The Role of Linguistics in Identifying Social-Ecological Keystones

Kawika Winter
Will McClatchey
Kim Bridges

Social-Ecological Systems

- Humans are a part of, not separate from, nature (Balèe 2006)
- Social and ecological systems are linked, and delineations between the two are arbitrary/artificial (Berkes and Folk 1998, Berkes *et al*. 2003)
- Links between cultural diversity and biological diversity exist (Maffi 2005)

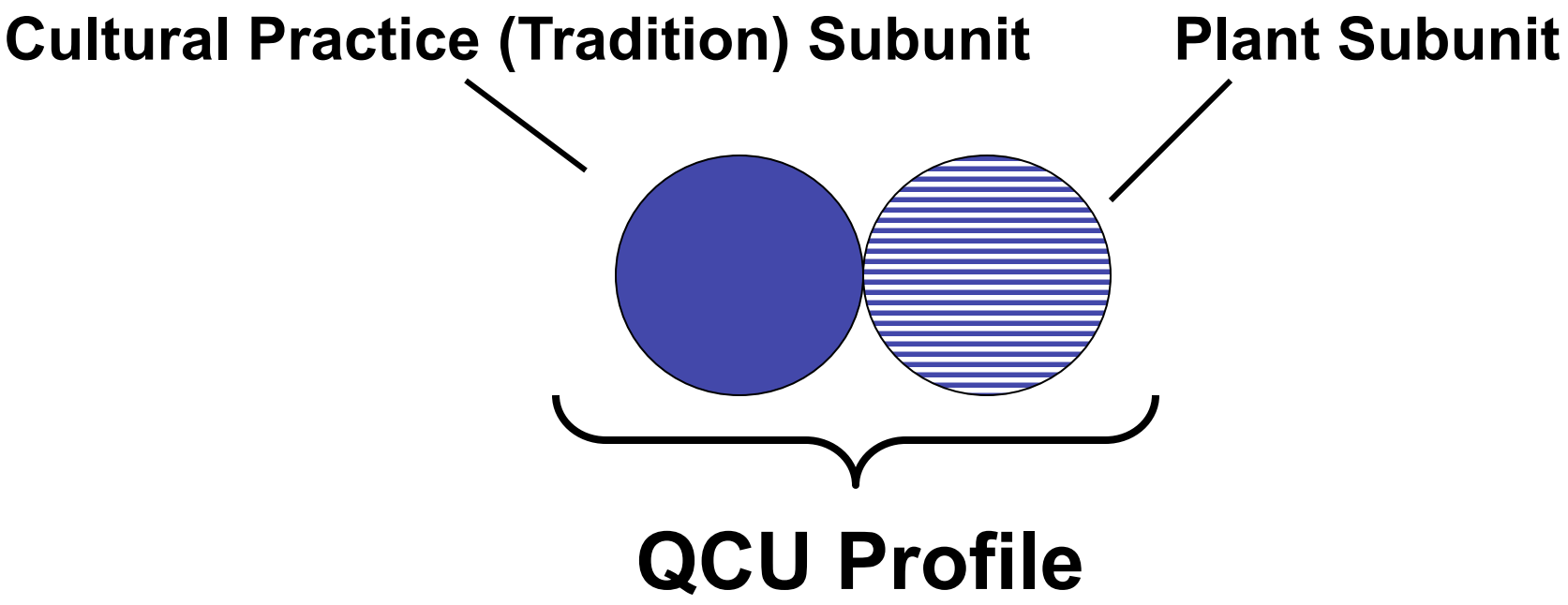
Quantum Ethnobotany Theory

- Fundamental units of interaction between people and plants (Bridges and McClatchey 2009, Winter and McClatchey 2009)

- Hypotheses addressed:
  - Potential for survival in environments based on different botanical and cultural toolkits (Bridges and McClatchey 2009)
  - Origin and continuing change (co-evolution) of people-plant interactions (Winter and McClatchey 2008)

- Quantum Co-evolution Unit (QCU) (Winter and McClatchey 2009)

Quantum Co-evolution Unit (QCU)



Keystone Species

- Operating definition: continuing debate
- Importance is disproportionately large in relation to biomass within system (Powers et al. 1996) or within functional group (Davic 2003)
- Loss of one results in large number of secondary extinctions (Christianou and Ebenman 2005)
- Quantitative

Cultural Keystone Species

- “The culturally salient species that shapes in a major way the cultural identity of a people.” (Garibaldi and Turner 2004)
- Qualitative

Cultural Keystone Practice

- “Practices so intrinsic to the culture that if they were to disappear the culture would be irreversibly altered to a point where its survival would be put into question.” (Brosi et al. 2007)

- Qualitative

- Many practices have material basis (i.e., plant)

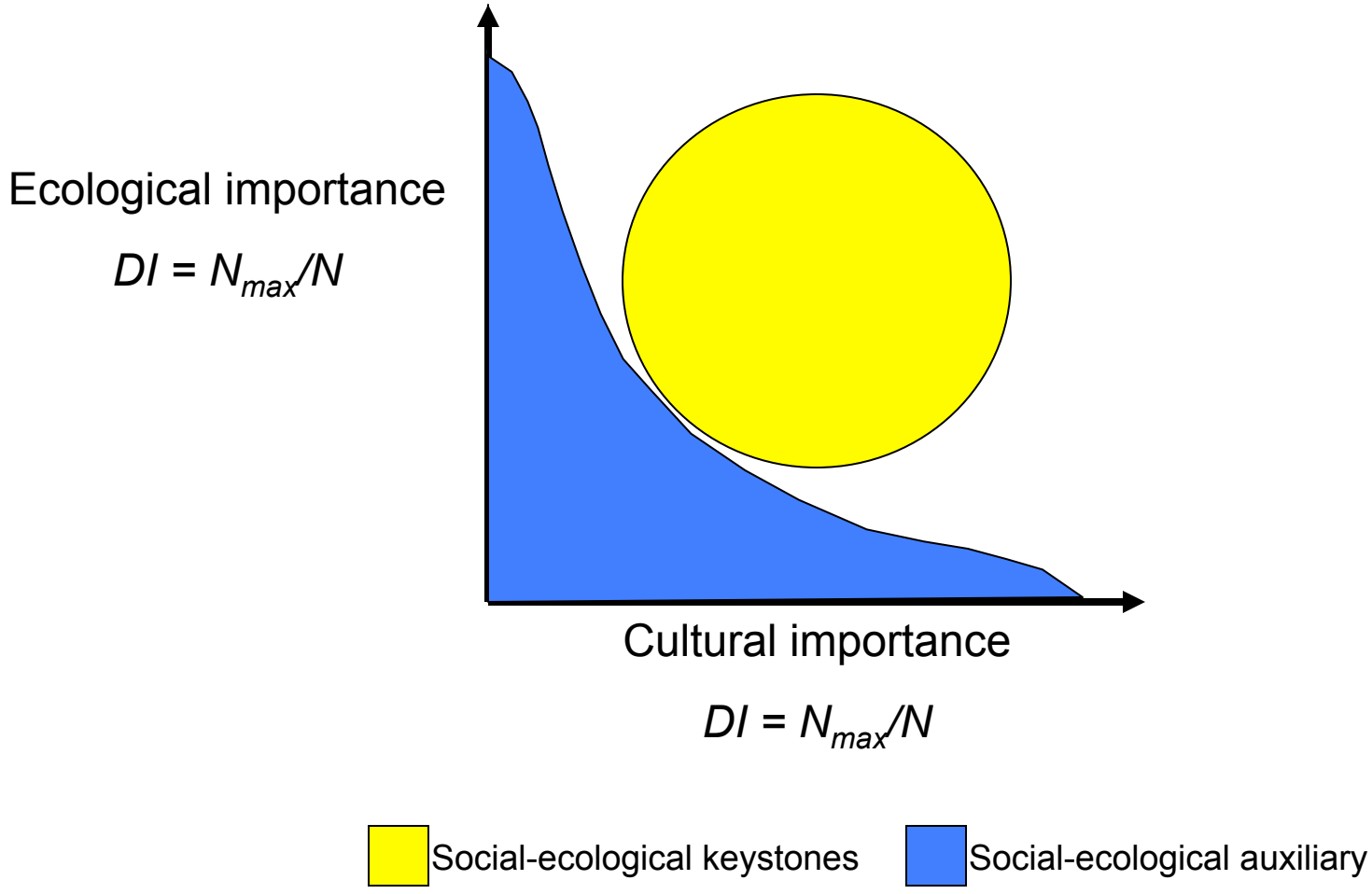
Social-Ecological Keystone

- Social-ecological keystone (Winter 2009)
  - Quantitative juncture between
    - Ecological keystone species
    - Cultural keystone species
    - Cultural keystone practice

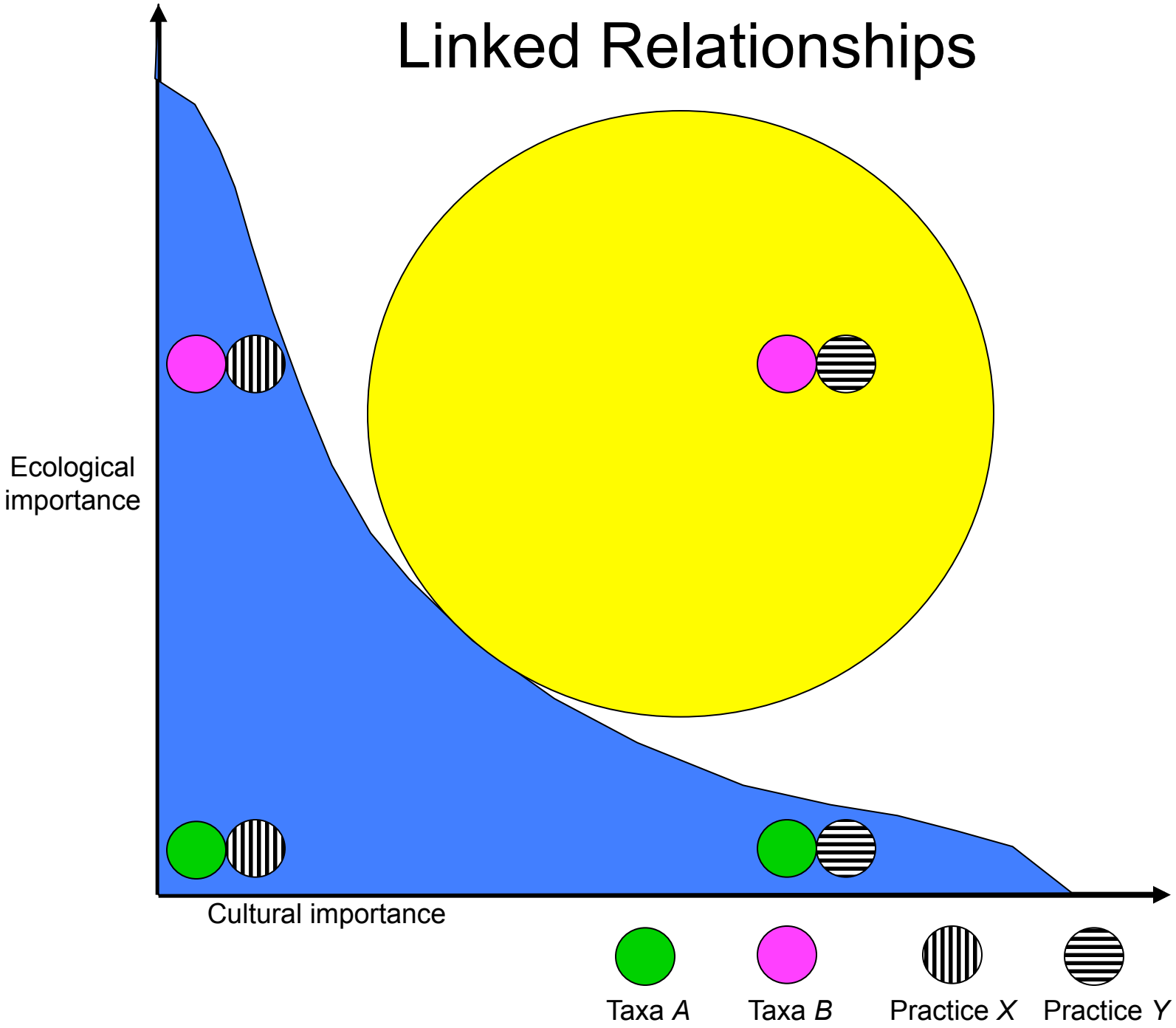
Quantifying Keystones

- Ecological keystone species
  - Dominance index (Berger and Parker 1970)
  - $DI = N_{max}/N$
    - N_{max}: number of individuals of most abundant species
    - N: total number of individuals within the system/ group
- Cultural keystone practices/species
  - Linguistic tools (free listing)
  - Dominance Index

Quantifying S-E Keystones



Linked Relationships



Implications

- Linguistics is key in determining S-E keystones
- An extinction of a S-E keystone could result in secondary extinctions on both sides of the system
- Identifying S-E keystones will aid resource managers in saving/perpetuating biocultural diversity

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