



23

ETY COUNCIL

strial World

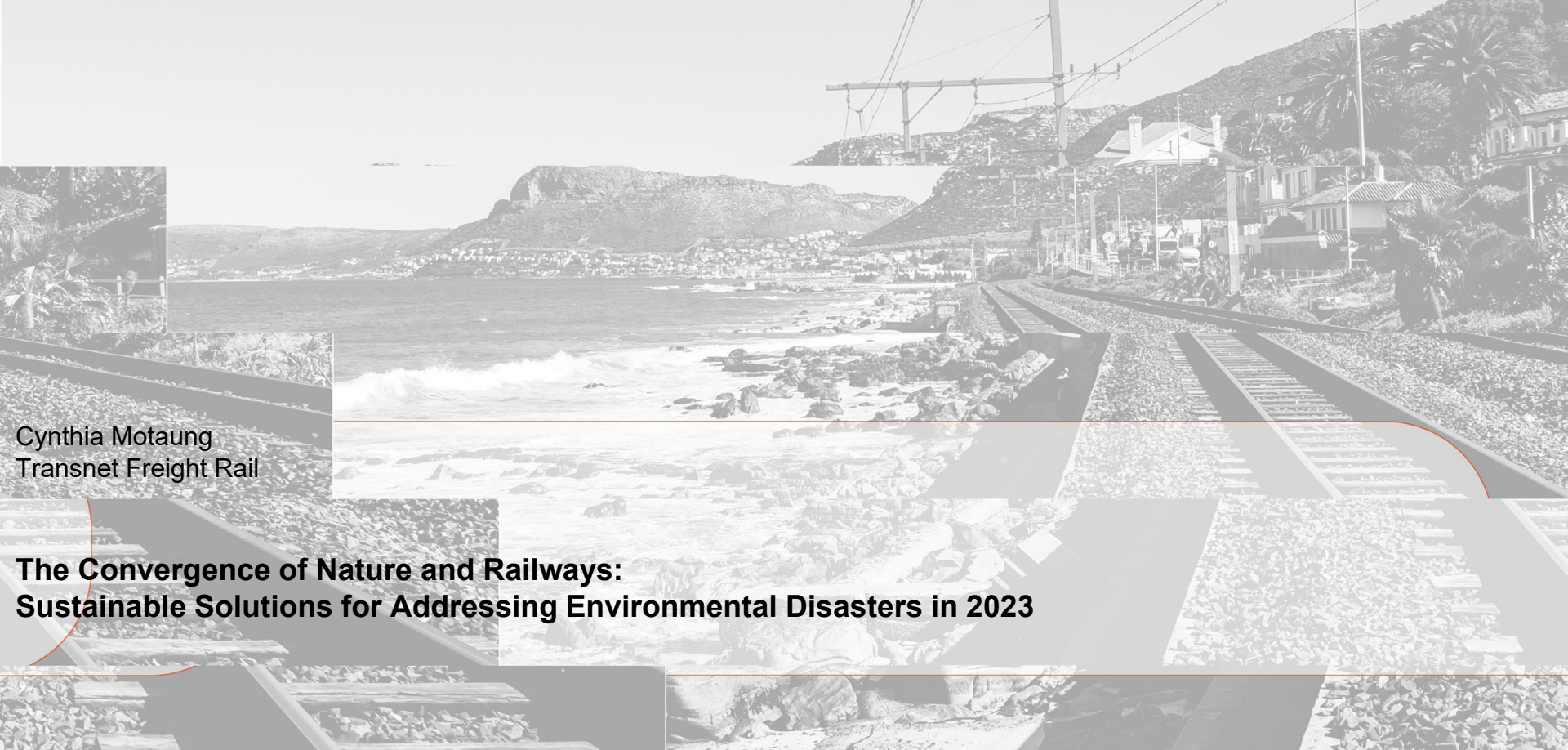
OCTOBER 1 - 6, 2023

IRSC 20

INTERNATIONAL RAILWAY SAF

"Recharging Reimagining railway

CAPE TOWN, O



Cynthia Motaung
Transnet Freight Rail

The Convergence of Nature and Railways: Sustainable Solutions for Addressing Environmental Disasters in 2023

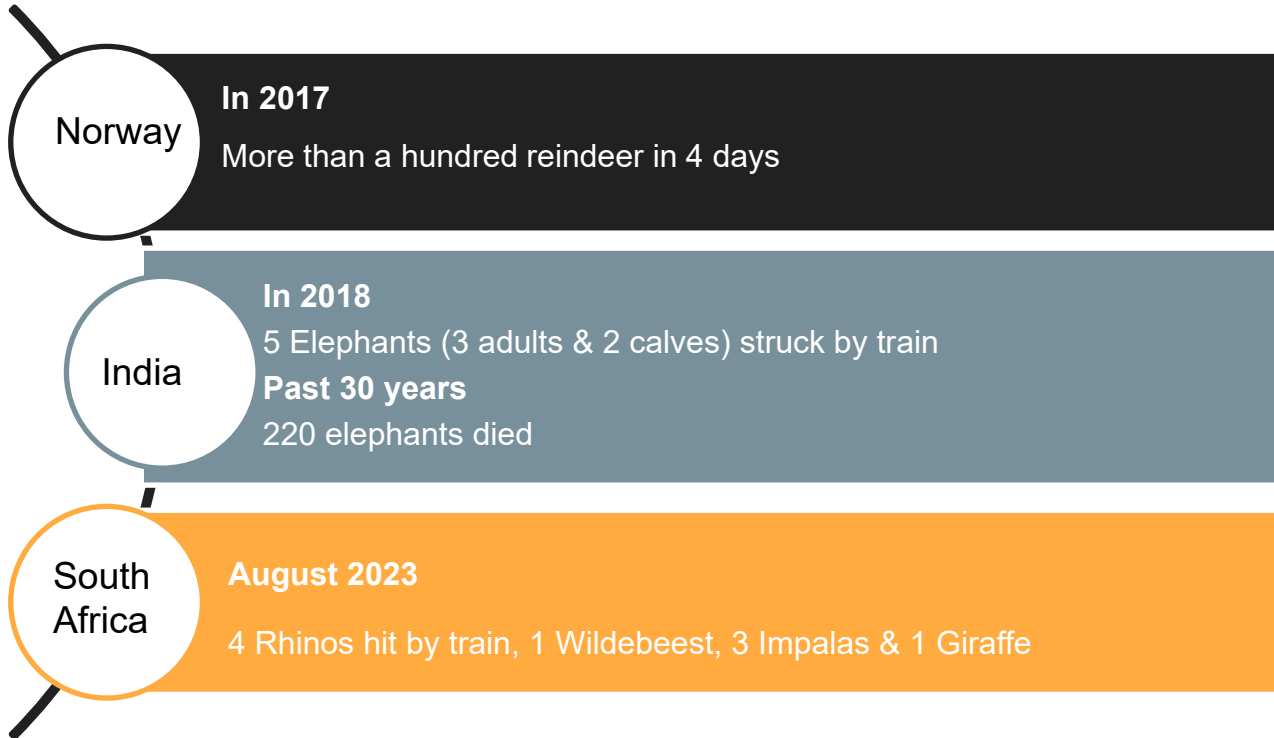
1. Introduction

- Railway mortalities not as visible to the public as road accidents.
- Not extensively studied compared road accidents.
- Railway lines harder to access for research and data collection.
- Rail infrastructure causes habitat fragmentation that affects the daily movement of wildlife.
- Need for versatile solutions to address environmental disasters.
- Focus on innovative approaches.

2. Railway mortality causes and impact

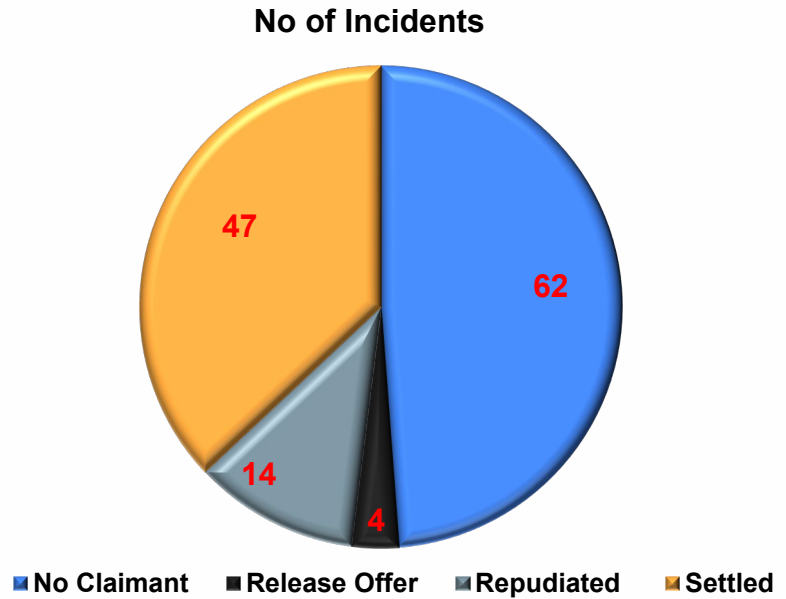
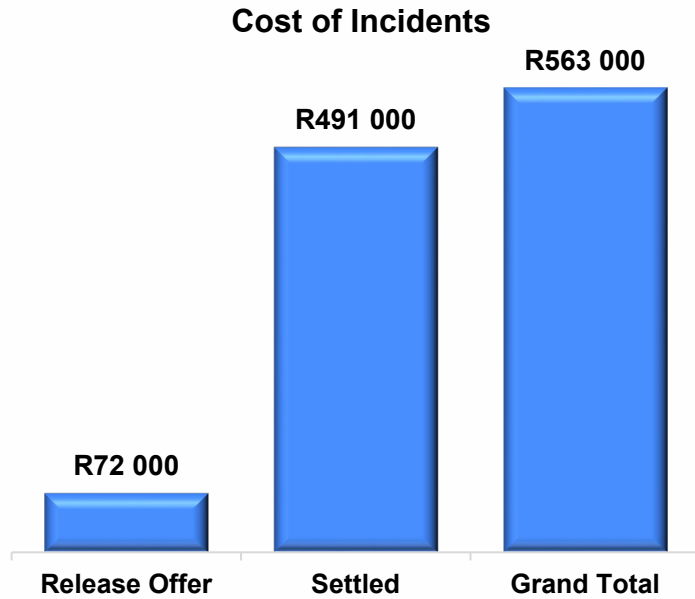
Causes	Impact	Types of animals
1. Collision	1. Ethical (animal suffering)	Trains collide with both wild and domestic animals
2. Electrocution	2. Social (working environment of train drivers)	
3. Being stuck between the rails (predation, starvation, or dehydration)	3. Economic (incurring economic costs for railway operators)	
	4. Ecological (mortality) losses.	

3. Wildlife-train collisions (WTCs) Statistics



Sources: <https://www.theguardian.com/world/2017/nov/27/reindeer-killed-by-freight-trains-norway>
<https://therevelator.org/wildlife-trains/>
<https://www.dailymaverick.co.za/article/2023-08-20-plea-for-transnet-to-slow-down-after-train-ploughs-into-four-rhinos-at-phongolo/>

4. Example of domestic animal collision claims - cattle



5. Examples of wildlife on railway lines



Photo courtesy: Biplab Hazra



Black Bear family in Oil Creek State Park,
Venango County, PA.

[Wildlife Journey Photography - Dave Bowser](#)



Deer on the railway tracks in New York. (Photo
by Timothy Vogel, CC BY-NC 2.0)



Busch Garden Rhinos
By boilerwash, posted 5 years ago

Where Nature meets Rail

6.1. Advanced Monitoring and Early Warning Systems

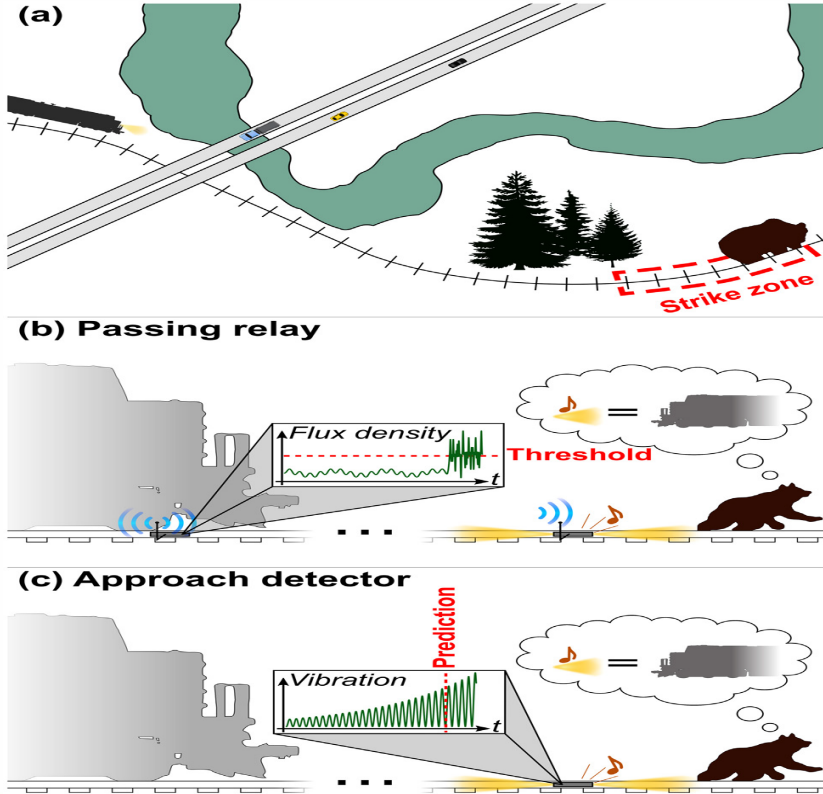


Fig. 1. Concept for a train-triggered wildlife warning system.

- (a) Warning signals produced by trains are inconsistently available at some locations: light and sound from the train can be obscured, distorted, masked, or imitated by the surroundings. As a result, wildlife may be unaware of approaching.
- (b) The passing relay uses a sensing device to detect trains and relay triggers to a remote warning device.
- (c) The approach detector uses in-rail vibrations to detect trains at a distance and trigger integrated warning signals.

Animals that have learned this association leave the track when the warning activates.

**Source: Backs, Nychka & St. Clair (2017).
Ecological Engineering Journal**

6.2. Advanced Monitoring and Early Warning Systems continued

- Warning systems triggered by trains could reduce collisions with wildlife.
- Precisely timed warning signals might help wildlife to avoid approaching trains.
- Animal flight initiation in response to trains was measured with and without warnings.

Backs, Nychka & St. Clair (2020) study found;

- Large animals fled 6.5 s (62%) earlier when warned; small animals 3.3 s (29%) earlier.
- Non-aversive warning signals could reduce wildlife mortality caused by train strikes.

7. Sustainable Infrastructure Design

- Incorporation of eco-friendly materials and wildlife-friendly structures.



*Landscape bridge, in Kallhäll Stockholm (opened 2017), providing a corridor for wildlife to safely pass over the railway.
Credit: Mikael Ullén/Trafikverket*



Wildlife overpasses, British Columbia, common for roads than rails. (Photo by B.C. Ministry of Transport, CC BY-NC-ND 2.0)

8. Other mitigations

- Exclusion fencing.
- Vegetation management practices for seamless integration with natural landscapes.
- Minimising impact on biodiversity and enhancing resilience against extreme weather events.
- Speed restrictions.

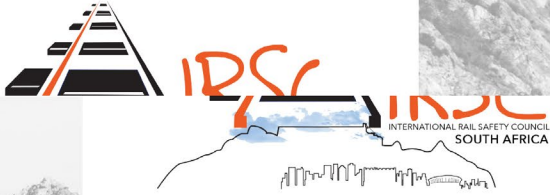
Proactive Wildlife Management;

- Understanding animal behaviour and migration patterns.
- Strategic deployment of detection and deterrent systems to reduce collisions.
- Preservation of wildlife habitats and protection of endangered species.

Stakeholder Engagement and Collaboration

- Fostering partnerships with environmental organisations, local communities, and government.
- Development of comprehensive environmental management plans.
- Inclusion of ecological restoration, pollution control, and public awareness campaigns.
- Creating a shared responsibility for sustainable coexistence of railways and nature.

NB: Additional research required



www.irsc2023.com

HOSTED BY



Insert
Speaker's
Organisation
Logo here

