Final Report

Conserving *Quercus steenisii*, a Narrow Endemic and Endangered Oak in Sumatra Island, Indonesia

Enggal Primananda, Iyan Robiansyah, Wendy Achmmad Mustaqim, Zulfan Arico

Research Center for Ecology and Ethnobiology
Research Organization for Life Sciences and Environment
National Research and Innovation Agency, Republic of Indonesia
31 January 2025

Final Report

Conserving *Quercus steenisii*, a Narrow Endemic and Endangered Oak in Sumatra Island, Indonesia

Enggal Primananda, Iyan Robiansyah, Wendy Achmmad Mustaqim, Zulfan Arico

1. Introduction

Quercus steenisii (Fagaceae), a single mountain endemic of *Quercus* species, was first discovered in 1937 and later in 1975. As a narrow endemic and Endangered (EN) species (Carrero & Strijk, 2020), *Q. steenisii*, is a species that should become the priority of research and conservation activities. The habitat of this species is restricted to the upper montane to subalpine ecosystems of the Mount Leuser area, from elevation 2,300 to nearly 3,460 m. In contemporary science, this habitat, which is located in the upper montane to subalpine ecosystems, is threatened by global warming (e.g. Hope, 2014). Due to threats from habitat degradation for logging and land conversion, the species is threatened with extinction and categorized as Endangered by the IUCN Red List. So far, this species was only recorded five times from a single trail in the Gunung Leuser National Park (GLNP), Aceh Province, and the population data was never gathered. The species is also not present in ex-situ collections.

The main objective of the project is to enhance the conservation of *Q. steenisii*. This will be covered by the following activities: i) conducting population surveys in all known locations of the species to provide its most current population status in natural habitats, ii) collecting plant materials (seeds, wildings, and/or cuttings) to serve as ex-situ collections, iii) disseminating the results of the project to the relevant stakeholders to increase their awareness regarding conservation of the endemic species and its habitat, and iv) updating the conservation status of the species using the IUCN Red List categories and criteria to inform wider audiences, including national authority as well as global initiatives and institutions. The results of the population survey will provide information on distribution, population size and structure, habitat preferences, and threats to the species. The data can be used as a baseline for the conservation planning of the species and its habitat. Collected plant materials will be cultivated and served as ex-situ collections at the Bogor Botanic Gardens. These collections are effective media for education and raising awareness of the garden's visitors and the public in general. They also can be used as source materials for future reintroduction programs. The project will provide current information on the population of *Q. steenisii* and will enhance its conservation through ex-situ collections.

2. Methods

Field surveys for *Q. steenisii* will be carried out using a focused survey method (Brewer, 2013). This method focuses on the intensity of surveys on areas of high potential habitat for target species. This method is frequently employed in the field survey of threatened and endemic plant species in Indonesia. We have successfully rediscovered some of Fagaceae, and most recently *Lithocarpus kotermansii* (Fagaceae) (Primananda et al. 2022). In each location where the species was found, site characteristics (elevation, slope, aspect and topography), geographical location, number of individuals and any apparent threats will be recorded. We will measure the diameter at breast height (DBH, measured at 1.3 m above the ground) and then categorize them into several DBH classes to describe the population structure of *Q. steenisii*. We will also categorize all the individuals into mature and immature stage based on the presence of flowers and/or fruits. We will collect plant

material of this species (seeds, seedlings, and/or cuttings) to serve as ex situ collections at the Bogor Botanic Garden and the local arboretum. To minimize the impact on the natural population, the amount of plant material collected will not exceed 10% of the total number of individuals (Guerrant, Havens, & Vitt, 2004) or of the reproductive output population in a season (Menges & Quintana-Ascencio, 2004).

The Conservation status assessment using the gathered data on population size and structure, geographical range, and threats, the extinction reassessment risk of *Q. steenisii* using IUCN Red List Category and Criteria version 3.1 (IUCN, 2012). There are five quantitative criteria (A–E) used in the IUCN Red List assessment: i) population size reduction (criterion A), ii) geographic range in the form of either extent of occurrence (EOO) and/ or area of occupancy (AOO) (criterion B), iii) small population size and decline (criterion C), iv) very small population or very restricted population (criterion D), and v) quantitative analysis (criterion E). In this study, we only used criteria B, C and D to assess the extinction risk of the species. For criterion B, the calculation of EOO and AOO of the species using Geospatial Conservation Assessment Tool (GeoCAT) (Bachman, Moat, Hill, De La Torre, & Scott, 2011). In addition, the population size estimate used in criteria C and D is calculated based on the number of mature individuals

2.1. Locations

The survey was conducted at three mountains in Aceh Province, Indonesia: Mount (Mt). Leuser National Park, Mt. Bandahara and Mt. Kemiri (**Figure 1**).

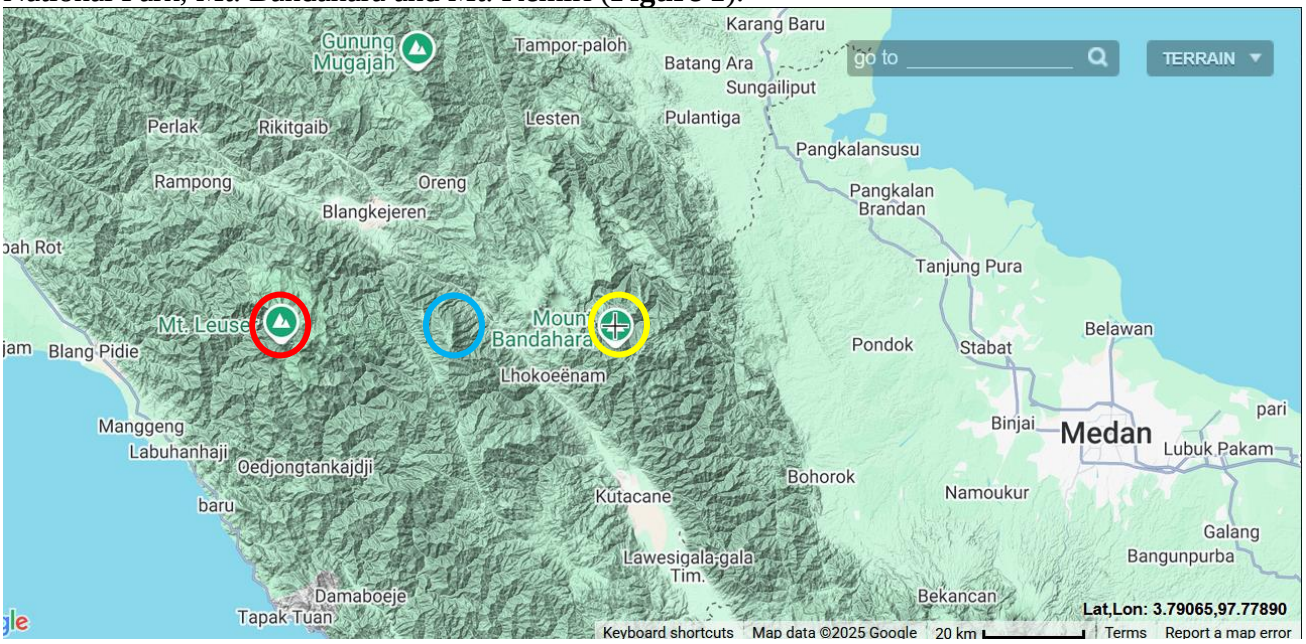


Figure 1. Location of study site: Mt. Lueser (red circle), Mt. Bandahara (yellow circle), Mt. Kemiri (blue circle) in Mt. Leuser National Park.

2.2. Survey date

- ✓ The first fieldwork for the population survey of *Quercus steenisii* was conducted from January 25 to February 13, 2024, at Mt. Leuser and Mt. Bandahara.
- ✓ The second fieldwork for the population survey of *Quercus steenisii* was conducted from 19-24 December 2024, at Mt. Kemiri

Fieldwork schedule:

No	Date	Activity
1	25 January 2024	- Flight from Jakarta to Medan - Travel from Medan to Langsa to pick up the University of Samudra Team
2	26 January 2024	- Travel from Langsa to Mt. Leuser National Park - Coordination with the local staff of the national park at the Resort of Mt. Leuser
3	27 January 2024	- Coordination with local guide and porters in Mt. Leuser - Preparation of equipment and logistic for camping and population surveys
4	28 January 2024	Population surveys in Mt. Leuser
5	29 January 2024	Population surveys in Mt. Leuser
6	30 January 2024	Population surveys in Mt. Leuser
7	31 January 2024	Population surveys in Mt. Leuser
8	1 February 2024	Population surveys in Mt. Leuser
9	2 February 2024	Population surveys in Mt. Leuser
10	3 February 2024	- Plant materials preparation - Coordination with the local staff of the national park
11	4 February 2024	- Travel form the Resort of Mt. Leuser to the resort of Mt. Bandahara - Coordination with the local staff of the national park at the Resort of Mt. Bandahara
12	5 February 2024	- Coordination with local guide and porters in Mt.Bandahara - Preparation of equipment and logistic for camping and population surveys
13	6 February 2024	Population surveys in Mt. Bandahara
14	7 February 2024	Population surveys in Mt. Bandahara
15	8 February 2024	Population surveys in Mt. Bandahara
16	9 February 2024	Population surveys in Mt. Bandahara
17	10 February 2024	Population surveys in Mt. Bandahara
18	11 February 2024	- Plant materials preparation - Coordination with the local staff of the national park
19	12 February 2024	Travel to Medan
20	13 February 2024	Flight from Medan to Jakarta
19	December 2024	Travel from University of Samudra, Langsa to the Resort Mt. Kemiri
20	December 2024	Additional population surveys of *Q. steenisii* in Mt. Kemiri by University of Samudra team
21	December 2024	Additional population surveys of *Q. steenisii* in Mt. Kemiri by University of Samudra team
22	December 2024	Additional population surveys of *Q. steenisii* in Mt. Kemiri by University of Samudra team
23	December 2024	Additional population surveys of *Q. steenisii* in Mt. Kemiri by University of Samudra team
24	December 2024	Travel from the Resort Mt. Kemiri to University of Samudra, Langsa

3. Results of the project

3.1. Project evaluation

No	The main objective of the project	Measure of Success	Achievement
1	conducting population surveys in all known locations of the species to provide its most current population status in natural habitats	At least the locality habitat was surveyed, and *Quercus steenisii* was rediscovered in its natural habitat, and population data was recorded	We conducted a population survey of *Quercus steenisii* in the habitat locality across three (3) mountains in Mount Leuser National Park. The survey began on Mount Leuser, with an expansion to Mount Bandahara in January 2024, followed by a second short survey on Mount Kemiri in December 2024. Fortunately, we successfully rediscovered *Quercus steenisii* only on Mount Leuser.
2	collecting plant materials (seeds, wildings, and/or cuttings) to serve as ex-situ collections	At least five (5) seedlings and five (5) herbarium specimens of *Quercus steenisii* were collected.	During the field surveys, we successfully located *Q. steenisii* and collected two (2) wildings and fifty (50) seeds for germination and acclimatization, to be conserved at the ex-situ conservation area in the Bogor Botanic Gardens for the fist time. We also collected five (5) herbarium specimens at the Herbarium Langsa (LGS), University of Samudra, for collection and educational purposes. The collection number is W.A. Mustaqim 3314.
3	disseminating the results of the project to the relevant stakeholders to increase their awareness regarding conservation of the endemic species and its habitat	At least one (1) activity of the project was conducted to raise public awareness.	The project activities have been disseminated through six (6) medias showing the IOS logo: an online webinar via Zoom, social media, a botany website, mass media, local tour guides, and scientific paper: 1. An online webinar: “Jamming Session 10: Biodiversity of Mount Leuser National Park" organized by the Research Center for Ecology and Ethnobiology, was held via Zoom with 294 participants and live-streamed on YouTube, garnering 302 views. The session was recorded and is available on YouTube at the following link: https://www.youtube.com/watch?v=RyeQe_HhBQw 2. Social Media on The Research Center for Ecology and Ethnobiology's Instagram account (@ekologietno_brin) received 220 likes at the following link: https://www.instagram.com/p/C84Js8lvCAW/?igsh=N3doM2hxYmxla2I1

			3. Botany website: Digital Flora of Indonesia: This checklist presents the currently known species of plants from Indonesia, the largest country in the Malesia phytogeographical region, at the following link: ➢ https://www.indonesiaplants.org/angiosperms/fagaceae/ ➢ http://phytoimages.siu.edu/cgi-bin/dol/dol_terminal.pl?taxon_name=Quercus_steenisii&rank=binomial 4. Mass media: WANALOKA.COM: Gajo, Tanaman Endemik TNGL yang 'Hilang' Setengah Abad Kini Ditemukan Lagi, at the following link: https://wanaloka.com/gajo-tanaman-endemik-tngl-yang-hilang-setengah-abad-kini-ditemukan-lagi/ 5. Local tour guides on the Mt. Leuser hiking trail at Kedah Pos. We made T-shirts featuring a photo of *Quercus steenisii* included the IOS Logo for seven (7) local guides to wear while guiding tourists for tracking to the Mt. Leuser summit. 6. Scientific journal: The data has recently been analyzed and is currently being drafted for submission to a scientific journal. In addition, funding from the International Oak Society (IOS) will be acknowledged in the manuscript text.
4	updating the conservation status of the species using the IUCN Red List categories and criteria to inform wider audiences, including national authority as well as global initiatives and institutions	An updated conservation status following the IUCN Red List	An updated conservation status of *Q. steenisii* has been made following the IUCN Red List standard format and under drafting in scientific paper. Based on the results, the new assessment of the species was proposed as as Critically Endangered (CR) under criterion D according to the IUCN Red List Criteria

3.2. Project budget and realization

No.	US$	15635.6	price IDR	Qty.	Unit	Day	IDR total	US$ total	Ralization IDR	Raliza tion US$	Explanation
1	**Travel costs**										
	Transport, traveling Bogor to Jakarta by car (1 unit x 2 days x US$35)	35	547,244	1	unit	2	1,094,489	70	870,000	56	We managed to use less budget for transport traveling Bogor-Jakarta
	Transport, flight ticket Jakarta to Kualanamu International Airport Medan (2 persons x 2 days x US$130)	130	2,032,622	2	person	2	8,130,486	520	6,030,841	386	We managed to use less budget for flight ticket
	Transport, Car rental (including gasoline and driver) for local transport (1 unit x 20 days x US$70)	70	1,094,489	1	unit	20	21,889,770	1,400	21,250,000	1,359	We managed to use less budget for car rental: Survey 1 on January 2024: IDR 850,000 x 1 unit x 20 days= 17,000,000 Survey 2 on December 2024: IDR 800,000 x 1 unit x 6 days= 4,250,000
	Accommodation, (4 persons x 19 days x US$19)	19	297,075	4	person	19	22,577,734	1,444	21,500,000	1,375	We managed to use less budget for accommodation: Survey 1 on January 2024: IDR 250,000 x 19 days x 4 people= 19,000,000 Survey 2 on December 2024: IDR 250,000 x 5 days x 2 people= 2,500,000
	Food during field survey (4 persons x 19 days x US$10)	10	156,356	4	person	19	11,883,018	760	13,330,000	853	The fee was higher US$92.54 compared to the initial budget because additional extra day for population survey: Survey 1 on January 2024: IDR 155,000 x 19 days x 4 person= 11,780,000 Survey 2 on December 2024: IDR 155,000 x 5 days x 2 person= 1,550,000
2	**Local guide/porter**										
	Fee for local guide and porter (3 persons x 18 days x US$13)	13	203,262	3	person	18	10,976,156	702	14,000,000	895	The fee was higher US$193.4 compared to the initial budget because additional local guide and extra day for population survey: Survey 1 on January 2024: IDR 250,000 x 11 days x 4 person= 11,000,000 Survey 2 on December 2024: IDR 250,000 x 4 days x 3 person= 3,000,000
3	**Other cost**										
	Entry permit/ Fee needed to get the entry permit to the study site (4 persons x US$15)	15	234,533	4	person	1	938,133	60	1,130,000	72	The fee was higher US$12 compared to the initial budget because tax fees for collecting plant material in conservation areas
	Plant materials air shipping cost (1 package x US$40)	40	625,422	1	package	1	625,422	40	0	0	We brought our plant materials directly, so there were no shipping costs

4	**Equipment** (Covered by host and patner institutions)	500	7,817,775	1	package	0	-	-		0	
5	**Materials** (Covered by host and patner institutions)	200	3,127,110	1	package	0	-	-		0	
6	**Supplies** (Covered by host and patner institutions)	100	1,563,555	1	package	0	-	-		0	
	TOTAL IDR and US$						**78,115,208**	**4,996**	**78,110,841**	**4,996**	

4. Result of the research

4.1. Populations survei of Quercus steenisii

Population surveys for *Quercus steenisii* were conducted on Mt. Leuser, Mt. Bandahara, and Mt. Kemiri, three mountains located within Mount Leuser National Park (MLNP), Sumatra. Fortunately, we successfully located the species only on Mt. Leuser. Despite field surveys on Mt. Bandahara and Mt. Kemiri did not locate the species. A total of 34 individuals were located during the survey, of which 25 (73.53%) were mature stage. Individuals with a diameter at breast height (DBH) of 10-20 cm dominate the population (**Figure 2**)

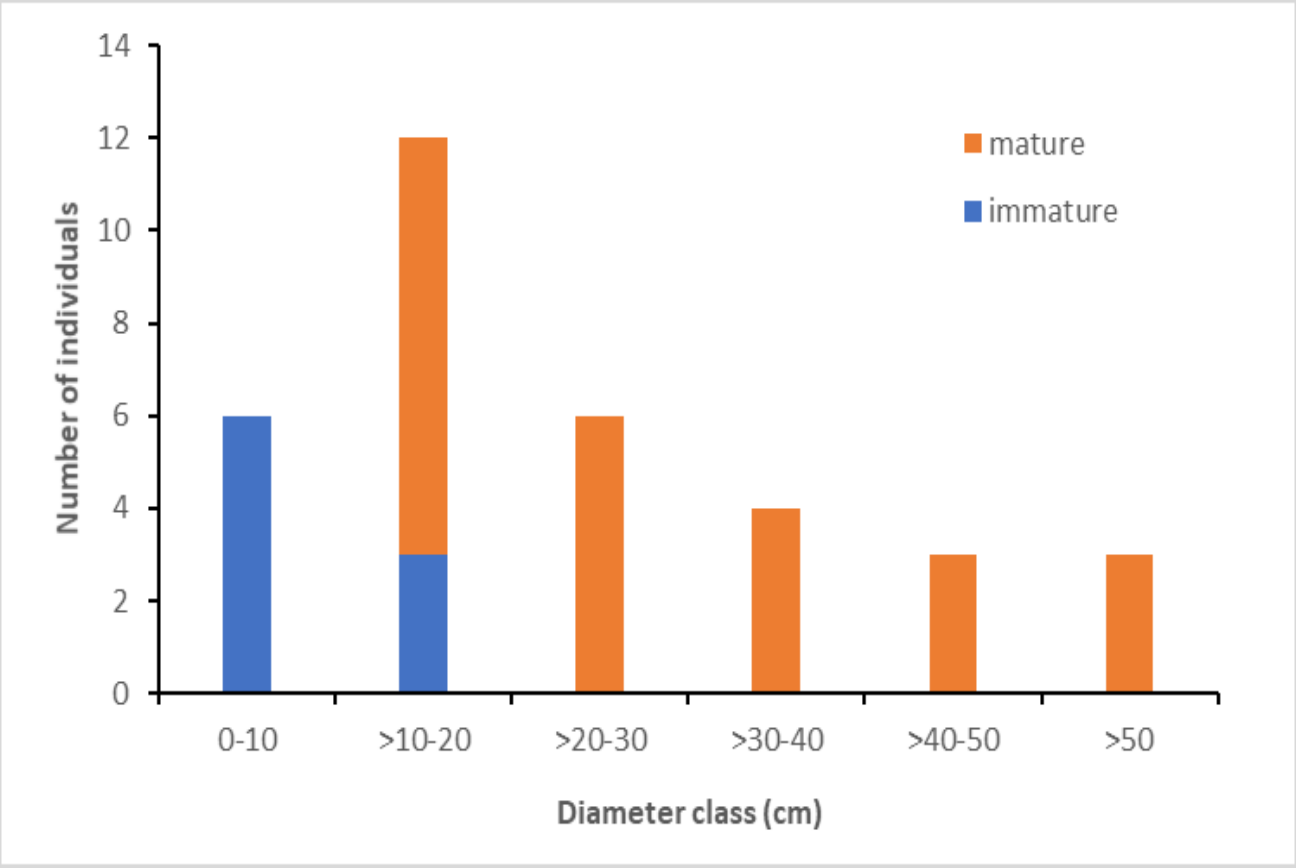


Figure 2. Population structure of *Quercus steenisii* in Mt. Leuser based on diameter at breast height (dbh) classes.

Several mature individuals of *Q.steenisii* were observed producing fruits (**Figure 3**). Therefore, we were able to document the first photograph of fresh acorns of the species. Based on this finding, we will complete the fruit description of the species. The proper photograph will be used in the manuscript article for the journal. Populations of *Q. steenisii* on Mt. Leuser were found in moist forests at Puncak Angkasan, within an elevation range of 2736-2762 m asl. Individuals of the species in Puncak Angkasan were located in a relatively flat area (slope range: 0-25°, mean = 4.8±1.32°) with a relatively northwest aspect.

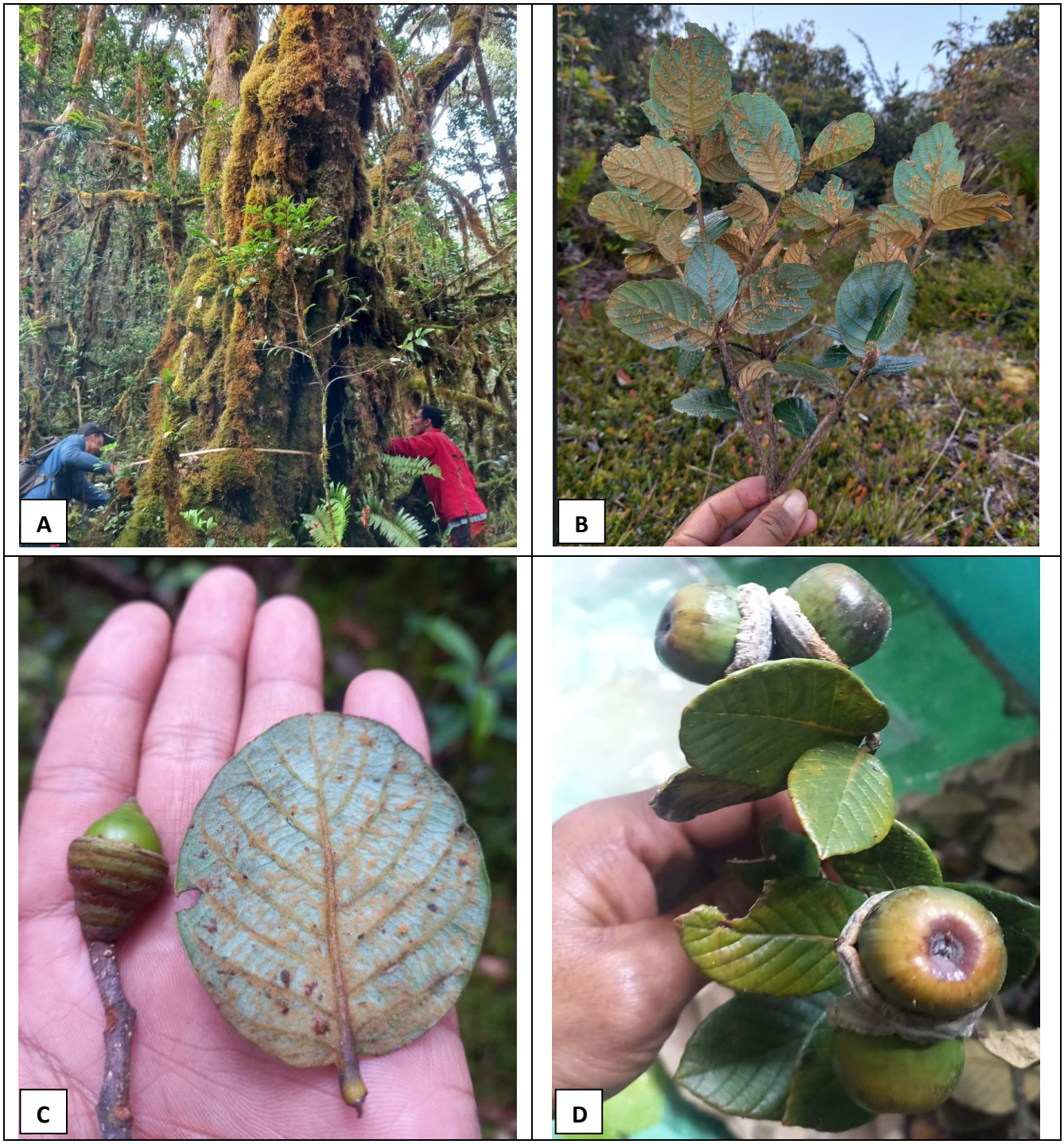


Figure 3. A. habitat and trees habitus; B. branch and leaves; C. young fruit and abaxial leaf blade; D. ripe fruit of *Quercus steenisii* in Mt. Leuser National Park.

4.2. Threats

The habitat of *Q. steenisii* is known to be within a conservation area, namely Mount Leuser National Park, at an elevation of over 2000 m asl. up to the summit, so there is actually no intensive anthropogenic threat from humans. Although forest conversion into agricultural fields (**Figure 4**), it occurs at the maximum elevation of 1200 m and is currently not threatening the population. However, some individuals were found along trekking paths used for mountaineers, which could disturb their species habitat. In the past, a prolonged drought occurred, leading to a fire at Puncak Angkasan. Additionally, there is a biological threat from herbivores to *Q. steenisii*, as deer eaten the acorns of *Q. steenisii* and many deer footprints were found under the mature individual trees of *Q. steenisii* during the fruiting season (**Figure 5**). The eaten acorns are damaged, which affects the regeneration of *Q. steenisii*. This is evidenced by the very few seedlings found (**Figure 2**). We are uncertain whether this should be considered a threat to *Q. steenisii* or if it is a normal part of the natural cycle.

Figure 4. Threat to the habitat: Forest conversion into agricultural fields (left) and trail of recreational activities by mountaineers (right).

Figure 5. Threat to the species: Acorn of *Q. steenisii* eaten by deer (left), deer footprint (right)

4.3. Collecting of Quercus steenisii (Wildling and seed collection and germination)

During the field surveys, we successfully located *Q. steenisii* and collected two (2) wildlings and fifty (50) seeds for germination and acclimatization. Acorns successfully germinated, but unfortunately, the wildlings did not survive. These will be conserved for the first time in the ex-situ conservation area at the Bogor Botanic Gardens (**Figure 6**).

Figure 6. Wildlings and acorns were collected and germinated at the Bogor Botanic Gardens

4.4. Herbarium collection

We have collected herbarium specimen from the field and preserved it at Herbarium Langsa (LGS) , Universitas Samudra, for collection and educational purposes (**Figure 7**).

Figure 7. Herbarium specimen of *Quercus steenisii* is preserved at Herbarium Langsa (LGS), Universitas Samudra, Aceh. The collection number is W.A. Mustaqim 3314.

4.5. Conservation status assessment

Conservation status of *Q. steenisii* was assessed against all the criteria of IUCN Red List. We checked and confirmed the locality name and coordinates recorded in the herbarium and those listed in GBIF. It turned out there was a discrepancy in the placement of the coordinates, so we performed a reduction analysis, removing two locations from Gayo, Aceh Tengah, and Southeast Aceh. Based on the final result GeoCAT calculation after reduction analysis, the species had an EOO and AOO of 70.120 and 12 km^2, respectively (**Figure 8**).

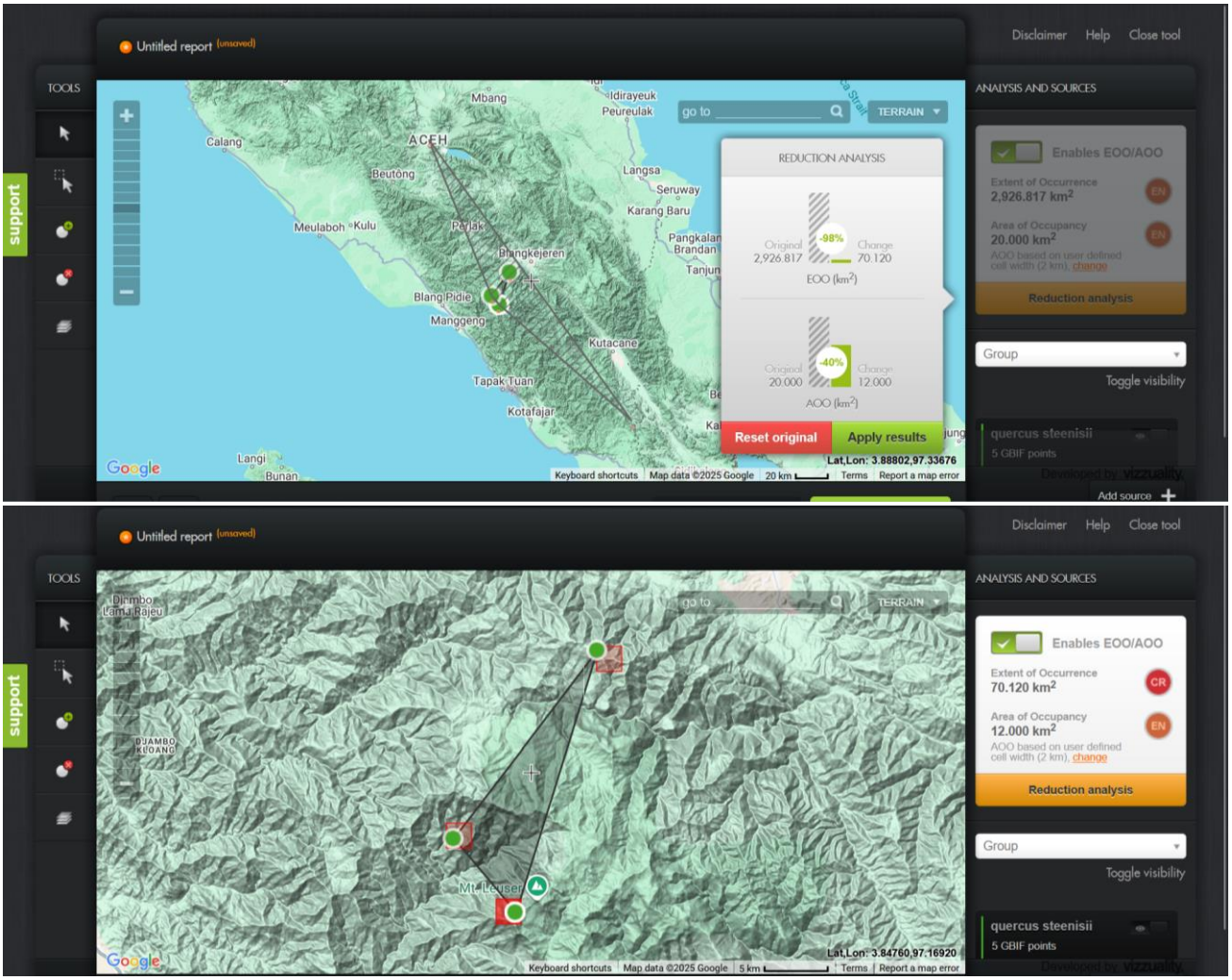


Figure 8. Reduction analysis of extent of occurrence (EOO) and area of occupancy (AOO) using GeoCAT website (Bachman et al. 2011; http://geocat.kew.org) (top) and final result (bottom).

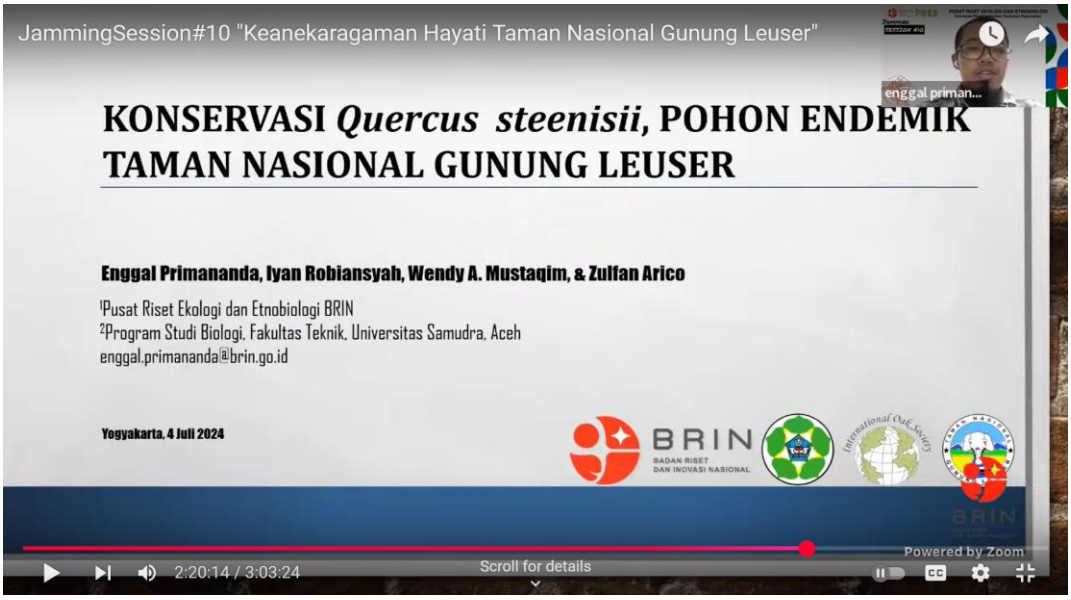
We observed some individuals were found along trekking paths used for mountaineers, which could disturb their species habitat. In the past, a prolonged drought occurred, leading to a fire at Puncak Angkasan. Additionally, there is a biological threat from herbivores to *Q. steenisii*, as deer eaten the acorns of *Q. steenisii* and many deer footprints were found under the mature individual trees of *Q. steenisii* during the fruiting season. This species is narrowly endemic, found only in one location on Mt. Leuser. The number of mature individuals was estimated to be 25 individuals (less than 50 individuals). Based on the results, the new assessment of the species was proposed as as Critically Endangered (CR) under criterion D according to the IUCN Red List Criteria.

4.6. Dissemination of the project activities

The project activities have been disseminated through six (6) medias: an online webinar via Zoom, social media, botany website, mass media, local tour guides, and scientific paper:

4.6.1. An online webinar

To increase scientist awareness in Indonesia, this project was also shared on online webinar: "Jamming Session 10: Biodiversity of Mount Leuser National Park" organized by the Research Center for Ecology and Ethnobiology, was held via Zoom with 294 participants and live-streamed on YouTube, garnering 302 views (**Figure 9**). Our presentation session titled "Konservasi *Quercus steenisii*, Pohon Endemik Taman Nasional Gunung Leuser" included the IOS Logo. The session was recorded and is available on YouTube at the following link: https://www.youtube.com/watch?v=RyeQe_HhBQw



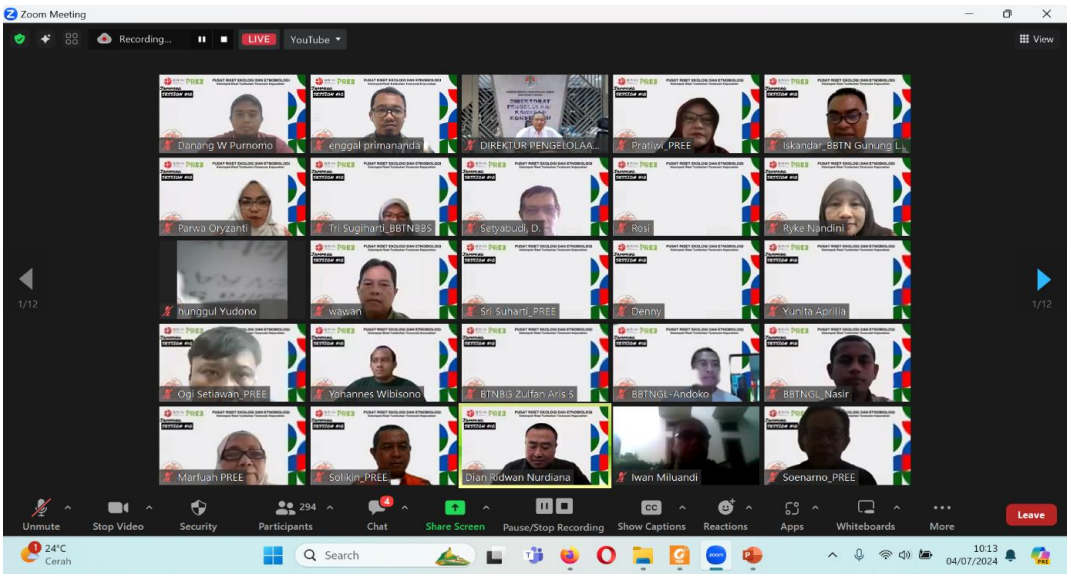


Figure 9. Dissemination of this project to the public through an online scientific webinar, organized by the Research Center for Ecology and Ethnobiology BRIN, in collaboration with Mt. Leuser National Park and Yayasan SINTAS Indonesia.

4.6.2. In Social Media

To increase millennial awareness, this project was also shared on social media through The Research Center for Ecology and Ethnobiology's Instagram account (@ekologietno_brin), where it received 220 likes (**Figure 10**). The post can be accessed at the following link: https://www.instagram.com/p/C84Js8lvCAW/?igsh=N3doM2hxYmxla2I1

Figure 10. Project dissemination in social media, Instagram

4.6.3. In a botany website

To increase the knowledge of young botanist this speciment photos of *Q. steenisii* also share to scientific website: Digital Flora of Indonesia: This checklist presents the currently known species of plants from Indonesia, the largest country in the Malesia phytogeographical region (**Figure 11**). The post can be accessed at the following link:

- https://www.indonesiaplants.org/angiosperms/fagaceae/
- http://phytoimages.siu.edu/cgi-bin/dol/dol_terminal.pl?taxon_name=Quercus_steenisii&rank=binomial

Figure 11. Project dissemination in Botany website of Digital Flora of Indonesia

4.6.4. In a Mass Media

To increase public awareness, this project was also shared with the mass media: WANALOKA.COM, in Indonesian, the title is "Gajo, Tanaman Endemik TNGL yang 'Hilang' Setengah Abad Kini Ditemukan Lagi" (**Figure 12**). The post can be accessed at the following link: https://wanaloka.com/gajo-tanaman-endemik-tngl-yang-hilang-setengah-abad-kini-ditemukan-lagi/

Figure 12. Project dissemination in Mass Media website WANALOKA.COM

4.6.5. With local tour guides

To increase tourist awareness, this project was also shared with local tour guides on the Mount Leuser trekking routes in Kedah. We made T-shirts featuring a photo of *Quercus steenisii* included

the IOS Logo for seven (7) local guides to wear while guiding tourists for tracking to the Mt. Leuser summit (**Figure 13**).

Figure 13. Dessimination with local tour guides in MLNP

4.6.6. In a Scientific journal

To increase awareness among international scientists, including botanists, ecologists, conservationists, and others, this project will be shared in an international journal. The data has recently been analyzed and is currently being drafted for submission to a scientific journal (**Figure 14**). In addition, funding from the International Oak Society (IOS) will be acknowledged in the manuscript text.

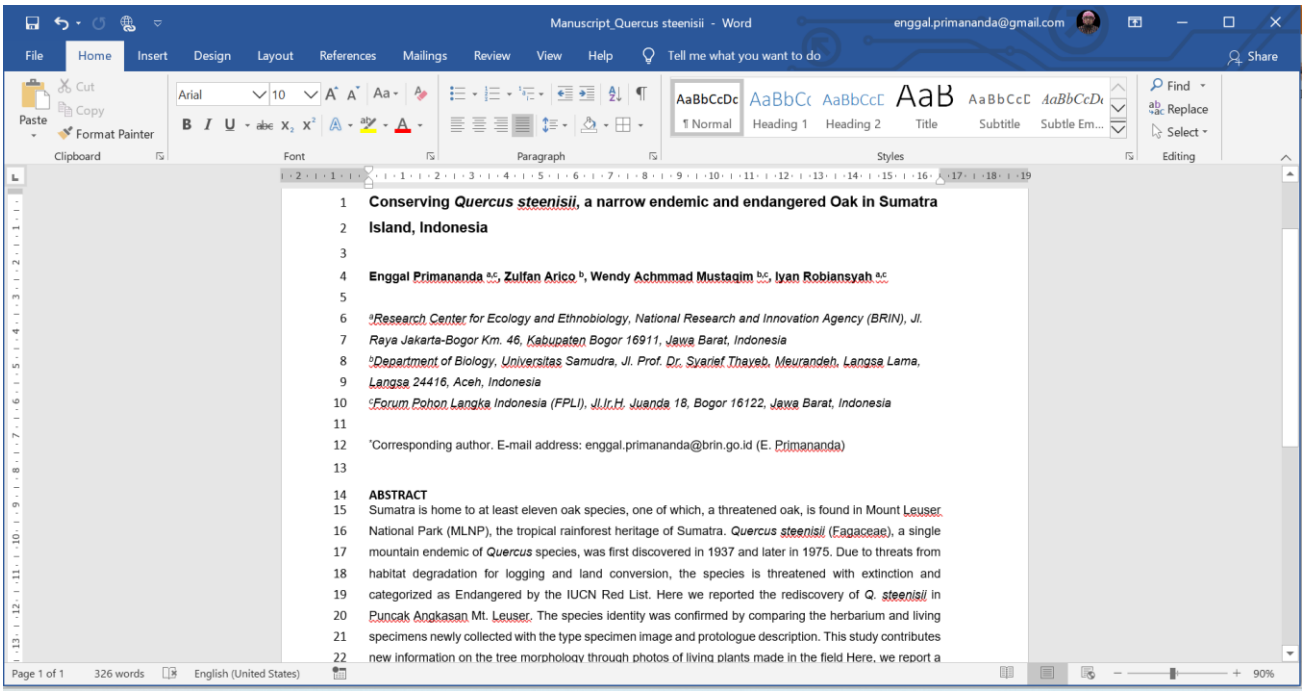
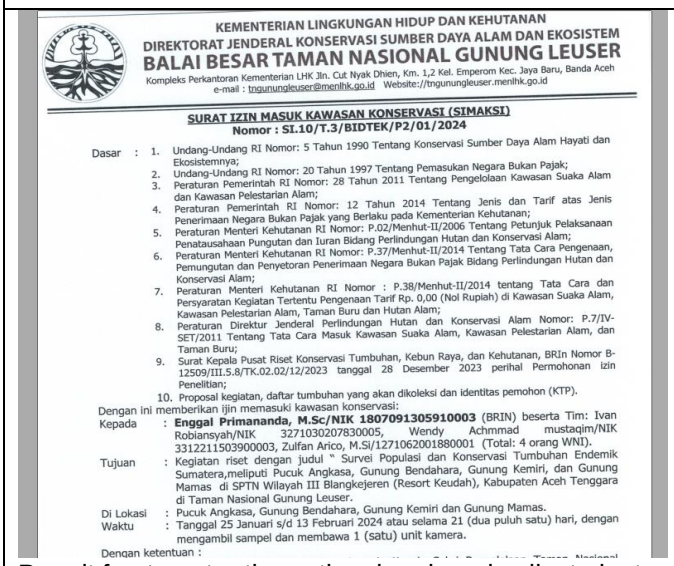


Figure 14. Preparation of the scientific article on *Quercus steenisii*

Documentation of fieldwork on *Quercus steenisii*

Coordination with the Head of Mount Leuser National Park (MLNP) for obtaining research permits

Coordination with the Head of Mount Leuser National Park (MLNP) for obtaining research permits



KEMENTERIAN LINGKUNGAN HIDUP DAN KEHUTANAN
DIREKTORAT JENDERAL KONSERVASI SUMBER DAYA ALAM DAN EKOSISTEM
BALAI BESAR TAMAN NASIONAL GUNUNG LEUSER
Kompleks Perkantoran Kementerian LHK Jln. Cut Nyak Dhien, Km. 1,2 Kel. Emperom Kec. Jaya Baru, Banda Aceh
e-mail : tngunungleuser@menlhk.go.id Website://tngunungleuser.menlhk.go.id

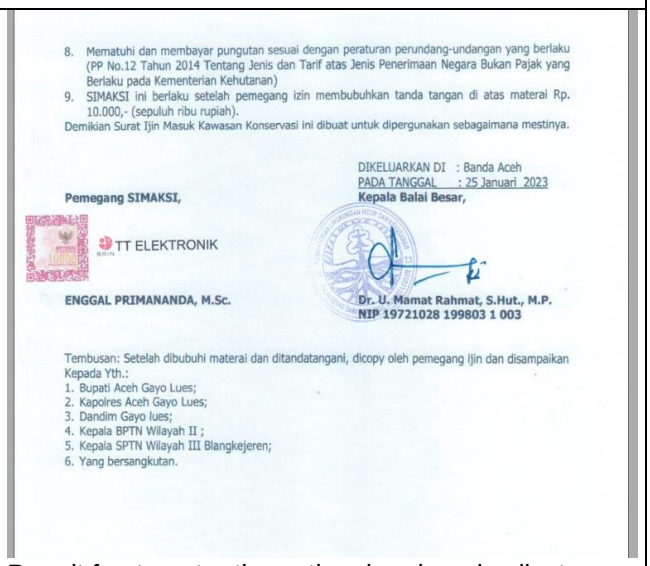
SURAT IZIN MASUK KAWASAN KONSERVASI (SIMAKSI)
Nomor : SI.10/T.3/BIDTEK/P2/01/2024

Dasar :
1. Undang-Undang RI Nomor: 5 Tahun 1990 Tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya;
2. Undang-Undang RI Nomor: 20 Tahun 1997 Tentang Pemasukan Negara Bukan Pajak;
3. Peraturan Pemerintah RI Nomor: 28 Tahun 2011 Tentang Pengelolaan Kawasan Suaka Alam dan Kawasan Pelestarian Alam;
4. Peraturan Pemerintah RI Nomor: 12 Tahun 2014 Tentang Jenis dan Tarif atas Jenis Penerimaan Negara Bukan Pajak yang Berlaku pada Kementerian Kehutanan;
5. Peraturan Menteri Kehutanan RI Nomor: P.02/Menhut-II/2006 Tentang Petunjuk Pelaksanaan Penatausahaan Pungutan dan Iuran Bidang Perlindungan Hutan dan Konservasi Alam;
6. Peraturan Menteri Kehutanan RI Nomor: P.37/Menhut-II/2014 Tentang Tata Cara Pengenaan, Pemungutan dan Penyetoran Penerimaan Negara Bukan Pajak Bidang Perlindungan Hutan dan Konservasi Alam;
7. Peraturan Menteri Kehutanan RI Nomor : P.38/Menhut-II/2014 tentang Tata Cara dan Persyaratan Kegiatan Tertentu Pengenaan Tarif Rp. 0,00 (Nol Rupiah) di Kawasan Suaka Alam, Kawasan Pelestarian Alam, Taman Buru dan Hutan Alam;
8. Peraturan Direktur Jenderal Perlindungan Hutan dan Konservasi Alam Nomor: P.7/IV-SET/2011 Tentang Tata Cara Masuk Kawasan Suaka Alam, Kawasan Pelestarian Alam, dan Taman Buru;
9. Surat Kepala Pusat Riset Konservasi Tumbuhan, Kebun Raya, dan Kehutanan, BRIn Nomor B-12509/III.5.8/TK.02.02/12/2023 tanggal 28 Desember 2023 perihal Permohonan izin Penelitian;
10. Proposal kegiatan, daftar tumbuhan yang akan dikoleksi dan identitas pemohon (KTP).

Dengan ini memberikan ijin memasuki kawasan konservasi:
Kepada : **Enggal Primananda, M.Sc/NIK 1807091305910003** (BRIN) beserta Tim: Ivan Robiansyah/NIK 3271030207830005, Wendy Achmmad mustaqim/NIK 3312211503900003, Zulfan Arico, M.Si/1271062001880001 (Total: 4 orang WNI).
Tujuan : Kegiatan riset dengan judul " Survei Populasi dan Konservasi Tumbuhan Endemik Sumatera,meliputi Pucuk Angkasa, Gunung Bendahara, Gunung Kemiri, dan Gunung Mamas di SPTN Wilayah III Blangkejeren (Resort Keudah), Kabupaten Aceh Tenggara di Taman Nasional Gunung Leuser.
Di Lokasi : Pucuk Angkasa, Gunung Bendahara, Gunung Kemiri dan Gunung Mamas.
Waktu : Tanggal 25 Januari s/d 13 Februari 2024 atau selama 21 (dua puluh satu) hari, dengan mengambil sampel dan membawa 1 (satu) unit kamera.

Dengan ketentuan :

Permit fee to enter the national park and collect plant materials



8. Mematuhi dan membayar pungutan sesuai dengan peraturan perundang-undangan yang berlaku (PP No.12 Tahun 2014 Tentang Jenis dan Tarif atas Jenis Penerimaan Negara Bukan Pajak yang Berlaku pada Kementerian Kehutanan)
9. SIMAKSI ini berlaku setelah pemegang izin membubuhkan tanda tangan di atas materai Rp. 10.000,- (sepuluh ribu rupiah).

Demikian Surat Ijin Masuk Kawasan Konservasi ini dibuat untuk dipergunakan sebagaimana mestinya.

DIKELUARKAN DI : Banda Aceh
PADA TANGGAL : 25 Januari 2023
Pemegang SIMAKSI, **Kepala Balai Besar,**
TT ELEKTRONIK
ENGGAL PRIMANANDA, M.Sc. **Dr. U. Mamat Rahmat, S.Hut., M.P.**
NIP 19721028 199803 1 003

Tembusan: Setelah dibubuhi materai dan ditandatangani, dicopy oleh pemegang ijin dan disampaikan
Kepada Yth.:
1. Bupati Aceh Gayo Lues;
2. Kapolres Aceh Gayo Lues;
3. Dandim Gayo lues;
4. Kepala BPTN Wilayah II ;
5. Kepala SPTN Wilayah III Blangkejeren;
6. Yang bersangkutan.

Permit fee to enter the national park and collect plant materials

Coordination with the head of Kedah Resort of (MLNP)

Coordination with the local guide and porter

Exploration of *Q. steenisii* in its natural habitat

Population study of *Q. steenisii* in its natural habitat

Measurement of diameter breast height (DBH) of *Q. steenisii*

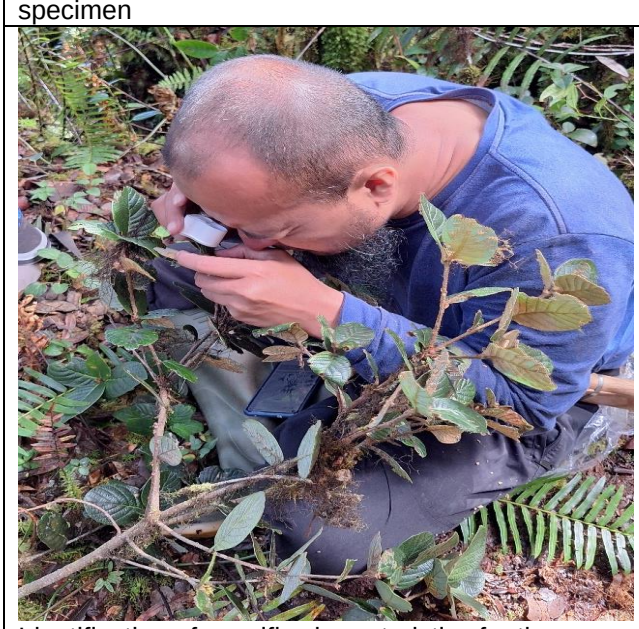
Measurement of the diameter breast height (DBH) of *Q. steenisii* and data recording

Collection of voucher specimens of *Quercus steenisii*

The biggest mature individual of *Q. steenisii*

Tree climbing for collection of *Quercus steenisii* specimen

Collection of the *Q. steenisii* specimen



Identification of specific characteristics for the confirmation of the *Q. steenisii* species

Identification of specific characteristics for the confirmation of the *Q. steenisii* species

Preparation of herbarium voucher for *Q. steenisii*

Preparation of herbarium voucher for *Q. steenisii*

Collection of herbarium voucher of *Q. steenisii*

Documentation of fresh specimen of *Q. steenisii*

Documentation of fresh specimen of *Q. steenisii*

Documentation of fresh specimen of *Q. steenisii*

Documentation of fresh specimen of *Q. steenisii*

Documentation of fresh specimen of *Q. steenisii*

Threats to the habitats of *Q. steenisii* in MLNP: Forest conversion into agricultural areas

Threats to *Q. steenisii* in MLNP from herbivores: Deer eating acorn has caused regeneration failure

Collecting wildlings of Q. steenisii

Collecting mature acorn of *Q. steenisii*

Collecting wildlings of *Q. steenisii*

Collecting wildlings of *Q. steenisii*

Sample checking by staff of Mt. Leuser National Park

Kementerian Lingkungan Hidup Dan Kehutanan
Direktorat Konservasi Sumber Daya Alam dan Ekosistem
Balai Besar Taman Nasional Gunung Leuser

TAHUN ANGGARAN 2024

BK.

KUITANSI BUKTI PENERIMAAN NEGARA BUKAN PAJAK

Sudah terima dari: Enggal Primananda, M.Sc

Jumlah Uang: Rp 430,000

Terbilang: Empat Ratus Tiga Puluh Ribu Rupiah

Untuk Pembayaran : Pungutan SIMAKSI An. : **Enggal Primananda, M.Sc**
Jumlah Orang : 4 (empat) orang WNI
Lembaga/ Peneliti : BRIN (Badan Riset dan Inovasi Nasional)
Tujuan : Kegiatan riset dengan judul "Survei Populasi dan Konservasi Tumbuhan Endemik Sumatera, meliputi Puncak Angkasan, Gunung Bendahara, Gunung Kemiri, dan Gunung Mamas"
Wilayah Kerja BBTNGL : Puncak Angkasan, Gunung Bendahara, Gunung Kemiri, dan Gunung Mamas di SPTN Wilayah III Blangkejeren (Resor Kedah), Kabupaten Aceh Tenggara, Taman Nasional Gunung Leuser
SK Izin Pengambilan Sampel Nomor : SI.10/T.3/BIDTEK/P2/1/2024 Tanggal 25 Januari 2023.
TMT SIMAKSI : Tanggal 25 Januari s/d 13 februari 2024 atau selama 21 (dua puluh satu) hari, dengan **mengambil sampel dan membawa 1 (satu) unit kamera**

Berdasarkan :
1. PP Nomor 12 Tahun 2014 Tentang Jenis dan Tarif Atas Jenis Penerimaan Negara Bukan Pajak Yang Berlaku Pada Kementerian Kehutanan.
2. Permenhut Nomor P.36/Menhut-II/2014 Tentang Tata Cara Penetapan Rayon di Taman Nasional, Taman Hutan Raya, Taman Wisata Alam, Taman Buru Dalam Rangka Pengenaan Penerimaan Negara Bukan Pajak Bidang Parawisata Alam.
3. Permenhut Nomor P.37/Menhut-II/2014 Tentang Tata Cara Pengenaan, Pemungutan dan Penyetoran Penerimaan Negara Bukan Pajak Bidang Perlindungan Hutan dan Konservasi Alam.
4. PermenLHK RI Nomor P.86/MenLHK/Setjen/Kum.1/11/2016 Tentang Penetapan Harga Patokan Tumbuhan dan Satwa Liar di Dalam Negeri atau di Luar Negeri.

Dengan Rincian Sebagai Berikut :

Pengambilan Sampel dan Spesimen Herbarium di Stasiun Penelitian Ketambe untuk Kepentingan Pengayaan Koleksi Bank Biji

No.	Nama Jenis	Harga Patokan Hidup (Rp)	Harga Patokan Herbarium (Rp)	Jumlah Anakan	Jumlah Herbarium	PNBP Anakan (Rp)	PNPB Herbarium (Rp)	Jumlah	Dasar
1	*Quercus steenisii*	20,000	10,000	2	3	20,000	15,000	35,000	PP.12 Thn 2014
2	*Lithocarpus atjehensis*	20,000	10,000	-	3	-	15,000	15,000	
3	*Rhododendron taxoides*	20,000	10,000	-	3	-	15,000	15,000	
4	*Gaultheria cinnabarina*	20,000	10,000	-	1	-	5,000	5,000	
5	*Daphniphyllum woodsonianum*	20,000	10,000	-	2	-	10,000	10,000	

Sample checking by staff of MLNP

Documentation of our team with the largest mature individual of *Quercus steenisii*: an endangered tree species endemic to Mount Leuser National Park

Documentation of our team with the largest mature individual of *Quercus steenisii*: an endangered tree species endemic to Mount Leuser National Park

Documentation of our team with enthusiasm and optimism in rediscovering *Quercus steenisii*: an endangered tree species endemic to Mount Leuser National Park

Finally, our team from the National Research and Innovation Agency (BRIN), in collaboration with the University of Samudra (UNSAM), would like to express our deepest gratitude to the International Oak Society (IOS) Oak Conservation and Research Fund for providing funding for our project titled *"*Conserving *Quercus steenisii*, a narrow endemic and endangered oak in Sumatra Island, Indonesia*."*

This project has been successfully completed in accordance with the objectives outlined in the proposal and has provided numerous benefits. The rediscovery of *Q. steenisii* has contributed to education for botanists and ecologists, stakeholders such as Mt. Leuser National Park, students at the University of Samudra, local tour guides, and the public.

Additionally, the collected specimens of *Q. steenisii* from this project are now preserved at the Herbarium Langsa (LGS) University of Samudra for educational purposes, the seedlings acclimatized as an ex-situ collection at the Bogor Botanic Garden for the first time, and documentation of the species is available on the Digital Flora of Indonesia, a botany website.

Furthermore, we would like to update the conservation assessment of *Q. steenisii* based on the IUCN Red List Criteria and publishing our research in an international journal by including IOS as a project donor in the acknowledgment section.

Warm regards,

Cibinong, 31 January 2025
Principal Investigator,

BRIN
NATIONAL RESEARCH AND INNOVATION AGENCY

ELECTRONIC SIGN

Enggal Primananda
Researcher at the Research Center for Ecology and Ethnobiology BRIN