Management Audit of the Aquaculture Development Program in the Department of Land and Natural Resources

A Report to the Governor and the Legislature of the State of Hawai'i

Report No. 94-21
December 1994

THE AUDITOR
STATE OF HAWAI'I

The Office of the Auditor

The missions of the Office of the Auditor are assigned by the Hawaii State Constitution (Article VII, Section 10). The primary mission is to conduct post audits of the transactions, accounts, programs, and performance of public agencies. A supplemental mission is to conduct such other investigations and prepare such additional reports as may be directed by the Legislature.

Under its assigned missions, the office conducts the following types of examinations:

1. *Financial audits* attest to the fairness of the financial statements of agencies. They examine the adequacy of the financial records and accounting and internal controls, and they determine the legality and propriety of expenditures.

2. *Management audits*, which are also referred to as *performance audits*, examine the effectiveness of programs or the efficiency of agencies or both. These audits are also called *program audits*, when they focus on whether programs are attaining the objectives and results expected of them, and *operations audits*, when they examine how well agencies are organized and managed and how efficiently they acquire and utilize resources.

3. *Sunset evaluations* evaluate new professional and occupational licensing programs to determine whether the programs should be terminated, continued, or modified. These evaluations are conducted in accordance with criteria established by statute.

4. *Sunrise analyses* are similar to sunset evaluations, but they apply to proposed rather than existing regulatory programs. Before a new professional and occupational licensing program can be enacted, the statutes require that the measure be analyzed by the Office of the Auditor as to its probable effects.

5. *Health insurance analyses* examine bills that propose to mandate certain health insurance benefits. Such bills cannot be enacted unless they are referred to the Office of the Auditor for an assessment of the social and financial impact of the proposed measure.

6. *Analyses of proposed special funds* and existing *trust and revolving funds* determine if proposals to establish these funds and existing funds meet legislative criteria.

7. *Procurement compliance audits* and other *procurement-related monitoring* assist the Legislature in overseeing government procurement practices.

8. *Fiscal accountability reports* analyze expenditures by the state Department of Education in various areas.

9. *Special studies* respond to requests from both houses of the Legislature. The studies usually address specific problems for which the Legislature is seeking solutions.

Hawaii's laws provide the Auditor with broad powers to examine all books, records, files, papers, and documents and all financial affairs of every agency. The Auditor also has the authority to summon persons to produce records and to question persons under oath. However, the Office of the Auditor exercises no control function, and its authority is limited to reviewing, evaluating, and reporting on its findings and recommendations to the Legislature and the Governor.

THE AUDITOR
STATE OF HAWAII

Kekuanao'a Building
465 South King Street, Room 500
Honolulu, Hawaii 96813

Report No. 94-21 December 1994

OVERVIEW

THE AUDITOR
STATE OF HAWAII

Management Audit of the Aquaculture Development Program in the Department of Land and Natural Resources

Summary

Aquaculture, or the farming of aquatic life, has long been seen as an opportunity for economic diversification in Hawaii. The Legislature officially established an Aquaculture Development Program (ADP) within the Department of Land and Natural Resources in 1985. Initially established as a planning program, ADP now engages in a wide variety of activities to support commercial aquaculture.

This audit examined whether ADP operations appropriately reflect its mission and effectively meet ADP goals and objectives. We found that the overall effectiveness of the program cannot be determined. ADP is a small program with a budget of about $900,000. ADP diffuses its impact through numerous activities that lack focus and purposeful direction. An underlying rationale or management strategy for aquaculture development is not readily apparent. ADP has little information on its impact on aquaculture development or the extent to which it has been successful in meeting its objectives. Consequently, it cannot be determined if ADP's current activities represent the best use of its limited resources.

ADP says that the marketing needs of Hawaii's aquafarmers are a priority. However, ADP spends only a small portion of its resources for marketing—about $28,000 or 2.8 percent of its budget of $982,000. We found ADP's marketing efforts also lack focus or direction Marketing efforts could be better targeted to achieve stronger results and to allow for an assessment of their impact.

ADP channels most of its resources into contracts for services. From FY1991-92 to FY1992-93, it spent $1.8 million or about 63 percent of its total appropriations on contracts. The contracts are supposed to result in commercial benefits. But in reviewing a sample of contracts, we found little evidence of commercial benefits. Several contracts are long term with questionable benefits. Almost all are with staff at the University of Hawaii and awarded on a non-bid basis. For example, one contract on feeds research has so far cost almost $400,000. The contract resulted in a commercial feed formulation that cannot be used in Hawaii because of questions about hormones added to the feed.

ADP also has contracts for extension services that do appear to benefit directly those in the industry. Under these contracts, extension agents give aquafarmers on-site problem-solving assistance, technical information on increasing production levels, advice about equipment, harvesting, obtaining permits, and rearing opportunities. Aquafarmers report satisfaction with the services they receive.

We found ADP's contracting procedures to be generally sound, but without sufficient follow up on completed contracts. It is not always clear how the moneys spent on contracts have advanced program objectives or benefited the public.

Recommendations and Response

To ensure better oversight and accountability of ADP, we recommended that the chair of the Department of Land and Natural Resources should require ADP to develop a management strategy for accomplishing its mission. ADP should report annually to the chair on the extent to which it is achieving specific program objectives. The objectives should be clearly linked to program activities and ADP's overall mission. We also recommended that the chair should require ADP to report on the potential commercial or economic benefits of the contracts it awards.

The chair of the Department of Land and Natural Resources responded that the department disagrees with the finding in the report that ADP lacked a clear management strategy. However, the department does concur with the importance of general management principles that it is essential for ADP to: (1) focus its activities to obtain the maximum benefits for the expenditures and (2) to measure activities to the extent possible to make the best decisions on allocating of limited resources.

The department also responded that the report contains innuendos, incomplete statements, and misstatements of facts. We carefully reviewed the department's comments and found no misstatements in our report. What the department calls misstatements are its disagreement with our conclusions. For example, the department says that it does have a management strategy. It points to a seven-year old 1987 formula that states the rationale for the program. The formula calls generally for improving the business climate by optimizing the mix of aquaculture production and service activities that can create economic, social, and environmental benefits. We believe that the department's response clearly illustrates the need for management to be more up-to-date, focused, clear, and specific in demonstrating how ADP will foster aquaculture and better allocate its resources.

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Management Audit of the Aquaculture Development Program in the Department of Land and Natural Resources

A Report to the Governor and the Legislature of the State of Hawaii

Submitted by

THE AUDITOR
STATE OF HAWAII

Report No. 94-21
December 1994

Foreword

The Legislature first began appropriating funds for aquaculture almost twenty years ago. Today, an Aquaculture Development Program within the Department of Land and Natural Resources engages in a wide variety of activities to support aquaculture. The Legislature requested that the State Auditor conduct a management audit of the program to determine whether it was fulfilling its mission and can coninue to do so in the future. This report responds to that request.

We wish to express our appreciation for the cooperation extended to us by the staff of the Aquaculture Development Program, the Department of Land and Natural Resources, and others that assisted in this audit.

Mation M. Higa
State Auditor

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Chapter 1
Introduction

Hawaii's water resources and climate generate economic opportunities throughout the state. One such opportunity is the aquaculture industry. State law defines aquaculture as farming aquatic life in controlled environments. It has been reported that from 1978 to 1990, revenues from aquaculture increased an average of 20 percent each year.[1] In 1992 the industry generated annual sales of about $23.4 million in the state.[2] Aquaculture is among the fastest growing sectors of Hawaii's ocean industries and diversified agriculture. Hawaii has a per capita consumption of seafood more than three times the national average. Yet, Hawaii continues to import more than 70 percent of its seafood.[3]

Hawaii first began to focus on aquaculture in 1976 when the Legislature appropriated $150,000 to the Department of Planning and Economic Development, now the Department of Business, Economic Development and Tourism (DBEDT), to conduct economic assessments and develop a statewide aquaculture plan. The Sea Grant College Program at the University of Hawaii assisted by providing $25,000, office space, and student support. In the following year, DBEDT reported to the Legislature that aquaculture had the potential for becoming a major industry. As a result, during the 1977 Special Session the Legislature passed Act 12, which gave DBEDT authority to establish aquaculture programs and hire temporary staff for what became the Aquaculture Development Program (ADP).

In 1981, ADP was transferred to the Department of Land and Natural Resources (DLNR) but was not formally established as a program until 1985 with the passage of Act 94 (now Chapter 187A, Hawaii Revised Statutes). Initially established as a planning program, today ADP engages in a wide variety of activities. These include developing state plans, marketing aquaculture species, and awarding aquaculture development contracts.

The program currently has a staff of 11, including a program manager, information specialists, aquaculture specialists, microbiologists, an economic development specialist, and clerical and administrative staff. In FY1993-94, the program had a budget of about $982,000. More than half or about $528,000 was spent on contracts for research and assistance to aquafarmers.

To better understand ADP's activities and functions, the Legislature, in Senate Concurrent Resolution No. 220 of the Regular Session of 1994, requested the State Auditor to perform a management audit of ADP.

Legislators expressed concern over the economic impact and role of ADP. They noted that almost a decade has passed since ADP began operations, and it was time to examine whether ADP was fulfilling its mission and can continue to do so in the future.

Objectives of the Audit

The objectives of this audit were to:

1. Assess whether the operations of the ADP appropriately reflect its mission, function, and responsibilities.
2. Evaluate whether ADP's programs are effective in meeting its goals and objectives.
3. Determine whether the ADP has reasonable assurance that its controls over contracts relating to aquaculture are prudent and proper.
4. Make recommendations, as appropriate.

Scope and Methodology

We reviewed the legislative intent, mission, organization, and management of ADP. We also reviewed coordination for aquaculture activities among ADP and related state agencies and organizations. Our review focused on ADP activities from 1990 to the present.

We interviewed officials at ADP, the University of Hawaii, state agencies, aquafarmers, and aquaculture industry officials. We reviewed and analyzed program files, agency agreements, policy and procedure manuals, and budget documents. We also examined relevant laws, rules, and functional statements.

To assess management controls over ADP's services-on-a-fee contracts, we sampled and reviewed 13 contracts (30 percent of all contracts from July 1990 to June 1993) to assess monitoring and program outcomes. We also interviewed contract officers and examined contract files.

Our work was performed from June 1994 to November 1994 in accordance with generally accepted government auditing standards.

Chapter 2

Findings and Recommendations

The Aquaculture Development Program (ADP) in the Department of Land and Natural Resources (DLNR) is responsible for aquaculture development in Hawaii. In this chapter, we examine ADP's mission and operations. ADP engages in various activities and services that appear to be useful. We believe that ADP could be more effective if it had a clearer focus and direction.

Summary of Findings

1. The overall effectiveness of the State's Aquaculture Development Program in fulfilling its mission of fostering aquaculture in Hawaii cannot be determined.

2. ADP expends more than half of its appropriations on contracts, but the benefits of state expenditures on some contracts are open to question.

Aquaculture Has Shown Little Growth Recently

Aquaculture in Hawaii has not been growing as expected. This is evident from annual reports that the Aquaculture Development Program prepares on behalf of the Hawaii Aquaculture Advisory Council, an advisory body to the chair of the Department of Land and Natural Resources (DLNR). Exhibit 2.1 shows projected and actual growth for the aquaculture industry for the years 1990, 1991, and 1992.

The exhibit shows that in recent years, growth in the aquaculture industry has consistently fallen short of expectations. Two years ago, the total industry was projected to grow in value to $25 million. Instead, the industry value has remained the same. Industry value was projected to grow at 12 percent a year. Instead, the value fell 5 percent in 1991 and since 1990, growth has been about 1 percent. Commercial production was projected to grow to $10 million but it has yet to regain the 1991 value of $9.2 million. Despite these losses, ADP continues to report bright prospects for aquaculture. However, the real prospects and the effectiveness of ADP's efforts in aquaculture development have yet to be determined.

ADP strategy for aquaculture development is unclear

It was difficult to determine if ADP operations appropriately reflect its mission and if it is effectively meeting its objectives since ADP does not link its operations to specific objectives. It has little information on the extent to which it has been successful in meeting any objectives and its impact on aquaculture development.

Exhibit 2.1
Growth in Aquaculture 1990, 1991, 1992

	1990	1991	1992
Projected industry value	*	$25 million	$25 million
Actual industry value	$23.2 million	$22 million	$23.4 million
Projected growth	12 percent	12 percent	7 percent
Actual growth	*	(5 percent)	6 percent
Proj. commercial prod.		$10 million	$10 million
Commercial production	$9.2 million	$6.9 million	$7.1 million
Projected employment	*	*	600
Actual employed - part & full time	491	509	550

Source: Hawaii Aquaculture Advisory Council, 1991, 1992, 1993 Reports, prepared by the Aquaculture Development Program

* Data not available

ADP is a relatively small program with an annual budget of about $982,000. Despite its small size, ADP has broad responsibilities for leading the State's aquaculture development efforts. The legislation establishing ADP made it responsible for promoting and supporting worthwhile aquaculture activities, seeking additional funding, coordinating development projects, and investigating and solving biological and technical problems involved in raising species. ADP has stated that its more immediate objectives are to foster profitable commercial enterprises by developing new products, improving technologies, and providing technical and marketing assistance.

In carrying out these responsibilities, ADP currently engages in numerous activities. Whether these activities are guided by an underlying rationale or management strategy for aquaculture development has not been stated. ADP has yet to explain how its activities have been effective in accomplishing specific aquaculture development goals. Consequently, it cannot be determined if ADP's current activities represent the best use of its limited resources.

ADP activities

We found no documented rationale or clear objectives for ADP's numerous activities. ADP groups these activities into three main

categories: (1) planning and coordination, (2) support services, (3) research development and demonstration projects.

ADP's planning and coordination activities include coordinating reviews of proposals for the Natural Energy Laboratory of Hawaii Authority; participating in various industry meetings, such as the Regional Center for Tropical and Subtropical Aquaculture; and serving on boards of sister agencies.

ADP has developed helpful information about the aquaculture industry. Since 1976, it has published several planning and policy reports on aquaculture in Hawaii, including the first state master plan, *Aquaculture Development for Hawaii,* and a *Report of the Governor's Aquaculture Industry Development Committee* in 1984. In 1993, ADP updated the master plan with a long-term strategy plan, *Hawaii's Future in Aquaculture, Strategy for the Blue Revolution.* ADP is currently developing an implementation action plan for the long-term strategy plan. According to ADP, the plan will contain detailed objectives, policies, and an action agenda to achieve the State's goals for expansion of the aquaculture industry. The plan is scheduled for release in early 1995.

Support services provided by ADP include presentations and publications, field trips, assistance to other agencies, and marketing. Research and development consists primarily of awarding and administering contracts.

ADP's current operational plan fails to link the activities to any specific objectives. ADP does not show how the activities will result in new commercial products or improved technology. As a result, ADP has no way to measure the success or effectiveness of any of its activities. To better manage its limited resources, we believe that ADP activities should reflect a clear management strategy. For example, its marketing efforts could be better targeted to achieve stronger results and to allow for an assessment of their impact.

No marketing strategy

ADP's annual industry survey says that the marketing needs of Hawaii's aquafarmers are a priority. Despite this, we found that ADP spends only a small portion of its resources for marketing — only $27,930 or about 2.8 percent of its appropriation in FY1993-94. In addition, marketing efforts are not focused and are not directed toward achieving any program goals or objectives.

ADP's marketing plan for 1994 does not establish marketing goals and objectives. The plan merely lists activities to be accomplished without

linking them to any results. Marketing activities include promoting aquaculture generally as well as promoting specific species. General marketing activities promote the aquaculture industry to audiences in-state and out-of-state. ADP participates in market events such as the annual Hawaii Seafood Festival sponsored by DBEDT, State Farm Fair, community conferences, and other in-state and out-of-state shows, conferences, expositions, and specialty promotional events such as food industry trade shows.

ADP has not set any specific goal in promoting targeted species. ADP's marketing activities include a campaign to provide support material for five major species: prawn, shrimp, limu and ogo, tilapia, and Chinese catfish. Single species are also targeted for promotion but without information or market research on which species has the strongest commercial value. For example, ADP has been concentrating its efforts on products abundant in Hawaii. In 1994, it selected ogo as a primary species for market promotions. It sponsored such activities as recipe contests for consumers and chefs. ADP will also participate in a seafood show in California where it will hand out ogo recipes and discuss export opportunities. ADP has not evaluated the effectiveness of its marketing efforts to date. In 1995, ADP will focus on marketing Chinese catfish. Whether this will result in a better use of ADP's marketing dollars is not known.

An ADP official acknowledged that the program does not measure the effectiveness of its marketing efforts. The official also acknowledged that, due to lack of funding, ADP has not conducted any market research or analysis that would identify where its efforts should be focused. However, in view of its limited resources, ADP should ensure that expenditures are put to the best use.

Purpose of economic activities unclear

ADP's other economic development activities also lack clear direction and purpose. ADP officials say they seek to be proactive in searching for new economic development opportunities for the aquaculture industry in Hawaii. They give as an example co-sponsorship of a pearl conference in 1994 that attracted over 600 people and that offered an opportunity for South Pacific islanders to develop the pearl industry in Hawaii. However, an agency official acknowledged that the impact of the conference was difficult to assess. The official also acknowledged that ADP has no criteria or measures of effectiveness for its economic programs.

ADP staff also deliver speeches at various seminars, exhibitions, and other institutions. Open to question is the extent to which these

activities contributed to ADP's objective of fostering commercial aquaculture enterprises by developing new products, improving technologies, and providing technical and marketing assistance.

ADP needs sharper focus and accountability

We believe that ADP diffuses its impact through numerous activities that lack focus and purposeful direction. Part of the reason may be the lack of oversight over ADP.

DLNR has overall responsibility for managing aquaculture programs. The ADP program director reports directly to the chair of DLNR. We found, however, that ADP does not systematically report to the chair of DLNR on the extent to which it is achieving its program goals. ADP is reviewed annually by the chair's office but according to an ADP official, ADP has discretion in deciding on program activities and reports on an as needed basis.

We believe that the chair of DLNR should systematically review ADP activities to ensure that they are purposefully related to accomplishing its mission and objectives. The chair should require ADP to report on outcomes and results of its efforts. This would allow the department to assess whether ADP activities are having an impact on the development of the aquaculture industry in Hawaii.

Benefits of ADP Contracts Are Sometimes Uncertain

ADP channels the major portion of its resources into contracts for services. From FY1991-92 to FY1992-93, it spent $1.8 million or about 63 percent of its total appropriations on contracts. These contracts are supposed to result in commercial benefits. According to Section 187A-3, HRS, ADP "shall coordinate development projects to investigate and solve biological and technical problems involved in raising selected species with commercial potential."

In reviewing a sample of contracts, we found little information on the commercial potential resulting from the contract. The reports available also failed to assess any financial benefits derived from the state-funded research.

ADP has established guidelines for contracts which are sent to members of the aquaculture community statewide. They request proposals that attempt to reduce the costs of production and improve yields for existing commercial species. They also ask for proposals that demonstrate the technical and economic feasibility of new species and systems. However, little follow-up information is reported on the actual commercial or economic potential of any resulting research either by the contractor or ADP.

ADP contracts are often for long-term projects that are routinely renewed annually. In many cases, year-end reports from contractors are only status reports that provide no information on commercial or economic benefits to justify continued funding. In our sample, we found no reports that included assessments on the transfer of benefits to the aquaculture industry. This type of information is critical to determining whether the contracts were useful. ADP should require contractors to report on potential commercial benefits and ADP should assess the results for contracts it funds.

Some contracts are long term with questionable benefits

Several of ADP's contracts are long term with questionable benefits. Almost all are with staff at the University of Hawaii and awarded on a non-bid basis. Whether some of these contracts result in the best use of state moneys is open to question.

For example, in FY1991-92, ADP awarded a contract on feeds research which was the second stage of an earlier contract from FY1987-88. The purpose of the research was to develop feeds at a lower cost than those imported from the United States mainland. The total cost of the contract so far has been $393,177. The contract resulted in a commercial feed formulation but the feed cannot be used in Hawaii because of questions about hormones added to the feed. Consequently, its benefits have yet to be determined.

In another instance, a contract for the commercial culture of mahimahi has been on-going since FY1983-84 at a cost of $297,643. An early benefit from the research was the development of technology to pilot test commercialization of mahimahi. However, to date only one aquafarmer has shown an interest in this species. According to ADP, an Australian businessman has also expressed interest but lacks funds to invest.

Although both contracts have lasted several years, no assessment has been made of their financial benefits or expected commercial potential. Even though interest from prospective investors was minimal, ADP in FY1992-93 continued to fund research on both feeds and mahimahi.

Extension services benefit farmers

ADP contracts for extension services appear to benefit directly those in the industry. To provide on-going support to aquafarmers, ADP contracts with the Department of Biosystems Engineering and Sea Grant Extension Program of the University of Hawaii for engineering and production extension services. The services are furnished by agents who give aquafarmers on-site, problem-solving assistance. In FY1992-93, the extension service contracts totaled $179,508 of ADP's general fund appropriations.

The engineering and production extension agents do provide aquafarmers with an array of technical, production, engineering, and financial assistance. They give farmers technical information on increasing production levels and efficiency and on solving problems that arise on aquafarms. They advise farmers about equipment, harvesting, obtaining permits, and rearing opportunities for such species as tilapia and Chinese catfish. Aquafarmers told us that they were satisfied with the extension services provided. The farmers also told us that the agents have provided immediate solutions to most of their problems.

ADP procedures for contracting are generally sound

Although ADP is weak in ensuring that its contracts actually result in useful outcomes, it does have sound procedures for selecting, awarding, and monitoring contracts.

Contracts are selected and awarded on the basis of their relevance to Hawaii's aquaculture development. ADP requires contracts to have practical applications with the potential for transferring the technology to farmers and the industry. ADP uses a preproposal selection process whereby each proposal is reviewed and ranked by a Technical Advisory Panel (TAP) appointed by ADP. TAP members include extension agents, farmers, researchers, and industry officials with aquaculture expertise. Final decisions on accepted proposals are included in ADP's biennium budget request.

ADP also conducts an annual industry survey to establish research priorities. The results of the industry survey are used in the selection of contracts. In our sample, we found that selected awards adhered to ADP's selection process.

We also found that ADP closely monitors its contracts, funding its contracts on a year-to-year basis. An agency official said that annual funding allows ADP to ensure compliance with contract specifications, such as quarterly reports. ADP makes sure that quarterly or biennial reports and final reports are received in a timely manner. ADP also ensures that all contract deadlines are met. However, although ADP pays close attention to the process, once the contract is completed, ADP does little with the results.

Results of completed contracts need attention

ADP does not follow up effectively on completed contracts. Consequently, it is not clear always how the moneys spent on contracts have advanced program objectives or benefited the public. ADP summarizes contract results in its "Research Progress Report" and various agency publications. The progress report is then disseminated to farmers and researchers for their information.

ADP does not report to the chair of the Department of Land and Natural Resources on the results of its contracts. We found no reports on the economic or commercial feasibility of various aquaculture products resulting from ADP contracts. We also found no mechanism by which ADP reports to the chair on whether the research has been effective or has improved the aquaculture industry. ADP merely identifies the contracts that have been selected for the year and includes them in its budget submissions.

We believe ADP should assess the usefulness of its contracts to the aquaculture industry. We also believe that the chair of the Department of Land and Natural Resources should require the ADP to report on the financial and commercial feasibility of results from its contracts.

Conclusion

ADP carries out numerous activities, but it needs to develop clear management strategies so that its activities are aimed at accomplishing specific goals and objectives. To the extent possible, it should be able to demonstrate measurable impact and progress. Without these basic management strategies, the true impact and value of ADP's efforts for the aquaculture industry will remain open to question. To ensure oversight and accountability, the chair of DLNR should require ADP to develop a management strategy for its activities and report annually on the extent to which the strategy is effective in accomplishing ADP's mission.

Recommendations

We recommend the following:

1. The chair of the Department of Land and Natural Resources should require ADP to develop a management strategy for accomplishing its mission and report annually on the extent to which it is achieving specific program objectives. The objectives should be clearly linked to program activities and ADP's overall mission.

2. To ensure linkage to program mission and measurable goals, the chair should also require the Aquaculture Development Program to report on the potential commercial or economic benefits of the contracts it awards.

Notes

Chapter 1

1. Hawaii, Department of Land and Natural Resources, *Program Overview, LNR 153, Commercial Fishery and Aquaculture,* n.d., p. 3.

2. Hawaii Aquaculture Advisory Council, *1993 Report,* Aquaculture Development Program, Department of Land and Natural Resources, 1993, p. 2.

3. Hawaii, Department of Land and Natural Resources, *Hawaii's Future in Aquaculture,* Honolulu, January 1993, p. xvi.

Response of the Affected Agency

Comments on Agency Response

We transmitted a draft of this report to the Department of Land and Natural Resources on November 17, 1994. A copy of the transmittal letter to the department is included as Attachment 1. The response from the department is included as Attachment 2.

The department responded that it disagrees with the findings in the report that ADP does not have a clear management strategy that links activities to specific objectives and measures the results of its activities to a satisfactory extent. However, the department does concur with the importance of general management principles that it is essential for ADP to focus its activities to: (1) obtain the maximum benefits for the expenditures and (2) measure activities to the extent possible to make the best decisions on allocating of limited resources.

The department also responded that the report contains innuendos, incomplete statements, and misstatements of facts. We carefully reviewed the department's comments and found no misstatements in our report. What the department calls misstatements are its disagreement with our conclusions. For example, the department says that it does have a management strategy. It points to a seven-year old 1987 formula that states the rationale for the program. The formula generally calls for improving the business climate by optimizing the mix of aquaculture production and service activities that can create economic, social, and environmental benefits. We believe that the department's response clearly illustrates the need for management to be more up-to-date, focused, clear, and specific in demonstrating how ADP will foster aquaculture and better allocate its resources.

ATTACHMENT 1

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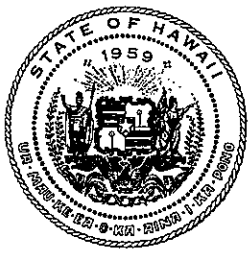

MARION M. HIGA
State Auditor

(808) 587-0800
FAX: (808) 587-0830

November 17, 1994

COPY

The Honorable Keith W. Ahue, Chair
Board of Land and Natural Resources
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street, Room 130
Honolulu, Hawaii 96813

Dear Mr. Ahue:

Enclosed for your information are three copies, numbered 6 to 8 of our draft report, *Management Audit of the Aquaculture Development Program in the Department of Land and Natural Resources*. We ask that you telephone us by Monday, November 21, 1994, on whether or not you intend to comment on our recommendations. If you wish your comments to be included in the report, please submit them no later than Monday, November 28, 1994.

The Governor, and presiding officers of the two houses of the Legislature have also been provided copies of this draft report.

Since this report is not in final form and changes may be made to it, access to the report should be restricted to those assisting you in preparing your response. Public release of the report will be made solely by our office and only after the report is published in its final form.

Sincerely,

Marion M. Higa

Marion M. Higa
State Auditor

Enclosures

ATTACHMENT 2

JOHN WAIHEE
GOVERNOR OF HAWAII

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY DIRECTOR
JOHN P. KEPPELER, II

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CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

NOV 28 1994

MEMORANDUM

TO: Marion M. Higa
State Auditor

FROM: Keith Ahue, Chairperson
Department of Land and Natural Resources

SUBJECT: Comments on Draft Audit Report

RECEIVED
Nov 28 3 21 PM '94
OFC. OF THE AUDITOR
STATE OF HAWAII

We have reviewed the draft report of the management audit of the Aquaculture Development Program (ADP), Department of Land and Natural Resources (DLNR). We are providing the following comments for the record, in the spirit of improving its accuracy and usefulness as an evaluation tool.

In carrying out the review, we appreciated that your staff was conscientious and very considerate of our scheduling of on-going work. Thank you for the opportunity to comment.

General Comment

From our perspective, the document contains important innuendos, incomplete statements, misstatements of fact, and errors in interpretation that are used to support the conclusions and two recommendations. Further, we believe a limited understanding of technology-based, economic development initiatives and scientific research and its administration, in general, and as they are found in ADP, in particular, contributes to short comings in the report. We will briefly note the errors of fact, omission, and interpretation and comment on the more significant concerns mentioned above.

Chapter 1 Introduction (page numbers and paragraphs are shown)

p. 1, para. 4 - Staffing should be described as two clerical and administrative staff, not three. The miscast position is a Laboratory Assistant position that is part of the four person Animal Health Management component of ADP.

Chapter 2 Findings and Recommendation

p. 3, para. 5 - As the report points out, the industry projections for the 1990-1992 timeframe were not met. Unfortunately, the report fails to mention the March 1991 flood that devastated Windward aquafarms and drastically affected production values statewide for 1991 and 1992, hence, the drop. A recovery is still underway.

The report indicates that despite not meeting expectations a bright future is reported by ADP and the real prospects for aquaculture have yet to be determined. We are puzzled by this negative tone, since the report appears to discount 10 years of continuous industry growth by one act of nature, the flood. Further,

ADP articulates the growth and potential for Hawaii aquaculture based on comprehensive worldwide knowledge of the industry (as specified by our statute), documented in detail most recently in the 1993 long-term Hawaii industry development strategy. Finally, the report fails to acknowledge that though production value decreased 1990-1992 because of the flood, new farms continued to be added to the industry during this period at about 10% per year, indicating continued strong interest in aquaculture.

p. 3 and 4 - Section titled "ADP Strategy ... unclear"

This section generally makes five significant points of difficulty: 1) determining if ADP operations reflect mission, 2) determining effectiveness in meeting objectives, 3) scarcity of information showing results and impact on development, 4) questioning whether the activities are guided by an underlying rationale or management strategy, and 5) no explanation how activities have been effective in accomplishing specific development goals.

We will briefly address these issues and highlight relevant information that was provided to audit staff in more detail during fact finding.

1. We believe the operations of ADP do reflect the mission. The stated mission for ADP is: to prepare and implement State aquaculture plans and policies for expansion of Hawaii's production and service industries, coordinate statewide aquaculture activities, and directly assist both private and public sector interests in achieving their aquaculture-related goals to create jobs and diversify the economies of all islands.

The stated ADP functions for implementation are as follows: carry out statewide planning, policy development and coordination; provide development support services and direct assistance in the areas of general and technical information, animal health management, permits, sites, species selection, promotion, feasibility studies, and marketing; and fund and co-fund applied research, development and demonstration projects to improve yields and reduce production costs of existing species and encourage development of new species and systems.

2. We believe it is clear how such capabilities as helping get a permit, finding a site, providing disease assistance or finding a sales outlet, implements the above mission. We believe ADP does link its operations to specific objectives broadly, as well as on an activity and project basis. Each of the major functional areas and sub-areas have specific purposes that contribute to the goal of industry development, which we submit is a multi-task job. Certain areas have recurring and regular activities or products, e.g., newsletters, Board representation or Farm Fair participation. While others are strongly customer-driven, responding to requests for information, for example, from the general public or specific farmer problems, e.g., "hands on" permit, disease or marketing assistance. We do not set quotas for the customer-driven activities and basically respond to the need, or opportunity believing any interested taxpayer should have this assistance, including industry members. We, of course, limit the resources committed to the less beneficial activities.

3. ADP formally and informally collects a great deal of information that demonstrates the results and effectiveness of its operations. We believe in multiple sources of feedback on our efforts from informal questions of users to formal surveys. ADP utilizes this type of information to allocate efforts weekly, if not daily. To illustrate, the first measure of an aquaculture development program is whether the industry develops. Growth is measured and reported as production volume and value, farms, research and technology transfer project value, service businesses and jobs from both production and services.

ADP also measures its specific activities and accomplishments during every fiscal year in eighteen categories, e.g., Speeches and Presentations, Major Promotional Events, New Business Development Activities, Problem-solving Activities, etc. We also have set target levels for these activities in the Tactical Plan required by the Chairperson. We wish to note that staff can determine, if desirable, the

impact of its assistance on a particular farm or project for the fiscal year. Again, this information is utilized to allocated time and resources based on workload plans and industry needs.

4. We believe there is a clear overall rationale for ADP operations. As has been stated, overall, the ADP formula focuses on improving the business climate for aquaculture, (e.g., broad education efforts); promoting investments, products and services; and providing "hands on" assistance to start-up businesses to reduce their initial costs and risks. Once a farm or business is in place, ADP directly assists local companies with solving problems and improving operations through its expert staff and targeted research and development budget. Moreover, the Program is responsive in that each year and biennium, short-range priorities and delivery of services are modified to address critical industry needs and problems, e.g., responses to the 1991 flood situation.

These support services and problem-solving capabilities are an economic development incentive, for businesses to invest in Hawaii aquaculture. Governments provide this type of encouragement to increase investment in a specific area.

5. We believe the Program is accomplishing its industry development goals by successfully implementing the array of clearly defined activities and projects (briefly described above) it carries out each fiscal year. During ADP's existence these key activities have been identified as being important to fostering industry development.

The Program's goals, which are the State's goals for the two-sector industry, are as follows:

Commercial Production Sector Goal - By the year 2000 establish Hawaii as an important Pacific site for commercial production of a wide variety of aquacultured foods and other products. Target wholesale value is $70M in annual sales.

Research and Technology Transfer Sector Goal - By the year 2000, establish Hawaii as an international center of excellence for aquaculture research, training, degree education, consulting and professional conferences.

The implementation strategy to achieve these goals are: Optimize the mix of aquaculture production and service activities that can technically and economically be carried out in Hawaii in order to create upscale jobs and economic, social and environmental benefits on all islands.

Program emphasis is on the Commercial Production Sector through the Program's activities have resulted in furtherance of both goals as measured by industry growth. Numerous specific examples were cited to your staff and are found in our accomplishment reports.

p. 4-5 ADP Activities.

This section makes four significant points of difficulty: 1) no documented rational or clear objectives for ADP's activities, 2) current operational plan fails to link activities to any specific objectives, 3) does not show how activities will result in new commercial products or improved technology, and 4) no way to measure success or effectiveness of any of its activities.

We will briefly address each point.

1) As mentioned previously, the ADP formula states the rationale for the program. Since you request more detailed rationales, we call your attention to the attached that have governed ADP operations since July 1987. The information is found in an internal document which was prepared for ADP staff, the Chairperson and Deputies , after ADP went through a lengthy "reinvention" exercise. This information was offered to your staff, but was deemed not essential at the time. Perhaps it will satisfy your desire to evaluate more detailed rationales for the Programs's functions and activities.

2) Again, we feel that operational capabilities are clearly targeted towards various aspects of the ADP formula. In general, these types of capabilities are often utilized to encourage economic development, but they are not generally integrated into one program, with one focus--aquaculture. We believe economies of effort and efficiencies are gained by this integrated approach.

3) During the fact finding period, staff used numerous examples to explain how the planning and coordination, support services and research development and demonstration project funding activities of ADP resulted in industry development. Also by virtue of having these multiple capabilities vested in experienced staff, we can assemble teams to advise a complex new development or handle a particular problem.

As was explained, new commercial products and improved technology result from direct assistance to startup farms (e.g., permits, sites, species selection, etc.), targeted research and demonstration projects (e.g., net development, stocking strategy development, Hawaiian fishpond demonstration, mahimahi hatchery process, shrimp virus disease diagnostics, new species quarantine assistance, etc.); and "hands on" extension of technical and marketing information (e.g., ADP staff expertise, contracted production and engineering expertise) developed by state-funded research or other research results from around the world.

Again, any given fiscal year with the monitoring we do and required reporting by the contracted projects, we can qualitatively assess the assistance given to a particular farm. We believe to go beyond the monitoring we currently do would be "overkill".

4. We strongly disagree with the assertion that ADP has no way to measure success or effectiveness of any of its activities. In fact, exactly the opposite is true. ADP is very concerned about impacts and effectiveness of its activities considering its limited and shrinking resources. ADP effectively uses multiple sources of feedback to determine results. To illustrate, broad effectiveness is measured by informal question and answer sessions with users, yearly written surveys of the industry, occasional comprehensive in-person surveys (e.g., 1992) and the detailed annual compilation of accomplishments. ADP also maintains a file of thank you letters and occasionally have won awards, e.g., 1990 Farm Fair Grand Champion. And, over the last fourteen years, two ADP staff have been recognized as Department Employees of the Year.

The effectiveness of certain individual activities is also measured routinely. For example, we judge the success of a promotional event by: attendance, information inquiries, recipes distributed, and product sales contacts. These determine if it is worth participating again, that is, does the benefits justify the effort.

We do acknowledge that some activities have immediate and near-term payoffs, e.g., information handouts, speeches, disease diagnosis and treatment, permit and site assistance, extension. While for others the payoff is longer term, if at all, e.g., time spent with a potential investor that never materializes, promotion of products and research that is not used immediately or is unsuccessful. Moreover, it is difficult at times in an economic development activity to trace cause and effect, when the effect can be delayed years or is cumulative, and often it is not cost-effective to do so. Given the resources available, we believe ADP is doing a more than adequate job in monitoring the impacts of its activities.

p. 5-6 - No Marketing Strategy

This marketing section is of particular concern because of various misstatements and errors of omission. The points of difficulty made are: 1) efforts are not focused and do not have program goals or objectives, 2) ADP has not set specific goals in promoting targeted species, 3) effectiveness is not measured, and 4) ADP has not conducted market research to identify where efforts should be focused.

General Comment

ADP markets three things: products, services and investment opportunities. Emphasis is placed on products, but significant activities occur for services and investment opportunities. ADP views every opportunity to tell someone about aquaculture as an opportunity to promote the industry. The educational activities we carry out are a major aspect of marketing, and create an informed citizen and potential customer for products and services or to invest in the industry. Because of this conceptual approach, marketing efforts are much larger than the budget figure cited.

ADP's specific approach to marketing services and investment opportunities emphasizes low budget, modern direct marketing. It utilizes its expertise, writing capabilities and network of contacts to tout Hawaii expertise and investment opportunities. ADP also piggybacks on larger mass marketing of technology efforts by other agencies, such as DBEDT, and do the direct hands-on follow through with the leads that develop.

ADP's marketing approach for products takes into account the following key principles:

- The industry produces 35 species and a generic marketing approach is needed.
- Aquaculture is a developing industry and consistency of supply is a problem in many species; therefore, local market emphasis and close cooperation with the industry are needed.
- ADP uses a demand-pull rather than a supply-push strategy, meaning we want to keep demand ahead of supply to keep farm prices up. This is consistent with what farmers want.
- ADP involves groups of farmers that are growing the same species in developing the activities and, importantly, efforts are gauged to their projected supplies. In other words, you don't market what you don't have.
- ADP attempts to leverage 2 private dollars for every State dollar, hence the effort is larger that apparent.

We wish to point out the following points made in regarding the report's product marketing discussion:

1. Marketing efforts are indeed focused. The generic awareness efforts address raising awareness of the general public for aquaculture and its products and services. The approach is to get the greatest exposure for the least cost. Modern techniques are used, e.g., newsletters, leaflets, authored articles, exhibits, presentations at meetings and direct mail. Each is predetermined to influence a desired audience. Activities are planned for the coming fiscal year, but ADP also responds to opportunities, such as, invitations to speak or write an article.

2. The retail marketing campaign for the species of greatest abundance was begun recently. In the written plans, target markets, objectives and specific tasks are discussed. Importantly, these plans have been reviewed by industry . Basically, the approach is to differentiate industry products in the market as a cultured product, using a form of branding (logo). Again, this is a standard approach.

3. It is too early and not cost-effective to do studies of the impacts. Farmer feedback, however, has been good. Special targeted efforts for ogo have stated objectives for the activities implemented. Ogo efforts have worked very well and with the cooperation of the industry, we anticipate 1995 catfish efforts to also be successful, as indicated by demand exceeding supply.

p. 6 para. 2 - These marketing statements are incorrect. Individual species are targeted for promotion because our surveys and farmer feedback tell us they are having a difficult time selling. Efforts on targeted species, e.g., ogo, are gauged on production estimates we solicit from farmers. Effectiveness of the marketing efforts is also measured by direct feedback from chefs, wholesalers, retailers and farmer users. We acknowledge that this is not an independent, statistically valid measure, but such tests are expensive and not cost-effective at this stage of industry development.

4. p. 6 para. 3 - The statement that ADP has not conducted market research needs clarification. What was said to your staff was we would like to do market research on some of the niche markets or market segments in the Hawaii market, for example, the buying habits of certain ethnic groups. We have tried, unsuccessfully to leverage other agencies to fund this work. This type of information does not exist for any aquaculture product and would be helpful.

It needs to be pointed out, however, that the major structure and characteristics of the Hawaii seafood market are well known from research by State and Federal agencies. And, ADP has all this information and utilizes it, plus essential input from farmers, to guide the efforts being made.

In summary, we believe ADP's approach with its strong industry guidance, does insure best use of resources.

p. 6-7 Purpose Activities Unclear

The major points of difficulty made by this section are: 1) ADP's other economic development activities also lack clear direction and purpose, 2) questioning how do activities foster commercial development, 3) ADP diffuses its impact through numerous activities that lack focus and purposeful direction, and 4) ADP lacks oversight.

We disagree with the first three points, which are somewhat repetitive. The ADP goals for commercial development are described. The Program mission is clear, as is the formula for achieving the mission. The Program's activities are purposeful and measurable and we have described through numerous examples, how various activities directly and indirectly result in expansion of the industry. Finally, the Program does have measures of effectiveness and the primary measures are those of industry expansion mentioned above and reported to the Legislature. Measurements of results for individual projects are also made on a routine basis.

p. 8 para 4 - Reference is made to the Pearls '94 Conference as an activity that was difficult to measure impact. We wish to clarify that while difficult, there are standard formulas for calculating the economic impact of a conference available from HVB and DBEDT. This Conference was very successful contributing $4.2 million to the economy.

It should be recognized that economic development is by nature a multi-task job, requiring a multi-disciplinary approach, Integration of these capabilities in one agency has been a great advantage fostering "economies of effort". We believe the Program is highly focused and has, over time, developed a finite array of capabilities and functions that clearly support production and service industry growth. We acknowledge that with economic development activities it is sometimes difficult to ascertain cause and effect.

p. 7 para 2-4 - The final point of this section suggests ADP may lack oversight by the Chairperson. Currently, ADP reports to the chairperson and functions as a division. This gives it the stature to interact with sister agencies. Reporting to the chairperson takes the form of: annual program reviews, biweekly staff meetings, individual meetings and memos. Individual meetings and memos, e.g., approvals, informational and reports of results, are largely at ADP's discretion, but regular. The Annual Program Review and biweekly staff meetings are regular events. We believe this type of reporting to be adequate for the chairperson to provide the policy and prioritization guidance requested.

In addition to the above, we should mention ADP prepares operational expenditure plans each year which are approved by the chairperson. Further, the chairperson approved the 1993-1994 ADP Tactical Plan which presented detailed activities and anticipated results.

p. 7 - 10 - Benefits of Contracts Sometimes Uncertain

The points of difficulty with some contracts as noted in this section are: 1) lack of information on the commercial potential resulting from the contract, 2) failure to assess financial benefits derived from the research, and 3) failure to adequately use and report contract results. This section also has several errors of fact and omission which we will addresss.

1. Information on commercial potential is solicited during the proposal phase of contract administration and is used by ADP staff and the Technical Advisory Panel in making decisions about which proposal will be funded. Once the contract is underway, reporting is focused on the technical scope of work of the contract. We wish to note all reports received are evaluated by the Aquaculture Specialist for completeness and use.

The Aquaculture Specialist makes appropriate recommendations for follow-up actions, including adjustments to the scope of work, continuation of funding in Year 2, or dissemination of results. ADP does not ask contractors to speculate about commercial benefits in their contract reporting and believe it would be generally appropriate for these technical specialists to do so.

p. 8 para 1 - We wish to correct the statement that ADP contracts are routinely reviewed annually. ADP goes through a request for proposals for each biennial budget, which includes extensive solicitation and ranking by an industry panel. Projects continue, if they continue to be ranked as important by the industry. In other words, it is a competitive process every biennium. Moreover, funding during the second year of the biennium is not routine. Projects must demonstrate they are making adequate progress or they could be cut.

2. We acknowledge that the quantitative financial benefits are not assessed when results are utilized by farmers. It would be very difficult to assess, for example, the impact on operational costs of a new procedure developed through a research project. We determine qualitatively if the results are being applied, not quantitatively.

p 8 para 3-5 - These paragraphs discuss two particular research contracts: feeds technology and mahimahi culture. We wish to clarify several points. We submit that research, development and demonstration projects result in multiple benefits to the State. Primary is the technical information derived from the work. However, there are other important immediate and longer-term benefits to industry development. For example, for the Feeds Development Project mentioned, in addition to the usable technical information, the project: a) brought in $295, 465 of Federal matching funds; b) helped educate over 50 undergraduate and graduate students; c) developed valuable long-term collaborative relationships with six universities in the U.S. mainland, Canada and Japan, as well as a major drug company (Monsanto); and positioned UH for participation in large multi-institution federal grant proposal on fish growth.

In the case of the mahimahi research contract multiple benefits also are evident, in addition to the successful development of hatchery procedures. The project leveraged $246, 648 of federal funds. Technical information derived was used as a basis for discussions with two (not one) potentially multi-million dollar commercial investors. One investor spent $500,000 conducting a demonstration project in Hawaii, supported by the UH research team, but did not expand. The other investor, an Australian, is presently looking for $5M to invest in Hawaii. In the meantime, the former researcher on mahi has begun his own farm and has begun to market fish this year (another benefit of research, breeds entrepreneurs).

The mahi research illustrates other less tangible benefits of research, namely, generation of information that can be applied to other commercially valuable fish species; supportive collaboration with Federally sponsored work at the Oceanic Institute; professional publications that build Hawaii's worldwide technical reputation; and assistance to educational exhibits at the Waikiki Aquarium.

We submit that while it is very difficult to put a precise dollar value on all these research benefits, the sum total of benefits justifies the expenditure.

3. The report criticizes the level of dissemination of some research results. We should note that research results vary with the scientific nature of the project. Results could be immediately transferrable as with a demonstration or feasibility project, or require further research, to determine their value and transferability. When to transfer of research results is a question of professional judgement and it would be irresponsible to extend results to the industry that are preliminary or premature.

The current mechanisms for dissemination of results are as follows: a) encouraging researchers to publish in professional journals ADP subscribes, b) biennial publication by ADP of a summary document called *Research in Progress* which is distributed to the industry; c) special publication of results by ADP which is sent to the industry; d) direct mail of results to select farmers with an interest; and e) utilization of extension specialists to deliver usable results to farmers. We believe these represent a very significant effort to get the usable results out to the industry.

p 9 para 3 - The Technical Advisory Panel is always made up of farmers and extension agents, only to elicit the practical perspective.

p 10 para 1 - We acknowledge that ADP does not frequently report research results to the chairperson except during the Annual Program Review.

p 10 para 1 - ADP does assess the usefulness of contract research results at the time of completion and in consideration of the question of dissemination.

Conclusion and Recommendations Section p 10

Considering the foregoing comments on the body of the report, DLNR has concerns over its conclusions and recommendations. We disagree that ADP does not have a clear management strategy, link activities to specific objectives and measures the results of its activities to a satisfactory extent. Moreover, it adequately reports results of its activities and projects to the chairperson and the industry.

We note that your staff interviewed a broad cross section of ADP public and private sector customers and the only mention of the results is that farmers seem happy with the extension specialist projects. Actually, ADP feedback indicates a high level of satisfaction with all ADP staff activities. However, "stepping back" from these disagreements, we concur with the importance of the general management principles articulated, that: a) it is essential to focus ADP activities and projects to obtain the maximum benefits to industry development for the expenditures, b) activities and results should be measured to the extent possible to make the best decisions on allocation of limited resources. These principles are brought into sharp focus by the shrinking State budget situation that exists today.