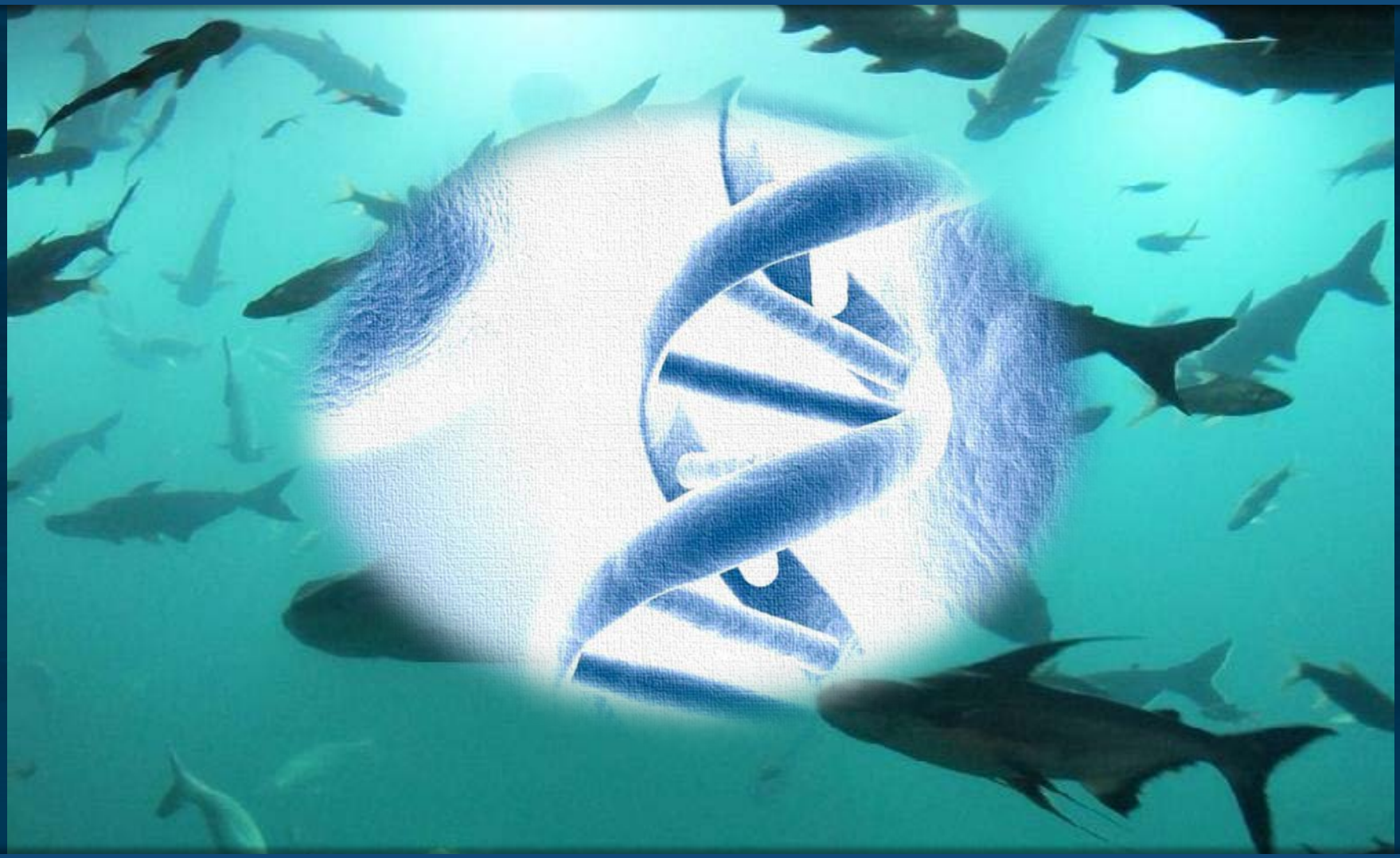
Environmental DNA for identifying areas of conservation importance



Harmony Patricio, Australian Rivers Institute, Griffith University

Challenges: Distribution Data

- Rarity
- Species diversity, taxonomy
- Conventional limitations

New tool: Environmental DNA (eDNA)

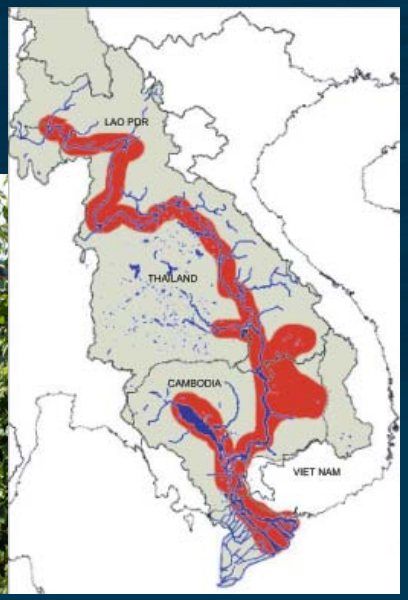
- eDNA = DNA of organisms shed into the environment

1. Persists for 1-2 weeks in aquatic environments
2. Next-generation sequencing = low cost
3. Rapid biodiversity assessments
4. More accurate and less invasive

(Dejean et al. 2011, Goldberg et al. 2011, Jerde et al. 2011, Minamoto et al. 2012, Thomsen et al. 2012)

Case Study: Mekong River

- Over 850 fishes described
- Migrations over 1500 km
- Scale of distribution data not adequate for planning



Case Study: Mekong River

- Water samples in 8 locations
- Specific primers for rare species
- Universal primers for fish biodiversity

Conclusions

- eDNA detects rare species
- eDNA detects a large number of species
- Data essential for conservation planning

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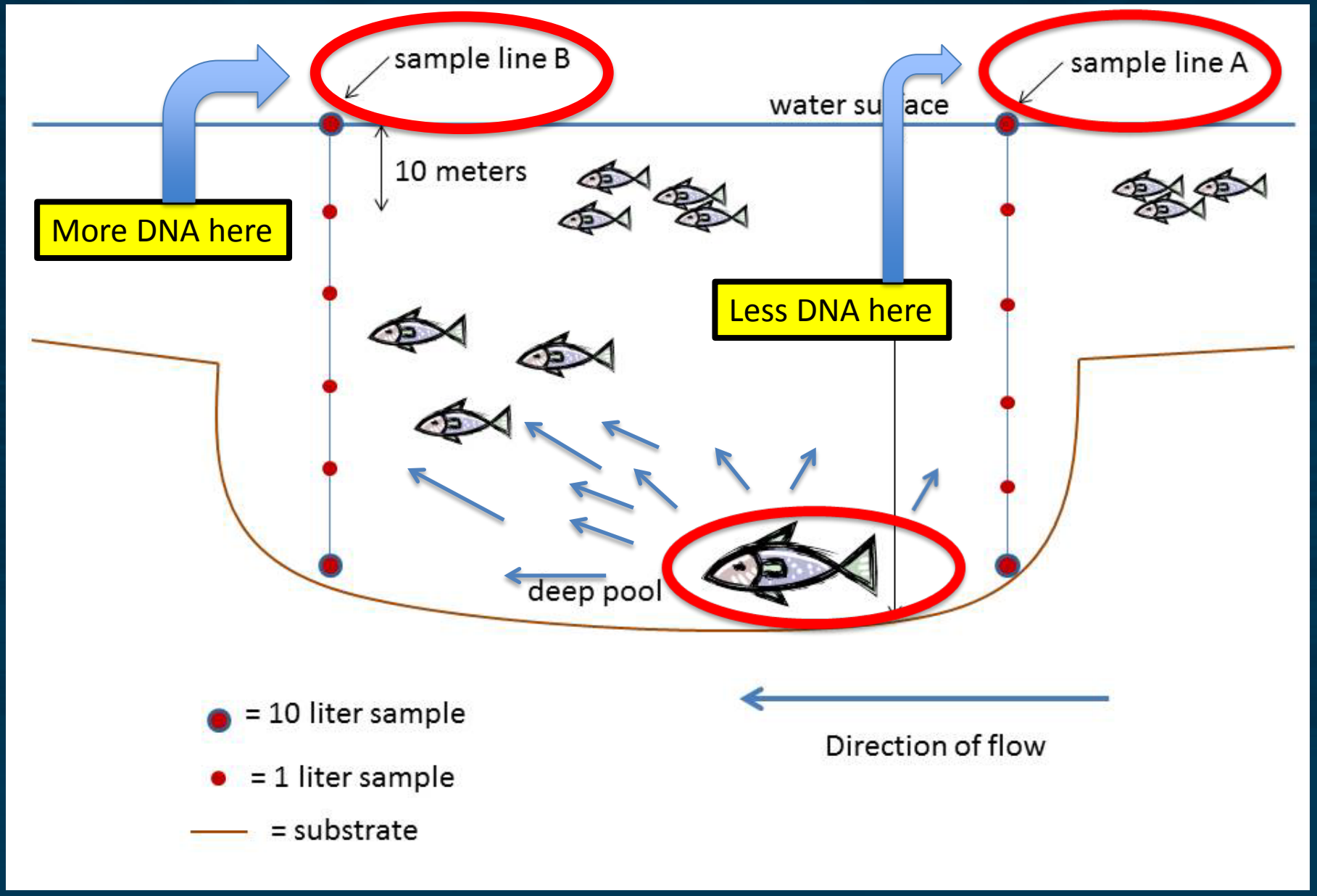
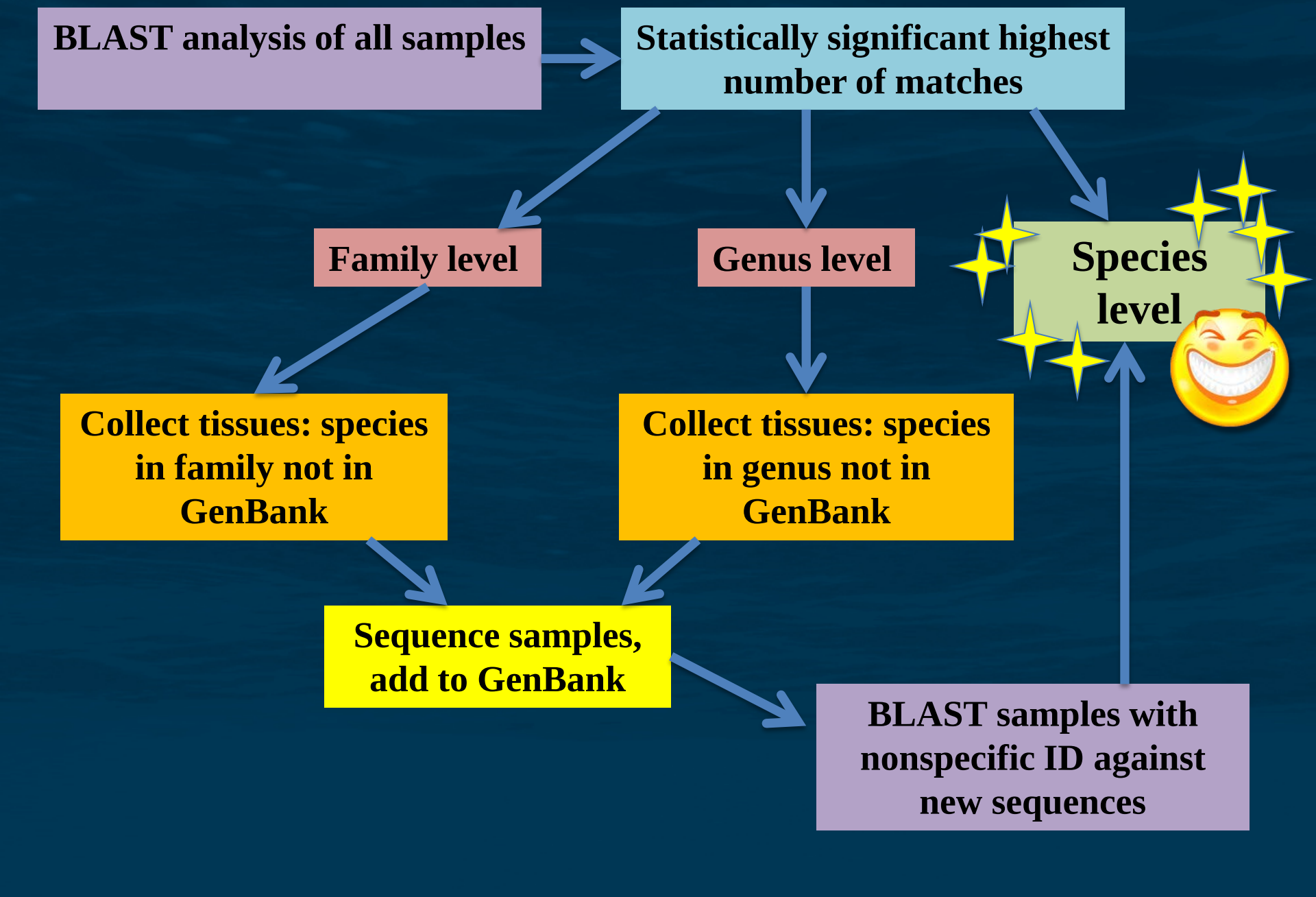
Research Methods: Location Validation



Biodiversity Analysis



Primer Validation