



# WWF Partners Symposium

## Pre-event Materials

March 7-8, 2016  
Washington, DC

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## FAQs

**Q. What time should I arrive at WWF Headquarters on Monday, March 7?**

A. Registration begins at 8:00 a.m.

**Q. What is the recommended attire?**

A. Monday, March 7: Business Casual  
Tuesday, March 8: Capitol Hill excursion: Business  
Zoo excursion: Business Casual

**Q. What do I need to know about the Capitol Hill and National Zoo excursions?**

A. Please refer to page 7 for specific information on each excursion.

**Q. What time should I arrive on Tuesday, March 8?**

A. Breakfast will begin at 8:00 a.m. Registration will also open at 8:00 a.m. for those who did not register on Monday.

**Q. What should I do if I have special dietary restrictions or need special assistance?**

A. Please contact us as soon as possible at (888) 993-1100.

## Getting to WWF: Driving Instructions

The **WWF Building** is located at **1250 24<sup>th</sup> Street NW, Washington D.C. 20037**

### **Driving directions to the WWF Building:**

From Maryland (via MD-295 Baltimore-Washington Parkway):

*\*If you are traveling from **Thurgood Marshall BWI Airport** you will take the signs pointing to MD-295 Baltimore Washington Parkway and then follow the instructions below.*

1. Traveling South on MD-295
2. Take slight right toward US-50 W/New York Avenue NE (signs for US-50 W/ Washington)
3. Take the ramp onto US-50 W/New York Avenue NE
4. Slight right onto L Street NW
5. Continue onto Massachusetts Avenue Northwest
6. Enter roundabout and take the 4<sup>th</sup> exit onto Rhode Island Ave, NW
7. Turn slight right onto M Street NW
8. Turn right onto 24<sup>th</sup> Street NW
9. The WWF Building will be on the left

From Maryland (via I-95 South):

1. Heading South on I-95 to I-495 (Capitol Beltway) toward Silver Spring/Northern Virginia
2. Keep right for exit 27 and merge onto I-495 W toward Silver Spring
3. Take exit 30 onto US-29 S/Colesville Road toward Silver Spring
4. Continue to follow Colesville Road
5. At the traffic circle, take the 3<sup>rd</sup> exit onto 16<sup>th</sup> Street NW heading south (entering the District of Columbia)
6. Turn right onto Florida Avenue NW
7. After crossing over Connecticut Ave NW, Florida Ave NW becomes 23<sup>rd</sup> Street NW
8. Turn right onto N Street NW
9. Take the 1<sup>st</sup> left onto 24<sup>th</sup> Street NW
10. The WWF Building will be on the right

From Virginia (via I-395 North):

*\*If you are traveling from **Reagan National Airport** you will take the George Washington Memorial Parkway North and follow signs to the Arlington Memorial Bridge. Then follow the instructions (below) starting at #8.*

1. Heading North on I-395 N
2. Take exit 8B toward Pentagon/Arlington Cemetery/Rosslyn (entering into the District of Columbia)
3. Take the George Washington Memorial Parkway North ramp toward US-50 W
4. Take the exit on the left toward US-50 W/Memorial Bridge/Arlington Cemetery
5. Keep left at the fork in the ramp
6. Enter next roundabout and take the 1<sup>st</sup> exit onto Arlington Memorial Bridge
7. Keep left at the fork to continue on Arlington Memorial Bridge
8. The Lincoln Memorial will be in front of you
9. After you cross the bridge, veer left around the Lincoln Memorial
10. Turn left onto 23<sup>rd</sup> Street NW
11. Enter the next roundabout and take the 4<sup>th</sup> exit onto Pennsylvania Ave NW
12. Turn right onto 24<sup>th</sup> Street NW
13. The WWF Building will be on the left

From Virginia (via I-66 East):

*\*If you are traveling from **Dulles Airport** you will take 267 East to I-66 East and then follow the instructions (below).*

1. Heading East on I-66
2. Keep left at the fork, follow signs for E Street/Interstate 66 E
3. Keep left at the fork, follow signs for Whitehurst Freeway and merge onto I-66 E
4. Keep right at the fork, follow signs for Whitehurst Freeway
5. Keep in right-most lane to exit, follow signs for Pennsylvania Ave and merge onto L Street NW
6. Slight right onto Pennsylvania Ave NW, then immediately get into the left-turn lane to stay on L Street NW
7. In approximately 1 block, turn left onto 24<sup>th</sup> Street NW
8. The WWF Building will be on the left

## **Getting to WWF: Walking Instructions**

*Map provided on Page 8.*

### **From Dupont Circle Station**

1. Exit station using the Connecticut Ave and 19<sup>th</sup> Street NW – Dupont South Exit
2. Continue south (straight ahead) on 19<sup>th</sup> Street NW
3. Turn right on N Street NW
4. Walk 6 blocks west on N Street NW
5. Turn left onto 24<sup>th</sup> Street NW
6. Walk approximately ½ block south on 24<sup>th</sup> Street NW
7. The WWF Building will be on your right

### **From Foggy Bottom Station**

1. Exit station and turn to your left. Walk approximately 1 block north on 23<sup>rd</sup> Street NW
2. Turn left on Washington Circle NW
3. Walk approximately 1 block west on Washington Circle NW
4. Bear left onto Pennsylvania Avenue NW
5. Walk a short distance northwest on Pennsylvania Avenue NW
6. Turn right on 24<sup>th</sup> Street NW
7. Walk approximately 2½ blocks north on 24<sup>th</sup> street NW
8. The WWF Building will be on your left

For more information on metro accessibility please go to: <http://www.wmata.com/>

### **From the Hilton Garden Inn**

1. Exit from the hotel's main entrance on 22<sup>nd</sup> Street
2. Walk toward M Street
3. Turn right on M Street
4. Walk two blocks to 24<sup>th</sup> Street NW
5. Turn right on 24<sup>th</sup> Street NW
6. The WWF Building will be on your left

## **Parking at WWF**

*(Parking rates are subject to change.)*

<b>Parking Garage Address &amp; Hours of Operation</b>	<b>Parking Garage Manager &amp; Phone Number</b>	<b>Hourly Rate</b>	<b>Daily Rate</b>	<b>Type of Payment</b>
1250 24th St NW (WWF HQ) M-F 6am-9pm	Colonial Parking; 202-295-8100	\$12	\$21	Cash and Credit Cards
2300 N St NW M-F 7am-11pm	Colonial Parking; 202-295-8100	\$11	\$19	Cash and Credit Cards
2300 M St NW M-F 5:30am-12am	PMI Parking; 202-785-9191	\$10	\$22	Cash and Credit Cards
Park Hyatt: 1201 24 <sup>th</sup> St NW M-F 6am-8pm	Hotel Phone Number; 202-789-1234	n/a	\$20	Cash and Credit Cards
The Akers Building 1255 23 <sup>rd</sup> St NW M-F 6am-7pm	Central Parking; 877-717-0004	\$11	\$17	Cash and Credit Cards

## **Excursions on Tuesday, March 8**

*Roundtrip transportation from WWF will be provided for both excursions.*

### **Capitol Hill**

- Government-issued photo I.D. is REQUIRED for entry
- Parking is not available for private automobiles, buses or other vehicles on Capitol grounds.
- We will walk approximately 4 blocks from the shuttle drop off to the Capitol Building at East Capitol Street and First Street, SE
- WWF staff will stand along the route to guide you to the correct location and entrance
- Please be sure to wear appropriate footwear
- If you are planning to meet the group at the Capitol Visitors' Entrance, the closest parking garage is at Union Station, 50 Massachusetts Avenue, NE
- Visitors are screened by a magnetometer and all items that are permitted inside the building are screened by an x-ray device.

#### **The following items are strictly prohibited:**

- Liquid, including water
- Food or beverages of any kind, including fruit and unopened packaged food
- Aerosol containers and Non-aerosol spray (prescriptions for medical needs are permitted)
- Any pointed object (i.e., knitting needles, letter openers, etc. Note: pens and pencils are permitted.)
- Any bag larger than 18" wide x 14" high x 8.5" deep
- Sealed boxes or envelopes
- Electric stun guns, martial arts weapons or devices, guns, replica guns, ammunition, and fireworks
- Knives of any size
- Mace and pepper spray
- Razors and box cutters
- Cans and bottles
- Battery-operated electronic devices (Medical devices are permitted.)

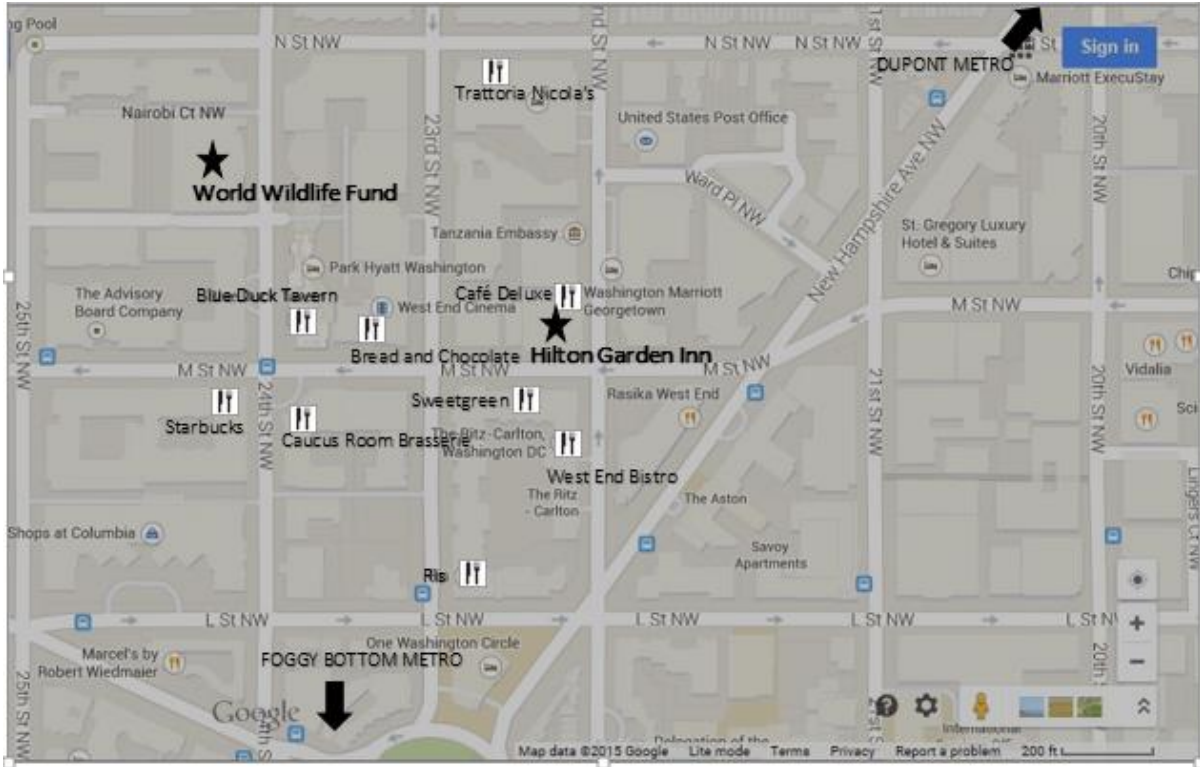
Capitol Hill Buildings are smoke-free.

### **National Zoo**

- Please be sure to wear appropriate footwear
- The shuttle will drop off at the front entrance of the zoo (Connecticut Avenue). The tour will conclude at the back entrance of the zoo (Beach Drive), where the shuttle will be waiting to pick us up.

## LOCAL DINING OPTIONS

*Please note: All meals Monday, March 7<sup>th</sup> and Tuesday, March 8<sup>th</sup> will be provided.  
[Dinner following the closing reception on Tuesday, March 8<sup>th</sup> is on your own.]*



**Blue Duck Tavern** (1201 24<sup>th</sup> Street NW)  
American cuisine  
\$\$\$ Lunch/Dinner - Fine Dining

**Bread and Chocolate** (2301 M Street NW)  
American cuisine  
\$\$ Breakfast/Brunch/Coffee - Cafe

**Café Deluxe** (2201 M Street NW) Inside the Hilton Garden Inn  
American cuisine  
\$\$ Breakfast/Brunch/Lunch/Dinner – Restaurant

**Caucus Room Brasserie** (2350 M Street NW) Inside the Westin Georgetown Hotel  
Steakhouse  
\$\$\$ Breakfast/Brunch/Lunch/Dinner – Restaurant

**\*Founding Farmers** (1924 Pennsylvania Avenue NW)  
Farm-to-Table American cuisine  
\$\$ Lunch/Dinner – Restaurant

**\*Rasika** (633 D St NW)  
Indian cuisine  
\$\$ Lunch/Dinner – Restaurant

**Ris** (2275 L Street NW)  
American cuisine  
\$\$\$ Brunch/Lunch/Dinner – Restaurant

**Starbucks** (2400 M Street NW)  
\$ Coffee/Breakfast – Cafe

**Sweetgreen** (2238 M Street NW)  
Salad/Sandwiches  
\$ Lunch/Dinner – Carryout

**Westend Bistro** (1190 22<sup>nd</sup> St NW) Inside the Ritz Carlton hotel  
French bistro and contemporary American cuisine  
\$\$ Lunch/Dinner – Restaurant

*\*not shown on map*



## **Background Reading materials**

**Story from the Field: Inside the World's Largest Transnational Conservation Area**

[Article: KAZA](#)

**Thirty Hills: Saving Sumatra's Forests and Wildlife**

[Report: Saving 30 Hills](#)

**The Future of Conservation: Education for Nature and Beyond**

[Report: 2015 EFN Annual Report](#)

**Finding Your *Together Possible* Story**

[Handout: Together Possible](#)

[Handout: Manifesto](#)

**Climate Change After Paris: Commitments for the Future**

[Press Release: Post-Paris Action](#)

**Magical Myanmar**

[Report: A Green Economy in the Golden Land](#)

[Report: A Better Road to Dawei](#)

Capitol Hill Excursion

[Meeting schedule](#)

# WORLD WILDLIFE

EXCERPTED FROM SPRING 2016



## DISCOVER KAZA

Vast herds of elephants, elusive lions and leopards, and hundreds of species of birds mix with human communities and cultures in KAZA—the Kavango Zambezi Transfrontier Conservation Area—which unites five nations to protect wildlife and improve people's lives.





# KAZA

AT THE HEART OF SOUTHERN AFRICA LIES  
A DRY LANDSCAPE FED BY LIFE-GIVING  
RIVERS. DISCOVER THE KAVANGO ZAMBEZI  
TRANSFRONTIER CONSERVATION AREA.



**3**  
Meet the people  
and wildlife of  
KAZA

**17**  
Untangle a few  
of KAZA's many  
interconnected  
parts


**19**  
Wildlife at night

## Safe Journeys

*In a vast African landscape where many people wish travelers “safe journeys” instead of “goodbye,” a burgeoning cross-pollination of ideas, people, and wildlife is making the future of the world’s largest terrestrial protected area bright*

by **Rachel Murchison**

photographs by **Gareth Bentley and Patrick Bentley**



IT IS STILL DARK OUTSIDE, with a sliver of a moon hanging in the enormous African sky, when Nelson Sabata starts for work. It's a short 10-minute walk from his small house to Camp Chobe, an elegant but rustic tented lodge nestled along a turn in the Chobe River, where the northeastern corner of Namibia hugs the border with Botswana. Sabata works at the lodge as a guide, introducing well-heeled tourists to the raw splendor of wild giraffes, hippos, lions, zebras, and other creatures that travel the area's generous floodplains.

But this morning he has a problem: His house is surrounded by elephants. It's too dangerous for him to try to make his way past the unyielding visitors on foot; last year his grandfather was killed by an elephant near their village. He calls the lodge, and soon the manager is in route in a truck to collect him.

Sabata appears unfazed by the momentary hitch. "I'm used to it," he says with an easy smile. "Elephants often stop by."

Sabata lives within Salambala Conservancy, one of Namibia's first communal conservancies—areas run by communities to sustain wildlife and create steady income for residents through nature-based activities like ecotourism, hunting, and locally made crafts. It's a model that is clearly benefitting him; at 25, he says he loves his job and makes a good living. His tidy tin-roofed house is adorned with a solar-powered satellite dish that streams 200 TV channels to his small living room.

Living in close proximity to elephants may sound exciting, even enviable, to those of us whose daily exposure to the



### **A GRAND PARADE**

At dusk, hundreds of elephants move through the brush near the Kwando River's famous "horseshoe" bend in eastern Namibia.

wild seldom extends beyond the odd neighborhood squirrel. But there are real risks. Predators like hyenas and lions attack cattle in the night. Grazing hippos and elephants, known for their voracious appetites, lay waste to farms. Less frequently, people like Sabata's grandfather are killed. Communities have reasons to fear and resent wild animals. They also have reasons to poach them. Rising demand for illegal ivory and rhino horn—much of it coming from newly affluent consumers in Asia—makes it extremely profitable. A kilogram of ivory fetches a local poacher about US\$500, a sizable amount in a country like Namibia, where roughly one in three people earns less than \$1.25 a day.

In many ways, Sabata's remote village, while seemingly at the edge of the world, is at the center of a global conversation—one that has profound consequences for the future of wildlife. Regardless of how many well-intentioned conservation strategies are developed or global treaties signed, if the people who live among wild animals do not value them, animals will continue to disappear. Given the alarming pace of species loss and rapid human population growth in the regions that shelter most of the world's remaining biodiversity, communities like Sabata's are on the front lines.



ROUGHLY 40 MILES DOWN the road from Salambala, Morris Mtsambiwa greets the morning from his new office in Kasane, Botswana. Kasane lies directly across the Chobe River from Namibia and only a dozen miles from the borders with Zambia and Zimbabwe, earning the area the name “four corners.”

Mtsambiwa has a friendly, optimistic demeanor—important qualities for the job before him. Earlier this year, after a stint as the director-general of the Zimbabwe Parks and Wildlife Management Authority, Mtsambiwa became the executive director of KAZA, the Kavango Zambezi Transfrontier Conservation Area. Formally created in 2011, KAZA is the world's largest transboundary conservation area, covering an area roughly the size of France and spanning territory across five southern African countries: Angola, Botswana, Namibia, Zambia, and Zimbabwe. The vision of KAZA is ambitious: to unite the five countries in a shared effort to protect wildlife, promote tourism, and support the socioeconomic well-being of local communities.

As with many big ideas, KAZA is moving incrementally toward realization. Aided by funding principally from the German development bank KfW, the five partner nations, WWF, Peace Parks Foundation, and nonprofit organizations such as Integrated Rural Development and Nature Conservation (IRDNC), the countries have created integrated development plans, delineated existing and future wildlife corridors, built initial infrastructure, and identified new tourism offerings.

Mtsambiwa admits that despite strong political support, bringing together five different countries with distinct laws, interests, and ways of doing business is not easy. “A huge part of my job is to find common ground between the governments.” He seemed pleased with a recent KAZA golf tournament that brought players from three of the five countries together in

shared frustration over their mediocre golf strokes. “They're getting along much better now,” he says with a chuckle.

What KAZA may lack thus far in formal infrastructure, it makes up for in biological richness. Advertising itself as a “Noah's ark” for almost 200 different species of mammals and over 600 species of birds, KAZA is endowed with extraordinary natural beauty. The region's sandy woodlands, wetlands, and grasslands host the world's largest population of elephants, along with buffalos, rhinos, lions, cheetahs, African wild dogs, and dozens of species of antelope.

Mtsambiwa dreams of seeing KAZA become a well-known tourist destination, enticing visitors to see the marvel of Victoria Falls in Zimbabwe, the wildlife-rich Okavango Delta in Botswana, the rustic beauty of Bwabwata National Park in Namibia, and the largely undeveloped wilderness of places like Zambia's Sioma Ngwezi National Park or Angola's Luiana National Park.

Most important, he wants to see local communities actively engaged in the process and reaping the benefits from tourism development. He wants more people like Nelson Sabata to start new careers and take leadership in decisions about the region's future. “This emphasis on bottom-up involvement is what makes KAZA so unique,” Mtsambiwa says. “Ultimately our success depends on the communities who live here.”



KAZA IS NOT JUST AN ECONOMIC DREAM; it has deep conservation aspirations as well. Wildlife such as elephants, zebras, and lions are freewheeling creatures, oblivious to national borders as they traverse large areas in search of food, water, cover, and mating opportunities. Creating optimum conditions for their survival requires managing entire landscapes, not just individual parks. When one country makes a decision—to dam a river or cut down a forest—it affects wildlife across the region.

On paper, KAZA forms a contiguous landscape, linking together more than 20 national parks and numerous reserves and other protected areas—including Salambala Conservancy in Namibia—so that animals can pass safely between countries.

But the reality is that wildlife faces many roadblocks. For the past nine years, WWF lead wildlife scientist Dr. Robin Naidoo has been studying the migration patterns of zebras, buffalos, and other wildlife in the area. His data shows the impact of fences and other linear boundaries on wildlife movements. For instance, there is a 125-mile veterinary fence erected by Botswana's government in 1996 to prevent the transmission of livestock disease along the Botswana-Namibia border. The fence obstructs one of the most important wildlife corridors in KAZA. WWF has been a strong advocate for removing portions of the fence, but before this can happen, Namibia must meet certain criteria related to cattle disease control.

Wildlife movements are also constrained by uneven levels of security in KAZA's five countries. “There is an overabundance of elephants in northern Botswana and Bwabwata National Park in Namibia because elephants are not traveling in large numbers into Angola and Zambia. They hesitate out of fear of poachers,” explains WWF-Namibia director Chris Weaver.



**NATURAL LEADER**

Conservation agriculture techniques help farmer Sipalo Mubita's corn thrive despite a drought, providing income for him, his family, and more than 40 farm staff.





EVEN BEFORE YOU SEE an elephant in Bwabwata National Park, the prodigious amount of trampled and gnawed up vegetation makes it clear that they are everywhere. Hardly an acacia tree in the park stands intact.

“Elephants are catholic feeders,” explains WWF-Namibia transboundary conservation advisor Russell Taylor. “They will eat almost anything. Bwabwata is a good example of what happens when you have a local overabundance of elephants. Research in which I’ve been involved suggests that when elephant density exceeds a certain tipping point, the total number of bird species in an area can decline by 50%.”

For nearby communities, too many elephants also means more frequent crop raids and risky human-wildlife encounters. “For people living on the front lines, the benefits they get from tourism don’t always keep pace with the challenges of increasing wildlife populations,” Taylor adds.

KAZA, therefore, is a needed solution; it offers corridors that elephants and other animals can use to travel from high-density population pockets to less crowded habitat. The KAZA Master Integrated Development Plan, created by working in close partnership with stakeholders including communities and conservation groups, delineates six “wildlife dispersal areas” based on existing animal migration routes. It is a practical way to break up the larger KAZA landscape into smaller, more manageable areas of focus, each of which contains critical habitat and strong income-generating potential for local people.

One of those six areas is the Kwando River Wildlife Dispersal Area, which connects Bwabwata National Park and surrounding communal conservancies in Namibia to more sparsely populated parks in Angola and Zambia, including Zambia’s Sioma Ngwezi National Park.

In contrast to Bwabwata’s well-kept roads, worn down by a steady passage of tourist vehicles, Sioma Ngwezi is wild. The park’s sometimes sandy, sometimes muddy and rutted roads are lined with thickets of thorny acacia that grate the sides of the rare vehicle that passes through. There are no elephants in sight, nor are there any tourists. But the landscape is beautiful and rich; its woodlands are auburn as winter nears and replete with bands of skittish impala, sable, wildebeest, and roan.

The habitat is ample, and primed to take on wildlife from Bwabwata; it could easily become an alluring, rugged destination for tourists interested in straying from the beaten path. But the animals here are skittish for a reason: In the middle of the park, circling vultures indicate that there is a fresh carcass a short distance from the road. Simasiku Sitali, a ranger with the Zambia Wildlife Authority, cocks his gun and surveys the landscape attentively. He is suddenly on alert; there may be poachers nearby.



POACHING, OF COURSE, is an ever-present threat, and KAZA’s success will depend in part on whether governments can keep it under control. Upwards of 20,000 African elephants are illegally killed for their ivory each year, feeding hungry black markets in





Asia and other parts of the world. It is a vicious, sophisticated business—on par with international drug cartels—raking in up to \$10 billion a year.

Sharing intelligence across borders is critical for catching criminals, and there are clear signs that the five KAZA governments are increasingly joining forces. Gryton Kasamu, senior warden of the Western Region for the Zambian Wildlife Authority, remarks that he is now working more closely with his counterparts in Angola and Namibia to apprehend poachers. In Zimbabwe, Zambezi National Park area manager Edmore Ngosi attributes successful arrests and convictions of wildlife criminals to improved cross-border information sharing and better

collaboration with the police. The penalties in Zimbabwe have been upped as well, to a minimum of nine years in prison.

And it's not just officials who are talking to each other. At the village level, community transboundary forums, some of which have been in place for over a decade, bring local leaders from adjacent countries together to discuss issues of common concern such as wildfires, human-wildlife conflict, poaching, and the formation and maintenance of wildlife corridors. One of KAZA's goals is to strengthen

and multiply these local structures across the region. The Kwandu-Imusho transboundary forum, for example, has a radio that connects the village of Imusho in Zambia with the Kwandu Conservancy in Namibia. Residents use the radio to share news and, as a result, cattle thefts and poaching have decreased noticeably.

"Conservation issues always span national borders, particularly in Africa, where migrating wildlife often travels through multiple countries," says Neville Isdell, former chairman and CEO of The Coca-Cola Company. "My wife Pamela and I both grew up in Zambia, and we care deeply about protecting the region for future generations. That is why we are such strong supporters of community transboundary forums, which bring people together to manage shared natural resources, grow the local economy, and fight poaching. These forums are the building blocks necessary for large-scale conservation in KAZA."

And beyond the crucial contributions made by forums, eliminating poaching in the region also requires addressing fundamental economic and social realities. "Poaching levels fluctuate here from year to year," Gryton Kasamu says from his post in southwest Zambia. "This year the entire region had very poor rainfall, and people are hungry. And when people are hungry, they're more likely to poach."



HUNGER AND POVERTY are a constant refrain. In a region where a single elephant intrusion can easily destroy a family's farm



### NATURE IN ALL THINGS

Clockwise from top left: A makeshift elephant fence strung with soda cans on the Salambala Conservancy; carved hippos for sale at Mashi Crafts center, which returns profits to the community; game guard Humphrey Mwanga describes efforts to mitigate human-wildlife conflict in Wuparo Conservancy; Anastasia Sabata heats water over a fire in Katounyana village near Camp Chobe; a wildlife monitoring book in Wuparo; Nelson Sabata, a guide at Camp Chobe, outside his home in Katounyana.





See KAZA in motion: Visit [worldwildlife.org/kazavideo](http://worldwildlife.org/kazavideo).



### **BRIDGED DIVIDES**

Victoria Falls forms part of the border between Zimbabwe and Zambia, with tourist attractions on both sides. The falls are on the Zambezi River, which provides water for all five KAZA countries before reaching the sea in Mozambique.



**ORGANIC REMEDY**

Imbamba Felicitas searches for devil's claw, a plant sold as a treatment for rheumatism in Europe. In Namibia, Khwe women earn money by sustainably harvesting the roots.

and disrupt their already tenuous food supply, there must be economic incentives for living among wildlife. Otherwise, local communities bear the costs of proximity, while visiting tourists and private operators reap the gains.

Namibia has pioneered a model of community-based conservation that has become a laudable success story. Since 1998, Namibia has created 82 communal conservancies covering nearly 20% of the country. Formed and run by local people, the conservancies offer protected space for wildlife and have embraced wildlife as a livelihood strategy. In fact, wildlife has generated more than \$54 million in benefits for communities through tourism and trophy hunting over the past 18 years. All of the benefits go directly to the conservancies, which use them to fund local development initiatives and improve rural livelihoods.

The model has produced impressive gains for wildlife: The black rhino, once nearly extinct, has rebounded, with Namibia's conservancies hosting the largest free-roaming rhino population in the world. Desert lions, reduced to fewer than 25 individuals by the mid-1990s, now number over 150 and roam vast areas of Namibia's arid northwest. Elephant populations too have grown, from just 7,600 individuals in 1995 to over 20,000 today.

WWF and local Namibian nonprofits like IRDNC have played a central role in the growth of the conservancies. Working in tandem with Namibia's Ministry of Environment and Tourism, the organizations have helped communities to reintroduce wildlife, create strong governance and financial management structures, and develop relationships with the private sector.

"Prior to the creation of conservancies, local people were living among wildlife but not getting any benefit," says IRDNC program director Karine Nuulimba. "The mindset at the time of Namibia's independence in 1990 was that tourism was largely a white person's industry and that wildlife was a nuisance. That has since changed. People are now growing up in communities that value wildlife and view tourism as a great economic engine."

Mayuni Conservancy, which sits in Namibia's panhandle in the heart of KAZA, was one of the first conservancies created, thanks in part to a prescient traditional authority, Chief Mayuni, who saw the opportunity ahead.

"As a leader, you can't ever know when you start something whether it's going to be a good idea. But I knew that I had to find a way to help my community. I had to try this idea because of the potential it held—for both people and wildlife," Chief Mayuni explains.

The gray-haired, bright-eyed chief is a study in contrasts: His two cell phones lie face up on his modern desk, but he rests his hands on a *namaya*—a traditional power stick made of black eland hair and ivory, which has been handed down over generations. And while he is a powerful authority in this area—in keeping with tradition, no one can approach him without first kneeling and clapping—he is at the same time heir to forces beyond his control. At this moment, he is desperate to get water for his community after moving the village away from prime river habitat, ceding the land to wildlife. To recognize the chief for this sacrifice, the KAZA Secretariat has committed to install boreholes at their new location, but so far nothing has happened.

"I am the chief and I have no water," Mayuni says. "I have to

go down to the river and fetch it in buckets in my car. Imagine what the rest of my community is dealing with."



DESPITE THE CURRENT WATER SHORTAGE, Chief Mayuni has much working in his favor. A strategic businessman, he is assisting his conservancy in partnering with private companies to develop new tourism opportunities. This includes the creation of joint-venture lodges that split revenue between the community and private owners. Mayuni Conservancy's newest addition is Nambwa Lodge, which with its palatial canopy tents and candlelit dinners overlooking stunning plains, makes for a seductive African experience. (Camp Chobe, where Sabata works, is also a joint venture lodge.)

One of Nambwa Lodge's shareholders, Juan Marx, is a native of South Africa and has been in the joint-venture business in Namibia for more than 12 years. He says one of the most satisfying parts of his job is getting to build long-term relationships with community members, many of whom work at the lodges.

"I've worked with some of the staff here at Nambwa for over a decade. Our chef, Lusken, for example, started at a sister lodge as a carpenter, then moved into the kitchen, and then slowly evolved into a role as a cook. Now, he's the head chef. It's been amazing to watch that growth happen. We sometimes sit together and watch BBC Food in the afternoons as he plans his next meal."

Joint-venture partnerships are not without their challenges. Reuben Mafati, who works as a tourism coordinator for IRDNC, explains that the organization "often helps facilitate conversations between the private sector and communities. There can be a huge power differential when the groups sit down at the table. Community representatives may only have an elementary-level education; they may not know what a percentage is. We join the conversation to help ensure that it is balanced."

WWF business specialist Richard Diggle—a former London banker who fell in love with Africa on his first trip to Kenya in 1992 and has lived in Namibia for the past 17 years—is quick to point out that the power dynamic can go both ways. "Conservancy leaders and traditional authorities are critically important business partners for lodge operators—they can make or break a lodge's success."



NAMIBIA'S CONSERVANCY model is not perfect; there are instances of corruption and financial mismanagement. In one such case, a conservancy chairman allegedly withdrew \$1,500 to purchase rifles that never materialized. But overall the program is producing significant results that are attracting the attention of Namibia's neighbors.

Across the border in Imusho, Zambia, Bornfree Kumara, the chairperson of a local village action group, wants to emulate Namibia's success. "We've seen our friends on the other side of the border fight to get where they are, and the benefits they are receiving are inspiring to us. We feel we could do something similar here if the government revised its policy to allow it."

Kumara says this with fire, adding: “We have very little else we can do here. This year the rains were bad, and people are starving.”

As KAZA evolves, it is building up structures that stimulate the cross-pollination of ideas and cooperation across borders. Kumara, who actively participates in the Kwandu-Imusho transboundary forum, remarked that he has learned a lot about communal conservation from visiting his Namibian neighbors. His chief, Gerard Mayema, wants to create a similar partnership between Imusho and a community in Angola to the west to form a large connected area between the three nations. His goal is to work together to protect their shared resources and grow the local economy through tourism.



SHARING RESOURCES IS A central theme at KAZA’s biannual transboundary forum in July 2015—a three-day, two-night affair, held under a sweeping mahogany tree at an enchanting spot above the floodplain within Salambala Conservancy—just a few miles down a dirt road from Nelson Sabata’s post at Camp Chobe. Here, Bornfree Kumara joins more than 60 other community members, NGO staffers, and government officials from four of the five KAZA countries—Angola, Botswana, Namibia, and Zambia—as well as representatives visiting from Tanzania, to share stories, successes, frustrations, and ideas. Nearby, a lone elephant grazes alongside the riverbank. As people arrive, greet each other with warm hugs, and unpack their camping gear, it feels like a family reunion.

Geraldo Mayira Moyo, who works with the nonprofit Association of Conservation and Integrated Rural Development, or ACADIR, in Angola, is attending the forum for the second time. Conservation has not taken a firm hold in Angola yet, and the portion of Angola that sits within KAZA may still have some land mines from prior conflicts, slowing efforts even further. Even Mayira Moyo admits that Angola is short on tourists and high on poachers. But he sees the example of Namibia as a beacon, and he was so heartened by what he learned at the last forum that he has returned—this time with a community leader and a representative from Angola’s Ministry of the Environment in tow.

As participants take their seats in plastic chairs and the dialogue begins, it becomes clear that this small, vibrant group of people—coming together to make conservation work in their shared landscape—is also taking part in a much bigger story. The world is in the midst of what *New Yorker* writer Elizabeth Kolbert aptly calls “the 6th extinction”—the rapid loss of animal and plant species due to human activity. In less than two human generations, populations of mammals, birds, reptiles, amphibians, and fish have dropped by half. Now human decisions, including those made by the people who live among vulnerable wildlife, will either further abet collapse or carry life forward to safer ground.

This afternoon, though, the gathering at Salambala Conservancy bears no signs of such gloominess. The air is buoyant. In the distance, zebras, once largely absent from the area, kick up dust clouds from the arid soil. The landscape is alive, the day is not yet over, and the outstretched plains invite the imagination toward unformed possibility. 🌍





### **FERTILE FLOODPLAINS**

On Salambala Conservancy land, a herd of zebras hundreds strong pauses in the morning light to rest. Their return to Salambala is proof that community-based conservation works.









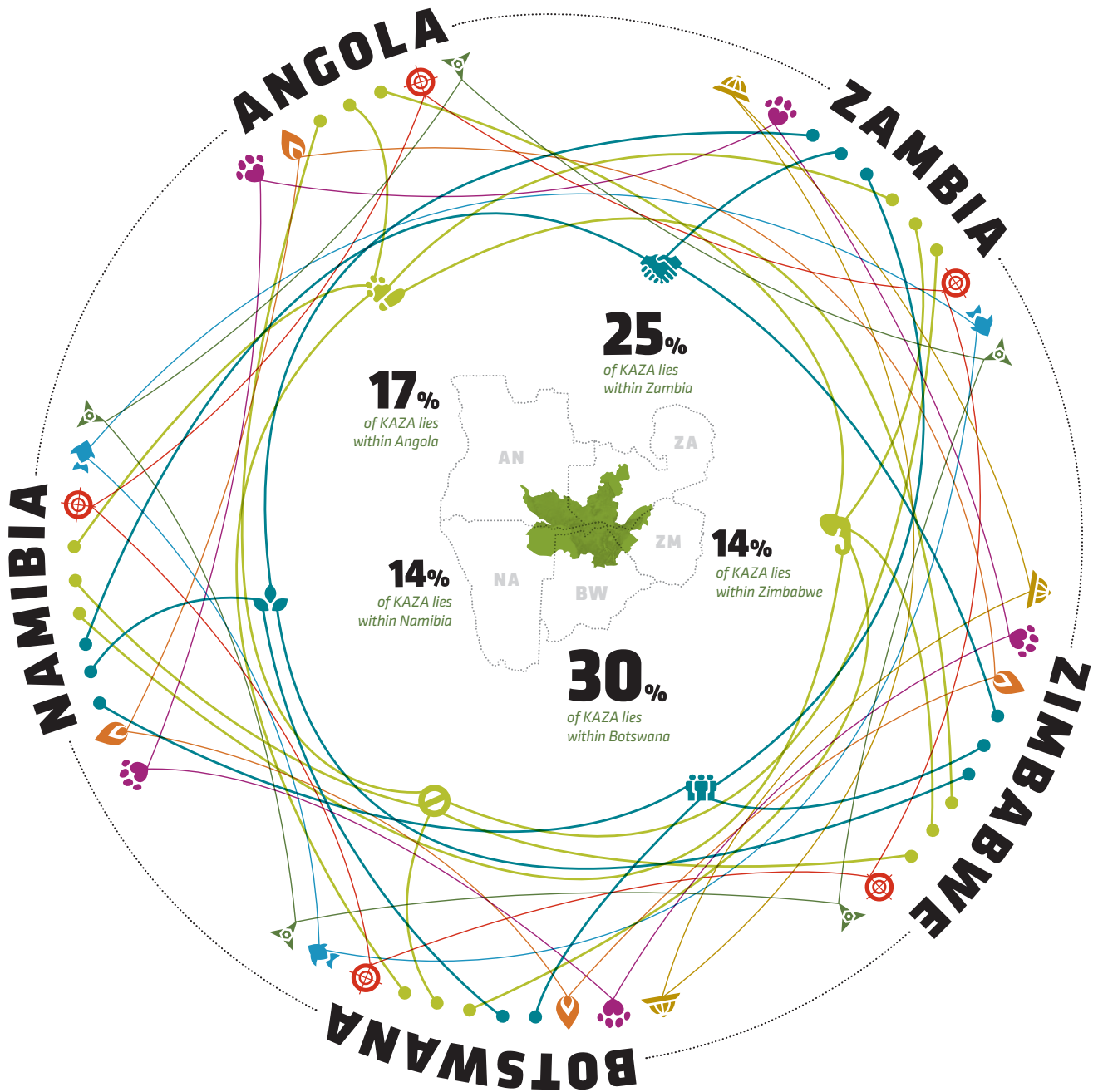
**SAFE HAVEN**

Near where the Chobe River marks the border between Namibia and Botswana, a common waterbuck surveys the surroundings. Joint-venture lodge Camp Chobe is seen in the distance.



# FIVE NATIONS IN CONCERT




An undertaking like KAZA is ambitious and complex, and each country—whether working independently or in tandem with others—is developing its own activities to meet the initiative’s goals. A few are represented here.




## INITIATIVES IN ALL KAZA COUNTRIES

-  **ELEPHANT SURVEYS**  
Aerial elephant surveys have been, or are being, conducted in all KAZA countries.
-  **ANTIPOACHING EFFORTS**  
Actions to fight commercial poaching at multiple points in the law enforcement chain include increased community awareness, strengthened informant networks, enhanced vigilance, improved law enforcement capacity, improved coordination among law enforcement agencies, and more reliable prosecution of poachers.
-  **HUMAN-WILDLIFE CONFLICT (HWC)**  
A growing human population and expanding development are leading to increased conflict between people and wildlife. Each KAZA country has its own approach to HWC mitigation; KAZA provides a platform for sharing and learning from those approaches to reduce the costs to communities living among wildlife.

## INITIATIVES IN MULTIPLE KAZA COUNTRIES


-  **COMMUNITY-BASED CONSERVATION BW + NA + ZA + ZM**  
Local people must be actively engaged in decision-making about their land and resources, and have strong incentives to value and protect wildlife. This is the most powerful deterrent against poaching.
-  **JOINT VENTURE (JV) PARTNERSHIPS NA + ZA + ZM**  
JVs create partnerships between communities and private investors to establish and operate tourism lodges or hunting camps. They provide jobs and income to communities as well as defined rules for managing land, wildlife, and other assets.
-  **CONSERVATION AGRICULTURE BW + NA + ZA + ZM**  
Conservation agriculture offers multiple benefits: increased food security and income, reduced clearing of woodlands, empowered women, and reduced human-wildlife conflict.


## TRANSBOUNDARY PARTICIPATION *Collaboration between two or more countries, particularly where a natural resource is shared.*

-  **FISHERIES MANAGEMENT BW + NA + ZA**  
The Zambezi River system has experienced declining catch rates, loss of valuable fish species, and increased use of damaging fishing gear. Joint patrolling, bans on destructive nets, and efforts to standardize fishing seasons and fishing tackle are increasingly in use.

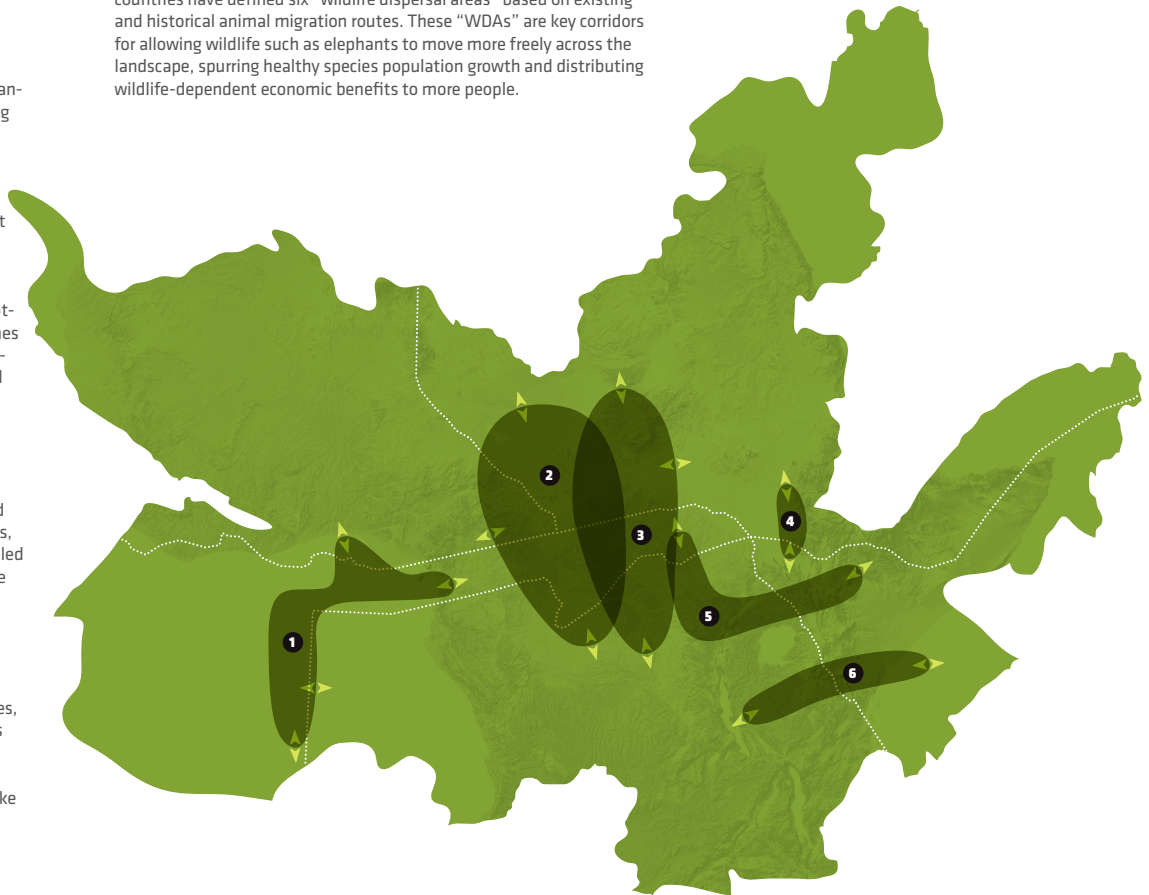
-  **WILDLIFE DISPERSAL AREAS AN + BW + NA + ZA + ZM**  
To facilitate wildlife movement across the region, the five KAZA countries have defined six "wildlife dispersal areas" based on existing and historical animal migration routes. These "WDAs" are key corridors for allowing wildlife such as elephants to move more freely across the landscape, spurring healthy species population growth and distributing wildlife-dependent economic benefits to more people.

-  **CARNIVORE CONSERVATION AN + BW + NA + ZA + ZM**  
KAZA shelters globally significant populations of wild dog, cheetah, lion, hyena, and leopard, some of which regularly cross national borders. All five countries are piloting shared management approaches and standards to ensure the long-term survival of these threatened apex predators.

-  **FIRE MANAGEMENT AN + BW + NA + ZM**  
Transboundary fire management is critical to reducing uncontrolled fires in the dry season. Fire breaks, planned early burning, and controlled floodplain burning reduce negative impacts to the woodlands and savannas of the region.

-  **ADVANCING TOURISM BW + ZA + ZM**  
While still in its early testing stages, the KAZA UNIVISA allows tourists to move between Zimbabwe and Zambia, and into certain parts of Botswana, as frequently as they like within a 30-day period.

-  **FIGHTING CROSS-BORDER WILDLIFE CRIME AN + BW + NA + ZA + ZM**  
While the open, porous nature of the countries' shared borders benefits transboundary wildlife movements, it also facilitates the movement of poachers, who can rapidly poach in one country and escape across the border. All KAZA countries plan to strengthen transboundary collaboration on investigating and prosecuting wildlife crime via increasing joint patrols and information-sharing mechanisms.



- 1 KHAUDUM-NGAMILAND**  
Wildlife moves throughout north-eastern Namibia with extensions into Angola and Botswana.
- 2 KWANDO RIVER**  
Movements follow the Kwando River through portions of four countries.
- 3 ZAMBEZI-CHOBE**  
Seasonal and migratory crossings between Botswana, Namibia, Zambia and sometimes Zimbabwe.
- 4 ZAMBEZI/MOSI-OA-TUNYA**  
Defined by world-famous Victoria Falls. Provides a small but important corridor between Zambia and Zimbabwe.
- 5 HWANGE-KAZUMA-CHOBE**  
Follows wildlife corridors from northwest to south-east, hugging the Botswana and Zimbabwe borders.
- 6 HWANGE-MAKGADIKGADI-NXAI PAN**  
Links major wildlife and tourism areas in Botswana with upriver habitat in Zimbabwe.

## See and Be Seen

*In a landscape largely undocumented by science, a researcher and a photographer team up to illuminate more than the night*

by **Alex MacLennan**  
photographs by **Will Burrard-Lucas**





A young lioness recorded as part of a joint research and communications project between the Kwando Carnivore Project, photographer Will Burrard-Lucas, and WWF.



LISE HANSSEN WALKS along the Kwando River near her camp as Timmy, her lanky, adopted village dog, bounds ahead. “He’s our early warning system for approaching wildlife,” she jokes as he barks into the trees. “Out here, we hear lions, hyena, and other animals all the time.”

Hanssen is leader and sole employee of the Kwando Carnivore Project. She shares the camp with Timmy and her husband Paul Funston, who leads lion and cheetah programs for big-cat conservation group Panthera. The camp is a cozy clump of tents and reed structures at the edge of the Kwando River on Mudumu Conservancy land in Namibia’s far eastern Zambezi region, within the vast Kavango Zambezi Transfrontier Conservation Area (KAZA). The family uses well water and a generator for power, and is linked to the broader world via satellite, cellphones, and a sandy, rutted road.

Hanssen originally came to the Zambezi region to conduct a camera-trap study of spotted hyenas. That initial research expanded scientific knowledge of hyena activities and proved they were crossing into neighboring countries; it also produced photo documentation of a much greater abundance and diversity of wildlife in the area than had been recorded previously. Blurry

nighttime images, taken with motion-tripped infrared camera traps, revealed African wild dogs, leopards, African wild cat, banded mongoose, serval, caracals, bats, and both common and rare antelope species like eland, kudu, roan, sable, and tsessebe. “We also saw owls,” she adds, “and if we see owls we know the population of smaller mammals—their prey—is healthy as well.”

That data, in the context of human land uses in the area—settlements, farming, livestock grazing, harvesting of wild plants and animals—led to her current mission: to document and conserve the diversity of Zambezi wildlife and to find ways for people and wildlife to live together harmoniously.

Today, Hanssen works with community game guards and government conservation managers—with support from Panthera, WWF, the Namibian organization Integrated Rural Development and Nature Conservation (IRDNC), and others—to document the area’s wildlife and mitigate human-wildlife conflict, primarily the predation of livestock by big carnivores. Hanssen’s particular role? An ongoing research project to document the predators in a large but little-studied area of forest, Bwabwata National Park, and several conservancies that connect to wildlife areas in Angola and Zambia.

To collect the new data, Hanssen and her research partners mounted almost 180 camera traps to trees, positioned on opposite sides of roads or tracks within the forest, in a grid of 1.5-square-mile areas covering about 775 square miles. “Camera trap images are a preferred method for developing a baseline population survey of large carnivores,” Hanssen explains, “because the cameras don’t interfere with the animals, which can carry on doing their natural day-to-day activities.”

For a two-month period, each camera recorded every animal that tripped its sensors, and sent the GPS-tagged image files to the satellite dish at Hanssen’s camp.

From the first round of this project, she received more than 220,000 photos, which she winnowed down by eliminating people, vehicles, livestock, and other non-carnivore images. Hanssen sorted, tagged, and recorded every image by species (leopard, hyena, lion, etc.), and then individual animal (lion #1, lion #2). This meticulous work yielded both data and tools for further research. For example, after several months she had assembled 205 leopard images—excellent tools for identifying individuals, since each leopard has a unique pattern of spots. “In a perfect world,” she laughs, “I’d have an army of volunteers to help!”

Hanssen’s goal is to repeat the full survey every two to three years, and to train more community guards and local nonprofits like IRDNC to do the job and make more informed decisions about managing the conservancy’s wildlife.

As a research tool, these images provided the first baseline numbers for leopard populations, information for the long-term monitoring of spotted hyenas, and insight into the pride



### NIGHT ANIMALS

As part of a team effort to understand and protect wildlife in Namibia’s Zambezi region, we captured thousands of images, including (clockwise from top left): a male lion, giraffes and elands at a watering hole, a leopard, two elephants, a serval, a gathering of bush pigs, a racing hyena; and a porcupine.



structure of the lions on Mudumu Conservancy and in Mudumu National Park. As an unexpected but important bonus, the photos also documented how people are using the land, whether for grazing, foraging, farming, hunting, or even poaching.

But what Hanssen hadn't captured—yet—were the sort of eye-opening images that would grab the public's imagination and make them care about the Zambezi region and the whole of KAZA. And that public engagement is so important: The state forest complex where Hanssen's study is centered is protected in name only. It is also square in the sights of a proposed 25,000-acre tobacco plantation. So without public support for a more defined conservation status, a huge swath of the forest could soon be stripped to sow a single crop.

Not surprisingly, her sense of urgency is palpable. Hanssen is always racing: racing to set camera traps or collect, catalog, and analyze the images; racing, with Funston, to train game guards to improve the lion-proofing of their community's livestock corrals; racing to respond when a wildlife tracker calls to say he's identified a previously unknown African wild dog den; racing, she says, to get persuasive data and influential images into the hands of the government, tribal authorities, and others who can direct the fate of this land.

That's where WWF and photographer Will Burrard-Lucas came in. Burrard-Lucas has made his name not only for photographing wildlife, but also for how he gets the photos. The inventor of the BeetleCam and other remote-controlled camera mounts, he's become known for finding nonintrusive ways to get surprisingly up-close images of elusive wildlife.

In July 2015, Hanssen and Burrard-Lucas teamed up to capture images that would not only supplement Hanssen's ongoing work, but also amaze people and inspire them to get behind much-needed conservation actions. And since the Zambezi's predators are primarily nocturnal, the best images were captured at night.

In particular, Burrard-Lucas hopes that people take note of Hanssen's research and "take action to protect the ranges of these animals." Personally, he adds, "the highlight came when we managed to capture images of lions that had strayed into community areas. These are rare pictures! They should really make people want to help protect the area, and keep finding ways for lions—and other wildlife—to thrive where so many people live."

The skittish nature of animals not yet inured to tourism is both a blessing and a challenge, Hanssen explains: "People may not understand the importance of this little corner of the world yet, but the Zambezi region can either be the heart of KAZA or the arrow through the heart. Truly—it's almost shaped like an arrow, and is intensely settled with people and livestock, and runs right through the middle of many wildlife corridors that cross multiple countries. Here, we are sitting with wildlife and people living together all around. Animals here are a shared resource, so we need to share our efforts to protect them."

"Now that we know what's here," Hanssen adds, "we know what there is to lose. Documenting the wealth of wildlife makes a strong argument for protecting it, and backing up that data with Will's powerful photos might just win the day." 🐾

*Read about Will Burrard-Lucas's perspective and see more wildlife images from the project at [worldwildlife.org/nightvision](http://worldwildlife.org/nightvision).*





[worldwildlife.org/magazine](http://worldwildlife.org/magazine)





## Saving 30 Hills

### Establishing an Ecosystem Restoration Concession in Sumatra's Bukit Tigapuluh Landscape

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#### A BIG WIN FOR SUMATRAN WILDLIFE

Today—after five years of steadfast and challenging work—WWF and our partners are thrilled to report that **we have successfully acquired two blocks of forest, Jambi I and II, as a restoration concession bordering Sumatra's Bukit Tigapuluh National Park.** This achievement is a milestone to celebrate as we continue the important work of protecting rare species and forests in peril. We are delighted to share the good news of our success.

Created in 1995, Bukit Tigapuluh National Park or “Thirty Hills” sits in the heart of Sumatra. This Indonesian island contains a disproportionate number of plant and animal species within its rainforests, some of which—such as the Sumatran orangutan—are found nowhere else on Earth. Within the labyrinth of these dense forests wander clouded leopards, rhinos, elephants, Malayan sun bears, and Sumatran tigers, the most threatened of the tiger subspecies.

Since Bukit Tigapuluh National Park was formed, WWF has tried to have the park expanded to its originally intended size, and encompass the logging concessions that ring it. The park covers only 42 percent of the forested landscape, mostly hilly areas, leaving lowland forests, habitat of most of the animals present in the area, unprotected. To secure protection for these precious forests, WWF and our partners took advantage of a special zoning designation created under Indonesian law: the ecosystem restoration concession. This designation allows a forest zoned for commercial production—a concession—to be leased and managed for its natural value rather than its short-term financial capital.

WWF and partners worked diligently to cultivate a broad base of support from the president of Indonesia, local communities, the governor's office, local political leaders, and indigenous people and advocates to acquire Jambi I and II. With this victory, the protected area around the park has grown by 96,000 acres, benefitting wildlife and indigenous communities alike.

This progress report describes WWF's work with partners and communities to prepare the restoration concession to offer safe, thriving habitat for wildlife while creating sustainable revenue for the indigenous groups who live here.

## BENEFITS FOR WILDLIFE AND COMMUNITIES

### Mapping concession boundaries

WWF and partners are working with communities in Thirty Hills to map traditional village land rights and uses, preparing for the next phase when we invite villages to become shareholders in our joint venture. This will give local families and indigenous, forest-dwelling tribes the opportunity to become equal partners in controlling land use, a level of community collaboration and empowerment not often seen in this region.



*The new concession will provide refuge to critically endangered Sumatran orangutans that have been reintroduced in Thirty Hills. Today there are only about 7,500 left in the wild.*

One of the challenges we face with mapping concession boundaries is unclear land tenure. The remote location also makes mapping difficult. To solve this problem, WWF's remote sensing team flew small drones equipped with cameras over the concession blocks to photograph land cover and use. We are using this information to map the concession boundaries, develop forest restoration strategies, work with local villages on conservation-friendly agriculture, and identify areas in need of urgent protection from illegal logging and encroachment.

### Strengthening surveillance and enforcement

One of our biggest priorities is to strengthen surveillance and enforcement in the concession, as poaching, encroachment, and illegal timber harvesting are all serious problems. To improve surveillance, WWF is building a new unit of our highly successful forest crimes unit, Eyes on the Forest, which will operate full time in Thirty Hills. Using undercover investigations, community-based anti-poaching operations, satellite imagery and local informants, Eyes on the Forest provides ground-truthed data on forest loss and the drivers behind it. It has earned a reputation as one of the most respected and effective investigative entities in Indonesia, whose findings are shared with the police, press, corruption investigation agencies, government officials and national and global forest product buyers. This unit is critical to ensure that illegal activity,

including logging, palm oil plantation development, poaching, and encroachment, is detected and halted early and that information leads to successful prosecutions.

### **Restoring forests**

WWF and partners are also restoring forest cover and connectivity between core areas, particularly for Sumatran tigers, orangutans and elephants. The Barito Pacific Corporation manages an adjacent rubber concession, shown on the map in the appendix. WWF is working to negotiate with Barito Pacific and its new joint venture partner, Michelin Tire, for a corridor between Jambi I and Jambi II to improve connectivity for wildlife. In addition, we are helping communities to build tree nurseries to prepare for forest restoration. Our goal is to generate the conditions for Sumatran tigers, elephants and other rare wildlife to disperse more widely and expand in population size. This includes continuing to reintroduce orangutans to the landscape, working in close coordination with the indigenous, forest-dwelling Orang Rimba and Talang Mamak communities, as well as the local Melayu communities residing here.

### **Generating revenue for communities**

WWF and partners are creating a for-profit joint venture company that will manage and generate revenue from the concessions over the long term. The company—PT Alam Bukit Tigapuluh, or PT ABT—recently had a quarterly meeting of the shareholders and is in the process of recruiting a CEO. Leveraging WWF’s ability to harness the private sector, we are negotiating a preferential buyer agreement with Michelin Tire that would allow PT ABT to trade rubber produced in the concessions by local community cooperatives. Our intention is to enable villagers to form forest-compatible businesses that can be contracted by our concession management company and provide a sustainable source of revenue, such as rubber tapping and processing. WWF and the Frankfurt Zoological Society have begun this work with a recent \$5 million grant from the German Development Bank. This grant was secured because we had initial funding for license acquisition in place, demonstrating extraordinary leverage.

### **Preventing human-wildlife conflict**

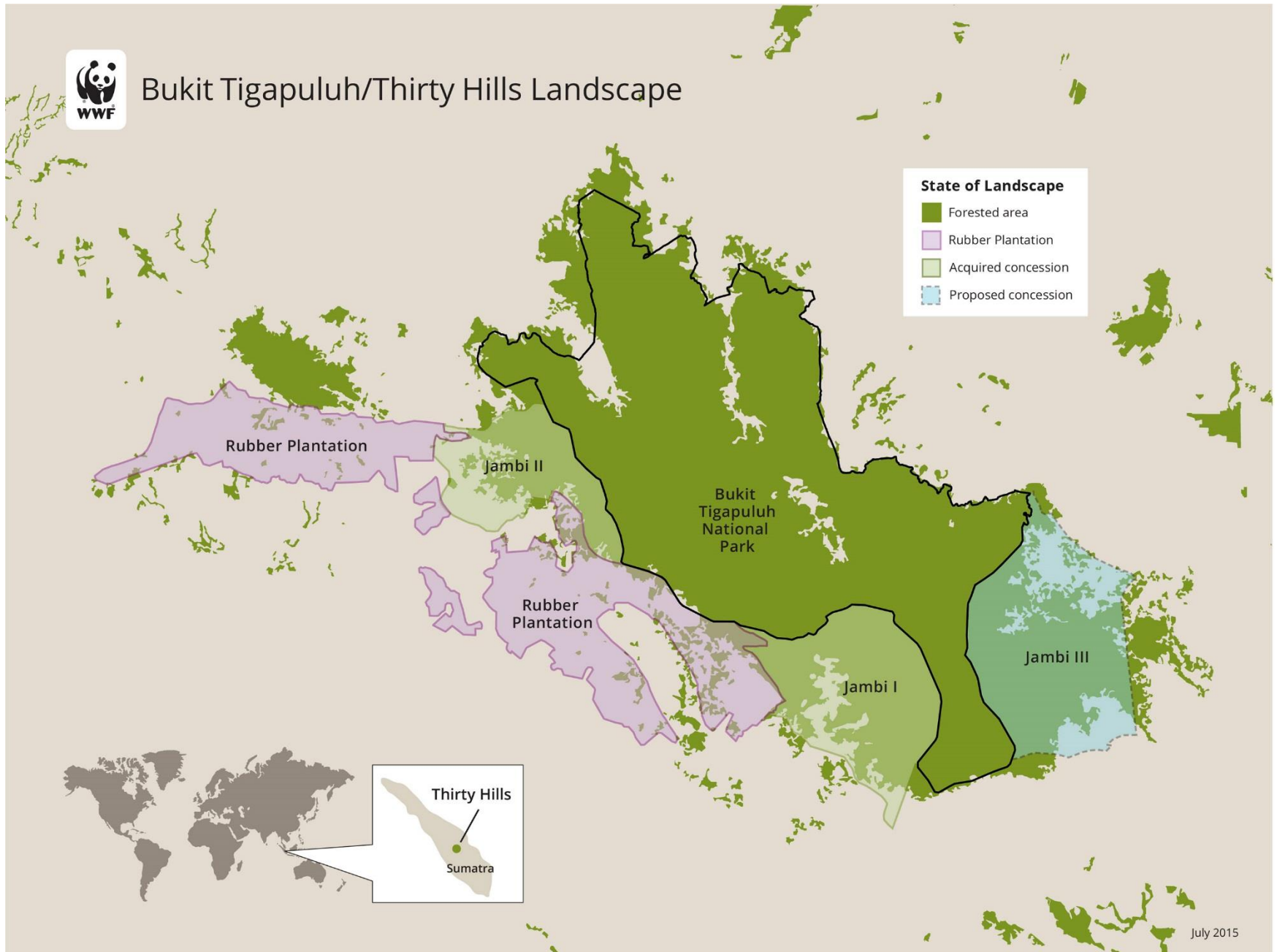
In addition, one of the most urgent priorities we are addressing is human-elephant conflict. Continuous forest clearing outside the concession boundaries has been driving more and more elephants into oil palm plantations and community areas where they feed on young palms and residents’ crops. In response, land users often poison or shoot the elephants to protect their resources. WWF and our partners are working with plantations and villages to find alternative solutions that safeguard both people and elephants. We have secured a commitment from the largest pulp company in the area to protect and, if necessary, move a herd of elephants that have become stranded on an adjacent pulp concession without adequate habitat. We have also secured a commitment from a neighboring rubber company to design, build and manage its concession in a wildlife friendly way, protecting its resident tigers, elephants and orangutans.

## CONCLUSION

The acquisition of the final license for Jambi I and II as an ecosystem restoration concession is a cause for celebration. These forests will now be managed for their long-term conservation value, providing safe harbor to wildlife and a source of sustainable revenue for local communities.

Though there is still much to do, this marks a big, groundbreaking victory on an island that has lost so much of its irreplaceable wilderness in recent decades. This work would not be possible without the commitment, passion and generosity of our donors. Together we built the necessary political momentum and paid 60 years' worth of taxes to obtain the final licenses. We are excited about this innovative project and look forward to further progress in the near future.

# APPENDIX - 30 HILLS MAP





# ➤ 2015 ANNUAL REPORT

Russell E. Train  
Education for Nature Program

# WHERE WE WORK

# 2,117

## ➤ TOTAL GRANTEES

The Russell E. Train Education for Nature Program has awarded over 2,100 grants to individuals and organizations throughout Africa, Asia, and Latin America to build capacity for conservation worldwide.

### LATIN AMERICA

- Argentina
- Belize
- Bolivia
- Brazil
- Chile
- Colombia
- Costa Rica
- Ecuador
- French Guiana
- Guatemala
- Guyana
- Honduras
- Mexico

## 808 GRANTEES

- Panama
- Paraguay
- Peru
- Suriname

**LEGEND**  
 1-49  
 50-99  
 100+

## 681 GRANTEES

### AFRICA

- Botswana
- Burkina Faso
- Cameroon
- Central African Republic
- Democratic Republic of the Congo
- Gabon
- Kenya
- Madagascar
- Malawi
- Mozambique
- Namibia
- Niger
- Republic of Congo
- Senegal
- South Africa
- Swaziland
- Tanzania
- Togo
- Uganda
- Zambia
- Zimbabwe

**LEGEND**  
 1-49  
 50-99  
 100+

### ASIA

- Armenia
- Bhutan
- Cambodia
- China
- India
- Indonesia
- Laos
- Malaysia
- Mongolia
- Myanmar
- Nepal
- Pakistan
- Papua New Guinea
- Philippines
- Solomon Islands
- Thailand
- Timor Leste
- Vietnam

**LEGEND**  
 1-49  
 50-99  
 100+

## 628 GRANTEES

## ➤ DEDICATED. INSPIRING. LEADERS.

These are just a few of the words that describe the 145 individuals and organizations supported by WWF's Russell E. Train Education for Nature Program (EFN) this year. With thousands of hopeful candidates applying each year, EFN is an important funding source that helps advance the careers of conservationists and strengthen local institutions worldwide.

WWF invests in the education of local conservation leaders because we know they are the key to protecting the natural resources that are needed and cherished where they live. To increase EFN's impact and fill knowledge gaps on issues critical to WWF's mission, EFN has aligned its programs with WWF's six overarching goals centered on wildlife, climate, forests, oceans, food, and fresh water. As you read on, you will learn about EFN grantees in action, working to advance conservation in these six critical areas.

In 2013, EFN was challenged to raise \$2.5 million in funding in order to receive a \$2.5 million match. We are excited to report that, thanks to many generous donors, we reached this goal! This wonderful achievement allows us to double the number of deserving organizations and individuals that will receive funding from EFN.

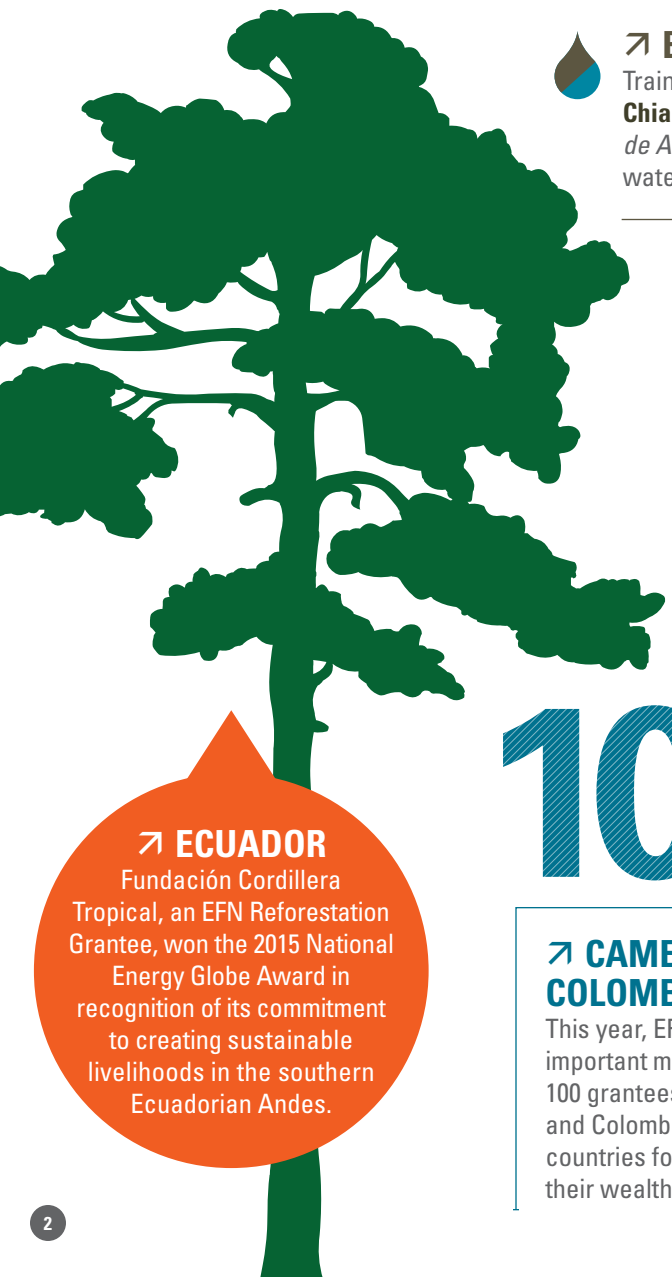
We are incredibly thankful for your generosity and support. You are a crucial part of our success, and together we are helping build capacity for conservation worldwide, one person at a time.

Sincerely,



Andrea Santy  
 Director, Russell E. Train Education for Nature Program





**7** **BRAZIL**  
Train Fellow **Rafael Morais Chiaravalloti** published *Falta de Agua*, a book about the water crisis in Brazil.

# 2015 ACCOMPLISHMENTS

**7** **ECUADOR**  
Fundación Cordillera Tropical, an EFN Reforestation Grantee, won the 2015 National Energy Globe Award in recognition of its commitment to creating sustainable livelihoods in the southern Ecuadorian Andes.

**100+**

**7** **CAMEROON AND COLOMBIA**  
This year, EFN reached an important milestone by surpassing 100 grantees in both Cameroon and Colombia—two high priority countries for conservation given their wealth of biodiversity.

**7** **CAMBODIA, VIETNAM, AND MOZAMBIQUE**  
EFN sent seven conservationists from Cambodia, Mozambique and Vietnam to the prestigious Natural Capital Symposium at Stanford University. The event draws people from around the world who are working to factor the true value of nature into decision-making.

**7** **NEPAL**  
**Pradeep Khanal**, a native of Nepal, had just started a course in the US on estimating wildlife abundance—supported by EFN—when the devastating 7.3 magnitude earthquake struck his home country. Pradeep finished the course and returned home, using what he learned to aid wildlife recovery in the earthquake's aftermath.



**7** **BELIZE**  
**Jamal Galves**, an EFN Professional Development Grantee, received the Ocean Hero Award from Oceana Belize for his inspiring work with manatees.

© YAMIRA NOVELO

**7** **THAILAND**  
EFN supported 15 organizations that collectively planted over 620,000 trees around the world in 2015. In June, EFN held the first reforestation practitioners workshop in Thailand.



© THAIHA 00

**7** **PERU**  
EFN Professional Development Grantee **Rossana Napuri** presented findings from the first whale shark study ever conducted in Peru at the 2015 International Conference on Conservation Biology.

**7** **REPUBLIC OF CONGO**  
Train Fellow **Roger "Patrick" Boundja** will become the first person from the Republic of Congo to earn a doctoral degree in conservation biology. Read about Patrick's amazing work with elephants on page 6.

**#1**

**6** **AMAZON RAINFOREST**  
Train Fellows **Anand Roopsind** and **Marisol Toledo** joined other colleagues in coauthoring an article for *Nature*. The article suggests that the Amazon forest will absorb less carbon from the atmosphere in the coming years than previously predicted.

**6** **C CARBON**

**7** **SOLOMON ISLANDS**  
Sea turtle expert **Henry Kaniki** became the first Train Fellow from Solomon Islands. Turn to page 9 to learn more about Henry.

## WWF ONLINE EDUCATION INITIATIVE

For 20 years, EFN has provided opportunities for outstanding conservationists to pursue graduate degrees on campus, whether in-country or abroad. This year, with generous donor support, WWF and partners launched online courses to reach exponentially more professionals and emerging leaders in developing countries.

Tested by past EFN grantees, these courses were fine-tuned, translated, and adapted to ensure a broad reach and applicability for individuals working at the forefront of conservation. WWF envisions that through the use of technology and online learning, we can dramatically expand educational opportunities and build local conservation capacity around the world.

EFN is excited to use this new initiative to broaden our reach. We hope to expand our offerings in the future, but are pleased to announce our currently available online conservation courses.

- Introduction to the Natural Capital Project Approach, through Stanford Online
- Climate Change Resilience and Adaptation, developed by WWF and available at [wwfadapt.org](http://wwfadapt.org)
- Conservation Leadership: Addressing Water, Food, and Energy Challenges, with digital case studies, created by Wake Forest University

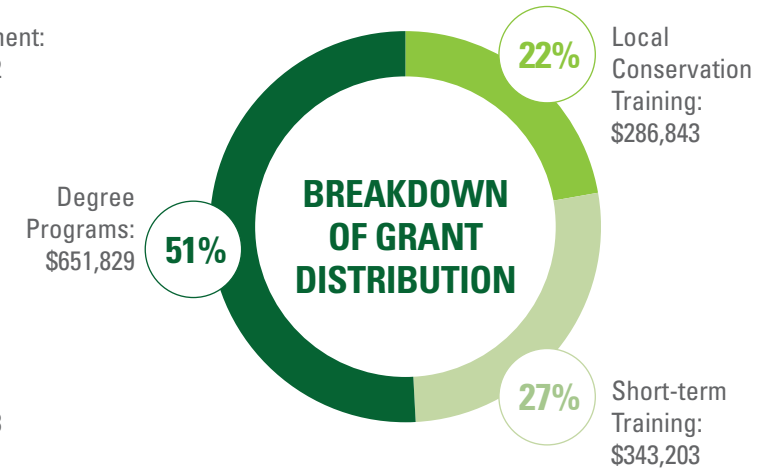
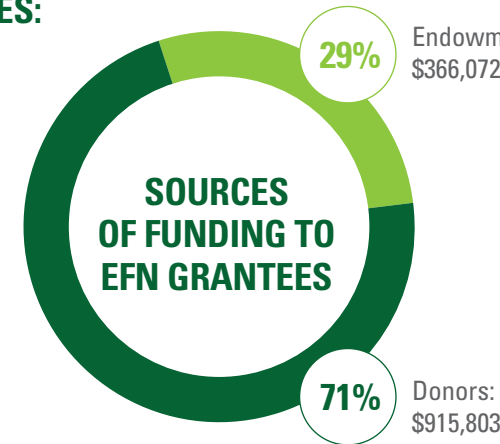
# FY2015 FINANCIAL INFORMATION

July 1, 2014 through June 30, 2015

© EDWARD PARKER/WWF

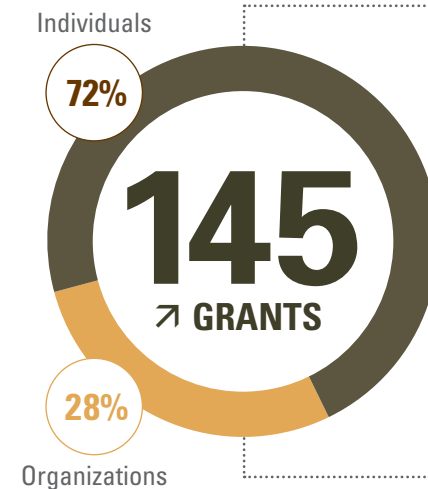
➤ **TOTAL GRANT EXPENDITURES:**  
**\$1,281,875**

- Through EFN, WWF supports:
- leaders to pursue degrees in conservation
  - professionals to attend short courses and conferences
  - organizations to conduct trainings in their communities



**36**

➤ **COUNTRIES SUPPORTED**



**DEGREE PROGRAMS: 28**

- 24 Train Fellowships
- 4 Train Scholarships

**SHORT-TERM TRAINING: 76**

- 62 Professional Development Grants
- 14 Alumni Grants

**LOCAL CONSERVATION TRAINING: 41**

- 26 Conservation Workshop Grants
- 15 Reforestation Grants

## WWF GOAL: WILDLIFE

Ensure that populations of the most ecologically, economically, and culturally important species are restored and thriving in the wild.



© ROGER PATRICK BOUNDJA

### ➤ ROGER PATRICK BOUNDJA

In the last 10 years, the forest elephant population has declined by over 62% in Central Africa. This devastation is due to many factors, but the biggest threats are poaching, human encroachment, the logging of forests, and unsustainable development activities, particularly in the Republic of Congo.

Roger “Patrick” Boundja is on a mission to save forest elephants. With over 12 years of experience in wildlife conservation and a master’s degree in conservation biology, Patrick has spent his life studying the impact of environmental degradation on elephants. His Train Fellowship is providing Patrick the opportunity to obtain his PhD from the University of Massachusetts, Amherst, where he will study elephant conservation and landscape ecology in the Northern Congo. He will be the first individual from the Republic of Congo to receive a doctoral degree in conservation biology.

After completion of his PhD, Patrick plans to return to Marien Ngouabi University in Brazzaville and develop academic curricula in conservation biology with a wildlife focus—a first for the Republic of Congo, one of the most critical elephant conservation areas left on Earth.

“After completing my PhD, I’ll be proud to join the ranks of Train Fellows who are working around the world to build a better way forward for wildlife and people.”



© MIRNA PRADEL



To date, EFN has supported over 95 individuals and organizations in Bolivia, including the country’s leading experts on Andean bear and river dolphin conservation.

## WWF GOAL: CLIMATE



Create a climate-resilient and zero-carbon world powered by renewable energy.

### ➤ MIRNA PRADEL

The Amazon is home to 10% of all known species on Earth and half of the planet’s remaining tropical forests. The region is extremely vulnerable to the threats of climate change. Warmer temperatures and less rainfall have produced severe droughts that have had devastating effects on people and wildlife.

With funding from EFN, Mirna Pradel will receive a master’s degree in conservation biology through TROPIMUNDO, a course in tropical biodiversity and ecosystems at Université libre de Bruxelles in Belgium. While there, she aims to develop a better understanding of the physical and biological function of fragmented forest landscapes in the Bolivian Amazon and their effect on regional climate change. Upon completion of the course, Mirna will return to her home country of Bolivia, where she aspires to restore natural forest habitats for the benefit of the local people and species that depend on them to survive.



© ANDREA SANTU

## WWF GOAL: FORESTS

Conserve the world's most important forests to sustain nature's diversity, benefit our climate, and support human well-being.

### ➤ FRIENDS OF WILDLIFE MYANMAR

Worldwide, 80% of terrestrial species live in forests. Many of these species are vital to the health and diversity of forest ecosystems. For example, in Myanmar the Eld's deer eats fruit and disperses the seeds, driving the structure of plant communities. Yet this ecologically critical species is a prized game animal and is often poached for its supposed medicinal powers. With a decline of over 50% in the past 15 years, the species is now endangered and exists only in small, fragmented populations in Southeast Asia and southern China.

The Chatthin Wildlife Sanctuary is home to the world's largest population of Eld's deer and has been recognized by biologists as the world's most important site for conservation of this species in the wild. Sadly, the increasing collection of fuelwood by locals has severely threatened the sanctuary forest. Friends of Wildlife Myanmar is an organization that works with government agencies, NGOs, local communities, and universities to protect this critical habitat. This year, EFN awarded Friends of Wildlife Myanmar a Reforestation Grant to train over 7,000 community members in livelihood diversification, environmental education, community conservation, and public outreach. The project will ultimately reforest 24 hectares and plant over 18,000 trees, helping to restore habitat that is crucial to the survival of the Eld's deer.

© JÜRGEN FREUND / WWF-INSSET; © HENRY KANIKI



## WWF GOAL: OCEANS

Achieve sustainable fisheries to meet the needs of people and nature, and protect vulnerable marine habitats and species.



### ➤ HENRY KANIKI

Henry Kaniki is the first Train Fellow from Solomon Islands, a nation in the South Pacific that is home to a wealth of species—many of which are found nowhere else on Earth. With a bachelor's degree in marine science and a postgraduate diploma in climate change, Henry has dedicated his life to protecting the ocean, particularly hawksbill sea turtles. Five of the world's seven species of sea turtle occur in Solomon Islands, including three migratory species that nest on its pristine beaches.

Historically, poaching and incidental capture were the main threats to sea turtles, but rising sea levels now pose a new set of challenges. Henry will study the potential impacts of sea level rise on turtle nesting habitats as he earns his master's degree in conservation biology from the University of the South Pacific. He will then develop and implement a better management plan for sea turtle conservation. As one of the only sea turtle experts in Solomon Islands, Henry hopes his research will inspire others in his country to protect the oceans and marine species.

# WWF GOAL: FOOD

Freeze the footprint of food, protecting the natural resource base while sustainably producing enough food to meet the needs of all.

## ➤ FIDELINE MBORINGONG

Across the globe, over 795 million people struggle with issues of food security. In Cameroon, Fideline Mboringong is working to improve agricultural practices—both to address food security and to safeguard the environment. Slash and burn, extensive agriculture, and deforestation are common practices in her country that negatively affect crop yields and damage the environment.

With an EFN Professional Development Grant, Fideline will attend the International Course on Addressing Household Food Security in the Context of the Changing Climate and Environment, hosted by the Institute of Rural Reconstruction in Cambodia. The course will enrich her understanding of sustainable food production and nutrition amidst the challenges of climate change. She will also have opportunities to engage in discussions with development professionals and local organizations in Cambodia about best agricultural practices for increasing resilience among rural communities. With this knowledge, Fideline will help shape policy decisions back home. Agriculture is the primary source of food and income for most Cameroonians, and informed decision makers like Fideline are critical for the future wellbeing of the country's communities and wildlife.



"In recent times there has been a lot of conflict between biodiversity conservation and economic development. If we are going to succeed in conservation we must improve people's livelihoods. EFN is helping me meet this challenge."

© DAVID NGWENYAMA

© AUDRA MELTON/WWF-US; INSET: © CORHINA GRACE



# WWF GOAL: FRESH WATER

Measurably improve the sustainability of freshwater systems in the world's major river basins.

## ➤ ASOCIACIÓN SERES

Guatemala is ranked as one of the world's top regions for biodiversity, but its freshwater resources are under threat from poor agricultural practices, water pollution, deforestation, and land degradation. To combat these issues, Asociación SERES, a youth-led organization in Guatemala, is empowering young leaders to build healthy, sustainable communities; promote biodiversity conservation; and support effective water management.

After receiving a Conservation Workshop Grant from EFN, Asociación SERES hosted a workshop on sustainable watershed management and water monitoring in San Juan del Obispo. The workshop brought together youth from three critical watersheds in Guatemala. Participants learned about the importance of natural resources and how to raise environmental awareness through citizen science and hands-on investigations of water quality in local rivers and streams. The workshop provided 30 hours of training in ecosystem and watershed monitoring, restoration, and protection for 11 local leaders. Ultimately, the project will engage over 500 youth in protecting and restoring freshwater resources.

## LOOKING AHEAD:

# GROWING CONSERVATION LEADERS

Natural resources are not distributed equally around the world, nor are human resources. To protect and preserve biodiversity, we need dedicated conservation leaders that have the skills and knowledge to address threats in their home countries. EFN provides the funding to make that happen. In the coming year, we will invest over \$1.2 million to train hundreds of conservationists and thousands of community members who are working daily for the good of people and nature.

EFN will also launch a new program to provide fellowships to students at select universities in Africa, Asia, and Latin America. Through a formal memorandum of understanding with six universities (two per region), EFN will award a dozen new fellowships to promising students to pursue advanced degrees in conservation in their home countries. We hope to create enduring relationships with these universities that will support a steady stream of Train Fellows and produce ongoing benefits for students and faculty.

EFN will also keep working to create ways for the more than 2,100 EFN grantees around the world to connect with one another, share ideas, and network. We will strengthen the EFN network through in-person events, online learning, and social media.

*With new and growing programs, we look forward to making the year ahead an exceptional one.*



© PAMELA KAMYA



# THANK YOU

Congratulations to the recipients of the 2015 Train Fellowships.

## ➤ BOLIVIA

Mirna Ines Fernandez Pradel

## ➤ CAMEROON

Mireille Pascaline Feudijo Tsague  
Serge Alexis Kamgang  
Beckline Mukete Awah

## ➤ COLOMBIA

Maria Constanza Rios-Marin

## ➤ KENYA

Nelly Kadagi  
Margaret Owuor  
Arthur Tuda

## ➤ MADAGASCAR

Anjara Saloma

## ➤ MOZAMBIQUE

Celia da Conceicao Felisberto Macamo  
Clerica Lisangela Flavio dos Mucudos  
Anildo Naftal Nataniel  
Pedro Pires  
Annae Maria Senkoro

## ➤ NEPAL

Thakur Silwal

## ➤ PAPUA NEW GUINEA

Pamela Kamyia (*pictured*)

## ➤ PERU

Valeria Biffi Isla  
Oscar Ernesto Gonzalez Medina  
Daniela Lainez del Pozo

## ➤ REPUBLIC OF CONGO

Roger Patrick Boundja  
Sydney Thony Ndolo Ebika

## ➤ SOLOMON ISLANDS

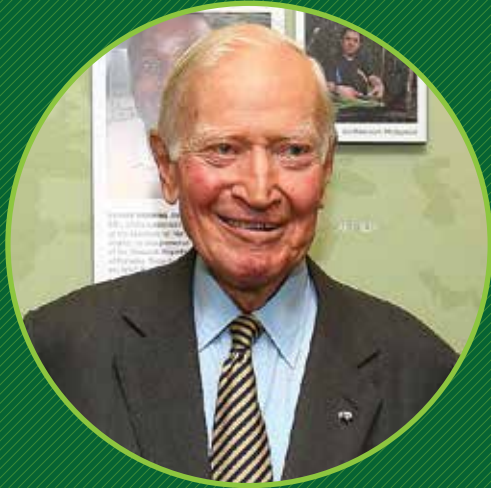
Henry Kaniki

## ➤ TANZANIA

Alfan Rija

## ➤ VIETNAM

Toai Nguyen



## ➤ RUSSELL E. TRAIN

Started in 1994 to honor the late Russell E. Train, founder, president, and chairman of the board of WWF, EFN upholds Mr. Train's vision of putting ownership of natural resources in local hands in the work it does every day.

© WWF-US



World Wildlife Fund  
1250 24th Street, NW  
Washington, DC 20037-1193 USA

+1 202 293 4800  
[efn@wwfus.org](mailto:efn@wwfus.org)  
[worldwildlife.org/efn](http://worldwildlife.org/efn)

Cover Photo: Daniela Lainez del Pozo is a Russell E. Train Fellow from Peru. She received funding in 2015 to support her PhD in Geography from the University College in London, England.

© MARCO CARPIO



# together possible

Our new brand expression.

It is an expression of urgency—a rallying cry to every person, business, institution, and government to take collective action on behalf of the very things that keep us alive: our forests, our oceans, our fresh water, our wildlife, our energy supply, our food supply.

It is an expression of participation—a way to describe how WWF works in unity with many people, partners, and institutions to achieve lasting conservation solutions.

It is an expression of optimism—a reminder to all our audiences and potential partners that one person or group may not be able to take on the Earth’s conservation challenges alone, but that many working together as one can take on anything.



## How to tell a story using the *together possible* brand lens

- ➔ 1. THE PROBLEM**  
What is the problem you are trying to address? How does it affect people in a tangible way? Why are others needed to come together to solve it? Why do we need to do it now? Emphasize *urgency*.
- ➔ 2. THE PARTICIPANTS**  
Who is coming together to work on the problem? How is WWF the convener and “humble hero?” Emphasize *participation*.
- ➔ 3. THE WORK**  
What are they doing together? How would this work not be possible if these groups didn’t come together?
- ➔ 4. THE RESULTS**  
How are they making an impact? What solutions are happening? How do the results make lives better for people? Emphasize *optimism*.



**together possible**



# together possible

I am protecting life on our planet.

Day by day. With every single thing I do.

I conserve the world's biggest forests. I safeguard the rivers and oceans.

I stand up for coral reefs, rain forests, tundras, deserts and grasslands.

I work with communities in the Amazon, the Arctic, the Congo and the Himalayas.

I collaborate with the biggest companies on Earth to make their processes and their products more sustainable.

I influence governments to create policy that recognizes and respects the importance of nature.

I give a voice to all animals who call Earth their home.

I am protecting life on our planet.

But because I am with WWF, I am not doing it alone.

Six thousand staff. Six million members. In over 100 countries.

For more than half a century.

Businesses. Foundations. Governments.

Communities. Individuals.

And one iconic panda.

Together, we are protecting life on our planet – including our own.

Because together, anything is possible.

WWF. Together possible.





**PARTNERS  
IN CONSERVATION**

World Wildlife Fund  
1250 Twenty Fourth Street, NW  
Washington, DC 20037

(888) 993-1100  
[worldwildlife.org/partners](http://worldwildlife.org/partners)

# Governments Set Course for Ambitious Action on Climate Change; More Immediate Steps Needed

For Immediate Release—December 12, 2015

**Lou Leonard, vice president, climate change, issued the following statement in reaction to the official closing of COP21 and the approval of a new UN climate agreement:**

“This is a pivotal moment where nations stepped across political fault lines to collectively face down climate change.

“The agreement hammered out over the last weeks in Paris creates a blueprint for progressively bolder action with regular moments where nations come back to the table to do more. The first of these moments is in 2018 when the national targets offered by countries this year will be strengthened. To meet the ambitious long-term goals established in Paris, we must seize each of these opportunities.

“For decades, we have heard that large developing nations don’t care about climate change and aren’t acting fast enough. The climate talks in Paris showed us that this false narrative now belongs in the dustbin of history.

“In Paris, there were no heroes or villains – all countries moved from their positions in the end. For its part, the United States has come a long way toward bridging the trust gap that’s hung over these talks through direct engagement with emerging economies like India, China, and Brazil.”

###

**(Paris, 12 December, 2015)** – World governments finalized a global agreement today in Paris that lays a foundation for long-term efforts to fight climate change. More effort is needed to secure a path that would limit warming to 1.5C. This new agreement should be continuously strengthened and governments will need to go back home and deliver actions at all levels to close the emissions gap, resource the energy transition and protect the most vulnerable. The Paris talks also created a moment that produced announcements and commitments from governments, cities and business that signalled that the world is ready for a clean-energy transition.

Governments arrived in Paris on a wave of momentum with more than 180 countries bringing national pledges on climate action. This progress was bolstered by impassioned speeches from more than 150 heads of state and governments and unprecedented mobilisations around the world that included hundreds of thousands of citizens demanding action on climate change. After two weeks of negotiations, governments reached an agreement that represents some progress in the long-term. This must urgently be strengthened and complemented with accelerated action in the near-term if we are to have any hope of meeting the ultimate goal of limiting global warming

well below 2C or 1.5C. Additionally, the finance for adaptation, loss and damage and scaled up emission reductions should be the first order of work after Paris.

While the Paris agreement would go into effect in 2020, science tells us that in order to meet the global goal of limiting warming to 1.5C or well below 2C, emissions must peak before 2020 and sharply decline thereafter. The current pledges will provide about half of what is needed, leaving a 12 to 16 gigatonne emissions gap.

**Tasneem Essop, head of WWF delegation to the UN climate talks:**

“The Paris agreement is an important milestone. We made progress here, but the job is not done. We must work back home to strengthen the national actions triggered by this agreement. We need to secure faster delivery of new cooperative efforts from governments, cities, businesses and citizens to make deeper emissions cuts, resource the energy transition in developing economies and protect the poor and most vulnerable. Countries must then come back next year with an aim to rapidly implement and strengthen the commitments made here.”

**Samantha Smith, leader of WWF’s global climate and energy initiative:**

“We are living in a historic moment. We are seeing the start of a global transition towards renewable energy. At the same time, we’re already witnessing irreversible impacts of climate change. The talks and surrounding commitments send a strong signal to everyone – the fossil fuel era is coming to an end. As climate impacts worsen around the world, we need seize on the current momentum and usher in a new era of cooperative action from all countries and all levels of society.”

**Yolanda Kakabadse, president of WWF-International:**

“The climate talks in Paris did more than produce an agreement – this moment has galvanized the global community toward large-scale collaborative action to deal with the climate problem. At the same time that a new climate deal was being agreed, more than 1,000 cities committed to 100 per cent renewable energy, an ambitious plan emerged from Africa to develop renewable energy sources by 2020, and India launched the International Solar Alliance, which includes more than 100 countries to simultaneously address energy access and climate change. These are exactly the kind of cooperative actions we need to quickly develop to complement the Paris agreement.”

**The Paris agreement needed to be fair, ambitious and transformational. Results in these key areas for WWF were mixed:**

**Create a plan to close the ambition gap, including finance and other support to accelerate action now and beyond 2020**

- The agreement includes some of the elements of an ambition mechanism such as 5 year cycles, periodic global stock-takes for emission reduction actions, finance and adaptation, and global moments that create the opportunity for governments to enhance their actions. However, the ambition and urgency of delivering climate action is not strong enough and will essentially be dependent on governments to take fast and increased action, and non-state actors, including cities, the private sector and citizens, to continue ambitious cooperative actions and to press governments to do more.

**Deliver support to vulnerable countries to limit climate impacts and address unavoidable damage.**

- The inclusion of a Global Goal on Adaptation as well as separate and explicit recognition for Loss and Damage are important achievements in the agreement. This goes a long way in raising the profile and importance of addressing the protection of those vulnerable to climate change. The Agreement, however, does not go far enough in securing the support necessary for the protection of the poor and vulnerable.

**Establish a clear long-term 2050 goal to move away from fossil fuels and to renewable energy and sustainable land use.**

- By including a long-term temperature goal of well below 2C of warming and a reference to a 1.5C goal, the agreement sends a strong signal that governments are committed to being in line with science. In addition the recognition of the emissions gap and the inclusion of a quantified 2030 gigatonne goal should serve as a basis for the revision of national pledges ahead of 2020.
- The agreement sets 2018 as a critical global moment for countries to come back to the table and take stock of their current efforts in relation to this global goal and this should result in stronger and enhanced actions on emission reductions, finance and adaptation.
- The Paris agreement made good progress by recognizing, in a unique article, that all countries must act to halt deforestation and degradation and improve land management. The agreement also included a process that can provide guidance for land sector accounting. Adequate and predictable financial support for reducing emissions from deforestation and forest degradation could have been stronger.



# A GREEN ECONOMY IN THE GOLDEN LAND

## Ensuring Economic, Social and Environmental Prosperity in Myanmar



© DAVID ABRAHAMSON

Sustainably managing and accounting for the value of Myanmar's natural capital is fundamental for the future of its economy and people. By choosing a green economy approach, Myanmar can efficiently develop its economy, while sustaining natural capital, and providing abundant opportunities for its people.

### MYANMAR A WEALTH OF NATURAL CAPITAL

Natural capital, including biodiversity, arable lands, forests, rivers and mineral resources, underpins all economic activity and human well-being in Myanmar. With three of the most pristine rivers in the region, one of the largest deltas in the world, 47 percent forest cover<sup>1</sup> and home to species such as the Indochinese tiger, Asian elephant and Irrawaddy dolphin, Myanmar has a wealth of natural capital.

Without well-managed natural capital, the food we eat, the water we drink and the protection we need against natural disasters are threatened. Shifting from a traditional economic growth path to a green economy approach will sustain and enhance the benefits that Myanmar's people derive from their natural capital. This will ensure food and water security, climate change mitigation and adaptation, and disaster risk reduction for generations to come.

## WHAT IS A GREEN ECONOMY?

Green economy is an alternative approach to growth and development. The approach can generate economic growth while improving people's lives and enhancing and sustaining the value of natural capital and the services it provides. According to UNEP, "A green economy results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities."<sup>2</sup>

## IN A GREEN ECONOMY APPROACH:

- Natural capital is maintained and restored;
- Renewable energy and low-carbon technologies replace fossil fuels;
- Resources and energy are used as efficiently as possible;
- Urban living is more sustainable;
- People use low-carbon forms of transport;
- Nature's resources and benefits are shared more fairly.

## CHANGING TIMES IN MYANMAR

Myanmar is undergoing rapid transformation in its politics, civil society and economy. From a political perspective, the parliament and cabinet have been empowered to make changes and are now drafting, debating and passing new laws. Civil society organizations – both old and new – are growing in their ability to influence a variety of development issues. While the country is experiencing rapid economic growth, it is also facing pressing human development needs. About 26 percent of the population in Myanmar lives below the poverty line - twice as high in rural areas, where 70 percent of the population lives.<sup>3</sup> Meeting these development needs and the increasing demands for food, energy and water will depend on how well Myanmar's natural capital is managed.

## WHY PURSUE A GREEN ECONOMY IN MYANMAR?

The rapid changes in the country, together with the great development needs and affluence of natural capital, put the country at a crossroads, with two very distinct and far-reaching paths to choose between. One path – business as usual – leads to fast depletion of natural capital, short-term economic benefits at high social and environmental costs and dependence on non-renewable energy sources. The other path – the green economy approach – can lead to sustainably managing and using Myanmar's natural capital, and creating jobs and development benefits that are equitably shared among its people. **By applying a green economy approach, Myanmar can become a role model for how to account for the economic value of natural capital in policymaking and development planning.**

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## A LONG-TERM VISION FOR MYANMAR

Myanmar's economy is built on its natural capital such as its land, timber and water. A green economy approach in Myanmar would support the long-term economic prospects and viability for the private sector as well as for the country itself by preventing the loss and degradation of natural capital. Finally, with the added pressure from climate change, natural capital can function as a buffer against natural disasters. This is especially critical for Myanmar, ranked as the country at highest risk of natural disasters in the Asia-Pacific region.

"Myanmar firmly believes the green economy contributes to eradicating poverty as well as to sustained economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth's Ecosystems."

- H.E. President U Thein Sein  
(2013 Green Economy Green Growth Forum)



© MYANMAR PRESIDENT OFFICE

## WHAT WOULD A GREEN ECONOMY APPROACH IN MYANMAR LOOK LIKE?

A green economy approach in Myanmar should be framed around the following principles:

1. **Sustainable** – creates sustainable economies that support a healthy planet.
2. **Efficient** – eliminates waste, closing the loop of resource-use cycles for maximum efficiency in consumption and production.
3. **Resilient** – contributes to economic, social and environmental resilience.
4. **Inclusive** – builds inclusive societies, governed by fair, participatory and transparent decision-making processes, for all generations, future and present.

## ASSESSING MYANMAR'S NATURAL CAPITAL

In order to manage Myanmar's natural capital, we must assess and measure its value. The environmental and social costs of degraded natural capital must be well understood in order to incentivize integrated planning and sustainable management. The value of natural capital therefore must be properly reflected in planning and economic decision-making as well as in the prices of goods and services.

Creating an inclusive green economy where gains and benefits are equitably shared among the population should be at the center of the green economy approach in Myanmar.

## NATURAL CAPITAL CAN BE DEFINED AS:

the planet's land, water and biodiversity that humanity depends on for sustenance and well-being. These natural assets provide valuable "ecosystem services" for people and wildlife – such as food and timber production, water purification or coastal protection. Natural capital is considered essential to the long-term sustainability of development as it provide crucial "functions" to the economy and mankind.<sup>4</sup>



© STEPHEN KELLY/WWF-US

## Energy in a Green Economy

Myanmar faces great challenges in its energy sector, as only 26% of the population has access to electricity.<sup>3</sup> However, the need to increase access to electricity presents a real opportunity to create a diversified energy basket, including renewable sources. A more stable and expanded national grid is needed to attract industries and hydropower is viewed by many as an attractive option. However, hydropower projects should be planned with the aim of minimizing negative social and environmental impacts and mitigating any impacts that occur during both construction and operation.

As Myanmar's energy security is tied to two of the country's most extensive natural capital assets – forests and water – an approach that will enhance and sustain these assets is needed. Energy is a cornerstone of a green economy approach and it will take time to expand the national energy grid. The focus for Myanmar should therefore be on enabling investments in renewables and off-grid solutions to rapidly increase access to clean and affordable energy. This will depend on policies that a) promote the development of renewable energy feed-in tariffs (REFITs) that encourage off-grid energy generation and b) help establish energy access programmes to promote micro-hydro, bio-gas, solar and fuel-efficient stoves for biomass.



## Forests in a Green Economy

Forests cover about half of Myanmar's land area. Timber exports have long been an important source of revenue, bringing in between US\$600 and 800 million annually. However the value of other forest services far exceeds timber values: non-timber forest products (US\$506 million), terrestrial forest watershed protection (US\$721 million), mangrove coastal protection (US\$707 million), forest carbon sequestration (US\$889 million), mangrove fishery nurseries (US\$1,130 million) and insect pollination for agriculture (US\$2,728 million) are some of the often undervalued forest services.<sup>5</sup>

Changing timber extraction fees to internalise all associated costs will help secure funds that can be reinvested in reforestation and forest management. In addition, given the multiple ecosystem services stemming from healthy forests, it is vital for the forest sector to adopt an integrated approach to connect forest management with major stakeholders including hydroelectric operators, water supply authorities, fishery managers, farmers and infrastructure developers. By involving these actors it will ensure that impact on and from the forest sector is well understood and addressed in management plans, policies and investments.



## SUSTAINABLE FINANCING IN A GREEN ECONOMY

New forms of sustainable financing that include the value of natural capital are a crucial element of a green economy approach. A wide range of sustainable financing options already exist and lessons can be drawn from several countries such as Vietnam, where a policy on payments for forest environmental services has been adopted. Payments for ecosystem services and similar schemes offer farmers, landowners, or businesses payment in exchange for sustainable management of natural capital and the ecological functions it provides. Another financing possibility would be to channel part of the revenues from the extraction of non-renewable natural capital, such as gas exports, to finance projects that enhance the value of natural capital, for example protected areas or water management.

## THE GREEN ECONOMY APPROACH IN MYANMAR CAN

- Build institutional capacity and promote policies that address key drivers of resource depleting activities, such as illegal wildlife trade and logging, rapid deforestation and land use changes from agricultural intensification and expansion;
  - Promote planning approaches for large scale development projects and cities that take into account land use changes to allow for more environmentally responsible decisions;
- Influence decision-making in financial investments in high impact sectors such as oil and gas, mining, forests, agriculture and energy;
  - Encourage responsible investments that are governed by social and environmental safeguards and apply best practices in order to minimize and mitigate negative impacts;
  - Prioritize policies that support renewable energy generation and off-grid solutions as well as low-carbon transportation options;
  - Encourage efficient use and integration of the value of natural capital in decision-making within sectors such as construction, infrastructure, agriculture, fisheries and mining;
  - Support the efforts of sectors such as tourism and manufacturing to take into account and minimize their social and environmental impacts.

Finally, a green economy approach in Myanmar has an opportunity to measure economic development beyond gross domestic product (GDP), and lead in alternative measures, such as GDP++, that also incorporate the economic value of natural capital and consider the social wellbeing of a nation's population. Such measures of growth would demonstrate whether Myanmar is growing its economy and reducing poverty without rapidly depleting its wealth of natural capital.

## Land in a Green Economy

Agriculture is the engine of Myanmar's rural economy and the principle livelihood for a majority of the population. Although industrialisation is a primary policy goal of the Myanmar government, small-holder agriculture is equally important as it supports broad based economic growth, food security and poverty reduction. Currently, over half the country's arable land is not used, making foreign direct investment (FDI) in the agricultural sector an attractive opportunity for ecological-deficit neighbours. Social and environmental project evaluation criteria should therefore be at the frontline of any investments.

Land tenure registration programmes, especially targeting marginalised groups, could be the catalyst to help reduce rural poverty. There is a much higher incentive for landowners to sustainably manage their land when tenure is secure. A sustainable landscape approach to planning should identify areas suitable for agriculture while maintaining areas of high biodiversity and valuable ecosystem services. Planning approaches should bring together farmers, water resource managers and forest owners to maintain watershed productivity, soil protection and fertility, as well as pollination services.



## HOW WILL WWF SUPPORT A GREEN ECONOMY APPROACH IN MYANMAR?

WWF's vision for Myanmar is for the country to pursue a development model that follows a green economy approach, maintaining a high degree of natural capital and biodiversity and helping conserve the ecological integrity of the Greater Mekong region.



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WWF will work with government, civil society and private sector actors to help Myanmar develop a green economy approach by:

- Conducting natural capital assessments;
- Supporting the development of a national green economy plan;
- Supporting the integration of green economy principles into key policies and sectors;
- Mobilizing green investments that influence related policy frameworks and legislation;
- Promoting integrated spatial planning and management to influence land and water use decisions;
- Encouraging public sector partners and the government of Myanmar to jointly implement development strategies framed by green economy principles.

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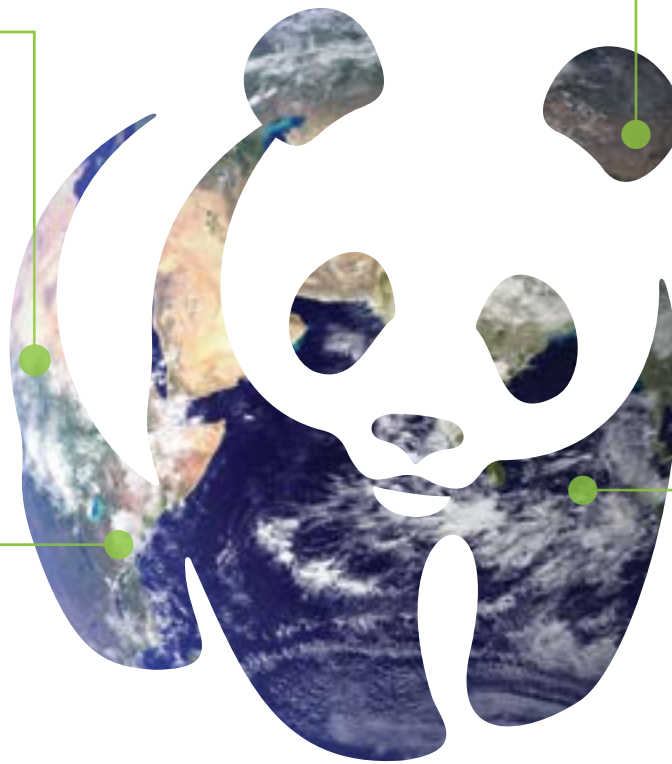
# Myanmar in numbers

**31.8 MILLION**

hectares of forest  
in 2010<sup>6</sup>

**7.3 BILLION**

value of Myanmar's forest  
ecosystem services  
in US\$<sup>5</sup>



**196,717**

Myanmar's micro- and  
small hydropower  
potential in megawatts<sup>6</sup>

**70%**

of Myanmar's working  
population employed in  
agriculture<sup>6</sup>

© NASA



**Why we are here**

To stop the degradation of the planet's natural environment and  
to build a future in which humans live in harmony with nature.

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**WWF-Myanmar**

#15/C, Than Taman Street, Dagon Township, Yangon, Myanmar.

Office phone: +95 1 229331

[wwf.panda.org/myanmar](http://wwf.panda.org/myanmar)

JUNE 2015



WWF

REPORT

MMR

2015

*An Overview Report*

# A Better Road to Dawei

Protecting Wildlife, Sustaining Nature, Benefiting People



JUNE 2015

*An Overview Report*

# **A Better Road to Dawei**

Protecting Wildlife, Sustaining Nature, Benefiting People

# WWF Position on the Dawei Project

Given that the proposed Dawei Industrial Development project and associated road to Thailand have been approved and are likely to be built in the coming years, WWF has significant concerns about the potential impacts on the globally important biodiversity of the Tanintharyi Region, including tiger habitat, dense forests, species-rich rivers and marine resources, which are a critical resource for local communities.

The Dawei Project cannot avoid impacting the environment and communities in the region, but WWF believes that those impacts must be minimized by careful planning and use of mitigation measures throughout the process, from design to development to completion and beyond.

WWF calls on the governments of Thailand and Myanmar, as well as the project's developers, to first carry out a comprehensive strategic environmental assessment, including social impacts, of the project, including the sea port, industrial zone and associated industries and the road between the Myanmar Special Economic Zone and Thailand. WWF also recommends that the results of the assessments, be used by technical experts, community representatives, and the project developers to design the project in a way that prioritizes the value of the region's critical ecosystem services, biodiversity and community needs. Negative environmental impacts from the Dawei project should be monitored and mitigated before, during and after construction and fair compensation provided for those affected.

## Authors

Hanna Helsingen (WWF), Sai Nay Won Myint (WWF), Nirmal Bhagabati (WWF), Adam Dixon (WWF), Nasser Olwero (WWF), Ashley Scott Kelly (University of Hong Kong), and Dorothy Tang (University of Hong Kong).

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In memory of our colleague Dr. Miklós Puky (1961-2015), who made vital contributions to this study.

This project was made possible with funding from the Helmsley Charitable Trust.

## Disclaimer

This report draws on work from a number of sources and has not undergone a full academic peer review. The views and recommendations in this report are based on available information and contributing authors will not be liable for damages of any kind arising from the use of this report.

## Report designed by

Ashley Scott Kelly (University of Hong Kong), Dorothy Tang (University of Hong Kong), and Ye Min Thwin (WWF).

Photos: Mie Maung, Stephen Kelly, and Hanna Helsingen.

Published: June 2015 by WWF Myanmar

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The current access road for the planned Dawei road, near the area of Elephant Cry Hill.

# Section 1

## Why address ecosystem services and wildlife in the development of the Dawei road?

### Introduction

*Safe, efficient and environmentally sustainable transport infrastructure can only be developed using a landscape approach.*

Roads and other transport infrastructure are necessary for Myanmar's economic development. However, poorly planned infrastructure can have many negative impacts, degrading the essential benefits that the people of Myanmar derive from their natural environment and biodiversity. These benefits include access to clean water, fertile agricultural lands, protection from natural disasters, and social security from medicinal plants and non-timber forest products. In turn, healthy ecosystems can protect infrastructure by reducing damage from natural hazards such as landslides, flooding and erosion. Experience from infrastructure development in Europe and beyond has shown that it is both more cost-efficient and safer if wildlife and ecosystem services are taken into account early on in the planning process. If located and designed thoughtfully and constructed responsibly, roads can increase mobility for people and products while protecting nature and reducing long-term costs of infrastructure maintenance. As Myanmar expands road networks and infrastructure, there is an opportunity to strategically plan and construct these permanent structures from the beginning.

The Dawna Tenasserim Landscape in southern Myanmar is one of the last large intact forest landscapes in the region, harboring a rich array of endangered wildlife found in few other places. This transboundary landscape between Thailand and Myanmar is a high priority for conservation, supporting significant populations of tigers, Asian elephants and a rich variety of other wildlife. The forest blocks running north-south in Tanintharyi region link two forest blocks in Thailand, the Western Forest Complex and Kaeng Krachan Forest Complex. Establishing an ecological corridor would support wildlife and ecosystem services, critical to the well-being of people in the area.

The Dawei Special Economic Zone (SEZ) and its planned road link will cut directly across the Tenasserim Hills connecting Dawei with Bangkok, via Kanchanaburi. If not planned and constructed thoughtfully by taking into account the impacts on nature and society, this area stands to lose much of its wildlife and ecological integrity, with serious consequences for the well-being of local people and Myanmar's economy.

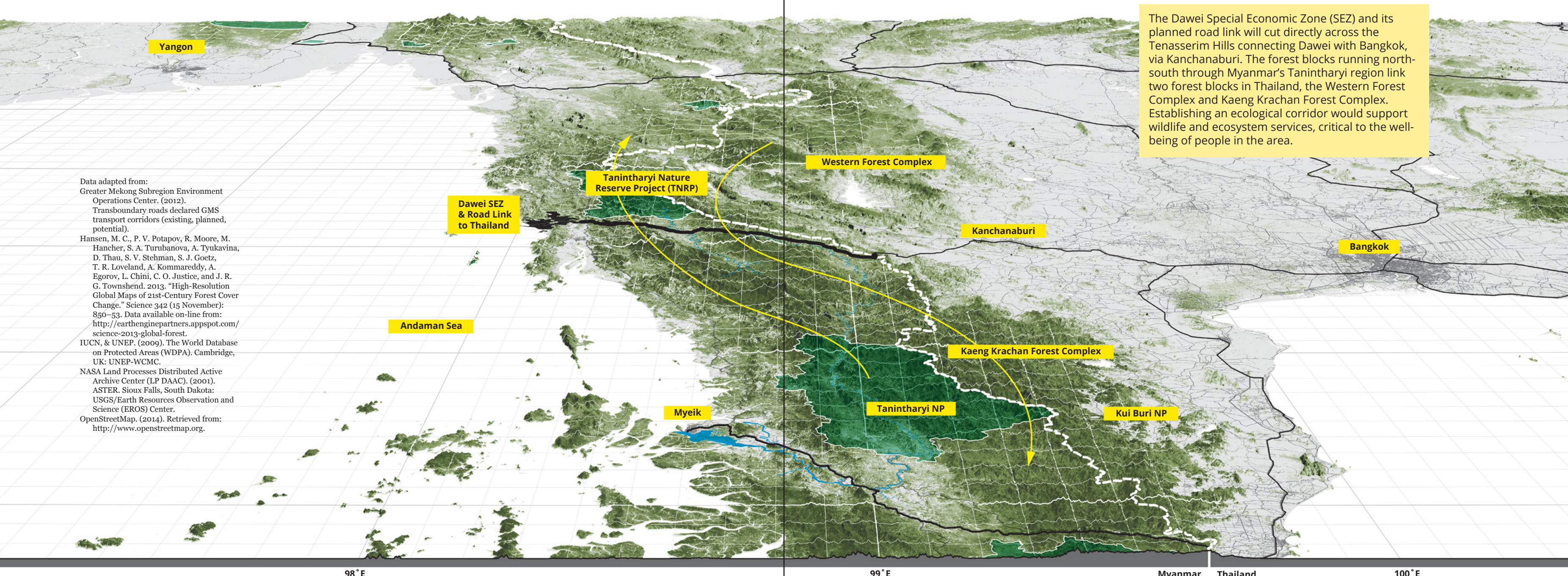
This report aims to help the Dawei road planners and developers to better address these issues, with specific focus on connectivity, wildlife and ecosystem services, in order to ensure that Tanintharyi and its transboundary landscape can continue to sustain present and future generations of people and wildlife.

**Section 1** *Why address ecosystem services and wildlife in the development of the Dawei road?*

**Section 2** *What do assessments and future scenarios tell us about ecosystem services in Tanintharyi?*

**Section 3** *Where can possible technical solutions be located and what measures should be implemented?*

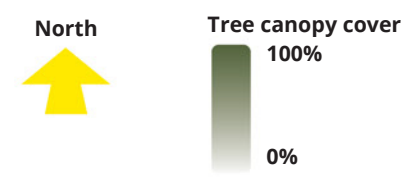
# Tanintharyi: Enabling an Ecological Corridor



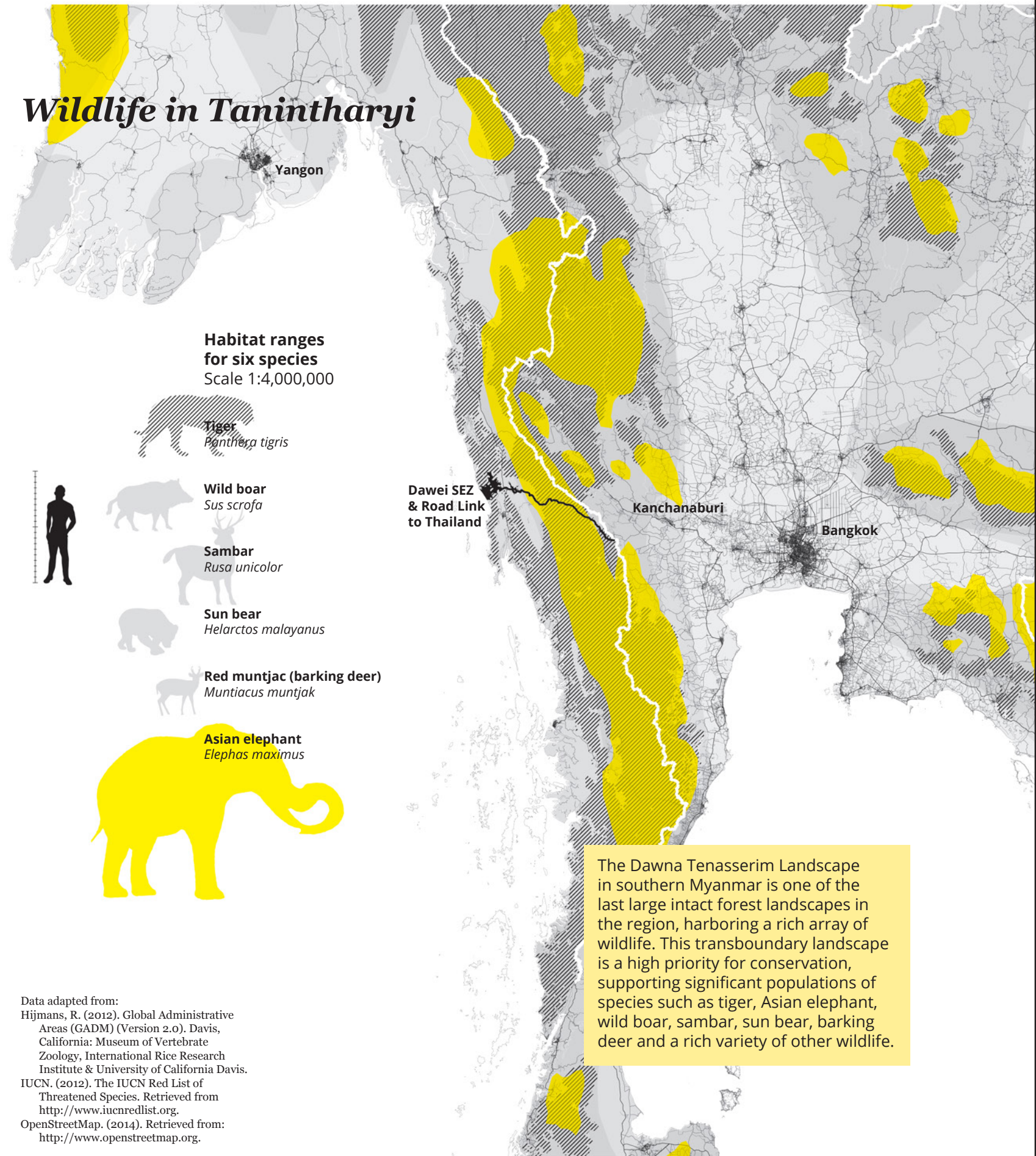
The Dawei Special Economic Zone (SEZ) and its planned road link will cut directly across the Tenasserim Hills connecting Dawei with Bangkok, via Kanchanaburi. The forest blocks running north-south through Myanmar's Tanintharyi region link two forest blocks in Thailand, the Western Forest Complex and Kaeng Krachan Forest Complex. Establishing an ecological corridor would support wildlife and ecosystem services, critical to the well-being of people in the area.

Data adapted from:  
 Greater Mekong Subregion Environment Operations Center. (2012). Transboundary roads declared GMS transport corridors (existing, planned, potential).  
 Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." *Science* 342 (15 November): 850-53. Data available on-line from: <http://earthenginepartners.appspot.com/science-2013-global-forest>.  
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 OpenStreetMap. (2014). Retrieved from: <http://www.openstreetmap.org>.

*Elevation exaggerated by three times to highlight topographic features. Plantations included in the tree canopy cover estimates.*



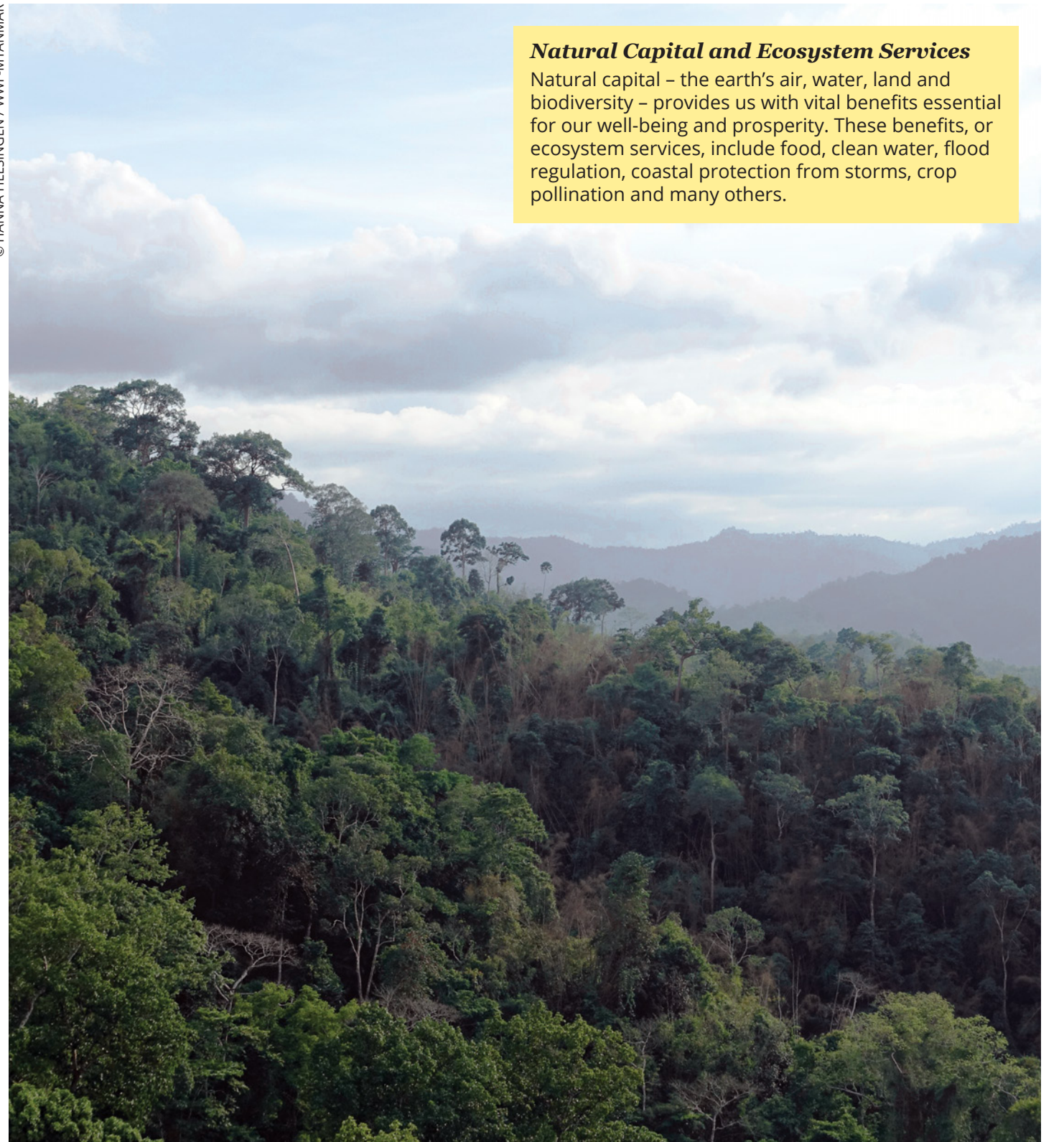
# Wildlife in Tanintharyi



The Dawna Tenasserim Landscape in southern Myanmar is one of the last large intact forest landscapes in the region, harboring a rich array of wildlife. This transboundary landscape is a high priority for conservation, supporting significant populations of species such as tiger, Asian elephant, wild boar, sambar, sun bear, barking deer and a rich variety of other wildlife.

Data adapted from:  
Hijmans, R. (2012). Global Administrative Areas (GADM) (Version 2.0). Davis, California: Museum of Vertebrate Zoology, International Rice Research Institute & University of California Davis.  
IUCN. (2012). The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org>.  
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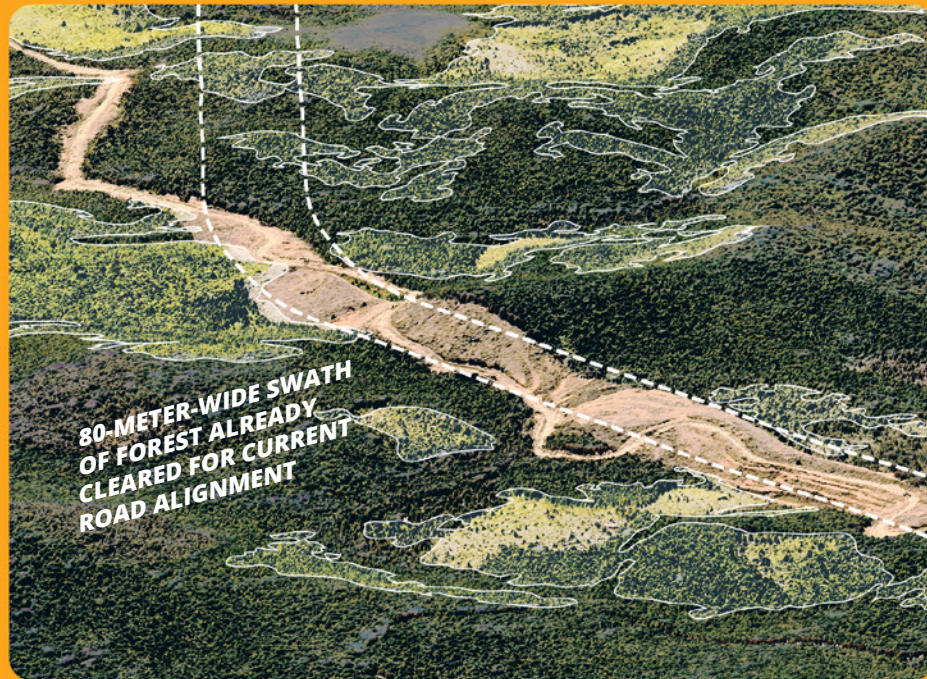


Forests near the area of Elephant Cry Hill.

**Natural Capital and Ecosystem Services**  
Natural capital – the earth’s air, water, land and biodiversity – provides us with vital benefits essential for our well-being and prosperity. These benefits, or ecosystem services, include food, clean water, flood regulation, coastal protection from storms, crop pollination and many others.

## Example Area 2

West of Myitta



### Fragmentation

The ability for wildlife to move around a landscape in search of food, shelter or to mate is negatively impacted by roads and often threatens species survival. The only ways to limit fragmentation are to avoid critical wildlife areas and to maintain corridors by constructing wildlife crossings and managing traffic flows.

### Habitat Loss

Road construction leads to physical change in land cover along the route as natural habitats are replaced or altered. Disturbance and isolation effects lead to an inevitable change in the distribution of species in the landscape.

## How Roads Impact Nature

### Disturbance & Pollution

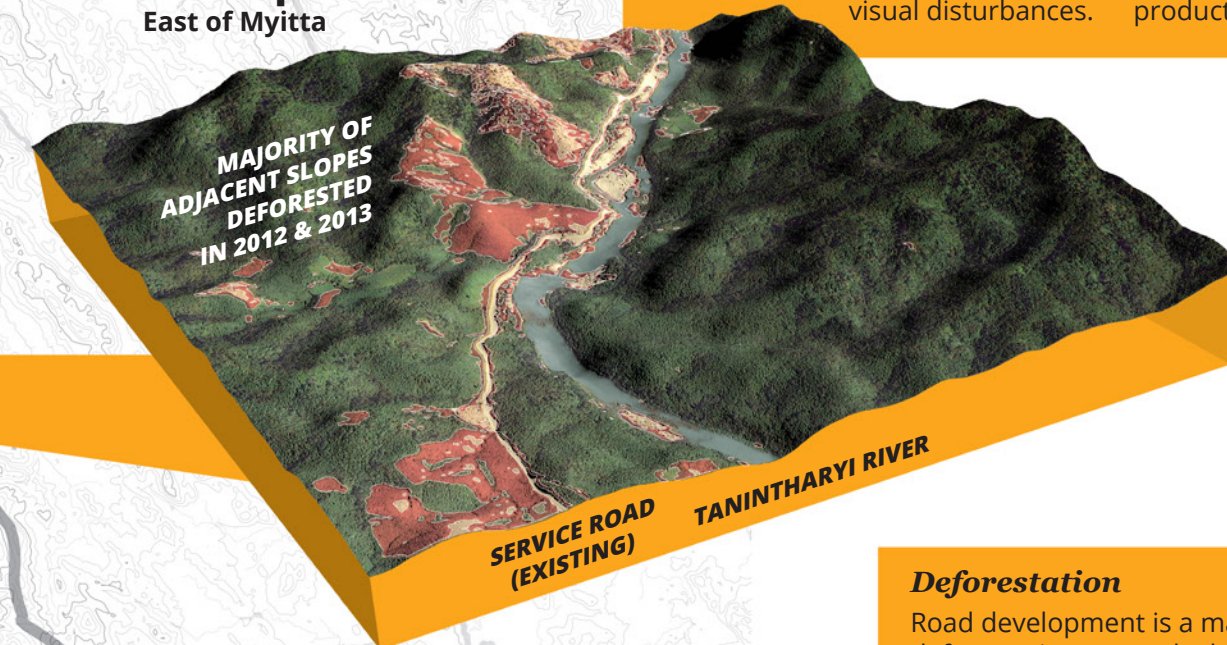
Road development and operation alter ecological characteristics of adjacent and distant habitats, which may change the way they are used by wildlife. The main types of disturbances are hydrological changes, chemical and air pollution, noise, vibration, lighting and visual disturbances.

### Ecosystem Service Loss

The damage to ecosystems from poorly planned and constructed roads degrades many vital benefits that people obtain from nature. These benefits, essential for human well-being, include provision of clean water, flood and erosion control, forest products and many others.

## Example Area 1

East of Myitta



### Wildlife Vehicle Collisions

Millions of animals are killed on roads and railways each year and many more are seriously injured. Wildlife-vehicle collisions also kill and injure many people every year, if preventive measures in design and management of the infrastructure are not considered.



### Secondary Impacts

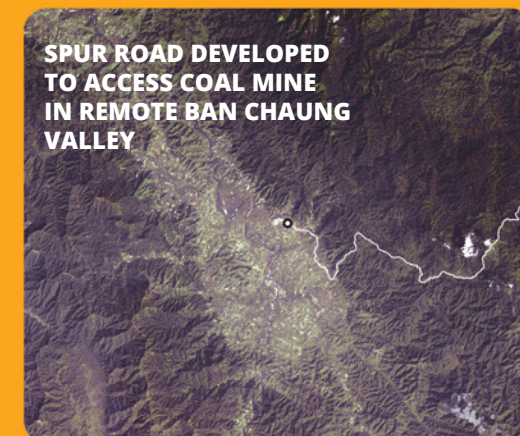
Construction of new transport infrastructure leads to secondary effects such as changes in land use, human settlement patterns or industrial development. These effects need to be considered especially if transport infrastructure is planned to access remote areas.

### Wildlife Poaching

Roads that provide access to previously undisturbed areas, could lead to an increase in poaching and illegal wildlife trade, if preventive measures, such as monitoring and enforcement are not taken.

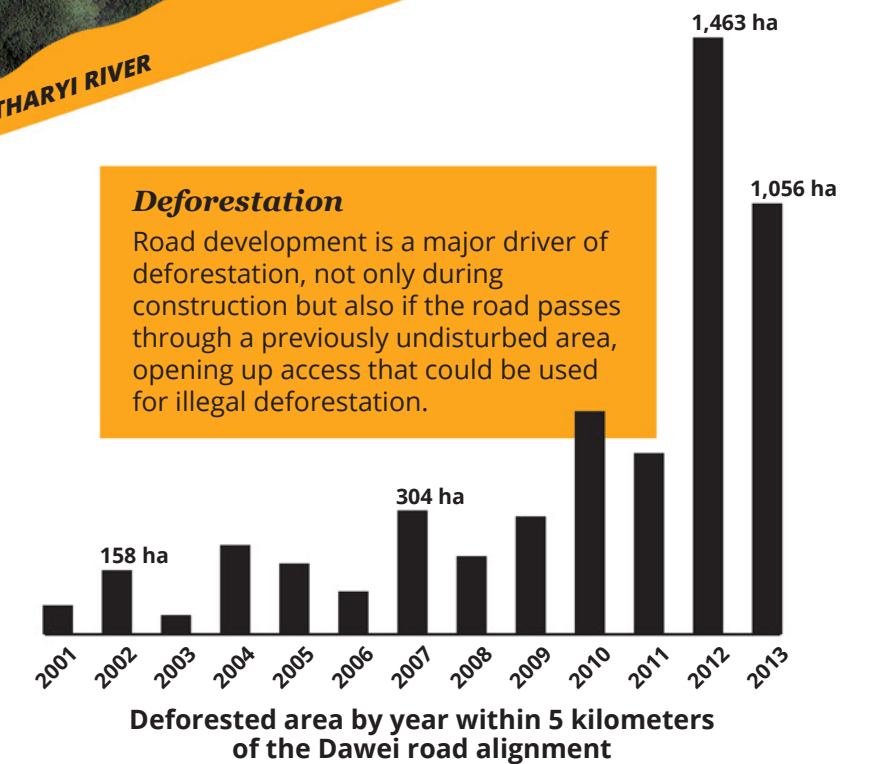
## Example Area 3

Ban Chaung Spur Road (Kunchaungyi-Amara Link)



### Deforestation

Road development is a major driver of deforestation, not only during construction but also if the road passes through a previously undisturbed area, opening up access that could be used for illegal deforestation.





*How Roads Impact Nature*, pp. 12-13  
*How Roads Depend on Nature*, pp. 14-15

Data adapted from:  
 Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." *Science* 342 (15 November): 850-53. Data available on-line from: <http://earthenginepartners.appspot.com/science-2013-global-forest>.  
 Landsat 8 Level 1 Product. Acquisition January 2015.  
 NASA Land Processes Distributed Active Archive Center (LP DAAC). (2001). ASTER. Sioux Falls, South Dakota: USGS/Earth Resources Observation and Science (EROS) Center.

**Air Quality**

Air pollution has negative consequences for human health. Roads, and especially the traffic they generate, reduce air quality. Vegetation can help to mitigate these impacts of roads on air quality by trapping and filtering pollutants.



**Flood Regulation**

Vegetation can reduce peak storm flows by enhancing soil infiltration and increasing water storage. Vegetation upstream of roadways can reduce flood risk to roads.

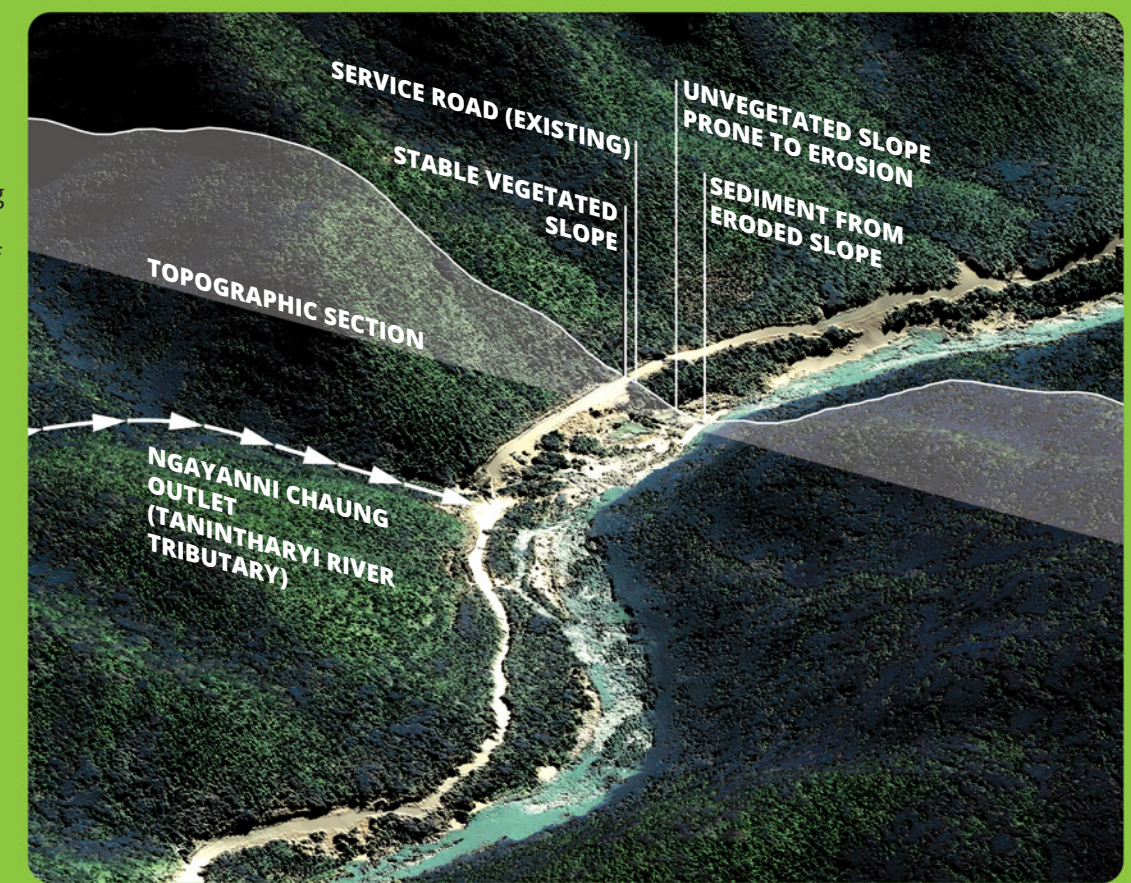
**How Roads Depend on Nature**

**Example Area 4**

West (upriver) of Aing Waing Village

**Erosion Control**  
 Vegetation holds soil in place, preventing erosion and keeping sediment out of waterways. Maintaining and restoring vegetation upstream of roadways reduces sediment on roads, lowering infrastructure and vehicle maintenance costs.

**Landslide Prevention**  
 Vegetation can help to stabilize soils and hillsides, reducing the risk of landslides. This can increase safety for road users and reduce maintenance costs.



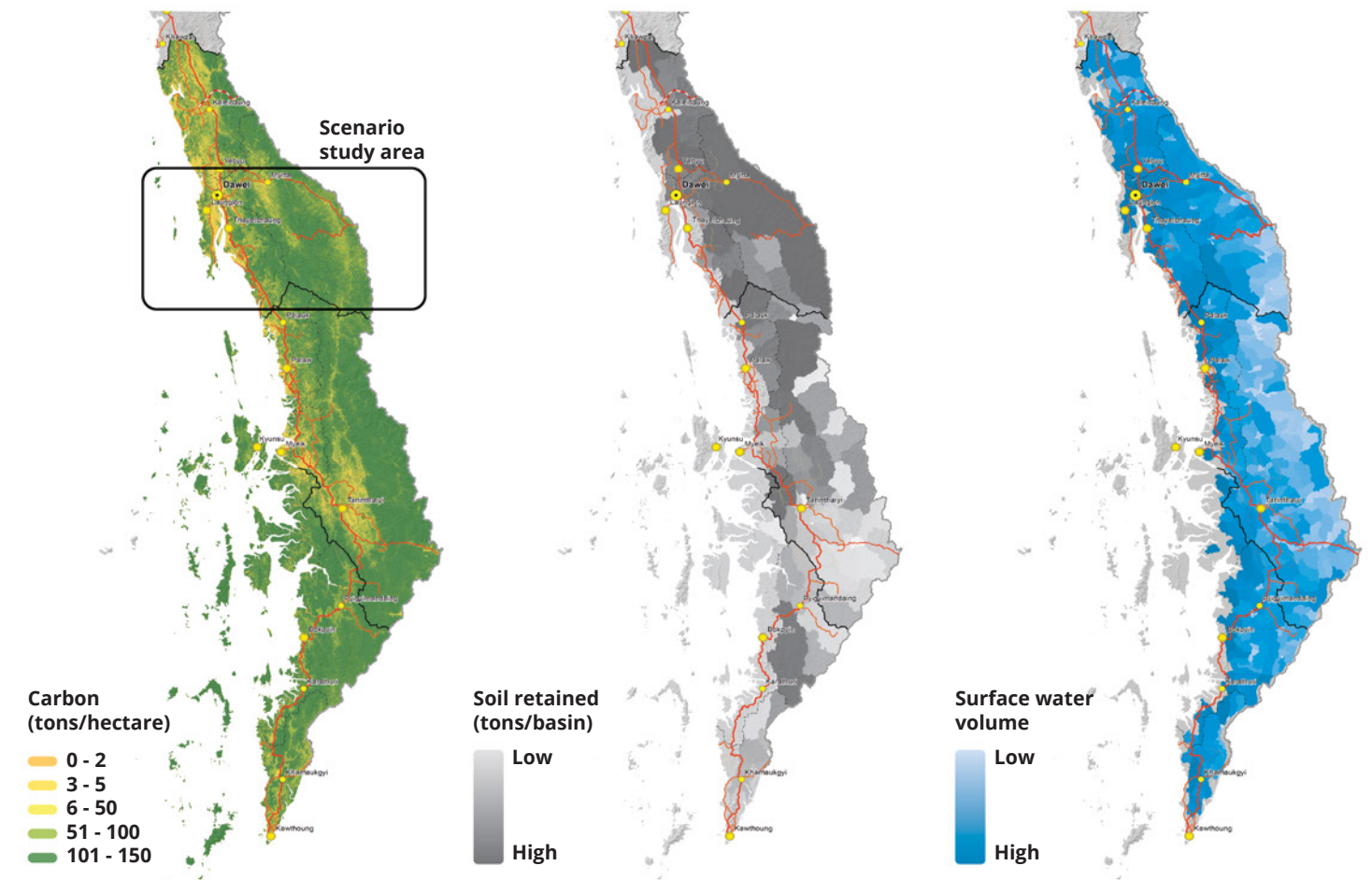


Soil erosion and minor landslides can be observed along the road.

# Section 2

What do assessments and future scenarios tell us about ecosystem services in Tanintharyi?

## Forests, Soil and Water in Tanintharyi



### Vegetation and Forest Cover

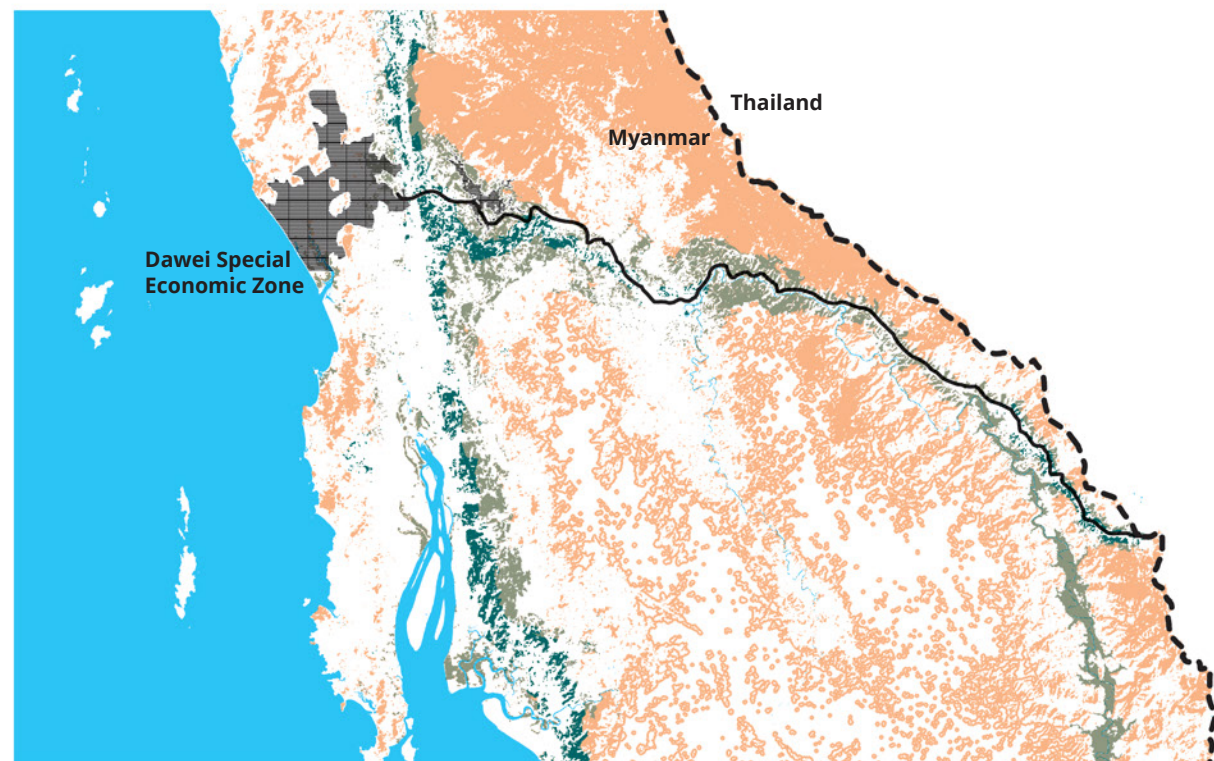
The forests along the planned Dawei road store large amounts of carbon, helping to mitigate climate change. Protecting these remaining forests and working with communities to promote natural resources management will help sustain ecosystem services provided by forests.

### Soil Retention (per watershed)

The planned Dawei road runs through a mountainous area. Forests and other vegetation on slopes help stabilize soils and hillsides, reducing soil erosion and landslides. If these forests were lost, increased erosion and landslides would pose serious threats to communities and to the integrity of the road itself. This in turn can result in increased risks to road users, higher maintenance costs, and road closures.

### Annual Water Yield (per watershed)

The planned Dawei road passes through an area of high surface water volumes. Proper and well planned road design is essential in order to avoid negative impact on water resources in the area and water damage to the road infrastructure.



Comparison of conversion scenarios  
Scale 1:1,000,000

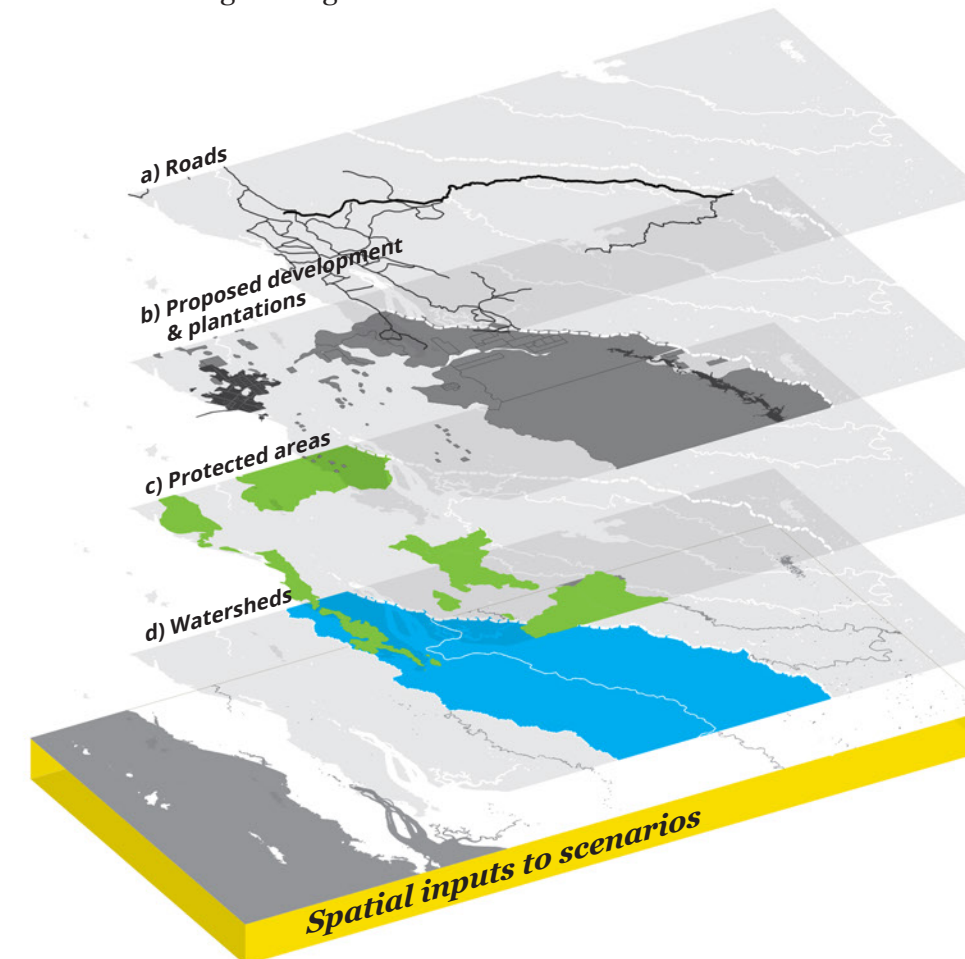
- Limited conversion
- More conversion
- High conversion

Data adapted from:  
WWF 2013 Tanintharyi land cover – Google Earth Engine.  
InVEST (Integrated Valuation of environmental services and tradeoffs) Natural Capital Project 2014 <http://www.naturalcapitalproject.org/>  
Myanmar Information Management Unit (MIMU). The datasets are developed by WFP, UNODC, UNEP, UN OCHA, and MIMU. <http://www.themimu.info/gis-resources>  
Worldpop. <http://worldpop.org.uk>

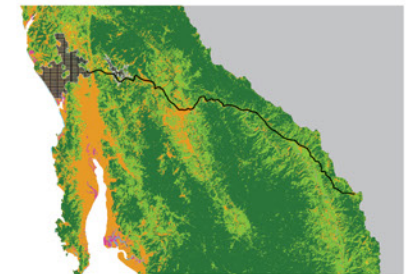
## Future Development Scenarios

Scenarios can help land use and road planners understand possible future outcomes under different development options. For example, this information can be used to identify key areas that should be avoided for infrastructure development, or areas that need to be protected. Development scenarios can also help to identify communities that may be affected and to locate mitigation measures to address negative social and environmental impacts.

“Limited” and “more” conversion scenarios show expanding frontiers of deforestation primarily concentrated around existing and planned roads and settlements. The high conversion scenario reflects a future where extensive forest conversion is similar to neighboring countries.



Scenario baseline



Limited conversion scenario



More conversion scenario



High conversion scenario



- Forest
- Other wooded lands
- Open forest
- Settlement/ Agriculture/ Bare
- Water
- Mangrove

# Ecosystem Service Outcomes Under Different Scenarios

## Carbon Loss

Continued deforestation will result in increased carbon emissions impacting global climate change.

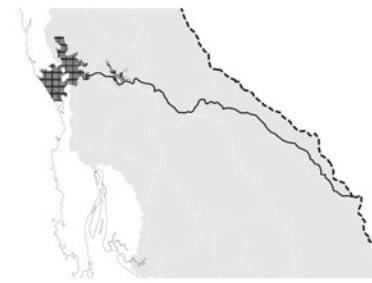
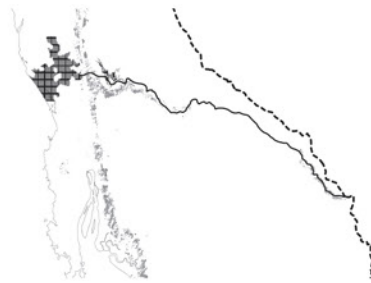
## Sediment Export

Soil erosion within sub-catchments increases with deforestation. Negative impacts of soil erosion include reduced water quality, soil deposition on roads, reservoirs and rivers and lower agricultural productivity.

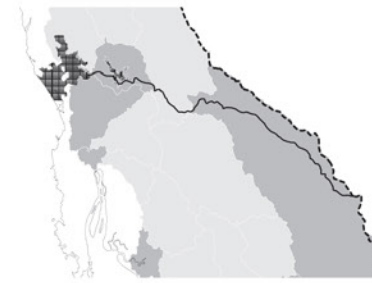
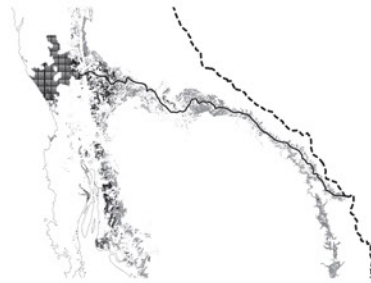
## Servicesheds

A serviceshed describes the area providing an ecosystem service to its specific users. Mapping servicesheds of villages can help identify areas from which communities are deriving benefits from nature such as water provision or reduced erosion.

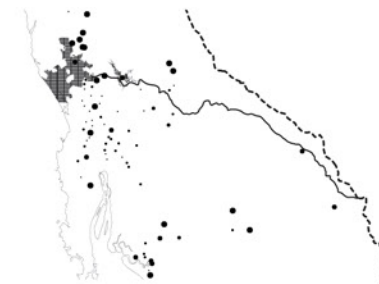
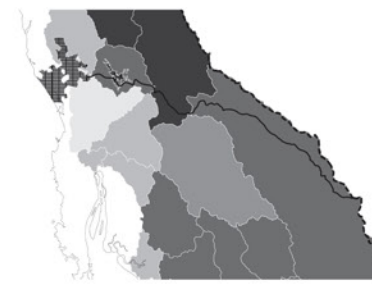
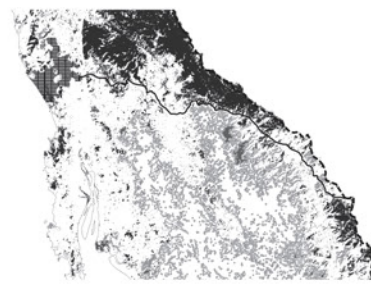
Limited conversion scenario



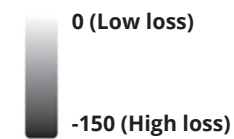
More conversion scenario



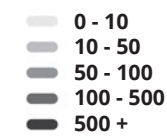
High conversion scenario



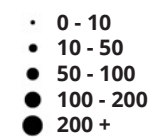
Carbon loss (relative to 2013 in tons/ha)



Percent increase (relative to 2013)



Percent increase in soil erosion at village location (relative to 2013)



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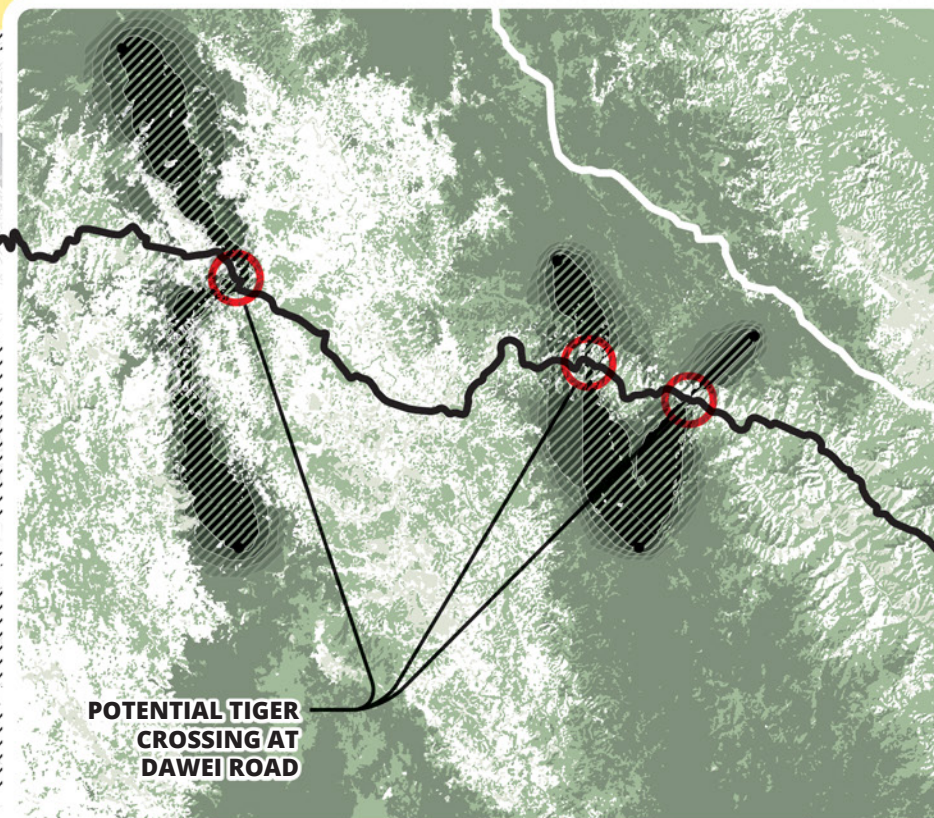


The current access road for the planned Dawei road outside the village of Myitta.

## Locating Critical Areas Along the Dawei Road

### Example of tiger habitat corridor model

Darker shaded areas indicate stretches of high-quality forest cover that extend up to the edge of the road on both sides of it. Such areas may be preferred by wildlife as corridors for moving across the landscape. Wildlife-vehicle collisions will result where these corridors cross the road. Engineering solutions such as overpasses, underpasses and elevated road sections will reduce collision risks by allowing wildlife to safely access the forest on both sides of the road without needing to cross the road surface.



POTENTIAL TIGER  
CROSSING AT  
DAWEI ROAD

# Section 3

Where can possible technical solutions be located and what measures should be implemented?

### Wildlife-vehicle accidents on the rise in the region

Wildlife-vehicle collisions happen every day around the world, and put both humans and wildlife at risk of death and injuries, as well as resulting in considerable costs due to vehicle, property and infrastructure damages. Wildlife-vehicle collisions are on the rise in Asia. In 2013, in Chapramari forest, in the state of West Bengal, India, a passenger train ploughed into a herd of 40 elephants, killing seven and derauling the train. At least 50 elephants have been killed by trains since 2004 in West Bengal alone. Elsewhere in India, over the past five years, 23 leopards have been killed in the state of Karnataka due to road accidents.

In 2014, in Thailand, three wild elephants in search of food walked onto a road near Khao Chamao National Park resulting in a car accident, killing six people and one elephant. Accidents involving animals are all too common on Malaysian roadways as well. According to the Department of Wildlife and National Parks of Malaysia, 1,924 wild animals were killed on roads from 2006 to 2014 because of destruction of wildlife habitats, poor mitigation measures and broken roadside fencing.

Beyond Asia, wildlife-vehicle collisions in the United States result in thousands of human injuries and deaths per year, along with USD 8 Billion in associated costs. As traffic and infrastructure expands across the region, the number of wildlife-vehicle collisions and casualties will continue to rise if proper mitigation measures, planning and designs are not put in place. Solutions to prevent transport infrastructure from becoming a major threat to both humans and wildlife are available and can be implemented.

Data adapted from:  
IUCN. (2012). The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org>.  
NASA Land Processes Distributed Active Archive Center (LP DAAC). (2004). ASTER. Sioux Falls, South Dakota: USGS/Earth Resources Observation and Science (EROS) Center.

Habitat range  
and corridor model  
Scale 1:500,000

Tiger  
*Panthera tigris*



Slopes along the access road for the planned Dawei road on Elephant Cry Hill.

# Recommendations

## PLANNING AND CONSULTATION

- 1) **A land use plan** for the Tanintharyi region should be developed to guide primary and secondary development, to avoid negative impacts communities, wildlife and the natural environment. Compliance and enforcement measures for this plan should also be developed.
- 2) **A Strategic Environmental Assessment (SEA)** should be developed to ensure that environmental and social considerations are taken into account at the outset of the entire Dawei project. It should include a general description of the plan for the Dawei project, its main objectives, and how it relates to other relevant plans and their complementary and accumulative environmental and social impacts.
- 3) **An Environmental Impact Assessment (EIA)** for the road should follow International Strategic Environmental Assessment standards and include both environmental and social impacts and recommendations for minimizing, mitigating and offsetting ecological negative impacts. The assessment should also include a comparison of alternative road alignments and their social, environmental and economic costs and benefits, including indirect and cumulative impacts.
- 4) **Civil society and local communities should be involved and informed** throughout the planning and construction processes. Additionally, affected communities should receive fair compensation.
- 5) **A natural resource management plan** for the management of the road should be developed to guide ecosystem and forest management, including wildlife conservation. This plan should include systems for limiting poaching and illegal wildlife trade, protecting forests and securing key ecosystem services that support human well-being, including the provision of clean water and minimizing flood risks.

- 6) **A multi-disciplinary technical advisory group** should be established and include planners, engineers, civil society, wildlife and ecology experts to ensure the road development will meet technical and economic requirements, while minimizing and mitigating social and environmental impacts.

## DESIGN AND CONSTRUCTION

- 7) **Avoidance**  
The road alignment should be adjusted to the topography of the Dawei area using engineering elements to minimize large earthworks. The road alignment should avoid protected areas, important forest areas, watersheds and migration routes to the widest extent possible. To avoid and minimize habitat fragmentation, the road alignment should consider ecological corridors, migration routes, population and distribution of important species, and their national and international conservation status.
- 8) **Mitigation**  
Where avoidance is not possible, mitigation measures should be properly designed and constructed:
  - a) **Wildlife crossings** such as elevated road sections, underpasses or overpasses are needed to maintain connectivity, and to ensure wildlife can safely cross the road, decreasing risks for wildlife-vehicle accidents. Passages should be adapted to various species, including elephants, large carnivores, primates, deer and amphibians. The number of measures required will depend on the behaviour of target species and the distribution of habitat types in the area, but should ensure connection of forested areas and the ability for wildlife movement.
  - b) **Culverts adapted for wildlife** would allow small or medium size mammals and amphibians to cross the road. Culverts for small creeks with permanent or temporal water flow should be adapted to secure movements of fish, amphibians, reptiles and small animals.

c) **Fencing and screening** should be put in place where necessary, especially adjacent to wildlife passages to guide wildlife to safe areas for crossing the road -increasing traffic safety. Fencing and walls should reflect local styles and materials. Screening can mitigate noise impact on bird populations and should be carefully designed to blend in with the landscape.

d) **Road signs, speed reduction and other warning systems** should be put in place in sensitive areas to reduce wildlife-vehicle collisions and can be powered by solar energy.

e) **Slope stabilization measures** should be put in place to prevent soil erosion on slopes, which are highly vulnerable in climates with intensive rainy seasons, such as Tanintharyi. Stabilizing slopes along the road early on will prevent future road damages and limit road closure. Measures can include:

- Terraces to break up sides of deep cuttings to overcome visual dominance, benefit structural stability and facilitate vegetation
- Native vegetation in areas with little or no vegetation cover
- Special nets and cover material

## MONITORING AND MAINTENANCE

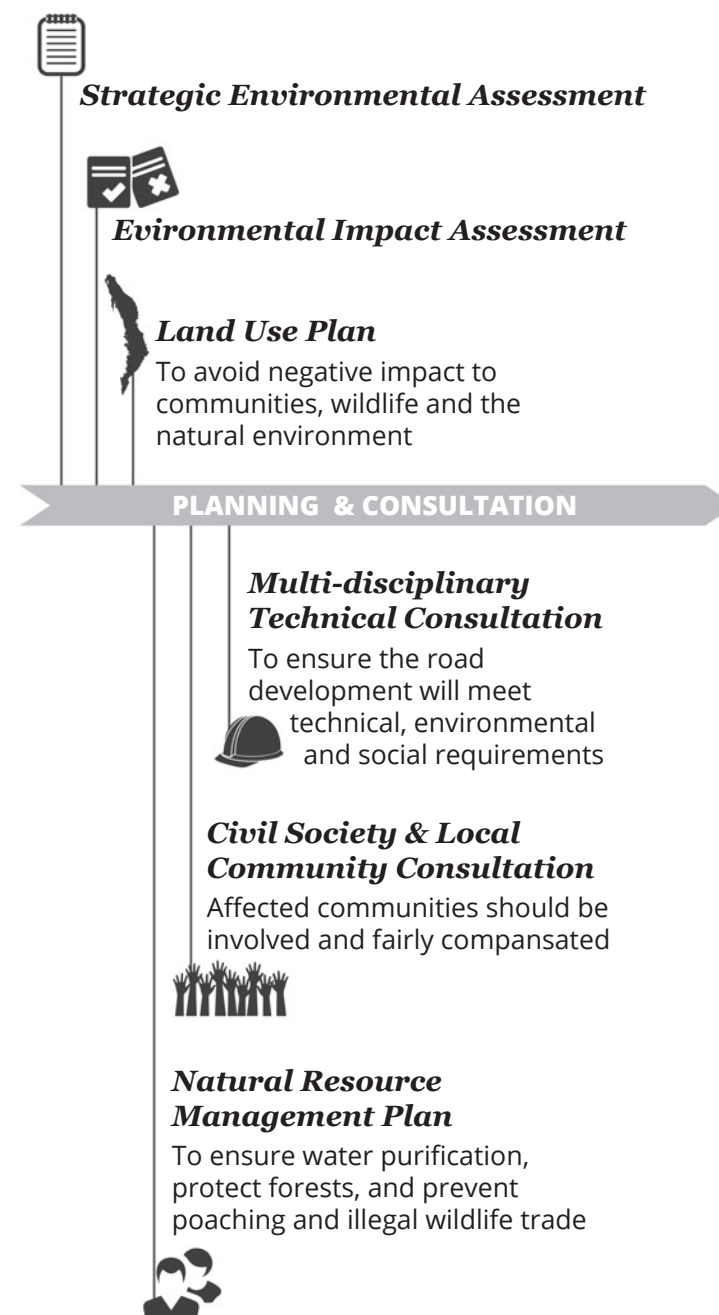
9) **Monitoring and maintenance** should be developed in collaboration with forest and wildlife departments, conservation organizations and communities to monitor wildlife movements and behaviour, and to prevent wildlife poaching around wildlife crossings and beyond. To improve traffic safety, data on wildlife casualties on the road should be collected to identify road sections with high risks to drivers and wildlife. Appropriate collision-mitigation measures should then be implemented. Responsibility and costs for monitoring and maintenance should be agreed on and allocated in the planning process.

## OFFSETTING

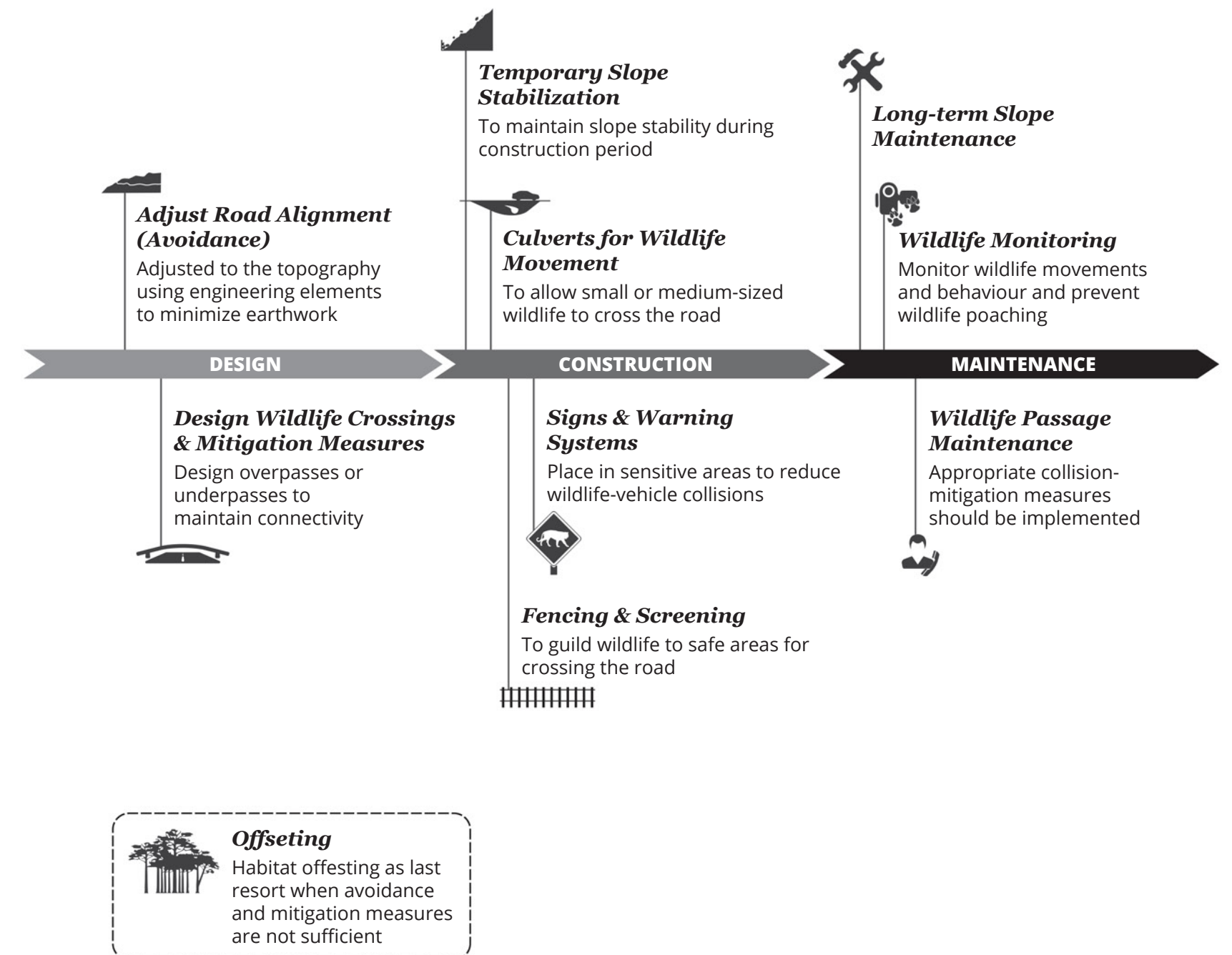
### 10) Offsetting

As a last resort, and only when the above avoidance and mitigation measures are not sufficient at a site of concern, offsetting should be implemented. Offsetting measures include habitat protection,

creation or restoration that would increase biodiversity and ecosystem services to an extent equal to or greater than what is lost at the original site. Any project designed for ecological offsetting should be in line with local and national nature conservation targets, and support local natural habitats. However, fragmentation caused by the Dawei road will have to be mitigated by appropriate measures and cannot be addressed through offsetting.



## The Road Map: Towards a Better Road to Dawei





The current access road for the planned Dawei road between the Myanmar-Thai border and the village of Myitta.

## Summary

This report has outlined why ecological connectivity, wildlife and ecosystem services should be taken into account in the planning and construction of the Dawei road link. The Dawna Tenasserim Landscape is a transboundary landscape supporting tigers, elephants and a range of other endangered wildlife. Linking two important forested areas, the Western Forest Complex and Kaeng Krachan Forest Complex in Thailand, through Tanintharyi in Myanmar will establish critical ecological corridors - supporting wildlife movement and natural processes - critical to the well-being of communities and wildlife in the area. The planned road link of the Dawei Project will be a great threat to this critical corridor, if measures are not taken.

Roads can have negative impacts on nature, including fragmentation, deforestation, land use change, and loss of ecosystem services. Roads also depend on nature through protection against threats such as landslides, floods and soil erosion. Ensuring that ecosystems are well managed will benefit people, wildlife and infrastructure investments in Tanintharyi. The natural capital assessments undertaken by WWF show that the landscape through which the road is planned is a hydrologically important area. The area contains high levels of surface water, and the presence of forests helps reduce soil erosion. The forests of the landscape also store significant amounts of carbon in forests and vegetation, helping to mitigate climate change. If future deforestation is not controlled, scenarios show high risks of carbon loss, soil erosion and loss of water provisioning services to communities.

With wildlife-vehicle collisions on the rise across Asia, it is important that measures such as wildlife crossings, speed control and barriers are put in place to improve road safety and decrease risks to both people and wildlife in Tanintharyi. In cooperation with road ecology experts from Infra Eco Network Europe (IENE), recommendations have been put forward to safeguard against social and environmental impacts as well as decreasing future economic risks and costs associated with the road. These include:

- Undertake Strategic Environmental Assessments for the entire Dawei project and Environmental Impact Assessment for the road specifically.
- Implement management practices to protect ecosystems, including forests.
- Adjust road alignment to avoid important forest areas, watersheds and wildlife migration routes.
- Implement mitigation measures such as wildlife passages, slope stabilization measures, culverts, fences and wildlife warning systems.
- Develop plans to monitor wildlife passages and wildlife-vehicle accidents and provide maintenance for these structures.
- Establish offsetting projects around and outside the road area to create or enhance natural habitats.

*Improving the planning and implementation of the Dawei road would protect wildlife, sustain nature and benefit people. As Myanmar continues to make progress on its development agenda, a better road to Dawei would guide and provide valuable lessons for safe, socially responsible and environmentally sustainable infrastructure development across the country.*



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*For text in the report see sources below; for visuals see data references on respective pages.*

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**Why we are here**

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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# Group 1

Group Leader: Vanessa Dick

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States: Washington, California, Pennsylvania\*

## Schedule\*

1:30	Rep. Steve Israel, D-NY Meeting with - Mark Snyder	2457 Rayburn HOB 202-225-3335
2:30	Sen. Dianne Feinstein, D-CA Meeting with Tristan Colonius	331 Hart SOB 202-224-3841
3:30	Sen. Patty Murray, D-WA Meeting with Kevin Stockhert	Committee Space SD-648 202-224-2621

## Participants

Mr.	Travis	Miller	WA
Ms.	Joyce	Lam	WA
Ms.	Devina	Garrity	CA
Ms.	Ruth	Lin	CA
Ms.	Sharon	Magnuson	CA
Mrs.	Chris	Davis	CA
Ms.	Debbie	Hossli	CA
Ms.	Barbara	Beck	PA

\*Tentative Scheduling

# Group 2

Group Leader: Roberta Elias

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States: Massachusetts, Colorado

## Schedule\*

2:00pm	Rep. Katherine Clarke, D-MA Meeting with - John Moreschi	1721 Longworth HOB 202-225-2836
2:30pm	Rep. Ed Perlmutter, D-CO Meeting with - Joe Minges	1410 Longworth HOB 202-225-2645
3:15pm	Sen. Ed Markey, D-MA Meeting with - Ana Cohen	255 Dirksen SOB 202-224-2742
4:00pm	Sen. Elizabeth Warren, D-MA Meeting with Louis Hart	154 Hart SOB 202-224-4543

## Participants

Mr.	Jack	Kerivan	MA
Ms.	Anne	Stetson	MA
Miss	Eleanor	Stetson	MA
Dr.	Oona	Johnstone	MA
Dr.	Dirk	Landgraf	MA
Ms.	Shaina	Aguilar	CO

\*Tentative Scheduling

# Group 3

Group Leader: Will Gartshore

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States: North Carolina, Virginia, Florida

## Schedule\*

1:30pm	Sen. Marco Rubio, R-FL Meeting with - Lauren Reamy, Eleni Valanos	284 Russell SOB 202-224-3041
2:00pm	Sen. Thom Tillis, R-NC Meeting with - Kayla Dolan	185 Dirksen SOB 202-224-6342
3:00pm	Rep. Dennis Ross, R-FL Meeting with - Timothy Cummings	229 Cannon HOB 202-224-4543
4:00pm	Rep. Robert Hurt, R-VA Meeting with - Nick O'Boyle	125 Cannon HOB 202-225-4711

## Participants

Ms.	Barbara	Kelly	NC
Mr.	Linda	Lawson	NC
Ms.	Susan	Polizzotto	NC
Mr.	Maynard	Davis	VA
Ms.	Deborah	Talbot	FL
Ms.	Christina	Sherry	FL

\*Tentative Scheduling

# Group 4

Group Leader: America May Pintabutr

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States: Illinois, Minnesota, Texas

## Schedule\*

1:45pm	Sen. Dick Durbin, D-IL Meeting with - Erum, Ali	711 Hart SOB 202-224-2152
2:00pm	Sen. Amy Klobuchar, D-MN Meeting with - Brian Werner	302 Hart SOB 202-224-3244
3:00pm	Sen. John Cornyn R-TX Meeting with - Will Lovell	517 Hart SOB 202-224-2934
4:00pm	Rep. Erik Paulsen, R-MN Meeting with - Ryan Huff	127 Cannon HOB 202-225-2871

## Participants

Mr.	Robert	Crawford, Jr.	IL
Mr.	Laura	Czekala	MN
Ms.	Lynn	Krapf	MN
Ms.	Monica	Morrison	TX

\*Tentative Scheduling

# Group 5

Group Leader: Todd Shelton

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States: Maryland, New York

## Schedule\*

1:30pm	Sen. Ben Cardin, D-MD Meeting with - Mike Wolfe	509 Hart SOB 202-224-4524
1:45pm	Sen. Chuck Schumer, D-NY Meeting with - Sean	322 Hart SOB 202-224-6542
2:30pm	Rep. Chris Van Hollen, D-MD Meeting with - Frederico Rodriguez	1707 Longworth HOB 202-225-5341
3:30pm	Sen. Kirsten Gillibrand, D-NY Meeting with - Andrew Hoyos	478 Russell SOB 202-224-4451

## Participants

Dr.	Jennifer	Preece	MD
Mr.	Jonathan	Chapman	MD
Mrs.	Kirsten	Chapman	MD
Mrs.	Carol	Schleicher	MD
Dr.	George	Mallis	NY
Ms.	Audrey	Huzenis	NY

\*Tentative Scheduling