

**TASMANIAN GOVERNMENT SUBMISSION
TO THE HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON
PRIMARY INDUSTRIES, AND REGIONAL SERVICES - INQUIRY INTO
DEVELOPMENT OF HIGH TECHNOLOGY INDUSTRIES IN REGIONAL
AUSTRALIA BASED ON BIOPROSPECTING**

MARCH 2001

Tasmania's Interest

Tasmania has a suite of terrestrial and marine organisms that demonstrate a high level of genetic diversity and substantial evolutionary separation from mainland Australia and the rest of the world. This diversity is evidenced by Tasmania's Gondwanan remnants, alpine and temperate rainforest ecosystems, and diverse set of marine provinces.

The Tasmanian State of the Environment Report, (1996),¹ links a high degree of endemism to the Gondwanan relics. Kirkpatrick and Brown, (1984),² demonstrated a number of centres of regional endemism in the higher plants. This pattern of a high degree of endemism and significant species radiation over small geographic areas is reflected in a number of taxonomic groups. A good example is the freshwater Crustacea, Horwitz (1990)³.

Tasmania is already a significant global access point for Antarctica. If the Antarctic and sub-Antarctic regions are also included Tasmania has a very large pool of unexplored species in a wide range of habitats offering fertile grounds for bio-prospecting. It also has a number of scientific institutions with the capability and mandate to become further involved in the bio-prospecting industry.

Tasmania is concerned that at least some of the potential value from the identification and subsequent commercial development of products derived from Tasmania's biological heritage be trapped in Tasmania and Australia for the benefit of our citizens.

Tasmania's potential for Accessing the Resources

Tasmania has a strong public research base in science, including biotechnology. The generation of intellectual property through public research is fundamental to the development of bioprospecting in the State. Linkages between industry and research organisations are important to facilitate the commercialisation of this intellectual property. The Cooperative

¹ Sustainable Development Advisory Council 1996, *State of the Environment Tasmania, Volume 1 – Conditions and Trends*, compiled by the State of the Environment Unit, Land Information Services, Department of Environment and Land Management, Tasmania.

² Kirkpatrick, J. B. & Brown, M.J. 1984, 'A numerical analysis of Tasmanian higher plant endemism', *Botanical Journal of the Linnaean Society*, vol. 88, pp. 165-182

³ Horwitz, P.1990, *The Conservation Status of the Australian Freshwater Crustacea: with a Provisional List of Threatened Species, Habitats, and Potentially Threatening Processes*, ANPWS Report No. 14, Australian National Parks & Wildlife Service, Canberra.

Research Centres (CRCs) offer an opportunity to make the linkages between intellectual property and the realisation of its commercial development.

Tasmania has the following research facilities:

- University of Tasmania;
- CSIRO Marine Research;
- Tasmanian Institute of Agricultural Research;
- Tasmanian Aquaculture & Fisheries Institute;
- Department of Primary Industries, Water and Environment Research Laboratories;
- CRC for Antarctic and Southern Ocean Studies;
- Australian Antarctic Division
- CRC for Aquaculture;
- CRC for Sustainable Production Forestry;
- Tasmanian Museum and Art Gallery; and
- Australian Maritime College.

There are few opportunities to foster the regional development of a biotechnology industry in Australia. The Tasmanian node of closely networked research institutions with the technical capacity to participate in the development of a new biotechnology industry represents such an opportunity. This is particularly so when combined with a rich source of genetic material and an emerging high technology industry base.

Because there are issues attached to ownership of the biological resources, particularly plants, on private land, Crown ownership becomes a significant factor in accessing and in controlling benefit flows derived from these resources. It is therefore significant that approximately 60 % of the State is in Crown ownership.

Current Activities

Current bioprospecting activities are at the very base level in the bioprospecting chain with little or no extension into the scale-up and early commercialisation phase of the biotechnology industry.

There have been some notable achievements in Tasmania, where whole organisms have been identified as having potential and new industries have developed around these initiatives. A good example of this is the development of a sea-horse industry in Tasmania. Sea-horses are now bred and grown in captivity for supply to the Chinese natural medicines market.

Arrangements exist between Commonwealth Government agencies and multinational pharmaceutical companies to screen particular components of the flora and fauna in the State.

There is an ExGenix contract with the Tasmanian Museum and Art Gallery to access the unique flora collection capabilities of the Herbarium.

The partnership between the Department of Agricultural Science at the University of Tasmania and the Antarctic CRC, which is collecting micro-organisms from Antarctica, has isolated a bacterium that produces significant quantities of poly-unsaturated-fatty-acids. With the skills and knowledge of this organism in Tasmania there is a significant advantage for Tasmania in securing early commercialisation and scale up activities. Without the investment in bioprospecting, this opportunity would not have arisen for Tasmania.

Impediments

Tasmania shares the problems experienced by other States, including:

- difficulty in trapping value in the State;
- funding support required for local research;
- high investment costs to ensure downstream processing occurs in the State;
- need for venture capital and capital investment in infrastructure;
- difficulty and costs of protecting intellectual property caused by differing national and international regulatory regimes;
- limitations of contract law in protecting local commercial interests;
- lack of expertise of scientists in negotiating business contracts;
- uncertainty regarding the ownership of the bio resource;
- market failure in determining the value of the new resource; and
- difficulty in achieving economies of scale.

Impacts and benefits on the Environment

Negative impacts will occur if there is inadequate or inappropriate regulation of bioprospecting or resource collection activities. The scale location and method of collecting biological material can all have adverse effects on the conservation status of either the target or non-target organism. Factors which can result in unsustainable bioprospecting include over collection, introduction of exotic species or use of inappropriate methods which result in collateral damage to habitats or other non-target biota.

Management of this issue is largely a State concern but could be assisted by cooperative national arrangements. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* has the potential to assist in this regard but would require the development of a national approach to management of access to biological resources by State, Territory and the Commonwealth Governments.

Bioprospecting has the potential to confer value on natural ecosystems and to provide an economic basis for the conservation of natural resources. Sustainable management of these resources is in the long-term interest of all stakeholders, including the bioprospecting industry.

Benefits to Tasmanians

The Tasmanian Government advocates the trapping of a reasonable share of the benefits of any bioprospecting industry in the State of origin of the resource.

Investment in value-adding processes has the potential to generate economic benefits to the State. This can be achieved by ensuring that conditions attach to the authority granting access to the resource. These conditions could relate to the location of parts of the biotechnology industry cycle in the State and for the transfer of knowledge to enhance local capacity.

An alternative approach is for either public or private sector organisations to enter into contracts with major bioprospecting companies for the provision of a package of services, which include field survey and sampling as well as some laboratory based preparation and analysis. These contracts should also provide for the return of some share of royalties from the end products, should they eventuate.

The sharing in royalties requires that there be a legal framework for tracking and passing the obligation to companies further down the processing stream and in other countries.

Linking bioprospecting to other natural resource management programs can provide synergistic benefits. For example, one of the key outcomes of the *National Strategy for the Conservation of Australia's Biological Diversity* is to improve the knowledge of the taxonomy and ecology of the plants and animals of Australia. Systematic collections, taxonomic research and collection of basic information on the ecology of the organisms are common requirements of bio-prospecting and conservation ecology. There is scope to gear funding for conservation research by contributing some resources from income earned from bio-prospecting. Commonwealth conservation programs should provide for arrangements of this nature.

Indigenous Australians

Consideration needs to be given by the States to the benefits of a bioprospecting industry being shared with indigenous Australians. There should be recognition of indigenous peoples' traditional knowledge and its contribution to the realisation of commercial benefits as well as mechanisms for the transfer of an appropriate share of the benefits to the indigenous community.