Fact database of grassland vegetation in Japan

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Abstract
This data paper reports vegetation census data collected in a network of 28 grassland sites in Japan. This is the largest grassland data set freely available in Japan. The network is the project “Grassland Dynamics in Japan” launched by the Ministry of the Agriculture and Forestry and Fisheries, Japan. It consists of semi-natural and artificial grasslands (pasture and meadow) and covers from Hokkaido to Kyushu area in Japan. Twenty to 12 permanent plots were established in each grassland. Censuses of plant species emerged in 1 m² quadrat were conducted every year from 1972 to 1982 at longest. The data provide species abundance, plant coverage (%) and length (cm) of 484 quadrats. The censuses adopted common census protocol, which provide good opportunities for meta-analyses and comparative studies among grasslands. The data have been used for ecological studies as well as for animal production reports published by the National Agriculture and Food Research Organization in Japan.

The detailed Metadata for this abstract published in the Data Paper section of the journal is available in MetaCat in JaLTER at http://db.cger.nies.go.jp/JaLTER/metacat/metacat/ERDP-2020-22.1/jalter-en.

KEYWORDS
plant coverage, plant length, plant species, site network, vegetation dynamics

1 | INTRODUCTION

There are no natural grasslands as climax vegetation in Japan, except the limited areas such as alpine grasslands and coastal grasslands (Numata, 1969, 1971). Therefore, most of native grasslands are regards as semi-natural grasslands under artificial managements, which are mowing, burning, grazing and cutting. If human impacts are lost, semi-natural grasslands will success to forests. They have many plant species and a considerable number of species included on the “red list,” a list of plant species determined to be threatened by the criteria of the International Union for Conservation of Nature and Natural Resources (Environment Agency, 1997). Although the semi-natural grassland is important for its characteristic ecosystem, it has lower productivity than the artificial grassland. Therefore, semi-natural grasslands occupied over 10% of the country area of Japan in 100 years or more before, but the occupancy is estimated to have decreased to about 1.5% now for advance with agricultural mechanization and shortage of labors in rural area (Shoji, 2003).

On the other hand, artificial grasslands have high productivity. Therefore, many artificial grasslands were quickly developed as a public pasture in Japan in the
1960s, and the number of public pastures counted more than 1,200 (Suyama & Nishimura, 1982). But few studies for long-term vegetation dynamics were conducted (Ide, Hayashi, Shimoda, & Sakanoue, 1999).

This data paper reports vegetation census data collected in a network of 28 semi-natural and artificial grasslands in Japan. This database was modified “Fact database of grassland vegetation in Japan (http://www.naro.affrc.go.jp/archive-nilgs/vegetation/)” conducted as the research project “Dynamics of the Grassland Ecosystems in Japan” launched by the Ministry of Agriculture, forestry, and Fisheries. This data paper aims at using for ecological studies, for example, the biodiversity research of long-term grassland vegetation dynamics.

2 | DATA DESCRIPTION

2.1 | Identifier

ERDP-2020-22

2.2 | Contributor

2.2.1 | Dataset owner

The Institute of Livestock and Grassland Science, The National Agriculture and Food Research Organization.

2.2.2 | Dataset creator

Katsuhisa Shimoda

The Institute of Livestock and Grassland Science, The National Agriculture and Food Research Organization.

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2.3 | Projects

2.3.1 | Title

Grassland Dynamics in Japan

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2.3.3 | Funding

Ministry of the Agriculture, Forestry and Fisheries, Japan.

2.3.4 | Objective

The research project “Grassland Dynamics in Japan” was begun in 1972 by Ministry of Agriculture and Forestry (National Grassland Research Institute, 1978). The principal purpose of this project was to clarify the dynamics of the biotic community in the grassland ecosystem belonging to each climatic zone in Japan. In addition, this project was to enable utilization sustainability and to ensure the conservation of grasslands in Japan. The project surveys above 100 grasslands throughout Japan and to continue monitoring them over the long term. The investigation methods for vegetation and plant production were determined in detail at the start of this project. At the few sites, the vegetation survey has been continued to the present.

2.4 | Geographical coverage

2.4.1 | Geographical description

Japan

2.4.2 | Bounding coordinates

West: 129.00
East: 146.00  
North: 44.00  
South: 32.00  
Geographic coordinate system is WGS84.

2.5 Temporal coverage

2.5.1 Begin

May in 1972.

2.5.2 End

June in 1982.

2.6 Taxonomic coverage

The data include 272 genus and 516 plant species.

2.7 Methods

2.7.1 Study sites and grasslands

The data were obtained at 484 grassland permanent quadrats in 28 grasslands in 17 sites. These grasslands cover from sub-arctic zone to warm temperate zone in Japan (Figure 1). Furthermore, these grasslands cover major artificial and semi-natural (including Miscanthus grassland and Zoysia grassland) grasslands in Japan. Detail data for each site is shown in Table S1 and each grassland is shown in Table S2.

2.7.2 Field method

A Permanent quadrats

Twelve or 20 quadrats were established in each grassland excluded some grasslands. At each grassland, we conducted survey at almost the same season in every census year (see Table S2). Census season was from late spring to autumn. Each quadrat size was 1 m² (1m × 1 m).

B Data collection

We measured in each quadrat as follows:

- Plant coverage (%): Total area which live plants occupy in each quadrat.
- Community height (cm): Mean height of plant community in each quadrat.
- Number of species: Number of vascular plants occupies emerged in each quadrat.

2.7.3 Taxonomy and systematics

Most botanical identifications were made in the field and recorded in Japanese common names (in the original data bases). Scientific names followed Ohwi and Kitagawa (1992) at first. If we cannot specify in it, we followed Japanese Society of Grassland Science (2000), Shimizu (2003) and Shimizu, Morita, and Hirota (2008). A large majority of plants were identified to species-level including subspecies and varieties. For some species, the minimum identification level varied. For example, it was identified to genus-level (ex. Taraxacum sp.) or family (ex. Gramineae sp.) only. Furthermore, Bryophyte plants...
recorded as *Bryophyta* sp. If it was not able to be identified, we recorded as unknown species.

2.8 | Data structure

2.8.1 | Data files

Data contents are shown in Table 2.

2.8.2 | File format

The data files are in ASCII text, comma delimited (csv) with the UTF-8 encoding.

2.8.3 | Variable definitions

The variables are listed in the order they appear in each data file. The variables are listed in Tables 3 and 4.

2.9 | Accessibility

2.9.1 | License and usage rights

1. This data set is provided under a Creative Commons Attribution-Non Commercial 4.0 International License (CC BY-NC 4.0: https://creativecommons.org/licenses/by-nc/4.0/).
2. Acceptable use. The dataset should not be used for illegal purpose or to violate the rights of the others. Use of the dataset will be restricted to academic, research, educational, government, recreational, or other not-for-profit professional purposes.
3. Citation. Data users should properly cite this Data Paper in any publications or in the metadata of any derived data products that were produced using the dataset. As the metadata and the dataset can be updated at any time, the date of the update should be shown in bibliography.
4. Acknowledgement. Data users should acknowledge as follows in any publications where the dataset contributed to its content: “Data for XXX was provided by the Institute of Livestock and Grassland Science, NARO, Grassland Dynamics in Japan Project”.
5. Notification. Data users will notify the Data Set Contact when any derivative work or publication based on or derived from the Data Set is distributed.

| **TABLE 2** | File name and contents of data files |
|-------------|-------------------------------------|
| **File name** | **Contents** |
| Stand.data.csv | Percentage of plant cover, community height and number of species of each quadrat, in each census year and each grassland. |
| Community.data.csv | Data of coverage and plant length for each species emerged in each quadrat, each census year and each grassland. |

| **TABLE 3** | Variable definition of stand data file |
|-------------|----------------------------------------|
| **Variable name** | **Definition** |
| Grassland no. | Number of each grassland |
| Grassland name | Grassland name (see Figure 1) |
| Date | Census date (YYYY.MM.DD) |
| Quadrat no. | Number of the quadrat in each grassland |
| Plant coverage (%) | Total percentage of the live plant occupied, projected on each quadrat |
| Community height (cm) | The mean height of the plant community in each quadrat |
| Species no. | The number of the species emerged in each quadrat (N/m²) |
| NA | No data cell |

| **TABLE 4** | Variable definition of community data file |
|-------------|------------------------------------------|
| **Variable name** | **Definition** |
| Grassland no. | Number of each grassland |
| Grassland name | Grassland name (see Figure 1) |
| Date | Census date (YYYY.MM.DD) |
| Quadrat no. | Number of the quadrat in each grassland |
| Species name | Scientific name of species with authority name |
| C | The coverage of each plant species in each quadrat it was recorded at percentage (%) or the scale of modified Braun-Blanquet (see Table 2) |
| L | Plant length (cm) of each plant species in each quadrat |
| NA | No data cell |
The data users will provide the Data Set Contact with two reprints or a PDF file of any publications resulting from use of the data set.

6. Collaboration. Data users are recommended to consider consultation, collaboration and/or co-authorship with the data owners.

7. Disclaimer. In no event shall the authors, data owners, or the Institute of Livestock and Grassland Science, NARO be liable to for loss of profits, or for any indirect, incidental or consequential damages arising from the use or interpretation of the data.

2.9.2 | Location of storage

http://db.cger.nies.go.jp/JaLTER/metacat/metacat/ERDP-2020-22.1/jalter-en

The Biodiversity Center of Japan, Ministry of the Environment and the data owners store the original data (in Japanese).

2.10 | Supplementary information

2.10.1 | Notes in Japanese

Although some notes/comments were recorded in the original data (in Japanese), they were removed from the data of this Data Paper. If you need the notes/comments, consult the Nasu Research Station (9. B).

2.10.2 | Related data

Dataset of this data paper are also available in Japanese from web site of Institute of Livestock and Grassland Science, National Agriculture and Food Research Organization (http://www.naro.affrc.go.jp/archive/nilgs/vegetation/), which includes some data that are not included in this data paper due to some reasons.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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