MAAP #123: Detecting Illegal Logging in the Peruvian Amazon

August 17, 2020

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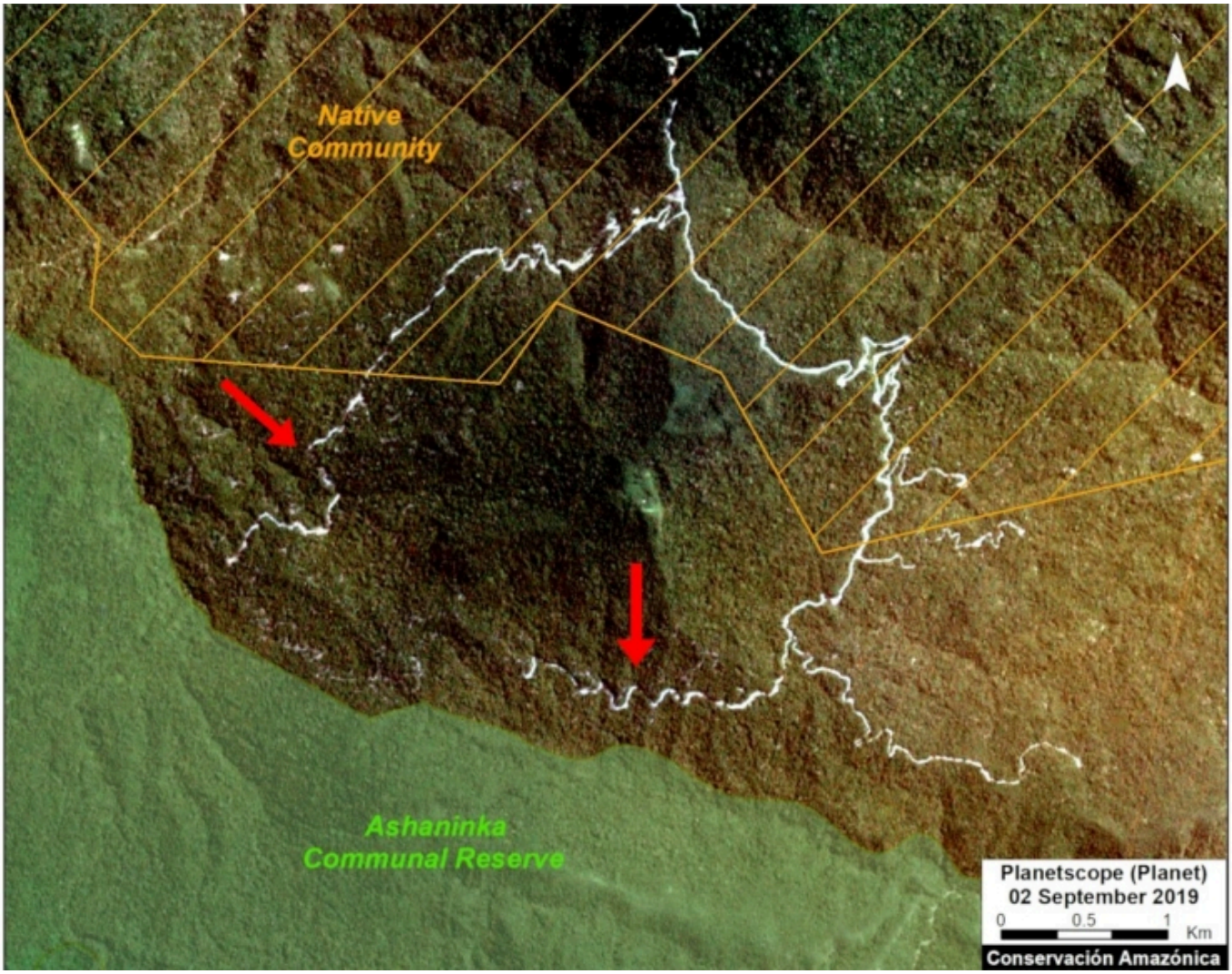

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Image 1. Example of a 2019 logging road with signs of illegality. Data: Planet.

In the **Peruvian Amazon**, the widespread illegal logging is difficult to detect with satellites because it is selective for high-value species (not clearcutting).

It is possible, however, to detect the associated **logging roads**.

In this report, we present a **novel technique** to identify illegal logging: analyze new logging roads in relation to detailed land use data available from government agencies.

Thus, our new method detects the crime in **real-time** and preventive action is still possible. This is important because when an intervention against illegal logging normally occurs, stopping a boat or truck with illegal timber, the damage is done.

This analysis has two parts. **First**, we identified the new logging roads built in the Peruvian Amazon during **2019**, updating our previous work for 2015-18 (see **Base Map**).

Second, we analyzed the new logging road data in relation to governmental land use information in order to identify possible illegality.

This data is from 2019, but we are now applying this technique in real time during **2020**.

Logging Roads 2019

The **Base Map** illustrates the location of logging roads built in the Peruvian Amazon during the last 5 years.

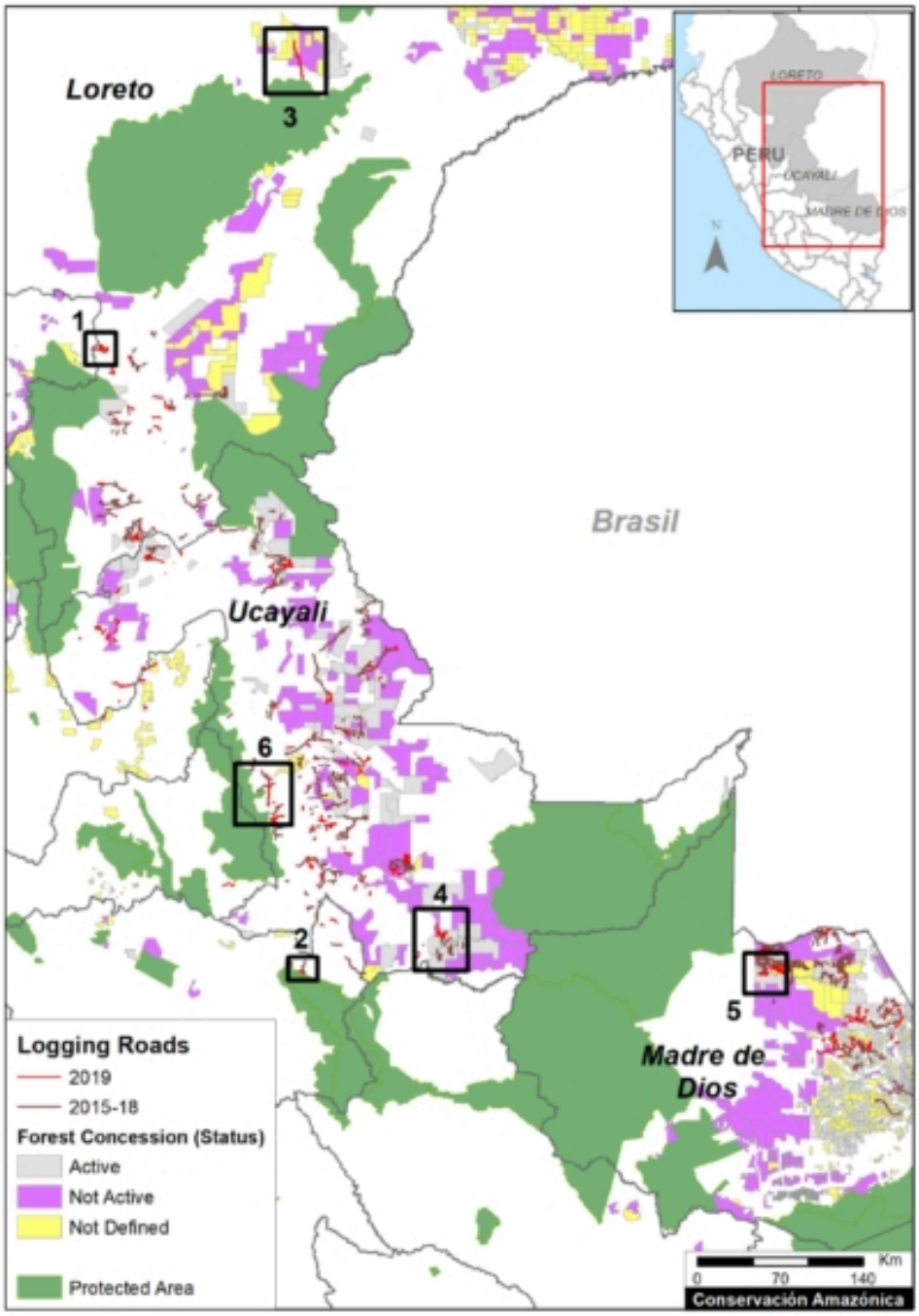
Previously (MAAP #99 (https://www.maapprogram.org/2019/detect_illegal_logging/)), we documented the construction of **3,300 kilometers** of logging roads between 2015 and 2018.

Here, we estimate the construction of an additional **1,500 kilometers** in 2019 (see **red**).

Note that forest roads are mainly concentrated in the Ucayali, Madre de Dios and Loreto regions.

Below, we show <u>three types of possible illegality</u> that detected in 2019:

- Logging roads in areas without forestry concessions or permits (Cases 1-2).
  .
- Logging roads in existing forest concessions, but whose current status is defined as “Non-Active or Undefined” (Cases 3-5).
  .
- Logging roads in Native Communities (Case 6).



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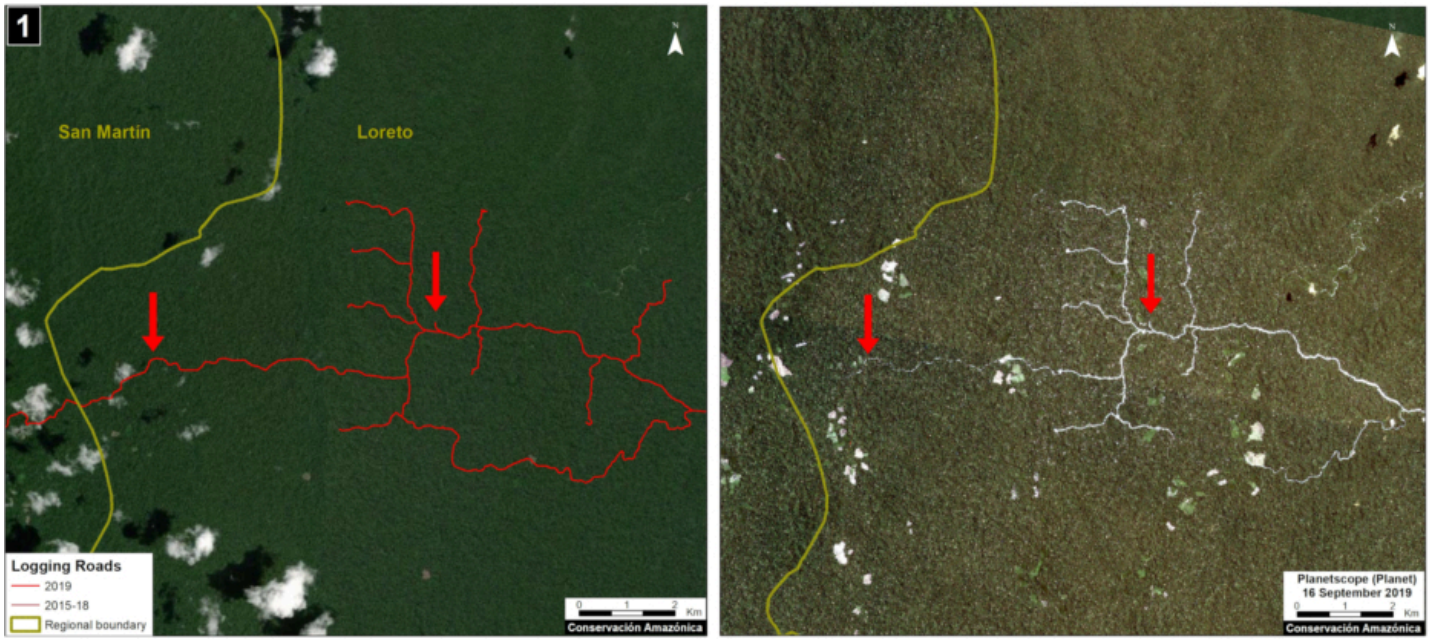
Base Map. 2019 Logging roads, in relation to 2015-18 logging roads. Data: MAAP.

Cases of Possible Illegality

Logging roads in areas without forestry concessions or permits

Case 1. We detected the opening of a new logging road network (55 km) in an area without forestry concessions or permits, between the limits of the Loreto and San Martín regions. The image shows the digitized logging roads (red, left panel), and non-digitized satellite image (right panel). The arrows provide reference points between panels.



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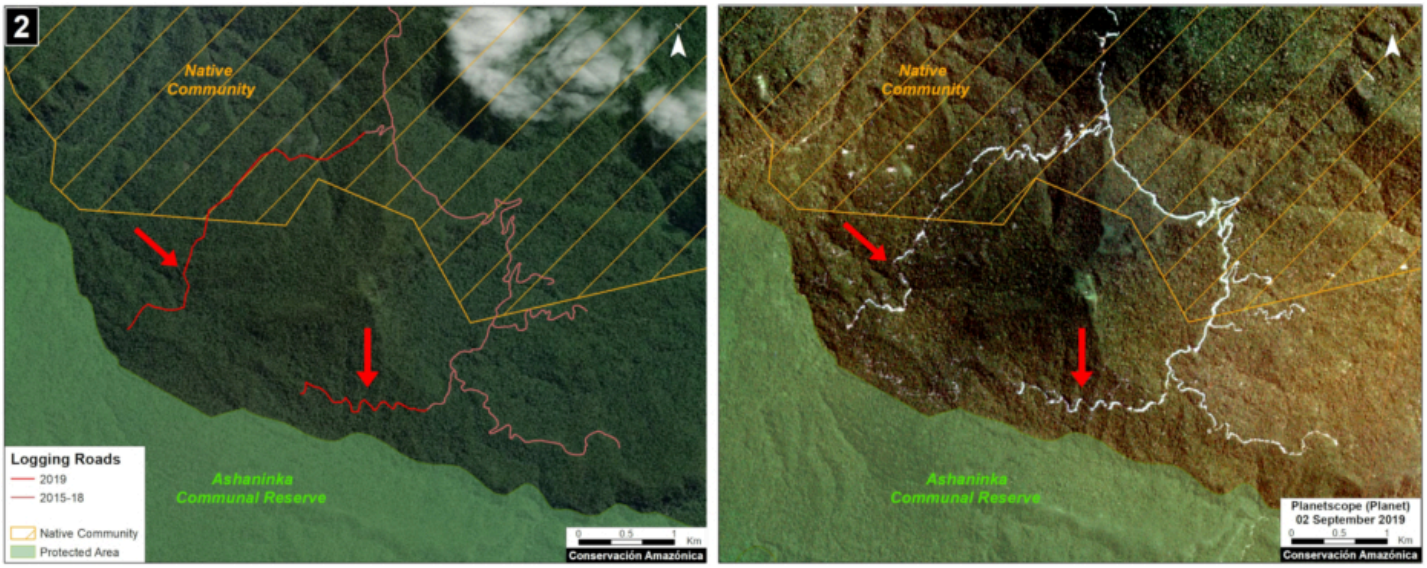
Case 1. Data: MAAP, Planet. Click to enlarge.

Case 2. We detected the construction of a new logging road network (5.8 km) in the buffer zone of Asháninka Communal Reserve, reaching only 300 meters from the protected area. The image shows the digitized logging roads (red, left panel), and non-digitized satellite image (right panel). The arrows provide reference points between panels.

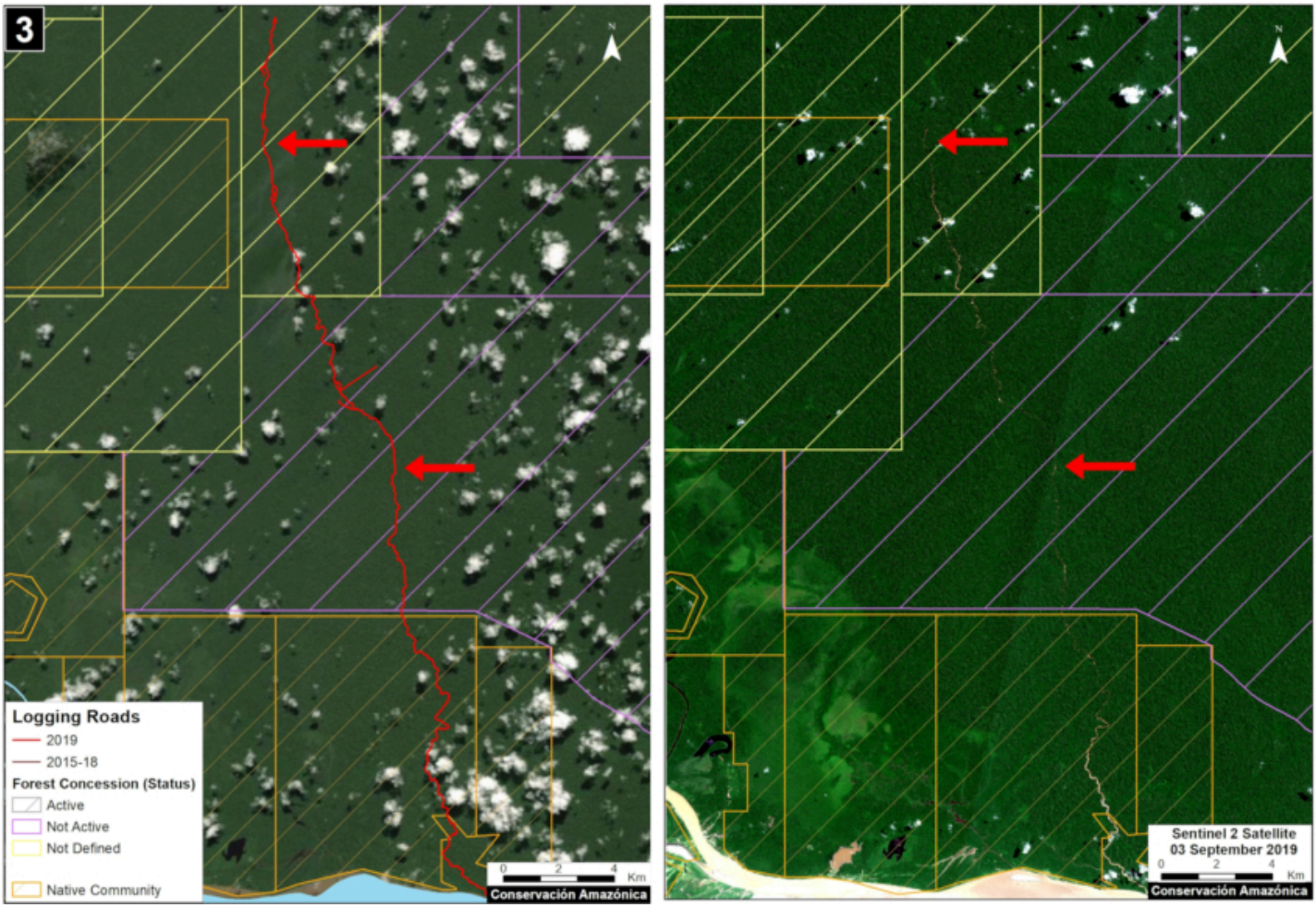


(https://www.maapprogram.org/wp-content/uploads/2020/08/maaproject.org-maap-123-detecting-illegal-logging-in-the-peruvian-amazon-zona2.jpg)

Case 2. Data: MAAP, Planet, IBC, SERNANP. Click to enlarge.

Logging roads in existing forest concessions, but whose current state is labelled as "Non-Active or Undefined"

Case 3. We detected the construction of a new logging road (45.3 km) that crosses a native community and reaches a forest concession whose status is defined as "Undefined," in the Loreto region just north of Pacaya Samiria National Reserve. The image shows the digitized logging roads (red, left panel), and non-digitized satellite image (right panel). The arrows provide reference points between panels.



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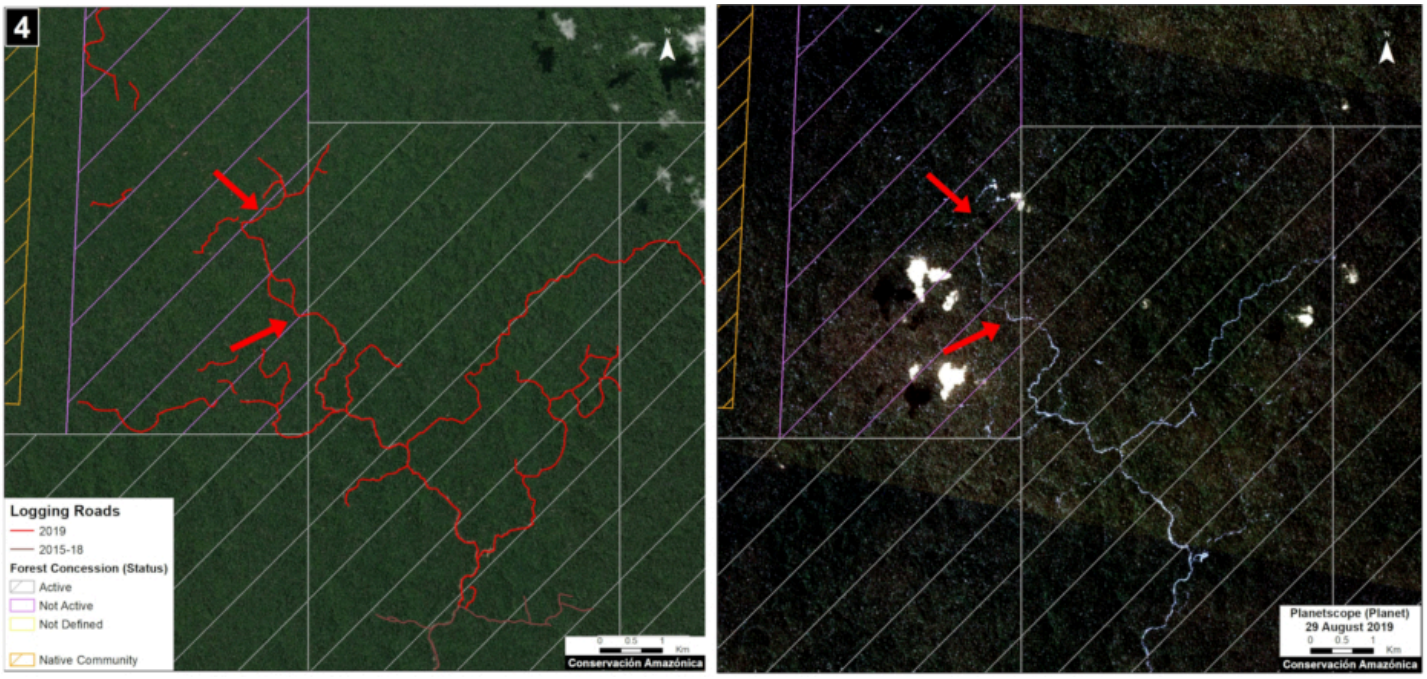
Case 3. Data: MAAP, ESA, IBC, SERFOR. Click to enlarge.

Case 4. We detected the construction of a new logging road network (53.2 km), of which nearly half (21.4 km) crosses a forest concession whose status is defined is "Non Active", near the town of Sepahua in the Ucayali region. The image shows the digitized logging roads (red, left panel), and non-digitized satellite image (right panel). The arrows provide reference points between panels.



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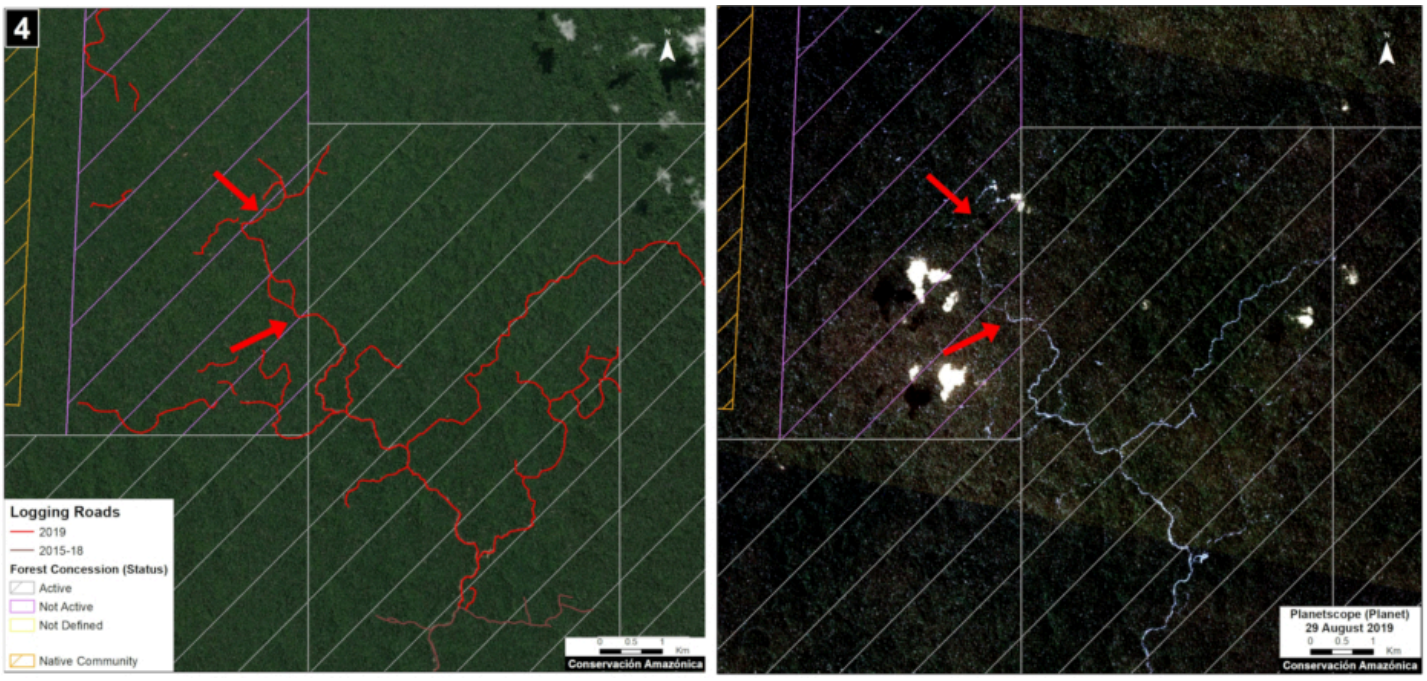
Case 4. Data: MAAP, Planet, IBC, SERFOR. Click to enlarge.

Case 5. We detected the construction of a new logging road (17.7 km) in a forestry concession whose current status is defined as “Non Active,” in the Madre de Dios region. The image shows the digitized logging roads (red, left panel), and non-digitized satellite image (right panel). The arrows provide reference points between panels.

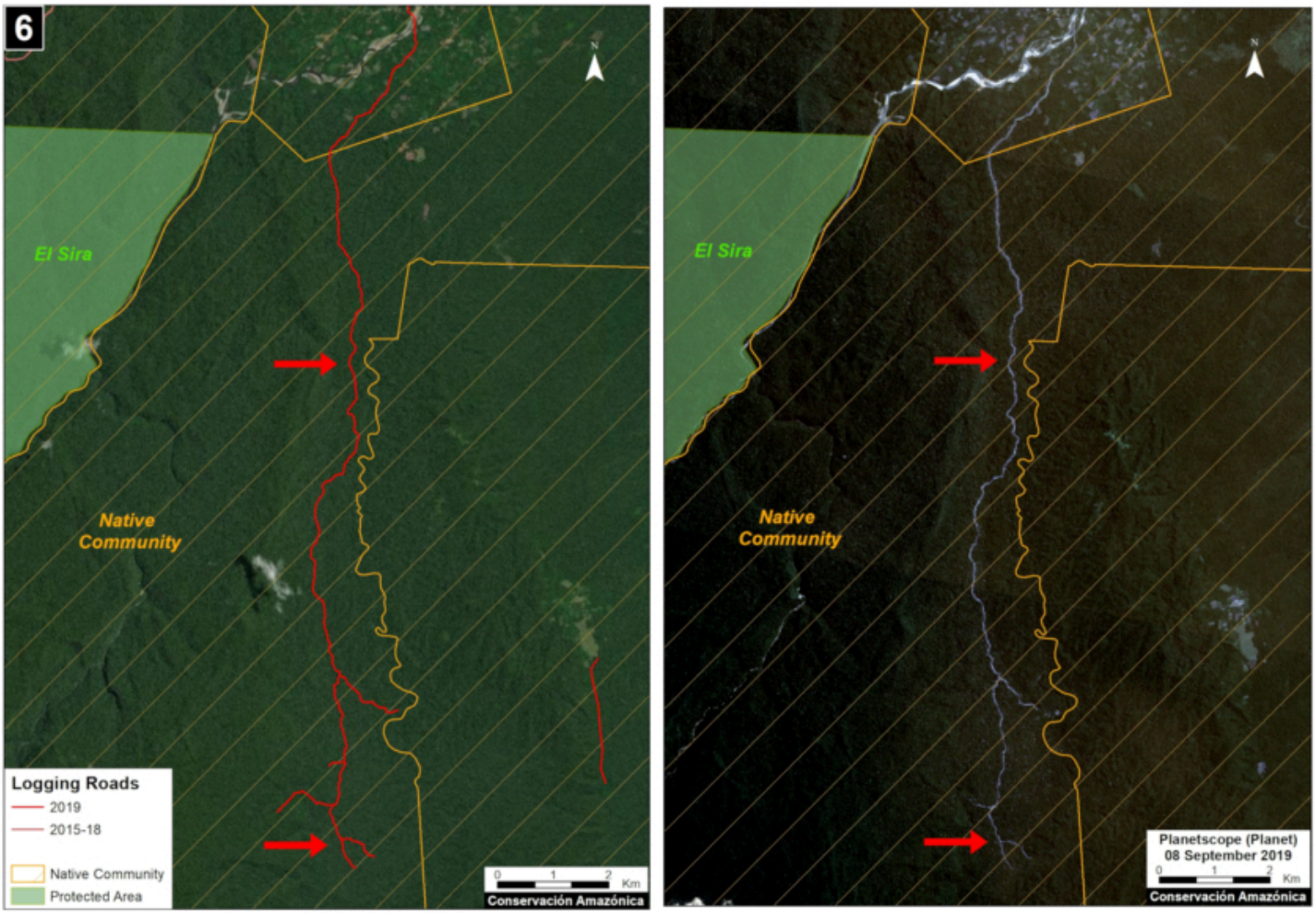


(https://www.maapprogram.org/wp-content/uploads/2020/08/maaproject.org-maap-123-detecting-illegal-logging-in-the-peruvian-amazon-zona4.jpg)

Case 5. Data: MAAP, ESA, IBC, SERFOR. Click to enlarge.

Logging roads in Native Communities

Case 6. We detected the construction of a logging road (23.4 km) within an indigenous community in the Ucayali region. We did not find evidence of a permit for this activity. The image shows the digitized logging roads (red, left panel), and non-digitized satellite image (right panel). The arrows provide reference points between panels.



(https://www.maapprogram.org/wp-content/uploads/2020/08/maaproject.org-maap-123-detecting-illegal-logging-in-the-peruvian-amazon-zona6.jpg)

Case 6. Data: MAAP, Planet, SERNANP, IBC, SERFOR. Click to enlarge.

Methodology

Our analysis included two main steps:

The first step consisted of evaluating linear patterns in the 2019 early warning and final forest loss data, available from Global Forest Watch (data from the University of Maryland) and Geobosques (data from the Peruvian Ministry of the Environment). From the linear patterns, we distinguished between logging access roads and other types of roads and highways. Logging roads tend to have linear patterns that branch into the interior of the forest where the commercial timber is found. Other types of roads have a more defined destination, such as towns or farms. Once logging roads were identified, we downloaded the associated high-resolution imagery (3 meters) from Planet Explorer and digitized the roads in ArcGIS. During this process, additional logging roads detected in the high resolution images were also digitized.

The second step focused on the legality analysis. The new logging road data were overlaid with other types of land use information, such as forestry concessions on the GeoSERFOR portal (SERFOR), permits and concessions on the SISFOR portal (OSINFOR), indigenous communities (IBC 2019), protected areas (SERNANP), population centers (INEI 2019), and official road networks (MTC 2018). For example, as shown above, this process identified logging roads near protected areas, within indigenous communities, and within non-active forest concessions.

We analyzed information on several websites now available from national and regional authorities, such as SISFOR (https://sisfor.osinfor.gob.pe/visor/) (OSINFOR), GEOSERFOR (http://geo.serfor.gob.pe/geoserfor/) (SERFOR), and IDERs (http://ider.regionucayali.gob.pe/) (Spatial Data Infrastructure of Regional governments). These new resources provide valuable information, however may have limitations in ability to constantly update information on the status of concessions and forest permits, especially from regional governments.

Annex – Logging road data per region

REGION, Logging Roads (Km)

LORETO, 231.2
MADRE DE DIOS, 477.8
UCAYALI, 720.0
HUANUCO, 45.5
JUNÍN, 19.8
PASCO, 15.1
SAN MARTIN, 2.4

TOTAL, 1511.7

References

Planet Team (2017). Planet Application Program Interface: In Space for Life on Earth. San Francisco, CA. https://api.planet.com (https://api.planet.com/)

Acknowledgments

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This report was conducted with technical assistance from USAID, via the Prevent project. Prevent is an initiative that, over the next 5 years, will work with the Government of Peru, civil society, and the private sector to prevent and combat environmental crimes in Loreto, Ucayali and Madre de Dios, in order to conserve the Peruvian Amazon.

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(https://www.maapprogram.org/wp-content/uploads/2020/06/maaproject.org-maap-reduccion-de-mineria-ilegal-en-la-amazonia-peruana-sur-maaproject.org-maap-reduccion-de-mineria-ilegal-en-la-amazonia-peruana-sur-USAIDLogo-2ColorRGB-Horizontal-RGB-294.png)

Citation

Finer M, Paz L, Novoa S, Villa L (2020) Detecting Illegal Logging in the Peruvian Amazon. MAAP: 123.