
IAIA13@Calgary
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Factors influencing occurrence of environmental conflict over wind farm projects in Japan
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Japanese Context

Wind energy in Japan

2.5 GW = installed capacity

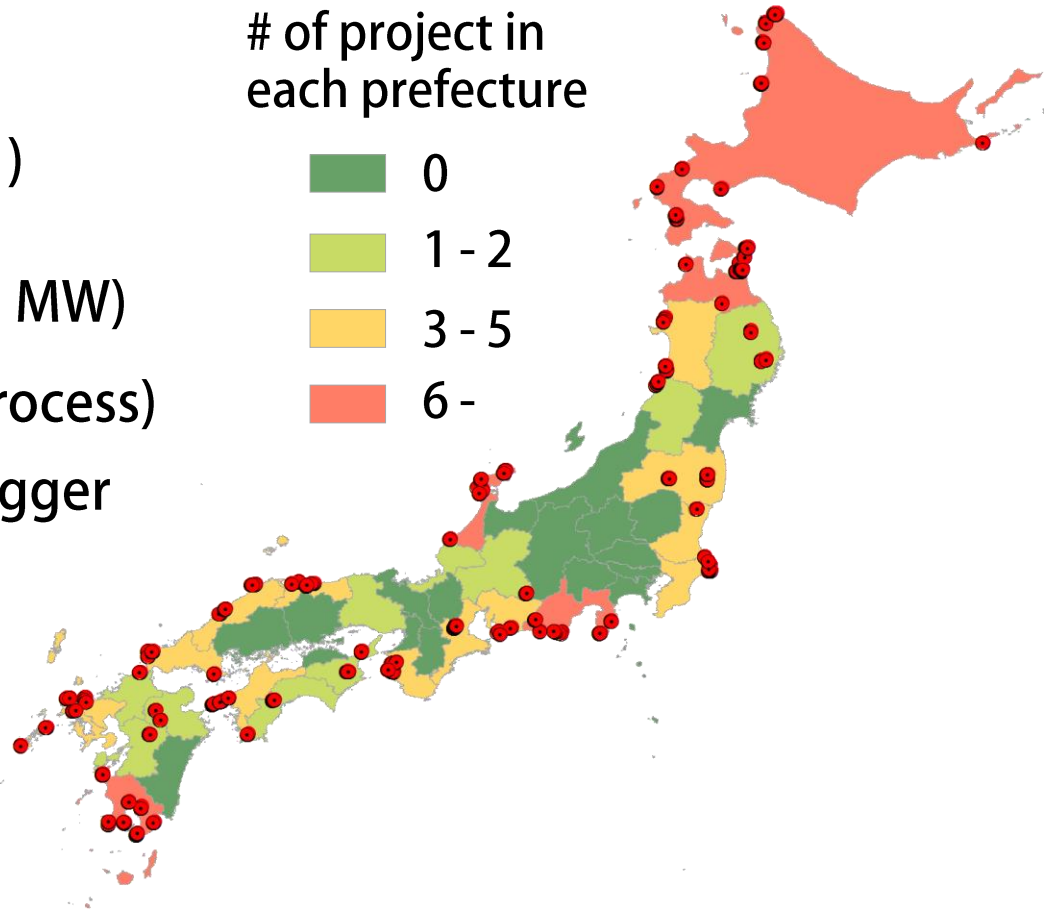
280 GW = potential (MoE, 2011)

109 projects = operating (>7.5 MW)

85 projects = planning (EIA process)

- FIT (2012~) became the trigger

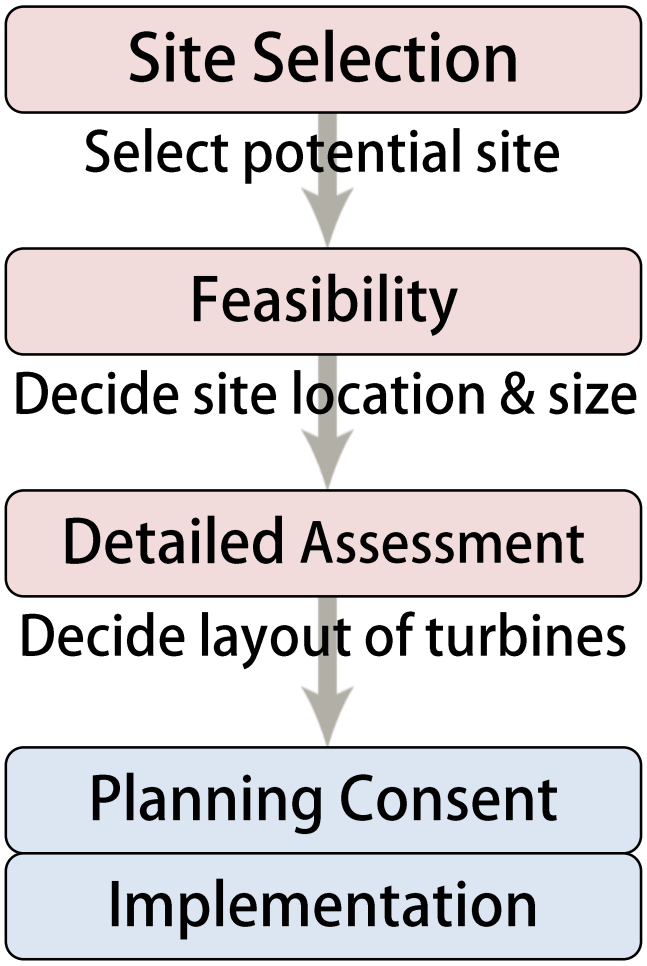
However...



Large number of environmental conflicts

- planning & operating stage

Planning of wind farm project



	EIA Act (1997)	New EIA Act (2011)
Land use zoning	×	×
Programmatic SEA	×	○ 2013~
[illegible]IA	△ some ordinance	○ 2012~

[Question] How to evaluate alternatives of location & size in terms of conflict prevention?

Research Aim

How to evaluate alternatives in terms of conflict prevention?

Clarify influential factors of conflict occurrence
and each weight of the factor

How ?

Analyze correlation between conflict tendency of past projects and those project feature

1. Land use
2. Habitat of rare species
3. Physical aspect
4. Social influential aspect

Conflict occurrence tendency of past projects

Data collection

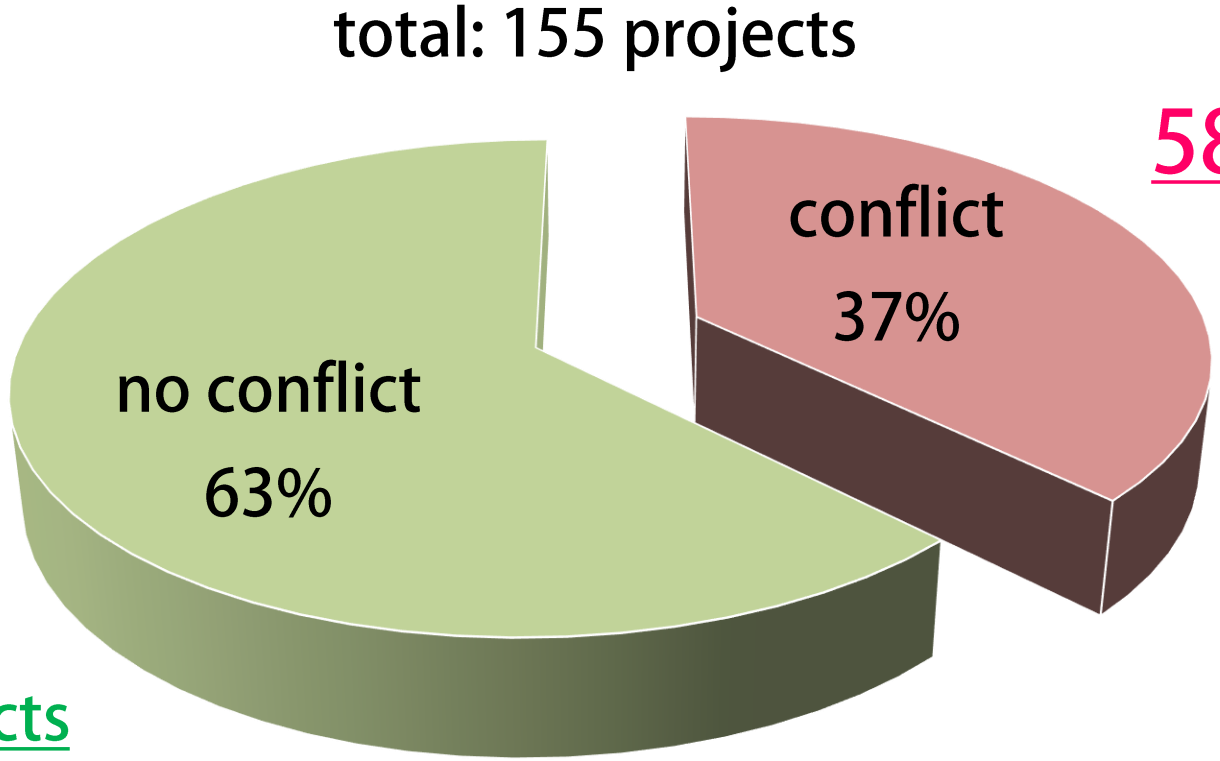
- large scale wind farm (total capacity >7.5 MW)

- approx. 3000 articles from 40 newspaper (national & local)

- definition of "conflict"
  - Specific opponents + the word like "oppose" (not concern)
  - environmental conflict at planning stage (not *operating*)

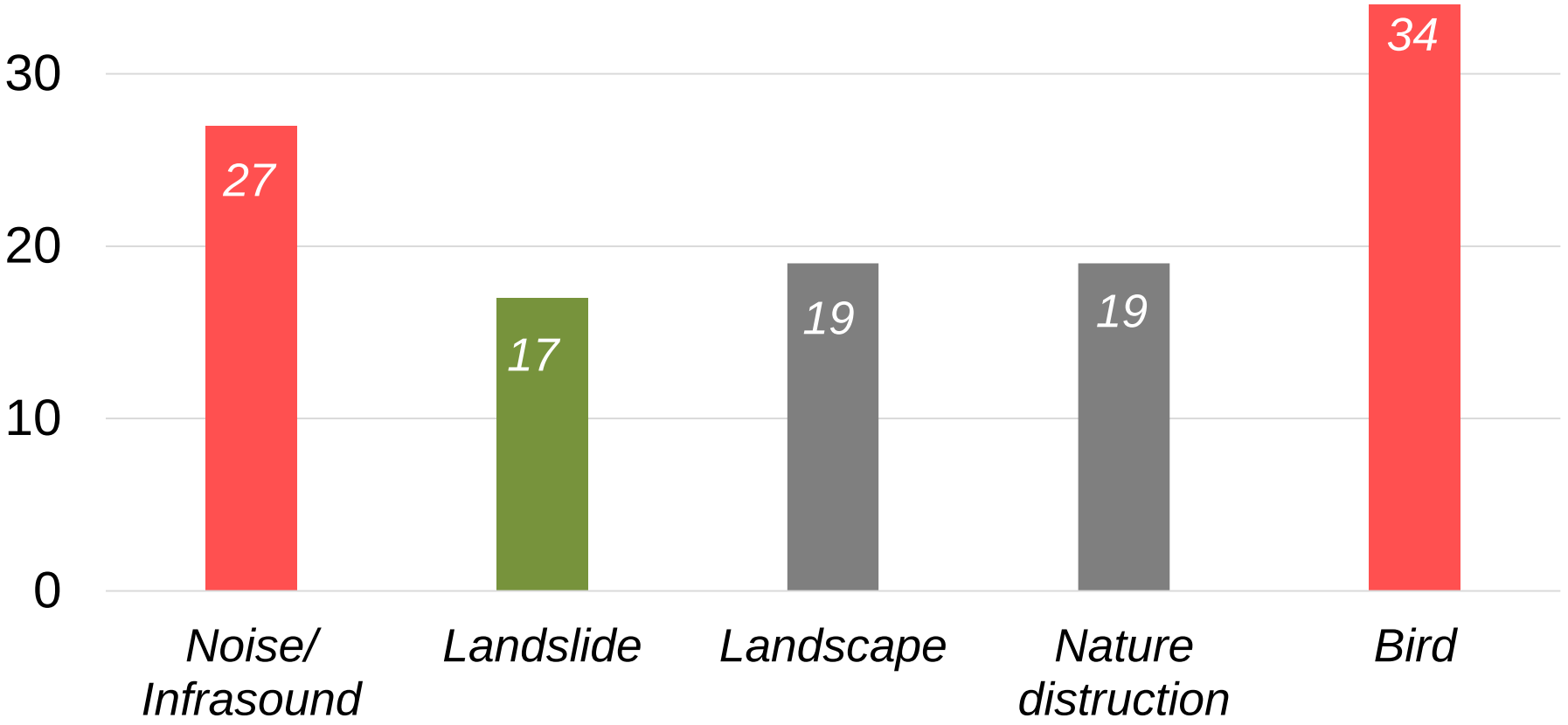
- grasp conflict tendency of past 155 projects in Japan

Conflict occurrence tendency in Japan



- Conflict at planning stage occurred in 58 projects (38%)

Issues of concern in the 58 conflicts



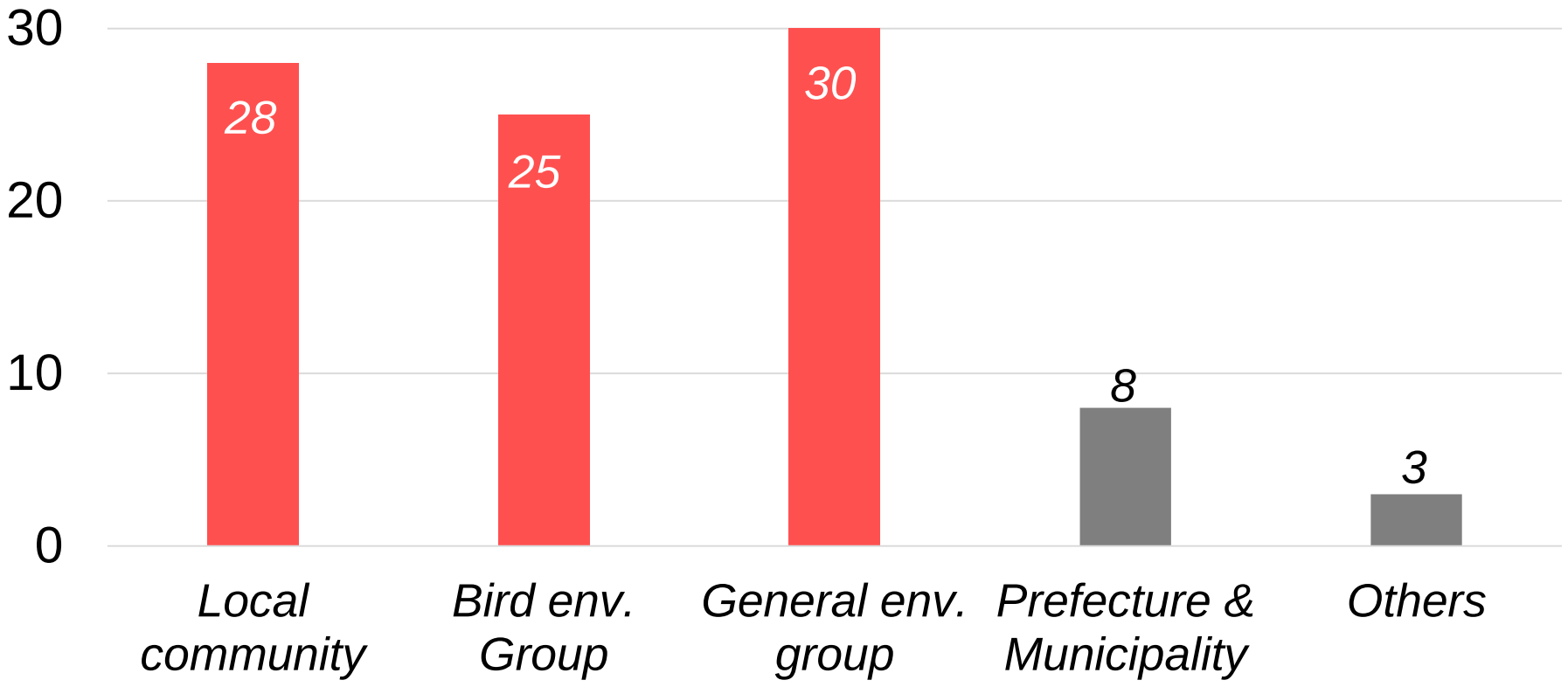
- Most cases have more than one issue (single is minority)
- Landslide is unique & one of dominant issues
- Noise/Infrasound & Bird are most frequent issues

What type of birds become the issues? 10

Mountain Hawk Eagle

- Most "Bird" cases concern about Raptores (eagle & hawk)
- Bird collision & habitat destruction by land development

Opponents in the 58 conflicts



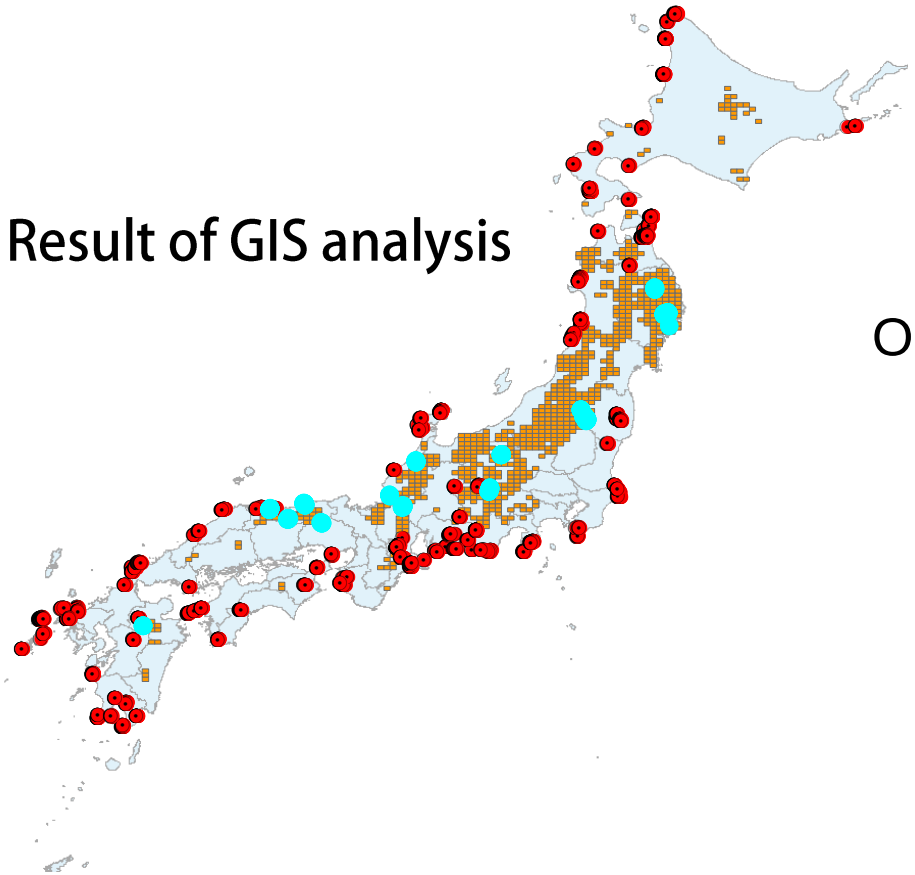
- Local community → Noise/Infrasound & Landslide
- Environmental group → Bird & Nature destruction

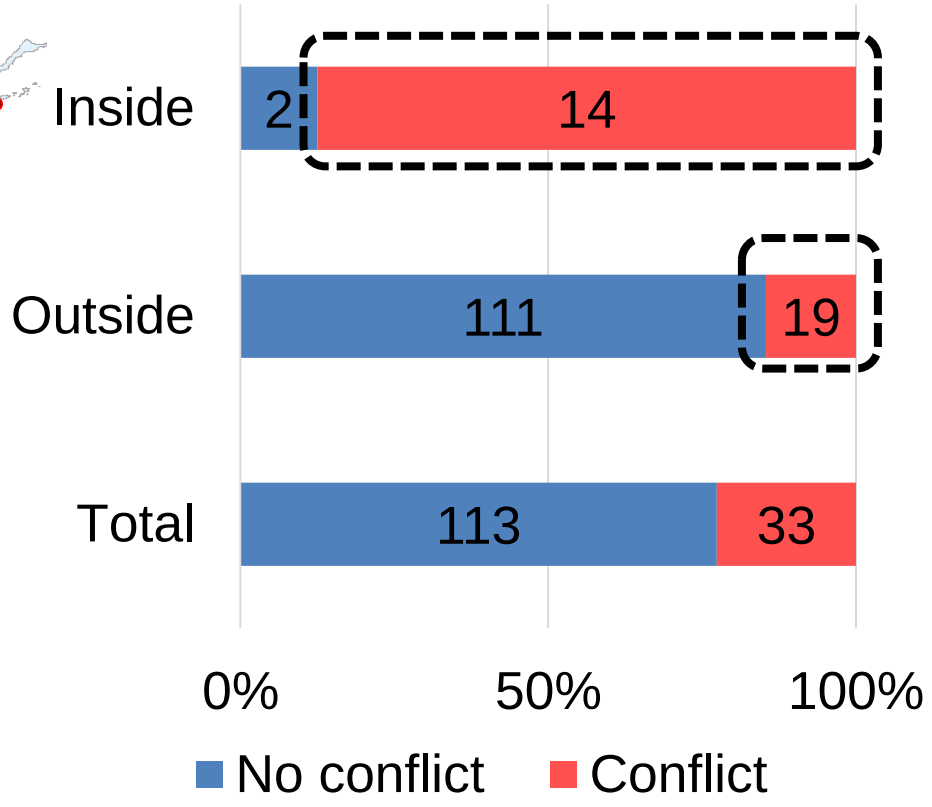
Influential factors of conflict occurrence

Habitat × conflict occurrence

Grid Habitat for Golden Eagle

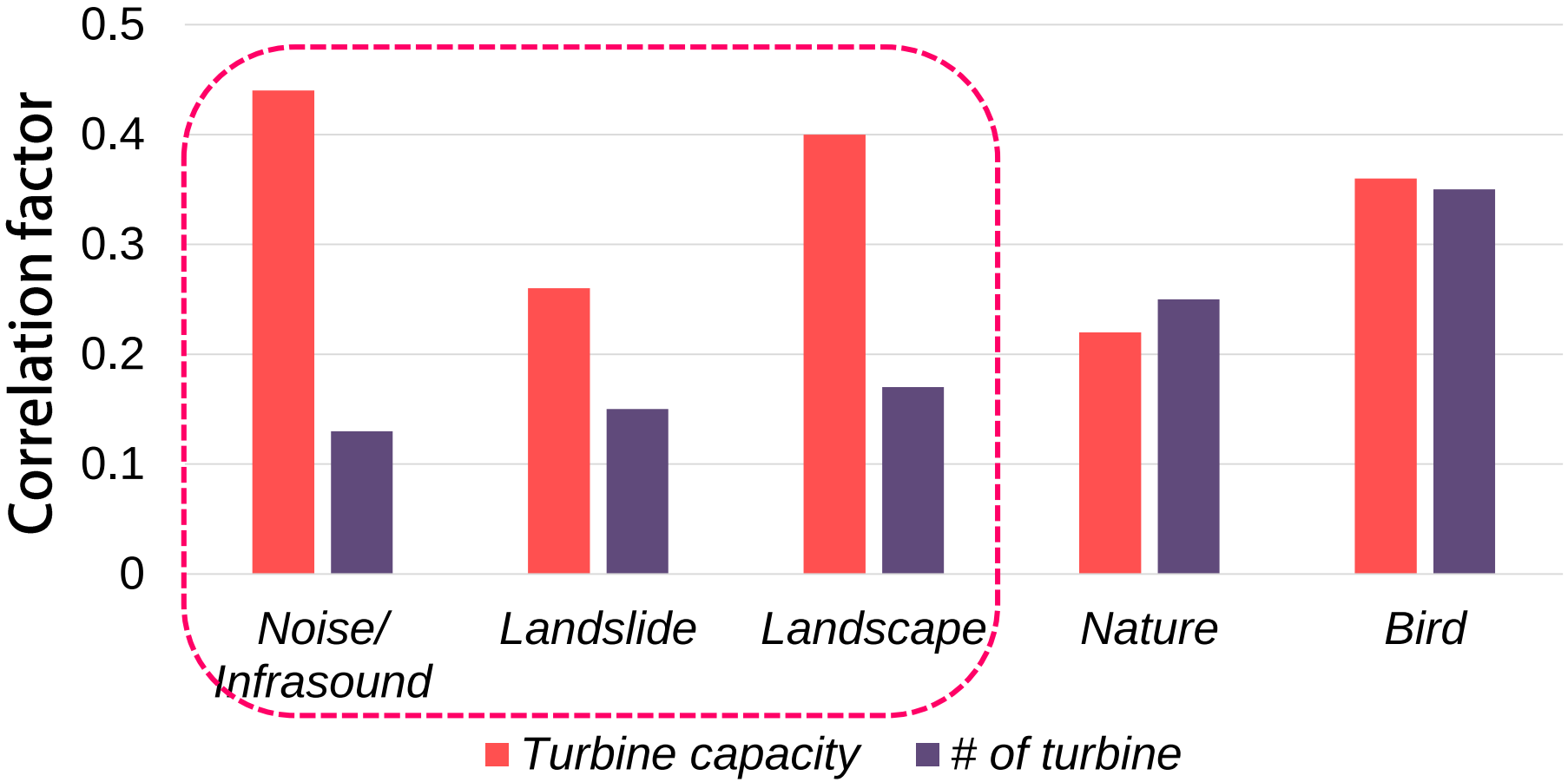
Result of GIS analysis





- Conflict risk of inside the habitat is much higher than outside

Physical aspects × conflict occurrence



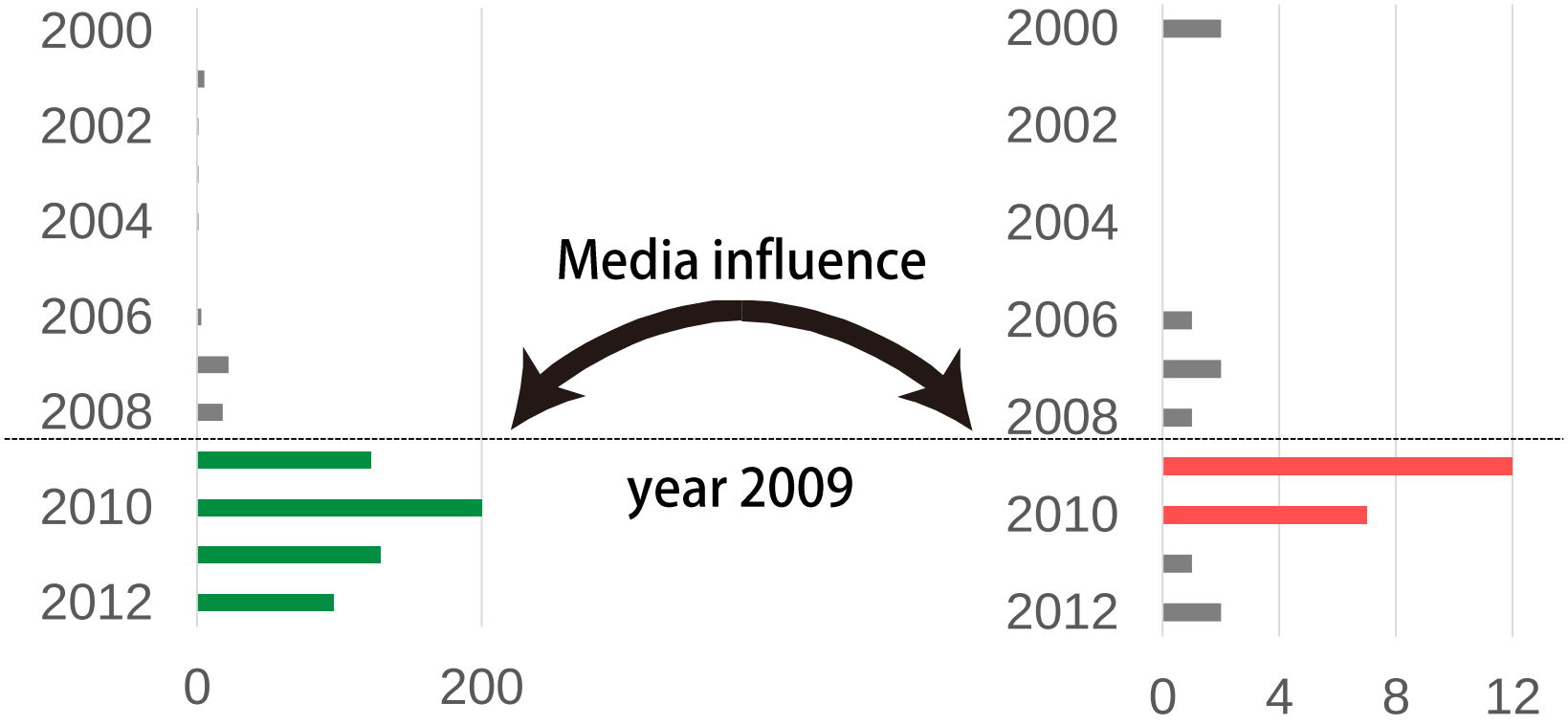
- Turbine capacity is more dominant in case of the 3 issues
  - Alternatives of turbine size at planning is more effective

Social influential aspects × conflict occurrence 15

Media influence

of articles including the word *Infrasound* in the newspapers

# of conflicts (Noise/Infrasound)
N = 27 projects



- Conflicts were increased sharply by media influence in 2009

Multivariable Analysis

- Binary logistic regression analysis
  - often used in medical field

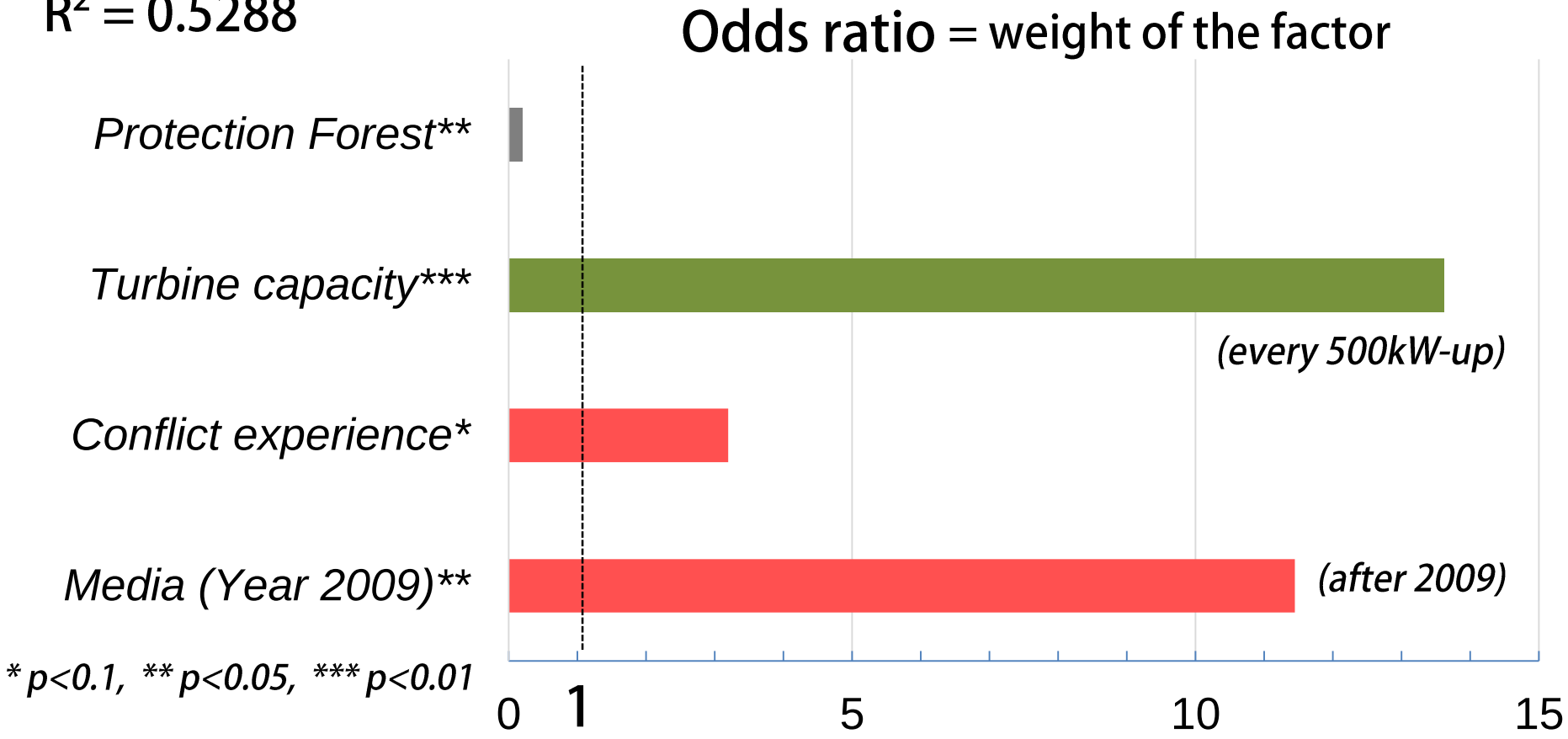
- Analysis Output → Odds ratio = weight of risk factor
  - e.g. Lung cancer risk of the people who are smoking is X times compared with the people who are not smoking

- Objective variable → binary : "conflict" or "no conflict"

- Explanatory Variables →
  1. Land use
  2. Habitat of rare species
  3. Physical aspect
  4. Social influential aspect

1) Noise/Infrasound

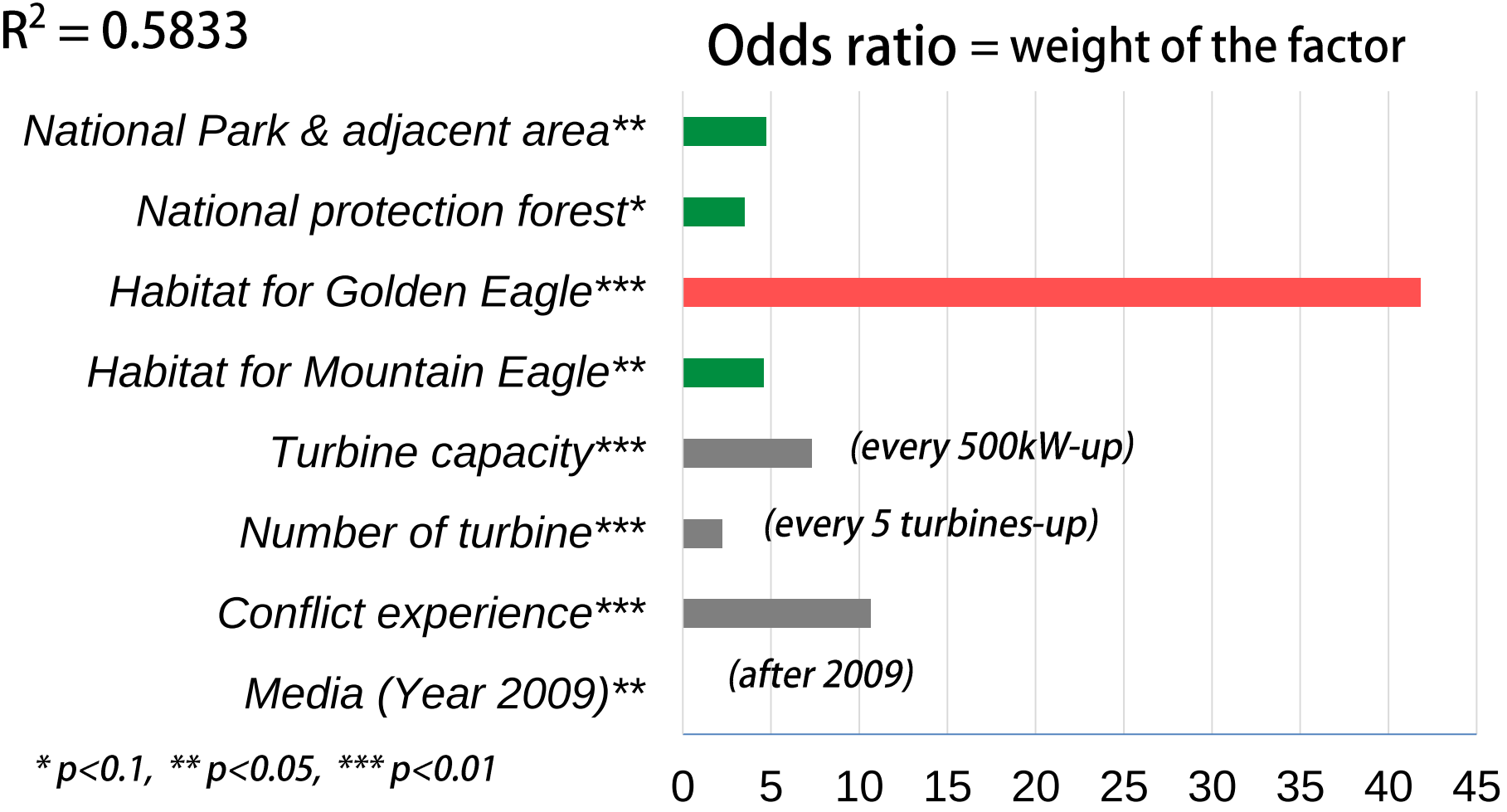
$R^2 = 0.5288$



- Turbine capacity & Social influential aspects are dominant
- Proximity to turbine are not significant

2) Bird (esp. Raptores)

$R^2 = 0.5833$



* p<0.1, ** p<0.05, *** p<0.01

- Grid habitat for Golden Eagle is critical factor (risk ×42)
- Odds ratio could be used for simple alternative analysis

Wrap-up

Wrap up

Conflict occurrence tendency of past 155 projects

- Conflict at planning stage occurred in 58 projects (38%)
- Noise/Infrasound & Bird are most frequent issues
  - Most case of Bird issue concerns Raptores
- Landslide is unique & one of dominant issues

Influential factors of conflict occurrence

- Turbine capacity & social influential aspect is dominant
- In case of Bird issue, habitat for golden eagle is critical
- Odds ratio could be used for simple alternative analysis

Thank you for your attention!

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