Goal 3: By 2030 the connectivity between key jaguar landscapes / JCUs will have been increased through the adoption of jaguar-friendly land use alternatives, habitat protection and restoration

tats, and b) encourage indigenous and other traditional communities to recover the knowledge, cultural beliefs and mythology relating to jaguars.

In the context of the broad over-arching Jaguar Strategic Framework (JSF), these strategies represent the essential strategic toolkit that any institution or organisation committed to conserving jaguars might want to refer to when designing or updating their own jaguar conservation plans and strategies.

The main strategic elements of the JSF (vison, goals, strategies, objectives) form the basis of the WWF Jaguar Strategy 2020-2030.

ANNEX 3
WWF Jaguar Landscapes (descriptions)

1. SELVA MAYA (transboundary: Mexico, Guatemala, Belize)
(part of JSF Region 1: Mexico, Guatemala, Belize)
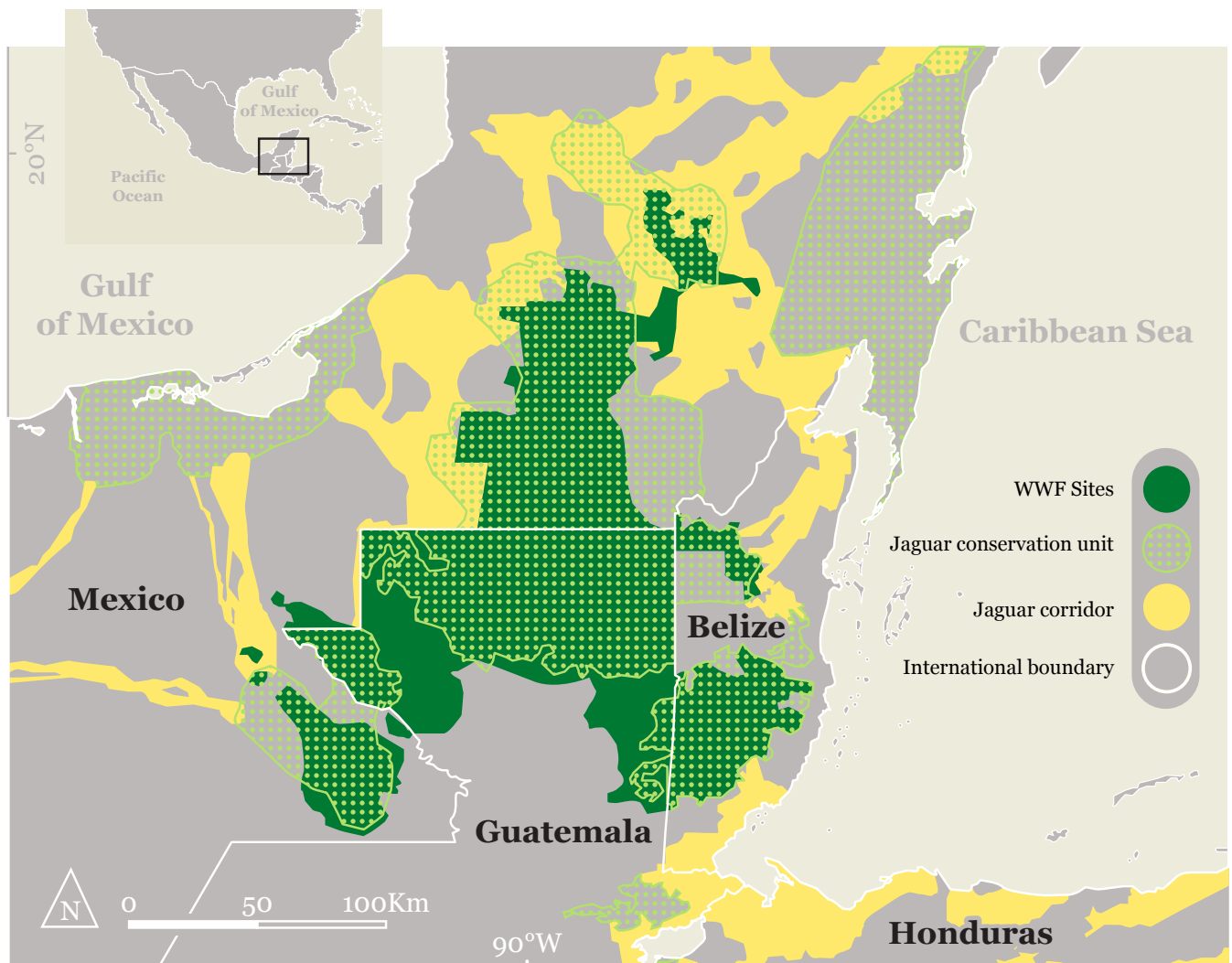
- **Location:** The transboundary Selva Maya landscape is one of the most important ecosystems in the world and is considered the most extensive continuous massif of humid and sub humid tropical forest in Mesoamerica. The two forest blocks within Belize are considered the last jaguar strongholds in the country.
- **Size of landscape:** app. 3 million ha
- **Sites:** this landscape includes the following sites:

  PA/IT on Mexico side:
  › Calakmul Biosphere Reserve, Campeche (720,000 ha)
  › Montes Azules Biosphere Reserve, Chiapas (330,000 ha)
  › Balaan Kaax, Quintana Roo (120,000 ha)

> Balam-Kin, Campeche (99,000 ha)
> Balam-Ku, Campeche (406,000 ha)

PA/IT on Guatemalan side:

> Maya Biosphere Reserve, Petén (2.1M ha); includes Sierra del Lacandón NP, Petén (202,865 ha)

PA/IT on Belize side:

> Belize Biosphera Maya: Rio Bravo-Gallon Jug-Yalbac block (190,000 ha), connecting through the Northern Petén in Guatemala into Southern Mexico (total = 3,100,000 ha)
> Belize Maya Mountains: Chiquibul-Cockscomb block extending to the Golden Stream Corridor (520,000 ha)

- **Jaguar population:** In Mexico, a jaguar population of 4,343 individuals has been estimated (Jedrzejewski et al., 2018) of which approximately 2,000 are believed to occupy the Yucatan Peninsula. Since 2015, at least 40 jaguars have been identified in the Montes Azules Biosphere Reserve (as reported by a WWF-Mexico partner organisation).
- **JCUs:** Selva Maya JCU (4M ha)
- **Threats:** forest fires, illegal logging, retaliatory killing due to conflict with livestock and illegal wildlife trade, as well as cattle ranching; in addition agriculture (oil palm), road construction, human settlements, drug trafficking, mining and oil exploration all contribute to deforestation and habitat fragmentation (Jaguar 2030 Roadmap)[27].
- **Conservation efforts by others (incl. Government interest):** the jaguar is a priority species for the Mexican government, which has developed an Action Program for the Conservation of the Species Panthera onca (PACE from its Spanish initials). The PACE presents a series of actions, strategies, goals, and indicators, to ensure the recovery of the species and its habitat across the country. Currently the PACE is being updated. Environmental agencies from the three countries, various non-governmental and civil society organizations collaborate in the Selva Maya. Community forest concessions in the area are considered successful conservation and development instruments with positive economic and social impacts. They have also achieved significant results in preventing and fighting forest fires (ibid).
- **Added value:** the Yucatan Peninsula is a critical and integral part of the hugely important Selva Maya JCU, and holds the largest jaguar populations in the country. The Selva Maya is the largest uninterrupted tract of humid and subhumid tropical forests in Mesoamerica. WWF-Mexico has recently successfully attracted large-scale funding for jaguar conservation in this landscape and the Atlantic Forest landscapes in the southern boundaries of its range. WWF can make positive contributions to the various existing Mexican fora devoted to jaguar conservation, including Jaguar National Conservation Action Plan (Plan de Acción para la Conservación de la Especies: Jaguar, or PACE Jaguar) implemented by CONANP (Commission of Natural Protected Areas), the National Jaguar Conservation Alliance (Alianza Nacional para la Conservación del Jaguar, or ANCJ) and the Group of Experts (Grupo de Expertos en la Conservación y Manejo Sustentable del Jaguar y otros Felinos Silvestres en México). Through a public-private partnership, the ANCJ produced an updated national strategy that provides direction for the conservation of the species, however, this requires updating (current strategy is based on the protection of populations within 40 legally protected lands and the reduction of conflict in the areas between them).

---

[27] The 'Jaguar 2030 – Conservation Roadmap for the Americas' (working draft, June 2019) is a multi-government plan to conserve jaguars supported by UNDP, Panthera, WCS and WWF.

2. CENTRAL PACIFIC (national: Mexico)
### (part of JSF Region 1: Mexico, Guatemala, Belize)

- **Location:** Mexican Central Pacific
- **Size of landscape:** app. 4.7 million ha
- **Sites:** this landscape includes the following sites:
  - › Manantlán Biosphere Reserve (139,577 ha)
  - › Chamela-Cuixmala Biosphere Reserve (13,141 ha)
  - › Marismas Nacionales Biosphere Reserve (133,854 ha)
- **Jaguar population:** : the Central Pacific Landscape holds the second largest jaguar population in Mexico, with more than 500 individuals (Zeller, 2007). For Marismas Nacionales Biosphere Reserve, in 2015, the density of jaguars was estimated as 4.5 ind per 100 km2 in 2013. This density is similar to that of sites like Chamela-Cuixmala (5.4 ind per 100 km2). On the other hand, the abundance of jaguars has been estimated between 17 and 120 individuals.
- **JCUs:** Jalisco
- **Prey:** peccaries, white tailed deer, armadillos, coatis, tlacuaches, tapir, ocelots, birds (pavo ocelado, ocofaisan); it sometimes preys on caimans, boa, iguanas, turtles and fish.
  The abundance of jaguar prey is estimated as low for the Marismas Nacionales Biosphere Reserve.
- **Threats:** Urgent to begin conservation efforts as there's rapid habitat loss and degradation. The Jalisco JCU is an important area of potential jaguar habitat; however, high human population densities

heavily affect this area, and the protected area of the Sierra de Manantlán alone is too small to support a stable population of jaguars.

- **Conservation efforts by others (incl. Government interest):** the jaguar is a priority species for the Mexican government, which has developed an Action Program for the Conservation of the Species *Panthera onca* (PACE from its Spanish initials). The PACE presents a series of actions, strategies, goals, and indicators, to ensure the recovery of the species and its habitat across the country. Currently the PACE is being updated.
- **Added value:** Mexico contains 69% of the total area of Central American jaguar corridors, of which less than 3% is protected. This landscape is key to facilitate connection between southwest and northwest of Mexico. As Mexico is the current northern edge of jaguar range, it provides the only possible link to re-establishing a population in the USA. Bringing more forested sections of jaguar corridors under official protection in Mexico would be highly beneficial (Olsoy et al. 2016).

3. SIERRA DE LAS MINAS BIOSPHERE RESERVE (national: Guatemala)
(part of JSF Region 1: Mexico, Guatemala, Belize)
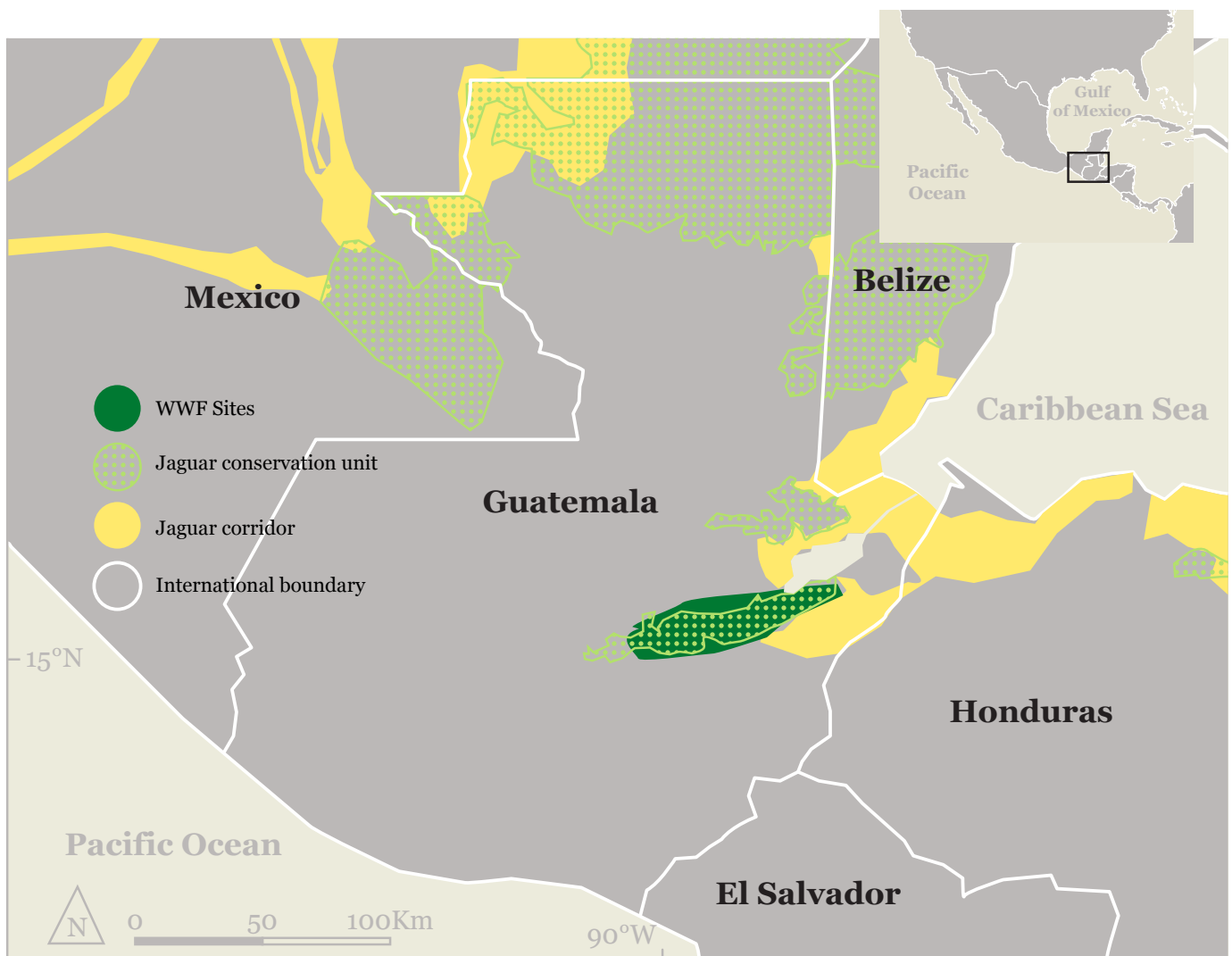
- **Location:** a mountain range in the southeast of Guatemala that extends over four departments: Baja Verapuz, Alta Verapuz, El Progeso Zacapa and Izabal
- **Size of landscape:** 250,000 ha
- **Sites:** this landscape includes the following sites:
  › Sierra de las Minas Biosphere Reserve (250,000 ha)
- **Jaguar population:** Country-level estimated jaguar population is approximately 1,000 individuals (Jędrzejewski et al. 2018). Status in the Sierra de las Minas JCU not clear.
- **JCUs:** Sierra de las Minas JCU
- **Threats:** forest fires, deforestation, habitat fragmentation, jaguar-human conflict
- **Conservation efforts by others (incl. Government interest):**
- **Added value:** Defenders of Nature Foundation (FDN-Fundación Defensores de la Naturaleza) is the co-manager of the Sierra de las Minas protected area and has been a partner of WWF in this Sierra for more than 10 years. As manager of the protected area, FDN is in charge of its management and monitoring. FDN monitors jaguars in the Sierra de las Minas with camera traps. For FDN, WWF has brought added value in managing the PA by using a landscape approach based on watersheds. This has led to improved governance in the watershed, as well as to the establishment of a monitoring and evaluation matrix with jaguars as an indicator of watershed health. WWF has provided scientific and technical information to elaborate and implement the integrated management plan.

4. HONDURAS CARIBBEAN BIOLOGICAL CORRIDOR (national: Honduras)
   (part of JSF Region 2: Central America)
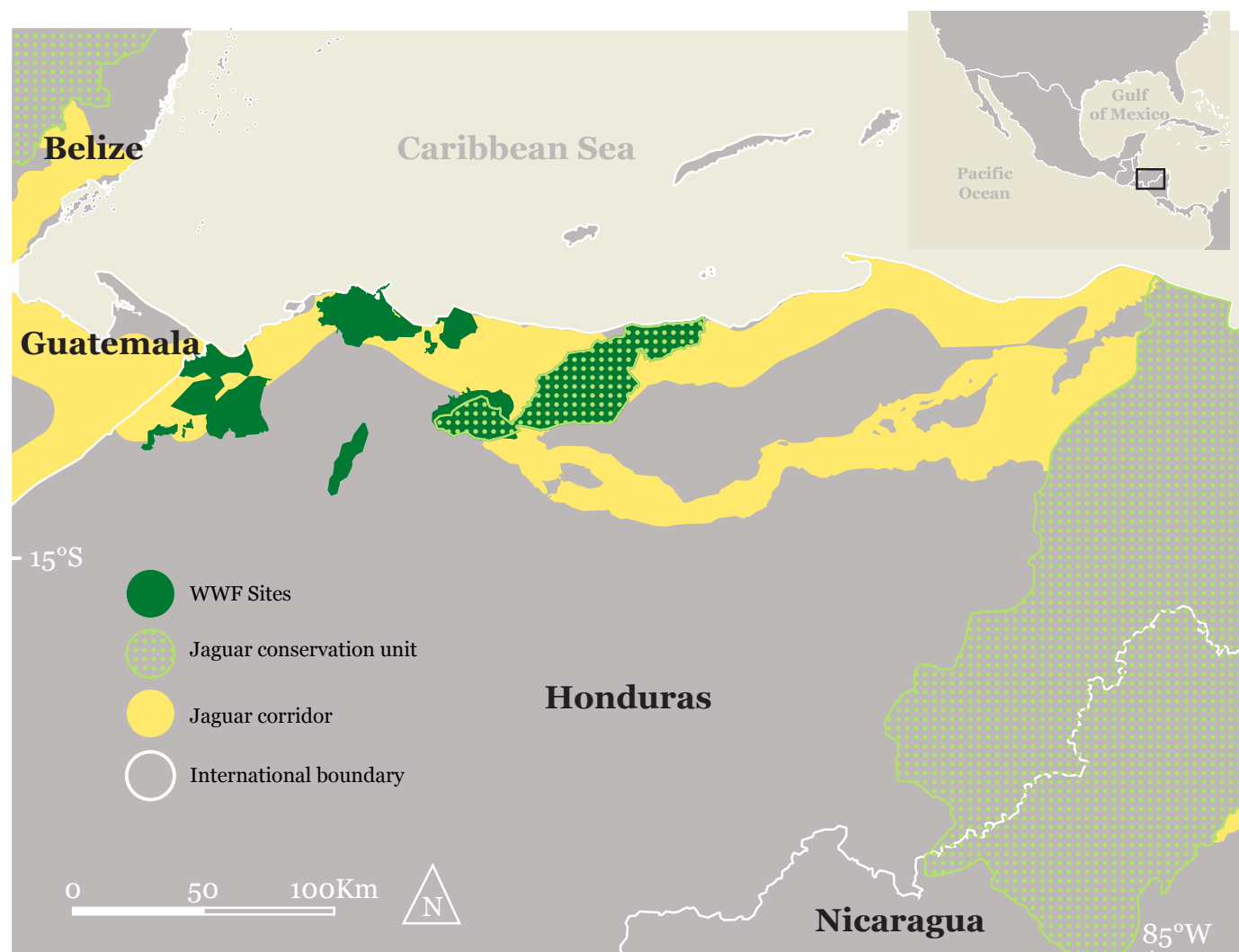
- **Location:** this landscape cover extends over the northwester coast of Honduras covering several JCUs in two major mountain ranges: Sierra del Merendón (a biological corridor between Guatemala and northern Honduras) and Sierra Nombre de Dios (northern coast of Honduras).
- **Total size of landscape:** (TBC)
- **Sites:** this landscape includes the following sites:
  › Zona Reserva El Merendón (40,000 ha)
  › Cusuco NP (23,000 ha)
  › Cuyamel Omoa NP (30,000 ha)
  › Parque Nacional Pico Bonito (56,000 ha) – Honduras largest NP
  › Parque Nacional Nombre de Dios (27,000 ha)
  › Blanca Jeanette Kawas-Punta Sal (78,400 ha)
  › Montaña de Mico Quemado y las Guanchias Ecological Reserve (29,000 ha)
- **Jaguar population:** Country-level jaguar population is approximately 1,200 individuals (Jędrzejewski et al. 2018)
- **JCUs:** Sierra Nombre de Dios JCU
- **Conservation efforts by others (incl. Government interest):**

- **Added value:**

›Sierra del Merendón has been identified as a 'genetic bottleneck' for the genetic diversity and population structure of Mesoamerican jaguar populations (Wultsch et al. 2016) which threatens jaguars in the region due to a pronounced genetic sub-division amongst its populations. WWF's added value in this landscape is its integrated river basin management approach, which strengthens governance and provides scientifically-based and technically-sound information for decision-making, including camera-trap monitoring data on jaguars and their prey, which are used as indicators of healthy catchments and 'high conservation value' areas (HCVs). WWF has supported best practice in sustainable agriculture programmes in the region for many years, including the establishment of crops that facilitate biological connectivity (e.g. sugar cane and oil palm) with added value gained from WWF's experience of influencing the private sector to adopt more sustainable practices in corridor areas used by jaguars. Another example of WWF added value is the establishment of the Alliance for Water Security of San Pedro Sula and development of community-based sustainable tourism initiatives in the Merendón Reserve Zone, which engages local residents in biological monitoring of jaguars and their prey, and environmental education.

›Sierra Nombre de Dios overlaps with the JCU of the same name and is home to a genetically-distinct jaguar population from that of the Selva Maya (Wultsch et al. 2016). WWF is the main institutional presence in this landscape, and is supporting a network of community-based eco-tourism initiatives in protected areas in the region, through facilitating access to the eco-tourism market and promoting best practice in sustainable tourism. Similarly to the Merendón landscape, for many years WWF has used the catchment management model as a conservation approach that benefits jaguars and their habitat, and has supported sustainable agriculture practices (oil palm) that increase connectivity in corridor areas through private sector engagement.

5. SOUTHERN GUIANAS LANDSCAPE (transboundary: Guyana, Suriname, French Guiana) (part of JSF Region 4: Amazon)
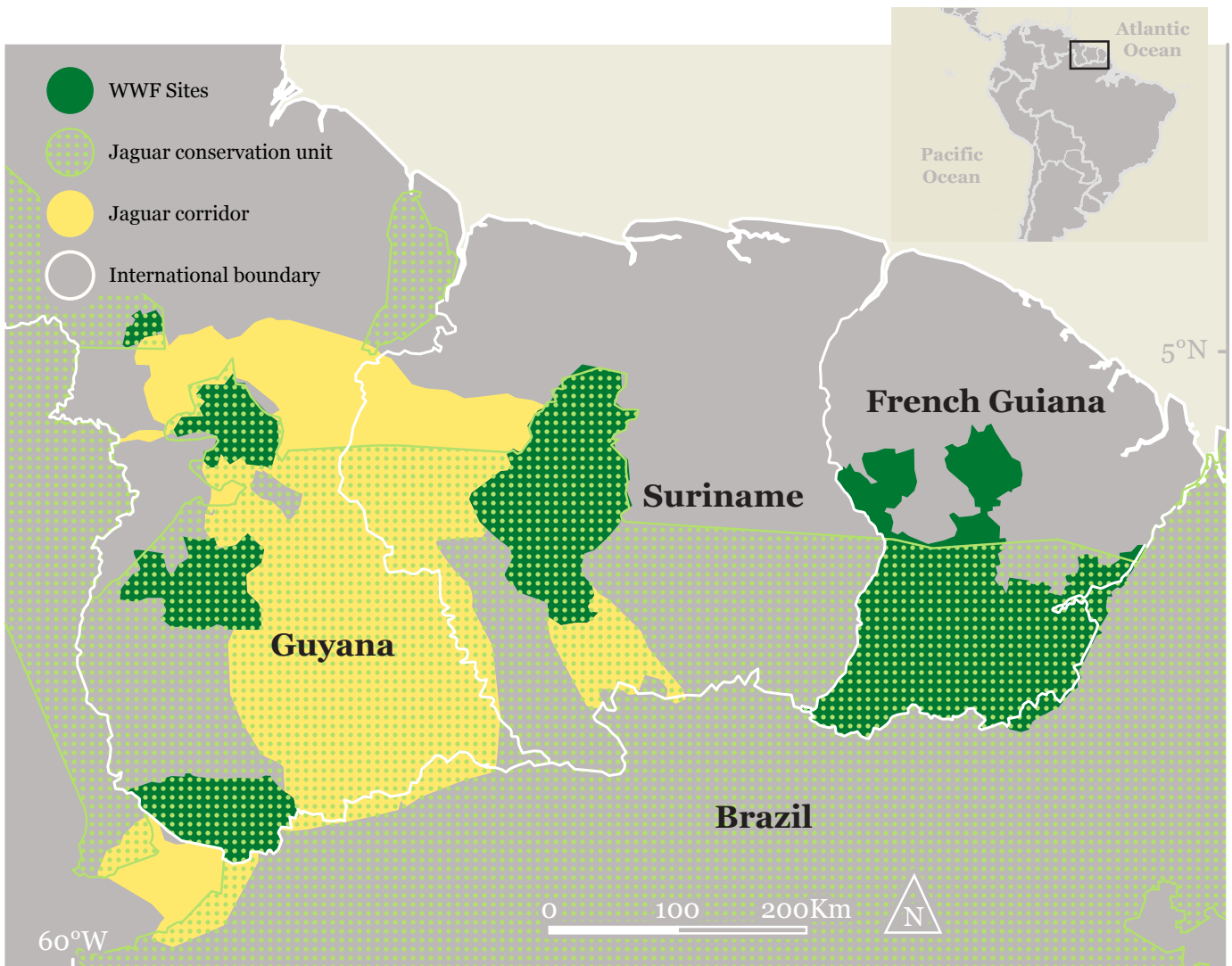
- **Location:** The Guianas are located in the north-eastern part of South America, along the Atlantic coastline and sits within the Guiana Shield region, a 1.7 billion year old Precambrian geological formation. The Shield is one of the regions of highest biodiversity in the world. It consists of three formations: 1) Guiana Highlands, 2) Tumucumaque Uplands, and 3) Chiribiquete Plateau. The region has year-round humid tropical climate, with 80-90 percent still covered by pristine dense tropical forests.
- **Total size of landscape (3 countries):** TBC
- **Sites:** this landscape includes the following sites:

PA/IT on Guyana side[28] (total Guyana PAs: 1.7 million ha):

› Kaietur NP (62,000 ha)
› Kanuku Mountains Protected Area (611,000 ha)
› Iwokrama Wilderness Reserve/Managed Resource Use Area (371,700 ha)
› Kanashen Community-Owned Conservation Area (625,000 ha)

---

[28] In Guyana, Indigenous communities are associated with each protected area within the landscape – located either within or adjacent to protected areas. Legislation guarantees the traditional rights of local communities to utilise resources in protected areas. The Kanashen COCA consists entirely of titled community lands and is the first indigenous protected area in Guyana's National Protected Area System. Within southern Guyana there are numerous mining and forestry concessions. These are located outside protected areas and in most cases outside indigenous titled lands.

PA/IT on Suriname side:

› South Suriname Conservation Corridor (SSCC) (7.2M ha) – red contour on map

› Central Suriname Nature Reserve 1.6M ha (also a UNESCO World Heritage Site)

PA/IT on French Guiana side:

› Parc Amazonien de Guyane – France's largest national park

- **Jaguar population:** estimated jaguar populations in Guyana = 4,000 individuals; Suriname = 3,000 individuals; and French Guiana = 1,600 individuals (Jędrzejewski et al. 2018)

- **JCUs:** (name TBC)

- **Prey:** the jaguar, a keystone species, plays an important role in keeping prey populations in their natural habitat within optimum levels of carrying capacity. With the reduction in jaguar populations, prey species, mainly herbivores, are likely to have increasingly negative impacts on the agricultural crops planted by the villagers adjacent to the forest, leading to human-jaguar conflict and potentially food security issues. To ensure that a healthy jaguar-prey-community livelihood relationship is maintained in these ecosystems, surveys of the status of jaguar populations and their prey in these areas are required. This knowledge is necessary to develop an effective conservation strategy for the jaguar, other wild cat species and their prey in South Suriname.

- **Threats:** Jaguar populations in Suriname and French Guiana are threatened by the illegal trade in jaguars and jaguar products, especially in gold mining and logging areas. It is likely that Guyana is also involved in trade but to what extent is not known. In Suriname and Guyana, additional threats include habitat fragmentation / loss associated with small and medium scale gold mining, expansion of large-scale agriculture, and retaliatory killings resulting from human-jaguar killings, along with an increase in forest concessions and mining areas (not all legal) that open access routes to forest areas.

- **Conservation efforts by others (incl. Government interest):** In Guyana, the Wildlife Management and Conservation Commission is working towards developing a plan to address human-jaguar conflict. A response team has been established but requires resources to adequately respond to reports of conflict. In Suriname, a collaborative partnership is being set up to deliver a data gathering project (2019-2021) to inform the development of a jaguar conservation strategy in southern Suriname, including a community-based monitoring program that will enable local communities to make informed sustainable resource use decisions. This effort will contribute to Suriname's National Biodiversity Strategy/ National Biodiversity Action Plan (NBS/NBAP). This NGO-government partnership includes WWF, the National Zoological Collection of Suriname/Center for Environmental Research (NZCS/ CMO), the National Herbarium of Suriname (BBS) and the Amazon Conservation Team Suriname (ACT-Suriname). The project will a) estimate the abundance of jaguars in 5 indigenous villages (Sipaliwini, Kwamalasamutu, Alalapadu, Curuni and Amatopo) within the Curuni-Luci watershed in South Suriname; b) assess prey preference of jaguars through scat analyses (NZCS/CMO); c) assess prey availability; and d) describe jaguar habitat preference. WWF will supply data from the survey to the larger initiative, and support awareness activities. This project is unique in its collaborative partnership arrangement involving NGOs, government academic institutions and local communities who will be working together to conserve jaguars in this region. Through the results of this cooperation, Suriname can contribute to ongoing regional jaguar conservation activities (e.g. Panthera's jaguar conservation programme) and could potentially unlock broader sustained finance for jaguars in Suriname.

- **Added value:** jaguar conservation is receiving stronger focus in Guyana and Suriname, as threats now becoming more apparent. Governments in both countries have committed to doing more to ensure that the jaguars and their habitats remain healthy and viable, but resource constraints are preventing actions from being implemented at the scale necessary. WWF can help plug resource constraints and maximise the opportunities provided by increasing political will. Apart from activities done by government, few organisations are directly focused on addressing threats to jaguars, or raising

awareness on the issue. WWF Guianas has extended its strategic focus to include jaguar conservation in its new 2024 Strategic Plan, and are working towards ensuring that JCUs and corridors are prioritised for conservation, and supported by national and sub-national land use policies and plans. This will be achieved through interventions implemented in partnership with local communities, CSOs, academia and other stakeholder groups over the next 5 years, including:

› Conduct population surveys and assess habitat health in the south Suriname and Guyana landscape

› Assess the status and magnitude of the illegal trade in jaguar parts in the Guianas

› Implement awareness and advocacy campaigns for jaguar protection and around human wildlife conflict.

› In addition, in Suriname, WWF will use the baseline data from the collaborative jaguar conservation partnership described above to initiate a process to develop a Jaguar Action Plan for Suriname by bringing together different parties involved in different jaguar conservation actions. WWF will also run a Jaguar Campaign (awareness).

6. SOUTHWEST AMAZON (transboundary: Brazil, Peru, Bolivia)
(part of JSF Region 4: Amazon)
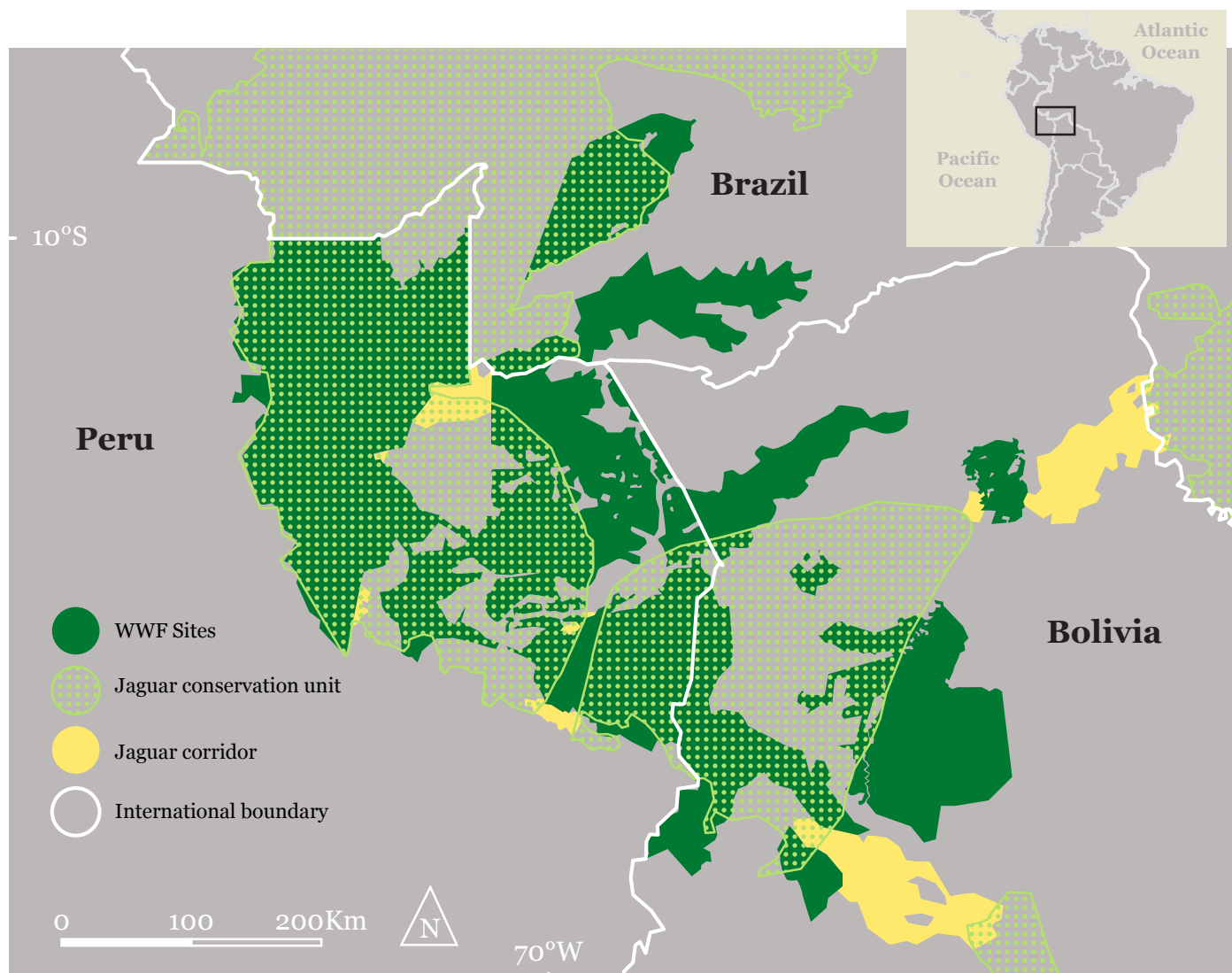
- **Location:** The border region of Madre de Dios (Peru), Acre (Brazil) and Pando (Bolivia) is known as the MAP region, located in the Southwest Amazon. In this region, nearly one-third of its lowland wet tropical forests are owned or managed by local communities, whose livelihoods are based on the extraction of Brazil nuts (*Bertholletia excelsa*), the most important non-timber forest product (NTFP) in the region.
- **Size of landscape:** total size = app 31 million ha (includes MAP transboundary initiative)
- **Sites:** this landscape includes the following sites:

On the Brazil side (Acre state):
› Chico Mendes Extractive Reserve, Acre (1M ha)
› Cazumbá-Iracema Extractive Reserve (754,987 ha)
› Serra do Divisor NP (846,300 ha)

On the Peru side (Madre de Dios and Ucayali Departments):
› Purus Communal Reserve (Ucayali) (202,033 ha)
› Purus National Park (2,510,694 ha)
› Forest concessions Tahuamanu (MDD) (~500,000 ha)
› Amarakaeri Communal Reserve (MDD) – includes areas of Peruvian Yungas (402,335 ha)
› Conservation corridor of Manu-Tambopata (MDD) (210,000 ha)

- › Tambopata National Reserve (includes areas of Bolivian Yungas) (MDD) (274,690 ha)
- › Bahuaja-Sonene NP (MDD) – includes some areas of the Peruvian Yungas (1,091,416 ha)

On the Bolivia side:

- › Manuripe Wildlife Reserve (747,000 ha)
- › Madidi National Park and Madidi Integrated Management Natural Area (1,895,000 ha)
- › TCO Tacana I Native Community Land (partial overlap with Madidi NP/IMNA)

- **Jaguar population:** status of jaguar populations in the landscape not known.[29]
- **JCUs:** (names TBC)
- **Threats:** Construction of the Interoceanic Highway, an extension of the Brazilian BR-317 into Peru and Bolivia, is changing conditions in this formerly remote region, by providing regional access to Pacific ports. In Acre, forest conversion has been rapid, extensive, and largely driven by establishment of cattle ranches (Souza et al. 2006). In Madre de Dios, the deforestation process has been slower and patchier than in Acre, and dominated by small farms, although recent paving has concentrated land ownership and increased deforestation (Chavez 2009). In Pando, deforestation has been minimal, with most land conversion occurring in close proximity to population centers and along the Brazilian border (Marsik et al. 2011).
- **Conservation efforts by others (incl. Government interest):**
- **Added value:**

On the Brazil side (Acre state):

› Major route for wildlife trafficking; of critical importance given the recent spike in the illegal trade in jaguar parts in Bolivia. WWF has been working here for many years, strong partnerships, and synergies with other ongoing projects. WWF can also add value through improving knowledge on jaguar populations in the region (very little knowledge at present).

On the Peru side (Madre de Dios Department):

› Conservation assured jaguar-friendly productive systems: WWF-Peru has many years of working on jaguar conservation within FSC certified forest concessions

› The only available baselines for jaguar monitoring in the Madre de Dios Department were defined inside forest concessions and in the Los Amigos conservation concession

› FSC certified forest concessions are ideal environments for long-term monitoring of jaguar populations as they include networks of tracks which are key in ensuring jaguar detection, as well as being of interest to concession owners

› Some protected areas (e.g. Tambopata National Reserve) have selected the jaguar as a key species for biological monitoring. In the specific case of Tambopata NR there is clear added value from long-term monitoring of jaguars within the Brazil nut management areas of the reserve, given that this is an economically important export product for Madre de Dios and Peru, which enhances local livelihoods whilst at the same time contributing to jaguar conservation in the long-term

› Both Brazil nut production areas and FSC certified forest concessions are well-suited for long-term jaguar monitoring within productive systems, as they generate economic returns for both local communities (Brazil nut extraction) and the private sector (concessions) whilst at the same time benefitting jaguars

› The Madre de Dios Department is likely a trafficking route for jaguars and their parts due to demand in Bolivia

---

[29] Estimates for jaguar populations in Brazil or in transboundary areas that include Brazil are difficult, as existing estimates are at the country level. Brazil holds the largest jaguar population (86,000 individuals). Jaguars occur over all recognized Brazilian biomes, with Amazonia providing not just a national core population but also a regionally significant core population. Additional populations are spread throughout the country in Caatinga, Cerrado, Atlantic Forest and Pantanal biomes.

On the Bolivia side (Pando Department):

› Manuripe protected area of national interest and a priority for WWF

› WWF-Bolivia has worked in the area for 17 years, and as a result the institutional relationship with park managers is strong and relations with local communities is trustful

› The park has one of the largest jaguar densities in Bolivia

› A jaguar focus on this area helps to strengthen and consolidate the MAP transboundary initiative (Madre de Dios-Acre-Pando), a priority for the WWF network

› Enhances connectivity for jaguars due to potential corridor connecting Manuripe Wildlife Reserve with Madidi NP and TCO Tacana II Native Community Land

› An important region for Brazil nut and 'açaí' palm collectors, this area demonstrates the value to local economies of keeping the forest standing and protecting its wildlife

7. EASTERN & COASTAL AMAZON (Amapá) (national: Brazil)
## (part of JSF Region 4: Amazon)
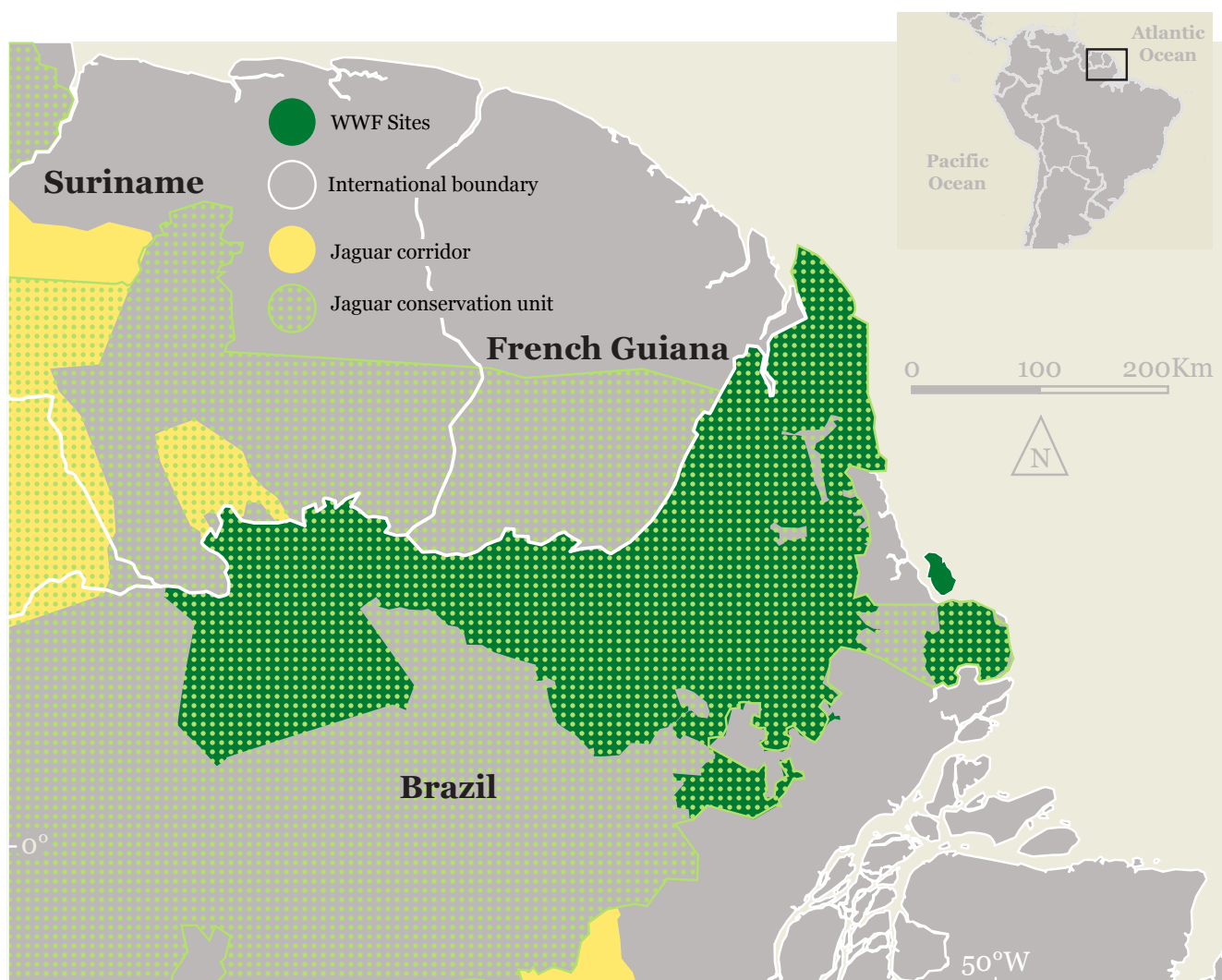
- **Location:** this landscape is part of the Guiana Shield ecoregion. Covering over 250 million hectares, the ecoregion comprises a vast forested region with huge diversity of ecosystems, endemic species and an immensurable natural capital. Its global importance as provider of ecosystems services including climate regulation, carbon storage and production of freshwater have lead WWF to recognise this region as a priority area for conservation. This mosaic of protected areas (including both state and federal protected areas) and indigenous territories is threatened by agricultural expansion, weak territorial governance, and incentives for unsustainable productive activities.
- **Size of landscape:** 6.5 million ha
- **Sites:** this landscape includes the following sites:
- **Amapá Eastern Amazon Mosaic:**
  › Montanhas do Tumucumaque NP? (3.9 million ha)
  › Amapá National Forest (412,000 ha)
  › Waiãpi Indigenous Territory (607,000 ha)
  › Uaçá Indigenous Territory (470,000 ha)
- **Amapá Coastal Amazon:**
  › Cabo Orange NP (619,000 ha)
  › Lago Piratuba Biological Reserve (357,000 ha)
  › Maracá-Jipioca Ecological Station (72,000 ha)

- **Jaguar population:** estimated jaguar populations in this landscape not known[30]
- **JCUs:** "JCU1" (Nijhawan 2012)
- **Threats:** TBC
- **Conservation efforts by others (incl. Government interest):**
- **Added value:** despite being a major biological corridor with protected areas and indigenous territories covering over half of Amapá state, there has been a marked increase of human-jaguar conflict in this region. There is virtually no information on jaguar populations in the region, a gap which WWF is starting to plug at present. Another added value is WWF's planned work in indigenous territories in the region.

---

[30] Estimates for jaguar populations in in Brazil or in transboundary areas that include Brazil are difficult, as existing estimates are at the country level. Brazil holds the largest jaguar population (86,000 individuals). Jaguars occur over all recognized Brazilian biomes, with Amazonia providing not just a national core population but also a regionally significant core population. Additional populations are spread throughout the country in Caatinga, Cerrado, Atlantic Forest and Pantanal biomes.

8. SOUTHERN AMAZON MOSAIC (Tapajós) (national: Brazil)
## (part of JSF Region 4: Amazon)
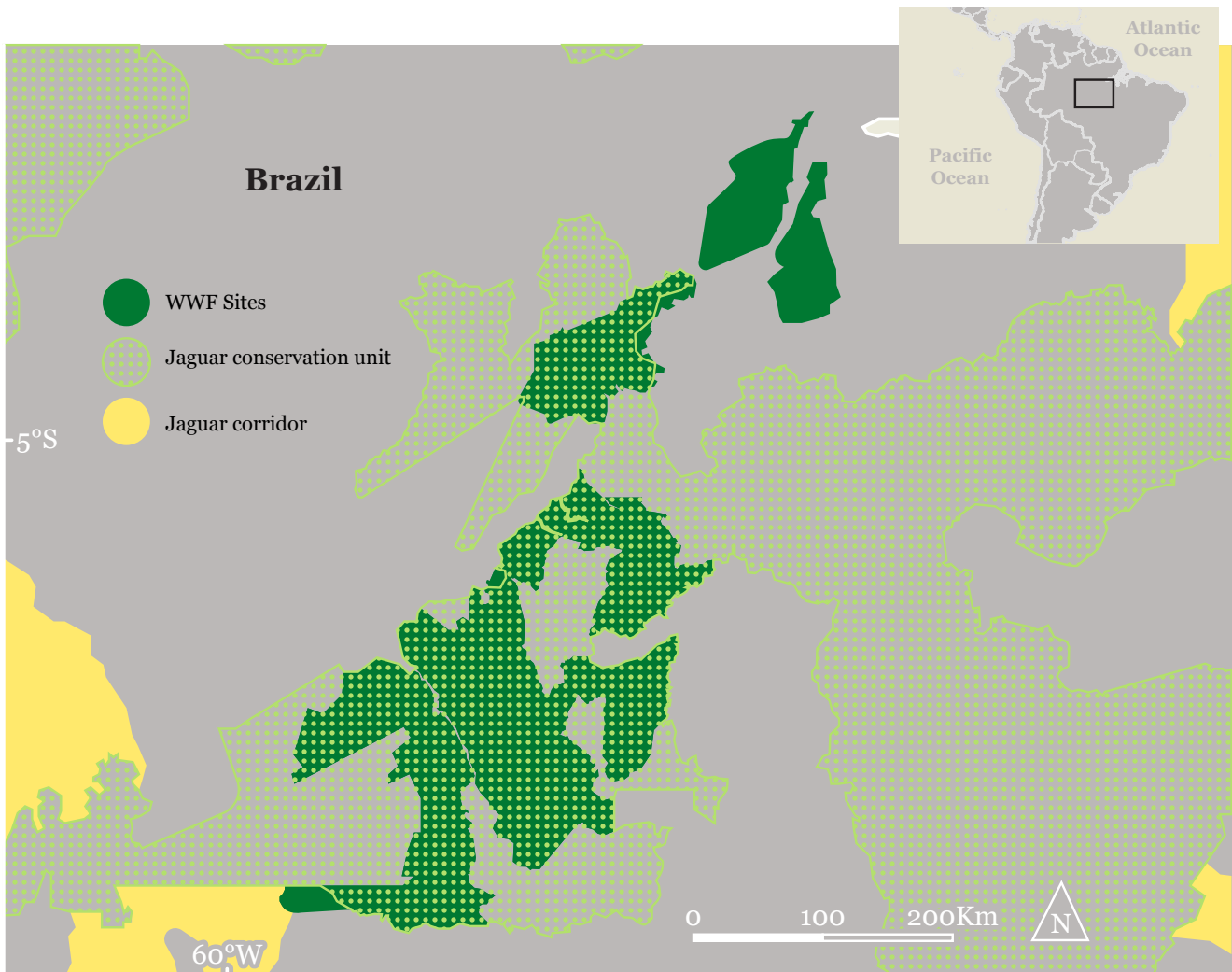
- **Location:** The Southern Amazon Mosaic is made up of 40 closely located protected areas in the states of Rondônia, Mato Grosso and Amazonas (see map), with a total land area of 7 million hectares, similar in size to Ireland. The mosaic was designed as a conservation tool for the consolidation of protected area management in the region, aiming to facilitate ecosystem and biodiversity conservation whilst at the same time improving the living conditions of the local population.[31]
- **Size of landscape:** app. 6.8 million ha
- **Sites:** this landscape includes the following sites:
  Southern Amazon Mosaic (Upper Tapajós Basin: Amazonas, Pará, Mato Grosso states):
  › Juruena NP (1.96 million ha)
  › Bararati Sustainable Development Reserve (114,000 ha)
  › Apiacás Indigenous Territory (overlaps with Apiacás Ecological Station) (100,000 ha)
  › Munduruku Indigenous Territory (2.31 million ha)
  Lower Tapajós (Pará state):
  › Tapajós National Forest (582,000 ha)
  › Amazonia NP (1.07 million ha)
  › Tapajós-Arapiuns Extractive Reserve (648,000 ha)

---

[31] https://www.wwf.org.br/?29690/Southern-Amazon-Mosaic-facilitates-Protected-Area-management

- **Jaguar population**: estimated jaguar populations in this landscape not known[32]
- **JCUs:** "JCU 2" (Nijhawan 2012)
- **Threats:** TBC
- **Conservation efforts by others (incl. Government interest):** TBC
- **Added value**: this jaguar landscape is part of the 'Tapajós Initiative'. The Tapajós is a key tributary of the Amazon river. Its basin represents 6% of Brazil's territory – an area larger than Germany - and includes 70 municipalities with a total population of 1.4 million, including over 9,000 indigenous peoples. In this landscape, all the threats faced by the Amazon converge, including infrastructure development such as dams and roads, which are impacting some of the Amazon's most biodiverse and culturally important places. This makes it high priority for WWF's focus in the coming years, with an urgent need to find sustainable development pathways that maintain rivers free-flowing and healthy, reduce deforestation, and provide sustainable livelihoods to the people most reliant on the region's rich natural resources.

  › WWF's added value is the creation of a baseline on jaguar population in the region, reducing human-jaguar conflict in this development frontier. Thanks to the Tapajós initiative, a diverse array of conservation strategies is being deployed in this region (PAs, indigenous lands, forest-based livelihoods, timber legality, governance etc). It is also likely that through a corporate partnership (with Reckitt Benckiser) significant funding may be raised for this region, which is changing rapidly and is a barrier to the expanding arc of deforestation coming from the south. This short video explains the Tapajós context well: https://www.youtube.com/watch?v=fW5onXk2GcU

---

[32] Estimates for jaguar populations in Brazil or in transboundary areas that include Brazil are difficult, as existing estimates are at the country level. Brazil holds the largest jaguar population (86,000 individuals). Jaguars occur over all recognized Brazilian biomes, with Amazonia providing not just a national core population but also a regionally significant core population. Additional populations are spread throughout the country in Caatinga, Cerrado, Atlantic Forest and Pantanal biomes.

9. NAPO-PUTUMAYO-META-CAQUETÁ (transboundary: Colombia, Peru, Ecuador) (part of JSF Region 4: Amazon)
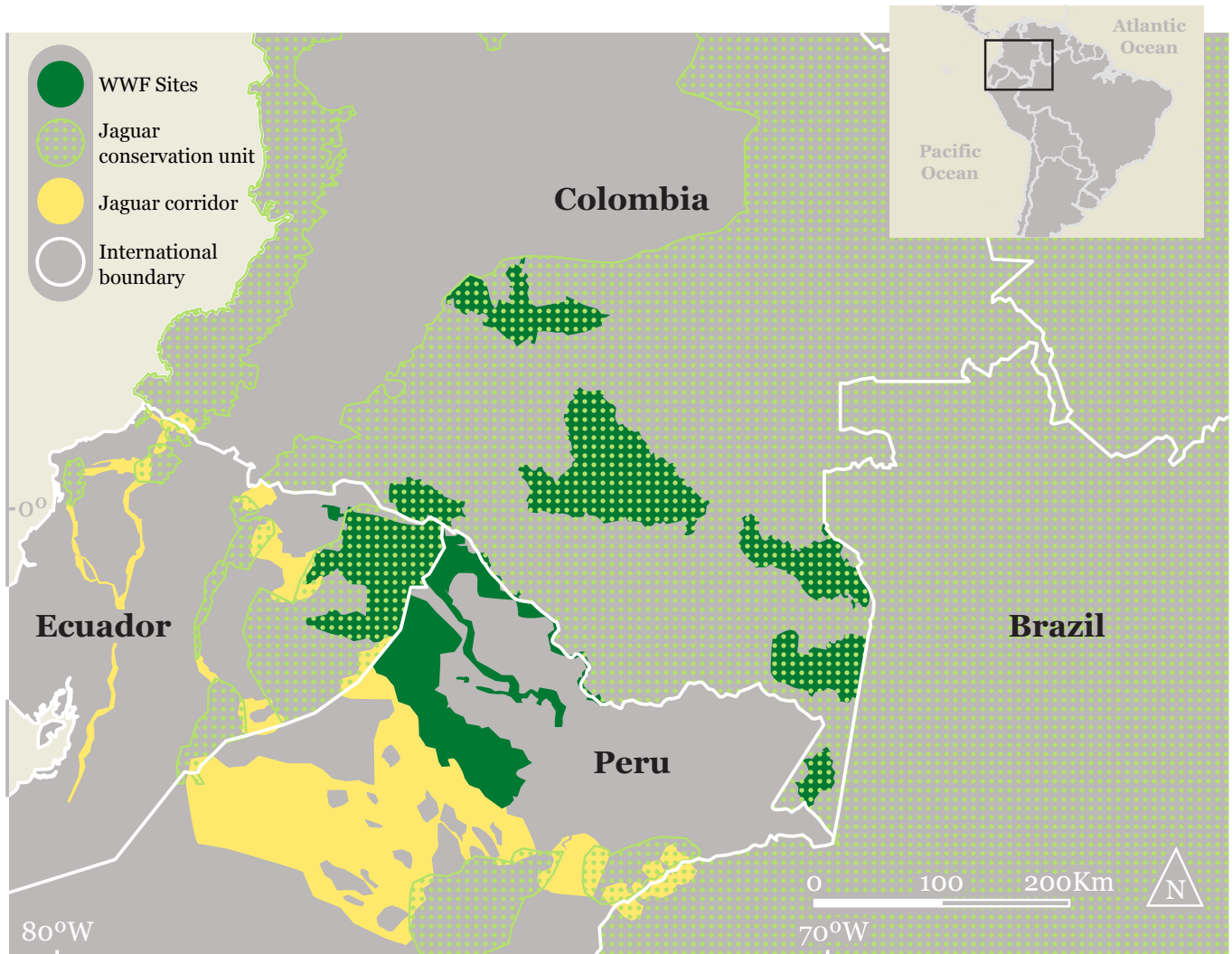
- **Location:** Landscape includes 4 river basins: Tigre, Napo, Putumayo and Nanay; the first three are transboundary basins. This region includes the Putumayo Trinational Initiative with Colombia and Ecuador comprising 3 adjacent protected areas: La Paya/CO, Güeppi/PE and Cuyabeno/EC covering 1.65 million ha.
- **Size of landscape:** total size TBC
- **Sites:** this landscape includes the following sites:
  › PA/IT mosaic on Colombia side:
  › La Paya NP (422,000 ha)
  › Chiribiquete NP (2.8M ha)
  › Yaigojé-Apaporis NP (1M ha)
  › Amacayacu NP (300,000 ha)
  › Rio Pure NP (1M ha)
  › Predio Putumayo IT (6M ha)
  › Serrania de los Picachos NP (450,000 ha)
  › Tinigua NP (200,000 ha)
 › Sierra de la Macarena NP (620,000 ha)

PA/IT mosaic on Ecuador side:

› Cuyabeno Wildlife Reserve (600,000 ha)

› Yasuni NP (1M ha)

› Cuyabeno-Lagartococha-Yasuní Ramsar site (770,000 ha): provides a corridor between Cuyabeno WR and Yasuni NP (partial overlap with both PAs)

PA/IT mosaic on Peru side:

› Güeppi-Sekimo NP (200,000 ha)

› Hulmeki Communal Reserve (141,000 ha)

› Airo Pai Communal Reserve (250,000 ha)

› Propuesta de Reserva Indígena (~800,000 ha)

› Pucacuro National Reserve (640,000 ha)

› Napo – Tigre Proposed Land Reserve (1,033,000 ha)

› Alto Nanay – Pintuyacu Chambira Regional Conservation Area (960,000 ha)

› Titled indigenous community lands (814,000 ha)

- **Jaguar population:** In the eastern portion of the landscape there are an estimated 2,000 jaguars (WWF-Peru estimate)[33]

- **JCUs:** Peru side: despite being a stronghold for jaguars, there is no JCU on the Peruvian side. WWF-Peru is revising all jaguar priority areas in the country based on extensive jaguar occurrence data. Ecuador: Eastern Cordillera Real JCU. Colombia: (JCU name TBC)

- **Threats:** Habitat loss due to deforestation, hunting, and loss of prey.

- **Conservation efforts by others (incl. Government interest):** The Peruvian government is considering the creation of an indigenous reserve for isolated and recently contacted indigenous peoples, which would ensure connectivity of jaguar populations in the region, as well as the maintenance of the ecosystem services they provide to these indigenous peoples, as well as to the local and regional population. This effort is led by the Ministry of Culture of Peru, in collaboration with the governments of the 3 neighbouring countries.

- **Added value:** WWF-Peru has been doing jaguar monitoring on the border region with Ecuador and Colombia for 2 years, and has produced sound estimates of jaguar density and population for this portion of the landscape.

---

[33] Estimates for jaguar populations in Brazil or in transboundary areas that include Brazil are difficult, as existing estimates are at the country level. Brazil holds the largest jaguar population (86,000 individuals). Jaguars occur over all recognized Brazilian biomes, with Amazonia providing not just a national core population but also a regionally significant core population. Additional populations are spread throughout the country in Caatinga, Cerrado, Atlantic Forest and Pantanal biomes.

10. PASTAZA BASIN (national: Ecuador)
(part of JSF Region 4: Amazon)
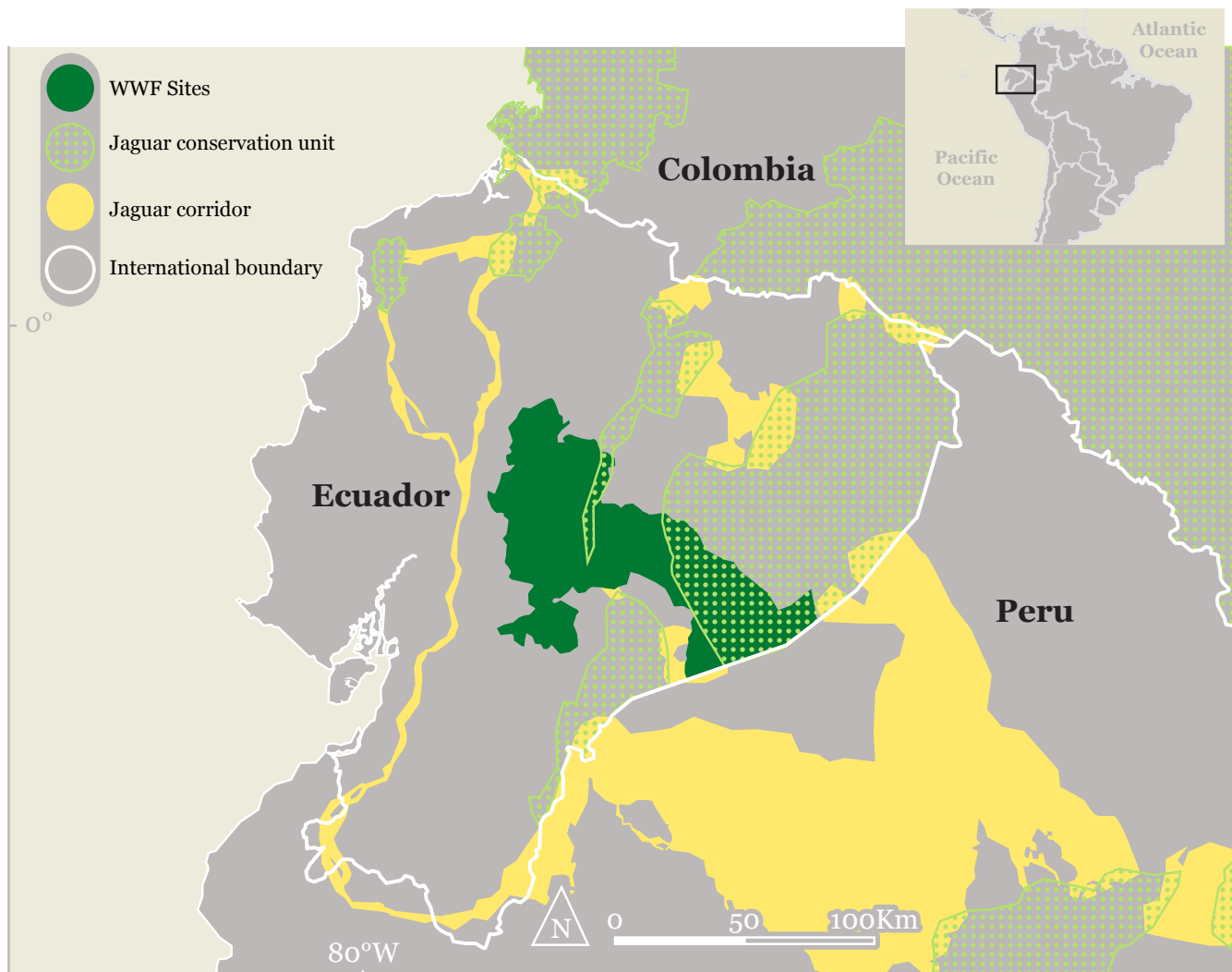
- **Location:** The Pastaza River Basin (~40,000 km²) drains the eastern slopes of the Andes Mountains and straddles the border between Ecuador and Peru. High in the Ecuadorian Andes, the Patate and Chambo River sub-catchments form the headwaters of the Pastaza River, draining a diverse landscape of croplands, human settlements, and protected areas, home to more than one million people. Descending in a south-easterly direction from the Ecuadorian Andes, the turbid Pastaza River rushes through a series of spectacular waterfalls and deep, humid canyons, carving a path through the jagged terrain of its middle basin and bisecting the Sangay-Llanganates corridor, one of the most biodiverse areas on earth. Once in the lowlands, the Pastaza River travels through remote rainforests and indigenous communities near the border between Ecuador and Peru.
- **Size of landscape:** 4 million ha
- **Sites:** this landscape includes the following sites:
  › Achuar Indigenous Territory (810,000 ha)
  › Sangay-Llanganates corridor (40,000 ha)
  › Part of Sangay and Llanganates National Parks
- **Jaguar population:** Country-level estimate of jaguar population is 1,100 individuals (Jędrzejewski et al. 2018)
- **JCUs:** (name TBC)

- **Threats:** The Ecuadorian Amazon is at high risk of deforestation and degradation. The region has an annual net deforestation rate of 61,111.76 ha per year (2014-2016), with important repercussions on biodiversity loss. The pressure on forest ecosystems is increasing as competing land uses from extractive and agricultural activities continue to rise, due in part to lack of sustainable economic alternatives for local population. The main deforestation drivers have been attributed to unplanned land use expansion, unsustainable land-water use practices (agriculture, livestock, extractive activities), poorly planned infrastructure development, and unplanned demographic expansion over forested areas. The agricultural sector is currently the main driver of deforestation, through cultivation of pastures for livestock. Pastaza river basin landscape have the largest percentage of forest cover in the country. In this landscape, deforestation almost doubled between 2000-2008, with 2.846 ha deforested in 2014-2016.

- **Conservation efforts by others (incl. Government interest):** The Government has developed a Jaguar Conservation Plan that outlines priorities at the national level. Several jaguar conservation activities have been developed in recent years. A GEF project on Landscapes and Wildlife has just been completed in 2019, implemented by the Ministry of Environment together with WCS and UNDP. This project included topics that support the conservation of several species, including the jaguar. Campaigns against wildlife trafficking, support to wildlife rescue centres, protocols to reduce conflicts with humans, etc. were developed. Research activities on jaguars have been led by universities and NGOs. San Francisco University has a scientific station in Yasuní NP and several years of monitoring with trap cameras. WCS and WWF work on monitoring jaguars with camera traps in Yasuní (WCS) and Cuyabeno (WWF).

- **Added value:** no other organisation is working on jaguar conservation with the Achuar people in this area, only WWF. There are other organisations such as Conservation International and the Pachamama Foundation that work with the Achuar but on other issues not related to jaguar conservation. This landscape complements WWF-Ecuador's jaguar landscape in the Middle Pastaza River Basin (southern portion of the Eastern Cordillera Real JCU). WWF-Ecuador is working here with resources from the WWF Network. There is good potential for extending WWF-Ecuador's jaguar conservation work to the Peruvian side of the Achuar territory in the Lower Pastaza basin, through a binational transboundary conservation programme between WWF-Ecuador and WWF-Peru (who also work with indigenous peoples in other regions in Peru), which would secure connectivity within the ancestral lands of the Achuar, as well for jaguars, combining transboundary river basin management, protection of indigenous territorial rights and jaguar conservation at scale.

11. GRAN CHACO[34] (transboundary: Bolivia, Paraguay, Argentina) (part of JSF Region 5: Chaco, Cerrado-Pantanal and Southern Andean Yungas)
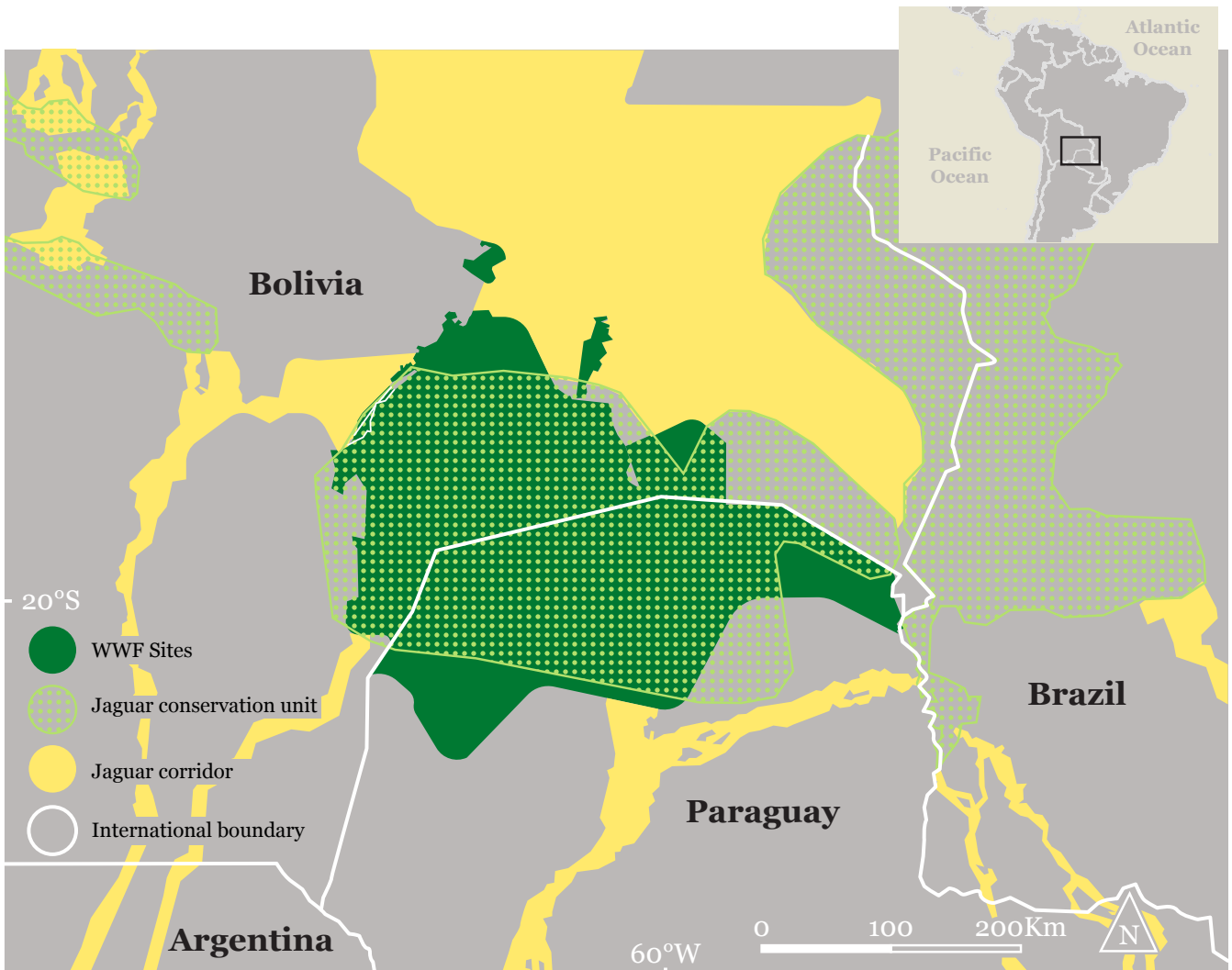
- **Location:** the northern Chaco ecoregion is defined by several types of semi-xerophytic deciduous forests as well as riverine forests and some wet savannas. It is connected with the Pantanal to the east.
- **Size of landscape:** TBC. The range of the jaguar in the Chaco is estimated to be about 150,000 km2 with large continuous blocks of habitat and densities are intermediate, reflecting the dryer habitat (Noss et al. 2012).
- **Sites:** this landscape includes the following sites:

On Bolivia side:
- › Guaraní Ñembi Guasu Conservation Area (size TBC)
- › Ka'a Iya NP (size TBC)
- › Otuquis NP (size TBC)
- › Laguna Concepcion Ramsar site (30,000 ha)
- › Palmar las Islas y Salinas San Jose (850,000 ha)
- › Bañados de Parapeti (600,000 ha)

---

[34] Information taken from the Jaguar Strategic Framework (JSF) and US Fish & Wildlife Service, 2018

On Paraguay side:

> Chaco Paraguayo Biosphere Reserve (size TBC)
> Defensores del Chaco NP (700,000 ha)

- **Jaguar population:** in 2011, the Wildlife Conservation Society (WCS) estimated a jaguar population in the Gran Chaco of Paraguay and Bolivia of 1,000 jaguars[35]. While populations are stable in the Bolivian Chaco, the species might be close to extinction in the Argentinian Chaco (Quiroga et al. 2013).
- **JCUs:** (name TBC)
- **Threats:** the main threats to the jaguar in the Gran Chaco are the expansion of human settlements, agriculture, and livestock; conflicts with cattle depredation, game hunting, and hunting for commerce; and mining and road construction. An estimated 80% of the region has been transformed (Rumiz et al. 2012).
- **Conservation efforts by others (incl. Government interest):** according to USFWS 2018, conservation activities in Bolivia include a core area of 120,000 km2 for jaguar protection in the frontier between Bolivia and Paraguay protecting part of the Chaco region (Rumiz et al. 2012). Additionally, Rumiz et al. (2012) mentioned that most of the Gran Chaco in Bolivia is still intact because of low human population density in the region. From 2001 to the present, WCS has been researching the distribution, abundance, food habits, and activity patterns of jaguars by means of camera traps in the states of La Paz and Santa Cruz. All of the information collected is being used to develop jaguar conservation strategies across the region.
- **Added value:**

On the Bolivian side:

> The Guaraní Ñambi Guasu Conservation Area is home to the Charagua Iyambae people, and has recently been recognised as the first autonomous indigenous government in Bolivia, and has the same status as a national-level protected area. This is providing a unique opportunity for WWF-Bolivia to influence and support the management of the area, building on good relations with WWF developed over many years. This are connects with the Ka'a Iya national park to the south (dry chaco) as well as with Otuquis national park to the east (Pantanal).
> This region is not densely populated, and is home to several indigenous groups.
> High density of jaguars
> Good potential to work across the border with Paraguay; strong transboundary potential

On the Paraguayan side: TBC

---

[35] https://www.newswise.com//articles/jaguar-photo-shows-conservation-success-in-bolivia

12. EL IMPENETRABLE CORRIDOR (national: Argentina) (part of JSF Region 5: Chaco, Cerrado-Pantanal and Southern Andean Yungas)
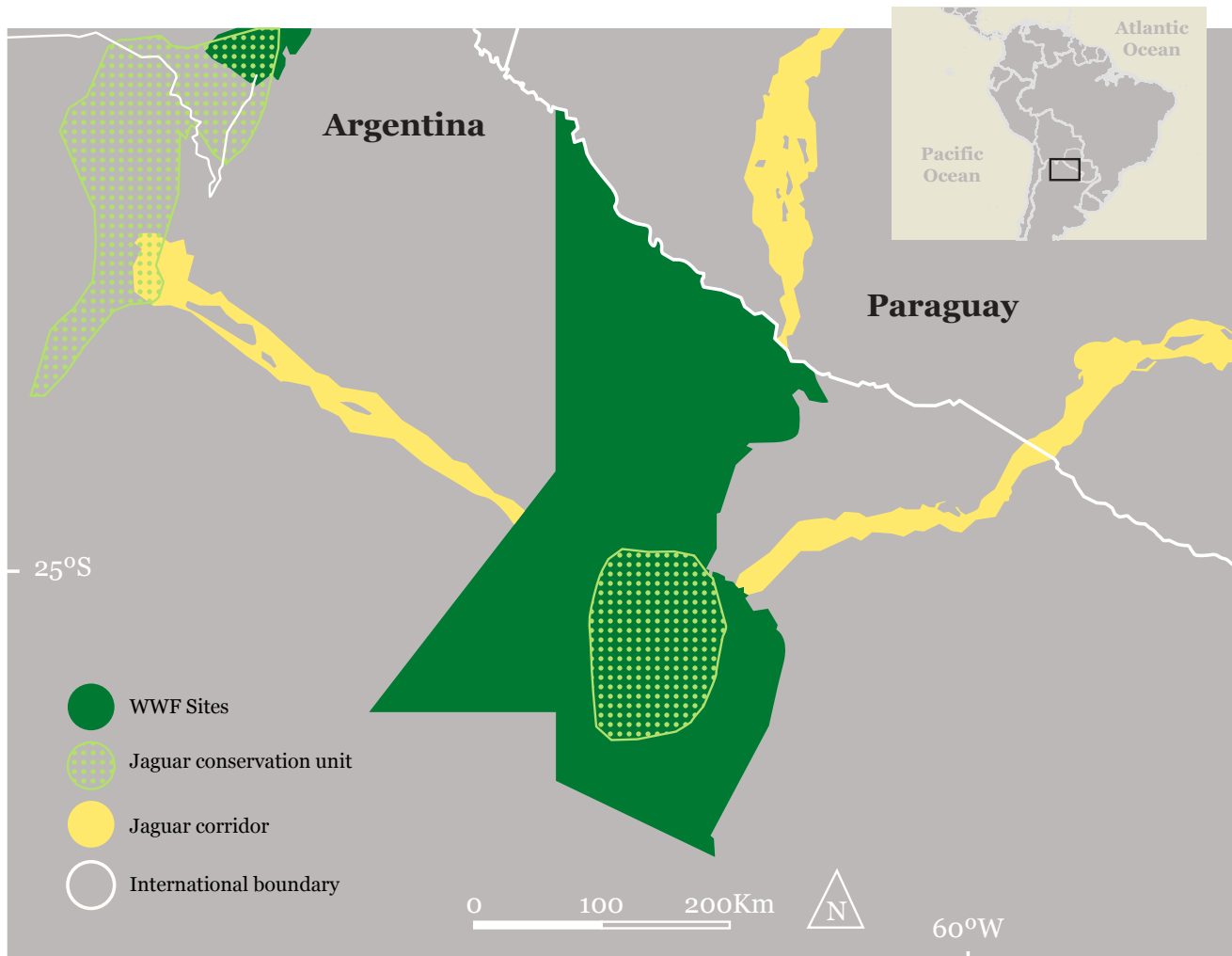
- **Location:** *El Impenetrable* Corridor, in the semi-arid Chaco ecoregion, still has large remaining and continuous blocks of native forest in acceptable conservation conditions, especially in the provinces of Chaco, Formosa and north-eastern Santiago del Estero.
- **Size of landscape:** 2.5 million ha
- **Sites:** this landscape includes the following protected areas:
  › Fuerte Esperanza Provincial Park (9,392 ha)
  › Loro Hablador Provincial Reserve (17,000 ha)
  › Copo National Park + multiple use Copo Provincial Reserve (118,118 ha + 85,000 ha)
  › Formosa National reserve (9,005 ha)
  › Riacho-Teuquito Biosphere Reserve and Provincial Reserve (81,000 ha)
  › El Impenetrable National Park (128,000 ha)
- **Jaguar population:** while jaguar populations are stable in the Bolivian and Paraguayan Chaco, the species might be close to extinction in the Argentinian Chaco, with less than 20 individuals in all four provinces (Quiroga et al. 2013). However, new pugmarks were found in the corridor in 2018, giving hope that the species could survive in the wild in this region.
- **JCUs:** Chaco JCU

- **Prey:** Although there have been no diet studies in the Argentine Chaco, in the Paraguayan Chaco the main prey are the three peccary species (*Tayassu pecari*, *Pecari tajacu* and *Catagonus wagneri)*, brocket deer 'corzuela' (*Mazama gouazoubira*), Chacoan cavy (*Dolichotus salinicola*), the tapetí (*Sylvilagus brasiliensis*) and the southern three banded armadillo (*Tolypeutes matacus*) (Taber et al. 1997).
- **Threats:** Threats to jaguars in the Chaco region are similar to those that the species faces in other parts of Argentina. In this region, hunting is the most relevant threat, followed by the reduction of prey availability, habitat fragmentation and habitat loss.
- **Conservation efforts by others (incl. Government interest):** In 2015, the National Parks Administration spearheaded the "Emergency Plan for the Conservation of the Yaguareté in the Argentine Gran Chaco", which was approved in 2017[36], outlining a detailed action plan and responsible institutions, including the four Chaco region provinces, the national government and several NGOs.
- **Added value:** Building on its wide recognition as one of the top research and conservation organisation in Argentina, with a strong track record in jaguar conservation, FVSA has recently expanded its jaguar work to the Chaco forest in the north of the country, a deforestation front where they have been working over the past few years, engaging producers and government agencies to find solutions to forest conservation, always with the jaguar as a focal and umbrella species. In this landscape, state agencies responsible for jaguar conservation are understaffed and under-budgeted and sadly jaguar issues are not a priority in local government agendas. Complementing the government's work in strategic areas where state agencies have implementation gaps is a key the role of our organisation. In this sense, FVSA's efforts in this landscape have prompted many urgent and important actions. FVSA counts on strong partnerships with local research groups that produce updated and locally-focused scientific information, which is used to make sound science-based conservation decisions. FVSA also has partnerships with a growing network of stakeholders, and seeks to create a favourable inter-institutional context for jaguar-focused conservation.

---

[36] https://sib.gob.ar/archivos/RES_HD_N_234-2017.pdf

13. PANTANAL (transboundary: Brazil, Bolivia, Paraguay)
(part of JSF Region 5: Chaco, Cerrado-Pantanal and Southern Andean Yungas)

- **Location:** this landscape overlaps completely with the Upper Paraguay River Basin, a vast area of 624,000km² shared by Brazil, Bolivia and Paraguay that includes the Pantanal ecoregion, the world's largest tropical wetland with approximately 158,000km². Most of the land is privately owned (>95%) and cattle ranching is widespread (Tomas et al. 2009; Santos et al. 2002). The landscape corresponds to the focal area of WWF's tri-national Cerrado-Pantanal ecoregional programme.
- **Size of landscape:** 624,000 km² (62 million ha)
- **Sites:**

In the Brazilian Pantanal, this landscape includes two main areas for focus of jaguar conservation:
› Porto Jofre area, in Mato Grosso state, including the following sites:
  - Jofre Velho Ranch (Panthera focal site)
› Miranda, Nhecolândia and Serra de Amolar areas, in Mato Grosso do Sul state:
  - Estância Caiman (Onçafari focal site)
  - Fazenda São Francisco (Panthera focal site)
 - Fazenda Barranco Alto (Jaguars of the Rio Negro project)
  - Serra de Amolar region (Instituto Homem Pantaneiro focal site)
On the Bolivian Pantanal side: TBC
On the Paraguayan Pantanal side: TBC

- **Jaguar population:** the Pantanal has some of the highest jaguar densities reported (Soisalo and Cavalcanti 2006), likely due to a high abundance of prey that thrive on the highly productive, heterogeneous and pulse-regulated floodplain, but conflict with cattle ranchers is widespread (Hoogensteijn et al. 2016).
- **JCUs:** Pantanal JCU (potential source populations for dispersal to neighbouring JCUs in the Chaco, Atlantic Forest)
- **Prey:** Yacare caiman (*Caiman crocodilus yacare*), Capybara (*Hydrochoerus hydrochaeris*), White-lipped peccary (*Tayassu pecari*), Collared peccary (*Pecari tajacu*), Marsh deer (*Blastocerus dichotomus*), Brocket deer (*Mazama* spp.), Giant anteaters (*Myrmecophaga tridactyla*), feral pigs, cattle and several other mammalian, avian and reptilian species (Azevedo and Murray 2007, Cavalcante and Gese 2010)
- **Threats:** Healthy populations of jaguar and other wildlife in the Pantanal, as well as the region´s habitat heterogeneity and high productivity, are closely tied to the annual flood pulse (Hamilton et al. 1996, Junk et al. 2006). The main threats potentially altering the natural flood pulse are native habitat conversions (>60% of highlands and >15% of the floodplain) and infrastructure projects, the latter including dams in the headwaters and channelization of the Paraguay river for barge traffic on the floodplain. In addition, climate change related drying and greater seasonality are predicted for the region. Other potential threats include increasing conflicts with ranchers as native habitats are altered and prey populations decline, as well as illegal trade in animal parts linked to infrastructure projects, e.g., dams and ports.
- **Conservation efforts by others (incl. Government interest):**
  › **Panthera** (rancher conflict resolution, livestock anti-predation techniques, tourism focused on jaguar observation, genetic surveys, wildlife monitoring);
  › **Onçafari** (ecological and range use studies, reintroductions of jaguar, tourism focused on jaguar observation),
  › **Jaguars of the Rio Negro project** (ecological and range use studies, wildlife monitoring, tourism focused on jaguar observation)
  › **Instituto Homem Pantaneiro** (rancher conflict resolution, livestock anti-predation techniques)
- **Added value:** the Pantanal is the world's largest wetland, and the second top stronghold for jaguars after the Amazon. It's open floodplains and abundance of prey mean jaguar sightings are relatively easier and more likely than in other landscapes, providing a valuable opportunity for enhancing jaguar-focused ecotourism, building on a growing market and consolidating opportunities for alternative livelihoods from tourism. Conflict is rampant, but also provides an opportunity to test different approaches for co-existence. Boosting jaguar-friendly ranching, private sector engagement and stronger governance are all urgently needed given the emerging threat of increased jaguar poaching for the illegal trade in parts (spill-over from Bolivia) and the overlap with other forms of organised crime such as the drug trade across the porous borders with Bolivia and Paraguay. WWF can add value to jaguar conservation by building on the successful 'Pantanal Initiative', a wide-reaching tri-national partnership and conservation agreement with Bolivia and Paraguay for the upscale of best practices in cattle ranching (which include criteria such as no jaguar killings), further enhancing jaguar-focused ecotourism, and promoting jaguar-friendly development including infrastructure. Recognizing the strong ecological links between jaguars and wetlands, WWF could also support studies and perhaps a communication campaign in the Pantanal related to the importance of jaguar/wetland interactions (aligned with the WWF Mexico program efforts).

14. MISIONES-UPPER PARANÁ (transboundary: Argentina, Brazil, Paraguay) (part of JSF Region 6: Atlantic Forest)
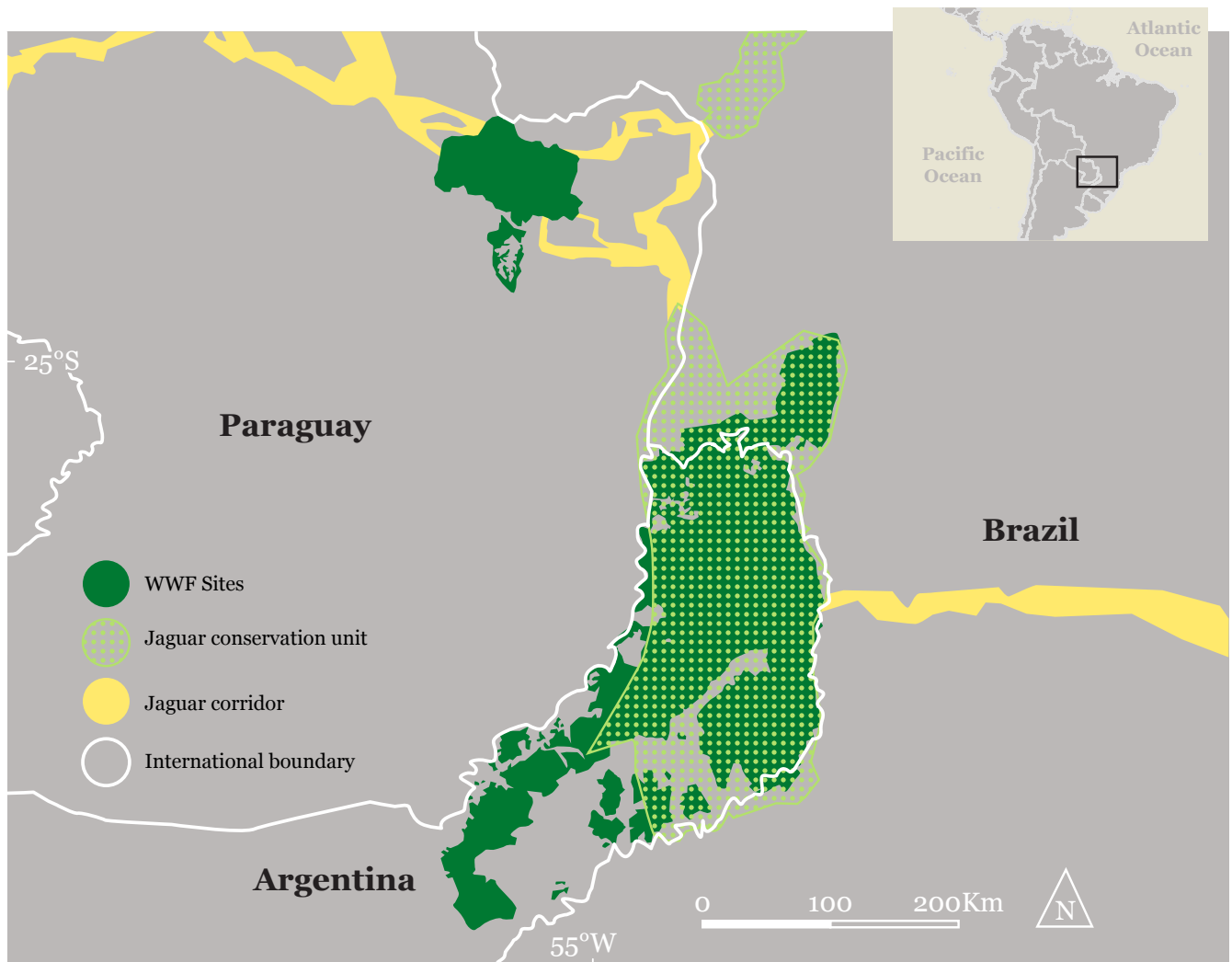
- **Location:** the Upper Paraná Atlantic Forest of northern Argentina, southwest Brazil, and southeast Paraguay holds the world's southernmost jaguar population (de Angelo et al. 2013).
- **Extent:** this landscape overlaps almost completely with the Green Corridor JCU which covers 1.45 million ha (Paviolo et al. 2016)
- **Sites:** this landscape includes the following sites:

On Argentina side: Misiones Jaguar Landscape (1.9M ha)
- › Iguazú National Park (ARG) (67,000 ha)
- › Yaboty Biosphere Reserve (ARG) (236,313 ha)
- › Urugua-í provincial Park (84,000 ha)
- › Puerto Península Provincial Park (6,900 ha)
- › Foerster Provincial Park (4,309 ha)
- › At least 10 other Provincial Parks (> 1.000 ha) (ARG)
- › Numerous ITs and private PAs (mostly small in area) (ARG)
- › Cruce Caballero – Yaboty Corridor (ARG)
- › Uruguaí-Foerster Corridor (ARG)

On Brazil side:
- › Iguaçú National Park (BR) (185,262 ha)
- › Turvo State Park (BR) (17,500 ha)

On Paraguay side:
  › Mbaracayú NP (65,000 ha)
  › Morombi NP (25,000 ha)

- **Jaguar population:** the jaguar population of the remaining Atlantic Forest is probably lower than 300 and severely fragmented in a few subpopulations (Paviolo et al 2016). The sub-population of the Misiones-Upper Paraná Landscape is estimated at 90-130 individuals.

- **JCUs:** the Green Corridor JCU is one of only three Type I JCUs[37] in the Atlantic Forest, the other two being the Serra do Mar JCU and the Upper Parana-Paranapanema JCU (Paviolo et al. 2016). It may still be connected to populations in the northwest in the Pantanal JCU, through the Upper Paraná River drainage (Jaguar 2030: A conservation Roadmap for the Americas).

- **Prey:** defaunation is widespread in the Atlantic Forest. Jaguar prey most affected by poaching are large mammals, especially ungulates (tapirs, peccaries, brocket deer). Most of what remains of the Atlantic Forest is affected by defaunation, suffering the 'half-empty forest' syndrome. The long-term consequences of defaunation and the loss of top predators in the Atlantic Forest are starting to be understood, and they include phenomena ranging from species loss to the disruption of evolutionary processes and ecosystem services.

- **Threats:** the main threats to the jaguar in the landscape are retaliatory killings in response to cattle depredation, habitat loss due to ranching, agriculture and forestry, indiscriminate hunting of prey and defaunation even in protected areas (Altrichter et al. 2006; Di Bitetti et al. 2016), and road kills (Paviolo et al. 2016).

- **Conservation efforts by others:** a comprehensive 'Action Plan for Jaguar Conservation in the Green Corridor' focuses on increasing the jaguar population size to 250 adults in the transboundary area that includes Misiones province (Argentina), Iguaçu National Park and Turvo State Park (both Brazil) (Schiaffino et al. 2011). In Paraguay, in 2017, the Environmental Ministry and WCS developed a 10-year National Conservation Plan for jaguars, covering the period from 2017-2026[38]. This plan seeks to integrate conservation actions to maintain and restore natural jaguar populations in Paraguay through five lines of action: scientific research, landscape connectivity, ex-situ management protocols, promote local community participation while building local capacity and education.

- **Added value:**
  › Brazilian side: WWF-Brazil provides critical financial and technical support to two local organisations working on jaguar conservation in this landscape: Instituto Pró-Carnívoros in the Iguaçu National Park area and Instituto Curicaca in the Turvo State Park area. The long-standing partnership with Instituto Pró-Carnívoros in support of the 'Jaguars of Iguaçu' project has focused on reducing jaguar-human conflict in the municipalities surrounding the park through outreach and awareness, with excellent results. The IPC team support the bi-annual census of jaguars in the Misiones-Upper Paraná landscape carried out jointly by Argentina partner organisations. The partnership with Instituto Curicaca is more recent and aims to strengthen monitoring o jaguar populations in the Turvo State Park and reduce defaunation of jaguar prey through innovative alternative livelihood activities. WWF also adds value by providing equipment and training in the use of tools such as SMART.
  › Argentinian side: FVSA is the environmental NGO with the largest capability (in terms of staff size, operational infrastructure, experience and background) and longest presence in the Argentine Atlantic Forest. It has the capabilities to deliver a strategy with this scope and magnitude, given its long trajectory of tri-national work (with Brazil and Paraguay). FVSA has more than fifteen years of experience and solid knowledge on the ecological and socioeconomic contexts of jaguar conservation. Its experi-

---

37 Type I JCUs are those that have a higher probability of long-term population persistence
38 Jaguar 2030 Roadmap – Draft – June 2019

ence of delivering projects with complementary strategies and the presence of an office in the Misiones region has gained them recognition from other NGOs as well as the government (municipality, provincial and national). In Misiones, state agencies responsible for jaguar conservation are understaffed and under-budgeted and sadly, whilst the federal government is supportive of jaguar conservation, jaguar issues are not a priority in local government agendas. Complementing the government's work in strategic areas where state agencies have implementation gaps is a key the role for FVSA, which works through strong partnerships with local research groups that produce updated and locally-focused scientific information that informs conservation decisions. FVSA also has partnerships with a wide network of stakeholders, working through inter-institutional approaches that have jaguar-focused conservation at its core.

› Paraguayan side: the Mbaracayú and Morombi National Parks are the last remaining blocks of Atlantic Forest in Paraguay, and critical for ensuring connectivity with jaguar populations in other forest remnants of the Atlantic Forest. WWF-Paraguay has a strong presence in these areas.

15. BRAZILIAN COASTAL ATLANTIC FOREST (national: Brazil)
(part of JSF Region 6: Atlantic Forest)
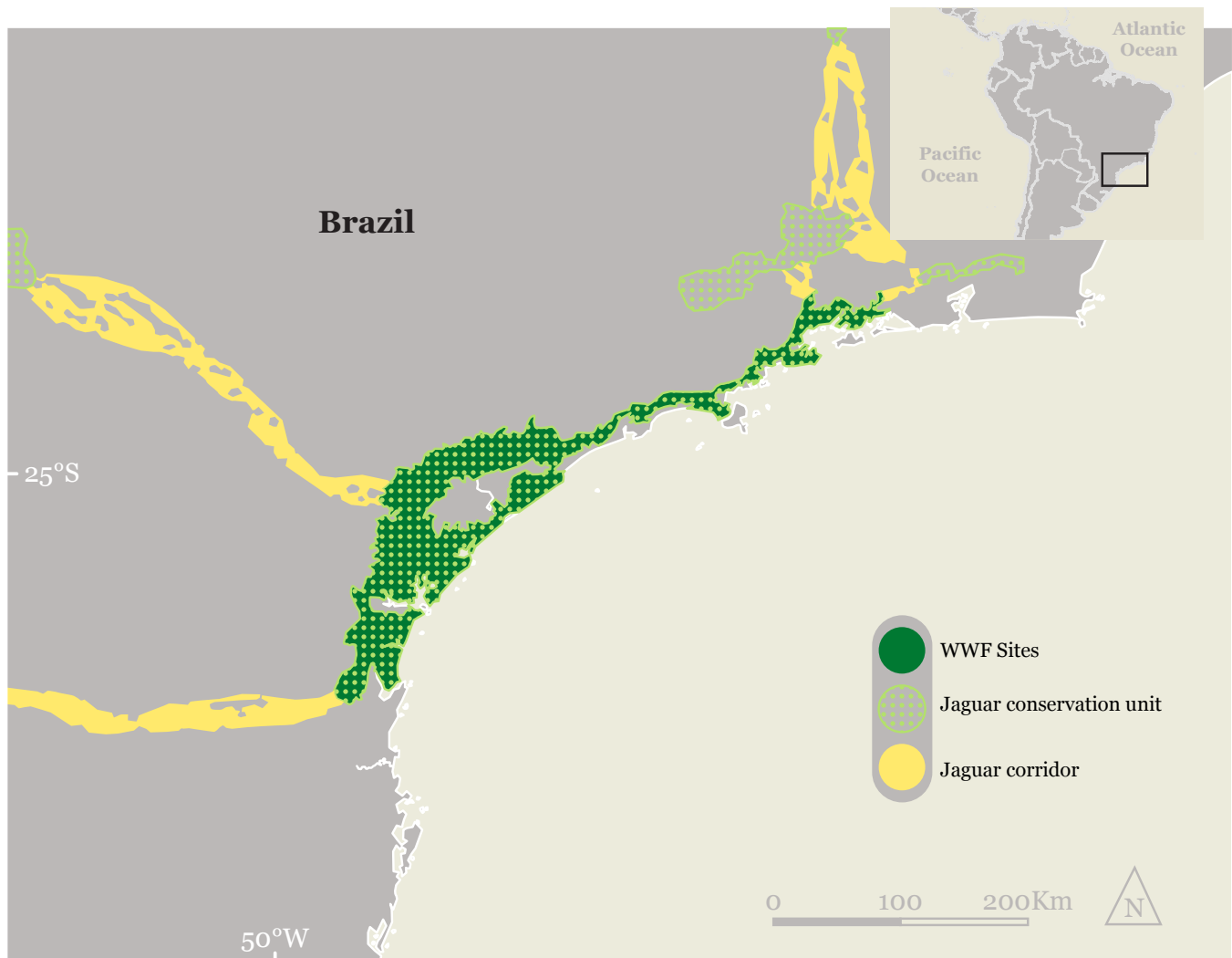
- **Location:** The Serra do Mar coastal forests cover a 100-km wide strip along the Atlantic Coast of Southeast and South Brazil. This area of Brazil is occupied by slopes and high summits of the Serra do Mar Mountain Chain. This large strip of coastal forests comprises one of the more remarkable centers of endemism in South America (www.worldwildlife.org/ecoregions/nt0160). What sets this ecoregion apart from other portions of the Brazilian Atlantic forests are large portions of montane forests with their richness of Bromeliaceae, Myrtaceae, Melastomataceae, and Lauraceae species (Leme 1997). The largest and best-protected tracts of the Brazilian Atlantic forest are located in this ecoregion (SOS Mata Atlântica e INPE 2014, Silva and Dinnouti 1999). The core area population of jaguars of the Serra do Mar lies within the southwestern portion of São Paulo (SP) state and adjacent areas of Paraná (PR) state where due to low socio-economic development human pressure on the forest is less accentuated than in the remaining Atlantic forest. The fragment including the Carlos Botelho, Intervales and PE-TAR State Parks is the best preserved portion of this forest.
- **Extent:** this landscape overlaps almost completely with the Serra do Mar JCU which covers 1.35 million ha (Paviolo et al. 2016)
- **Sites:** this landscape includes the following sites:
  › Serra do Mar State Park (southern section, Núcleo Itariru), SP state (53,927 ha)
  › Jurupará State Park, SP state (26,000 há)
  › Legados das Águas Private Reserve, SP state (32,000 ha)

- › Carlos Botelho State Park, SP state) 37,000 ha
- › Intervales State Park (SP state (42,000 ha)
- › Alto Ribeiro Tourism State Park – PETAR, SP state (35,000 ha)
- › Lagamar de Cananeia State Park, SP state (40,000 ha)
- › Ilha do Cardoso State Park, SP state (13,500 ha)
- › Superagui National Park, PR state (34,000 ha)
- › Guaraqueçaba Environmental Protected Area, PR state (282,446 ha) (including urban areas and other protected areas)
- › Bom Jesus Biological Reserve, PR state (34,179 ha)
- › Saint-Hilaire/Lange National Park, PR state (25,118 ha)
- › Guaricana National Park, PR state (49,286 ha)
- › Salto Morato Private Reserve, PR state (2,253 ha)
- **Jaguar population:** while the population of the Serra do Mar JCU is probably smaller than 50 individuals, it was classified as a Type I JCU because the habitat availability of the area is large enough to maintain a larger population.
- **JCUs:** the Serra do Mar JCU is one of only three Type I JCUs[39] in the Atlantic Forest, the other two being the Green Corridor JCU and the Upper Paraná-Paranapanema JCU (Paviolo et al. 2016).
- **Threats:** the potential loss of connectivity with other source areas (Green Corridor and Upper Paraná-Paranapanema) is a major threat to the long-term conservation of this population. A key strategy should be to secure or restore connectivity with other source areas in the Atlantic Forest biome to increase the probability of long-term conservation of this population and to justify investments made in the short term. Road kills and poaching of jaguars and their prey are also important threats.
- **Conservation efforts by others:** Previous work by Manacá , the Cananéia Institute, and CENAP Pró-Carnívoros.
- **Added value:** this relatively recent partnership (2018) with two local organisations (Instituto Manacá and the Cananéia Research Institute) aims to establish a Large Mammal Monitoring Network in the mosaic of protected areas that extends from the north of Paraná state to the south of São Paulo state, in this otherwise human-dominated landscape. This unusual multi-institutional network aims to produce standardised monitoring data on populations of key species (including jaguars and their prey), threats and management effectiveness that can be shared by all members and stakeholders of the network across the two states. WWF also adds value by providing equipment and training in the use of tools such as SMART. There is scope to build on existing partnerships with the private sector for forest restoration (e.g. partnership with pulp and paper company), which would enhance connectivity with other source areas.

---

[39] Type I JCUs are those that have a higher probability of long-term population persistence

ANNEX 4
Objectives and Activities

The continental scope of the WWF Jaguar Strategy 2020-2030, the heterogeneity of ecosystems and habitats within jaguar landscapes, and the diversity of threats and local contexts in landscapes and countries calls for milestones that are sufficiently generic to be relevant to all 15 landscapes, while at the same time specific enough to trigger concrete conservation action by WWF, FVSA and their partners. The milestones defined in the tables below include short- and medium-term results (3-5 years), as well as longer-term outcomes (8-10 years).

This 10-year WWF Jaguar Strategy 2020-2030 does not seek to define country- or landscape-specific strategies and objectives, national-level implementation plans, or even strategies and objectives for the transboundary landscapes. The WWF Jaguar Strategy outlines WWF's overall strategic thinking on its contribution to range-wide jaguar conservation through a set of over-arching strategies and objectives that deliver action on the ground at the landscape level, as well as cross-cutting and non-landscape-specific actions at the national, regional and international levels. This strategy does not intend to be prescriptive in terms of the specific strategies and actions that each country will use, as these will need to reflect national- and landscape-specific contexts and respond to specific threats as they increase, shift or emerge. For transboundary areas, detailed plans (including monitoring plans) and coordination mechanisms need to be developed by multi-office working groups, with their own expertise, nationally-representative advisory committees, and office-based implementation teams, together with their partners on the ground.

Some WWF offices (including FVSA) already have or are developing their own jaguar strategies, and other country offices should be encouraged to do the same. However, as offices develop or refine their own implementation strategies, these will need to be aligned with and based on WWF's Jaguar Strategy 2020-2030 so as to ensure a joined-up, range-wide, coordinated and cohesive approach to the delivery of WWF's 2030 jaguar conservation Goals, and ultimately of its Vision for jaguars in 2050. In particular, we will need each of the priority jaguar landscapes to report on the indicators we have set for the 5 Objectives and the Goals.

One of the most challenging aspects of any strategic plan is finding an optimum balance between achievability and ambition, especially for Goals, Objectives, and milestones which are longer-term. Most practitioners are faced with the challenge of managing differing internal and external expectations, in terms of whether Goals and Objectives should be more ambitious or more realistic (i.e. achievable with a high degree of certainty), and this approach is reflected in the below Objectives.

Objective 1 – SECURE JAGUAR STRONGHOLDS: Protected Areas and Indigenous Land		
WWF Jaguar Milestones	**Indicators**	**Activities**
Objective 1.1 - By end 2025, **key protected areas within WWF landscapes are better-managed** from a jaguar conservation perspective in relation to 2020 baseline, and where possible new PAs are designated, contributing to enhanced connectivity within landscapes	• management effectiveness assessments include Jaguar KEAs[40] • # new PAs designated • # PAs that use jaguar monitoring data to inform management effectiveness efforts • PA budgets include jaguar conservation activities	• 2020: WWF offices define 3-5 year targets for improved PA management effectiveness in priority landscapes, as part of landscape-specific action plans • define 2020 baseline for selected PAs within landscapes • maximise opportunities for designation of new PAs within WWF Jaguar Landscapes • assess potential connectivity between PAs • implement RAPPAM in key sites • Implement "Conservation Assured" certification processes for PAs and other sites within WWF jaguar landscapes • promote learning exchanges within and between landscapes • develop sustainable finance mechanisms for improved PA management effectiveness • develop joint communications plans that support better management effectiveness
Objective 1.2- By the end 2025, **indigenous territories integrate jaguar key ecological attributes (KEAs)** in their territorial life plans and **recover their traditional knowledge**, cultural beliefs and mythology relating to jaguars	• # IT life plans that incorporate KEAs • local / indigenous communities have pride in recounting jaguar traditions and myths	• identify priority ITs for expanding strongholds and enhancing jaguar connectivity within WWF landscapes[41] • document successful examples of ITs that are implementing self-imposed rules that benefit jaguars (e.g. the Achuar in Ecuador control hunting of jaguar prey so as to enhance prey populations) • develop life plan mapping exercises in priority ITs • hire consultant to document cultural traditions and myths regarding the jaguar • use this material in communications, education and campaigns • create a regional campaign that highlights the conservation and cultural importance of jaguars, local names, legends, stories, testimonials, etc
Objective 1.3 – From 2020 to 2030, **WWF offices successfully revert government plans to de-gazette, reduce or weaken protected areas**, in particular PADDD[42] events, and especially those affecting WWF landscapes	• system in place to monitor government plans to reduce or otherwise impact PAs • # of PADDD events avoided	• disseminate the use of PADDD Tracker https://www.padddtracker.org/ building capacity in the region to anticipate, monitor, report and act upon PADDD events • engage international bodies (UNESCO, CBD Secretariat, international media) to react to government PADDD plans

---

[40] The following Jaguar Key Ecological Attributes (KEAs) were defined as part of the JSF: Population size, Population density, Availability of prey, Habitat quality (vegetation cover), and Habitat quality (connectivity)

[41] An example from Peru are the indigenous reserves for isolated indigenous peoples, which have the same level of intangibility as protected areas

[42] PADDD: Protected Area Downsizing Downgrading and Degazettement

	Objective 2 – BUILD CONNECTIVITY: Best Practices and Jaguar-friendly Economic Development	
WWF Jaguar Milestones	**Indicators**	**Activities**
Objective 2.1 - By end 2023, WWF and partners are successfully implementing standard **best practices**[43] **in productive and other economic activities** (livestock, soy, oil palm, timber, tourism) in at least 5 WWF jaguar landscapes contributing to connectivity in non-protected lands	• uptake of best practices within landscapes • (- additional indicators of progress towards reducing conflict to be defined based on WCS's extensive JHC experience)	• apply SAFE SYSTEMS approach • workshop to share experiences in effective livestock management practices (e.g. WCS and Panthera) and replicate similar approaches in key jaguar landscapes. • capacity building programmes for best practices in key jaguar landscapes including tools and methods for conflict reduction (e.g. introduction of creole cattle breeds, electrical fencing, controlled breeding, etc) • carry out exchanges between communities and ranchers who have successfully implemented jaguar-friendly livestock management practices and target communities committed to adopting such practices • raise awareness of local communities, farmers, ranchers through media outlets where they can obtain information • develop outreach instruments that engage user groups and local communities on farms and on ranches • engage ranching associations, agricultural cooperatives in outreach activities
Objective 2.2 - By end 2025, local communities (including indigenous), ranchers and farmers in at least 5 WWF jaguar landscapes are **generating income from jaguar-friendly economic activities and receiving livelihoods-enhancing** incentives in recognition of their role in habitat protection and jaguar-livestock conflict reduction	• # communities, ranchers, and farmers engaged in jaguar-friendly productive activities (e.g. NTFPs, tourism), and level of livelihood generated • # incentives mechanisms	• establish 2020 baseline of positive community-focused initiatives that improve livelihoods as well as reducing conflict and habitat loss • support the development of benefits / incentives mechanisms and test in pilot areas
Objective 2.3 - By end 2028, **'jaguar-friendly' certified products** are produced and marketed by jaguar range countries, for example non-timber forest products, FSC-certified timber products, sustainable cocoa and coffee, and jaguar-focused ecotourism	• # of jaguar-friendly certified products reaching national and international markets	• Engage existing certification schemes (e.g. FSC, Rainforest Alliance, etc) • product development with community management; launching and promotion • Demonstrate the conservation value of shade-grown agricultural products (coffee, cocoa) for jaguar conservation • Identify promising jaguar-focused ecotourism initiatives / success stories • promote exchanges between ecotourism entrepreneurs • seek impact investment for scaling up jaguar friendly products
Objective 2.4 – By 2030, at least 2 **key jaguar corridors are secured and/or restored** within WWF each jaguar landscapes, based on the principles of good governance, with ample participation of key stakeholders.	• # corridors within / between landscapes	• advocacy work with governments to agree which corridors need to be secured through collective action with NGOs targeting relevant local stakeholders (farmers, businesses, local communities, agencies responsible for PAs and ITs, development-oriented ministries e.g. transport, energy, mining)

43 Best practices in productive activities that benefit jaguars that protect habitat and prevent killings may be developed alongside / in coordination with existing commodity sustainability standards (GRBS-Global Roundtable for Sustainable Beef, GTPS-Brazilian Roundtable on Sustainable Livestock, RTRS-Roundtable for Responsible Soy, RSPO-Roundtable for Sustainable Palm Oil, Rainforest Alliance-certified shade grown coffee and cocoa, FSC-Forest Stewardship Council, etc

Objective 3 – STOP JAGUAR KILLINGS: Co-existence, Attitude Shift, Law Enforcement and Trafficking Disruption		
WWF Jaguar Milestones	**Indicators**	**Activities**
Objective 3.1 - By end 2025, successful approaches to **human-jaguar co-existence including effective conflict response mechanisms and improved community stewardship**, are replicated within WWF jaguar landscapes	• evidence of successful coexistence with jaguars in areas under production • effective conflict response mechanisms are in place	• disseminate successful animal husbandry approaches amongst ranchers within WWF jaguar landscapes • scoping of existing conflict response mechanisms across the jaguars' range • identify suitable government partners in each focal country for developing and implementing a pilot conflict response mechanism • upscale mechanisms based on lessons learned from pilot
Objective 3.2 - By end 2025, awareness and education campaigns effectively promote **changes in attitudes a**nd perceptions of jaguars and their conservation in jaguar landscapes	• perception surveys on jaguar conservation and value assigned to jaguars and their prey	• carry out stakeholder analyses for each landscape to map perceptions of jaguar conservation issues and motivations for all types of jaguar killings (retaliatory, preventative, for the trade in jaguar parts) • workshop to share experiences of jaguar-related awareness and campaigns (e.g. FVSA, indigenous Cofan in Ecuador), define target audiences, campaign objectives, etc • implement outreach to target groups (local communities, farmers, ranchers) to raise awareness about methods that reduce conflict as well as the positive role that jaguars play in the environment • assess viability of creating volunteer networks for jaguar monitoring (citizen science) • strengthen the awareness of the importance of prey availability for jaguar conservation
Objective 3.3 - By 2025 **effective enforcement** is in place in key jaguar landscapes so that the killing of jaguars and their prey is discouraged and is close to zero (against baseline TBD).	• # jaguars killed (both IWT and HJ conflict) significantly reduced • data on seizures of jaguar parts • scientific research on hunting/trade in jaguar parts • scientific research on hunting of prey species • empirical evidence (media)	• Roll out the 6 pillars of the Zero Poaching Framework in priority sites • establish baselines of jaguar killing and hunting of prey in key landscapes, using SMART • strengthen capacity of enforcement agencies in particular in transboundary areas • advocacy with governments to strengthen legal frameworks and better resource law enforcement authorities

	Objective 4 – CATALYSE COOPERATION: Range-wide and International Political Will		
WWF Jaguar Milestones	**Indicators**	**Activities**	
Objective 4.1 - By end 2025, **transboundary cooperation agreements** are developed and implemented by relevant governments for at least 3 transboundary WWF jaguar landscapes	• # bi- or multi-lateral cooperation agreements in place	• assess priority transboundary jaguar landscapes that would benefit from bi- or multi-lateral cooperation agreements to tackle key threats (e.g. spike in jaguar poaching on the Bolivia-Peru-Brazil border; habitat loss on Mexico-Guatemala-Belize border; jaguar-livestock conflict on Brazil-Argentina-Paraguay border) • establish an online platform that acts as a regional database, including resources available, news, maps and dashboards to integrate and communicate transboundary and regional efforts	
Objective 4.2 - By 2025, destination countries for jaguar parts sanction **measures to reduce or stop the international trade of and demand for jaguar parts**, in compliance with relevant international conventions	• effort corrected seizure data • # of measures sanctioned by demand countries	• Targeted demand reduction campaigns in demand countries, building on the ivory demand reduction experience • advocacy with embassies of demand countries (China, other Asian countries)to encourage strengthened law enforcement in demand countries and throughout trade chain • Global Summit on illegal trade in jaguar parts with supply and demand countries	
Objective 4.3 - By 2030, a broad-ranging **inter-governmental agreement** that recognises the role of jaguar conservation for safeguarding neotropical biodiversity, maintaining climate stabilising forests and enhancing human wellbeing is implemented between key jaguar range countries, setting the stage for the development of national-level legislation and public policies	• inter-governmental agreement under implementation by multiple jaguar range countries	• WWF participation in Jaguar 2030 Roadmap process • WWF advocacy with national governments to stimulate their engagement in Jaguar 2030 process • push for a Regional Jaguar Summit	
Objective 4.4 - From 2020, WWF secures sufficient **long-term funding** for implementation of its Jaguar Strategy, and supports governments to leverage large scale, long-term finance for jaguar conservation	• funding secured for implementing WWF Strategy • finance leveraged for wider jaguar conservation	• NGOs committed to jaguar conservation develop funding proposals in partnership with international organisations and relevant governments for addressing the main threats to jaguars across its range. • Novel avenues explored for innovative finance, including impact investing, carbon finance, etc.	

Objective 5 – CREATE ENABLING CONDITIONS: Science for Evidence-based Policies and Decisions, Public Support and Funding		
WWF Jaguar Milestones	**Indicators**	**Activities**
Objective 5.1 - From 2020, **WWF is recognised as a key ally** for jaguar conservation at the landscape scale in jaguar range countries and successfully promotes a cohesive and joined-up approach to conserving jaguars and their habitat across its range	• multi-stakeholder dialogues in key landscapes	• conduct in-depth stakeholder analysis at landscape level to identify most promising stakeholders to engage in jaguar conservation work in WWF jaguar landscapes (e.g. ranchers, farmers, private sector, cooperatives, associations, local communities, local/ state/federal governments, NGOs, research institutions), and to inform landscape-specific management plans
Objective 5.2 - By end 2023, all 14 jaguar range countries where WWF is present have **adopted new or updated existing jaguar National Action Plans (NAPs), and by 2025 have adequately resourced them**, as part of the integrated range-wide strategy for jaguar conservation promoted by the 2030 Roadmap	• # countries with jaguar NAPs (baseline 2019 = only 8 countries have NAPs) • design, implementation and monitoring of NAPs is carried out with participation of scientists	• WWF helps draft jaguar NAPs or review existing ones • support in-depth stakeholder analysis and multi-stakeholder consultation processes that strengthen inter-institutional synergies and promote good governance • help ensure synergies between NAPs and the emerging Jaguar 2030 roadmap • advocacy work with environment ministries to influence the development of jaguar NAPs
Objective 5.3 – By 2023, robust science is used to advocate for the development of **evidence-based national and sub-national policies, laws and regulations governing key economic sectors** (especially agriculture and linear infrastructure), recognising the wider role of jaguar conservation for maintaining ecosystems services and supporting livelihoods	• # evidence-based policies • # national/ sub-national policies and legal instruments that incorporate jaguar biodiversity criteria • # infrastructure development plans that consider jaguar biodiversity criteria	• support governments to develop science-based landscape management plans that support both conservation and economic development • build inter-ministerial support for jaguar landscape management plans • integrate jaguar needs into land use planning • engage with governments in the development of wildlife-friendly infrastructure • scope out existing national /sub-national land use policies and plans to identify opportunities for including WWF jaguar landscapes as priority conservation areas • promote WWF jaguar landscapes to government agencies as priority areas for strengthening PA management and implementation • integrate jaguar monitoring into PA management effectiveness strategies and monitoring
Objective 5.4 - From 2020, **build political will** at the landscape, national and international levels – including the will of countries outside of range states whose cultural practices impact on jaguar conservation	• level of governments investment in jaguar conservation and PA management	• advocacy work to encourage national and sub-national governments to invest more in wildlife conservation and protected area management within landscapes
Objective 5.5 - From 2020, **mobilise public support** through inspirational media and educational programmes that build local support, instil a sense of pride, consolidate the jaguar as a symbol of Latin American cultural identity, and foster behavioural change within landscapes	• perception surveys • local, regional, national surveys	• develop landscape-specific communications and education materials • launch and implement national-level mass communication initiatives and public campaigns to increase jaguar conservation visibility and engagement
Objective 5.6 - By end 2030, public and private development projects (mining, infrastructure, agroindustry, cattle ranching, logging) planned in jaguar landscapes and their financiers incorporate **social and environmental safeguards** that explicitly include jaguar conservation and management requirements.	• safeguards adopted by development projects	• identify potential early adopters of safeguards within development sectors (mining, infra-structure, agriculture, cattle ranching, logging) that have or plan to have projects within jaguar landscapes • stakeholder workshop for disseminating proven road fragmentation mitigation techniques • develop sector-specific safeguards • influence financial flows to these projects