

Development of countermeasure technology against biodiversity conservation regulations related to the electric power industry

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01

Background: Environmental conservation actions are accelerating toward 2020

01-1 COP ; The conference of the parties to the convention on biological diversity



COP12 in Pyeong Chang, Korea 2014

COP11 in Hyderabad, India 2012



01-2 Aichi Biodiversity Targets ; the world aim adopted in COP10

Five Strategic Goals & Twenty Targets required to be achieved by 2020

SG A
Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

- Awareness increased
- Biodiversity values integrated
- Incentives reformed
- Sustainable consumption and production

SG B
Reduce the direct pressures on biodiversity and promote sustainable use

- Habitat loss halved or reduced
- Sustainable management of marine living resources
- Sustainable agriculture, aquaculture and forestry
- Pollution reduced
- Invasive alien species prevented and controlled
- Pressures on vulnerable ecosystems reduced

SG C
To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

- Protected areas increased and improved
- Extinction prevented
- Genetic diversity maintained

SG D
Enhance the benefits to all from biodiversity and ecosystem services

- Ecosystems and essential services safeguarded
- Ecosystems restored and resilience enhanced
- Nagoya protocol in force and operational

SG E
Enhance implementation through participatory planning, knowledge and capacity building

- NBSAPs adopted as policy instrument
- Traditional knowledge respected
- Knowledge improved, shared and applied
- Financial resources from all sources increased

**Some of these affect
the power company's
field operation.**

02

CASE 1 :

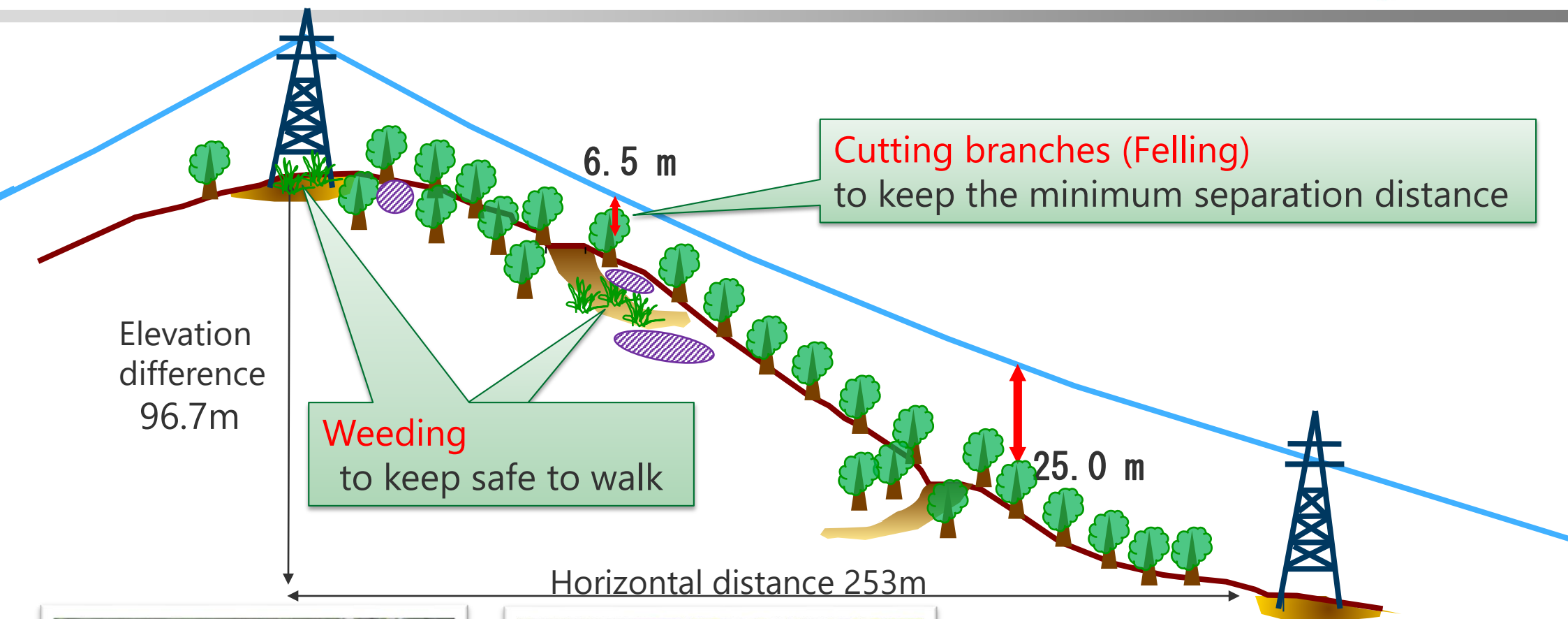
Countermeasure to regulations for endangered species protection



By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Quotation from Aichi Biodiversity Targets – Fliers, CBD

02-1 That was detected on the patrol path



Site of tower



On the path way

Weeding and felling :
the important maintenance
to prevent the power
outage accident

02-2 To protect this flower, discontinuance of weeding was required

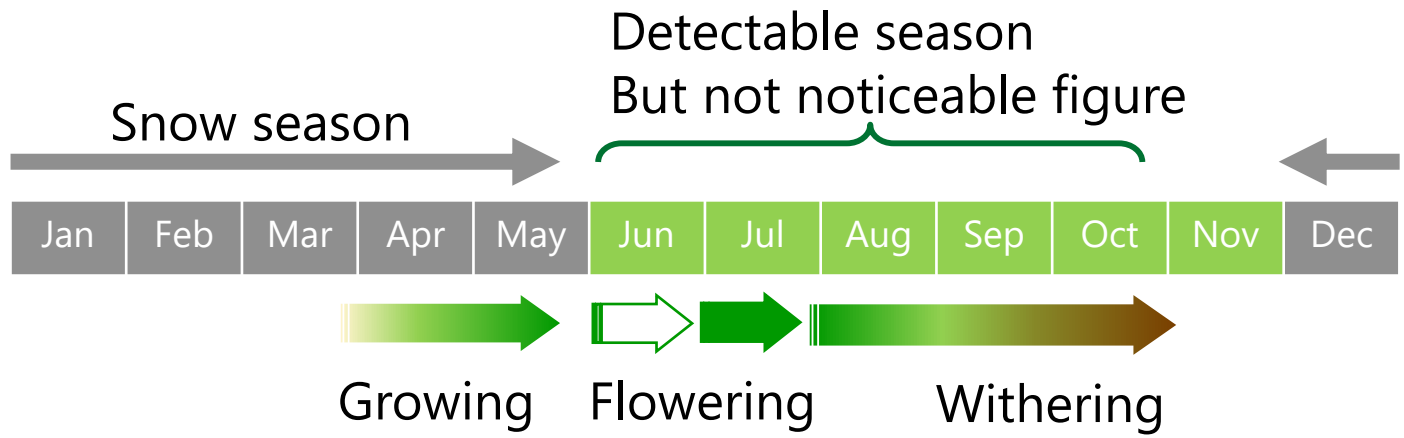
"Tadesumire" (*Viola Thibaudieri*)



Opened flower
(White but small)

Closed flower
(Green on green leaf)

Height : 20~40cm



Listed on

"the ordinance of
designated rare wild
animals and plants"

of Nagano Pref.

02-3 Researches and experiments to establish an artificial propagation



Researching their habitat



Collecting seeds



Artificial seeding



Making clear their germinating conditions



Making clear their growing conditions



Get to bloom under the artificial cultivated condition

02-4 Transplant around the site and following monitoring

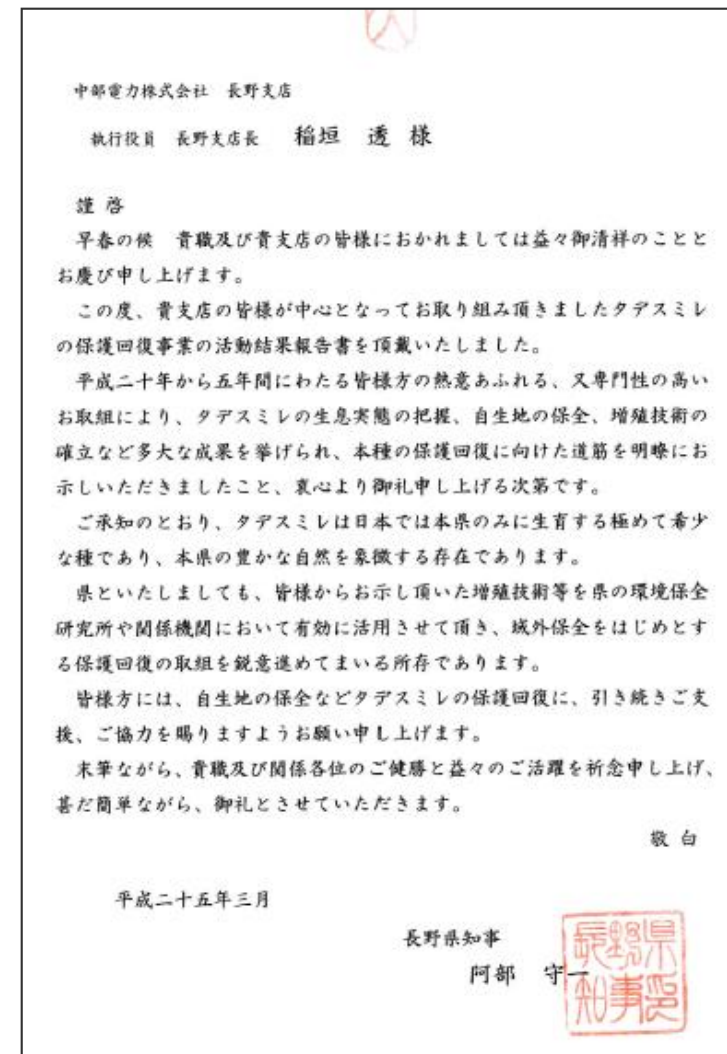


With Nagano pref.'s institute and the environmental conservation group

- We had worked on this study for four years.
- We had achieved a better relationship.



- Artificial propagation was succeeded.
- The way of weeding not disturbing their habitat or growth was revealed.
- Weeding was permitted continuously.



The appreciation letter from Nagano governor

02-5 Endangered Plants

established the conservation technology in our institute  CHUBU Electric Power



Viola Thibaudieri / violet



Yoania flava / orchid



Bletilla striata / orchid



Aconitum kiyomiense / aconite



Magnolia tomentosa / magnolia

CASE 2 :

Countermeasure to new regulations for invasive species prevention and domestic biodiversity protection



03



By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Quotation from Aichi Biodiversity Targets – Fliers, CBD



By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Quotation from Aichi Biodiversity Targets – Fliers, CBD

“Guideline for slope greening in the national parks”

Oct. 2015, Ministry of the Environment

- ✓ Don't use alien grasses or herbaceous plants
 - ✓ Use native plant species only
 - ✓ Collect the seeds or seedlings
near the construction site
- with the view to protect the “national” or “regional” genetic diversity of plant species from imported invasive plants

03-2 What is the problem ?

Functionalities required by greening ;

To prevent scattering or collapsing of soil, cover the ground speedy and stable



Courtesy of Japan Conservation Engineers & Co.,Ltd.

Conventionally,

- Imported pastures have been used, because
- ✓ Germinate stably
 - ✓ Grow fast
 - ✓ Low seed cost
 - ✓ Large amount of distribution



- What kind of native species is appropriate for our construction site?
- Is here suitable collecting area to protect their genetic diversity?
- How long does it take to get adequate seed?



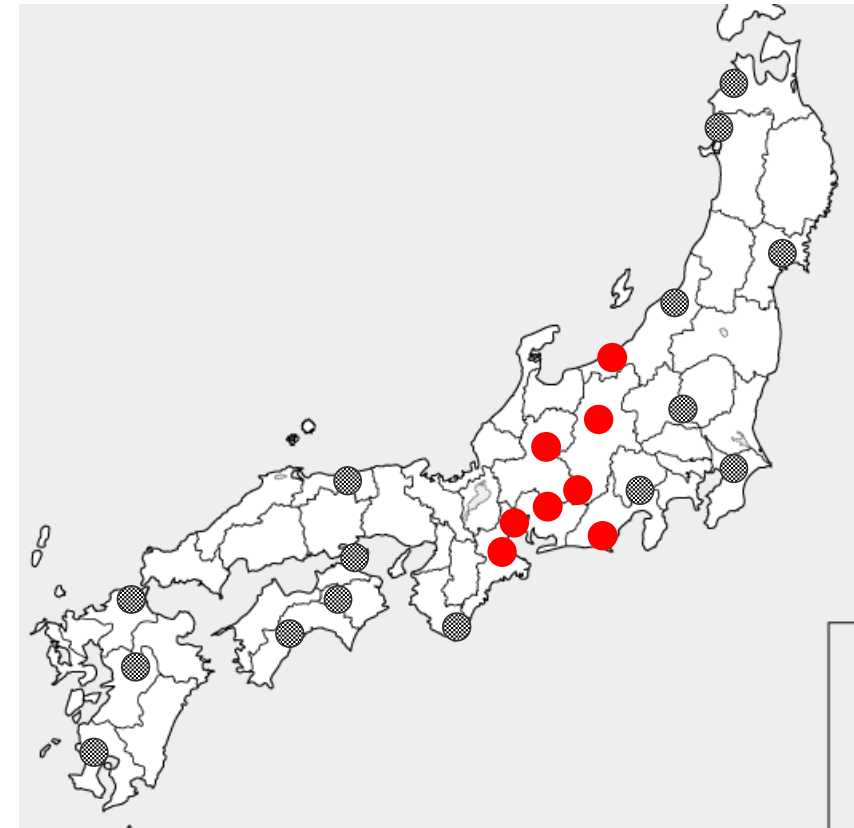
!! Construction term "longer"
!! Greening cost "higher"

03-3 Select and evaluate regional genetic diversity of native plant species in Japan

10 native herbaceous plants
self-sown in Chubu-region



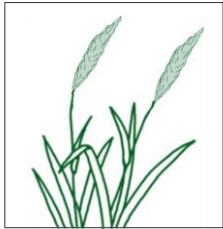
Collected samples
from 23 regions of Japan



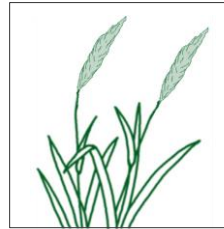
03-4 The way of confirming the genetic differences



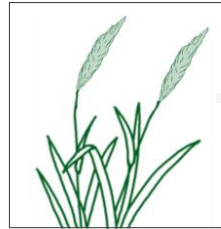
Point 1



Point 2

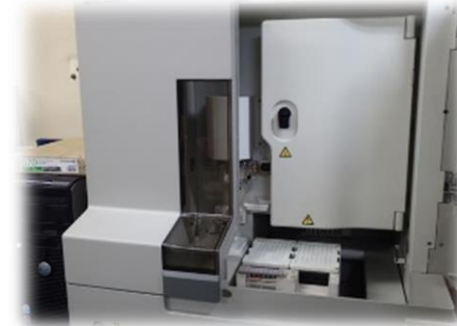
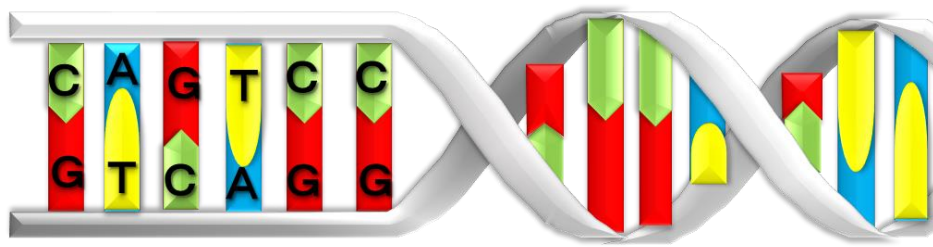


Point 3



Point 4

- Analyze same kind and same shape but different place

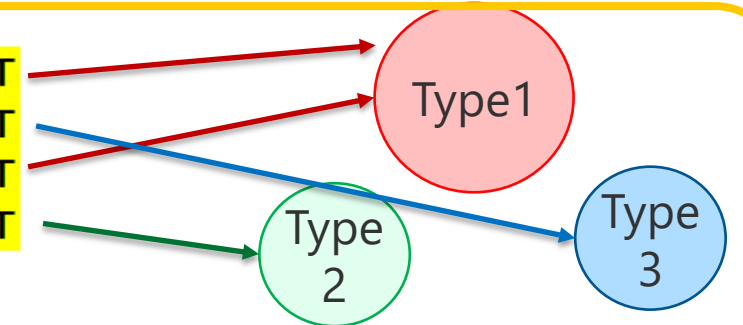


- Read bases of their DNA



Point 1	A	A	T	G	C	G	G	C	T	T	A	A	T	A	T	A	A	C	C	G	T	T	A	A	A	G	T	A	C	G	G	T
Point 2	A	A	A	G	C	C	C	A	A	T	T	T	A	T	A	T	A	A	C	C	A	A	G	T	A	C	G	G	T			
Point 3	A	A	T	G	C	G	G	C	T	T	A	A	T	A	T	A	A	C	C	G	T	T	A	A	A	G	T	A	C	G	G	T
Point 4	A	A	T	G	C	G	G	C	T	T	A	A	T	A	T	T	A	C	C	G	T	T	A	A	A	G	T	A	C	G	G	T

- Detect differences between them



- Grouping from similarity

03-5 Distribution of genetic type of native plant (1)

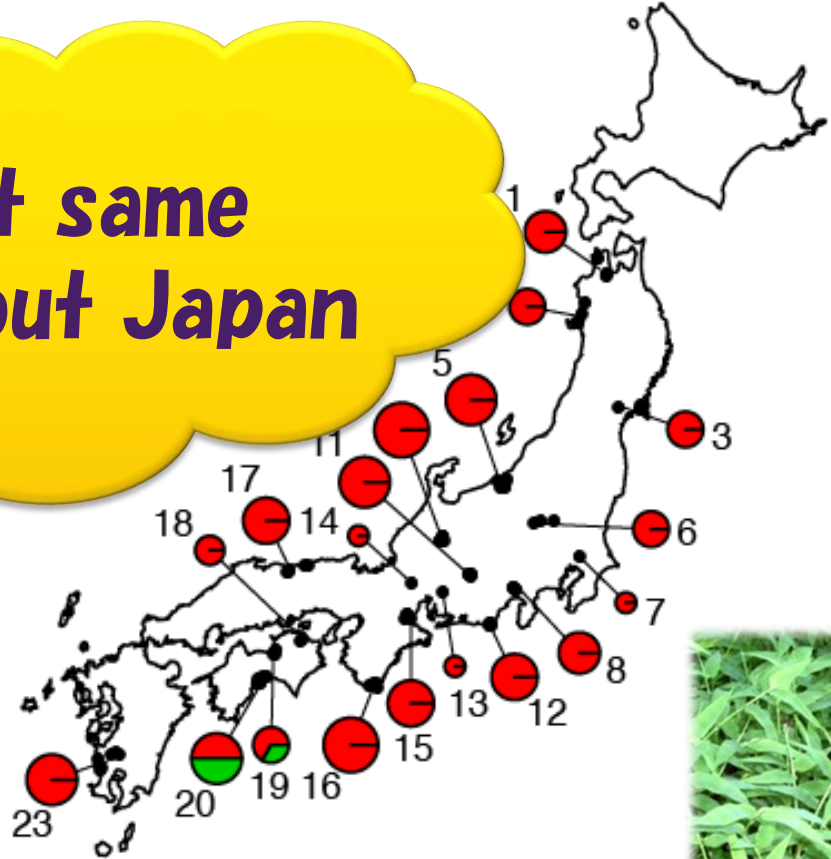
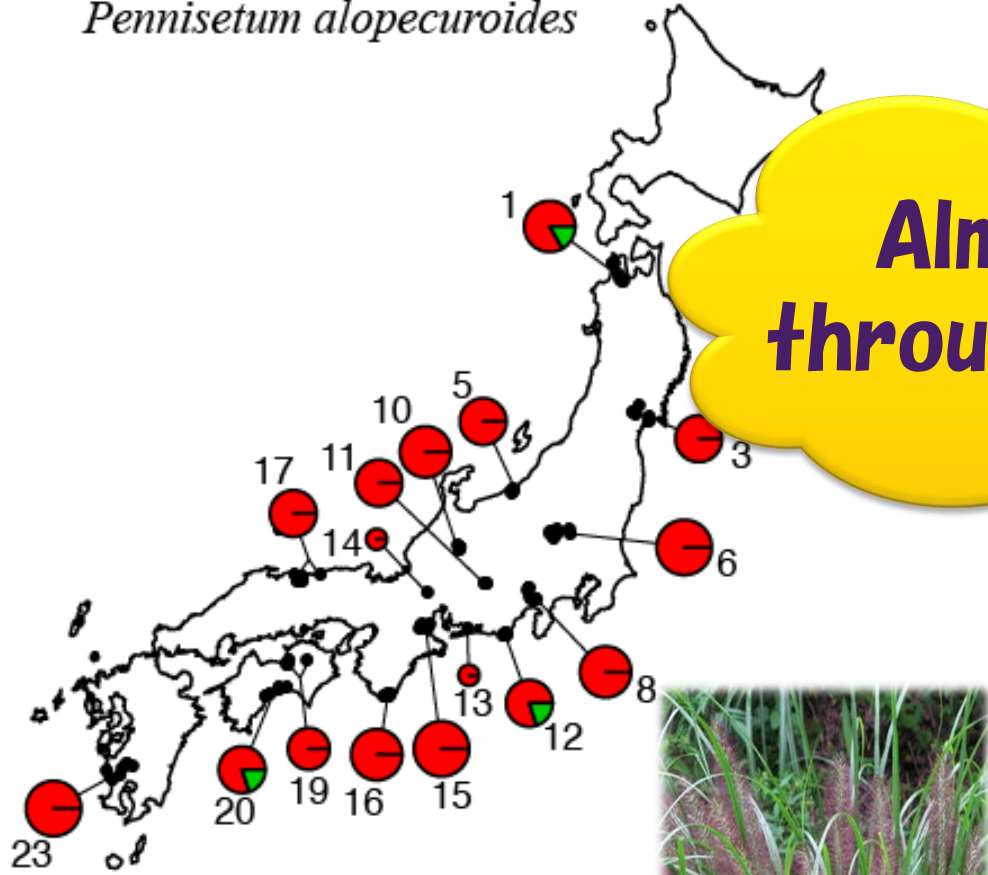
Pattern 1

It can not be confirmed genetic differences.

Pennisetum alopecuroides

Microstegium japonicum

Almost same throughout Japan

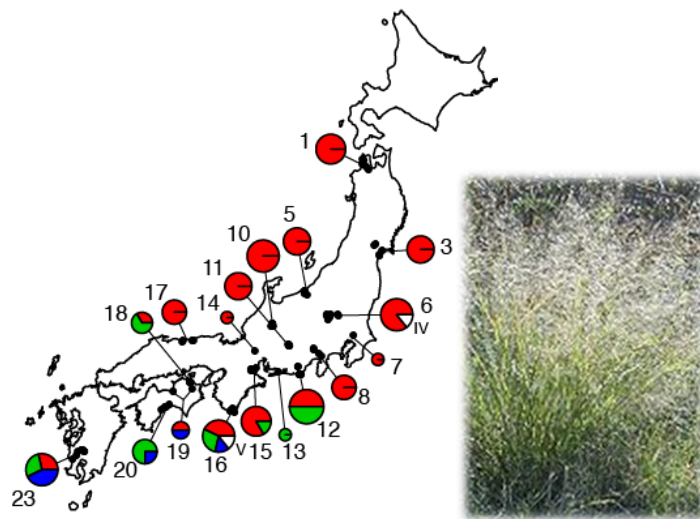


03-6 Distribution of genetic type of native plant (2)

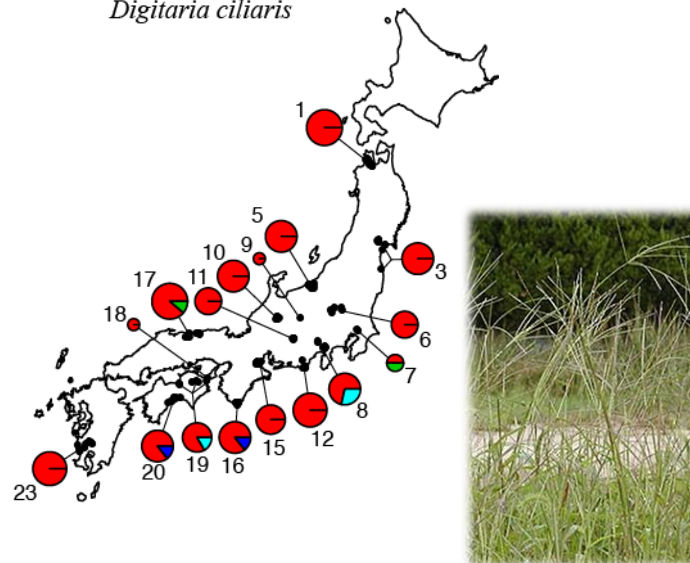
Pattern 2

Plural but not much genetic types are detected.

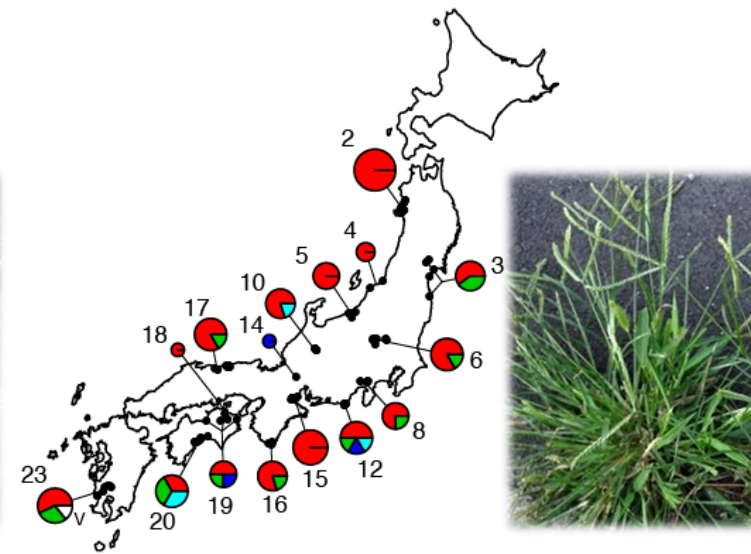
Eragrostis ferruginea



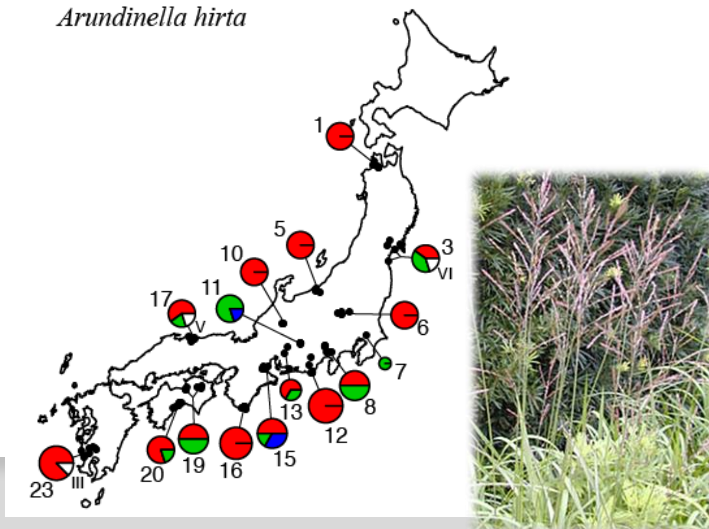
Digitaria ciliaris



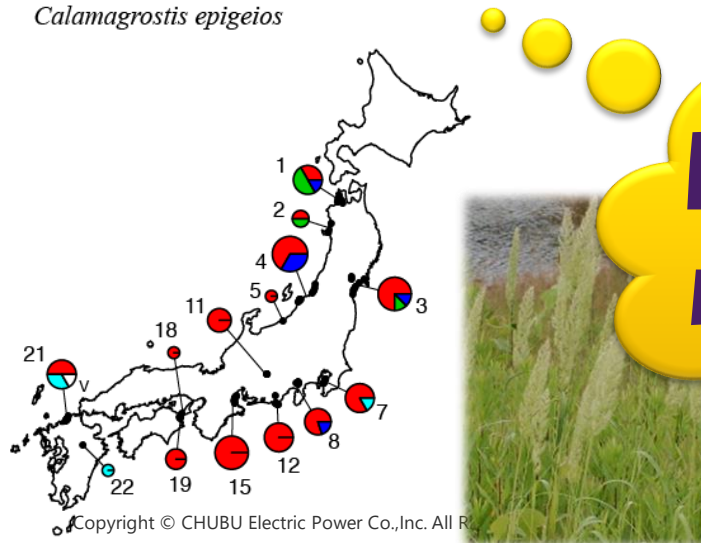
Eleusine indica



Arundinella hirta



Calamagrostis epigeios



Not so many regionalism?

03-7 Distribution of genetic type of native plant (3)

Pattern 3

Various genetic types are detected.

Imperata cylindrica

Preservation at each site might be necessary...



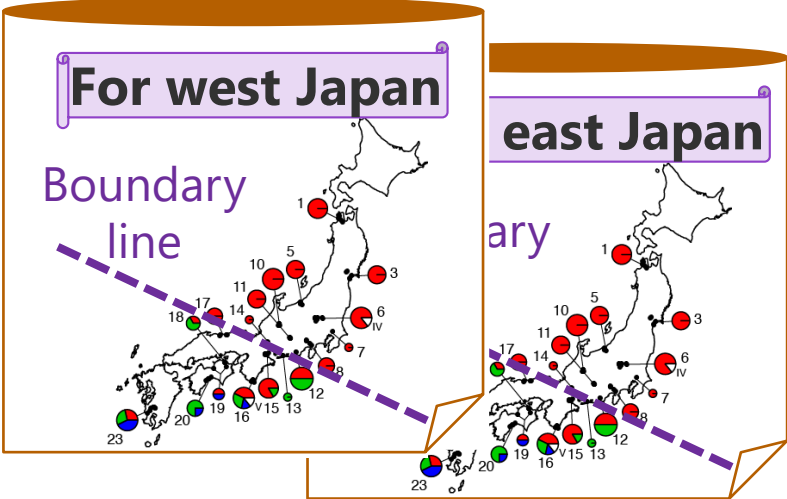
03-8 The expected results of this study

Native seed or seedling could be produced commercially.

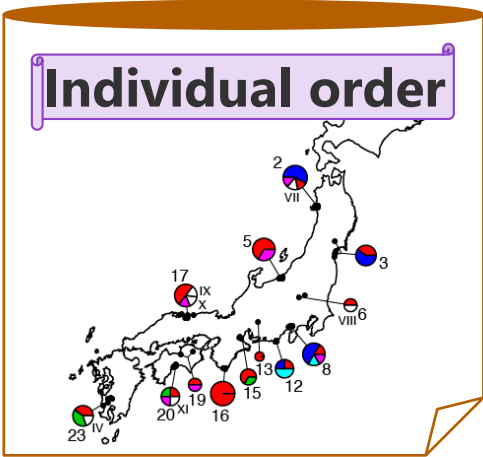
Pattern 1



Pattern 2



Pattern 3

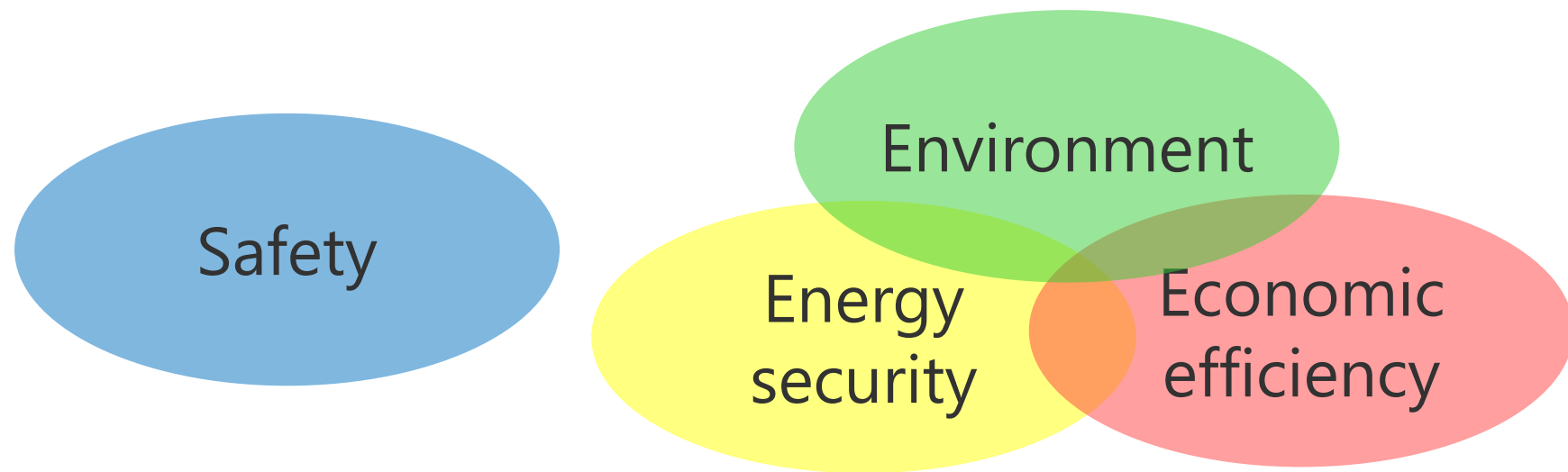


Excessive cost and term for greening could be reduced reasonably.

Business activities and biodiversity conservation could be compatible certainly.

Commitment to Environmental Conservation

The responsibility of Chubu Electric Power is to achieve "S+3E" simultaneously



during the process of delivering energy

CSR