



# NOSDRA



## Managing Oil Spills Using Geospatial Information Technologies for Environmental Sustainability in Nigeria

Dr. Mahmoud, I. M | NOSDRA – 5-12-2019



1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



SUSTAINABLE DEVELOPMENT GOALS

8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



16 PEACE, JUSTICE AND STRONG INSTITUTIONS

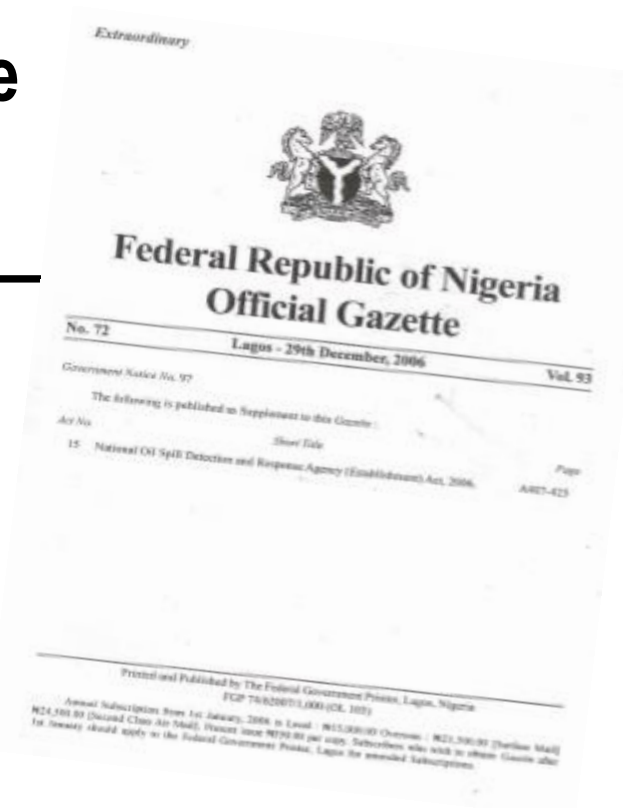


17 PARTNERSHIPS FOR THE GOALS



# National Oil Spill Detection and Response Agency (NOSDRA)

❑ The National Oil Spill Detection and Response Agency (NOSDRA) was Established by **ACT No. 15 of National Assembly, 2006** as the **lead Agency for oil spill management** in the Nigerian Oil and Gas industry.



❑ The Agency regulates the upstream, midstream and downstream activities of all operators in the oil and gas industry by ensuring that environmental compliance concerns are adhered to strictly.

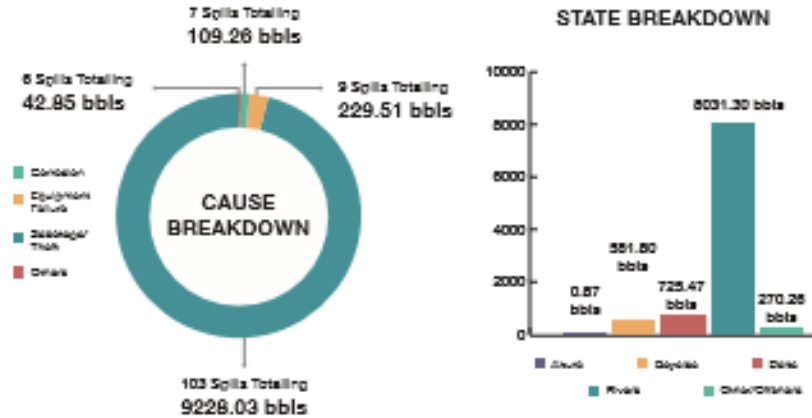
# The Oil Spill Monitor in Nigeria

Unknown amount of condensate spilled due to sabotage/theft. NPDC UTOROGU 12S CRUDE OIL FLOWLINE.

Spill ID: 118457.NPDC/HSE/OTU/2018/04/02  
 Status: **spill confirmed**  
 Zonal office: **Warri**  
 Company: **NPDC**  
 Incident number: **NPDC/HSE/OTU/2018/04/02**  
 Incident date: **4/28/2018**  
 Report date: **4/29/2018**  
 Contaminant: **condensate**  
 Type of facility: **Flow line**  
 Cause: **sabotage/theft**  
 Site location name: **NPDC UTOROGU 12S CRUDE OIL FLOWLINE.**  
 Latitude: **5° 26' 17.70"**  
 Longitude: **5° 52' 6.20"**  
 LGA: **Ughelli-North**  
 Spill area habitat: **land**  
 Description of impact: **Vegetation was impacted, the spill was within the company's right of way.**  
 States affected: **Delta**  
 Attachments:

JIV date: **4/30/2018**  
 Present at JIV: **NOSDRA, State Ministry of Environment, Company, Community**  
 Last updated by: **2018-05-08 WA003**

## TOTAL RECORDED SPILLS FOR THIS QUARTER:



Spills larger than 10bbls: **35**  
 Spilling an estimated: **9419.75 bbls**

Report a spill | News & links | About

Details Table

Status: not invalid Filter +

Located 5029 of 5362 spills

Sat Map

- Oil company
- Third party
- Not visited
- No quantity
- Cleaned up

Ecoregions

LGA 2004 OSM

NOSDRA offices

Oil blocks

Population

Soil

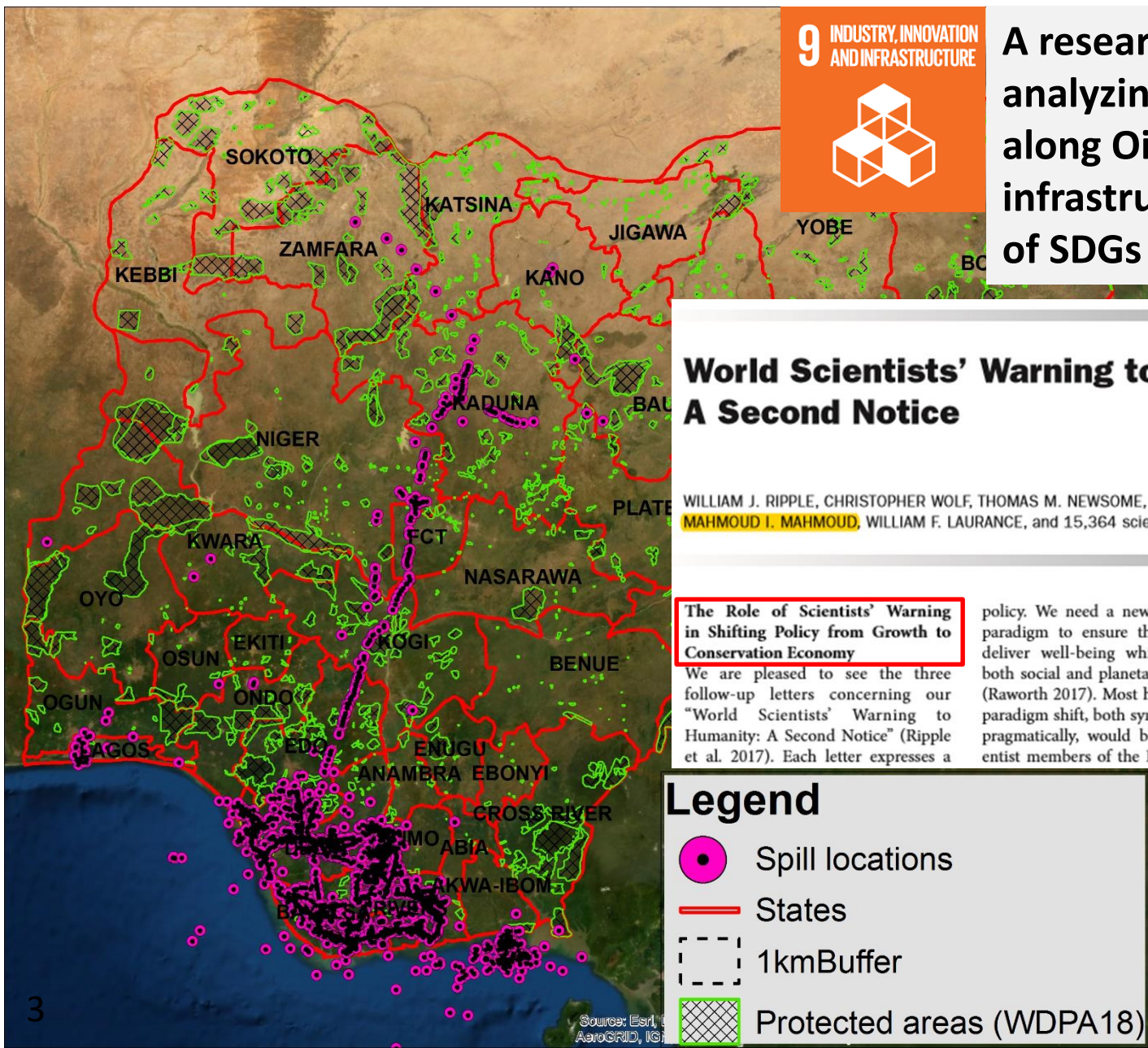
States

Waterbodies

Wetlands



# Assessing the Impacts of Oil Spills along Pipelines and the Fate of Sensitive Environments in Nigeria



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INDUSTRY, INNOVATION  
AND INFRASTRUCTURE

A research concept of analyzing pattern oil spills along Oil and Gas infrastructure in the context of SDGs (SDGs 9)

Viewpoint

## World Scientists' Warning to Humanity: A Second Notice

WILLIAM J. RIPPLE, CHRISTOPHER WOLF, THOMAS M. NEWSOME, MAURO GALETTI, MOHAMMED ALAMGIR, EILEEN CRIST, MAHMOUD I. MAHMOUD, WILLIAM F. LAURANCE, and 15,364 scientist signatories from 184 countries

Letters

### The Role of Scientists' Warning in Shifting Policy from Growth to Conservation Economy

We are pleased to see the three follow-up letters concerning our "World Scientists' Warning to Humanity: A Second Notice" (Ripple et al. 2017). Each letter expresses a

policy. We need a new development paradigm to ensure that economies deliver well-being while respecting both social and planetary boundaries (Raworth 2017). Most helpful for this paradigm shift, both symbolically and pragmatically, would be for the scientist members of the Royal Swedish

into 17 different languages: Spanish, Portuguese, French, Traditional Chinese, Simplified Chinese, Dutch, German, Telugu, Hindi, Swedish, Serbian, Italian, Hebrew, Turkish, Japanese, Catalan, and Korean versions of our original scientists' warning article can be found in the

Legend

Spill locations

States

1kmBuffer

Protected areas (WDPA18)

# Environmental Sensitivity Index(ESI) Map



- ESI mapping is the cartographic presentation of selected environmental attributes (**physical, geomorphic, biological and socio-economic features**) of a given area.
- These attributes are usually classified and ranked in terms of sensitivity to stress factors.
- In our case, the stress factor is the **Oil Spill**. It is also colour coded to distinguish environment types or classes.
- ESI maps contain features to assist spill response in deciding suitable and effective positions in placing booms, skimmers, absorbents and other clean-up materials. (*Including the six elements of spill response incident command, remote sensing, collection and containment, mechanical recovery and in-situ burn*)



# Why ESI Map?

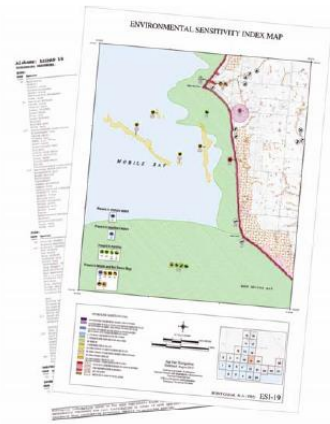
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In the event of an oil spill,

- Responders must quickly decide which locations along the shoreline to protect.

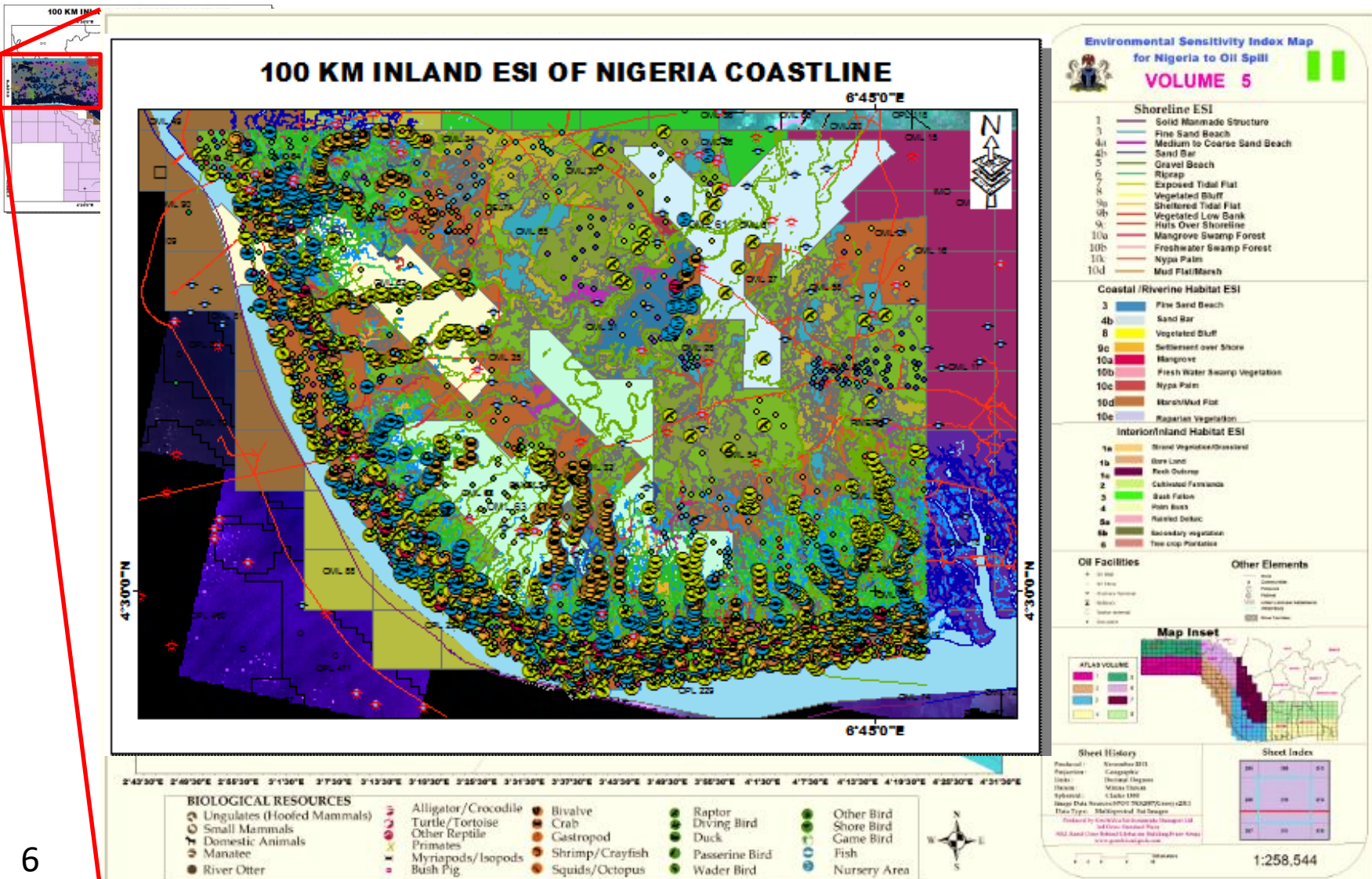
To do this effectively, they first need to assess which areas would suffer the greatest consequence if impacted by the spill. Since there will be limited response equipment available, they will want to focus their efforts on the more sensitive shoreline areas and the areas where sensitive physical, biological and human resources are found.

- ESI maps can be a valuable tool in Oil Spill response process.





# ESI Map of Nigeria Coastline in 400 Grid Line Sheets Stretching Badagry,Lagos to Calabar



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# Linking Earth Observation to SD



ESI maps **reduce the environmental consequences** of an oil spill by:

- identifying sensitive and vulnerable locations
- establishing protection priorities
- identifying cleanup strategies
- **Tool for policy making and decision taking**

**Pre-planning is essential**

# Role of Earth Observation to SD

## Space Solutions for Sustainable Development



Space-applications are increasingly **relevant to developing world challenges**

=



Space systems, including communications, earth observation and navigation satellites, can **deliver on-the-ground development impact**

+



Space and sustainable development sectors are **collaborating and partnering** now more than ever before

+



International organizations and developing country governments are **building capacity to leverage space applications**

# Obrigado

# Thank you for your attention

Integrating Geoinformation and Socioeconomic Data  
for Assessing Urban Land-use Vulnerability to Potential  
Climate-change Impacts of Abuja

## Economic, Socio-Political and Environmental Risks of Road Development in the Tropics

Spatiotemporal Analysis and Simulation of  
Landscape dynamics in Two Petroleum-Oriented  
Cities in Niger Delta, Nigeria



Mohammed Alamgir, Mason J. Campbell, Sean I. Mahmoud I. Mahmoud, and William F. Laurance  
Centre for Tropical Environmental and Sustainability Sci  
Queensland, 4878, Australia  
\*Correspondence: [bill.laurance@jcu.edu.au](mailto:bill.laurance@jcu.edu.au)  
<https://doi.org/10.1016/j.cub.2017.08.067>

frontiers  
in Ecology and Evolution

PERSPECTIVE  
published: 11 July 2017  
doi: 10.3389/feco.2017.00075



## Infrastructure expansion and the fate of Central African forests

by William F. Laurance<sup>1</sup>, Mahmoud I. Mahmoud<sup>2</sup>, Fritz Kleinschroth<sup>3</sup>

The tropical forests of Central Africa  
sustain exceptionally high biodiversity  
and environmental services such as forest  
hydrology and carbon storage. These forests

Across Africa, infrastructure projects are expanding at an  
unprecedented pace. These projects include a large number  
of industrial mining projects; over 50,000 km of proposed  
'development corridors' that would crisscross much of the  
continent; the world's largest hydropower dam complex,  
at Inga Falls on the Congo River; ambitious plans to

## Land-cover change threatens tropical forests and biodiversity in the Littoral Region, Cameroon

MAHMOUD I. MAHMOUD, MASON J. CAMPBELL, SEAN SLOAN  
MOHAMMED ALAMGIR and WILLIAM F. LAURANCE

**Abstract** Tropical forest regions in equatorial Africa are  
threatened with degradation, deforestation and biodiversity  
loss as a result of land-cover change. We investigated his-  
torical land-cover dynamics in unprotected forested areas  
of the Littoral Region in south-western Cameroon during  
1975–2017, to detect changes that may influence this impor-  
tant biodiversity and wildlife area. Processed Landsat im-  
agery was used to map and monitor changes in land use

et al., 2005; WWF, 2017). They also provide numerous and  
valuable environmental services, including carbon storage,  
protection of threatened ecosystems, hydrological func-  
tioning (Abernethy et al., 2016), and medicinal products  
(Colfer, 2012). African forests also provide significant socio-  
economic resources, including plant and animal products,  
food, medicine, products of cultural value, and building  
and construction materials.

remote sensing



Article

## Analysis of Settlement Expansion and Urban Growth Modelling Using Geoinformation for Assessing Potential Impacts of Urbanization on Climate in Abuja City, Nigeria

Mahmoud Ibrahim Mahmoud<sup>1,2,\*</sup>, Alfred Duker<sup>3</sup>, Christopher Conrad<sup>2</sup>, Michael Thiel<sup>2,\*</sup>  
and Halilu Shaba Ahmad<sup>4</sup>

Research Article

## Alternative Routes for a Proposed Nigerian Superhighway to Limit Damage to Rare Ecosystems and Wildlife

Tropical Conservation Science  
Volume 10: 1–10  
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[sagepub.com/journalsPermissions.nav](http://sagepub.com/journalsPermissions.nav)  
DOI: 10.1177/1940082917709274  
[journals.sagepub.com/home/tcs](http://journals.sagepub.com/home/tcs)  
SAGE

Mahmoud I. Mahmoud<sup>1</sup>, Sean Sloan<sup>1</sup>, Mason J. Campbell<sup>1</sup>,  
Mohammed Alamgir<sup>1</sup>, Inaoyom Imong<sup>2</sup>, Odigha Odigha<sup>3</sup>,  
Hazel M. Chapman<sup>4</sup>, Andrew Dunn<sup>2</sup>, and William F. Laurance<sup>1</sup>