# Impacts on biodiversity and expected inputs to management from monitoring

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# Introduction

Monitoring on EIA follow-up meant to produce data, information and knowledge to promote effective impacts management

Biodiversity targets such as NNL and NG at project level adopted by sectorial groups, certifications and as condition to finance projects

Monitoring demonstrating compliance with regulatory requirements AND providing strategies to achieve targets and show their accomplishment

Ideal, but may not always contain the necessary information

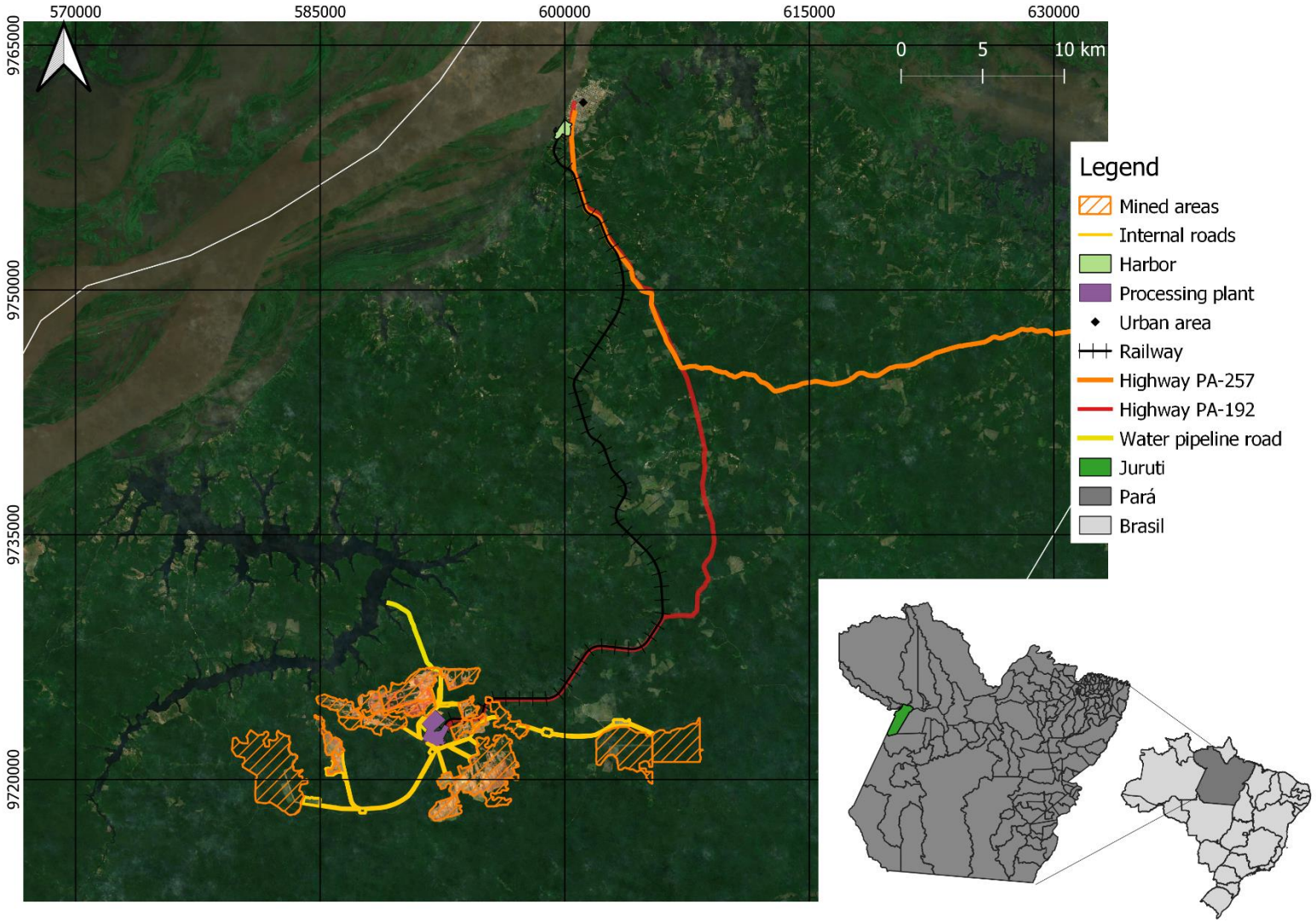
Opportunity to improve data collection, storage and analysis

***Research objective**: understand if monitoring is properly demonstrating the actual impacts of a mining operation, necessary to promote effective management of impacts on biodiversity and to demonstrate results of biodiversity targets*

# Materials and Methods

Juruti bauxite mine as study object:

- Situated in Brazilian Amazon, north state of Pará
- Alcoa started operation in 2009




Elaborated by Larissa Souza (2024)

# Materials and Methods

Juruti bauxite mine as study object:

- Situated in Brazilian Amazon, north state of Pará
- Alcoa started operation in 2009

Documents reviewed:

- EIS presented in 2004
- Operation's environmental management plan
- Operation's annual compliance reports from 2016-23

Proceedings:

- Revised list of impacts on biodiversity
- Built causal chains 'activities–aspects–impacts'
- Adjusted description of impacts when imprecise
- Associated mitigation measures to the impacts
- Analysis on adequacy by monitoring indicators
- Monitoring plans reviewed for frequency, grid, parameters and indicators
- Interpretation about the impact reviewed on the annual reports

# Results and Discussion

- 21 impacts on biodiversity
- 11 plans → fully or partially monitoring 19 impacts (indicators analysis)
- Review of monitoring plans' characteristics → timeline stablished (partial result)

- Compliance reports present poor evidence of impacts:
  - Results of monitoring campaigns of the year
  - Related impacts not explicitly stated on reports
  - Monitoring results compared with recent years, not with the baseline
  - Comparison pointing trends, not impact magnitude

**- fauna monitoring**: changes on monitoring grid or sampling effort
**- flora monitoring**: impossibility of accessing monitoring areas due to extreme events
**- extinction risk flora monitoring in the railway**: changes in indicators

# Results and Discussion

**Detailing an example:**

**Impacts**:

- fauna individuals' loss
- fauna injury
- population decline
- diversity decrease
- disturbance of terrestrial ecosystem stability

**Monitoring plan:**

Terrestrial fauna monitoring:

- general monitoring for different groups
- fauna run-over monitoring

# Results and Discussion

**Monitoring plan:**

Terrestrial fauna monitoring:

- **general monitoring for different groups**
- fauna run-over monitoring

- Selected indicators: abundance, species richness, diversity and equitability
- Comparison of indicators for the same year grouping monitoring grid by area of influence – bias on grouping
- Interannual comparison – no further consideration on monitoring grid or effort

Does not state that the different results imply on the impact's magnitude, but does not either explicit the comparisons' limitations → There are more accurate analysis that can be done

# Results and Discussion

**Monitoring plan:**

Terrestrial fauna monitoring:

- general monitoring for different groups
- **fauna run-over monitoring**

- Started in 2019 by observed incidents reported to regulating part (different from general monitoring, stemmed from EIS)
- Selected indicators: taxonomic identification, abundance, richness, number of run-over individuals, animal condition (dead or alive) and run-over rate
- Monitoring areas: the internal mine roads, the dedicated railway, and the public highway
- Mitigation: Conducted on a daily basis, rescue of injured fauna taken to wildlife rehabilitation facility and wildlife passages installed on the railway surroundings

Since its inception, fauna run-over monitoring informed the proposition of mitigating measures, to be refined with monitoring knowledge

# Conclusion

- Accurate description of impacts is essential
- Compliance reports do not necessarily seek to determine the magnitude of impacts or evaluate mitigation effectiveness
- BUT when monitoring was targeted at supporting impact mitigation, an **integrated approach** has proved to be capable of promoting an **effective** and **adaptive management** of biodiversity impacts
- Adoption of biodiversity targets as an opportunity to **deepen the analysis of already available data** and transform them in **information of interest to a range of stakeholders**

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