



13th SPC Heads of Fisheries Meeting
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Information Paper 9

Pacific Marine Specimen Bank

FAME Secretariat

Regional context

1. Important components of FAME's research the estimation and validation of species life-histories for parameterisation of population dynamics models and understanding how changes in habitats will impact fisheries production, species distribution and ecosystem structure and function.
2. The estimation and validation of species life histories has been regularised into the work programme of WCPFC Scientific Committee through the establishment of the Pacific Marine Specimen Bank (PMSB). This biobank has created a reserve of fish skeletal material, muscle and reproductive tissue for estimation of species age and growth relationships, reproductive biology and genetic connectivity. The biological samples for the PMSB are collected during chartered tagging and research cruises, through at-sea observer programmes, industry participation and community programmes.
3. The PMSB has been designed to fully integrate the collection of tissue from coastal fisheries. In this context the PSMB supports all of FAME activities to generate data to better understand the dynamics of fish stocks across PICT's EEZs and the Pacific region. This involves developing capacity within coastal and offshore fisheries departments to undertake rigorous tissue sampling programmes appropriate to their needs.
4. In addition to underpinning the estimation of essential life history information the PMSB is increasingly supplying material for trophic ecology, methyl mercury analyses, persistent organic pollutants, micro/nano-plastics pollutants and genetic and genomic applications.
5. Following HoF12, FAME has increased its in-house capacity in the field of fisheries genomics to support genetic work on stock structures, applications of close-kin mark recapture for estimating absolute abundance of stocks and the application of genetic metabarcoding as a means for rapid identification of species from tissue and water samples to monitor ecosystem status. This capability will have spin-off benefits for traceability monitoring and tuna provenance.

Infrastructure Expansion

6. The current facilities at SPC Headquarters in Noumea are restricted to a small taxonomic laboratory providing workspace for one to two technicians plus capacity for 40m³ cold storage of tissue samples at -20°C and 1.5m³ capacity for storage of tissues at -80°C.

7. FAME is currently undertaking a feasibility study to expand this laboratory to allow for the full range of analytical services needed to support analyses of the PMSB collection (see Table1).
8. The new facility will maintain existing storage and taxonomic capacity and add:
 - Clean/Trace laboratory for preparation and analyses of genetic samples
 - Dry laboratory for otolith preparation analyses.
 - Chemical laboratory for histological preparation and reproductive biology and trophic analyses.
 - Wet laboratory for sample preparation.
9. This additional capacity will allow FAME to ensure chains of custody and meet ISO laboratory standards and procedures.
10. The expansion is being designed to complement existing capabilities at SPC-Suva. The SPC-Noumea development will ensure that SPC can maximise opportunities from both locations and offset risks associated with single location facilities.
11. The development is expected to reduce costs currently associated with out-sourcing various analyses. Current demands for laboratory facilities are outlined in Figure 2.
12. The development will enhance FAME's capacity to provide opportunities in fisheries science to Pacific Island members in addition to enhancing training capabilities.

Table 1. Breakdown of FAME laboratory requirements to support analyses of the PMSB collection

| Function | Facility | Comment |
|------------------------------------|--|---|
| PSMB vault | Wet laboratory -20°C Storage -80°C Storage Reference collection | Capacity to curate collection Digitisation & global cataloguing needed |
| Taxonomy | Taxonomic laboratory | Microscopes, Digitisation, X-ray capable |
| Elemental and isotope analyses | Laboratory for sample preparation | Equipment and laboratory space lacking Analyses currently contracted out |
| Histology and reproductive biology | | |
| Genetics/genomics | | |
| Fish ageing | | |

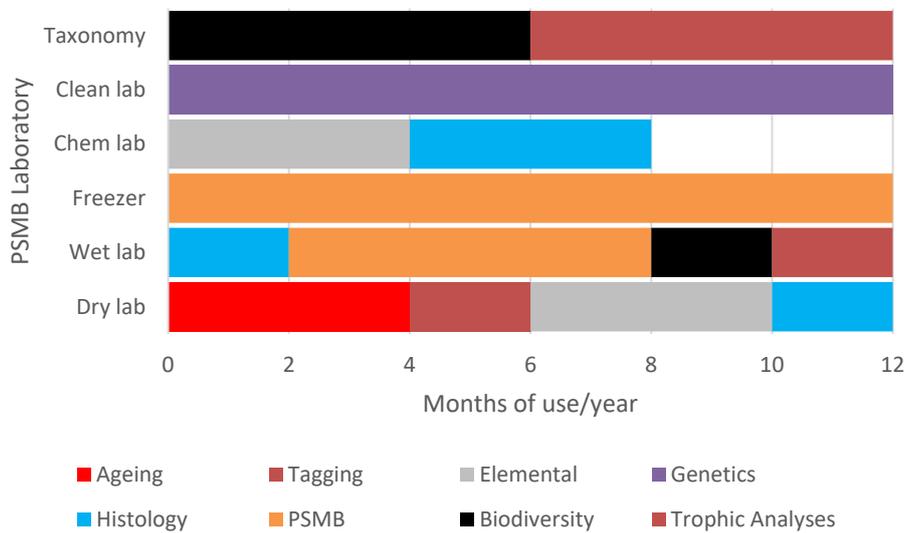


Figure 1. Current laboratory demands for analyses of PMSB collection