

**Mapping Loita Maasai Land Use and Occupancy
Enguserosambu, Tanzania**

Mapping Maasai Life, for Maasai, by Maasai

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Mapping Loita Maasai Land Use and Occupancy Enguserosambu, Tanzania

Mapping Maasai Life, for Maasai, by Maasai



Prepared for the Enguserosambu Forest Trust (EFT)

Prepared by:

the Kesho Trust

the Geography Department, University of Victoria, Canada

2021

The Kesho Trust - www.thekeshotrust.org

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Cover photo: *Maasai researchers Julius Daniel, Koisikir Nangiria, Terere Tutayo and Nanjalai Moina on route from Almatasia Camp to conduct mapping interviews at a homestead in the Ng'arwa area, November, 2019. (E. Val)*

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Dedication (Endamunoto Enkipirta)

This report is dedicated to the memory of our parents, grandparents and other ancestors of the Loita Maasai whose footsteps are everywhere throughout our territory in Kenya and Tanzania. They live on in our memory through our oral traditions, culture and the many struggles to protect our lands and way of life. They also live on in the practices, minds and hearts of our Elders who were interviewed for this pioneering traditional land use and occupancy mapping project. Their never-ending commitment to future generations, experience, skills and knowledge are the foundation upon which this report is built.

Meeyu Ole Pumbun, Chair
Enguserosambu Forest Trust
September, 2020



Members of the Enguserosambu Forest Trust: (LtoR) Lekoyo Medukenya; Lawrence Tutayo; Sunde Tutayo; James Meeyu Pumbun; Mark Talash; Samwel Nangiria; Yohana Turuni; Noolaimutia Meipuki; Nasha Nkomom. Nov. 2019

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Foreword (Orkilikwai le Dukuyia)



Samwel Nangiria, Oct. 2018.

(B. Downie)

The Maasai are recognized as nomadic pastoralists committed to their culture and traditions. The most powerful legal rights held by the Maasai in Tanzania are related to their customary land rights. These rights are central to protecting our way of life which is defined by our knowledge, ability to manage our affairs and steward our natural resources including livestock, rangelands, forests and water. We manage these resources in a manner which peacefully coexists with wildlife. In the absence of these land rights, the collective rights and the future of Loita Maasai are in jeopardy.

Historical and contemporary struggles of the Maasai relate to protecting our land rights and traditional management systems. Despite these hard-fought struggles, we have not had the opportunity, through study, to articulate the close connection we have to our pasture and forest lands, and how that relationship defines who we are – our culture. This vacuum of information has undermined the development of national legislation and policy by not recognizing the significance of our culture and way of life. Recently we have started to seek recognition of our customary land rights in the courts. The judicial system relies extensively on verifiable evidence, documents and witness statements. In the absence of such information, the Maasai have not been able to win many court cases. Both the national and local governments have and continue to violate our fundamental land rights. The recognition of these rights is central to our future cultural and economic survival.

In 2012, the Loita Maasai designed the Enguserosambu community forest initiative to address many of the historical and contemporary injustices created by outsiders who systematically dispossessed us of our traditional homeland – a legacy of colonialism. This initiative is based on traditional practices and knowledge and utilizes an effective local management structure – the Enguserosambu Forest Trust (EFT), guided by the Council of Elders (Orkiaama). This structure provides for community involvement to steward our forest resource in a holistic manner that takes into account our rich culture, sustainable development and climate change. We view this initiative as an exceptional achievement in decolonizing conservation and resource management practices, and allows us to reconnect our people to their traditional homeland.

The conservation and management of our community forest and pasture lands, an area that we have occupied and used since the time of our earliest ancestors – along with our relationship to wildlife and livestock, and the habitat that they depend on – demands that we have a comprehensive community-based

management strategy. Conserving and protecting these lands start with understanding them. This is the heart and purpose of this mapping project. The report and maps are the first comprehensive documentation of our traditional land use and occupancy, and will set the stage for further more detailed studies. The study provides important information to help us realize the promises made by the government to transfer the management, control and ownership of our traditional forest lands. This will revitalize our traditional management systems which are critical to our cultural survival, economic security and community well-being.

Broadly speaking, Maasai across Tanzania and Kenya have witnessed top down development driven by government which has disrupted our social, cultural and economic equilibrium for more than a century. Without question, our sustainable future is premised on the continued use of our pasture and forest lands. This project contributes to the future work of the EFT and helps to identify what measures are required to achieve this critical future.

Samwel Nangiria
Founding Director
Enguserosambu Forest Trust

Acknowledgements

This work could not have been done without the support of the Enguserosambu Forest Trust (EFT) and international and national donors - United Nations Development Programme (UNDP), the Kesho Trust and the University of Victoria, Canada. In particular the EFT was instrumental in coordinating the involvement of the communities in this project by identifying the Elders to be interviewed and the community researchers who conducted the interviews. Furthermore, the Loita Maasai Elders (see appendix 2) who generously participated in the community interviews were absolutely critical to the success of this project.

More specifically Samwel Nangiria (EFT Founding Director), Mark Talash (EFT Coordinator), Bruce Downie (Founding Director, Kesho Trust) and Julius Daniel (Field Coordinator, Kesho Trust) provided incredibly important direction, insights and advice throughout all stages of the research. Bruce also edited, prepared and laid out the final report. The community researchers who completed the mapping interviews were essential to the success of this project (Koisikir Nangiria, Terere Tutayo, Anna Shololoi and Stephen Sitoi). Equally important was the support provided by Nanjalai Moina and his staff at the Almatasia Camp (Kanai, Salayo, Nai Posyo, Marko Seko and John Talash) who kept us well fed, safe and secure.

Faculty and staff of the Geography Department at the University of Victoria (UVic) provided technical mapping advice and financial support for the project (Phil Dearden, Crystal Tremblay, Chris Bone, Jessica Fitter and Ken Josephson). Students from UVic, Michael Scinocca and Emily Crist, did an incredible job processing my handwritten field notes. Michael further digitized the maps. Brian Lewis, a Geographic Information Systems consultant, did excellent work in preparing the maps for this report. Also thanks go to Miche Genest and Hector Mackenzie for their support of this study while they worked on their own projects at Almatasia Camp.

Finally, I also want to thank Gillian McKee, my wife, for the time she afforded me to do this work in Tanzania while she had to stay behind to take care of the farm and face a Yukon winter on her own.

Thank you all for the time and effort you have so generously given to this important project. Any errors or omissions in this report are entirely my responsibility as the project coordinator and report author.

Erik Val
Project Coordinator
Whitehorse, Yukon, Canada
January, 2021



*Bill Kemp (1936-2020): an archaeologist and anthropologist, was a founding member of a group of northern researchers in Canada that in the early 1970's developed a community-based mapping methodology to document Inuit land use and occupancy. Bill went on to expand his work on cultural heritage, mapping, and Indigenous rights to other parts of the world. He worked with the Maya Indians in Belize. In South Africa he helped map and document San Bushmen land use to help them reconnect with their traditional lands. Other projects included rescuing historic cultural resources in war-torn Croatia, biodiversity conservation in Vietnam, water management in the Nile Basin in Africa, tsunami relief in Indonesia, and traditional fishery management in the Mekong Delta, Viet Nam.

Preface

Forty-five years ago, I was a young university student studying geography in Montreal, Canada at McGill University. There I met Professor Bill Kemp* who in 1974 sent me to Canada's North for six months as part of a team to document traditional Inuit land use and occupancy. This research was conducted to validate Inuit land claims by mapping where individual hunters had lived, hunted, fished, trapped and traveled.

The study, the Inuit Land Use and Occupancy Project report (Canada, 1976) was used during negotiations with the Government of Canada leading to the Nunavut Land Claim Agreement in 1993 (Canada, 1993). The report has also been used to support Canada's assertion of sovereignty over waterways in the Arctic (Freeman, 2011).

Over the years and since my retirement, this experience provided me opportunities to do similar mapping work with other Indigenous communities in Canada's North to support their land claim negotiations and to help them implement their land claim settlements.

My involvement in this project stems from a trip that my wife, friends and I took to Tanzania in the fall of 2018. Organized by the Kesho Trust (KT), an organization that supports Maasai community-based conservation projects, we met the Board of Directors of the Enguserosambu Forest Trust (EFT). The EFT is a Loita Maasai organization that manages the conservation of land and forest resources of the Loliondo II Forest Reserve in northeastern Tanzania (Map 1).

During our discussions I became aware of the need to conduct a comprehensive land use and occupancy study. This study would support the Board's efforts over the last decade to gain greater control over the management and conservation of its forest and pasture lands. In turn, this greater control will help reconnect the Maasai to their culture and traditional practices, and will contribute to the efforts of other Indigenous groups in fighting global climate change. A year later in October-November 2019, I returned to Tanzania to undertake this study with a team of dedicated, enthusiastic community researchers under the direction of EFT and KT.

Erik Val, Project Coordinator
Whitehorse, Yukon, Canada

1. Project Purpose, Process and Methodology

1.1 Introduction

Understanding Maasai history and the impacts of European colonialism helps to set the stage for this mapping project. As described by Julius Daniel, the Field Coordinator, the Maasai originated from the lower Nile valley and began migrating south around the 15th century, arriving in an area of land stretching from what is now northern Kenya to central Tanzania between the 17th and late 18th century. When Europeans (German and British) arrived some 100 years later the Maasai occupied most of the land between Lake Victoria and the east coast of Africa.



Looking over the history of Maasailand, it seems that the British misunderstood how the Maasai traditionally used and controlled their land.....The Maasai kept large herds of cattle not only because it was prestigious to do so, but also because they needed enough animals to be sure that part of their herd would get through a drought Traditional nomadism supported more people on the savannahs than the modern farm does today, while causing less damage. (p 56-57, Monbiot, 1994)

In his book, “*No Man's Land*”, George Monbiot described the relationship of the Maasai to the land and their livestock, and how fundamentally the Germans and British misunderstood that relationship.

In 1961, with a new constitution, Tanganyika became independent under the leadership of Julius Nyerere. Three years later Tanganyika and Zanzibar were united to become Tanzania with Nyerere serving as President to the new united country. He believed that multiple political parties, in a nation with hundreds of ethnic groups, were a threat to national unity and therefore sought ways to ensure a one party system. In a post-colonial and unstable social environment, he was aware of the divisiveness of ethnic chauvinism and moved to excise tribalism from national politics. Over the years, the effects of colonialism and the policies of post-colonial governments have undermined and continue to threaten the cultural make up of Tanzania’s ethnic minorities including the Maasai.

This project provides an overview of Loita Maasai land and water use and occupancy, which will assist future generations in understanding their history, culture and the importance of their traditional homeland.



San people mapping travel routes and hunting sites in the Kalahari Desert, Botswana, 2007 (W.B. Kemp)



Traditional Vietnamese fishers mapping fish harvest sites in the Mekong Delta, Vietnam, 2009 (W.B. Kemp)

1.2 Indigenous Land Use and Occupancy Mapping Worldwide

Over the last 45 years, Indigenous Peoples around the world have been mapping their land use and occupancy – Inuit in Nunavut, Canada, San people in Botswana, traditional fishers in the Mekong delta, Vietnam – to document the deep ties that they have with their traditional homeland.

Indigenous people draw on a life time of individual and collective experience when mapping this knowledge:

First Nations (Indigenous) peoples carry maps of their homelands in their heads. For most people, these mental images are embroidered with intricate detail and knowledge, based on the community's oral history and the individual's direct relationship to the traditional territory and its resources. Land use and occupancy mapping is about documenting those aspects of the individual's experience that can be shown on a map. (p 1, Tobias, 2000)

There are many reasons why mapping this knowledge and experience is important and often necessary to:

- document Elders' oral history before more knowledge is lost;
- provide evidence for court cases involving Indigenous rights and land title;
- negotiate management agreements with government and/or other Indigenous groups;
- determine probable impacts of and mitigative measures for resource development;
- provide baseline data for long-term community planning and resource management; and,
- develop education curricula and programs.

This project will assist the Loita Maasai when dealing with any of the topics described above.



Inuit hunters from Gjoa Haven mapping harvest sites and travel routes around King William Island, Nunavut, Canada, 2016.

1.3 Project Purpose

The Enguserosambu Forest Trust (EFT) is a Maasai organization with the mandate to manage and conserve forest resources in the Loliondo II Forest Reserve (Map 1). The purpose of this project is to assist the EFT in their responsibilities by documenting land (pasture and forest) and water use and occupancy of the Loita Maasai homeland in northeastern Tanzania, east of the Serengeti National Park. The results of this research and the maps will contribute to the conservation and protection of the forest and pasture lands which is critical to the social, cultural and economic well being of the Loita Maasai. It also will enable the Maasai to fight the impacts of climate change, and provides future generations a means to understand the cultural connection of the Maasai to their homeland.

The approach used to undertake this project was described by Samwel Nangiria, Founding Director of the EFT, during the initial planning meeting November 1, 2019. He provided these guiding words for how the project should proceed:

“Mapping Maasai Life, for Maasai, by Maasai”

Similar to the “nothing about us without us” movements of other indigenous and marginalized communities, this mantra was used while conducting the community interviews and documenting the results during the four weeks of field work completed in November 2019.

This report and the supporting maps will be a permanent record of Loita Maasai land use and occupancy in their traditional homeland. The EFT may also use the report and maps to engage the Ngorongoro District Government in land rights negotiations. This could mean securing land title for the Loliondo II Forest Reserve and gaining greater land and water management responsibilities for their traditional homeland including the Loliondo I Forest (Map 1).

1.4 Key Definitions

Use and *Occupancy* are two related but different terms. The spatial extent of *use* describes the areas of resource use and typically is larger in size and more variable than the extent of *occupancy* which documents the combined cultural, social and economic ties that Indigenous peoples have to their traditional homeland. For the Maasai, *use* refers to the seasonal (dry and wet) herding of livestock (cattle, goats and sheep); the harvesting of forest resources (medicinal plants, shrubs and trees, lumber and firewood); the cultivating of small family plots (maze /corn, beans, potatoes and sun flowers); the gathering of wild and cultivated honey; and the extensive travelling to engage in these and other activities.

Occupancy, on the other hand, relates to areas which the Maasai consider their own by virtue of continuing, multi-generational use, habitation, place naming, knowledge, and management control over and stewardship of land and resource use. *Occupancy* mapping for the Maasai involves recording stories and legends; ecological knowledge of wildlife and livestock; and place naming of; habitation sites, water sources (wells, springs, wetlands and seasonal/year-round rivers); and trails (human and livestock).



Forest and pasture lands with a maze (corn) plot being prepared for the rainy season, located between Almatasia Camp and the Ng'arwa area, Nov. 2019.



First meeting of the Loita Maasai land use and occupancy mapping team at the Almatasia Camp, Nov. 2019 (clockwise from left: Koisikir Nangiria, Erik Val, Stephen Sitei, Terere Tutayo, Mark Talash, Anna Shololoi and Julius Daniel)

1.5 Research Process and Methodology

Table 1 describes the three stages used in the research process: 1) preparation; 2) data assembly; and 3) reporting. It also describes the specific steps used in each stage to complete the work. A summary is provided in Appendix 2 of all the mapping interviews conducted including the Elders who participated and documents all the audio and video recordings and photos taken during each interview.

Table 1: Research Process

Project Stage	Description
1) Preparation 1a) Organizational Preparations Oct. 1 – 19, 2019	<p>The project coordinator:</p> <ul style="list-style-type: none">• arranged to create and printed earth satellite base maps at 1:40,000 and 1:25,000 scales;• purchased and assembled mapping materials and supplies (i.e. acetate overlays, pens, etc...); and• briefed the UVic Geography Department participants, Chris Bone, Jessica Fitter, Crystal Tremblay, and Ken Josphenson on the project and a senior geography student, Michael Scinocca, who was recruited to digitize field maps and create the database for the maps. <p>The host organizations, the EFT and KT:</p> <ul style="list-style-type: none">• selected Julius Daniel (field coordinator, KT) and community researchers: Terere Tutayo (Orkiu Juu), Anna Shololoi (Ng'arwa), Koisikir Nangiria (Enguserosambu) and Stephen Sitei (Naan); and,• prepared Almatasia Camp, the operational base for the project, to support community researchers and field and project coordinators

Project Stage	Description
<p>1b) Fieldwork Preparations</p> <p>Nov. 1 – 4, 2019</p>	<p>The research context was discussed with EFT advisors, community researchers, and field and project coordinators including topics such as:</p> <ul style="list-style-type: none"> • mandate, goals and organization of the EFT; • EFT relationship with the district and local governments and communities; and • external development and growth pressures on the Loita Maasai traditional homeland. <p>The purpose of the mapping project was reviewed and confirmed including:</p> <ul style="list-style-type: none"> • how the size and scale of base maps were determined; • use of geo-referenced acetate overlays to capture information on the base maps; and • use of points, lines and polygons and different colours and line types to represent features or information on overlays or directly on the base map. <p>Four topics/themes that should be mapped were identified and confirmed:</p> <ul style="list-style-type: none"> • living/homestead areas and place names to show the connection that the Maasai have to their traditional homeland; • land use (seasonal livestock pasture use) from 1920-1990 and from 1990 to present as a means to measure change in land use patterns; • human and livestock trails and water sources in the forest and describing forest use and management practices and cultural activities; and, • important wildlife distribution related to livestock-predator management, disease control, and water and pasture sharing between wildlife and livestock <p>Additional interview topics were identified which could be addressed, time permitting: role of women in the forest, external land use pressures impacting pasture and forest land uses, the role of Moran (warriors) and Elders in Maasai culture, and a description of the Maasai annual activity calendar.</p>

Project Stage	Description
<p>1c) Training</p> <p>Nov. 5 – 6, 2019</p>	<p>The project coordinator provided technical background and trained the community researchers on the requirements and methods of data collection including:</p> <ul style="list-style-type: none"> • the purpose of the mapping project as illustrated by examples of similar work in Canada, Africa and Southeast Asia; • how the base maps were created using earth satellite images and general land use information; • how to geo-reference the acetate overlay on the base map; • how to use colour and different line types to show different points, lines or polygons on the acetate overlay to represent features such as place names, human and livestock trails, cultural sites, homestead areas, forest and water use areas, pasture lands and land development pressures; • how to label/code interview maps and acetate overlays, capture and record field notes, place names and other information; and • the nature and details of each of the 4 interview topics identified in 1b).
<p>1d) Approach</p> <p>Nov. 5, 2019</p>	<p>A meeting with the EFT board (held Nov. 5, 2019) confirmed the following:</p> <ul style="list-style-type: none"> • how the mapping project would proceed; • what planning and training had been completed; • the topics/themes to be covered in the interviews, and • the details related to conducting the interviews including: <ul style="list-style-type: none"> - 2 days of interviews would be completed for each of the 4 homestead areas with 2 interviews occurring each day lasting 2-3 hours with 6 Elders participating; - each Elder would be given a gift of 3,000 Tsh as a sign of appreciation for their participation; and - EFT board would provide the names of Elders to be interviewed from each of the 4 homestead areas .

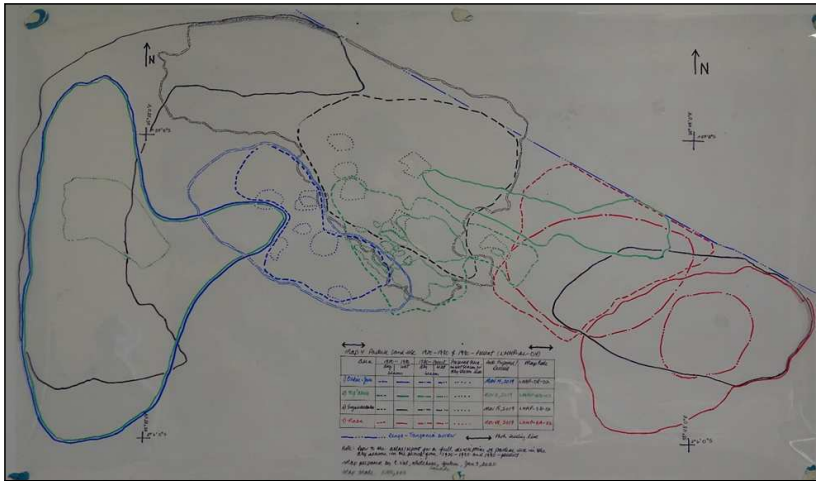


Map training at Almatasia Camp, Nov. 2019 (L-R Stephen Sitoi, Koisikir Nangiria, Anna Shololoi and Julius Daniel)



Mapping interview at a homestead in the Orkiu Juu area, Nov. 2019

Project Stage	Description
2) Data Assembly 2a) Interviews Nov. 7 – 27, 2019	<p>The community researchers conducted mapping and data/information collection as follows:</p> <ul style="list-style-type: none"> • four interviews (1 in the morning and 1 in the afternoon) over 2 days were completed in each of the 4 homestead areas; • each interview occurred outside on the ground on 1-2 cattle hides, lasted 2-2.5 hours and involved 6 Elders (3 male/3 female); • a total of 16 homestead area interviews were conducted which involved a total of 48 Elder participants (24 male/24 female); • all mapping interviews were conducted by between 2-5 community researchers in Maa, the Maasai language, and 8 of 16 interviews were attended by either Mark Talash (EFT Coordinator) or Meeyu Ole Pumbum (EFT Chairperson) to provide the introduction to the mapping project; <p>During the interviews, the project coordinator’s role was as a resource person and to operate the audio and video recorders and a small camera;</p> <ul style="list-style-type: none"> • after the daily mapping interviews, the community researchers reviewed their interview notes with the project coordinator, who summarized and transcribed these notes into his field books. The data and information in these books along with the interview maps were used to create the final maps and report for this study; • two additional interviews were conducted: one with 3 Maasai women in Loliondo (an Elder, a younger adult and an older teenager) to discuss the role of women in using and conserving forest resources and another interview with the EFT Founding Director and Coordinator to document external development pressures on their traditional homeland; and, • in total 18 field interviews were completed directly involving 53 participants including 49 Elders. Many others (men, women and children) observed the interviews and some also participated in the mapping.



Independent Overlay: copied from the interview maps showing land use in 1920-1990 and 1990-2019, Jan. 2020

A



B

Overlay with base map: The overlay is placed on top of the original base map. Note that the original base map was not big enough to capture all the land use information. The final report base map area was expanded to account for this shortfall. Jan. 2020

Project Stage	Description
<p>2b) Process interview maps and notes</p> <p>Dec. 1, 2019 – Jan. 7, 2020</p>	<p>Following the fieldwork, the project coordinator:</p> <ul style="list-style-type: none"> • re-drew all the original interview maps on acetate overlays; • geo-referenced, labelled and keyed data to a standardize legend (see A); • mapped each of the 4 homestead areas as separate colours on the interview maps and then consolidated the data on the final report maps to show that the Maasai live as one community on their traditional homeland; and • took high resolution photos of map acetate overlays independently (see A) and then the overlays together with the base map underneath (see B) - these photos were used to create the electronic database and digitize the final report maps .
<p>2c) Create Attribute Tables and Maps</p> <p>Feb. – Sept., 2020</p>	<p>The project coordinator met with UVic participants in January 2020 to deliver the redrawn acetate overlays and the high-resolution digital photographs, and to start the process of transcribing the interview notes into a database and to digitize the interview maps.</p> <p>Map adjustments made to reflect new contextual information provided:</p> <ul style="list-style-type: none"> • the earth satellite image base map was expanded to accommodate area information; • the boundary of the Lolita Maasai (Enguserosambu) traditional homeland was adjusted to include areas west of Wasso and north into Kenya; • boundaries were added for: the Loliondo I and II Forest Reserves; the municipal boundaries of Wasso and Loliondo; and, the Enguserosambu Ward; • Michael Scinocca, and Emily Crist, UVic geography students, prepared the map attribute tables and digitized the final hand drawn maps; and • Brian Lewis, a Montreal, Canada based Geographic Information Systems (GIS) consultant, prepared the report maps.



Recording place names during a mapping interview at a homestead in the Orkiu Juu area, Nov. 2020

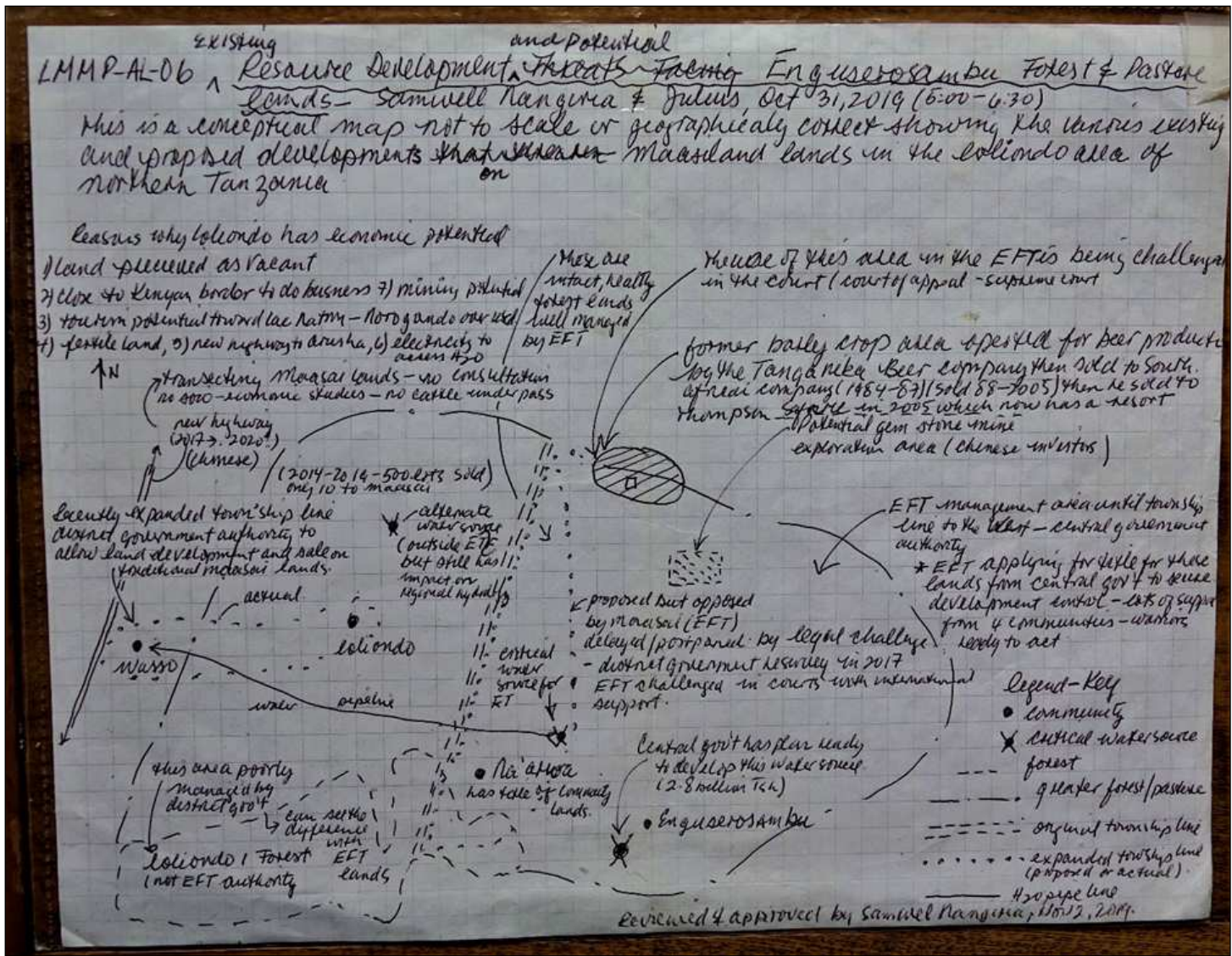


Accommodations at the Almatasia Camp located in the Loliondo II Forest Reserve, Nov. 2019

Project Stage	Description
3) Reporting 3a) Prepare and review draft report Aug. – Dec. 2020	<ul style="list-style-type: none"> the project coordinator prepared the draft report according to an annotated outline agreed to by the EFT, KT and UVic the draft report including the maps was reviewed by the EFT, KT, the field coordinator and a selection of community members; and, a meta data table was prepared as Appendix 2 in the final report
3b) Prepare final report Oct. 2020 – April 2021	<ul style="list-style-type: none"> the project coordinator prepared the final draft report by incorporating provided comments and edits. the final report was formatted for printing by the KT; and, final reports were then printed and submitted to the EFT and funders.
3c) Prepare wall maps Oct. 2020 – June 2021	<ul style="list-style-type: none"> the report maps were scaled up and consolidated into poster sized maps for display purposes - additional photos and text were added to make them self explanatory



Breakfast at Almatasia Camp, the operational base for the mapping project, Nov. 2019



The hand drawn annotated sketch map (not to scale) of Samwel Nangiria's description of the development pressures facing the Loita Maasai (Almatasia Camp, November 2, 2019). This sketch was transcribed onto a base map with additional details and notes provided by Samwel Nangiria and Mark Talash during an interview in Loliondo on Nov. 27, 2019, and is Map 10 of this report.

2. Regional Context and Summary of Land Use and Occupancy (1920-2019)

Before starting the training and conducting the community interviews, Enguserosambu Forest Trust (EFT) representatives, the field coordinator and the project coordinator spent 2 days together at the Almatasia Camp to discuss: i) the context and need for the mapping project, ii) the purpose of the project, iii) similar mapping initiatives with Indigenous peoples elsewhere in the world, iv) the themes to be covered in the interviews, v) who would be interviewed, vi) how interviews would be conducted, and vii) the various roles that the coordinators and the community researchers would play. The results of the discussions were brought to the board of the EFT for its review.

With some adjustments, approval was given and the community mapping interviews began. These initial discussions quickly identified the development pressures facing the Loita Maasai, which were noted on a piece of graph paper. That sketch provided the means to draw and describe in words the area context and effectively demonstrated the power that maps have in telling a story and documenting information (see map opposite).

During these initial discussions, 4 principal mapping themes were identified which the EFT approved and guided the community researchers through the mapping interviews. Understanding these themes and why the information was important to collect provided the researchers with the basis to conduct the interviews in Maa. This allowed them to communicate directly with the Elders without the distraction and delay of either Swahili or English translation, and eliminated the risk of losing the meaning of the Elders' conversations through poor or mis-translation.

The maps and the descriptions that follow in this report are based on these 4 mapping interview themes:

- Homesteads and Place Names
- Pasture and Forest Land and Water Use
- Human and Livestock Trails
- Wildlife and Livestock

In addition, a fifth theme - development pressures facing the Loita Maasai - was mapped based on interviews with EFT representatives.

Map 1 shows the regional context including: basic features such as topography, hydrology, political boundaries and principal roads; the boundary of the Loliondo I Forest Reserve; and the boundary of the Loliondo II Forest Reserve (which is the area that the board of the EFT has the authority and responsibility to protect and conserve).

Most importantly, this map includes an area, 745 km² in size, shaded in light yellow that shows the extent of Loita Maasai traditional and contemporary land use and occupancy. This area is a consolidation of all pastoral, agricultural, forestry and water use and wildlife information that was collected over 8 days during 16 interviews at 8 different homesteads. It embodies the knowledge

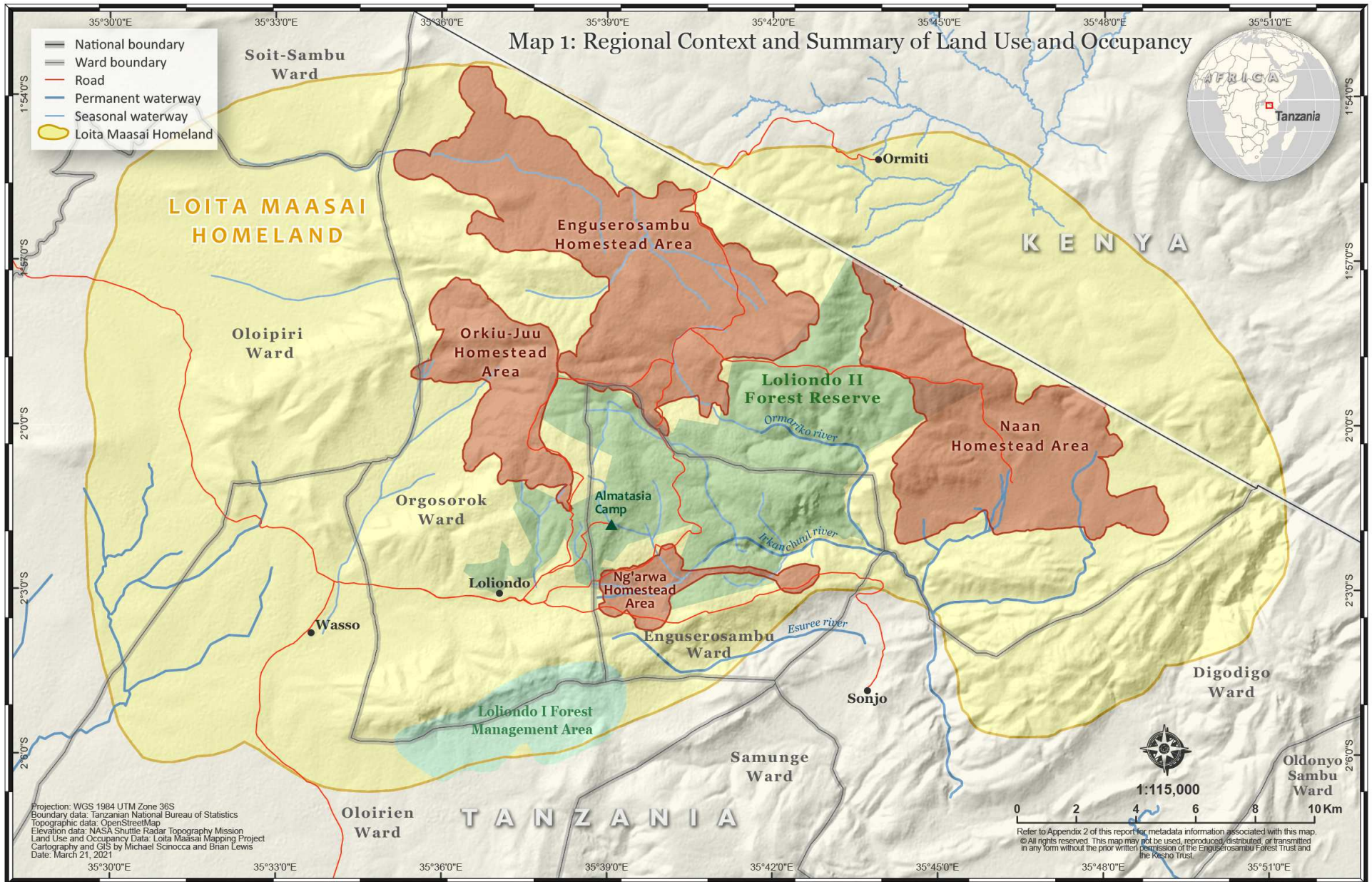
and life experience of 48 Elders, men and women. The area defines on a map created by them for the first time their traditional homeland, known to the Loita Maasai as *Enguserosambu*. The area represents the land and water use and occupancy that have inextricably bonded for over 100 years the Loita Maasai to Maasailand, the larger traditional homeland for the some 2 million Maasai that today live in Tanzania and Kenya.

Note: the six original redrawn interview map overlays are available in Appendix 3.



Ng'arwa area Elders being shown Inuit hunters mapping their land use, Gjoa Haven, Canada. Nov. 2019

Map 1: Regional Context and Summary of Land Use Occupancy



3. Homestead Areas and Connecting Trails (1920 - 2019)

The word *boma* means a round fenced corral in the Swahili language. Built of either standing tree posts gathered from the forest or thorn bushes collected from pasture lands, the enclosure is primarily used to protect overnight a family's livestock (cattle, sheep, goats, and donkeys). Around the boma, a family has a number of mud-stick structures with either grass thatched or metal roofs traditionally built by the women. These buildings are used either for cooking, sleeping, visiting, keeping newly born livestock or storing equipment, tools or produce (maize, potatoes and beans).

Together the boma and the associated structures are called *Engang'* in Maa. In English this term is best described as a homestead. Usually, a number of related families have their homesteads close to each other, and that grouping in Maa is called *Ingang'itie*.

Map 1 shows these *Ingang'itie* or homesteads grouped into 4 main areas – Orkiu Juu, Ng'arwa, Enguserosambu and Naan, which together represents the Loita Maasai community, known collectively as Enguserosambu. These 4 areas along with forest and pasture land and the waterways are the integral components that make up their traditional homeland.

Map 2 shows in detail the location of the individual homestead groupings, and Table 2 identifies the name of each of them. Also shown is the trail network that connects 50 of these homestead areas. Trails are critical to maintaining extended family ties, communications and the social fabric of the community.

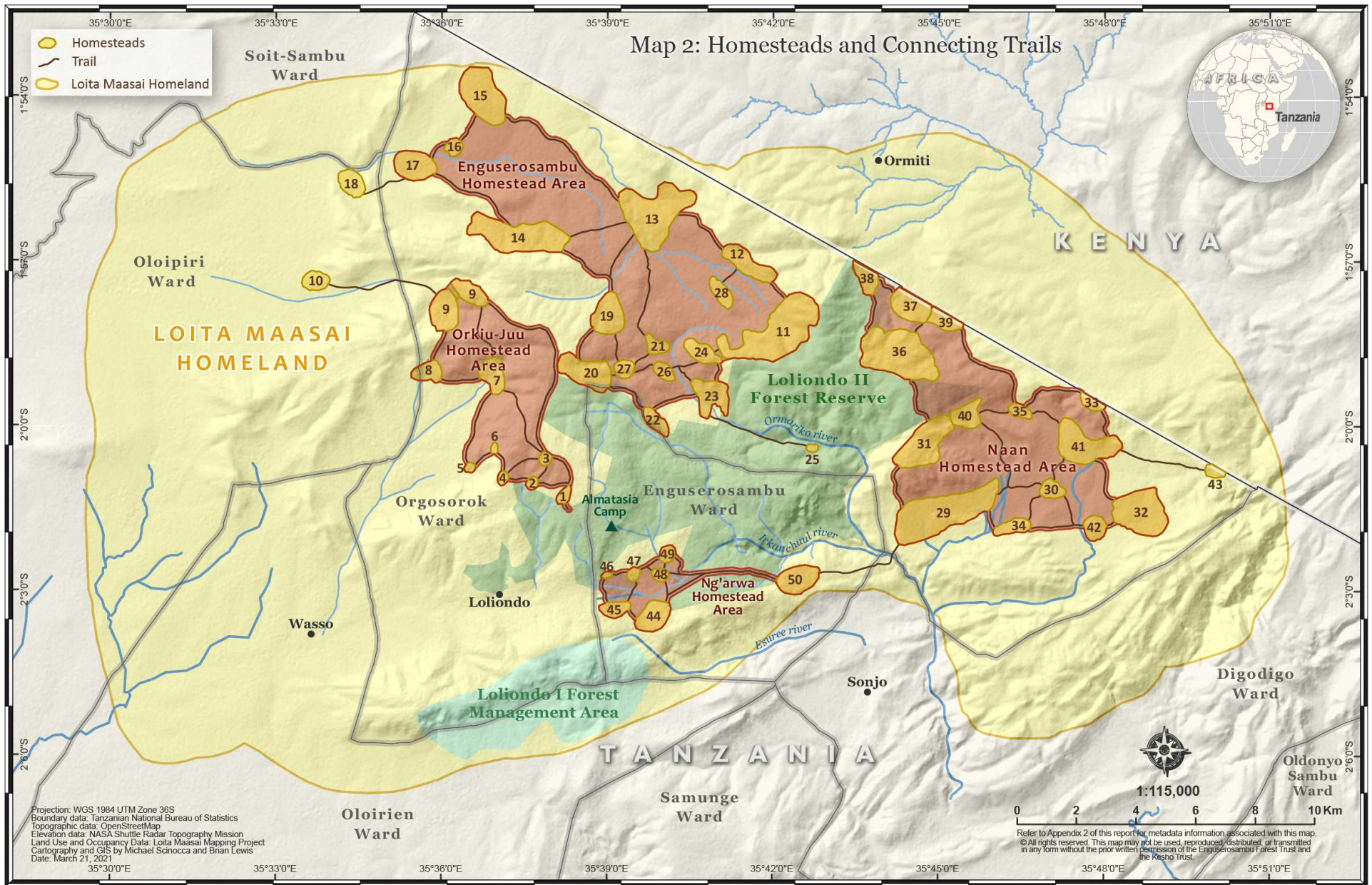
Table 2: Homestead Names

	Homestead Name		Homestead Name		Homestead Name		Homestead Name
1	Olokeri	14	Irmong'isirwai	27	Olunguya	40	Engutoto
2	Irmonchin	15	Olosirapiding'	28	Endoinyo oo Ngamuriak	41	Kirrunyan
3	Ilaiser	16	Impopong'	29	Naan	42	Kisikirya
4	Imartin	17	Nesiteti	30	Noombarwa	43	Oloolalo
5	Engutoto	18	Karkarmorru	31	Iltungurri	44	Oloika
6	Entapot	19	Engoseremai	32	Olchurrai	45	Engurashi
7	Orkoro	20	Kapiro	33	Inairebuk	46	Oloongoitoi
8	Iloishiaa	21	Orkatani	34	Irkoroin	47	Oloolarriak
9	Olosingo	22	Karantini	35	Ormoti	48	Ntinyika
10	Ilotimi	23	Olasai	36	Olosho	49	Olendetia
11	Ilopiriki	24	Iltarakwa	37	Engoiyangalani	50	Emburbul
12	Sukude	25	Emurua Ormong'i	38	Ngosesia		
13	Ndulele	26	Indukai Olasai	39	Entashata		



A homestead consisting of a Boma, or livestock corral and home in the Orkiu Juu area, Nov. 2019

Map 2: Homesteads and Connecting Trails



4. Place Names and Occupancy (1920-2019)

Over 200 place names were mapped and described during four 2-3 hour-interviews by 24 men and women Elders. The names have been known for generations and passed down over time. They are known based on the experiences people have had there and the stories that are told about them. The detailed descriptions that people provided demonstrate a deep and enduring connection to their traditional homeland which culturally defines the Loita Maasai.

These place names: locate where people have lived; describe where walking or livestock trails begin and end; detail who lived there, what they did and special events that occurred there; locate *Moran* or warriors' meat camps and traditional residential cultural training camps (also known as *Emanyatta* [singular] or *Imanyatt* [plural]); and, help people find pastures for grazing, streams, wells or springs for watering livestock, or sacred forest sites for fertility ceremonies or coming of age celebrations.

The place names have been organized into 6 categories and then recorded on 3 maps to avoid crowding. These categories include place names that: i) describe natural landmarks (hills, valleys, etc.); ii) name homesteads (past and present); iii) identify pastures; iv) locate water sources; v) demarcate human and livestock trails; and, vi) identify wildlife landmarks. Different coloured diamond symbols show these categories and with a number they are used to located the place names. The table opposite the map links the numbers to the Maa place name. The associated description for each of the listed place names is provided in the table in Appendix 1.



An Elder story teller from the Orkiu Juu area, Nov. 2020

Here is a sampling of place names and the wonderfully rich and diverse stories that describe the location:

Oloormisigiyo is a hill in the Naan area named after the *misigiyo* tree. The roots of this tree are used as an herb, which is boiled in water and mixed with animal fat to make a soup. The soup has medicinal properties that cure colds, running noses, and is known to calm worried or anxious people. The fruit is also edible.

Ololariak is a pasture near a homestead in the Ng'arwa area where the *Ilarriak* bird is found. This bird feeds on ticks found on livestock, various antelope and Cape buffalo. The Elders explained that this bird is critical in helping to maintain livestock health.

Embaasha Oowuyai is a narrow valley in the Naan area where the *Ndorobo*, a hunter-gather, non-Maasai tribe, used to set leg hold and neck traps to harvest antelope, zebra and Cape buffalo that came to drink at a spring fed water hole. The steep valley walls forced the animals to use a narrow trail along which the traps were set.

Orng'arwa is a wide valley found in the Ng'arwa area. Here the water table is close to the surface which keeps the floor of the valley very green and productive, and has many human-made wells and natural watering holes for livestock. The name of this area, *Ng'awra*, originates from the name of this valley.

Lekupai is a stone weir or *irmotiok* found in a creek in the Orkiu Juu area. It is where an old man named *Mussa* used to water his livestock in the 1950's, at a time when people moved their livestock great distances between the savannah grasslands west of Wasso during the wet season (November-May) and the highlands east of Loliondo during the dry season (June-October).



Maasai Elders from the Naan area discussing the location and story behind a particular place name, Nov. 2019

Lorchartuiyan is a natural reservoir in the Engusersambu area where livestock come to water. The reservoir is named after the *Ilchartuiyani* tree which grows along its banks. The branches of the tree are used to make traditional Maasai herding sticks and along with mud to construct buildings.

Oloongewan is a forest in the Orkiu Juu area, where many years ago a Moran (warrior) group, the *Nyangusi*, would hunt by bow and arrow the *inkewan*, also known as the turaco, a beautiful green bird. The bird would be cleaned and worn on a head band with ostrich feathers as a sign of an accomplished bow hunter.

Endonyo Olarru is a small hill in the Enguserosambu area which was frequented by the *olarro*, the Cape buffalo. The buffalo came there to graze and drink from springs that seeped from the hill side.

Engoriong' Ontepes is a hill top in the Orkiu Juu area which is covered in *intepes* or thorn bushes. Goats are the only livestock that eat the bush's leaves at the beginning of the dry season (June - July) to become fat and healthy. The leaves also have a medicinal-spiritual use by being boiled in water and washed over the body of a sick person. This is done under the direction of a medicine person.

When these places were described by the Elders it frequently would lead to animated story telling about memorable people or special events which listeners would appreciate and learn from. When this sampling of the Elder's knowledge is extrapolated over all the 211 place names shown on Maps 3, 4 and 5, it vividly demonstrates the cultural significance and importance of the Enguserosambu homeland to the Loita Maasai.

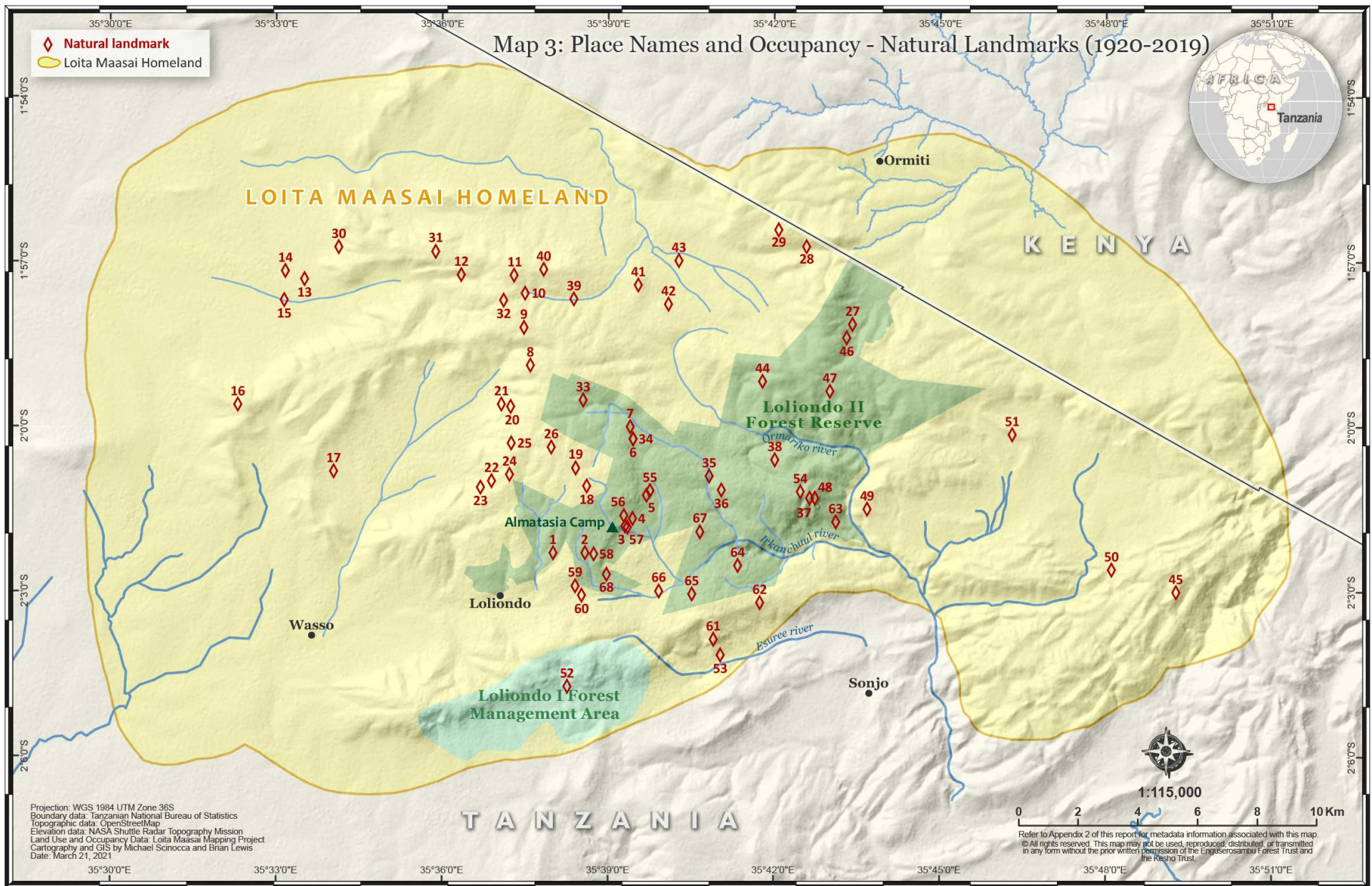
4.1 Natural Landmarks (1920 - 2019)

Map 3 shows those place names associated with natural landmarks and landscapes such as hills, valleys, mountain passes, and cliff faces. Appendix 1 contains a complete listing of the type and descriptions associated with each of these place names.

Table 3: Place Names: Natural Landmarks

	Place Name		Place Name		Place Name		Place Name
1	Orangai	18	Iloshon Rongeni	35	Erramashata	52	Emowuo Orkita Laswa
2	Musaakwani	19	Embeti	36	Osiidu	53	Ilororo
3	Ewuas Rangai	20	Olokuseroi	37	Sangulungul	54	Sangulungue
4	Ewuas Olaimurunyi	21	Enderkeny	38	Oloosuyan	55	Ewuas Orkereyan
5	Ewuas Orkereyan	22	Orkarkar Lengapune	39	Engoseremai	56	Ewuas Orkeek
6	Oloongoitoi	23	Oromboi	40	Tiololo	57	Orkarkar Lewuas Orangai
7	Iwuasin Oo Mbaoi	24	Olosho Lenkijape	41	Koimasasi	58	Musaakwani
8	Ngodin	25	Oyarata Lenoondatwa	42	Edoinyo Enchimbi	59	Entepesi
9	Olokuseroi	26	Oyarata Lesoit	43	Enguserosambu	60	Oyarata Loloombirbili
10	Engoseremay	27	Oldonyo Lormurran	44	Loltidu	61	Nkoomani
11	Engoriong' Ontepes	28	Iyarat Lorkimusei	45	Oloosirwai	62	Orkarkar Lorkonoyi
12	Osupuko Rangai	29	Sukude	46	Oloomuran	63	Enkorika
13	Ilotimi	30	Ilotimi	47	Loirukuruko	64	Loodokulukok
14	Ngaabashi Engeju	31	Oloingo	48	Sangulungul	65	Ewuas Esoit
15	Elangata Ormutani	32	Engidikirroto	49	Irkarkarri Lekilutori	66	Orng'arwa
16	Esoit Olowuaru	33	Endoinyio Olarro	50	Embaasha Oowuyai	67	Olenapi
17	Embaash Olobo	34	Oloongoitoi	51	Oldonyo Onyokie	68	Oloonkoitoi

Map 3: Place Names and Occupancy - Natural Landmarks (1920 - 2019)



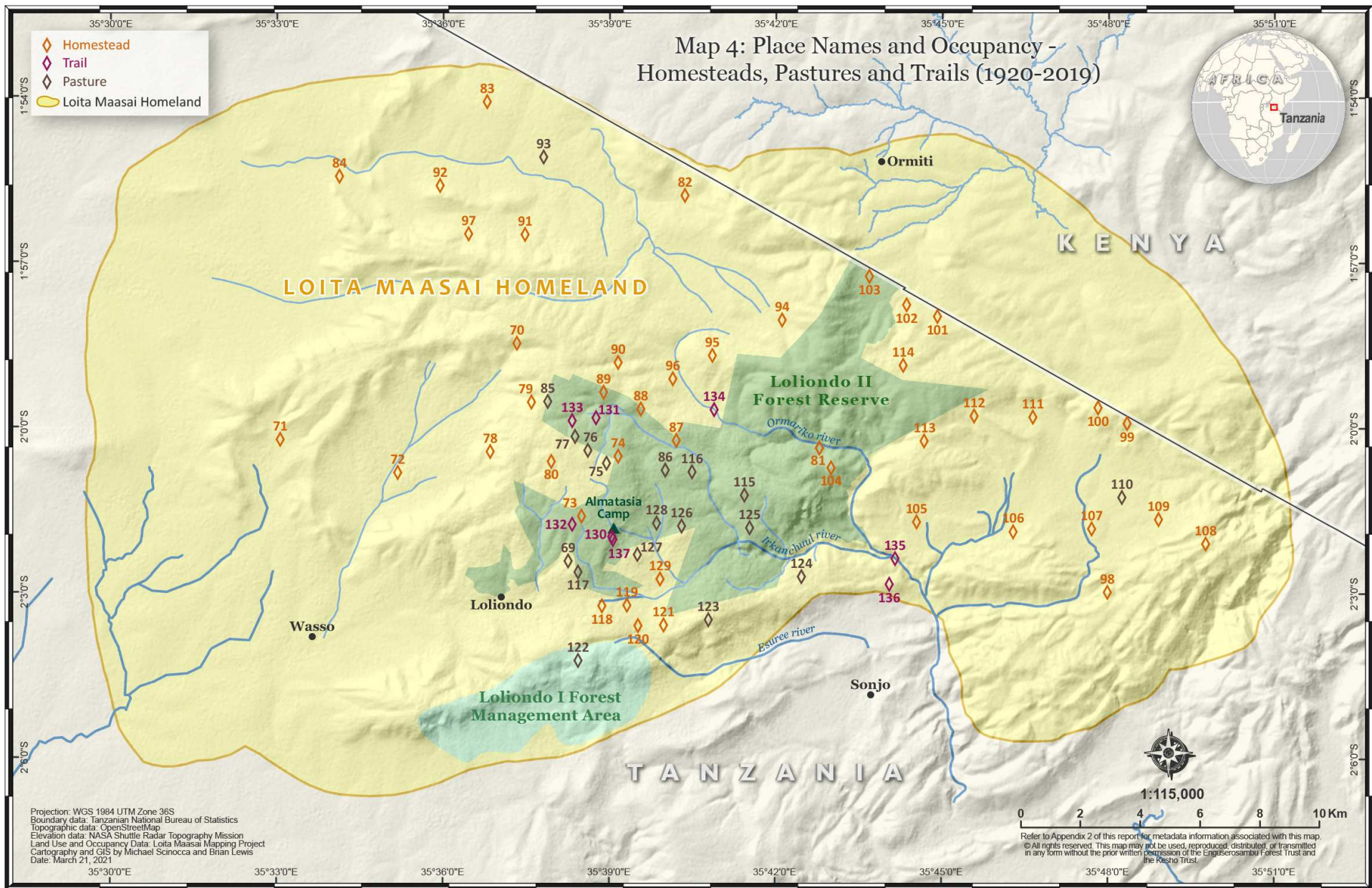
4.2 Homesteads, Pastures and Trails (1920 - 2019)

Map 4 shows those place names associated with homesteads, pastures and trails. Like other maps relating to place names, these features are both from the past and present encompassing the full period that this report documents. Appendix 1 contains a complete listing of the type and descriptions associated with each of these place names.

Table 4: Place Names: Homesteads, Pastures and Trails

	Place Name		Place Name		Place Name		Place Name
69	Olchamba	87	Irmatasiani	105	Naan	123	Osiidu
70	Orkoroi	88	Karandini	106	Lositeti	124	Emburbul
71	Emurwa Orkirorwa	89	Kapiro	107	Kisikiria	125	Olodung'oro
72	Ilchorieti	90	Olenguya	108	Olenareyo	126	Olendetia
73	Imanyat Ekujuk	91	Irmong'isirwai	109	Olchurai	127	Ololariak
74	Emurua Ooretet	92	Masinde	110	Mutengwarr	128	Ewuas Oloigeruno
75	Olosho Oodo	93	Eluay Enengorotik	111	Ngang'itie Ormoti	129	Ntinyiak
76	Ilshon Lolturoto Onyokie	94	Ilopiriki	112	Engutoto	130	Nagotisho
77	Olnidai	95	Iltarakwa	113	Iltungurri	131	Iwasin Orturoto
78	Entapot	96	Ildukai Lolasai	114	Olosho	132	Orkutoto Loloing' oni
79	Emuate Enkeseyian	97	Empepedoi	115	Irkutot Loloormongin	133	Egos Omunyi
80	Emurwa Oltimanang'eni	98	Emurwa Endodo	116	Olosomodiok	134	Elang'ata Oo Nkeek
81	Emurwa Oormong'i	99	Kirunyan	117	Olchamba	135	Elang'ata e Masinde
82	Ndulele	100	Enairebuk	118	Olengurare	136	Ole Naidurra
83	Olosira Piding	101	Endashata	119	Engurashi	137	Nagotisho
84	Karkar Moru	102	Engoiyangalani	120	Engang' Orpiripiri		
85	Isupukia	103	Ngosesia	121	Olaika		
86	Iloosomodiok	104	Engidikirroto	122	Ewuas Nalala Oldonyo		

Map 4: Place Names and Occupancy - Homesteads, Pastures and Trails (1920 - 2019)



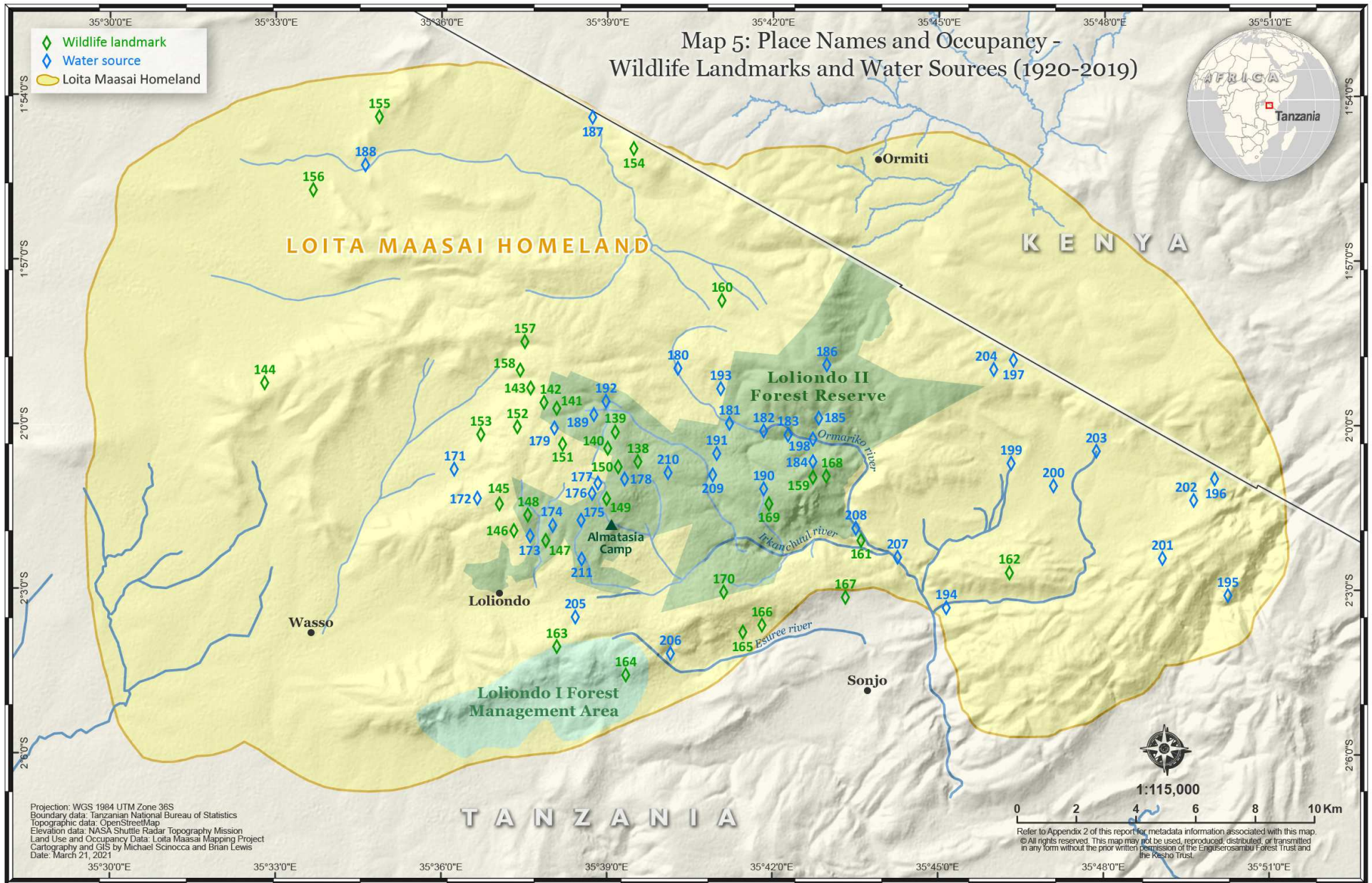
4.3 Wildlife Landmarks and Water Sources

Map 5 shows those place names associated with wildlife landmarks and water sources. Wildlife landmarks includes such locations as known habitat while water sources identify key points such as springs as well as seasonal water sources. Appendix 1 contains a complete listing of the type and descriptions associated with each of these place names.

Table 5: Place Names: Wildlife Landmarks and Water Sources

	Place Name		Place Name		Place Name		Place Name
138	Embaash Ole Nasieku	157	Orkoro	176	Enkishepui Oondondoli	195	Orkeju Arus
139	Iretet	158	Ngodin	177	Ndondoli	196	Alaalalo
140	Elang'ata Oreteri	159	Olorien Lepuus	178	Mburbuli Enempirpiri	197	Ngarmate
141	Olenjata	160	Edonyo Oongaimuriak	179	Karukai Ilaruka	198	Ormariko
142	Isupukia	161	Oloormisigiyo	180	Osilange Lolasa	199	Ilotimi
143	Orperes	162	Ololoitikoshi	181	Lolarru	200	Irkoro
144	Irmotiok Lekupai	163	Ormusaakwa	182	Loorchartuiyan	201	Enchoro Endukai
145	Lorkidong' oi	164	Ormelelek	183	Ormariko	202	Ormatasia
146	Oloongewuan	165	Iretet	184	Noonchuta	203	Olorook-Kiek
147	Noongopir	166	Orchani Lormotonyi	185	Oyarata Loolaimurunyi	204	Olturoto Lesoit
148	Nainokieki Emowuo	167	Nengushirit	186	Enchorro Ole Jartan	205	Esupukiai olturoto
149	Olchani Lolesipai	168	Oloirien Lepuus	187	Pololeti	206	Esuree
150	Olchani Lomotonyi	169	Entim Dapash	188	Irkesometi	207	Masinde
151	Eyarata Orkonoi	170	Kinande	189	Iwasin Olturoto	208	Ormariko
152	Eyarat Lenorgoo	171	Kidongonyek	190	Olturoto Lolormonchin	209	Erramashata
153	Orkipire Lekima	172	Moruange	191	Kiturgumo	210	Iseli
154	Lemisigiyo	173	Nempiripiri	192	King'arana	211	Olturoto Lolchamba
155	Ilmasilig	174	Orgos Onyokie	193	Ingang'itie Olasai		
156	Ang'ta Elekoko	175	Inchoroi Olengamurai	194	Enaistiyapa		

Map 5: Place Names and Occupancy - Wildlife Landmarks and Water Sources (1920 - 2019)



5. Human and Livestock Trails (1920-2019)

Map 6 shows the trails that connect the Loita Maasai within their homeland. These trails are used either by people walking or motorcycling to other homesteads to visit or to Loliondo to shop, bank or visit. They are also to move livestock to different pastures, water sources or market in Wasso, Tanzania or Ormiti, Kenya. They are such an integral part of their homeland based on generations of use that most locations are named and used as navigational landmarks.

Trails are regularly used, well defined and familiar to members of the community. They run through open pasture lands or forested areas. Wildlife including leopards, hyenas, baboons, wild dogs, snakes and other predators also use these trails, which means that children or unfamiliar visitors are usually guided to ensure their safety. Trails also provide a means to meet others and take the time to chat and exchange news.

During the interviews, Elders described the majority of the trails in terms of the homesteads or towns (Wasso, Loliondo, or Ormiti) they connect and the purpose of their use, such as accessing shops, medical services, livestock auctions, government services and banking.

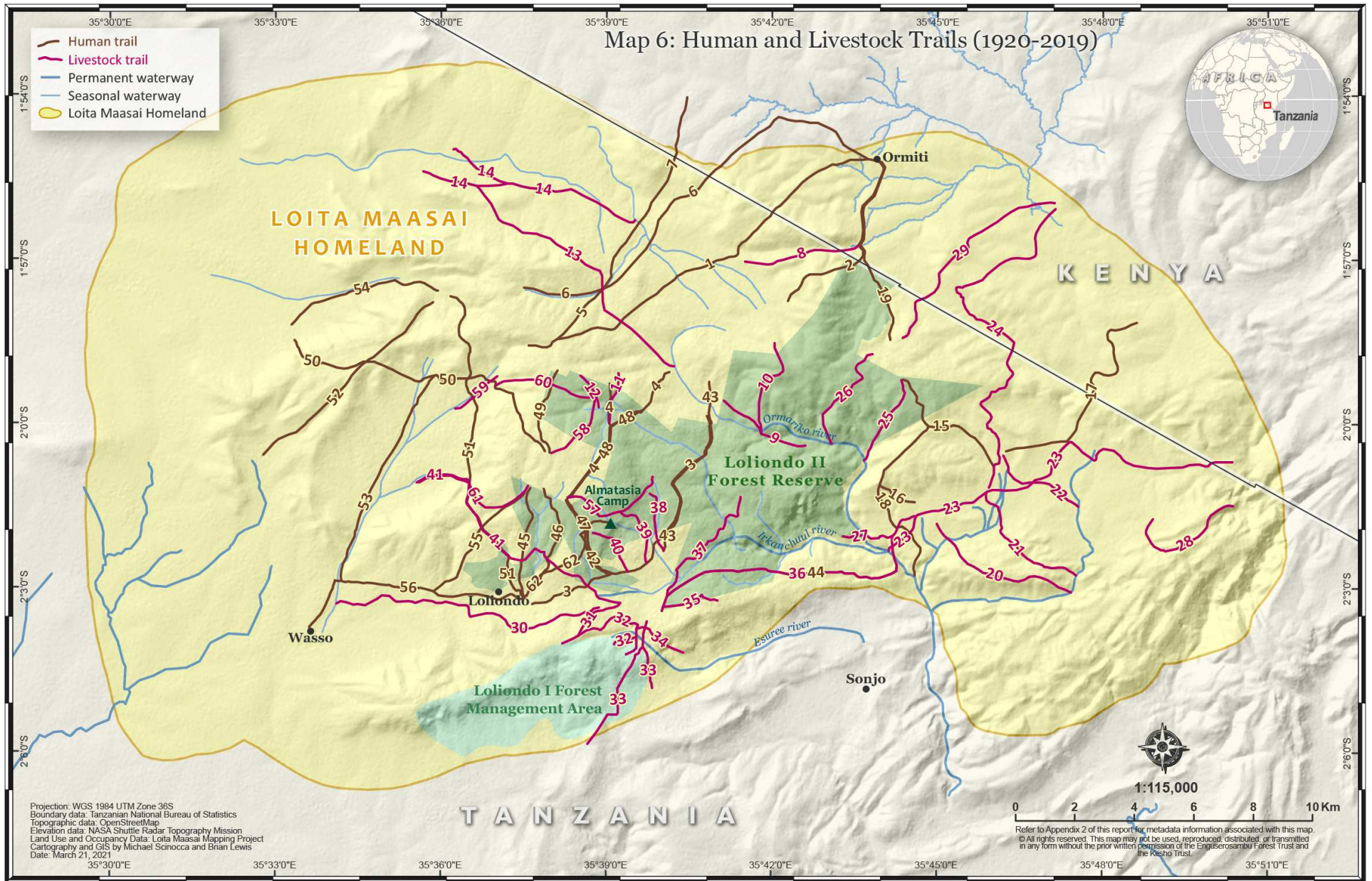


Established trails among pastures and bomas facilitate access around the area, Nov. 2019

Table 6: Trail Names**Key for Table 6:** human trail (H); livestock trail (L)

	Trail Name		Trail Name		Trail Name		Trail Name
1	Engoitoi Enadengare (H)	17	No Name (H)	33	Orgos Loowuasin (L)	49	Narukoreki (H)
2	Engoitoi Olopiriki (H)	18	No Name (H)	34	Orgos Leng'apune (L)	50	No Name(H)
3	Engoitoi King'arana (H)	19	No Name (H)	35	Orgos Lekisinande (L)	51	No Name (H)
4	No Name (H)	20	No Name (L)	36	Orgos Loolodokulukok (L)	52	Engoitui Engoriong' Olosingo (H)
5	Narukoreki (H)	21	No Name (L)	37	Orgos Lolodung'oro (L)	53	No Name (H)
6	Kisheirmorwak (H)	22	Orgos Lorkoroin (L)	38	Orgos Lewuas Orkereiyen (L)	54	Engoitoi Oo Mbeuti (H)
7	Engoitoi Oondulele (H)	23	Orgos Le Masinde (L)	39	Orgos Lolaimurunyi (L)	55	No Name (H)
8	Orgos Lolopolui (L)	24	No Name (L)	40	Orgos Lenagotisho (L)	56	No Name (H)
9	No Name (L)	25	No Name (L)	41	No name (L)	57	Orgos Lolaimurunyi (L)
10	Orgos Leloltidu (L)	26	Orgos Loolairamiram (L)	42	No Name (H)	58	Orgos Leking'arana (L)
11	No Name (L)	27	Orgos Lelang'ata Enterit (L)	43	No Name (H)	59	Orgos Loo Mbolio (L)
12	Orgos Lekapiro (L)	28	No Name (L)	44	Orgos Loolodokulukok (H)	60	Orgos Lorperes (L)
13	No Name (L)	29	No Name (L)	45	Engoitoi Orkutot Looltatwa (H)	61	Orgos Lekidongonyek (L)
14	No Name (L)	30	Orgos Loobolio (L)	46	Engoitoi Orangai (H)	62	Amalatasia (H)
15	No Name (H)	31	No name (L)	47	Engoitoi Oo Musaakwani (H)		
16	No Name (H)	32	Orgos Lesuree (L)	48	No Name (H)		

Map 6: Human and Livestock Trails (1920 - 2019)



6. Pasture and Forest Land Use (1920-2019)

6.1 Pasture Land Use 1920-1990

Map 7 shows that from 1920 to 1990 pasture land use for grazing cattle was clearly differentiated between the wet (November-May) and dry (June-October) seasons.

During the wet season two principal areas were used: i) the savannah grasslands west of Wasso and north to the Tanzania-Kenya border (primarily used by herders from the Orkiu Juu and Enguserosambu areas); and, ii) the rangelands east and north of Sonjo (primarily used by herders from the Ng'arwa and Naan areas).

The plains area west of Wasso, called *Ronjoo*, had temporary homesteads that were used by people from the Orkiu Juu area. The Elders explained that sheep and goats spent both the dry and wet season here because: i) the grass was too high for grazing in the dry season in the highlands further north; and, ii) it was too cold in the dry season and too rainy in the wet season in these highlands.

During the dry season cattle were moved from the savannah grasslands to the highlands north and northeast of the Almatasia Camp to the Tanzania-Kenya border. During this period there was little to no cultivation of crops at any significant scale.



Cattle grazing south of homesteads in the Enguserosambu area, Nov. 2019

6.2 Pasture Land Use 1990-2019

Over the last 30 years, pasture land used for all livestock (cattle, sheep and goat), has significantly contracted to two areas: i) the highlands north of the Almatasia Camp to the Tanzania - Kenya border for both the wet and dry seasons (primarily used by herders from the Orkiu Juu, Ng'arwa and Enguserosambu areas); and, ii) north east from the camp in two separate areas respectively for the dry and wet seasons (primarily used by herders from the Naan area) (see Map 7).

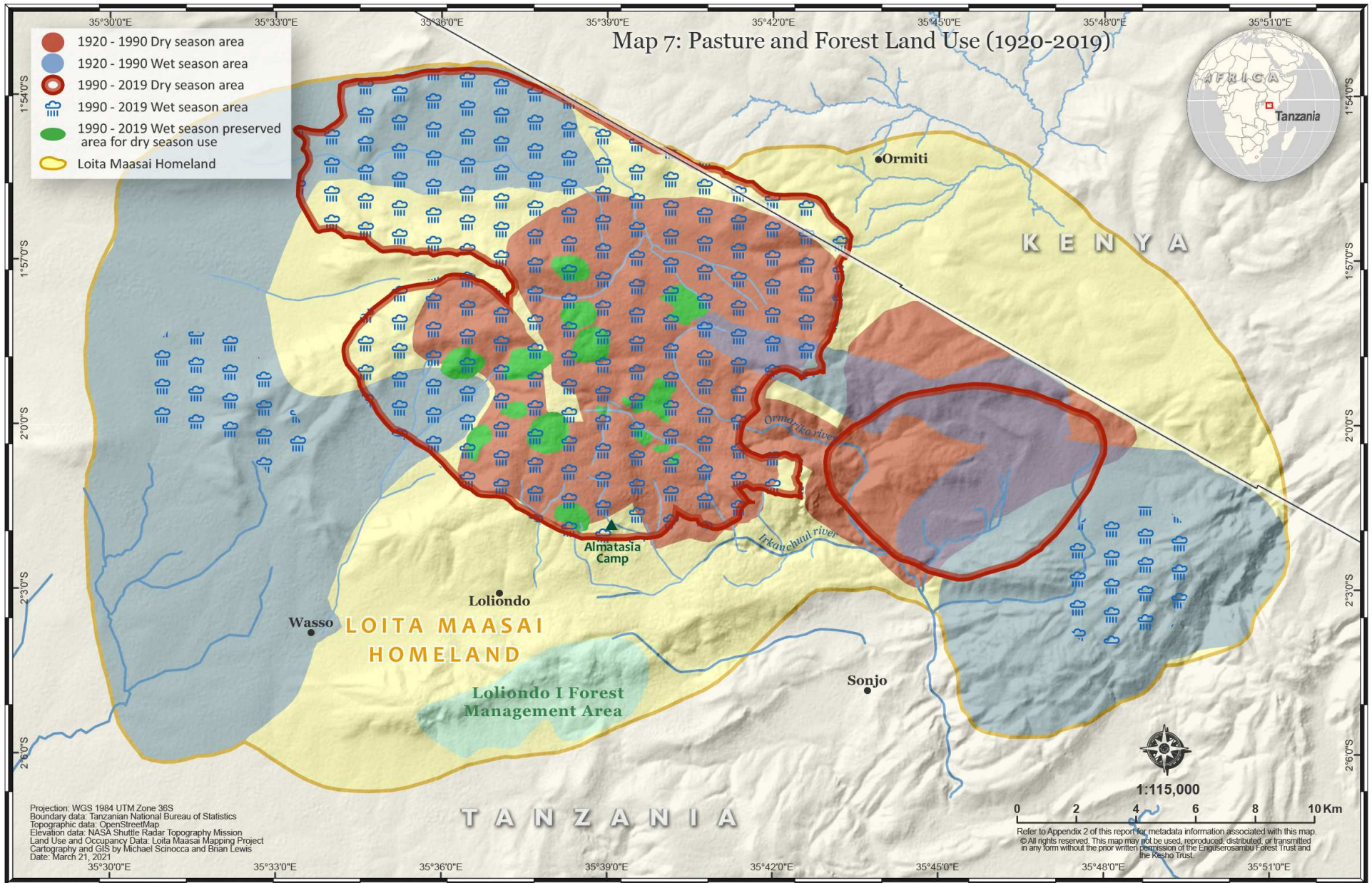
In order to address this contraction, the Maasai adapted by using much of the same land for both the dry and wet season. This is done by preserving areas in the wet season for dry season use, as shown on the map by smaller green polygons. These areas average about 0.7 km² in size and total approximately 13 km² or five percent of the 1990-2019 dry land area. Thorn brush or *intepes* fencing is used to keep livestock out of these preserved areas. This strategy does not work further east in the Naan because of higher elevations, rockier terrain, cooler temperatures and smaller pasture sizes, which when combined results in reduced grass land productivity.

Also note that the map shows two smaller wet season areas used by herders from the Ng'arwa and Naan areas that overlap with 1920-1990 wet season located on the west and east sides of the traditional homeland.



Cattle continuing to graze while returning to their protective bomas in the evening in the Orkiu Juu area, Nov. 2019

Map 7: Pasture and Forest Land Use (1920 - 2019)



The Elders explained that the primary reasons for having to use these areas for both dry and wet seasons is the shrinking availability of pastureland due to: i) increased population growth and the expansion of urban areas (Wasso, Loliondo and Sonjo); ii) government promotion and expansion of crop cultivation; and, iii) new infrastructure development such as the highway from Arusha to the Serengeti region.

Other drivers of change include the increasing market value for sheep since 2005, which resulted in significant flock expansion. At the same time cattle herd sizes were reduced because of the limited availability of grazing areas in both the wet and dry seasons.

The Elders described that in the past cattle herd size was naturally regulated according to carrying capacity or viability of the pasture which was primarily determined by the timing and amount of rain fall. Now with climate change, the Maasai have noticed that the rate of extreme

drought has changed from once every five years to once every three years. Also, the pattern of the rains is less predictable, starting up to two months earlier (in September rather than in November) and lasting only to January, two to three months earlier than previously.

The last drought was in late 2016 - early 2017, so now they are expecting another soon in late 2020 - early 2021. With this concern in mind, herders are beginning to follow the livestock auction sale prices in Wasso and Ormiti to be ready to sell to reduce the herd size. Depending on the herd composition, cattle are usually the first to be sold because they require the most pasture and water compared to sheep and goats. The proceeds of these sales are either used to buy additional feed (maize/corn) or saved until after the drought to buy additional livestock to rebuild the herd. Elders said that sheep are hardy and need only seven days on good pasture to survive up to seven days, whereas cattle need 30 good pasture days to survive the same length of time. Also, the grazing pattern of cattle requires grass of certain minimum height and thickness whereas sheep and goats can feed on much poorer quality grass. Goats can even feed and thrive on thorn brush.



Maasai herder with cattle along the forest edge in the Ng'arwa area, Nov. 2019

When considering these pressures, questions have been raised over the last 10 years about the economic viability of livestock herding. In 2009, an in-depth economic analysis was done by the University College London (UK) and the International Livestock Institute, Nairobi (Kenya) of 6 districts including the Mara District which is north along the Tanzania-Kenya border, not far from this study area.

The result of the study showed that:

The overwhelmingly consistent message from these analyses is that livestock emerge as not only central to the great majority of livelihoods for Maasai residents of the rangelands, but that those livestock are an essential part of broader livelihood strategies across the range of wealth and income. They play key roles in pathways out of poverty for the most vulnerable, in robust livelihoods strategies that protect against poverty, and in investment portfolios representing relative prosperity for the well-off. (p 20, Homewood, 2009)



A recently ploughed crop plot ready for seeding surrounded by pasture land in the Ng'arwa area, Nov. 2019

6.3 Crop Cultivation 1990-2019

Some 30 years ago cultivation was encouraged by the government to increase food security by producing crops such as maize, beans and potatoes; but also, to move the Maasai away from their nomadic way of life and thereby reduce the geographic extent of their land use. George Monbiot summarized the attitude of government at the time:

It has long been the conceit of governments in East Africa that nomads contribute nothing to their countries. In Tanzania they are classified by the government as people with “no productive employment”. The problem is three-fold. Nomads tend to live in the driest regions, where the environment is so sparse that they can seldom produce more than a small surplus. The livestock and hides they sell have tended, historically, to be bartered, not exchanged for cash. In the more remote regions they inhabit, nomads can generally avoid paying tax, so their contribution to the economy, while real, is often invisible. In truth they tend to extract as much as they can from their land without destroying it. They trade their stock, when they can afford to, for grain, clothes, metals and beads. Most importantly they keep themselves alive, without relying on the efforts of other people for food. There is, in fact, almost certainly no use of the savannahs which could sustain more people’s livelihoods. But because their contribution is often invisible and may, even when it surfaces, be small, nomads can be written off by governments as of no economic value to the country (p 134 - 135, Monbiot, 1994)

Today, family scale crop production along with herding livestock are integrated land use activities that are closely tied to the dry and wet seasons. Cultivation typically occurs close to or within the individual homestead area or between homestead areas, usually in lower lying areas, valley bottoms along hillsides. As with pasture land use, the Maasai from the Oriku Juu, Ng’arwa and Enguserosambu areas have similar patterns of cultivation. The principle crops are maize or corn, potatoes and beans primarily for family consumption but, at times, extra maize is planted to feed livestock in the dry season. Any crop surplus is bartered for other produce or sold to pay for school fees, uniforms, books and food at lunch. There are two periods during the wet season in November/December and February/March that seeding occurs. After the harvest in May, the maize stocks are left in fields as forage for livestock, and in preparation for seeding the ground typically is first ploughed by a contracted tractor and then further tilled by oxen. Seeding and harvesting is done by hand.



*Ceremonial opening of an iretet tree
in the forest in the Orkiu Juu area,
Nov. 2019*

The people from the Naan area cultivate differently using smaller, more dispersed plots. This is because of higher elevation, cooler temperatures, rockier terrain, more brush and forest cover and greater distance from markets and services such as tractors for hire (ground breaking and soil tilling is done in the traditional way by oxen). When plots are too far away from the homestead, a few family members will move there during the growing season. Some passive ditch-based irrigation occurs when plots are close enough to a river or stream. The Elders explained that the growth of crop cultivation was a defensive response to the Sonjo people who were expanding their cultivation into the Naan area in the mid 1990's.

Larger, industrial scale farming occurs in the lower lying, flatter topography of Loliondo-Wasso area where it is warmer and closer to sources of equipment, implements and maintenance services. This scale of farming requires much more land than family based agriculture and is a constant threat by reducing the availability of pasture lands. The threat is so real that in November 2019, 4 foot deep trenches were being dug around the outskirts of Loliondo to prevent the spread of large farm land developments into the highlands.

6.4 Forest Use 1920-2019

There are two principle forests in the homeland area: the Loliondo I Forest southwest of the town of Loliondo and to the northeast in the highlands, the larger Loliondo II Forest Reserve, which is sustainably managed by the Enguserosambu Forest Trust (EFT). The Loliondo I Forest continues to be over-harvested and poorly managed by the district government. Eventually, the EFT wants to assume management responsibilities for the Loliondo I Forest to restore the forest's health and diversity, and to eventually gain land title of the forest reserve.

For cultural and economic reasons these forests are as important to the Maasai as their pasture lands. The forest provides wood for fuel to cook and heat and to build bomas and homes and other structures. It is also a source for harvesting fruit, nuts and honey to eat; accessing trees and plants for medicinal and ceremonial purposes; and meeting and gathering to celebrate special events (such as the transition of youth into Moranhood) or undertaking healing treatments (such as the women's fertility ceremony) or seeking spiritual renewal. The majority of these forest activities are organized, managed and undertaken by the women.



Woman carrying firewood Ng'arwa, Nov. 2019

The forest plays an important role as a source of income such as women gathering and selling firewood, which the EFT discourages favouring alternatives such honey production as a more sustainable activity. The forest also is a source of water for people and livestock, and a refuge from the heat during the dry season.

Here are some examples of the cultural and economic importance of the forest:

- The branches of the *Olarni* tree are harvested and burnt to create hot embers which are put into the calabash (the gourd that women use to collect milk from livestock), left overnight and in the morning the ashes are shaken out. This process and remaining residue prevent the milk from going sour for up to 3-4 days. A European biochemical firm is studying the chemical make-up of this process to determine whether it is an effective alternative to refrigeration.
- The *aloe vera* plant, which grows throughout the forest, has medicinal qualities that have been used for generations to reduce swelling of the prostrate or to apply to cuts to stop bleeding and promote healing. The Elders said this another example of how the pharmaceutical industry has appropriated from Indigenous Peoples their traditional knowledge and natural resources for profit without proper consultation, consent or compensation. Aloe vera is also used as a skin moisturizer and has the potential to slow the spread of cancer.
- The *oseiyiai*, *olainitui*, *oreteti*, *ormisgiyioi*, *oloirien* and *oltukai* trees are used in the woman's ceremony to increase fertility. The leaves from these trees are burned in the centre of a boma and the ashes are brought to and stay at the home of an infertile woman. Then the fertility ceremony is conducted in the forest by the women, who have had children, to bless and wish good fortune for the woman to become fertile.

6.5 Summary of Land Use Change from 1920-1990 to 1990-2019

A GIS digital spatial analysis was completed to compare the extent of change in land available for pasture and forest use between these time periods. The result of the analysis showed that there has been a 40 percent reduction.

7. Water Use (1920-2019)

Seasonal and year-round rivers, human made wells, natural springs, wetlands and constructed dams and reservoirs provide a diversity of water sources critical for managing livestock during the annual cycle of dry and wet seasons. Tables 7 and 8 identify important water sources and their seasonality. These sites are located on Map 8.

Over the last 30 years access to rangelands to pasture livestock has been significantly reduced due to competing land uses such as expanding agriculture, increasing immigration/population, growing conservation lands and increasing demands for water.

This shrinking access to land requires the Maasai to carefully manage their herd size and composition from one season to the next. Over the last 10 to 15 years cattle have been steadily replaced by sheep which require significantly less water and land for grazing. Furthermore, the market demand for sheep has increased over the same period of time thereby providing more income per pound. Goat numbers are growing as well compared to cattle because they require less water; and, are more opportunistic grazers including thorny vegetation which cows and sheep will not eat.

Most of the seasonal rivers start dry in the highlands and gradually increase their water flow further downstream as they lose elevation until they join a larger year-round river.



Human made livestock water reservoir as seen from the Almatasia Camp, Nov. 2019

Table 7: Water Sources - Rivers

Key for Table 7: Year-Round River (Y); Seasonal River (S)

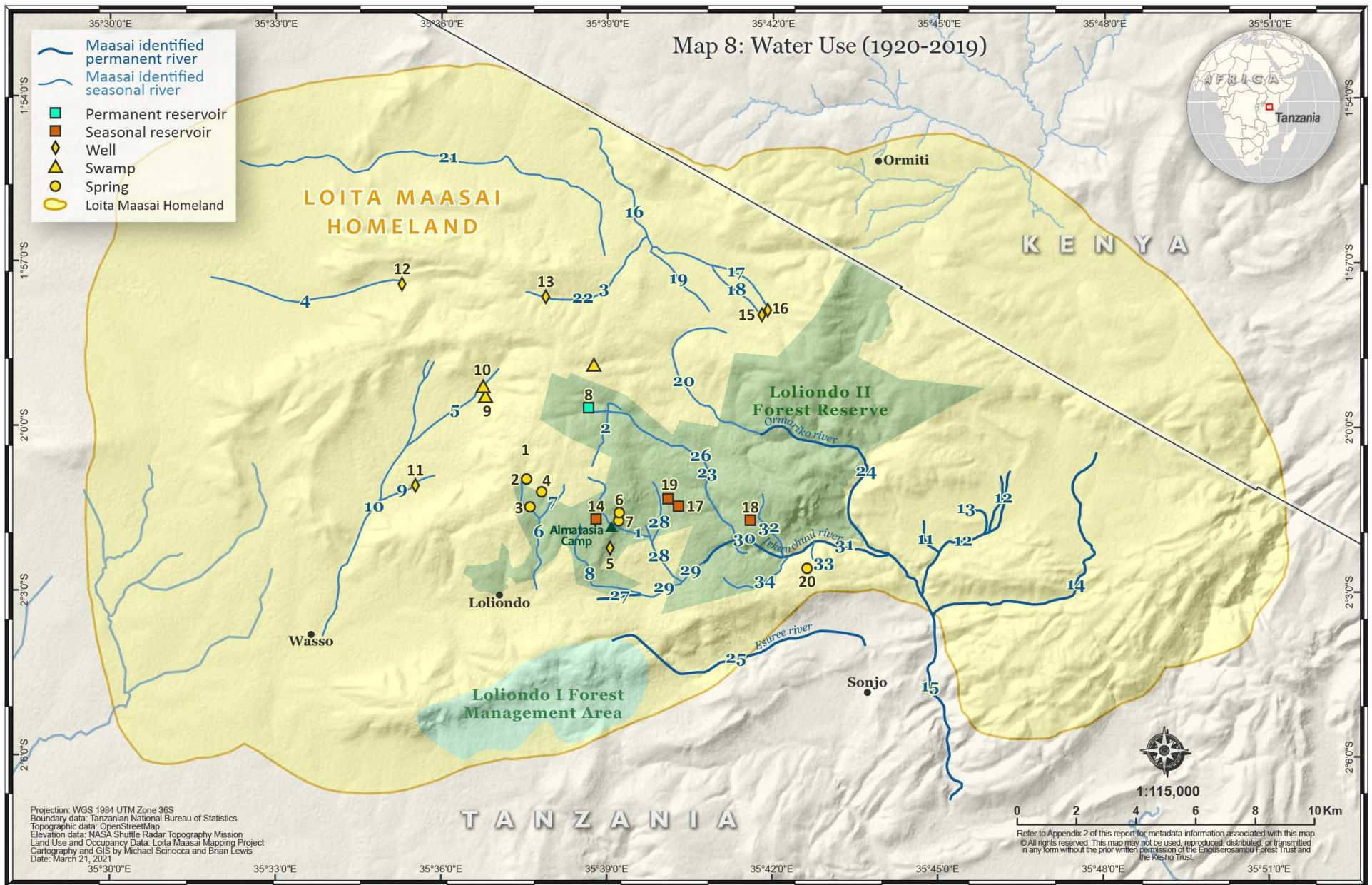
	River Name		River Name		River Name		River Name
1	Indondole (S)	10	Lepolosi (S)	19	Ormagutian Lolokeri (S)	28	Olaimuriunyai (S)
2	Olembaima (S)	11	Naan (Y)	20	Orkejulolasai (S)	29	Orkereiyai (S)
3	Engoseremai (S)	12	Ilotimi (Y)	21	Noosindin (S)	30	Ngeretti (Y)
4	Imbeuti (S)	13	Oloibor Soit (Y)	22	Engoseremai (S)	31	Orkanchuul (Y)
5	Embolioi Narok (S)	14	Irkoroin (Y)	23	King'arana (S)	32	Ingetura (S)
6	Oloondare (S)	15	Ormariko (Y)	24	Ormariko (Y)	33	Unnamed (S)
7	Iparrbali (S)	16	Pololet (S)	25	Esuree (Y)	34	Orkejua Lenoongidikoni (S)
8	Inchoroi (S)	17	Orimagutian Loolchoroi (S)	26	Erramashata (S)		
9	Kidongonyek (S)	18	Ormagutian Lendoinyo (S)	27	Oloombirbili (Y)		

Table 8: Water Sources - Other

Key for Table 8: Well (W), Spring (S), Wetland (WL) and Seasonal Reservoir (SR) and Year-Round Reservoir (YR)

	Water Feature Name		Water Feature Name		Water Feature Name		Water Feature Name
1	Orchoro Loo Ndare (S)	6	Enchoro Ole Sara (S)	11	Kidongonyek (W)	16	Elchoroi Lenapukudet (W)
2	Orchoro Lotpiron (S)	7	Olaimurunyai (S)	12	Imbeuti (W)	17	Oloendetia (SR)
3	Orchoro Loondisi (S)	8	King'arana (YR)	13	Engoseremai (W)	18	Olturoto Lolodung'oro (SR)
4	Tendeu (S)	9	Olayiangalani (WL)	14	Enchoro Enesirwa (SR)	19	Olturoto Loopiripirin (SR)
5	Enchoro Lesirmei (W)	10	Esere (WL)	15	Elchoroi Lenapukudet (W)	20	Enchoro Ole Moina (S)

Map 8: Water Use (1920 - 2019)



These water sources are widely used and known by their name and associated history or description:

- The ***Tendeu*** is a natural freshwater spring in the Orkiu Juu area that feeds a well made by a person named *Tendeu*. He was Terere Tutayo's, one of the community researchers, grandfather who used to pay him as a child to clean the mud from the well every year.
- The ***Noosindin*** is a seasonal river which joins the *Loosirwai* River in the Enguserosambu area. It is named after *Isindin* stones which make up the riverbed. The stone or pebble is red in colour and is used by children to colour their face red during play time.
- The ***Ilotimi*** is a year-round river which flows into the *Ormariko* River, the principal waterway in the Naan area. The river gets its name from the *Ilotimi* or baboon which reside in the big tall trees along the banks of the river. This river is used by most of the homesteads in the Naan area for domestic and livestock use.
- The ***Esuree*** is a year-round river used by the Maasai from the Ng'arwa area and by the Sonjo people who live to the southeast. The water from this river is pumped by pipeline to Wasso and Loliondo, which is some 20 km to the west. In the future Loliondo wants to pump even more water from the river to service increasing residential development within its recently expanded municipal boundaries.
- The ***Oloombirbili*** starts as a year-round river in the Ng'arwa area but disappears to ground when arriving in a wide valley and then it re-appears as the *Orkereiyen* which is a seasonal river up stream of the *Negeretti* which is a year-round river up stream of the *Orkanchuul* River. These names represent 4 different sections of the same river; each likely reflecting a different lived experience by a different Maasai group.
- ***Ormagutian Lolokeri*** is a tributary of the *Pololet* River in the Enguserosambu area. A tough grass, *Ormagutian*, which cattle can not eat grows along its banks. The grass is planted around crops to delineate ownership and to prevent cattle from wandering into these plots and eating maize (corn)



Water supply stream at the start of the wet

8. Wildlife and Livestock Predation

When identifying the mapping themes, it became clear to the research team that attempting to capture the Elders' understanding of the wildlife ecology of their homeland would be beyond the scope of the project as well as the time and resources available. That work is a stand-alone effort that can be done in the future when time and funds permit. Instead, it was agreed that the focus for now would be on the key wildlife species that have cultural and economic significance (impact of predation) to the Maasai.

Elders described that the distribution of wildlife throughout their pasture and forest lands has not changed significantly over the last 30 years, but the density of wildlife has declined which means that there are fewer wildlife – livestock encounters. Today, wildlife such as the hyena, wild dog, leopard, eland, baboon and colobus monkey can be found generally anywhere in the 1990 - 2019 year-round land use area shown on Map 9. Therefore, these animals have not been specifically mapped. However, over the last 30-50 years the range and prevalence of animals such as the lion, Cape buffalo and rhinoceros have been partially or significantly reduced. The remaining locations of these and other animals such as the wildebeest, ostrich, zebra and hartebeest along with particularly high concentrations of eland and leopard are shown on Map 9. Table 9 provides the Maa names and documents the frequency of each species identified.

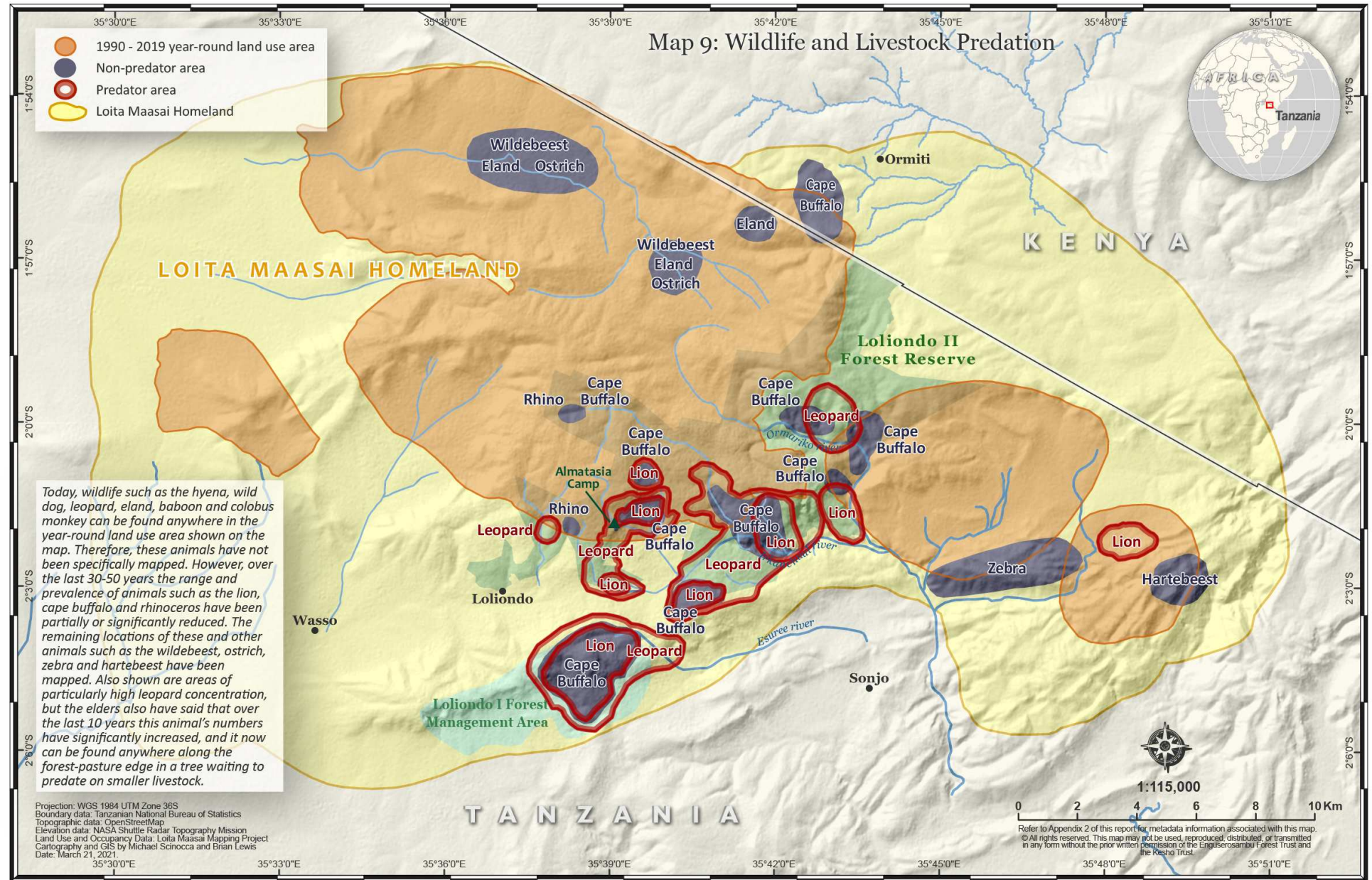
A countervailing and economically significant trend over the last 10 years described by the Elders is the growing numbers and concentration of the leopard population. This is an increasing concern for the Maasai and a challenge to manage. The animal can be found anywhere along the forest-pasture interface resting in a tree waiting to quietly drop, kill and retrieve smaller livestock in a split second. This happens so quickly that it is typically unnoticed.

Table 9: Wildlife Names and Frequency

	Maa	English		Maa	English
1	Oltome (2)	Elephant (2)	15	Orkon'di (3)	Hartebeest (3)
2	Emuny (1)	Rhino (1)	16	Engailee (4)	Thompson Gazelle (4)
3	Olarro (3)	Cape Buffalo (3)	17	Olong'ukumbau (3)	Water Buck (3)
4	Isuiyian (4)	Wild Dog (4)	18	Embarie (4)	Savanah Fox (4)
5	Orbitir (3)	Wart Hog (3)	19	Orpwaa (4)	Bush Buck (4)
6	Orkonoi (4)	Hyena (4)	20	Orpilis (4)	Serval Cat (4)
7	Olowuaru Keri (4)	Leopard (4)	21	Inderei (4)	All Monkeys (4)
8	Iloitikoshi (4)	Zebra (4)	22	Dyai' (4)	Porcupine (4)
9	Iingatin (4)	Wildebeest (4)	23	Ormeut (3)	Giraffe (3)
10	Orguia (4)	Bush Pig (4)	24	Orng'atuny (2)	Lion (2)
11	Orkoroi (4)	Colobus Monkey (4)	25	Entara (3)	Python (3)
12	Oekenyi (4)	Baboon (4)	26	Esidai (2)	Ostrich (2)
13	Enaishiri Dama (4)	Ardvark (4)	27	Engewua (4)	Turoco (4)
14	Osirwa (3)	Eland (3)	28	Orkurragos (4)	Vulture (4)

Key for Table 9: (1) not present, (2) seldom seen, (3) small numbers, (4) large numbers

Map 9: Wildlife and Livestock Predation





Cattle in the Ng'arwa area at the forest-pasture interface, a location often frequented by Olowuaru Keri (leopards) to predate on calves, lambs and ewes, Nov. 2019



Lambs in a protective boma in the Orkiu Juu area. They stay safe here at night when predators are hunting. Nov. 2019.



Iloitikoshi (zebra), oingat (wildebeest) and cattle sharing the same savannah grasslands west of Lake Natron, Oct. 2019

The Elders also described that the government has often argued when evicting Maasai from protected areas it is because of the impact livestock have on wildlife habitat. Traditionally and today this is reportedly not the case, even around waterholes where they take turns drinking without conflict.

The Elders told stories about wildlife and their relation with livestock and how they use the land:

- ***Oltome*** or elephants in the past, and to a lesser degree now, migrate through the Orkiu Juu area while grazing going west in the wet season (November-May) to the savannah plains west of Wasso, and then in the dry season (June-October) they go east to the forest highlands where they can find water.
- ***Iloitikoshi*** or zebras drink at water holes early in the morning, then go to pasture and occasionally the reverse drinking late in the evening. They share pasture and drinking holes with cattle, and typically migrate slowly through the grasslands as they graze.
- ***Olowuaru keru*** or leopards are confident and not intimidated by people or other animals because they can use trees as a route of retreat or escape.
- ***Orng'atuny*** or lions are the “King of the Forest”. When encountering each other, a leopard will retreat to avoid the lion. The lion preys on any animal, even the elephant – hunting as a family. When elephants pass, the dominant male will hide and attack by separating out the young, smaller or older, weaker elephant for the kill while others divert the larger adults.
- ***Orkonoi*** or hyenas are known as wasteful, wild, out of control predators killing more than they need. They attack the hind quarter or under belly of cattle and start eating the running animal while it is still alive. They rely on vultures to show them carrion sites. They are seen as big cowards, using their acute smell to quickly run from danger.



Ekenyi, baboons are known to raid gardens and attack calves by jumping them and scratching their eyes out, Nov. 2019

Table 10: Wildlife Impacts and Protection Strategies

Wildlife	Impact	Maasai Protection Strategy
1. Ekenyi (baboon) <ul style="list-style-type: none"> live and are active in the forest travel, hunt and forage in extended family groups (troops) 	<ul style="list-style-type: none"> raid and destroy crops kill lambs, ewes and calves by jumping on their back and scratching their eyes out 	<ul style="list-style-type: none"> at sunrise someone is always watching the crops and ready to ward off the troop herders will chase off the troop with a staff or club
2. Engaluko (impala) <ul style="list-style-type: none"> live primarily in the forest to feed and secure shelter 	<ul style="list-style-type: none"> feed on crops at night 	<ul style="list-style-type: none"> set up wire traps use scare crows made of sticks and cloth to frighten them off
3. Orguia (bush pig) <ul style="list-style-type: none"> live in the brush close to pasture and crop lands 	<ul style="list-style-type: none"> feed on crops by digging at night and during the day 	<ul style="list-style-type: none"> set up traps make fires by burning goat manure which smells bad driving the pig away
4. Orkonoi (hyena) <ul style="list-style-type: none"> live in ground holes attack only when livestock is moving attack from behind or under the belly 	<ul style="list-style-type: none"> hunt livestock (calves, ewes, lambs) in packs killing more than what is needed uncontrolled, random hunter 	<ul style="list-style-type: none"> keep dogs out at night to alert herder bring livestock into the boma at night for protection
5. Orng'atuny (lion) <ul style="list-style-type: none"> being pushed out due to population growth and increased farming but still is a threat 	<ul style="list-style-type: none"> aggressive, intimidating hunter using their roar and presence, very technical and controlled in August 2019, 2 young males killed a calf in the Orkiu Juu area 	<ul style="list-style-type: none"> protect livestock in bomas at night confront and legally kill lion by spear and/or bow and arrow set up big fires around the boma
6. Isuiyian (wild dog) <ul style="list-style-type: none"> only in the area in packs in the wet season attack only once and then leave the area 	<ul style="list-style-type: none"> feed on calves, lambs and ewes organized, tactical hunter in packs will pass meat to other dogs while running eat only fresh kills 	<ul style="list-style-type: none"> protect livestock in bomas at night keep dogs out at night to alert herder
7. Olowuaru keru (leopard) <ul style="list-style-type: none"> present in large numbers found in trees in the forest-pasture interface 	<ul style="list-style-type: none"> technical, strategic, quick tree-based hunter 	<ul style="list-style-type: none"> can be baited and trapped can be poisoned

9. Existing and Proposed Development Pressures

9.1 Overview

Map 10 shows that in the past, and now, the Loliondo-Wasso area has and will continue to be under significant pressure to develop economically. These pressures have included: i) the establishment of vast conservation/protected areas, game hunting reserves and privately, foreign owned wildlife-viewing safari operations; ii) the development of plans and construction of major infrastructure projects to encourage and support population growth; iii) the uncontrolled harvest of forest resources; iv) the private development of mineral resources; and, v) the continuous expansion of crop cultivation.

There are reasons that this area is under such pressure: i) government perceives the pasture land as vacant, under-used, and seeks to provide access to vast areas of fertile land for cultivation; ii) existing conservation/protected areas are overused and there is potential for establishing new areas toward Lake Natron; iii) proximity to the Tanzania-Kenya border presents business opportunities; iv) significant water potential exists in the highlands northeast and east of Loliondo; and, v) the construction of the Arusha to Serengeti highway will provide critical access to resources of the region and the services of Arusha.



Road building equipment constructing the Arusha to Serengeti highway south of Wasso, Oct. 2019

Conservation Areas

The impact of these conservation initiatives since the 1950's, have displaced the Maasai, many times violently or by legal order, arrest or fines, from their traditional pasture lands. People have been evicted by government authorities and threatened by private developers, their homes have been burned, their property has been destroyed and their cattle have been seized.

There are three examples since the early 1990's that demonstrate this (Mittal and Fraser, 2018):

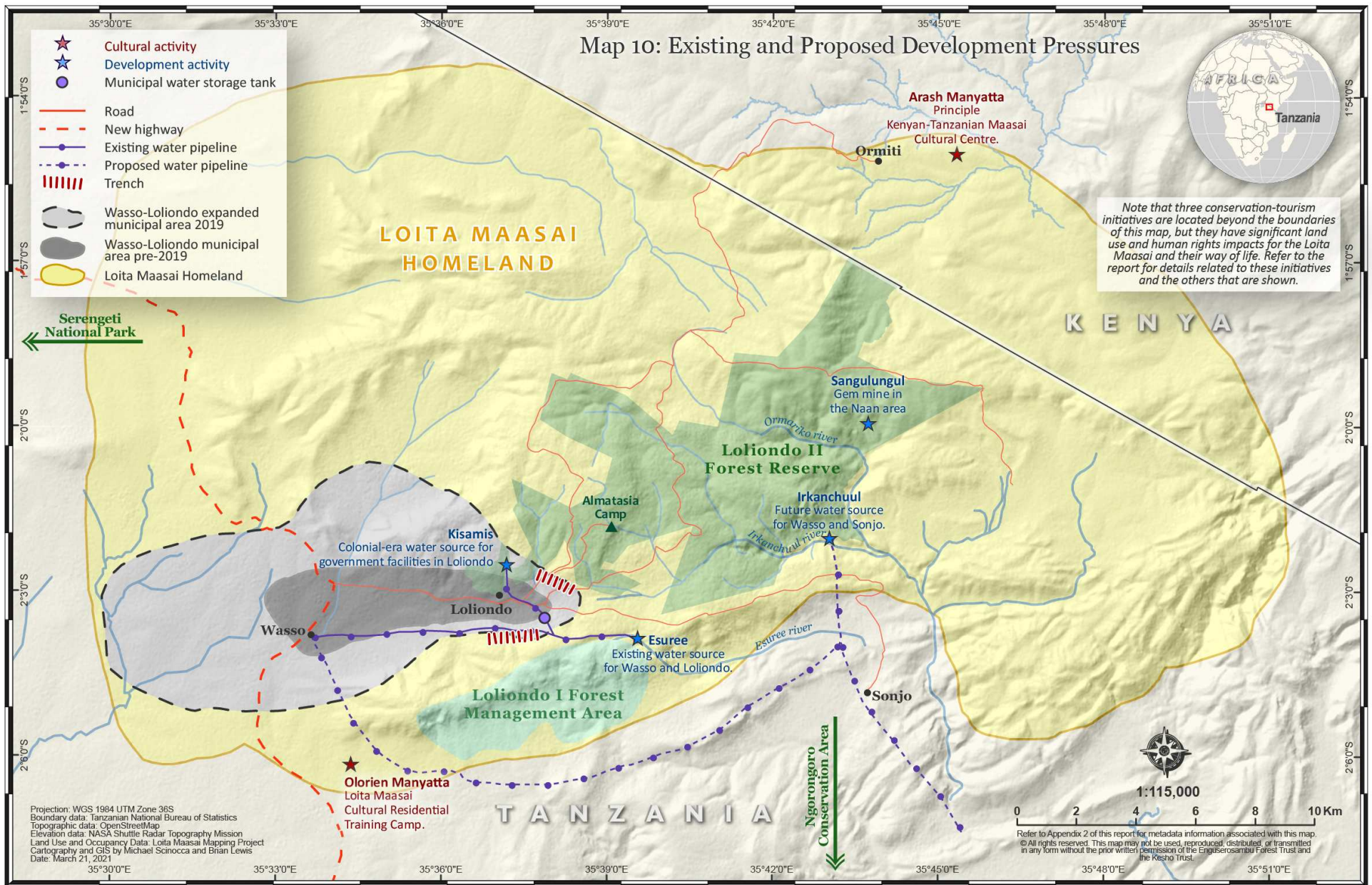
- the granting in 1992 of a large exclusive hunting reserve adjacent to the Serengeti National Park to the Ortello Business Corporation (OBC), owned by the United Arab Emirates Royal Family;
- the transferring in 2006 of a 1,200-acre lease to Thomson Safaris, a US owned company, that operates luxury wildlife safaris in northeastern Tanzania; and
- the 2019 proposed significant expansion of the Ngorongoro Conservation Area by 4,000 km² driven by international pressure from UNESCO.

In the case of the expansion of Ngorongoro Conservation Area, re-settlement lands have been offered by the Tanzanian Government but local Maasai Elders remain concerned:

“The land cited for replacement, despite its size, does not have a single stream and is not suitable for pastoralism. If this plan is to prevail, cows will perish in the Ngorongoro Conservation Area before 2030 and will mark the end of the Maasai community in this famous World Heritage Site.” (Maasai Elder, name withheld for security reasons, October 9, 2019; Mittal, 2020)

All three of these conservation-pasture land conflicts have or are being challenged by the Maasai in the East Africa Court of Justice, with the assistance of international human rights and legal defense groups. Outcomes from these proceedings have been generally supportive of the Maasai.

Map 10: Existing and Proposed Development Pressures



9.2 Other Developments

From 2014-2019, 500 residential lots were sold in the Wasso-Loliondo area of which only 10 were sold to Maasai. Because of the growing demand for land to develop, in 2019 the boundaries of the 2 towns were expanded into the adjacent Maasai homeland. This doubled the area of the municipalities which now allows for more commercial and residential land development. The expansion also included the development of a new water source, which is essential to supporting future development.

Map 10 also shows a future water and pipeline development at *Irkanchuul* for an estimated cost of 2.8 billion Tsh (\$12.5 million US) to serve Wasso and Sonjo. This proposed development is a threat to the water supply in the Naan and Engusersambu areas.

The *Sangulungul* gem mine located in the Naan area has been operating intermittently over the last 6-7 years with few environmental controls under a licence issued to a Chinese company and another to the Maasai from the Naan area. Currently the mine is dormant, but when operating a large supply of water is required to process the gems.

10. Conclusions and Recommendations

The intent of this project was to collect as much information from as many Elders as possible over a relatively short period of time. This approach documented a comprehensive overview of Loita Maasai traditional and contemporary land use and occupancy in northeastern Tanzania. This was successfully achieved for the following reasons and should be considered best practice for future research:

- being prepared and self sufficient in terms of basic interviewing equipment, mapping materials and supplies in a remote area without electricity, with limited facilities and little access to re-supply;
- having basic field support including prepared meals and secure accommodations which allowed the research team to focus on training, conducting interviews and documenting findings;
- having a clear understanding of the priority information that was needed and developing specific interview themes around those priorities;
- providing the technical training for the community researchers to conduct the interviews using basic techniques such as working with a base map and overlay outdoors on a cow skin on the ground. Direct to digital mapping using a laptop will not work due to the lack of accessible electrical power, the poor outdoor interviewing conditions (i.e. sun glare, high wind/blown dust, rain etc.), and the number of participants (i.e. 4 or more participants around a small screen). The digital technology is also intimidating and would be a distraction to fully engaging the Elders;
- conducting mapping interviews by knowledgeable, committed community researchers who could communicate directly with the Elders without the distraction and delays of translation;
- capturing the high level of participation and interest of the Elders and community researchers through audio and video recordings and photographs;

- reviewing, with the community researchers and documenting in detailed notes, shortly after the interview, the map information and the notes taken during the interview to ensure that the person (project or field coordinator) preparing the final report and digital maps has a clear understanding of the findings;
- reviewing the draft report and maps with the community researchers, the Enguserosambu Forest Trust, the Council of Elders, the Kesho Trust and the Elders who participated in the interviews;
- taking the time before the interview to engage the Elders explaining the importance of the mapping and that other Indigenous groups around the world have undertaken similar projects for similar reasons; and
- being flexible and accommodating when arranging and conducting interviews in four different locations over a large, remote area.



Sheep near the Almatasia Camp, Nov. 2019

Based on how this research was done and the land use and occupancy information that was generated, a number of recommendations are offered related to undertaking future research:

- engage and fund an experienced study coordinator to oversee the research and to prepare draft and final reports, and a field coordinator to oversee and organize the activities of the community researchers;
- use and fund the same team of community researchers who now have the experience, confidence and credibility to conduct interviews and document findings;
- build on the community good will and support that was created by this initial study by using the best practices described above to organize and conduct the research; and,
- establish future research priorities that complement this initial study including suggestions provided below.

a) **Detailed Use and Occupancy Mapping:**

Focus on building a deeper understanding of land, forest and water use patterns past and present by conducting detailed individual/family map biography interviews. In addition to basic use mapping this would include family demographics, birth places, Manyatta sites, special ceremonies, temporary living sites, travel routes, livestock management practices, agriculture activities, wildlife predation management strategies etc. These individual/family interviews would be digitally consolidated/rolled up to show at a community scale both the intensity and extent of land, forest and water use. Also, a wealth of cultural and historical information would be collected to demonstrate occupancy or the strong culture ties that the Maasai have to the land, forest and water.

As shown in the Canadian experience, this detailed research would provide the “evidence” that would be expected by the judiciary as “proof” of customary land rights based on traditional and contemporary land use and occupancy.

An initial estimate of effort would be 25 interviews for each of the four sub-communities for a total of 100 interviews. With two 3-4-hour interviews per day by two community researchers working an average of four days a week, the 4-person research team could complete the work in approximately 8 weeks. An additional estimated 16 weeks (project coordinator and GIS person, 5 days / week) would be required to process and digitize the maps and prepare the draft and final reports.



The new Musoma (Lake Victoria) to Arusha highway with the town of Wasso in the back ground, Oct. 2019

b) Detailed Development Pressure Assessment and Mapping:

Since the creation of Serengeti National Park by the British in the 1950's, there have been steady development pressures on the Maasai use of land for pasturing their livestock during the dry and wet seasons. In addition to conservation related land withdrawals, since the early 1990's the cultivation of small family scale maize, beans and potato plots has grown extensively. More recently there have been growing development pressures related to: urban expansion in towns such as Wasso and Loliondo; large community scale wells and water pipeline developments and proposals; exclusive hunting reserves and safari lodges; new mining developments; forestry operations; and, the building of a highway from the Serengeti to Arusha. These developments have been occurring in the absence of meaningful consideration of the social, economic and environmental impacts on the Maasai culture and way of life.

To address this shortfall, a comprehensive assessment is required to understand and map these impacts and then by overlaying them on the Maasai land use and occupancy maps, the social, economic and environmental impact can be identified. Such an analysis also will identify the cumulative effects of these various development projects and provide a basis for the Maasai to argue for greater land rights. With such rights, they could continue to lead a traditional lifestyle and maintain a close cultural connection to their homeland.

Undertaking such an assessment would be controversial and take a significant amount of time and resources to complete given the number of development pressure that will likely proceed in the next 10-15 years. A multi-disciplinary team would be required of local Maasai researchers and others from Tanzania and elsewhere with technical specialities in various areas. This project would have to be coordinated with the detailed land use and occupancy mapping recommended above.



Relaxing between mapping sessions at a homestead in the Ng'arwa area, Nov. 2019



(L-R) Anna Shololoi, community researcher, and Elders taking a break from mapping at a homestead in the Enguserosambu area, Nov. 2019

11. Post Script

When this mapping project started, the research team was reminded by Samwel Nangiria that maps were “a tool of colonial governments to control and dispossess Indigenous Peoples of their lands”. By drawing boundaries which divided traditional homelands the seeds of inter-tribal conflict were sown and often encouraged, some which have continued for generations. Map making also was used to create a European system of land ownership – a system that the Maasai as semi-nomadic pastoralists never accepted. Today, this lack of so-called “evidence of ownership” continues to be to their disadvantage in the courts as they fight for their traditional land rights. It is the hope of the research team that this report and the maps that the Elders created will start to reverse this legacy of colonialism, and that the report and maps can be used fruitfully in the Loita Maasai struggle to claim what is rightfully theirs.



A Maasai herder watching livestock just before leaving for his homestead in the Orkiu Juu area, Nov. 2019

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Appendix 1: Detailed Place Name Types and Descriptions for Maps 3, 4 and 5

#	Place Name	Type	Description
1	Orangai	TL	Maasai walking trail/route.
2	Musaakwani	TL	Named for the scrub and small trees (called <i>Musaakwani</i>) found in patches.
3	Ewuas Rangai	TL	Located in pasture lands used by the Maasai.
4	Ewuas Olaimurunyi	TL	Named after the nearest well named <i>Olaimurunyi</i> .
5	Ewuas Orkereyian	TL	An open area in the middle of the forest with a tall grass species called <i>Orkereyian</i> .
6	Oloongoitoi	TL	An extremely eroded area due to over use by large cattle herds.
7	Iwuasin Oo Mbaoi	TL	This area in the forest is where logging started for the village of Orkiu Juu.
8	Ngodin	TL	The <i>Ngodin</i> or Hartebeest is found here.
9	Olokuseroi	TL	An area with lots of trails naturally made by erosion.
10	Engoseremay	TL	Valley with Loserema trees.
11	Engoriong' Ontepes	TL	Goats eat the leaves and fruit of the <i>Ontepes</i> tree at the beginning of the dry season to become fat and healthy. Traditionally it is used as a natural medicine by boiling the leaves and washing the body under the direction of the medicine person.
12	Osupuko Rangai	TL	Named after a narrow open area.
13	Ilotimi	TL	Hill with trees with lots of <i>Ilotimi</i> or baboons living there earlier and now they eat pasturing lambs and baby goats.
14	Ngaabashi Engeju	TL	This location is a known land mark.
15	Elangata Ormutani	TL	This location is a major crossing point in the valley.
16	Esoit Olowuaru	TL	Outcrop where <i>Orng'atuny</i> , or lions used to stay with good view for hunting.
17	Embaash Olobo	TL	A place name for a mountain pass.
18	Iloshon Rongeni	TL	Three sets of parallel hills with a stream in each valley.
19	Embeti	TL	Valley with a wetland which has a stone/rock dam which needed mud to fill the cracks.
20	Olokuseroi	TL	In the dry season the clay ground will crack and in the wet season these cracks will close.
21	Enderkeny	TL	This hill is so steep that a person would have to climb hand over hand when they are ascending and on their behind when they are descending.
22	Orkarkar Lengapune	TL	Rocky place with caves used by Moran to slaughter livestock for the meat camp.

Key for Appendix 1: Topographic / Natural Landmark (TL); Living Site / Homestead (LS); Pasture (PA); Biological / Wildlife Landmark (BL); Trail or Crossing (TC); and Water Feature (WF).

#	Place Name	Type	Description
23	Oromboi	TL	Hill with sparkling rocks which can be seen in the distance glittering when hit by the sun or moon light.
24	Olosho Lenkijape	TL	Hill without trees that is windy and very cold.
25	Oyarata Lenoondatwa	TL	In the first half of the 20th century, a man named <i>Oltatwani</i> built a well there for his and his livestock's use.
26	Oyarata Lesoit	TL	This valley has a big rock that herders sit on when it is not raining and stand on when raining to find shelter.
27	Oldonyo Lormurran	TL	A lot of springs are in this area which makes it a good place for meat camps. Plus the surrounding forest provides herbs for the Moran during meat camps.
28	Iyarat Lorkimusei	TL	This is an area which has many small valleys
29	Sukude	TL	These small rolling hills look as if they are crouching. All of these hills are conserved or set aside in the wet season for dry season use. This is also a homestead area.
30	Ilotimi	TL	In the foot hills of this area there are springs for livestock and humans. There also is a large number of <i>Olkenyi</i> , or baboons living here. This area has grazing potential.
31	Olosingo	TL	In the foothills of this area there is a homestead in a location named <i>Olosingo</i> that provides significant pasture lands.
32	Engidikirroto	TL	The area is named after the natural feature.
33	Endoinyio Olarro	TL	This area was used by big buffalo who drank water from the spring on that hill. The hill also provides a grazing area.
34	Oloongoitoi	TL	An extremely eroded area due to over use by large cattle herds.
35	Erramashata	TL	The two hills that meet here make a valley which is called <i>Erramashata</i> .
36	Osiidu	TL	This open area is created by two long forests which are parallel to each other.
37	Sangulungul	TL	Place where people go to sacrifice a sheep, cow, or bull, when there is extended drought.
38	Oloosuyan	TL	Found in the middle of the forest where plenty of wild dogs, or <i>Isuiyan</i> , stayed in the past.
39	Engoseremai	TL	Valley with human-made wells and with a patch of <i>Elooserena</i> trees.
40	Tiololo	TL	Place where the <i>Orkon'di</i> , or Hartebeest is found.
41	Koimasasi	TL	The place name is the actual description of the location.
42	Edoinyo Enchimbi	TL	This place is named after a person named <i>Nehimbu</i> who was eaten by a <i>Orkonoi</i> , or Hyena there a long time ago.
43	Enguserosambu	TL	This is a grassy area with loam soil that in the dry season cracks in a zig-zag pattern similar to the stripes of a <i>Ilotikoshi</i> , or zebra.
44	Loltidu	TL	Named after a flying insect which bites livestock and wild animals in the wet season.

#	Place Name	Type	Description
45	Oloosirwai	TL	In the 1980s this area had many <i>Osirwa</i> , or Eland antelope that were hunted heavily by the <i>Ittorobo</i> tribe, a hunter and gatherer group who are very nomadic.
46	Oloomuran	TL	Means Moran hill and is used by the Moran or warriors for meat camps because of the herbs available for soup and the freshwater provided by a river.
47	Loirukuruko	TL	A series of parallel hills and valleys with good pasture lands.
48	Sangulungul	TL	Place where people go to sacrifice a sheep, cow, or bull, when there is extended drought. There is a sudden drop into a deep valley with a dense forest.
49	Irkarkari Lekilutori	TL	This area has a large overhanging cliff face which people can walk under.
50	Embaasha Oowuyai	TL	This is a lowland which people and animals used to travel through, and the <i>Ndorobo</i> tribe put traps there to capture animals. This tribe is nomadic and hunts wild game and gathers fruit.
51	Oldonyo Onyokie	TL	When it rains the water turns red due to the high concentration of iron in the soil.
52	Emowuo Orkita Laswa	TL	The forest on the hillside had the <i>Orkitalaswa</i> tree that was used by Moran (warrior) to make soup when camping.
53	Ilororo	TL	The forest surrounding the outcrop has a tree harvested by the women for traditional bed posts.
54	Sangulungue	TL	Place where people go to sacrifice a sheep, cow, or bull, when there is extended drought.
55	Ewuas Orkereyan	TL	An open area in the middle of the forest with a tall grass species called <i>Orkereyan</i> .
56	Ewuas Orkeek	TL	An area named for the few single trees there.
57	Orkarkr Lewuas Orangai	TL	A narrow open area of rock outcrop within the forest.
58	Musaakwani	TL	Named for the scrubs and small trees found in patches .
59	Entepesi	TL	Area is concentrated by thorny short trees, called the <i>Intepes</i> tree.
60	Oyarata Loloombiribili	TL	An area where women gather grass to weave drinking cups.
61	Nkoomani	TL	Rocky outcrop with grass and the <i>Ekooma</i> tree.
62	Orkarkar Lorkonoyi	TL	Rocky outcrop with small deep caves where <i>Orkonoi</i> , or hyenas live.
63	Enkorika	TL	The place name is the description of the topography and vegetation of the location.
64	Loodokulukok	TL	Two hills with an open area between the hills which have red soil.
65	Ewuas Esoit	TL	Open area with a rock outcrop in the middle.
66	Orng'arwa	TL	Wide valley in which the water table is close to the surface which keeps the valley floor green. The valley has many human made wells. This is where the name "Ng'arwa" comes from.
67	Olenapi	TL	This place name describes a hill which has a steep/sharp peak.

#	Place Name	Type	Description
68	Oloonkoitoi	TL	An extremely fragmented area due to erosion caused by the movement large cattle herds.
69	Olchamba	PA	A large German farm during the colonial period which now is re-settled by Maasai.
70	Orkoroi	LS	This is the name used for one of the smaller sub-communities of Orkiu Juu.
71	Emurwa Orkirorwa	LS	This living site is named after a Maasai Elder's group who used to live there in the late 1890s.
72	Ilchorieti	LS	A living site which is no longer used. The place name comes from the Maasai word <i>Eloitorcori</i> which means level or flat land.
73	Imanyat Ekujuk	LS	Place where many manyattas were established and were last used in the 1980s by the third to last Moran age group. Signs of the structures still remain.
74	Emurua Ooretet	LS	This place is close to a patch of trees.
75	Olosho Oodo	PA	Place name for where livestock graze and it is the highest hill in the Orkiu Juu area.
76	Ilshon Lolturoto Onyokie	PA	Hills are near swamps with red water due to the iron content of the red soil.
77	Olndidai	PA	Someone named <i>Olndidai</i> used this pasture for his sheep and goats everyday a long time ago.
78	Entapot	LS	This area has some homesteads on the flat top of a hill.
79	Emuate Enkeseyian	LS	Old homestead of someone called <i>Enkeseyian</i> who lived there in the 1880's.
80	Emurwa Oltimanang'eni	LS	This place is where someone used to live but now vines with flowers grow on the ground.
81	Emurwa Oormong'i	LS	Prior to being a homestead, this area was grazed specifically for oxen to fatten them up for traditional purposes including slaughtering ceremonies.
82	Ndulele	LS	This area is named after the <i>Intulele</i> shrub.
83	Olosira Piding	LS	This homestead is found on a small hill in the foothills of a bigger mountain range. This area has thin row of <i>Elwaa</i> trees which makes it look as if it was drawn on the landscape.
84	Karkar Moru	LS	This area is covered by rocks with round stones that are used in Moran circumcision ceremonies.
85	Isupukia	PA	Earlier this area was used for livestock grazing during wet season. The <i>Isupukia</i> tree grows in this area.
86	Iloosomodiok	PA	This is a grazing area which is heavily used with lots of livestock dropping and is very productive.
87	Irmatasiani	LS	In this area there are plenty of <i>Ormatasia</i> trees which are used for body perfuming and used by Moran to create beds at the meat camps.
88	Karandini	TL	This hill was preserved for sick or infected livestock because it could be easily closed to healthy livestock and had access to pasture and water.
89	Kapiro	LS	People believe that a person named <i>Kapiro</i> used to live there many years ago.

#	Place Name	Type	Description
90	Olunguya	LS	This homestead is named after <i>Olunguya</i> , a person who lived there in the late 1900's.
91	Irmong' isirwai	LS	This place is named after oxen who go there to become fat during the rainy season.
92	Masinde	LS	Formerly a livestock pasture area named after <i>Ole Masundu</i> who used to live there. He was the first person to build a homestead there a long time ago.
93	Eluay Enengorotik	PA	This pasture produces good grass for good milk production, so cows have to be milked regularly to prevent calves from over drinking to prevent diarrhea.
94	Ilopiriki	LS	This homestead is located along a narrow path which livestock follow because of the thick forest on either side.
95	Iltarakwa	LS	This place is named after two <i>Iltarakwa</i> trees , which provided shade to resting livestock and were used for house and corral building. These trees are no longer there.
96	Ildukai Lolasai	LS	This is a shopping area now, but previously it was located along the banks of the river described in place name 93 (<i>Ingang'itie Olasai</i>).
97	Empepedoi	LS	Located near a hill which has a steep peak.
98	Emurwa Endodo	LS	This was a homestead 20 years ago called <i>Endodo</i> after a local bird.
99	Kirunyan	LS	Established recently as a long time for settlement. No history or background to the name.
100	Enairebuk	LS	Because of the frequent rains caused by a Kenyan mountain range this area is always damp. This forest here is called <i>Naimina Engiyio</i> .
101	Endashata	LS	This area is located in a shared border area between Tanzania and Kenya . The homestead is currently lived in.
102	Engoiyangalani	LS	This area borders Tanzania and Kenya and is located near a natural reservoir named <i>Engoiyangalani</i> .
103	Ngosesia	LS	An area with plenty of <i>Ololesiai</i> trees.
104	Engidikirroto	LS	This is a homestead used in dry season in the past and now, and is located in a high flat area with views of Naan.
105	Naan	LS	Naan is a secondary tributary of the <i>Ilotimi</i> River which runs into the <i>Ormariko</i> River. Also the name is used to call the complete area including all the homesteads of Naan. Naan is not a Maasai word and nobody knows its meaning.
106	Lositeti	LS	A location with a concentration of <i>Isitet</i> trees which is used to make the Maasai herding stick, known as the <i>Enchartuyian</i> and to build homes.
107	Kisikiria	LS	People don't remember the specific meaning of this place name.
108	Olenareyo	LS	This is where someone named <i>Olenareyo</i> lived in the first half of the 20th century. He made a short trail to check on his homestead and his wife.
109	Olchurai	LS	Place where there are small thorny <i>Ilchuraa</i> trees which are used to make fencing around the homestead. These trees are also used to make soup by boiling the bark and roots.

#	Place Name	Type	Description
110	Mutengwarr	PA	This valley has salt lick minerals which help cattle get fatter. After feeding on the salt lick the tendons of livestock soften along with their muscles.
111	Ngang'itie Ormoti	LS	A place where there is a hole in a rock outcrop that fills with water. The hole, which is 10 - 15 ft (3 - 5 m) wide, is made by swirling water.
112	Engutoto	LS	Located in the elbow or sharp angled valley made up of some hills.
113	Iltungurri	LS	A place where long ago, the <i>Iltungurri</i> or Cape buffalo used to gather. Formerly hunted for Moran or warrior ceremonial and traditional cultural purposes such as making rope and shields, but not for eating.
114	Olosho	LS	A pasture in an open hill area without trees that was set aside or blocked in the wet season as a management strategy to provide livestock feed during the dry season.
115	Irkutot Loloormongin	PA	A grazing area in forest used frequently by the <i>Iromongin</i> clan also known as the <i>Iltaroseero</i> clan.
116	Olosomodiok	PA	Grazing area which is heavily used with lots of livestock droppings and very productive.
117	Olchamba	PA	A large German era farm used during the colonial period and is now re-settled by Maasai.
118	Olengurare	LS	This homestead area was once open fields which had rock accumulations.
119	Engurashi	LS	Location of a cattle dipping facility for the treatment of insects/pests by walking the animals into water with insecticide.
120	Engang' Orpiripiri	LS	Homestead with the <i>Orpiripiri</i> tree close by.
121	Olaika	LS	Homestead high on a hill.
122	Ewuas Nalala Oldonyo	PA	Broad open area on a high hill.
123	Osiidu	PA	Forest on both sides making a narrow pasture.
124	Emburbul	PA	A flat pasture area which now has a homestead.
125	Olodung'oro	PA	This area is preserved in the wet season for grazing during the dry season.
126	Olendetia	PA	This area is named after a wealthy Maasai who owned a lot of livestock. He lived here a long time ago.
127	Ololariak	PA	These are grazing lands near homesteads where the <i>Ilariak</i> birds feed of the ticks on all livestock and wild animals. This is important for the health of the livestock.
128	Ewuas Oloigeruno	PA	Open area surrounded by forest which is used as a pasture
129	Ntinyiak	LS	The place name describes that bomas here are crowded together.
130	Nagotisho	TC	A narrow path between rocks on either side used by the Maasai.
131	Iwasin Orturoto	TC	Seasonal swamp found in a natural catchment basin during the wet season.

#	Place Name	Type	Description
132	Orkutoto Loloing'oni	TC	The place where a grazing bull was killed by an <i>Orng'atuny</i> , or lion in the first half of the 20th century.
133	Egos Omunyi	TC	This trail was made by <i>Emuny</i> , or rhino a long time ago - where it used to live amongst the trees.
134	Elang'ata Oo Nkeek	TC	Crossing point on the <i>Ormariko</i> River for livestock to get to the <i>Oloosuyian</i> pasture.
135	Elang'ata e Masinde	TC	Year round flowing river, very deep, where logs are used to make a foot crossing.
136	Ole Naidurra	TC	An animal trail used by people to move from Ng'arwa to Naan and other places, and is a meeting point of other trails.
137	Nagotisho	TC	A narrow path with rocks on either side used by the Maasai.
138	Embaash Ole Nasieku	BL	A place where a <i>Olarro</i> , or Cape buffalo killed a person named <i>Ole Nasieku</i> in the first half of the 20th century.
139	Iretet	BL	When the areal roots of this tree form an opening in a north-south direction around the trunk; a woman can pass through that opening 4-8 times to improve her fertility. The tree is also used in the circumcision ceremony for boys when becoming a Moran.
140	Elang'ata Oreteri	BL	Crossing point in a valley with many <i>Oreteri</i> tree.
141	Olenjata	BL	This area is a known landmark because there is only one tree there.
142	Isupukia	BL	This area has many <i>Isupukia</i> trees.
143	Orperes	BL	There is no recollection of the origin of name.
144	Irmotiok Lekupai	BL	An old man named <i>Orkupai Mussa</i> used to water his livestock here in the 1950's.
145	Lorkidong'oi	BL	An odd tree is located there with three roots that extend out of the ground that support the main trunk.
146	Oloongewuan	BL	A place where one of the old Maasai age groups named the <i>Nyanguse</i> hunted the <i>Inkewuan</i> or the turacos, a colourful green bird, during the transition period to becoming a Moran.
147	Noongopir	BL	A place with many birds, whose feathers drop to the ground. The area is named after the bird feathers on the ground.
148	Nainokieki Emowuo	BL	In the late 19th century, a Moran group performed a spiritual ceremony that involved burning a buffalo horn to transmit the strength and braveness of the <i>Olarro</i> , or Cape buffalo to the Moran.
149	Olchani Lolesipai	BL	A patch of trees named after the son of <i>Sipai</i> who built a boma (home or living area) near the trees.
150	Olchani Lomotonyi	BL	A patch of trees named a long time ago after a big bird that lived there.
151	Eyarata Orkonoi	BL	This is where the <i>Orkonoi</i> , or hyena (near the forest and homestead) would howl and would chase lost livestock including calves to kill and eat them.
152	Eyarat Lenorgoo	BL	In this valley, the <i>Emorogi</i> tree produces fruit that can heal chest coughs. It is eaten when it is ripe and yellow.
153	Orkipire Lekima	BL	The shrub <i>Orkipire Lekima</i> is found there and when it dries the leaves become even sharper during the dry season.

#	Place Name	Type	Description
154	Lemisigiyo	BL	This hill borders Tanzania and Kenya. Named after a culturally significant tree called the <i>Ormisigiyo</i> tree. This tree is used in traditional ceremonies including the Moran circumcision.
155	Ilmasalig	BL	On these hills there is a flower called the <i>Masilig</i> which grows seasonally only during the wet season.
156	Ang'ta Elekoko	BL	A man named <i>Lekoko</i> lived in this area in the 1940's.
157	Orkoroi	BL	An area frequented by <i>Orkoroi</i> , or Colobus monkeys.
158	Ngodin	BL	Location of the <i>Ngodin</i> , known in English as Hartebeest.
159	Olorien Lepuus	BL	This forest contains the <i>Oloirien</i> tree, a tree which is used by Elders to gain the strength of the tree by sitting under it.
160	Edonyo Oongaimuriak	BL	Named after the <i>Ilmuriak</i> tree which produces long sharp thorns and a small black berry which people eat.
161	Oloormisigiyo	BL	Named after the <i>Misigiyo</i> tree which is used to make soup from the roots and herbs. The fruit are used for medicinal purposes to cure a cold, running nose and sore muscles and to calm people down. The root is boiled in water with fat to make the soup.
162	Ololoitikoshi	BL	Grazing land and place where the <i>Ilotikoshi</i> , or Zebras used to stay in bigger numbers, but less so now.
163	Ormusakwa	BL	A small forest populated by the <i>Musaakwa</i> tree. It's leaves are used to clean children after defecating.
164	Ormelelek	BL	In this forest the <i>Ormelelek</i> tree is found and used to make the Moran club (for personal defense) or to assist in skinning a cow by beating the skin as its pulled back.
165	Iretet	BL	This is a small forest with the <i>Eretet</i> trees which are used by women to increase fertility. The ceremony involved walking through a north-south opening or gate created by the hanging roots.
166	Orchani Lormotonyi	BL	In the forest along a river there is a large tree where a big bird used to live, possibly in the nest.
167	Nengushirit	BL	An area with the <i>Engushirit</i> tree which is used as fences posts that eventually grow in the ground.
168	Oloirien Lepuus	BL	Forest contains the <i>Oloirien</i> tree, a tree which is used by the Elders to gain the strength of the tree by sitting under it.
169	Entim Dapash	BL	A big forest with a large number of trees.
170	Kinande	BL	In this area the <i>Osinandei</i> tree can be found.
171	Kidongonyek	WF	The water from this spring is reddish in colour and very salty. In Maasai the word <i>Kidongonyek</i> means red spring.
172	Moruange	WF	The well is named after the old man, <i>Moruange</i> , who dug it to get enough water when eating meat from hunting wild animals. The man is estimated to have been born in the early 1920's and to have died in the early 1990's.
173	Nempiripiri	WF	The well has a big tree beside it - which is called the <i>Orpiripiri</i> .
174	Orgos Onyokie	WF	Red coloured trail used by <i>Tutayo's</i> cattle when going to <i>Kisamis</i> water source in the 1940's.
175	Inchoroi Olangamurai	WF	A number of springs were found by <i>Olangamurai</i> who built/dug a basin to collect water.

#	Place Name	Type	Description
176	Enkishepui Oondondoli	WF	A tributary of the <i>Oodondoli</i> river which runs through a small valley.
177	Ndondoli	WF	The central watering place for livestock from Orkiu Juu to drink - where lots of sounds are created including those of frogs.
178	Mburbuli Enempirpiri	WF	In this area there is a small well named after a big tree called the <i>Orpirpiri</i> tree and now the whole area is named after the tree.
179	Karukai Ilaruka	WF	In the dry season, when the water is level is low the water is undrinkable due to how muddy it is and that there are many worms.
180	Osilange Lolasae	WF	Very large, year round, central reservoir in Enguserosambu that was built in the 1980's, and prior to this there was a human made well named <i>Olchoro Lemeipuki</i> .
181	Lolarru	WF	<i>Olarro</i> , or Cape buffalo used to drink from this pool a long time ago. Water is used for human and livestock consumption.
182	Loorchartuiyan	WF	Named after the <i>Ilchartuiyani</i> tree which was traditionally used for construction of homes and herding sticks.
183	Ormariko	WF	Found along the river bank, the <i>Eltuka</i> tree has leaves that are used for blessings in many ceremonies including the Moran circumcision. Also the <i>Oseyiai</i> grass is used as the bedding for slaughtered oxen during traditional ceremonies.
184	Noonchuta	WF	Along this tributary there are many Moran meat camps. Water is used by both livestock and humans.
185	Oyarata Loolaimurunyi	WF	In the valley there is a natural reservoir which fills in the rainy season. This reservoir is named after the <i>Olaimurunyi</i> .
186	Enchorro Ole Jartan	WF	This spring box is named after the person who built it, <i>Ole Jartan</i> .
187	Pololeti	WF	It is the major source for the big year-round river which runs through Serengeti Park named the <i>Pololeri</i> river. The river is wide and difficult to cross during high water.
188	Irkesometi	WF	This deep well was dug by hand to reach the water table . The <i>Elterito</i> is an old age/Elder group from the 1880's to early 1900's who dug wells like this one.
189	Iwuasin Olturoto	WF	Swamp found in a natural catchment area during wet season.
190	Olturoto Lolormonchin	WF	This area was preserved by a clan called the <i>Ermonchin</i> , which is the basis for its name.
191	Kiturgumo	WF	This swamp provides pasture when dry. Here a small reservoir fills quickly in the wet season and is an important source of water.
192	King'arana	WF	This river starts by flowing above ground, then it goes underground where there are a number of human made wells. Then it reappears as the same river, but is called the <i>Erramashata</i> river in the Ng'arwa area.
193	Ingang'itie Olasai	WF	This river runs through the centre of the Enguserosambu homestead area. Named after the <i>Oretet</i> tree, which is used to bless women during the traditional fertility ceremony.
194	Enaistiyapa	WF	Tributary of the <i>Ormariko</i> River which flows year round. There is a river crossing here. An <i>Orpanya</i> or machete is required to clear the thick vegetation along the river when making the crossing.

#	Place Name	Type	Description
195	Orkeju Arus	WF	This river flows year round, flowing into Lake Natron from Kenya. <i>Arus</i> or salt deposit, which livestock lick, can be seen along the banks.
196	Alaalalo	WF	Flowing year round this river has <i>Ilalo</i> trees with edible fruit along the banks.
197	Ngarmate	WF	This reservoir is used by livestock. This reservoir is fed by a river flowing from <i>Garmati</i> hill.
198	Ormariko	WF	This is a year round river with <i>Ormariko</i> tree, a banana like tree, which grow along the bank. The tress don't produce bananas. The river borders Naan and Ng'arwa.
199	Ilotimi	WF	A stream with big trees used by <i>Oekenyi</i> , or baboon to birth babies.
200	Irkoroin	WF	Long water stream where there are trees used by <i>Orkoroi</i> , or Colobus monkeys who shake the trees when jumping and playing.
201	Enchoro Endukai	WF	This is a spring that comes from the base of a <i>Oltukai</i> tree, which is used in blessing ceremonies for young men. Women use the small branches like a brush to clean the <i>Calabash</i> , the gourd used to hold livestock milk.
202	Ormatasia	WF	A stream with <i>Irmatasiani</i> trees along the banks. The trees are used to make bedding for sleeping in the meat camps and perfume for the Moran and also are used as tooth brushes.
203	Olorook-Kiek	WF	A stream with a concentration of <i>Ilalo</i> trees, which have black leaves.
204	Olturoto Lesoit	WF	A rock feature beside the reservoir, which when raining would act as a trough to quickly fill the reservoir. In the beginning of the wet season, livestock usually are rushed there as an assured source of water.
205	Esupukiai olturoto	WF	A small seasonal swamp/reservoir during the wet season surrounded by a small forest populated by <i>Osutukiai</i> trees.
206	Esuree	WF	This is an important location which is used as a Moran meat camp and a traditional site to sacrifice sheep or cows to bless women to increase their fertility, and in the past to circumcise women and now to circumcise boys.
207	Masinde	WF	A river that runs to lake Natron, used by Naan and other communities.
208	Ormariko	WF	This is a year round river with <i>Ormariko</i> tree, a banana like tree, which grow along the bank. The tress don't produce bananas. The river borders Naan and Ng'arwa.
209	Erramashata	WF	This is a river with five meat camps in caves used by Moran. This is where cows and sheep are slaughtered.
210	Iseli	WF	A natural reservoir holding water in the rainy season. This place is where the EFT Council of Elders was officially launched and where it received responsibility for the forest. Traditional blessings are made here as well.
211	Olturoto Lolchamba	WF	This place retains water in the wet season, located in a former German era colonial estate.

Appendix 2: Activities and Map Interviews Meta Data Summary

The table below is an inventory of the mapping interviews and other activities undertaken with the Loita Maasai in 4 homestead areas - Orkiu Juu, Ng'arwa, Enguserosambu and Naan (see Map 1 & 2). These areas are located in north eastern Tanzania south east of the Serengeti National Park in proximity to the Tanzania - Kenya border. The table identifies the metadata associated with the interviews including dates, locations, themes/topics, participants and interviewer names and other related information. The table describes how and when these interviews and other activities occurred from October 31, 2019 to November 27, 2019. This information is assembled from original field notes and a journal prepared by the project coordinator.

The "Interview Map Code" column (field) of this table identifies the maps in this report by their numbers and the associated row (record) provides the metadata for that map. The map references are found at #'s 3, 9, 10, 12, 13, 15, 16, 17, 18, 20, 21, 23, 24, 27, 28, 29, 30, and 35 in the table.

Abbreviations for the key participants in the process are used in the following table as follows: Julius Daniel (JD); Koisikir Nangiria (KN); Terere Tutayo (TT); Anna Shuloloi (AS); Stephen Sitei (SS); Mark Talash (MT); Samwel Nangiria (SN); Nanjalai Moina (NM); Lilian Nangiria (LN); Erik Val (EV); Hector Mackenzie (HM); and, Miche

Mapping Interviews and Other Activities Summary, Oct. 31 - Nov. 27, 2019

#	Date	Map Code	Location	Activity	Participants	Int.	AV card #	Comments
1)	Oct 31 3:30-4:00	N/A	Almatasia Camp	Introduction to camp operations & protocols	all	N/A	Photos 144_08_0001-0041 (1238-1279)	First organizational meeting of all camp participants including camp manager, security staff, kitchen trainees, community researchers & volunteers
2)	Oct 31 4:30-5:30	N/A	Almatasia Camp	Introduction to mapping project, review background & objectives & start to identify mapping themes	SN, MT, JD & EV	N/A	see photo series above no video or audio	Organizational meeting to confirm purpose of mapping, the data/information needed, how to conduct the mapping interviews & identifying the mapping themes
3)	Oct 31 5:30-6:00	LMMP-AL-01 Map 10	Almatasia Camp	Mapping current & potential development within the Loita Maasai Traditional Homeland	SN & MT	JD & EV	see photo series above no video or audio	Impromptu interview without the use of a base map, redrawn as a schematic/conceptual map and later used to guide the last map (LMMP-AL-02) interview on the same theme on Nov27 with SN & MT.
4)	Nov 1 12:00-2:00 3:30-5:30	N/A	Almatasia Camp	Introductory training session with community guides & interviewers	TT, KN, SS, AS, JD & EV	N/A	Photo 144_08_0042-0081 (1280-1319) no video or audio	Start to getting community researchers familiar with maps, mapping techniques & developing mapping themes.

Appendix 2 (cont.)

#	Date	Map Code	Location	Activity	Participants	Int.	AV card #	Comments
5)	Nov 2 3:00-6:30 Nov 3 2:30-5:30	N/A	Almatasia Camp	Continue to develop mapping themes	SN, MT, JD & EV	N/A	Photos 144_08_0082-0107 (1320-1345) no video or audio	Review & confirm 4 mapping interview themes: 01) Place Names: a critical measure of Maasai connection to the land 02) Land Use: before 1990 & after 1990 when agriculture introduced 03) Forest Use: human & livestock trails & water sources: rivers & wells 04) Wildlife & Livestock: managing predation & cultural significance. With 4 themes identified, SN & MT proposed that a half day interview would be spent on each interview, so 2 days in each of 4 homestead areas with 1 interview in the morning and 1 in the afternoon. 6 Elders (3 male & 3 female) per day of interviews had been identified by the Board of the Enguserosambu Forest Trust (EFT). This meant that a total of 16 interviews were conducted with 48 participants.
6)	Nov 4 11:30-1:30 2:30-5:00	N/A	Almatasia Camp	Continue & complete mapping & interview training	TT, KN, SS, AS, JD & EV	N/A	Photos 144_08_0108-0123 (1346-1361) no video or audio	After this last day of training the community researchers understand what is required & why.
7)	Nov 5 5:30-5:15	N/A	Almatasia Camp	Meeting with the EFT Board of Directors to review & confirm the 4 mapping themes	EFT Board of Directors, MT, SN & EV	N/A	Photos DSC0097-0098 no video or audio	The Board approved the mapping themes & confirmed that the interviewing can begin in the 4 homestead areas.
8)	Nov 6 2:15-6:30	N/A	Orkiu Juu	Introductory meeting to describe mapping project with the community before the interviews started on Nov 7	25 community members, TT, KN, AS, JD & EV	N/A	Photos 144_08_0124-0188 (1362-1426) no video or audio	This introductory meeting allowed the community researchers to get comfortable for the first interview scheduled for the next day. Meetings occurred outside on the grass in 2 locations: the centre of the village & the other in smaller sub-village site.
9)	Nov 7 11:30-1:00	LMMP-OR-01 Map 3 to 5	Orkiu Juu	Introduction, description of mapping project & received permission to proceed which includes taking audio, photos & video. Place name interview result in identifying 67 locations	Sunde Tutayo (M) Ndima Narretena (M) Olorupa Tutayo (M) Nooltimito Salayo (F) Ngodi Posyo (F) Noosirwai Ngojio (F)	JD, TT, KN & EV	Photos: 144_08_0189-0289 (1427-1327) Video: 2019-11-7 (16 min) Audio: Zoom 0001 (1 hr 35min)	Many names collected with some overlap with Ng'arwa. One community researcher collected the names & another documented the background to or description of each of the names. Interviews for the day take place outside between 2 bomas on 2 cow hides on the grass. In addition to the 6 Elders many other community members including youth, moran (warriors) & women participated in the 2 days of interviews.

Appendix 2 (cont.)

#	Date	Map Code	Location	Activity	Participants	Int.	AV card #	Comments
10)	Nov 7 3:00-4:30	LMMP-OR-02 Map 6	Orkiu Juu	Land use interview: mapping livestock use in wet & dry seasons before 1990 & after	Sunde Tutayo (M) Ndima Narretea (M) OlorupaTutayo (M) Nooltimito Salayo (F) Ngodi Posyo (F) Noosirwai Ngoijjo (F)	JD, TT, KN & EV	See photos referenced in 9 See video reference in 9 Audio: Zoom 0002 (17 min)	Document land use management strategies to adapt to shrinking land base after 1990. Missed over an hour of audio recording due to battery problems.
11)	Nov 8	N/A	Loliondo & Wasso Market & Livestock Auction	Day trip to Loliondo & Wasso to shop and see the market and auction	JD, MG, HM, EV, NM, LN & others	N/A	Photos 144_08_0290-0334 (1328-1372) no audio or video	Purchased basic camp food & supplies
12)	Nov 9 11:30-1:30	LMMP-OR-03 Map 7 & 8	Orkiu Juu	Forest use interview: focus on livestock & human trails, water sources & stories about the cultural importance of the forest	Moringe Sirmei (M) Kumakia Olochurie(M) Kumari Mbaima (M) KamakiaKumari (F) Nayanoi Melita (F) Normirisho Mbotonyi(F)	TT, KN JD, AS & EV	Photo 144_08_0335-0481 (1373-1518) Video: 2019-11-9 (13 min) Audio: Zoom 0003 (2hr 12min)	Mapped rivers, wetlands, wells & springs & livestock & human trails. Interviews for the day took place outside under a large tree on 2 cow hides on the grass
13)	Nov 9 2:30-4:30	LMMP-OR-04 Map 9	Orkiu Juu	Wildlife relations with livestock (predation) & the cultural significance of wildlife interview	Moringe Sirmei (M) Kumakia Olochurie (M) Kumari Mbaima (M) KamakiaKumari (F) Nayanoi Melita (F) Normirisho Mbotonyi (F)	TT, KN JD, AS & EV	See photos referenced in 12 See video reference in 12 Audio: Zoom 0004 (1hr 50min)	Focussed on wildlife predation & management strategies for specific predators. Documented cultural significance of high priority wildlife species.
14)	Nov 10	N/A	Almatasia Camp	Sunday, church services, no village interviews, reviewed & prepared detailed field notes & confirmed mapping information	N/A	EV, JD & TT	N/A	LN & SN came for lunch, they were pleased with the Orkiu Juu interview maps, Samwel re-iterated the purpose of the mapping: to negotiate for land title. Afterwards went into Loliondo in the late afternoon to shop for the camp & re-charge batteries
15)	Nov 11 11:30-1:30	LMMP-NG-01 Map 3 to 5	Ng'arwa	Introduction, description of mapping project & received permission to proceed including audio, photos & video. Place name interview: 49 locations identified	Nashiru Ngoyou (F) Parmitoro Pumbun(M) Letaloi Ngoyou (M) Norkirrupi Orkedianye (F) Kanashe Kipurda (F) Olemidolu Kaparo (M) Meeyu Pumbun (M)	EV, JD & TT, AS & KN	Photo 144_08_0482-0679 (1519-1716) Video: 2019-11-11 (24 min) Audio: Zoom 0004-0005 (1hr 45min)	James made the introductions & described the purpose of the mapping & stayed for the entire day of interviews. Many names collected some overlapping with Orkiu Juu. One interviewer collected place names & another documented the background to or description of the names. In addition to the 6 Elders many other community members including youth, moran (warriors) & women participated in the 2 days of interviews. Interviews for the day took place outside in the centre of the village overlooking pasture lands on 2 cow hides on the grass.
16)	Nov 11 2:45-4:30	LMMP-NG-02 Map 6	Ng'arwa	Land use interview: mapping livestock use in wet & dry seasons before 1990 & after	Nashiru Ngoyou (F) Parmitoro Pumbun (M) Letaloi Ngoyou (M) Norkirrupi Orkedianye (F) Kanashe Kipurda (F) Olemidolu Kaparo (M) Meeyu Pumbun (M)	EV, JD & TT, AS & KN	See photos referenced in 15 See video reference in 15 Audio: Zoom 0006 (1hr 56min)	Documented land use management strategies to adapt to shrinking land base after 1990

Appendix 2 (cont.)

#	Date	Map Code	Location	Activity	Participants	Int.	AV card #	Comments
17)	Nov 12 12:00-1:45	LMMP-NG-03 Map 7 & 8	Ng'arwa	Forest use interview: focus on livestock & human trails, water sources & stories about the cultural importance of the forest	Musa Kiriawo Kukuyet (M) Soinda Meigweri (F) Memusi Moina (F) Kongokie Meigweri (M) Noortimito Sasi (F) Sumulek Seko (M) Meeyu Pumbun (M)	JD, TT, AS, KN & EV	Photo 144_08_0680-0787 (1717-1824) Video: 2019-11-11 (24 min) Audio: Zoom 0007(1hr 45min)	James made the introductions & described the purpose of the mapping & stayed for the entire day of interviews. Mapped rivers, wetlands, wells & springs & livestock & human trails. Women described the use of forest & cultural traditions. Interviews for the day took place outside on 2 cow hides on a grassy ridge overlooking the valley towards Almatasia Camp.
18)	Nov 12 3:15-4:30	LMMP-NG-04 Map 9	Ng'arwa	Wildlife relations with livestock (predation) & the cultural significance of wildlife interview	Musa Kiriawo Kukuyet (M) Soinda Meigweri (F) Memusi Moina (F) Kongokie Meigweri (M) Noortimito Sasi (F) Sumulek Seko (M) Meeyu Pumbun (M)	JD, TT, AS, KN & EV	See photos referenced in 17 See video reference in 17 Audio: Zoom 0008 (1hr 51min) & Zoom 0009 (1hr 17 min)	Focussed on wildlife predation & management strategies for specific predators. Documented cultural significance of high priority wildlife species.
19)	Nov 13	N/A	Almatasia Camp	Could not secure motorcycle to travel to Enguserosambu, no village interviews, reviewed & prepared detailed field notes & confirmed mapping information	N/A	JD, TT, AS, KN & EV	Photo 144_08_0788-0792 (1825-1829) no video or audio	AS, KN, TT & JD did great, detailed interviews, documented findings very well and they provided a lot of additional information throughout the debriefing.
20)	Nov 14 1:00-2:30	LMMP-NA-01 Map 3 to 5	Naan	Introduction, description of mapping project & received permission to proceed including audio, photos & video. Place name interview: 38 locations identified Delayed start in order to have all identified Elders attend. Did not stop for lunch.	Jacob Keko (M) Olaigwenani Saisa (M) Sapiyo Mushlta (M) Naalaretwa Reson (F) Kerembe Kilorit (F) Narikungera Tinga (F)	MT, JD, TT, SS & EV	Photo 144_08_0793-0859 (1830-1896) Video: 2019-11-14 (36 min) Audio: Zoom 0010-0012 (1hr 28min)	Traveled for 2 hours on trails & road to Naan from the Almatasia Camp on 2 motorcycles. Rain in the morning made travel difficult. MT made the introductions & described the purpose of the mapping. JD provided details on how the mapping would proceed. Interview occurred outside at the community maze milling station between two groups of bomas on the edge of the village. In addition to the 6 Elders some other community members including youth & men motorcycling by stopped to participate in the interviews for the day. One interviewer collected place names & another documented the background/ description of name.
21)	Nov 14 2:30-4:30	LMMP-NA-02 Map 6	Naan	Land use interview: mapping livestock use in wet & dry seasons before 1990 & after	Jacob Keko (M) Olaigwenani Saisa (M) Sapiyo Mushlta (M) Naalaretwa Reson (F) Kerembe Kilorit (F) Narikungera Tinga (F)	MT, JD, TT, SS & EV	See photos referenced in 20 See video reference in 20 Audio: Zoom 0013 (1hr 31min)	Documented land use management strategies to adapt to shrinking land base after 1990

Appendix 2 (cont.)

#	Date	Map Code	Location	Activity	Participants	Int.	AV card #	Comments
22)	Nov 15 7:00-10:00	N/A	Almatasia Camp	Farwell breakfast for MG & HM	N/A	NM, John, Alarajha, Valentine, Salayo, Kanae TT,MT, SN, JD, MG, HM & EV	Photo 144_08_0860-0882 (1897-1919) no video or audio	MG & HM off to Arusha to start a 2week safari.
23)	Nov 15 1:00-2:30	LMMP-NA-03 Map 7 & 8	Naan	Forest use interview: focus on livestock & human trails, water sources & stories about the cultural importance of the forest. Mapped rivers, wetlands, wells & springs & livestock & human trails. Women described the use of forest & cultural traditions	Norkitoip Saisa (F) Noolamala Tutayo (F) Normeiyaari Sunguiya (F) Olemusana Moina (M) Letowuon Lesile (M) Saitoti Mereu (M)	MT, JD, TT, SS & EV	Photo 144_08_0883-0971 (1920-2008) Video: 2019-11-15 (11 min) Audio: Zoom 0014 (2hr 45min)	Left Almatasia Camp at 10:00 for Naan with a stop in Enguserosambu for fuel. Arrived in Naan at 12:15. Visited the school principal for 15 minutes. Interview started at 1:00. MT made the introductions & described the purpose of the mapping & stayed for the entire day of interviews. JD provided details on how the mapping would proceed. Mapping occurred on the school grounds under a tree. School children came to see the interviews at recess.
24)	Nov 15 2:30-4:15	LMMP-NA-04 Map 9	Naan	Wildlife relations with livestock (predation) & the cultural significance of wildlife interview	Norkitoip Saisa (F) Noolamala Tutayo (F) Normeiyaari Sunguiya (F) Olemusana Moina (M) Letowuon Lesile (M) Saitoti Mereu (M)	MT, JD, TT, SS & EV	See photos referenced in 23 See video reference in 23 See audio in 23	Focussed on wildlife predation & management strategies for specific predators. Documented cultural significance of high priority wildlife species.
25)	Nov 16	N/A	Almatasia Camp	Went in the morning to Loliondo to shop, do some banking & recharge batteries. In afternoon & evening reviewed & prepared detailed field notes & confirmed mapping information	N/A	JD, KN & EV	Photo 144_08_0972-0978 (2009-2014)	Met SN & MT in Loliondo to discuss progress of interviews
26)	Nov 17	N/A	Almatasia Camp	Sunday, no interviews. In morning & evening reviewed & prepared detailed field notes & confirmed mapping information.	N/A	JD, KN, TT & EV	Photo DSC0215-0255 no video or audio	Went for hike in the afternoon in the forest with camp staff & research team. Started to draft report outline

Appendix 2 (cont.)

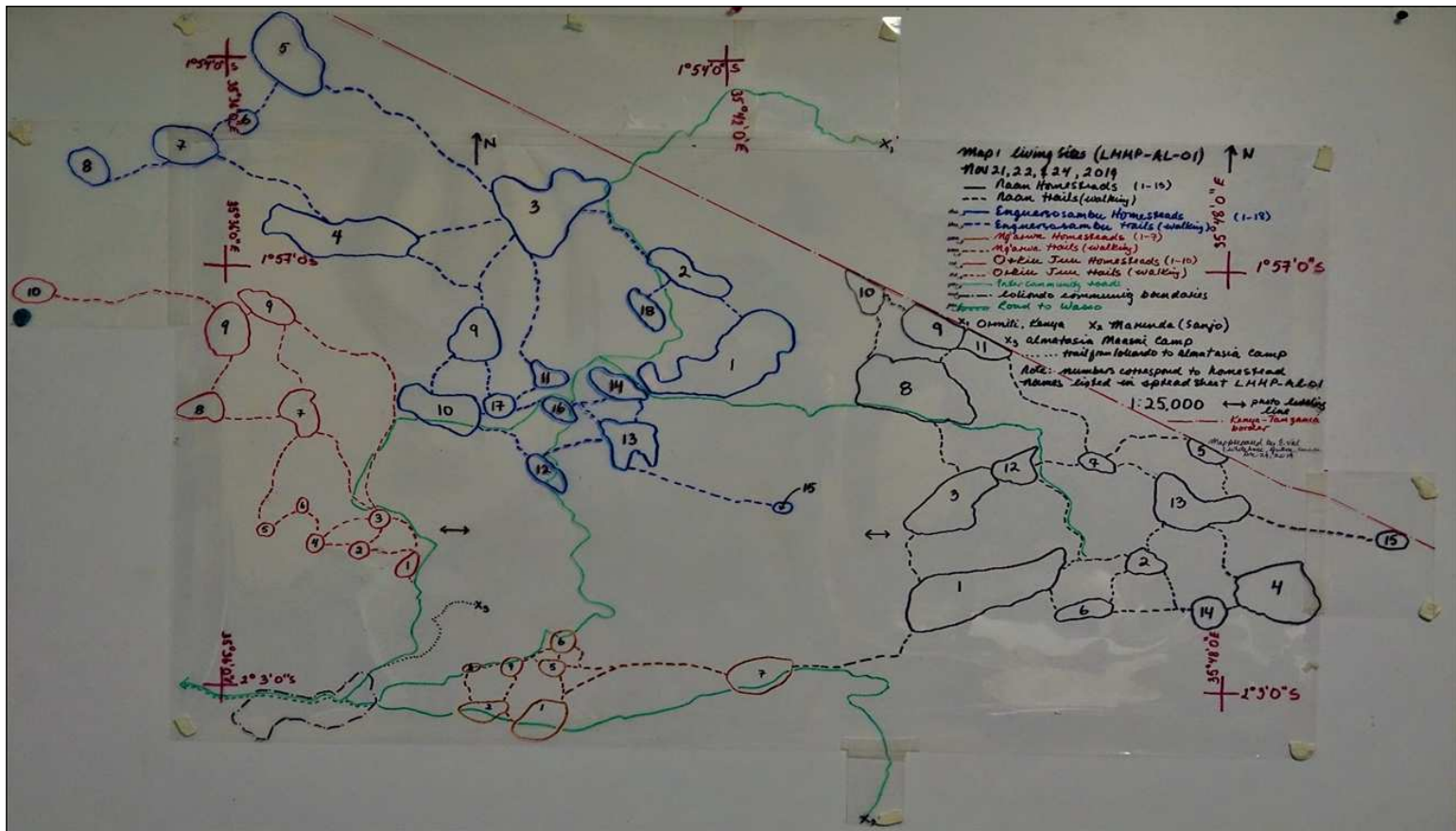
#	Date	Map Code	Location	Activity	Participants	Int.	AV card #	Comments
27)	Nov 18 11:45-2:30	LMMP-EN-01 Map 3 to 5	Enguserosambu	Introduction, description of mapping project & received permission to proceed including audio, photos & video. Place name interview: 57 locations identified	Olaandare Ng'eteus (M) Oloshokop Nangiria (M) Naalaimutia Meipuki (F) Noormerugi Sikor (F) Nashiru Kutita (F) Olemonson Orkeerarie (M)	JD, KN, TT, AS & EV	Photos: 144_08_0979-1113 (2015-2149) Video: 2019-11-18 (25 min) Audio: Zoom 0015-0018 (3hr 40min)	Traveled for 1.5 hours on trails & road to Enguserosambu from the Almatasia Camp leaving on foot at 10:00. JD made the introductions & described the purpose of the mapping, & provided details on how the mapping would proceed. The interviews for the day took place at KN's bomas outside on the grass on 2 cow skins under a large tree overlooking pasture lands. In addition to the 6 Elders some other community members including youth, Moran (warriors) & men stopped to participate in the interviews for the day. One interviewer collected place names & another documented the background/ description of name.
28)	Nov 18 3:15-4:45	LMMP-EN-02 Map 6	Enguserosambu	Land use interview: mapping livestock use in wet & dry seasons before 1990 & after	Olaandare Ng'eteus (M) Oloshokop Nangiria (M) Naalaimutia Meipuki (F) Noormerugi Sikor (F) Nashiru Kutita (F) Olemonson Orkeerarie (M)	JD, KN, TT, AS & EV	See photos referenced in 27 See video reference in 27 See audio reference in 27	Documented land use management strategies to adapt to shrinking land base after 1990
29)	Nov 19 12:30-2:00	LMMP-EN-03 Map 7 & 8	Enguserosambu	Forest use interview: focus on livestock & human trails, water sources & stories about the cultural importance of the forest. Mapped rivers, wetlands, wells & springs & livestock & human trails. Women described the use of forest & cultural traditions	Olekoisenge (M) Meiponyi KASHU (M) Olodido Kene (M) Noongishu Ngiding'a (F) Narikungera Koisenge (F) Nooseuri Oleloombaa (F)	JD, KN, TT, SS & EV	Photos: 144_08_1114-1263 (2150-2299) Video: 2019-11-19 (25 min) Audio: Zoom 0019-0020 (2hr 22min)	KN picked up EV on motorcycle to leave for Enguserosambu at 9:30. Extensive discussions with key village representatives about the purpose of the mapping project. JD and KN explained that the EFT board had identified those to interview & after a few calls were made, the interviews proceeded. The interviews for the day occurred outside under some trees on a ridge overlooking a valley which bordered the Tanzanian-Kenyan border.
30)	Nov 19 2:00-5:00	LMMP-EN-04 Map 9	Enguserosambu	Wildlife relations with livestock (predation) & the cultural significance of wildlife interview	Olekoisenge (M) Meiponyi KASHU (M) Olodido Kene (M) Noongishu Ngiding'a (F) Narikungera Koisenge (F) Nooseuri Oleloombaa (F)	JD, KN, TT, SS & EV	See photos referenced in 29 See video reference in 29 See audio reference in 29	Focussed on wildlife predation & management strategies for specific predators. Documented cultural significance of high priority wildlife species.

Appendix 2 (cont.)

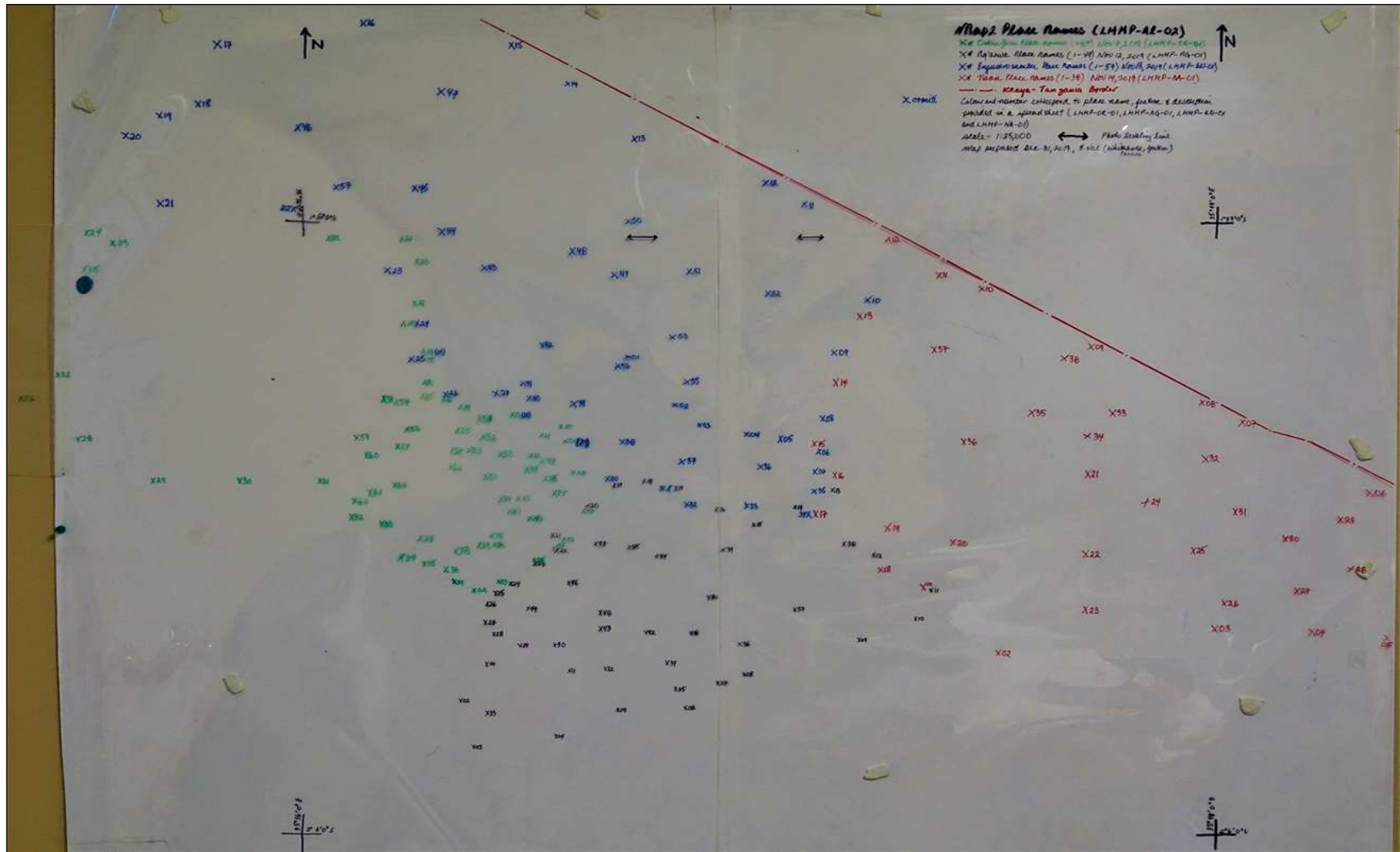
#	Date	Map Code	Location	Activity	Participants	Int.	AV card #	Comments
31)	Nov 20-22	N/A	Almatasia Camp	Reviewed & prepared detailed field notes & confirmed mapping information for Naan, Orkiu Juu, & Ng'arwa including the location of the living sites identified in Final Project Map 1.	N/A	SS, JD, AS, TT, KN, JD & EV	Photos: 144_08_1264-1317 (2300-2353) Video: 2019-11-21 (6 min) no audio	SN brought a youth group from Arusha on Nov 20, the group was preparing a video presentation for the COP20 to show conservation initiatives in Tanzania. JD showed them the work completed to date. They came back the next day to interview SN & JD. Over the 3 days field notes & maps for the 3 homestead areas were completed & verified ready for processing.
32)	Nov 23	N/A	Almatasia Camp	Went in the morning to Loliondo to shop, do some banking & recharge batteries	N/A	JD, NM &, EV	Video: 2019-11-23 (6min) no photo or audio	Resupplied camp with food & other supplies
33)	Nov 24-25	N/A	Almatasia Camp	Reviewed & prepared detailed field notes & confirmed mapping information for Enguserosambu including the location of the living sites identified in Final Project Map 1.	N/A	JD, KN & EV	Video: 2019-11-24 (12min) See photos referenced in 31 no audio	Completed additional wildlife predation notes. All field notes & maps completed & verified ready for processing.
34)	Nov 26	N/A	Loliondo	Did a 3-hour interview with LN, an Elder woman & younger woman both from Orkiu Juu on the economic & cultural importance of the forest and the role of women in forest management at LN's home in Loliondo.	LN, an Elder woman & younger woman from Orkiu Juu	JD, MT & EV	Photos: 144_08_1318-1345 (2354-2381) Video: 2019-11-26 (21min) Audio: Zoom 0021 (2hr 11min)	Important interview with the 3 generations of women. No mapping done but some of the information collected will be integrated into the forest use description in the final report. MT made arrangements for EV to return to Arusha/Moshi.
35)	Nov 27	LMMP-AL-O2 Map 10	Loliondo	Completed last interview in Loliondo with SN & MT to finish Final Map 10: Existing & Potential Development Pressures. EV left the camp for Loliondo and overnights in Wasso to catch a Tanzania Natural Resource Forum (TNRF) Land Cruiser ride back to Arusha/Moshi.	SN, MT & LN	JD & EV	Photos: 144_08_1346-1357 (2381-2408) no video or audio	Important interview which builds on the original pressures schematic map/drawing prepared on Oct 31 by SN & MT & includes detailed field notes. Spent night in tradition Tanzanian hotel filled with migrating locust-bed netting really useful in order to get some sleep.
36)	Nov 28	N/A	Wasso	EV left early in morning taking an alternate route west of Lake Natron through the Ngorongoro Gate to Arusha/Moshi because of heavy rain road wash outs	N/A	EV & others from the TNRF & 1 US & 1 German national	no photos, video or audio	Great return drive over the greening up plains with lots of grazing wildlife. Meet up in Moshi with friend and stayed for 3 days with him at Marangu Lodge for rest & relaxations & journal writing. Left for Canada via Amsterdam from Kilimanjaro International Airport on Dec 1 arriving in Whitehorse, Yukon late Dec 2.

Appendix 3: Redrawn Original Interview Map Overlays

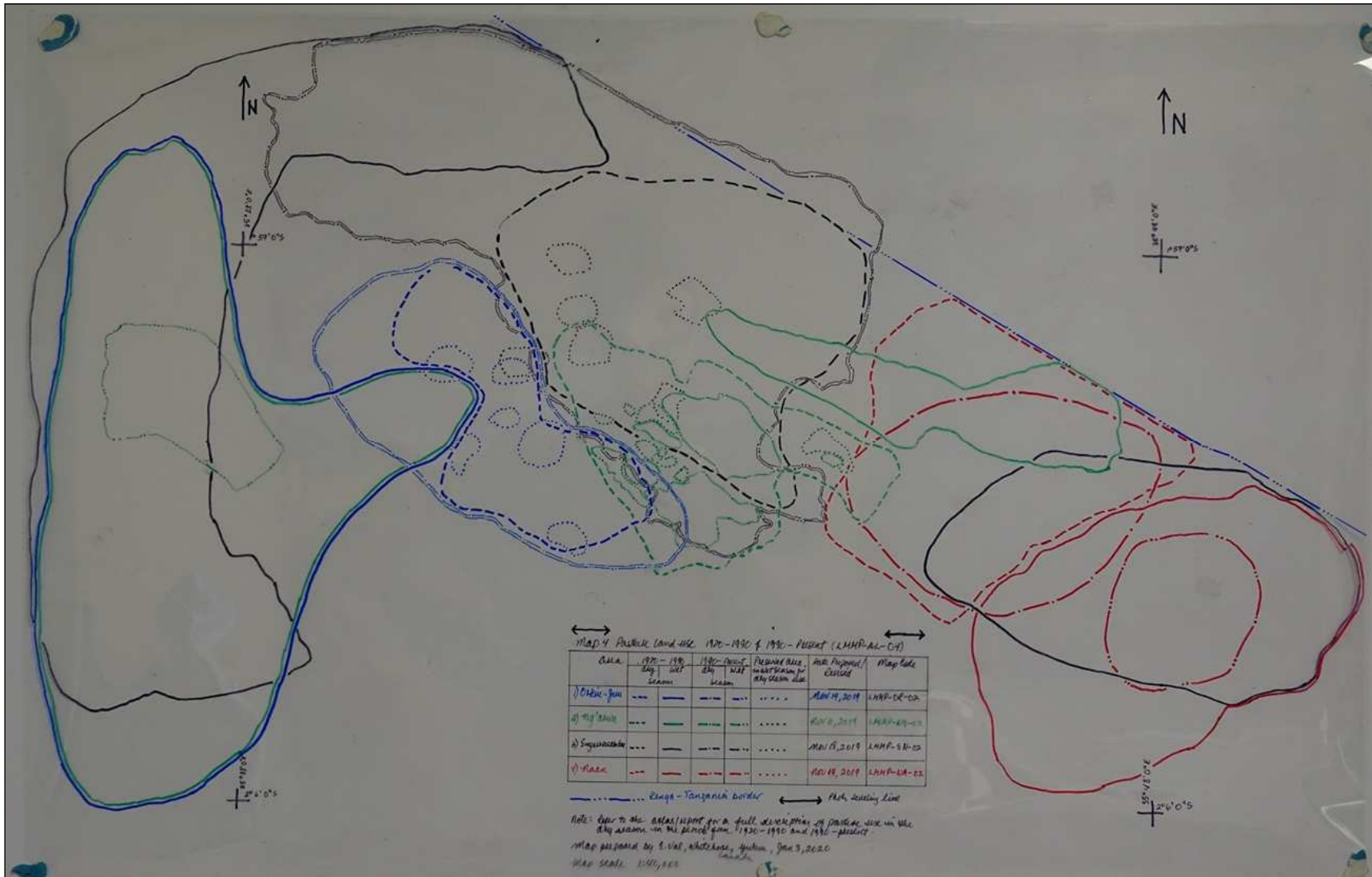
The following images are high resolution photographs of the 6 redrawn original interview map overlays that documented all information collected in 16 community interviews and 1 other interview with Samwel Nangiria and Mark Talash related to existing and potential development pressures facing the Loita Maasai homeland. These maps were geo-referenced and digitized to create the 10 maps in this report.



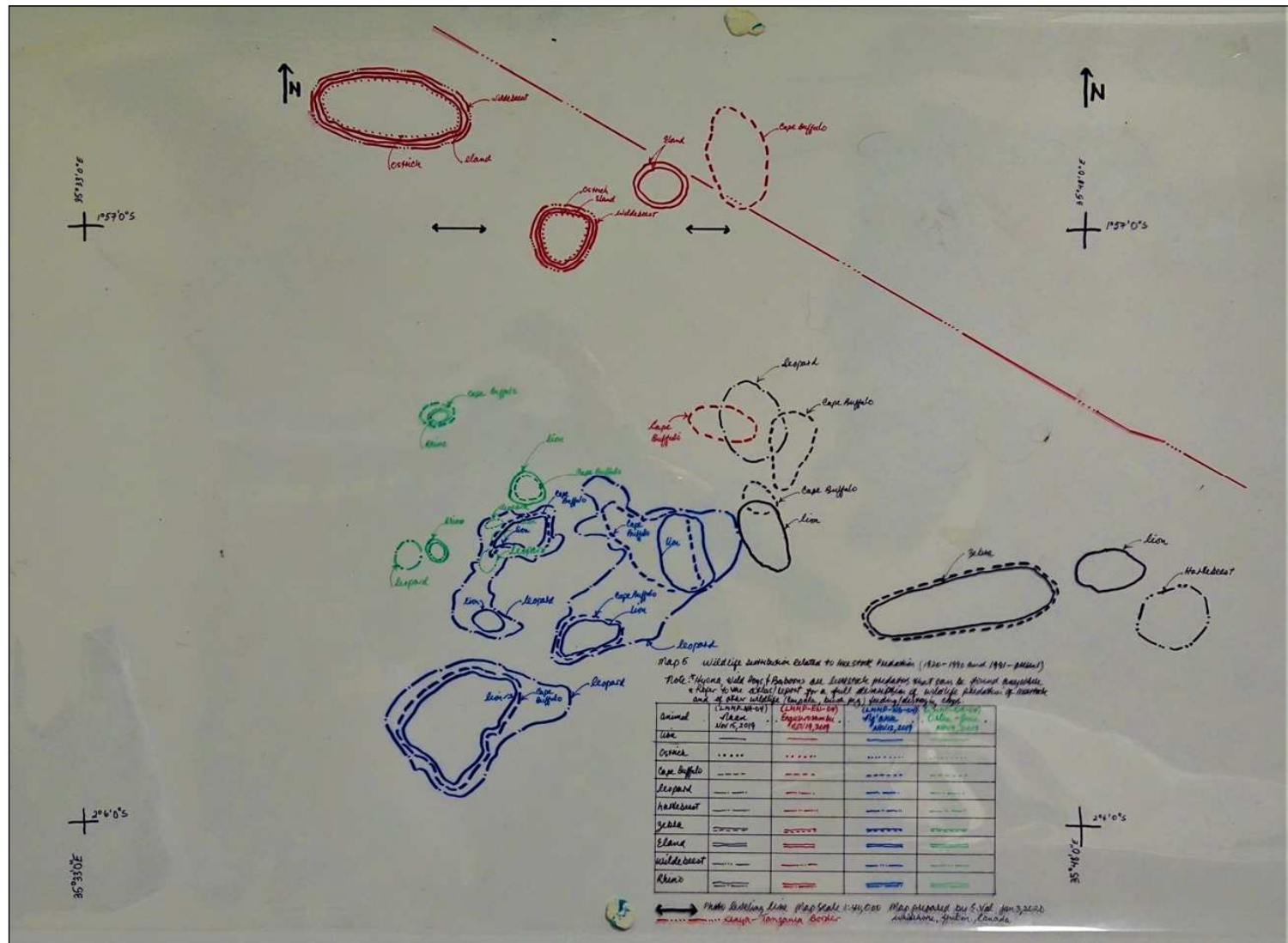
Map 1: Living Sites (LMMP-AL-01)



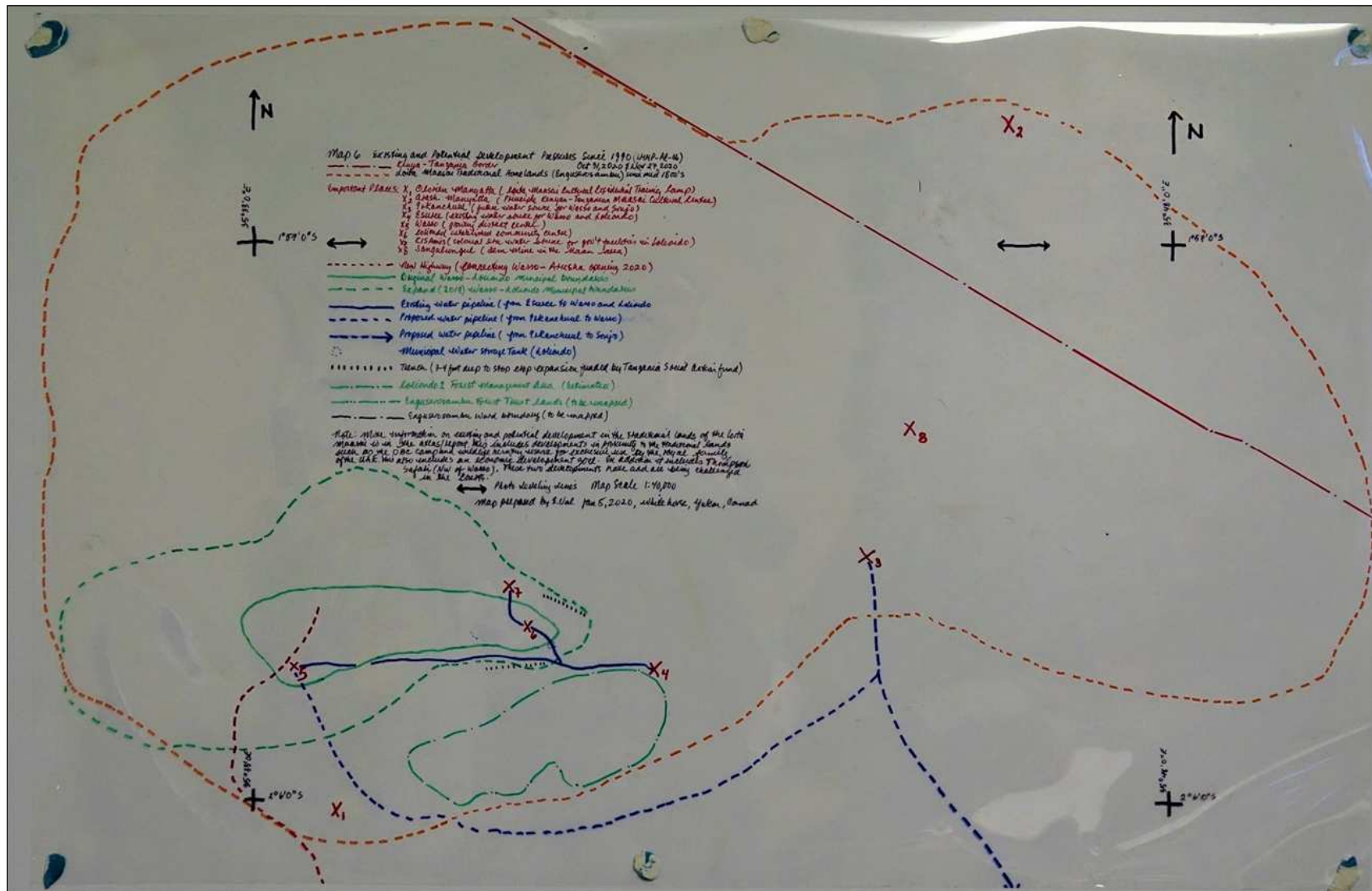
Map 2: Place Names (LMMP-NG/OR/EN/NA-02)



Map 4 Pasture Land Use (LMMF-NG/OR/EN/NA-04)



Map 5 Wildlife and Livestock Predation (LMMP-NG/OR/EN/NA-05)



Map 6 Development Pressures and Land Use Change (LMMP-AL-02)

