

## EDUCATION, SCIENCE AND TRAINING

### SENATE LEGISLATION COMMITTEE - QUESTIONS ON NOTICE 2006-2007 ADDITIONAL ESTIMATES HEARING

**Outcome:** CSIRO  
**Output Group:** CSIRO

#### DEST Question No. E913\_07

Senator Carr provided in writing.

#### Question:

National collections

Your 2005/06 Annual report speaks of the value of on-going divisional reviews. What external review of the management and curation of the national collections does CSIRO undertake? If it is part of each divisional review, please provide a copy of the brief for such a review as an indication of the approach taken to national collections? Similarly, given that reviews are conducted by external experts, what external experts in the field of collection management have been involved?

#### Answer:

CSIRO has provided the following response.

#### *National collections*

CSIRO's National Biological Collections are reviewed as part of divisional Science Assessment Reviews, within the research theme to which they belong.

A copy of CSIRO's Policy on Science Assessment Reviews, is attached.

International experts who have been involved in the divisional science assessment reviews incorporating the national collections have included:

- **Professor Donald R. Strong**, Department of Evolution and Ecology, Division of Biological Sciences, University of California
- **Dr Scott Miller**, Associate Director for Science, National Zoological Park, and Curator of Entomology, National Museum of Natural History, Smithsonian Institution
- **Professor John Thompson** Professor of Ecology and Evolutionary Biology at UC Santa Cruz and coordinator of the Molecular Ecology and Evolutionary Genetics (MEEG) Facility
- **Professor Mary Clutter** recently retired from the position of assistant director of the National Science Foundation (NSF) responsible for the Biological Sciences Directorate that supports all major areas of fundamental research in biology
- **Professor David Smyth**, Fellow of the Australian Academy of Science; past member of ARC Biological Science panels; Leading Australian researcher in molecular genetics of flower development and biotechnology.

**CSIRO**

**POLICY ON SCIENCE ASSESSMENT REVIEWS**

*[Introduced July 2004. Responsibility with Dr Michael Barber, Executive Director, Science Planning. Enquiries to Dr Ian Elsum (02) 62766534 .]*

**PURPOSE**

To introduce procedures to assure the quality and vitality of CSIRO's science base and scientific outputs through a program of regular assessments by external review panels of Divisional research outputs and their relationship with the outcome-oriented themes (applications) of the Division and/or Flagships or other cross-Divisional programs (i.e. impact).

**BACKGROUND**

The quality and relevance of the science base in CSIRO and its scientific outputs is critical to the ongoing impact and reputation of the Organisation's work. In the May 2004 *Backing Australia's Ability—Building Our Future through Science and Innovation* statement the Government announced an "improved assessment of the quality and impact of Australia's publicly-funded research effort and to ensure that research is as accessible as possible to potential end-users" through the establishment of Quality and Accessibility Frameworks for Publicly Funded Research. In its Triennium Funding Agreement (TFA) for 2004-7 CSIRO has agreed to a continuing process for assessment of its research performance; see Attachment A for the relevant extract from the TFA. Current CSIRO and Divisional approaches to assessing science quality are varied. There is a need for a more structured, robust approach involving external peer review, together with a commitment to implement actions arising from such reviews.

**POLICY PRINCIPLES**

1. CSIRO's capabilities, science base and outputs to be subjected to a transparent program of regular Divisional reviews. All Divisions to be reviewed by an external expert review committee every three years.
2. The Review to focus on Divisional capabilities, the scientific skills and infrastructure behind these capabilities and the feasibility of achieving the agreed and documented theme outcomes.
3. Where appropriate, Reviews should specifically assess and comment on the relevance of the Division's performance in the delivery of outcomes of the National Research Flagships
4. The Review to assess the following elements of research performance:
  - the quality of research;
  - the systems for ensuring research focus, quality and achievements;
  - the application and/or dissemination of research outputs; and

- the development of early career researchers, including involvement in research training of postgraduate students and post docs.
5. The Review to identify future or emerging capabilities that are believed to be necessary to achieve the Division's longer-term objectives and the likelihood of the Division's leadership and management strategies to develop or acquire these capabilities.
  6. The Review to comment on the Division's activities in relation to relevant government policies and directions (including National Research Priorities) and CSIRO's Strategic Plan.
  7. Outputs from Reviews to feed into and inform broader Organisation-wide prioritisation, allocation and investment decisions by providing conclusions on strengths and potential and the extent to which a Division's capabilities and research activities are competitively positioned to address Australia's problems and opportunities.
  8. To ensure full accountability and transparency, all review reports, responses and implementation reports to be provided to the Board and, in accord with the 2004-7 Triennium Funding Agreement, to the Minister via an external committee established by the Minister. Summaries together with CSIRO's responses to be included in CSIRO's Annual Report.

#### **MEMBERSHIP OF EXPERT REVIEW COMMITTEE**

1. Review Committees should consist of 3-5 external members; the number depending on the size and scope of a Division's capabilities plus the Executive Director, Science Planning or nominee.
2. At least one member should be from an end-user organisation preferably with a technical background relevant to the Division's capabilities.
3. At least one member should be a distinguished international scientist since an international perspective is considered an essential input.
4. If possible, Review Committees of cognate Divisions should have some common membership.
5. The Chair of the Committee should be an external member.

#### **SCOPE**

Each Divisional review should cover all research and associated technology diffusion activities in the Division and document the Division's connectivity/collaboration with other relevant research communities nationally, internationally and within CSIRO (recognising that periodic cross-cutting reviews will be carried out to assess particular activities on a broader basis). The reviews are to include the Division's project management processes as they pertain to the maintenance of research quality and relevance but are not to include an assessment of general Divisional management (except where commentary is

central to consideration of the Division's overall capabilities and the maintenance of science quality and relevance).

This review would cover:

- The quality of the capabilities and their underpinning scientific skills and disciplines and the associated outputs (publications, patents, reports, technology transferred to users, etc.).
- The relevance of the capabilities to the themes and to achieving the proposed outcomes: Are the theme outcomes feasible given the science base? Is the Division competitively positioned?
- The identification of future or emerging capabilities that are believed to be necessary to achieve the Division's longer-term aspirations and the feasibility of the strategies proposed to acquire or develop these capabilities. (An assessment of the Division's Emerging Science Plan would be included.)

Each Division is to prepare a 'self assessment' report covering the above scope. The Division would include in its report available measures such as numbers of publications and consulting reports, citations, invited lectures, patents, revenue details, customers, EFTs, evidence of impacts etc. In addition the Review Committee would receive copies of the Operational Plan, divisional strategic plan or statements of strategic intent, divisional annual report (if exists), general brochures including organisation chart. This material would be sent to the Review Committee one month in advance of the divisional visit.

The keystone will be a testing by the external review panel of each Division's self-assessment of its capabilities and the relationship with both the underpinning science-base and the outcome-oriented applications (themes).

While each review would be centred on a particular Division, that Division's connectivity with other relevant research communities, both within CSIRO, externally and particularly with the Flagships, would be an integral part of the assessment.

## **TERMS OF REFERENCE**

The Expert Review Committee will assess and make recommendations to improve:

- The quality of the Division's capabilities and their underpinning scientific skills and disciplines and the associated outputs (publications, patents, reports, technology transferred to users, etc.). Quality should be judged in terms of the scientific and/or technical excellence; and the distinction of the research leaders as indicated by measures of esteem conferred by the scientific community.
- The relevance of the capabilities to the Division's themes and to achieving the proposed outcomes, ie are the theme outcomes feasible given the science base?

- The extent to which the Division’s capabilities are distinctive on the Australian scene and their relative standing with respect to leading international groups and whether the resulting scientific outputs are nationally or internationally important.
- The strength and effectiveness of the Division’s collaborations and cooperation with other CSIRO Divisions and external research groups.
- The identification of future or emerging capabilities that are believed to be necessary to achieve the Division’s aspirations and the feasibility of the strategies proposed to acquire or develop these capabilities. The Review Committee should specifically comment upon the Division’s Emerging Science Plan and particularly the “frontier science” identified as being relevant to the Division’s activities.
- The effectiveness of the Division’s policies and programs to develop researchers, including the extent of the Division’s involvement in the supervision of postgraduate students, the training and skill development of postdoctoral researchers and the research training outcomes achieved, eg what are the destination of postgraduate students and post docs trained by the Division.
- The Division’s internal project management processes in maintaining quality and relevance in the scientific outputs of the Division and the extent to which these processes meet the standards set by the ANAO best practice manual, *Management of Scientific Research and Development Projects in Commonwealth Agencies*.

## **PROCEDURES & RESPONSIBILITIES**

1. The Executive Director Science Planning (EDSP), in consultation with the Group Executives and Chiefs, to determine a schedule of reviews, the first cycle to commence in late 2004 and conclude around by the end of 2006.
2. Each review to have a lead time of up to six months with the terms of reference, membership of the review panel and timetable to be established and agreed as follows:
  - The Chief of the Division may recommend to the responsible Group Executive additional terms of reference to suit his/her Division and nominate possible external expert members of the review panel taking into account the breadth and scope of the Division’s research activities. Any such nominations by the Chief must be made in writing to the Group Executive and must include confirmation of the independence of the nominees, declaration of any possible conflicts of interest and include a brief cv.
  - The responsible Group Executive to then review the proposed scope of the review (including possible inclusion of concurrent reviews of related capabilities from other Divisions), endorse the terms of reference and recommend to EDSP the review panel membership.

- The EDSP to approve both the final terms of reference (and scope of the review) and the review panel membership.
  - The relevant Group Executive formally to invite members of the review panel to conduct the review.
3. The Expert Review Committee to conduct the review through a program of site visits and interviews (around a week), consideration of current Divisional self-assessment material (including publications, patents, citations, successful technology transfers etc) and the previous Divisional review report (where available).
  4. The review report to highlight key findings and contain clear recommendations for action.
  5. Report should be submitted to EDSP, Group Executives and the Chief. The Chief should prepare a comprehensive draft response.
  6. The EDSP and Group Executive to consider the implications of the review's findings, appropriately amend the proposed action and implementation plan if necessary and provide feedback (where appropriate) to the Flagship Oversight Committee and the Emerging Science Oversight Committee together with feedback to the Chief for consideration in the context of future Divisional Plans.
  7. The EDSP to inform ET of each review's outcomes, recommendations and agreed implementation plan and to feed assessment data into CSIRO's overall strategic resource investment process.
  8. Following ET review, EDSP will present the Expert Review Committee's report together with the agreed implementation plan to the CSIRO Board for endorsement and transmission to the Minister for Science.
  9. To assist in reviewing reports and implementation plans, CSIRO (normally through the EDSP) will liaise with a high level committee chaired by the Chief Scientist that the Minister intends to establish.
  10. Summary results of reviews and follow up actions will be reported publicly in CSIRO's Annual Reports.
  11. The Chief to prepare a report on the implementation of the agreed actions flowing from each review 12 months after the completion of each review. This report to be provided through the Group Executive to the EDSP with a summary to be provided to the Board and included in the Annual Report.

## **GUIDELINES**

1. Each Divisional Review will focus on an assessment of each of the capabilities of each Division as documented in the Divisional Operational Plan. Generally this will involve 6-12 major capabilities for each Division (indicatively, comprising an annual expenditure of between \$5-10M).

2. When considering the terms of reference and scope of each review, the Chief, Group Executive and EDSP will consider the need to include specific reference to matters peculiar to the Division under review eg the maturity of a particular capability, the market pull on a capability for particular applications etc.
3. The EDSP and Group Executives will monitor the “granularity” of reviews to ensure that a consistent level and form of assessment data is available at the end of each review as input into the Organisation-wide strategic resource investment process.
4. The costs of reviews will be shared 50:50 between the Division being reviewed and Science Planning with the contribution from Science Planning capped at \$30K per review.
5. The appointment of a Support Officer for each review is critical to the successful prosecution of the review. The Chief and Group Executive to consult with the EDSP to identify an appropriate individual for this key responsibility which should be seen as a significant talent development opportunity. The EDSP may approve the cost of releasing the Support Officer from their home Division as a legitimate review cost, see 4 above.

**30 June 2004**





including terms of reference, to be applied throughout the triennium to the Minister for Science by July 2004.

- (d) CSIRO will provide research assessment reports together with proposals for follow up action, if any, to be taken in response to each review to the Minister for Science following consideration by the CSIRO Board. To assist in reviewing reports and actions proposed to be taken in response by CSIRO, the Minister will establish a high level committee chaired by the Chief Scientist. CSIRO will cooperate with the committee. Summary results of reviews and follow up actions will be reported publicly in CSIRO's Annual Reports.
- (e) In the event that the agreed arrangements create unexpected difficulties for CSIRO the agency is entitled to make representations to the Minister proposing changes to those arrangements.