

# **College Planning Committee**

## **Report**

**March 31, 2010**

**College of Agricultural and Environmental Sciences**  
**University of California, Davis**



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## Preface

On October 22, 2009, Dean Neal Van Alfen (College of Agricultural and Environmental Sciences, University of California, Davis) appointed the College Planning Committee (CPC) to make recommendations on how to best organize the college by building on the recommendations of the Academic Prioritization Committee (APC) as provided in their July 31, 2009 report. Both committees were created to develop a comprehensive, integrated, and contemporary plan for our college vision, within the context of an estimated reduction of full-time equivalent (FTE) faculty between 10–20 percent. Following the APC’s analysis of departments’ status in light of budget constraints and potential faculty retirements, the CPC was given a more specific mandate to develop proposals for college reorganization that might take budget realities into account while also identifying and embracing cutting-edge and important areas of scholarship.

The CPC consisted of two working groups, focusing on future opportunities and organization in the areas of “agricultural/food systems/health/communities” (AFSHC) and “environmental/ natural resources/planning/design” (ENRPD). The planning by these two working groups was not intended to signify future divisional organizations, but was developed for practical reasons to promote inclusion, provide disciplinary expertise, and avoid discussion constraints of an overly large committee, at least initially. In reality, almost all planning and discussions were accomplished jointly between the two working groups.

### AFSHC members on CPC:

Mary Delany, cochair, associate dean, College of Agricultural and Environmental Sciences	
Linda Bisson	Department of Viticulture and Enology
Rick Bostock	Department of Plant Pathology
Steve Boucher	Department of Agricultural and Resource Economics
Kent Bradford	Department of Plant Sciences
Carl Keen	Department of Nutrition
Howard Ferris/Ed Lewis	Department of Nematology
Joy Mench	Department of Animal Science
Lisa Miller	Department of Human and Community Development
Toby O’Geen	Department of Land, Air and Water Resources
Raul Piedrahita	Department of Biological and Agricultural Engineering
Neal Williams	Department of Entomology
Gang Sun	Division of Textiles and Clothing
<sup>1</sup> Glenn Young	Department of Food Science and Technology

### ENRPD members on CPC:

Jan Hopmans, cochair, associate dean, College of Agricultural and Environmental Sciences	
Cort Anastasio	Department of Land, Air and Water Resources
Mary Cadenasso	Department of Plant Sciences
<sup>1</sup> Mike Denison	Department of Environmental Toxicology
Dirk Van Vuren	Department of Wildlife, Fish and Conservation Biology
Ryan Galt/Chris Benner	Department of Human and Community Development
Doug Larson	Department of Agricultural and Resource Economics
Sharon Lawler	Department of Entomology, and chair, Ecology Graduate Group
Frank Mitloehner	Department of Animal Science
Jim Sanchirico	Department of Environmental Science and Policy
Mark Schwartz	John Muir Institute for the Environment (ex officio)
Steve Wheeler	Landscape Architecture Program

<sup>1</sup>Contributions by Jean-Xavier Guinard (FST) and Bob Rice (ETOX) to substitute for their departmental representatives at times that committee members were unavailable are especially acknowledged.

## I. Executive Summary

This College Planning Committee (CPC) report provides recommendations on future college priority areas and organizational options to maintain academic preeminence and foster new opportunities despite budgetary-driven anticipated reductions of 30 to 40 faculty (I&R/AES). The recommendations of both the 2009 Academic Planning Committee (APC) and the College Planning Committee provide an opportunity for the college to build upon its highest priority academic programs.

The CPC believes that reorganization of departments must be founded on programmatic synergies in curricula, research, and Cooperative Extension. The focus of the CPC was on four areas: maintaining research excellence, adhering to the Agricultural Experiment Station mission, examining impacts of reorganization on undergraduate and graduate curricula, and addressing the needs and role of Cooperative Extension.

The full scope of CPC discussions and related suggestions are found in this document. The following points summarize the primary recommendations of the committee as to college programmatic areas, departmental organization, and related issues of concern:

1. The CPC recommends that the CA&ES should consider its overall future challenge as one of research, teaching, and service “*toward environmentally sustainable food production, natural resources, and communities in a changing world.*” A unique strength of our college is its ability to reach across the broad disciplines of agricultural, environmental, and human community sciences to find solutions for society’s problems. This integration is critical to finding sustainable solutions to increasingly complex societal issues.

After careful review of all available information, we recommend that cutting-edge scholarship in the college be thoughtfully considered and coordinated across the three programmatic areas in (i) Agricultural and Food Systems (AFS), (ii) Human Ecology, Resource Economics, and Policy (HEREP), and (iii) Natural Resources and Ecosystem Science and Management (NRESM). Together these represent a unique and integrated programmatic vision of the college. Reorganization of faculty and departments should carefully consider alignments along these three programmatic areas. These areas are synergistic for creative problem-solving and providing new ideas to serve California. Our college will retain its preeminence in research, teaching, and service by continued planning and promotion across these areas.

2. In agreement with the 2009 APC Report, the CPC recommends that three departments — Textiles and Clothing (TXC), Nematology (NEM), and Landscape Architecture (LDA) — be reorganized such that their faculty join with other departments. To this end, we recommend that:
  - a. Textiles and Clothing (TXC) merge with Biological and Agricultural Engineering (BAE);
  - b. Nematology (NEM) merge with Plant Pathology (PLP);

- c. Landscape Architecture (LDA) merge with Human and Community Development (HCD).

As these reorganized departments develop, it is strongly recommended that integrated academic planning is initiated, especially in areas of undergraduate teaching and prioritization of new faculty positions.

The CPC recognizes that the merger recommendations affect a number of other departments (BAE, PLP, and HCD) and full review of the options discussed for these units, with issues and considerations, are found within the individual departmental reports (Section V, page 19).

3. We recommend that the current organizational structure of two departments — Agricultural and Resource Economics (ARE) and Plant Sciences (PLS) — be maintained.
  - a. Plant Sciences reorganized in 2005, achieving integration of research and teaching efforts. Its current structure has resulted in many benefits to faculty and the college.
  - b. Agricultural and Resource Economics faculty programs cut across all three programmatic areas of the college. The CPC recommends continued enhancements of interdisciplinary interactions and collaborations of ARE faculty with other college faculty/programs.
4. We recommend that the current organization structure of the following nine departments be maintained: Animal Science (ANS), Entomology (ENT), Environmental Science and Policy (ESP), Environmental Toxicology (ETOX), Food Science and Technology (FST), Land, Air and Water Resources (LAWR), Nutrition (NUT), Viticulture and Enology (VEN), and Wildlife Fish and Conservation Biology (WFCB).
5. However, it is also recommended that all these nine departments (under 4), as outlined in a–c below, initiate discussions of programmatic coordination. The CPC recognizes the potential for many synergies and collaborative opportunities through coordinated academic planning among departments within programmatic strength areas, and notes that faculty attrition in the coming years, coupled with reduced departmental FTE targets, will make further realignments of current departments relevant. Our main recommendations for coordination include:
  - a. The environmental sciences-related departments of ETOX, WFCB, LAWR, and ESP: Recognizable areas of existing synergies and collaborations include conservation biology, environmental health, environmental policy, biological toxicity, and integration of policy with biology and physical sciences.
  - b. The food sciences-related departments of FST, VEN, and NUT: Coordination among these departments may be especially desirable to explore cross-disciplinary teaching opportunities.
  - c. The animal sciences-related departments of ANS, WFCB, (and possibly NEM faculty), as well as ENT: Particular opportunities may exist for collaborations in curriculum and joint advising in areas of animal biology, conservation, and management.

We recommend that the dean appoint faculty committees in each of these areas to develop programmatic coordination and possibly department alignments. Specifically, these exploratory committees should examine ways to (1) simplify the delivery of undergraduate curricula through coordination using umbrella majors with tracks, if applicable, and (2) develop academic planning guidelines towards prioritizing FTE jointly by way of coordinated position requests that best meet common research and teaching needs.

In addition to making recommendations on college reorganization, the College Planning Committee was charged to consider impacts of reorganization and downsizing on undergraduate and graduate programs and on Cooperative Extension. The following points summarize our relevant discussions on such issues:

- Strategic planning must be initiated to address future Cooperative Extension (CE) FTE needs and roles in the college's highest priority areas. Academic planning such as in the programmatic areas mentioned above should include CE and should consider priorities of the UC statewide Division of Agriculture and Natural Resources (ANR) leadership and the ANR Strategic Plan. Conversely, the CA&ES vision for the future of Cooperative Extension must be clearly expressed to Agriculture and Natural Resources. All departments with four or more Cooperative Extension faculty stated their interests in pursuing split appointments that will allow CE to be credited for teaching, and/or have already integrated CE into the classroom to support teaching needs, often for core courses. However, for split appointments to be successful there will have to be clearer guidelines for academic personnel committees concerning the nature and role of CE staff in such positions. (See Section VI, page 67)
- College reorganization must consider impacts on undergraduate education. Reductions in faculty FTE of the magnitude expected will inevitably impact undergraduate education, both in terms of student numbers and quality of instruction. Although consideration of many of the potential actions to mitigate these impacts was beyond the scope of our committee, we recommend continued examination of relevant issues and actions. Such actions include: revising the Resource Allocation Committee (RAC) formula that funds undergraduate programs; implementing other recommendations of the 2008 Interdepartmental Majors (IDM) report; maintaining teaching assistant funding (for laboratory and studio classes particularly); reconsidering the overall number of majors offered; considering joint appointments between departments to meet common teaching needs that are not the highest priority for any individual department; facilitating instruction by non-senate faculty; and developing guidelines for faculty teaching load. (Section VII, page 69).
- Reorganization of the college must be planned with attention to the potential consequences for graduate education. Reductions in faculty numbers could lead to disproportionately large reductions in graduate teaching as departments focus on delivering their undergraduate majors and curricula. While we expect the number of graduate students to decrease in tandem with the decrease in faculty FTE, there are

several actions at the college and university level that could help maintain vibrant graduate groups and programs. These include encouraging the participation of Academic Federation members and adjunct faculty in graduate education, maintaining teaching assistant funding for graduate students, limiting increases in graduate fees, and ensuring sufficient and equitable support for graduate program administration. (Section VIII, page 72).

- And finally, although there was not sufficient time to discuss fully or develop a sub-report, the CPC suggests that creative strategies be developed by which senior faculty might retire while still continuing to contribute academically. Current demographics in the College of Agricultural and Environmental Sciences are such that more than 30 faculty are age 65 or older. The CPC recommends that the college work with departments to create win-win strategies for advanced-career faculty, e.g., by developing standard memorandums of understanding (e.g., regarding office and lab space) and promotion of appropriate appointments (e.g., research professors) to facilitate transition to retirement while securing opportunities for continued academic contributions.

## II. Introduction

### A. Background

During the early months of 2009 it became clear that the state's fiscal crisis would present an enormous challenge for the University of California as multi-year scenarios of reduced budgetary support to the individual campuses were presented. In consideration of this reality, the College of Agricultural and Environmental Sciences (CA&ES) initiated steps to analyze its academic priorities and organizational structure to determine how best to cope with multi-million-dollar cuts to its general funds. Of great concern was that the new budget reductions would be taking place in the context of extensive recent and past cuts which reduced (i) faculty numbers, (ii) research, teaching, and outreach programs, (iii) facilities, and (iv) administrative support.

Between the budget news in early 2009 and the writing of this report in early 2010 the college gained more exact information as to the severity of budget reductions for CA&ES: \$1.72 million for 2008–09, \$3.8 million for 2009–10, and \$5.2 million (preliminary value, March 2010) for 2010–11.

A key challenge for college planning is to seek ways to reduce the permanent budget by close to \$10 million (of an approximately \$60 million budget), while still maintaining the highest standards of excellence and upholding our responsibilities for instruction and disciplinary research (I&R), Agricultural Experiment Station (AES) research and outreach, and Cooperative Extension (CE) research and outreach. The scope of the currently known budget reduction requires a 15–20 percent reduction in faculty numbers to help balance the budget. This is the third major downsizing in less than two decades, and thus it is essential to consider our academic vision carefully.

In February 2009, Dean Neal Van Alfen charged an Academic Prioritization Committee (APC), chaired by Professor M.R.C. Greenwood and composed of 10 faculty members, to analyze the priorities of the college within the context of significantly lower faculty numbers for the future. The APC carefully collected and reviewed a considerable number of “metrics of success” for all departments. In July 2009, the APC released its report to the dean.

The report categorized all departments as (1) stable, (2) of concern, or (3) for redistribution, and provided other options for budget streamlining. The dean developed an “action plan” which was discussed with department chairs and managers at a retreat in September 2009. Additional discussions ensued within the dean's Policy Council and also with chairs at a monthly chairs' meeting, which included center and institute directors as well as representatives from the college Executive Committee (EC) and Specialist Advisory Committee (SAC). Because of these discussions, it was recommended that a second committee be appointed to address college reorganization in a more specific manner than the APC recommendations. This new committee with college-wide representation would be asked to consider the full scope and mission of our programs — from delivery of undergraduate and graduate education, to fundamental, translational, and applied research that extends knowledge to a wide range of audiences including the citizens of California.

In October 2009, the College Planning Committee (CPC) was formed. The CPC included members from all 17 departments of the college, with 24 members in all, and was co-chaired by

associate deans Mary Delany and Jan Hopmans. Appendix A provides the committee service appointment letters with charges. From the outset, it was deemed essential for this committee to be transparent and consultative as it developed options and refined recommendations for college organization.

This process began with selection of committee members. The committee was selected on the basis of departmental recommendations such that there was a balance of characteristics including stage of career, gender, and position responsibilities (I&R, AES, and CE). Initially, to more effectively review programmatic strengths of the college, the CPC was organized into two working groups: the AFSHC (agriculture/food systems/health/communities) group and the ENRPD (environment/natural resources/planning design) group. As reorganization models were discussed and developed, both working groups convened together as a single committee to reach consensus recommendations.

The overarching objective of the CPC was to “...develop a comprehensive, integrated and contemporary plan for our college.” (October 22, 2009 charge letter from Dean Neal Van Alfen). The complete list of charges to the CPC included (see also Appendix A):

- Project to the future and envision the cutting-edge and important areas of scholarship that our college needs to be prepared to lead.
- Envision ways to organize the college so that we can meet these challenges and maintain our reputation for world-class scholarship and leadership.
- Consider organizational models that include both stable, enduring departments (existing or new), and interdisciplinary centers that address current issues.
- Recognize and plan for possible re-alignment of faculty and programs, through a process of self-selection, between existing and potential new departments.
- Consider the impacts of reorganization on department and interdepartmental undergraduate and graduate degree programs.
- Academic priorities and college organization must address the mission of Cooperative Extension and align with the ANR strategic vision.
- Existing or new college departments must contain greater than 12 faculty members, even after the smaller FTE targets are set, to ensure stability and preeminence into the future.

At the outset the College Planning Committee decided that it would not rely solely on the recommendations of the Academic Prioritization Committee report in considering college reorganization. Rather it would examine the college as a whole and discuss organizational options for all departments within a downsized college (a smaller number of faculty). Each department was considered independently and in the context of other units. After considering a wide array of potential strategic options for every department, we recommended “a best option” and frequently commented on additional considerations for the future (see Section V).

In regard to organization, the CPC also decided that it would not use FTE numbers as the primary motivation for any departmental realignment, but instead would consider first and foremost programmatic issues and the position of each department within the college as a whole. Therefore, we extensively discussed undergraduate majors (departmental and interdepartmental; Section VII), graduate groups (Section VIII), Cooperative Extension (Section VI), and a vision for the current and future college. Section III, entitled “An Integrated Programmatic Vision of

the College,” describes the components of the College of Agricultural and Environmental Sciences, with its programmatic strengths, interactions, and uniqueness. It is intended to provide a framework for further discussion.

Below we describe in detail the work of the College Planning Committee and the processes utilized to conduct its work. The process employed is important because of the commitment of the committee to transparency and consultation in order to achieve the best and most realistic organizational structure for the college. However, this made coming up with “bold plans” inherently more difficult. Nonetheless, the entire process benefited by the stimulating conversations held outside the committee, both within and among departments, on topics of costs and benefits of potential realignments with potential partners; the fact that these conversations were held provide direct evidence that the goal of transparency was achieved.

The CPC recognizes that not all aspects of our charges received equal attention: the greatest emphasis was placed on exploring departmental strategic options for reorganization in concert with related models for change and opportunity.

The CPC hopes the report will be informative and that our recommendations will provide a springboard for decision-making about college organization. We also hope that this report will promote continued college-level conversations, recognizing that more work is needed to envision the college of the future while maintaining and improving the excellence of our programs.

## **B. Process**

Below we describe the structural and procedural aspects of the College Planning Committee work and report development.

### **Meetings:**

- An initial CPC retreat was held November 18, 2009. At this retreat, the CPC was addressed by Dean Neal Van Alfen, Executive Associate Dean Jim MacDonald, and Associate Dean Jan Hopmans who provided perspectives on the status of the college and the fiscal challenges ahead, the outcome of the Academic Prioritization Committee report, and the major themes of the college in relation to academic programs and organizational structures. Department chairs also joined the meeting and participated in a general discussion of key issues and concerns regarding research, teaching, and outreach programs.
- In all, seven AFSHC and seven ENRPD workgroup meetings were held (2-hour meetings; total of 28 meeting hours) between the end of November 2009 and the beginning of February 2010. In addition, seven “joint” workgroup, i.e., CPC meetings, were held between mid-December 2009 and mid-March 2010 (2-hour meetings; total of 14 hours of meetings). Meeting notes, which included attendance, summaries of workgroup and committee conversations, and action items, were posted on the CA&ES Academic Planning SmartSite after each meeting (see below).

- At most meetings, one or two CA&ES Executive Committee (EC) members attended so that they could report to the Executive Committee on the nature of the College Planning Committee discussions and the path for planning of the CPC work.
- For a few departments the CPC faculty representative changed in-process due to previously arranged short-term research leaves or sabbatical plans. Toward the end of the work period, as strategic options were being developed, if a committee member could not attend, then another faculty member from that department attended (see ad hoc member list on page 2).
- Administration for the meetings, organization of the SmartSite, committee reminders, and draft notes were ably orchestrated by Brenda Nakamoto in the CA&ES Dean's Office. The CPC gratefully acknowledges her efforts on behalf of the committee and the college.

### **Transparency:**

- A SmartSite was developed (<https://smartsite.ucdavis.edu/xsl-portal>, "CA&ES Academic Planning 2009–10) in fall 2009 and was used as an accessible location for document placement (e.g., APC report, workgroup committee meeting notes, budget information, survey results, draft departmental reports, and forum feedback); this site was open for all CA&ES I&R/AES/CE faculty to review. It is anticipated this site will remain open for an indefinite period of time; much of this material is included in the appendices to this report.
- As mentioned above, members of the CA&ES Executive Committee attended most of the workgroup and CPC meetings and reported to the entire Executive Committee. In addition, associate deans Jan Hopmans and/or Mary Delany attended all EC meetings to provide updates from their vantage and to answer questions and consider Executive Committee comments and suggestions.
- In addition, associate deans Delany and Hopmans provided updates monthly to chairs at the college chairs' meetings, at Dean's Council (DC) meetings, and at Specialist Advisory Committee (SAC) meetings. During the CPC process, both Hopmans and Delany also organized "divisional chairs" meetings with departmental chairs of human sciences (one meeting), agricultural sciences (two meetings), and environmental sciences (two meetings).
- As the College Planning Committee was working through the departmental draft reports during February 2010, the CA&ES Executive Committee asked that these draft reports be placed on the SmartSite so that all faculty were given the opportunity to provide feedback on strategic options prior to CPC developing the final recommendations. The draft reports were placed on SmartSite by March 5 and faculty were asked to give feedback prior to the final CPC meeting on March 12, when recommendations were finalized.
- A writing team was established during February (Jan Hopmans, Mary Delany, Cort Anastasio, Rick Bostock, and Steve Wheeler) to draft the final CPC report, which was circulated to the entire College Planning Committee for comment and input. The writing team held four additional meetings in addition to the regular CPC meetings.

## Consultation:

- In addition to faculty representation on the committee, the CPC engaged the college to the fullest extent possible to both gain and transmit information, and using that new information to move forward. In addition to those listed above (the Executive Committee, Dean's Council, Specialist Advisory Council), the following groups were also consulted:
  - Master advisors from interdepartmental majors (Ed Lewis—Animal Biology, John Yoder—Biotechnology, Wendy Silk—Environmental Science and Management) and Will Horwath on behalf of the Sustainable Agriculture and Food Systems major, which is under development. (December 2009)
  - Associate Dean for Undergraduate Programs Diane Ullman provided an overview of all 27 college majors, and provided insights on delivery of majors (both departmental and interdepartmental), as well as budgetary and advising issues. (December 2009)
  - College faculty-at-large (I&R/AES/CE faculty and professional researchers, project scientists, adjunct professors, lecturers with SOE) were queried and comments were invited via an initial survey (SurveyMonkey) (see Appendices B and C). The survey received 200 responses from an estimated 514 invited to take part (a response rate of about 39 percent). The results were posted on the Smart Site and the “Integrated Programmatic Vision for the College” (see Section III, page 13) was in part based on the feedback received from this survey. (December 2009)
  - Departments were queried via a questionnaire. The questionnaire was distributed to the chairs with a request to discuss and develop responses by way of faculty consultation about the planning and foreseeable impacts on college budget cuts. All but one department responded (16 of 17 departments) and most chairs reported that they consulted with their faculty by e-mail or faculty meeting (see Appendices D and E). (January 2010)
  - Graduate group chairs were invited via questionnaire to provide their comments and concerns about the impact of decreased faculty numbers on graduate education. Most CA&ES graduate groups/programs responded, in addition to some college-affiliated graduate groups that are administered outside the college (see Appendices F and G). (January 2010)
  - Department chairs were invited to attend (in small groups) one College Planning Committee meeting, and were asked to respond to questions by CPC members on issues related to reorganization. All 17 department chairs participated. (February and March 2010)
- The individual draft reports for each department with strategic options for organization were placed on SmartSite for input by faculty and departments (posted March 5). Over 70 sets of comments were received on the Forum in SmartSite (Appendix N). The CPC members reviewed the forum comments electronically and hard copies of all comments

were distributed at the March 12 CPC meeting, when final recommendations were developed. (March 2009)

- Throughout the November–March period of CPC meetings, the departmental representatives on the College Planning Committee were asked to share progress and discussion materials with their chairs and faculty, and to bring departmental concerns and conversation back to the CPC for discussion. As a result of all of the engagement, the process of developing strategic options and recommendations for departmental reorganization recommendations was a highly iterative process during the full four-month working period of the CPC.

### III. An Integrated Programmatic Vision of the College of Agricultural and Environmental Sciences

#### A. Overview

The College of Agricultural and Environmental Sciences (CA&ES) at the University of California, Davis (UC Davis) is one of the nation's premier institutions for agricultural, environmental, and human sciences. As part of the system of land-grant universities, our college partners with the residents and communities of California to address both regional and global issues, and to provide cutting-edge, research-based solutions.

California is a nationally and globally significant center of biological and environmental diversity, with an agricultural system among the most diverse and valuable in the world. Its climate, geography, and economy continually draw new residents, setting the stage for challenges over uses of land, water, and other natural resources. A key strength of CA&ES is its ability to reach across the broad disciplines of agricultural, environmental, and human sciences to find solutions for society's problems. This integration is critical to finding sustainable solutions to increasingly complex societal problems. In response to this "changing world," the college has evolved from a largely agricultural focus to encompass today's much wider range of concerns and issues, such as natural resource management and environmental protection, food safety and nutrition, human health and well-being, and, most recently, global climate change impacts, mitigation, and adaptation.

During the next decades, California will continue to face new challenges to support **sustainable communities**, as a result of changes in population, demographics, type and distribution of crops and animal products, biodiversity, energy supply and demand, climate, water and land use, soil health, and nutrition-related human health. In response to this changing world, the College of Agricultural and Environmental Sciences is committed to:

- Reinforcing the sustainability of California's agricultural production systems
- Solving environmental problems and managing our natural resources and ecosystems
- Fostering human health and well-being for individuals, families, and communities
- Providing research-based information for sound planning and policymaking
- Improving food safety and striving for global food security
- Maintaining its international stature in teaching world-class undergraduate and graduate curricula, and conducting cutting-edge research that translates into sustainable solutions

For the college to address the challenges ahead, the planning of any reorganization of academic programs in the college must be founded on a broad-based discussion of the college vision. For this reason we sent a college-wide survey to all faculty and academic appointees to identify the programmatic areas in the college that represent the existing strengths and future vision of the college in teaching, research, and outreach. We asked the faculty to specifically consider those programmatic areas that differentiate CA&ES from other campus academic programs, and emphasized that each programmatic area should be broad enough so that multiple departments can identify with it.

## B. Programmatic Description

In addition to the survey (Appendix B), the CPC used information already available from (1) the 2007 CA&ES Academic Plan, (2) responses to question 3 in the APC faculty questionnaire (Appendix D): “Independent of your department, what CA&ES themes or areas will be the most important over the coming decade?,” (3) departmental academic plans, and (4) the 2009 ANR Strategic Vision Report.

After careful review of all available information, we recommend that critical research areas of scholarship in the College of Agricultural and Environmental Sciences be organized across three programmatic areas that together represent the college’s unique strengths and world-class leadership:

- I. Agricultural and Food Systems (AFS),
- II. Human Ecology, Resource Economics, and Policy (HEREP), and
- III. Natural Resources and Ecosystem Science and Management (NRESM).

These three broad-based programmatic areas encompass the **unique contributions** of CA&ES on the UC Davis campus, and include specific topical areas of research, teaching, and Cooperative Extension related to the overall challenge of moving “Toward Environmentally Sustainable Agricultural Food Systems, Natural Resources, and Communities in a Changing World.”

The final integrated programmatic vision of CA&ES is summarized by the matrix on the next page that represents the academic footprint of the college, emphasizing the integration of research, teaching, and outreach across programmatic areas. A definition of the identified critical research areas is provided in Appendix J.

Although the three programmatic areas are presented separately in this matrix, there is significant integration across all areas. For example, CA&ES departments generally contribute to either two or all three programmatic areas, while the research of many individual faculty, including Cooperative Extension specialists, is cross-cutting. Additional program integration happens through the teaching of curricula in 27 undergraduate majors and through research collaborations and faculty interactions across 21 graduate groups and programs in the college. Reorganization of faculty and departments should carefully consider alignments along the three programmatic areas.

<p align="center"><b>College of Agricultural and Environmental Sciences —</b>  <b>Toward environmentally sustainable agricultural food systems, natural resources, and communities in a changing world</b></p>			
<p align="center">In addition to teaching world-class undergraduate and graduate curricula, the College of Agricultural and Environmental Sciences partners with the residents and communities of California to seek sustainable solutions to regional and global issues by applying cutting-edge research knowledge</p>			
<p align="center"><b>Integration across the three programmatic areas occurs by way of multidisciplinary research programs, interdepartmental majors and graduate programs, international programs, centers, and other collaborative initiatives in focus areas of food, environment, energy, and climate</b></p>			
	<p align="center"><b>Agricultural and Food Systems (AFS)</b>            Develop sustainable food, fiber, and energy production, processing and utilization processes that are competitive, safe, nutritious, energy efficient, and respect stewardship of environmental and human resources</p>	<p align="center"><b>Human Ecology, Resource Economics, &amp; Policy (HEREP)</b>            Social sciences to help society achieve sustainable and healthy communities</p>	<p align="center"><b>Natural Resources and Ecosystem Science and Management (NRESM)</b>            Maintain and improve environmental quality of natural and managed ecosystems</p>
<p align="center"><b>RESEARCH</b>  <i>Critical research areas</i></p> <p align="center"><b>AES: 141 FTE</b>            (1/1/10)</p>	Agroecology · Bio-based materials · Complex microbial systems · Energy- and water-efficient agriculture · Environmental genomics · Food safety · Biotechnology · Foods for health · Fermentation science · Food security · Food processing · Integrated pest management · International agricultural development · Precision agriculture · Sustainable animal and crop production systems · Viticulture	Built environments · Economic sustainability · Human development and behavior · Regional change · Human-agricultural-environmental interactions · Environmental economics and policy · Sustainable communities · Transportation · Urban-rural interfaces	Biodiversity and ecosystem services · Climate change impacts on environment · Conservation biology · Global change · Environmental health · Environmental informatics · Invasive species · Natural resource policy and management · Sustainable ecosystems · Water and watersheds
<p align="center"><b>ANR — CE</b></p> <p align="center"><b>64 FTE</b>            (1/1/10)</p>	<p><b>Healthy Food Systems:</b> Competitive sustainable food systems · Endemic and invasive pests and diseases · Safe and secure food supplies</p>	<p><b>Healthy Families and Communities:</b> Enhance health of Californians and California’s agricultural economy</p>	<p><b>Healthy Environments:</b> Sustainable natural ecosystems · Water quality, quantity, and security</p>
	<p align="center">Science literacy in natural resources, agriculture, and nutrition · Improve energy security and green technologies</p>		
<p align="center"><b>TEACHING</b></p> <p align="center"><b>IR: 154 FTE</b>            (1/1/10)</p> <p align="center"><u>Underlined major &lt; 50 students</u></p>	<p><b>AFS:</b> Animal science · Animal science and management · Animal biology · Biotechnology · Clinical nutrition · <u>Entomology</u> · <u>Environmental horticulture and urban forestry</u> · <u>Fiber and polymer science</u> · Food science · Nutrition science · <u>Plant sciences</u> · <u>Sustainable agriculture and food science systems</u> · Viticulture and enology. <b>Total: 2032 students</b> (1/1/10)</p> <p><b>HEREP:</b> <u>Agriculture and environmental education</u> · Community and regional development · Human development · (Pre)Managerial economics · <u>International development</u> · (Pre)Landscape architecture · Textiles and clothing. <b>Total: 1709 students</b> (1/1/10)</p> <p><b>NRESM:</b> <u>Atmospheric science</u> · <u>Ecological management and restoration</u> · <u>Hydrology</u> · Environmental science and management · Environmental policy analysis and planning · Environmental toxicology · Wildlife, fish and conservation biology. <b>Total: 637 students</b> (1/1/10)</p> <p align="center"><b>Exploratory: 701 Students</b> (1/1/10)</p>		
<p align="center"><b>Graduate Groups and Programs</b>            ~ 920 Graduate students</p>	<p><b>CA&amp;ES:</b> Agricultural and environmental chemistry · Agriculture and resource economics · Animal biology · Atmospheric science · Avian sciences · Child development · Community development · Ecology · Entomology · Food science · Geography · Human development · Horticulture and agronomy · Hydrologic sciences · International agricultural development · Nutritional biology · Pharmacology and toxicology · Plant pathology · Soils and biogeochemistry · Textiles · Viticulture and enology</p> <p><b>Affiliated:</b> Biological systems engineering · Genetics · Microbiology · Plant biology · Population biology · Psychology</p>		
<p align="center"><b>OUTREACH and FACILITIES</b></p>	<p align="center"><b>Facilities:</b> Genomics Facility · CA&amp;ES Informatics Center · Contained Research Facility · Greenhouse and field facilities · LTRAS</p> <p align="center"><b>Outreach:</b> International Programs Office · Research and Extension Centers</p>		
<p align="center"><b>Centers and Institutes</b></p>	<p>ASI · Arboretum · CABA · CCIA · CCUH · CIFAR · CRC · CRF · CVED · CPS · FFHI · FPS · FSS · Gifford Center · IR-4 · JMIE · SBC · RMI · FSNEP · WIFSS · 4H-CYD</p>		

## **IV. Reorganization Considerations**

The College Planning Committee report provides recommendations on realigning departments for the purposes of maintaining academic preeminence and creating new opportunities in the programmatic strength areas of our college, despite budgetary and associated FTE reductions in the coming years. Even if the economic recovery in California occurs more quickly than anticipated, the College of Agricultural and Environmental Sciences will have to develop a strong case for growth FTE to maintain and expand its high-priority academic programs on campus. Hence, irrespective of state funding to UC in the near future, the CA&ES academic planning is of high relevance to position our college within the campus as a leading college, and in achieving the chancellor's goal to increase UC Davis' ranking to be among the top five national public universities.

### **A. Challenges facing the College of Agricultural and Environmental Sciences**

- College demographics: About 50 percent of CA&ES faculty are 55 years of age or older, compared to 25–35 percent for the other colleges on campus. Without replacements for retirements and other losses, many departments, large and small, will significantly reduce in size by attrition in the coming five years.
- Since a reduction in FTE will only occur by attrition, it will take at least three years before the college will have achieved the campus-imposed budget target.
- The anticipated college-wide FTE reduction of about 30–40 will have major impacts on all college programs, unless an across-departmental academic planning effort is initiated that focuses on streamlining undergraduate teaching and coordinating FTE needs. Moreover, realignment of faculty/departments must be considered.
- In addition to anticipated FTE reductions over the next several years, there will also be an overall reduction in financial support for academic programs and faculty.
- Any reorganization must consider curricular, research, and outreach goals and synergies among academic programs.

### **B. Potential strengths associated with reorganizing academic programs**

- To sustain smaller academic programs within the context of near-term reductions in faculty FTE and support budgets, one strategy is to consolidate smaller-sized units with similar goals and vision within larger scholarly programmatic areas.
- Larger program-integrated academic units have more flexibility, can better absorb FTE losses in the short term, and are better positioned to make a strong case for new FTE when these become available.
- Reorganization by way of consolidating multiple smaller academic units into a single larger academic unit may put the larger unit into a position of strength, even if the smaller units are very disciplinary. The single integrated unit can be stronger than the sum of the smaller individual units for visibility and synergy on a national level. This is particularly important as the new NIFA (National Institute of Food and Agriculture) research initiatives are established and the call for proposals is on the basis of high impact, multidisciplinary teams, including extension.

- Reorganization can reduce redundancies in the delivery and support of undergraduate teaching across departments. A blend of high quality interdepartmental majors as well as departmental majors can be refined and supported appropriately.
- Reorganization allows for integration and facilitates interdisciplinary teaching, research, and outreach programs. Specifically, elimination of programmatic overlaps of expertise will achieve a more effective academic unit regarding delivery of curriculum and research capacity.
- Reorganization into larger academic units facilitates administrative clustering of staff and resources, thereby increasing flexibility and effectiveness of staff and resources.
- The college planning and resulting reorganization will provide the dean with solid justifications for CA&ES FTE at the campus level. Accomplishing college planning now will provide the necessary foundation for a strong college in the future.

### **C. Potential weaknesses associated with reorganizing academic programs**

- Most departments have developed unique teaching and research programs that are recognized on campus and by stakeholders both within and outside of California. Realignment of departments or redistribution of their faculty may result in the permanent loss of both departmental identity and high quality academic programs.
- Programmatic areas and undergraduate majors can be negatively “submerged” into the larger academic units after reorganization, such as by consolidating departments. Therefore, it is strongly suggested that to minimize negative impacts on programs and majors, academic planning efforts should be initiated very early during the process of reorganization. Alternatively, agreements or MOUs among departments should be established.
- The current size of a small department may be typical of similar programs in California or elsewhere, or have been so historically in the college, thus allowing the delivery of high quality teaching and research programs. Why change a successful status quo?
- Reorganization may lead to faculty within a department increasingly being located in different buildings across campus.
- Faculty in larger departments may currently enjoy administrative services that might not be as strong after consolidation with another department. However, careful administrative clustering will ensure equality of basic administrative services among all departments.
- The streamlining of undergraduate majors with the goal to more effectively teach the undergraduate curriculum among related majors may weaken the undergraduate curriculum and teaching in the college. For streamlining undergraduate majors with the goal to more effectively teach the undergraduate curriculum among related majors, additional considerations of interdepartmental majors in the college is highly relevant. However, a new funding structure must be developed to ensure long-term departmental buy-in to curricula and faculty commitment to the teaching of courses outside their department. It is strongly recommended that the 2008 Interdepartmental Majors (IDM) report is further reviewed and implemented.
- The retention of some existing majors may not be affected as much by reorganization as by whether faculty members with key specialties are replaced.

## D. Complementary Options

As described on the following pages, the general options considered by the College Planning Committee for each department included maintaining the current departmental structure or reorganizing by redistributing or merging with other departments. Mergers were widely discussed because of recommendations in the July 2009 Academic Prioritization Committee report and the dean's charge to the College Planning Committee that departments should contain at least 12 faculty. Other complementary responses to budgetary cuts were discussed with some receiving more attention than others. These other considerations include:

- Instead of merging departments, the CPC can envision collective and integrative academic planning of programmatic areas of research, teaching, and outreach by having clusters of departments work together to prioritize future faculty FTE. Such a solution may provide the same outcome in the short term without requiring faculty consensus on reorganization by faculty vote.
- In addition to departmental reorganizations within the college, additional opportunities may exist by considering cross-college synergies and overlaps in curricula and academic programs.
- Interdisciplinary research could be facilitated using centers that serve as seeds for integrated research collaborations in emerging areas.
- Additional college revenue streams such as endowments and gifts to hire new faculty must be facilitated and encouraged, thereby reducing the dependence on state funding.
- Short term teaching "holes" could be mitigated by increasing the hiring of temporary lecturers and adjunct professors, and I&R appointments for interested Cooperative Extension or other Academic Federation faculty should be facilitated.
- A campus-wide policy that allows scientists from state/federal agencies (e.g., Environmental Protection Agency, U.S. Department of Agriculture, Department of Water Resource, Air Resources Board) and national laboratories (e.g. Lawrence Livermore National Laboratory, Lawrence Berkeley National Laboratory) to teach at UC Davis is needed.
- Current evaluation of the demographics in CA&ES shows that 30+ faculty are 65 years of age or older (Appendix L). CPC recommends that the college develops win-win strategies for senior faculty retirements, such as by developing MOUs to facilitate transition into retirement.
- Joint appointments between departments should continue as a strategy to promote planning and interdisciplinary research and teaching.

## V. Departmental Reports: Options and Recommendations

### Agricultural and Resource Economics (ARE)

#### 29 faculty (3/9/10)

- 25 I&R/AES
- 4 CE

#### Majors (fall 2009)

- Pre-managerial economics: 331
- Managerial economics: 523

#### Graduate students (fall 2009): 90

#### APC recommendation: Stable

The department aligns well with the college's mission, and has pending but not immediate demographic risk — although the wrong combination of faculty attrition could devastate individual programs.

#### Demographics (2/1/10): Number greater than 61 years of age:

- 7 I&R/AES
- 1 CE

**Fit with CA&ES programmatic areas:** ARE fits within the Agricultural and Food Systems, the Human Ecology, Resource Economics, and Policy, and the Natural Resources and Ecosystem Science and Management programmatic areas.

#### Strategic Options:

1. **Key academic goal:** Maintain existing disciplinary and research strength and continue to offer accredited majors.
  - a. **Organizational implications:** Maintain current structure.
  - b. **Strengths:** Two major strengths of the department are its large size and high quality of disciplinary-based undergraduate and graduate programs. Despite the large undergraduate major and relatively high student-credit hours per FTE, Agricultural and Resource Economics has a clear and clean major (i.e., it does not depend on other units to teach courses) and provides numerous service courses to other units across the college and campus. Combining parts or all of ARE with other groups within the college would weaken ARE's disciplinary strengths and lead to inefficiencies. ARE already collaborates in research broadly across the college, as illustrated by the synergies data, and there is no reason to believe that this collaboration would be enhanced by any merger. The department is currently working on administrative clustering with Environmental Science and Policy to gain administrative efficiencies.
  - c. **Weaknesses:** A possible overlap was noted between the Department of Agricultural and Resource Economics and the Department of Economics in the

College of Letters and Science. While some overlap in upper division courses is evident, given the large number of undergraduate majors in both departments it seems unlikely that any substantial savings would come from combining the teaching efforts of the two programs. There would seem to be few benefits to be gained by tinkering with a department that is one of the most clearly distinguishable academic units in the college, from undergraduate through graduate levels.

2. **Key academic goal:** Streamline the delivery of economics on campus
  - a. **Organizational implications:** Agricultural and Resource Economics (ARE) and Economics (ECN) merge.
  - b. **Strengths:** This could simplify the structure of economics on campus, as both units would be teaching in a single undergraduate program, and both would contribute to a unified graduate program (though both ARE and ECN could participate in other graduate groups).
  - c. **Weaknesses:** It would be very costly to conduct the reorganization in terms of faculty attention, administrative costs, and differing appointments. Given the size of both departments' undergraduate and graduate programs, it is not clear what savings would be realized without dramatically increasing class sizes, which could already be done within the respective units. Synergies in delivery of courses across colleges are already in place, as many undergraduate and graduate courses are cross-listed, and there is active participation in cross-supervision of Ph.D. dissertations and participation in orals and dissertation committees where appropriate. There is a significant risk that a merger with Economics would reduce participation by ARE faculty with other CA&ES units.

While early discussions of the CPC noted an overlap of ARE's curriculum with that of Economics, it is the opinion of our committee that this overlap is minimal as the departments have worked to avoid duplication. ARE is, to a large degree, a collection of applied micro-economists and econometricians focused on problems related to micro-economics, while Economics covers most other areas of economics with little overlap in the area of applied microeconomics. Reflecting the differences in research focus, the core curriculum taught by the two departments is also different.

3. **Key academic goal:** Strengthen the delivery of environmental and resource policy on campus
  - a. **Organizational implications:** Agricultural and Resource Economics (ARE) and Environmental Science and Policy (ESP) merge.
  - b. **Strengths:** This option speaks to the faculty survey in December wherein alignments with ESP were evident, suggesting that there are already many research collaborations in place. No significant new strengths were identified that would arise from a merger, since the overlap occurs between a minority of faculty in each department, namely those involved with environmental and resources economics, and those faculty already collaborate in research and teaching.

- c. **Weaknesses:** Few synergies exist beyond the small groups in each unit that work in similar areas. The resulting department would be large (~51 faculty) without much to unify most of the faculty, and it risks damage to the strong identities and reputations of both ARE and ESP. The two units already collaborate in several ways to achieve efficiencies, including cross-listing courses at the undergraduate level and current and historical participation by ESP faculty in the ARE graduate program. Tying the ARE economics expertise to a specific subset of natural science disciplines could have the effect of reducing its collaborations with other units.

**Recommendation:** The College Planning Committee recommends that Agricultural and Resource Economics maintain its current structure (Option 1).

**Additional Comments:** Actions should be taken to further strengthen collaboration between ARE and other college units. Interdisciplinary research efforts within the college could benefit from additional collaborative opportunities with ARE, and it is well worth devising new structures, or modifying existing ones, to better enhance these opportunities. Given the faculty numbers in the department, demographics, disciplinary strength and mission, and the fact that collaborations exist with Economics and ESP, the CPC found no rationale for either of the other two merger options. Diffusing the economics expertise of the college widely would have significant adverse effects on the delivery of undergraduate and graduate curricula and the professional development of the economics faculty. As such, the committee suggests that ARE should continue to be the primary home to economists in the college.

## Animal Science (ANS)

### 36 faculty (3/9/10)

- 27 I&R/AES
- 9 CE

### Majors (fall 2009)

- Animal science: 728
- Animal science and management: 78
- Agricultural and environmental education (with School of Education): 24
- Avian sciences (to close): 12

### Graduate students (fall 2009): 73

### APC recommendation: Stable

The department aligns well with the college's mission, and has pending but not immediate demographic risk — although the wrong combination of faculty attrition could devastate individual programs.

### Demographics (2/1/10): Number greater than 61 years of age:

- 7 I&R/AES
- 3 CE

**Fit with CA&ES programmatic areas:** Fits well within Agricultural and Food Systems programmatic area.

### Strategic Options:

1. **Key academic goal:** Ensure that Animal Science continues to be recognized as a distinct area of teaching and interdisciplinary research that contributes to numerous undergraduate and graduate majors and maintain a strong identity in this area.
  - a. **Organizational implications:** Maintain current structure.
  - b. **Strengths:** Relatively large department with a large and robust undergraduate program and large numbers of undergraduate majors and graduate students. Strong and well-funded research programs.
  - c. **Weaknesses:** Significant demographic risk (10-year horizon). Pending retirements in several areas of expertise could have a significant negative impact on key instructional areas within ANS. Animal Science has already made some adjustments by refocusing some its majors and is examining some interdepartmental teaching possibilities.

2. **Key academic goal:** Integrate the studies of domestic and wildlife organismal biology to form a department with a broader focus on animals.
  - a. **Organizational implications:** Align with Wildlife, Fish and Conservation Biology (ANS–WFCB)
  - b. **Strengths:** Both units have a focus on organismal biology; the merger would extend this area to include both domestic and wild animals. Synergies with aspects of both ANS and WFCB undergraduate majors can be recognized. The combined department would cover wild (native and captive) to domestic animal studies, improve avian focus/avian ecology, and there are potential teaching synergies in Animal Biology. The combined unit could host the animal biology major.
  - c. **Weaknesses:** Because the thematic focus of the two departments is traditionally separate, this initiative would require a new, shared vision by both departments.

**Recommendations:** The CPC recommends that Animal Science maintain its current structure (Option 1). Animal Science has a large and robust undergraduate teaching program and a well-funded research program spanning a number of different scientific disciplines.

**Additional Comments:** ANS should explore a possible consolidation with WFCB (Option 2) to increase focus on the agricultural-environmental interface and strengthen teaching in animal biology. The CPC notes that the ANS faculty indicated that they are strongly in favor of exploring this possible alignment.

## Biological and Agricultural Engineering (BAE)

**15 faculty** (3/9/10)

- 14 I&R/AES
- 1 CE

**Majors:** Biological systems engineering: 135 (major resides in the College of Engineering)

**Graduate students** (fall 2009): 28

**APC Recommendation:** Stable

BAE aligns well with the college's mission and has pending but not immediate demographic risks — although the wrong combination of faculty attrition could devastate individual programs.

**Demographics** (2/1/10): Number greater than 61 years of age:

- 0 I&R/AES
- 1 CE

**Fit with CA&ES Programmatic Areas:** BAE fits within the Agricultural and Food Systems area of the college. However, some of BAE's mission fits in the other areas as well — the Human Ecology, Resource Economics, and Policy, and the Natural Resources and Ecosystem Science and Management programmatic areas.

**Strategic Options:**

**1. Key academic goal:** Continued focus on CA&ES goal to generate sustainable agricultural systems that are less dependent on external inputs.

- Organizational implications:** Maintain current structure.
- Strengths.** Biological and Agricultural Engineering has a strong departmental major and a clearly defined and distinguishable mission and has sufficient size with low demographic risk. The department plays an important role in bringing engineering into the agricultural enterprise. BAE collaborates with departments across the college and has faculty with joint appointments in LAWR, FST, PLS, and TXC. BAE is a unique department in the UC system and as such it fosters a nexus of positive linkages between the College of Engineering (COE) and the College of Agricultural and Environmental Sciences (CA&ES).
- Weaknesses.** There may be teaching inefficiencies due to overlap between engineering and non-engineering majors on similar topics (e.g., hydrology, food processing). The identified hiring priorities (water resources engineer, food engineer) seem to also fit well within other departments (LAWR and FST, respectively).

**2. Key academic goal:** Strengthen CA&ES programs in bio-based materials and processes.

- Organizational implications:** Merge with Textiles and Clothing (TXC).

- b. **Strengths.** TXC and BAE have already begun exploring a merger. A combined department would strengthen research and teaching in bio-based materials, which is an emerging area identified in the CA&ES academic plan. There may be improved teaching efficiencies in the biological systems engineering major. The department would be larger and better able to deal with future retirements.
  - c. **Weaknesses.** The two majors currently offered by TXC would likely have to be restructured in a merged department. It is unclear how the current Textiles and Clothing major would fit within the context of the merged department. It is also unclear how TXC faculty concerned with the social science aspects of textiles and clothing would fit in within the new department.
- 3. Key academic goal:** Focus engineering efforts within the university into one college.
- a. **Organizational implications:** Shift department entirely over to College of Engineering (COE).
  - b. **Strengths.** A shift of Biological and Agricultural Engineering into the College of Engineering would simplify the organizational structure.
  - c. **Weaknesses.** This action would diminish the impact that UC Davis engineers have on the AES mission. We feel that the contribution of engineers to the AES mission is substantial and worth the cost of cross-college joint administration. Additionally, CA&ES would lose resources if BAE were to shift entirely into COE.
- 4. Key academic goal:** Distribute engineering expertise among key CA&ES departments to produce closer links within teaching and research.
- a. **Organizational implications:** Split BAE between Land, Air and Water Resources (LAWR) and Food Science and Technology (FST).
  - b. **Strengths.** There is considerable overlap between activities in BAE and departments such as LAWR and FST, where a major distinction lies in whether a student becomes an engineer or not. Efficiencies in teaching may be achieved through integration.
  - c. **Weaknesses.** The major is located within COE. Dividing BAE to have engineering and non-engineering majors may be overly confusing to students and overly complicated to administer. Although there may be clear partners with LAWR and FST, the BAE engineers would need a home. This would spread engineers across a number of departments (LAWR, FST, and others), would result in the loss of an engineering focal point in CA&ES, and would likely result in the elimination of the undergraduate major.

**Recommendations:** The CPC recommends Biological and Agricultural Engineering maintain its current structure while exploring a merger with Textiles and Clothing (Options 1 and 2). This recommendation is made with acknowledgement by the CPC that BAE could maintain its current structure as the department aligns well with the college's mission and, as noted by the APC, does not appear to be at risk of becoming too small based on its demographics.

**Additional Comments:** The department plays an important role in bringing engineering into the agricultural enterprise and we feel that the contribution of engineers to the AES mission is worth the cost of cross-college joint administration. However, the merger with Textiles and Clothing could strengthen research and teaching in bio-based materials.

## Entomology (ENT)

### 21 faculty (3/9/10)

- 17 I&R/AES
- 4 CE

### Majors (fall 2009)

- Entomology: 22

### Graduate students (fall 2009): 35

### APC recommendation: Stable

The department aligns well with the college's mission, and has pending but not immediate demographic risk although the wrong combination of faculty attrition could devastate individual programs.

### Demographics (2/1/10): Number greater than 61 years of age:

- 3 I&R/AES
- 1 CE

**Fit with CA&ES programmatic areas:** Fits well within the Agricultural and Food Systems and the Natural Resources and Ecosystem Science and Management programmatic areas of the college.

### Strategic Options:

1. **Key academic goal:** Maintain department's disciplinary expertise and distinct academic major.
  - a. **Organizational implications:** Maintain current structure.
  - b. **Strengths:** The current department has an organismal focus similar to that of Animal Science and Plant Sciences; there are strong benefits to such an organismal focus. The department integrates expertise from biochemistry to ecology in both basic and applied research, which provides for perspectives and synergy. This option would maintain a strong departmental identity.
  - c. **Weaknesses:** No deficiencies were identified for teaching in the undergraduate entomology major, despite the fact that insect systematics will be lost as a course. However, if significant retirements occur without reinvestment of faculty in this unit, it will become endangered.
2. **Key academic goal:** Form a broader organismal unit incorporating nematodes under one structure.
  - a. **Organizational implications:** Merge with Nematology (NEM).
  - b. **Strengths:** Entomology faculty would welcome this reorganization. The advantages include shared interests in invertebrate research, reasonably close proximity to existing offices (in Storer and Briggs Hall), and two existing joint hires.

- c. **Weaknesses:** Some faculty in NEM have a stronger affinity to other units such as Plant Pathology (PLP) and there are active discussions underway with Plant Pathology for a NEM–PLP merger.
3. **Key academic goal:** Create a center of excellence in pest sciences and systems biology.
    - a. **Organizational implications:** Merge Entomology, Nematology, and Plant Pathology.
    - b. **Strengths:** This option would enhance shared interests in plant health among some faculty. It capitalizes on existing research relationships among some faculty in all three units. One possibility that could emerge from this option is the creation of a new “biological pest” major for the merged department to administer and service.
    - c. **Weaknesses:** This option would result in a large department (with about 38 I&R/AES FTE and 9 CE FTE) with less co-location. Departmental cultures differ, and not all faculty share interests.
  4. **Key academic goal:** Create a center of excellence in Animal Biodiversity and Conservation.
    - a. **Organizational implications:** Merge with WFCB.
    - b. **Strengths:** This option enhances shared research interests among the ecologically-oriented faculty in both units, and is supported by the fact that museums run by each are co-located, and there is existing shared teaching in animal biology.
    - c. **Weaknesses:** Not all faculty in Entomology have a conservation biology emphasis; however, it is one of three areas of emphasis in the current department.
  5. **Key academic goal:** Create a center of excellence in Animal Biodiversity and Conservation.
    - a. **Organizational implications:** Merge with WFCB and elements of NEM.
    - b. **Strengths:** This option enhances shared research interests among the ecologically-oriented faculty in all three units, and is supported by the fact that museums run by ENT and WFCB are co-located. There is existing shared teaching in animal biology and this merger would provide a firm home for the major, perhaps led initially by individuals from Entomology and Nematology.
    - c. **Weaknesses:** Not all faculty in Entomology have a conservation biology emphasis; however it is one of three areas of emphasis in the current department. Would reduce the singular identity of Entomology.
  6. **Key academic goal:** Build a unified college-level program of Animal Biology and Conservation with comprehensive programs dealing with managed populations, both wild and domestic, including both vertebrate and invertebrates.
    - a. **Organizational implications:** Merge with WFCB and ANS to form a department of Animal Biology and Conservation.
    - b. **Strengths:** This option draws on a common organismal focus of the departments. It would lead to a department emphasizing organismal biology, management, and conservation of animals, and it would bring together existing strengths among departments in areas such as physiology, behavior, genetics, and ecology. The new department could provide a stable home for the animal biology major, since these are

three of the four departments that currently support that major. There are already strong links between WFCB and Entomology in areas such as behavior, genetics, conservation, aquatic ecology, and disease ecology, as well as a strong commitment to the value of specimen collections.

- c. **Weakness:** Because the three departments represent disciplines that traditionally have been considered distinct, this merger would create a very large department that is potentially rendered unwieldy by the divergent traditions and departmental cultures.

**7. Key academic goal:** Strengthen other units by addition of Entomology faculty.

- a. **Organizational implications:** Disperse faculty into other units.
- b. **Strengths:** There are three strong focal areas in Entomology that could merge with other units (within and outside of the college) bringing strength to those units; alternately new units could be formed in Conservation Biology, Animal Biodiversity, or Conservation and Management.
- c. **Weaknesses:** The strong arguments for the merger of the animal and plant departments made over the past decade into organismally-focused units apply to Entomology as currently configured; distributing faculty to other units breaks up a strong unit with a structure akin to other units in the college.

**Recommendation:** The CPC recommends that Entomology maintain its current structure and pursue discussions with members of Nematology who may wish to join the program (Options 1 and 2).

**Additional Comments:** An innovative option would involve ENT, WFCB, and some or all members of NEM (Options 4 and 5). We recommend that members of these departments initiate discussion of such options. This merger has programmatic and curricular advantages. Entomology has a core group of ecologists and other faculty whose research interests overlap with those of researchers in WFCB and NEM. This unit would focus around management and conservation of animals and harness complementary expertise among faculty in these departments. Teaching in the animal biology major is currently shared among members of these departments and this merger would provide a firm home for this program. It is recognized that this would require some reorganization of the major. ENT and WFCB currently support museums allied around outreach efforts.

## Environmental Science and Policy (ESP)

### 22 faculty (3/9/10)

- 21 I&R/AES
- 1 CE

### Majors (fall 2009)

- Environmental policy, analysis, and planning: 151
- Environmental biology and management (ending): 59
- Environmental science and management (interdepartmental with LAWR): 121

### Graduate students (fall 2009): 78

### APC recommendation: Stable

The department aligns well with the college's mission, and has pending but not immediate demographic risk — although the wrong combination of faculty attrition could devastate individual programs.

### Demographics (2/1/10): Number greater than 61 years of age:

- 5 I&R/AES
- 0 CE

**Fit with CA&ES programmatic areas:** The department fits well within the Natural Resources and Ecosystem Science and Management, and the Human Ecology, Resource Economics, and Policy programmatic areas.

### Strategic options:

- 1. Key academic goal:** Preserve synergies between natural science and social science approaches to solving basic and applied environmental problems.
  - a. Organizational implications:** Maintain current structure.
  - b. Strengths:** The Environmental Science and Policy program is healthy and has well established research and teaching collaborations within the department as well as across other departments in and outside of CA&ES. The programmatic themes envisioned by ESP for growth — environmental policy and biodiversity, sustainability, and global climate change — align well with the college's emerging themes in natural resources and ecosystem science and management, human-environment interactions, and the interface between natural and sustainable agricultural systems. Programmatic synergies could be achieved through research centers, the shared undergraduate major, and other collaborations.
  - c. Weaknesses:** Attrition within the policy group and possibly other groups could put important core elements of the department at risk. Attaching a broader array of natural and social scientists to a group that fosters these cross-disciplinary interactions could broaden the impact of this approach.

2. **Key academic goal:** Bring greater cohesion and identity to UC Davis' world-class programs in the environmental sciences and enhance interactions among physical and biological environmental scientists.
  - a. **Organizational implications:** Combine with ETOX, LAWR, and WFCB to form an environmental science department with four units; or consider a merger with some subset of these four departments either as stand-alone departments (e.g., ESP and WFCB) or within a larger multiple-unit environmental science department.
  - b. **Strengths:** A merger of the environmental departments could strengthen the potential for interaction among the physical and biological environmental sciences and may foster broader integration of environmental policy across disciplines. This merger would force a re-thinking of a number of undergraduate majors and may lead to streamlining curriculum delivery and simplify the structure of environmental majors, along the lines of the recently developed ESP–LAWR interdepartmental major. Potential synergies could emerge in a large number of areas (e.g., the impact of environmental change on ecosystems, abiotic-biotic interactions) and the merger could strengthen a biodiversity–conservation theme. The constitution of a very large department could potentially enhance the competitiveness of the department to attract large-scale research funds. The programmatic themes in environmental policy and biodiversity, sustainability, and global climate change resonate with all of the groups.
  - c. **Weaknesses:** Consolidation with ETOX, LAWR, and WFCB would create a department with over 70 faculty, potentially an overly broad and excessively large department that would be difficult to administer. The resulting merger would create a physical- and biological-science dominated department with marginalization of (or overworking of) the policy faculty and perhaps other groups.

Efficiencies of scale may be counterbalanced by multiple locations, different fundamental stakeholder groups (e.g., dominant granting agencies) and existing departmental cultures, cumbersome merit reviews, and potential lack of adequate representation of the diverse scholarship at the college level. Some faculty groups (e.g., policy faculty in ESP; ecotoxicology faculty; vertebrate biologists in WFCB) would each represent a small component, and a merged department could be at risk of losing a critical core that can effectively deliver training. Any merger of this magnitude would require re-envisioning of academic plans to assure unity and identity of the various disciplines both within the natural sciences and across the natural and social sciences.

**d. Addendum.** Nearly all pairwise combinations of these four departments have also been considered by the College Planning Committee, and each has strengths and weakness that would have to be carefully considered. With respect to ESP, WFCB has the most disciplinary similarity and a merger could create a core biodiversity–conservation group with a solid policy presence, while ETOX has the least thematic and disciplinary overlap.

3. **Key academic goal:** Enhance programmatic strengths in environmental and natural resource economics and public policy.
  - a. **Organizational implications:** Merge with Agricultural and Resource Economics.

**b. Strengths:** A merger with ARE could enhance programmatic interests in environmental and natural resource economics. In addition, a subset of the policy faculty might not feel outnumbered as they might in the other mergers under consideration.

**c. Weaknesses:** ESP largely does not share ARE's interest in production agriculture and economics and ARE does not largely share ESP's interest in political science and the policy process. Strong identity of ESP's programs in environmental policy and biology would likely be diminished in such a merger.

**4. Key academic goal:** Strengthen the policy core of Environmental Science and Policy to enhance the department's and the college's ability to deliver solutions to global climate change and conservation of natural resources.

**a. Organizational implications:** Invite policy scholars from ARE, HCD, and LDA to join ESP.

**b. Strengths:** This would create a better balanced department with broad social science and natural science expertise.

**c. Weaknesses:** Would weaken the other groups from which these faculty were drawn unless those groups dissolved for other reasons.

**Recommendations:** The CPC recommends that Environmental Science and Policy maintain its current structure (Option 1). It has unique strengths in the college in that its structure fosters integration of science and policy to address environmental issues.

**Additional Comments:** We also recommend that ESP discuss potential synergies and integration related to teaching, outreach, and research (and the associated future FTE needs) with ETOX, LAWR, and WFCB during the next year. The CPC believes that strategic planning among these departments could help to create a broader college focus on natural resources, conservation, and the environment. Such an approach could also increase the visibility of the college's environmental programs. Over a 10-year horizon, more-coordinated planning could strengthen programs addressing global environmental change, environmental health, biodiversity, and conservation. At the current time CPC does not recommend a four-department merger (Option 2).

## Environmental Toxicology (ETOX)

### 10 faculty (3/9/10)

- 9 I&R/AES
- 1 CE

### Majors (fall 2009)

- Environmental toxicology: 79

### Graduate students (fall 2009): 12

### APC recommendation: Demographically of concern

The department is a relatively small department with high demographic risk. It has valuable core programs and aligns well with the mission, but may not be sustainable as a stand-alone department. It is recommended that opportunities to strengthen by association and consolidation with others units be explored.

### Demographics (2/1/10): Number greater than 61 years of age

- 3 I&R/AES
- 1 CE

**Fit with CA&ES programmatic areas:** Fits well both within the Agricultural and Food Systems and the Natural Resources and Ecosystem Science and Management programmatic areas of the college.

### Strategic Options:

- 1. Key academic goal:** Ensure Environmental Toxicology continues to be recognized as a distinct area of teaching and research at the UC Davis campus as this is a unique undergraduate major among all UC campuses.
  - a. Organizational implications:** Maintain current structure.
  - b. Strengths:** Maintain strong departmental identity and internationally recognized program in ETOX at UC Davis. Strong and well funded and productive research programs. Expanding and robust undergraduate major.
  - c. Weaknesses:** The Academic Prioritization Committee identified this department as both small and at high demographic risk. The department faculty disagree with this assessment and consider themselves demographically stable for a decade or more. However, unexpected reductions to faculty numbers could hit small units particularly hard.
- 2. Key academic goal:** Bring greater cohesion and identity to UC Davis' world-class programs in the environmental sciences and enhance interactions among physical and biological environmental scientists.
  - a. Organizational implications:** Combine with ESP, LAWR, and WFCB to form an environmental science department with four units; or consider a merger with some subset

of these four departments either as stand-alone departments (e.g., ETOX and WFCB) or within a larger multiple-unit environmental science department.

**b. Strengths:** A merger of the environmental departments could strengthen the potential for interaction among the physical and biological environmental sciences and may foster broader integration of environmental policy across disciplines. This merger would force a re-thinking of a number of undergraduate majors and may lead to streamlining curriculum delivery and simplify the structure of environmental majors, along the lines of the recently developed ESP–LAWR interdepartmental major. Potential synergies could emerge in a large number of areas (e.g., the impact of environmental change on ecosystems, abiotic-biotic interactions) and the merger could strengthen a biodiversity–conservation theme. The constitution of a very large department could potentially enhance the competitiveness of the department to attract large-scale research funds. The programmatic themes in environmental policy and biodiversity, sustainability, and global climate change resonate with all of the groups.

**c. Weaknesses:** Consolidation with ESP, LAWR, and WFCB would create a department with over 70 faculty, potentially an overly broad and excessively large department that would be difficult to administer. The resulting merger would create a physical- and biological-science dominated department with marginalization of (or overworking of) the policy faculty and perhaps other groups. Efficiencies of scale may be counterbalanced by multiple locations, different fundamental stakeholder groups (e.g., dominant granting agencies) and existing departmental cultures, cumbersome merit reviews, and potential lack of adequate representation of the diverse scholarship at the college level. Some faculty groups (e.g., policy faculty in ESP; ecotoxicology faculty; vertebrate biologists in WFCB) would each represent a small component, and a merged department could be at risk of losing a critical core that can effectively deliver training. Any merger of this magnitude would require re-envisioning of academic plans to assure unity and identity of the various disciplines both within the natural sciences and across the natural and social sciences.

**d. Addendum.** Nearly all pairwise combinations of these four departments have also been considered by the CPC, and each has strengths and weakness that would have to be carefully considered. With respect to ETOX, WFCB has the most disciplinary similarity and a merger could create a group that focuses on wildlife management and wildlife health. This definition does not fit all ETOX faculty, but appears to be a close enough fit that these faculty could discuss disciplinary and thematic overlap.

**Recommendations:** The CPC recommends that Environmental Toxicology maintain its current structure (Option 1). ETOX is a relatively small department, but has a distinct mission and strong programs.

**Additional Comments:** We recommend that ETOX discuss potential synergies and integration related to teaching, outreach, and research (and the associated future FTE needs) with ESP, LAWR, and WFCB during the next year. The CPC believes that strategic planning among these departments could help to create a broader college focus on natural resources, conservation, and the environment. Such an approach could also increase the visibility of the college’s environmental programs. Over a 10-year horizon, more-coordinated planning could strengthen programs addressing global environmental change, environmental health, biodiversity, and

conservation. At the current time CPC does not recommend a four-department merger (Option 2).

## Food Science and Technology (FST)

**21 faculty** (3/9/10):

- 16 I&R/AES
- 5 CE

**Majors** (fall 2009):

- Food science: 187

**Graduate students** (fall 2009): 51

**APC recommendation:** Of concern

The department has medium demographic risk, but future investment in food safety is critical to its continued alignment with the mission. Possible amalgamation with other units should be considered.

**Demographics** (2/1/10): Number greater than 61 years of age:

- 4 I&R/AES
- 1 CE

**Fit with CA&ES programmatic areas:** Food Science and Technology fits well with the Agricultural and Food Systems programmatic area.

**Strategic Options:**

- 1. Key academic goal:** Maintain department's disciplinary expertise and distinct academic major.
  - a. Organizational implications:** Maintain current structure.
  - b. Strengths:** Currently successful department due to interdisciplinary structure (five new faculty in past two years); largest number of undergraduate food science majors in the country (187 students); provides an important accredited major; maintains strong external interactions with USDA Western Regional Research Center and major food companies; currently undergoing administrative clustering with Viticulture and Enology; discipline aligns well with future college mission.
  - c. Weaknesses:** Department has 8 of 20 faculty over 50 years of age; FTE attrition is already causing a reduction of one elective course and one undergraduate course; too small to justify an administrative cluster on its own; loss of opportunities that could come from synergies in a larger unit.
- 2. Key academic goal:** Strengthen CA&ES programs in fermentation, food chemistry, sensory and flavor science.
  - a. Organizational implications:** Merge with Viticulture and Enology
  - b. Strengths:** Existing synergies and collaborative opportunities in teaching and research (e.g., food/wine chemistry, fermentation/industrial engineering, sensory science); overlaps exist in core curricula; geographically co-located; common need

- for analytical chemistry equipment and support facilities (e.g., fermentation); Robert Mondavi Institute for Wine and Food Science as synergizing and outreach center.
- c. **Weaknesses:** Would encompass broad disciplinary range; potentially could reduce influence of viticulture component of VEN in preference to food science/fermentation/enology components; does not strengthen connection to nutrition and to foods for health; loss of independent external visibility; does not enable any novel interactions not already in place. Causes increased teaching load for future faculty; both FST and VEN have high SCH/FTE loads that would not be addressed by a merger with eventual FTE attrition.
3. **Key academic goal:** Strengthen CA&ES programs in nutrition, foods for health, and food safety.
    - a. **Organizational implications:** Merge with Nutrition and Environmental Toxicology
    - b. **Strengths:** Integration of research and teaching expertise from food to humans; overlaps exist in core curricula; build upon overlapping strengths in biochemistry, analytical chemistry; potential for creative CE connections on delivery of nutritional programs to communities; synergies from food production, quality, and safety to human consumption and health; potentially improve interdisciplinary interaction with USDA Western Human Nutrition Research Center, Robert Mondavi Institute for Wine and Food Science, Foods for Health Institute, etc.
    - c. **Weaknesses:** Creates very broad disciplinary range (medical school to engineering); not currently co-located; may not strengthen community nutrition components; little desire among some faculty for merger; not all current faculty may fit the goals of the new unit (five faculty have joint appointments with engineering). Other merged FST/Nutrition departments have resulted in weakened programs with low rankings; poor perception of UC Davis inadvertently created. Causes increased teaching load for future faculty; both FST and NUT have high SCH/FTE loads that would not be addressed by a merger with eventual FTE attrition.
  4. **Key academic goal:** Strengthen CA&ES programs in food chemistry, food safety, toxicology, and biomaterials.
    - a. **Organizational implications:** Merge with Environmental Toxicology and/or Textiles and Clothing or some faculty in those units.
    - b. **Strengths:** Shared expertise in analytical chemistry, food safety, biomaterials processing; create new unit with strength in biomaterials and biofuels in addition to foods.
    - c. **Weaknesses:** Merger would only benefit some faculty in ETOX and TXC, so some faculty would be dispersed among other units; does not strengthen connection to nutrition and to foods for health. Merger does not address the need of TXC to deliver the fiber and polymer science and the textiles and clothing majors. Causes teaching overload to Food Science and Technology unless majors are discontinued.
  5. **Key academic goal:** Create combined center of excellence in nutrition, food chemistry, and fermentation science
    - a. **Organizational implications:** Merge with VEN, NUT, and possibly components of ETOX or TXC.

**b. Strengths:** Many synergies and collaborative opportunities in teaching and research extend over all these departments, as noted above; common themes in research and in facilities/analytical needs; the Robert Mondavi Institute for Wine and Food Science and the Foods for Health Institute could both be strengthened as synergizing and outreach centers for this thematic cluster; potential for stronger interdisciplinary cooperation (e.g., with Human and Community Development) but would maintain Nutrition in a chemical/biological science-based unit.

**c. Weaknesses:** Would encompass a very broad disciplinary range; would likely require substructure (sections) within large unit; some subareas could lose influence; little desire among faculty for merger; advantages of smaller mergers or faculty shifts described above could be counterbalanced by disadvantages of large department. FST, NUT, and VEN have high SCH/FTE loads that would not be addressed by a merger with eventual FTE attrition. Merger does not address the need of TXC to deliver the fiber and polymer science and the textiles and clothing majors. Use of a college division structure, to include FST, NUT, and VEN, could accomplish the goal of promoting interdepartmental collaboration.

**Recommendation:** The College Planning Committee recommends Food Science and Technology maintain its current structure (Option 1).

**Additional Comments:** The CPC recommends FST increase joint research, teaching, and outreach programmatic planning and activities with NUT and VEN, among other units, ideally through a stronger divisional structure.

## Human and Community Development (HCD)

### 20 faculty (3/9/10)

- 9 Community Development (CD): 8 I&R/AES, 1 CE
- 11 Human Development (HD): 10 I&R/AES, 1 CE

### Majors (fall 2009)

- Community and regional development: 189
- Human development: 429

### Graduate Students (fall 2009): HD 37, CD 40

### APC recommendation:

- **HCD, Community Development (HCD-CD)** is a relatively small department with high demographic risk. It aligns well with the mission. HCD-CD and HCD-HD could be a strong unit but synergies haven't developed. Given the lack of resources to invest, it may be difficult to maintain as an independent unit; however, there is a potential strong link with the Landscape Architecture program and regional planning. It is recommended that opportunities to strengthen by association and consolidation with other units be explored.  
**Demographics (2/1/10):** 2 I&R/AES and 0 CE greater than 61 years of age

- **HCD, Human Development (HCD-HD)** is a relatively small department with high demographic risk. As currently constituted it does not align entirely well with the mission. HCD-CD and HCD-HD could be a strong unit but synergies haven't developed. Given the lack of resources to invest, it may be difficult to maintain as an independent unit. It is recommended that opportunities to strengthen by association and consolidation with other units be explored.  
**Demographics (2/1/10):** 4 I&R/AES and 1 CE greater than 61 years of age

**Fit with CA&ES programmatic areas:** Both HD and CD fall well within the Human Ecology, Resource Economics, and Policy programmatic area.

### Strategic options:

1. **Key academic goal:** Develop a department focused on how the relationship between people and their environment affects human and community well-being.
  - a. **Organizational implications:** Create a three-unit department with Landscape Architecture (LDA). (same as in Option 2 of LDA report)
  - b. **Strengths:** Detailed discussions along these lines are already underway among HD, CD, and LDA faculty and are addressing undergraduate and graduate education, research focus, and administrative and governance issues. This merger could help to offset some of the issues of attrition, and capitalize on synergies between regional development in CD, planning and design in LDA, and human interactions with their environment in HD.
  - c. **Weakness:** It is not fully clear yet how large the synergies would be with the units due to their individual teaching needs, though there are potential synergies in

methodology, social theory, and elective courses. A three-unit department where each undergraduate program is maintained would only be consistent with the need to create a smaller CA&ES footprint if such synergies are realized.

2. **Key academic goal:** Develop program on community development and design.
  - a. **Organizational implications:** Merge Community Development (CD) and Landscape Architecture (LDA) (same as Option 3 of LDA report).
  - b. **Strengths:** Based on the current levels of FTE, the new department would have 16.8 FTE. The synergies related to community/regional planning and design would be realized. Instead of separate majors, a single new, broader undergraduate major could be developed around “sustainable communities.” The new major could potentially serve more students than at present. The accredited landscape program could move to the master’s degree level to serve a smaller cohort of graduate students. LDA is exploring these options.
  - c. **Weaknesses:** Whether the accredited Landscape Architecture undergraduate degree could continue at either undergraduate or graduate levels is not immediately clear. Issues of accreditation for LDA would need to be considered with any merger including the department.

**Under Option 2**, there are a number of distinct organizational possibilities for HD including:

2i. **Key academic goal:** Develop further expertise in human development and family.

- a. **Organizational implications:** HD becomes a stand-alone department.
- b. **Strengths:** This would maintain the strong programs in human development. According to the Chronicle of Higher Education, Human Development is ranked third in the nation and this option would enable continued excellence.
- c. **Weakness:** HD would need to be able to replace FTE that were recently lost and/or will be lost in the coming years (e.g., retirement) to maintain a targeted FTE of 12.

2ii. **Key academic goal:** Develop a program around the Healthy Families and Communities theme.

- a. **Organizational implications:** Human Development is merged with Nutrition.
- b. **Strengths:** This could further develop the synergies around the Healthy Families and Communities theme and on the critical role that nutrition plays in the health and well-being of people. The new department would have 28 FTE.
- c. **Weakness:** Given the current significant differences in the undergraduate majors and if this merger maintained the majors, the merger would not likely create synergies on the teaching side, as the FTE for the core courses would still need to be addressed. There is the potential loss of clinical nutrition.

2iii. **Key academic goal:** Enhance CA&ES researchers’ ability to integrate human development and family aspects into their research.

- a. **Organizational impact:** Human Development faculty could be split into different departments according to their research interests.

- b. **Strength:** If the major is consolidated with other majors on campus, then the issue of core courses is addressed.
  - c. **Weaknesses:** Losing the identity of a strong program, with substantial external funding and that aligns well with the ANR strategic initiatives. The college would also lose a relatively large major that is delivered with a teaching efficiency index that is the highest in the college.
  
- 3. **Key academic goal:** Develop synergies around community development and design and maintain strength/identity in human development.
  - a. **Organizational impact:** Maintain a two-unit structure (as opposed to the three-unit structure in Option 1) by merging Community Development and Landscape Architecture into one unit and maintaining Human Development as a separate unit.
  - b. **Strengths:** Create a smaller footprint and still maintain the goal that the department will continue to facilitate synergies across teaching, research, and outreach.
  - c. **Weakness:** Similar to Option 1 and Option 2.
  
- 4. **Key academic goal:** Integrate researchers throughout CA&ES based on research, teaching, and outreach synergies.
  - a. **Organizational impact:** HCD professors to select into other departments, such as LDA, PLS, ESP, and NUT.
  - b. **Strength:** If the majors are consolidated with existing majors at the same time, this would solve the teaching of core courses and thereby reduce the footprint of CA&ES.
  - c. **Weakness:** Loss of both units' identity in terms of research, teaching, and outreach. (See also 2c)
  
- 5. **Key academic goal:** Maintain programs in Human and Community Development.
  - a. **Organizational impact:** Maintain current structure but develop strong synergies between the units
  - b. **Strengths:** Human Development faculty have expressed interest in strengthening ties to the Center for Regional Change and creating a new interdisciplinary Healthy Families and Communities Center. The latter center could serve to improve the alignment of the group with the college's mission, as it fits nicely within the ANR strategic vision. The overall research mission of Community Development, which centers on investigating and teaching sociological, economic, and cultural processes affecting diverse communities and regions, fits nicely within the mission of the college.
  - c. **Weakness:** The differences in HD and CD and the management of the programs as two separate units (management is more akin to administrative clustering) puts both programs on an unsustainable path. With past and future retirements, an area of concern for both HD and CD is the ability to deliver core courses in their undergraduate majors.

**Recommendation:** The CPC recommends the development of a new department (with an appropriate new name decided upon by the department faculty) focused on how the relationship between people and their environment affects human and community well-being. The new

department would combine Human Development, Community Development, and Landscape Architecture into a single department with three distinct units (Option 1).

**Additional Comments:** The college should support current efforts underway in these departments to identify, articulate, and strengthen substantial synergies in the three units in research, outreach, undergraduate instruction, and graduate training. The CPC recognizes that options in which any of the three units lose their distinct identity would have negative consequences for teaching, research, and outreach. As a result, the CPC does not support pursuing alternative options.

## Land, Air and Water Resources (LAWR)

### 36 faculty (3/9/10)

- 27 I&R/AES
- 9 CE

### Majors (fall 2009)

- Atmospheric science: 18
- Hydrology: 21
- Environmental science and management: 121 (interdepartmental with ESP)
- Environmental resource science: 82

### Graduate Students (fall 2009): 82

### APC recommendation: Stable

The department aligns well with the college's mission and has pending but not immediate demographic risk — although the wrong combination of faculty attrition could devastate individual programs.

### Demographics (2/1/10): Number greater than 61 years of age:

- 5 I&R/AES
- 2 CE

**Fit with CA&ES programmatic areas:** LAWR fits well in the Agricultural and Food Systems and the Natural Resources and Ecosystem Science and Management programmatic areas.

### Strategic Options:

- 1. Key academic goal:** Integrate soil, water, and atmospheric sciences with a systems level approach
  - a. Organizational implications:** Maintain current structure.
  - b. Strengths:** LAWR is a relatively large department with large and vibrant undergraduate and graduate teaching programs. Cross-departmental collaboration in research, outreach, and teaching is strong. The recent move to the large, joint environmental science and management major with ESP should (if managed smoothly) strengthen the quality and long-term viability of the undergraduate teaching program.
  - c. Weaknesses:** In the short run (five years), the most immediate concerns of the department are maintaining strength in atmospheric processes related to climate change and maintaining excellence in the irrigation/water resources extension program when the imminent retirements occur. However, these concerns would not be addressed by merging with another department.
- 2. Key academic goal:** Bring greater cohesion and identity to UC Davis' world-class programs in the environmental sciences and enhance interactions among physical and biological environmental scientists.

**a. Organizational implications:** Combine with ESP, ETOX, and WFCB to form an environmental science department with four units; or consider a merger with some subset of these four departments either as stand-alone departments (e.g., LAWR and ESP) or within a larger multiple-unit environmental science department.

**b. Strengths:** A merger of the environmental departments could strengthen the potential for interaction among the physical and biological environmental sciences and may foster broader integration of environmental policy across disciplines. This merger would force a re-thinking of a number of undergraduate majors and may lead to streamlining curriculum delivery and simplify the structure of environmental majors, along the lines of the recently developed ESP–LAWR interdepartmental major. Potential synergies could emerge in a large number of areas (e.g., the impact of environmental change on ecosystems, abiotic-biotic interactions) and the merger could strengthen a biodiversity–conservation theme. The constitution of a very large department could potentially enhance the competitiveness of the department to attract large-scale research funds. The programmatic themes in environmental policy and biodiversity, sustainability, and global climate change resonate with all of the groups.

**c. Weaknesses:** Consolidation with ETOX, ESP, and WFCB would create a department with over 70 faculty, potentially an overly broad and excessively large department that would be difficult to administer. The resulting merger would create a physical- and biological-science dominated department with marginalization of (or overworking of) the policy faculty and perhaps other groups. Efficiencies of scale may be counterbalanced by multiple locations, different fundamental stakeholder groups (e.g., dominant granting agencies) and existing departmental cultures, cumbersome merit reviews, and potential lack of adequate representation of the diverse scholarship at the college level. Some faculty groups (e.g., policy faculty in ESP; ecotoxicology faculty; vertebrate biologists in WFCB) would each represent a small component, and a merged department could be at risk of losing a critical core that can effectively deliver training. Any merger of this magnitude would require re-envisioning of academic plans to assure unity and identity of the various disciplines both within the natural sciences and across the natural and social sciences.

**d. Addendum.** Nearly all pairwise combinations of these four departments have also been considered by the CPC, and each has strengths and weakness that would have to be carefully considered. With respect to LAWR, the most disciplinary similarity is with ESP, and a merger could create a core environmentally oriented group with a solid policy presence. However, this would produce a very large department of over 50 faculty. WFCB has the least thematic and disciplinary overlap because no LAWR faculty focus on vertebrate biology, ecology, and conservation. There is a slight amount of overlap with ETOX because a few ETOX faculty are interested in the transport and processing of toxicants in soil, water, and the atmosphere. However the majority of the ETOX faculty work at the physiological or organismal levels, and would have little shared academic vision with LAWR.

**Recommendations:** The College Planning Committee recommends that Land, Air and Water Resources maintain its current structure (Option 1).

**Additional Comments:** However, the CPC also recommends that LAWR discuss potential synergies and integration related to teaching, outreach, and research (and the associated future FTE needs) with ESP, ETOX, and WFCB during the next year. The CPC believes that strategic planning among these departments could help to create a broader college focus on natural resources, conservation, and the environment. Such an approach could also increase the visibility of the college's environmental programs. Over a 10-year horizon, more-coordinated planning could strengthen programs addressing global environmental change, environmental health, biodiversity, and conservation. At the current time CPC does not recommend a four-department merger (Option 2).

## Landscape Architecture (Environmental Design) (LDA)

**8 faculty** (3/9/10)

- 8 I&R/AES
- 0 CE

**Majors** (fall 2009)

- Pre-landscape architecture: 104
- Landscape architecture: 79

**Graduate students** (fall 2009): 23

**APC recommendation:** Redistribution

The department has a medium to high demographic risk and is so small that it cannot continue unless substantial resources are invested, which is unlikely given the current fiscal climate. It was recommended that faculty be incorporated into other units where their expertise can be well utilized.

**Demographics** (2/1/10): Number greater than 61 years of age:

- 2 I&R/AES

**Fit with CA&ES programmatic areas:** LDA fits within the area of Human Ecology, Resource Economics, and Policy.

**Strategic Options:**

- 1. Key academic goal:** Maintain department's disciplinary expertise and distinct academic major.
  - a. Organizational implications:** Maintain current structure.
  - b. Strengths:** Maintains a unique program on campus that has a strong major if FTE losses can be minimized. The program is considering migrating its accredited degree to the graduate level, with a smaller cohort size, and developing a larger undergraduate major on a theme such as Sustainable Planning and Design. LDA might then serve a larger number of undergraduates through a less intensive major, while keeping an accredited program at the graduate level, at approximately the current level of resources.
  - c. Weaknesses:** The department remains small. If FTEs are not replaced and the existing bachelor's degree in landscape architecture is continued, the major will remain highly impacted (many pre-landscape architecture students are turned away). Faculty might have to decrease the number of majors accepted or reduce courses in the major. If FTEs are not replaced, the new degree configuration will be difficult to achieve.
- 2. Key academic goal:** Develop a human ecology department focused on how the relationship between people and their environment affects human and community well-being.

- a. **Organizational implications:** Merge with Human and Community Development and maintain a three-unit department. (same as Option 1 for HCD)
  - b. **Strengths:** There are significant synergies with Community Development already, and discussions are ongoing among the faculty of CD, HD, and LDA. The Center for Regional Change is a shared interest. LDA and CD could potentially develop a large shared major or synergistic undergraduate majors. There are some shared interests with HD around environmental psychology and designing places for youth, the elderly, and other special user groups. The merged department could potentially keep an accredited landscape architecture degree at the graduate level if an undergraduate solution is developed either through a shared LDA/CD major or a new, less-intensive major taught by landscape architecture faculty.
  - c. **Weaknesses:** Maintaining an accredited degree requires faculty with a landscape architecture focus; CD faculty can't teach LDA courses. Accreditation requires that the landscape architecture degree be offered by an academic program with "landscape architecture" in the title. Because it is difficult and time consuming to get a new graduate degree approved, the potential LDA realignment of degrees faces significant transaction costs.
3. **Key academic goal:** Develop a program on community development and design, possibly as a new Department of Sustainable Communities.
- a. **Organizational implications:** Merge LDA and CD. (same as Option 2 for HCD)
  - b. **Strengths:** LDA has more in common with CD than with HD, so a merger with CD may make sense in terms of shared interests. The resulting department would be in strong alignment with the college themes.
  - c. **Weaknesses:** The social science culture of Community Development has historically been different than the design culture of Landscape Architecture; this situation is changing, but there are still differences. Planning-related elements of Environmental Science and Policy also relate to the sustainable communities theme as well, and perhaps should be included.
4. **Key academic goal:** Develop a comprehensive program related to planning and designing environmentally sustainable communities.
- a. **Organizational implications:** Merge LDA and CD and explore additional coordination with ESP.
  - b. **Strengths:** LDA, CD, and some faculty within ESP have mutual interests related to land use planning, GIS, transportation, and ecology. Possible synergies in teaching land-use planning could be achieved with greater coordination. This would fit well with the college sustainability themes.
  - c. **Weaknesses:** Little interest from Environmental Science and Policy. The programs have different cultures; ESP is more science-oriented and based on quantitative research, while LDA is design-oriented and grounded in qualitative research, and CD emphasizes social issues.

**Recommendation:** The CPC recommends the development of a new department (with an appropriate new name decided upon by the department faculty) focused on how the relationship

between people and their environment affects human and community well-being. The new department would combine HD, CD, and LDA into a single department with three distinct units (Option 2).

**Additional Comments:** The college should support current efforts underway in these departments to identify, articulate, and strengthen substantial synergies in the three units in research, outreach, undergraduate instruction, and graduate training. This option could take advantage of synergies between the programs, especially in terms of future coordination of undergraduate majors, while allowing for a continued accredited landscape architecture degree, probably at the graduate level. With retirements, maintaining the current program structure (Option 1) would result in LDA becoming an even smaller unit, while joining with CD alone (Option 3) misses out on potential synergies with HD while raising questions about future alignment of HD. A more comprehensive realignment around sustainable community themes, including ESP (Option 4), would be desirable in terms of creating a more integrated approach to this topic, but runs into difficulties related to the natural science orientation of ESP and different departmental cultures.

## Nematology (NEM)

**7 faculty** (3/9/10)

- 6 I&R/AES
- 1 CE

**Majors** (fall 2009)

- Animal biology: 244 (interdepartmental major) (intending to give up)

**Graduate students** (fall 2009): 7

**APC recommendation:** Redistribution

The department has high demographic risk and is very small. The APC recommended that either reinvestment was needed (unlikely under current financial conditions) or faculty be incorporated into other units where their expertise can be well utilized.

**Demographics** (2/1/10): Number greater than 61 years of age:

- 3 I&R/AES
- 0 CE

**Fit with CA&ES programmatic areas:** Faculty can fit within the Agricultural and Food Systems, as well as Natural Resources and Ecosystem Science and Management.

**Strategic Options:**

- 1. Key academic goal:** Maintain department's disciplinary expertise.
  - a. Organizational implications:** Maintain current structure
  - b. Strengths:** Nematology is a unique department at UC Davis. It is one of only two such departments in the UC system. The other NEM department is at UC Riverside and it is in danger of being lost to merger and reorganization. There is a clear benefit to an organismal focus in nematology. Retaining an identifiable program in nematodes, and being one of a very few universities that does so, makes CA&ES a leader in this field. The group has already undergone administrative clustering with Plant Pathology. The group has already shifted its teaching program away from small, specialized courses in this field to larger courses. As such, there are relatively few administrative costs for maintenance of the current situation.
  - c. Weaknesses:** The department is too small to retain functionality as a department given its current size, anticipated retirements, and the projected reduction in faculty FTE in CA&ES. The group has identified gaps in its program and these are likely to grow with anticipated retirements. This group is down to the size of an area of strength within other departments.
- 2. Key academic goal:** Form a new department focusing on plant organismal interactions.
  - a. Organizational implications:** Merge with Plant Pathology
  - b. Strengths:** Most of the nematologists work either directly on nematodes as crop pests, or on nematodes as biological control agents for crop pests. Thus,

- disciplinarily, this group fits well with plant pathology. The department appears to accept this as a possible solution to the current situation. Administrative clustering already exists between the two departments and has been successful. Discussions of merger are underway.
- c. **Weaknesses:** Possible loss of identity and visibility for Nematology. High demographic risk of NEM would transfer to this component in a merged department. The merger would leave a few nematologists well outside their field and may require consideration of a departmental shift for some individuals (as do other options below). Integration increases the risk of decreasing CA&ES's renown in nematode biology. By integrating Nematology with a department that does not have an undergraduate major, the training of future nematologists is at risk. The animal biology major would likely go back to Animal Science. Restructuring majors to have a nematology track might be helpful.
3. **Key academic goal:** Form a broader organismal unit incorporating nematodes and insects under one structure.
    - a. **Organizational implications:** Merge with Entomology
    - b. **Strengths:** The Nematology departmental plan highlights its research on nematodes as biological control agents for insect pests of crops. This, disciplinarily, fits well with the mission of Entomology. The two departments have historic connections. Entomology has an undergraduate major, and the nematologists might benefit by fitting within this major and attracting more student interest. The animal biology major could be administered by the merged department. There is precedence at other institutions for such an alignment.
    - c. **Weaknesses:** Nematology has already taken significant steps toward a merger with Plant Pathology. Entomology is not unanimously in favor of a merger with Nematology, but the topic has been broached between the chairs.
  4. **Key academic goal:** Create a center of excellence in pest sciences and systems biology.
    - a. **Organizational implications:** Merge Entomology, Nematology, and Plant Pathology.
    - b. **Strengths:** Shared interests in plant pests among faculty in the three departments. Capitalizes on existing relationships among some faculty. Creates an opportunity for a new major in "biological pests." The animal biology major could be administered by the merged department.
    - c. **Weaknesses:** This would be a large department (with about 38 I&R/AES FTE and 9 CE FTE) with less co-location. Departmental cultures differ, and not all faculty share interests.
  5. **Key academic goal:** Form a broader organismal unit incorporating nematodes and animals under one structure.
    - a. **Organizational implications:** Merge Nematology and Animal Science.
    - b. **Strengths:** Nematology already teaches significantly in animal biology and houses the major; nematodes are animals. ANS has agricultural and fundamental emphases, which could fit under the umbrella of a new agriculturally and environmentally

focused department: Animals in their Environment. The animal biology major would likely be administered by the merged department.

- c. **Weaknesses:** Loss of identity. Few of the nematologists' specialties would be of interest to Animal Science faculty.
6. **Key academic goal:** Strengthen other departments by inclusion of NEM faculty.
    - a. **Organizational implications:** Disperse faculty into other units.
    - b. **Strengths:** This would allow each faculty member to move into the unit that fits his or her teaching, research, and outreach best. Destinations are likely to be mostly Entomology and Plant Pathology, but some might move into Environmental Science and Policy or Plant Sciences.
    - c. **Weaknesses:** This strategy seems the most likely to spell an early demise for any identity/focus in nematode biology that this campus and college currently carries. The animal biology major would likely go back to Animal Science.

**Recommendation:** The CPC recommends a merger with Plant Pathology (both departments have expressed interest in such a joint program) (Option 2).

**Additional Comments:** There is concern that not all NEM faculty work with nematodes that are plant pests. The question of whether these faculty will form a small minority interest in a large department focused on plant pathology has been raised. Many U.S. universities have their nematologists housed in plant pathology departments, so there is precedent for such a merger. PLP and NEM have had some discussion on the topic of administering the animal biology undergraduate major. The major would have to be altered to fit in such a department, but it is possible to do so.

Alternatively, the committee suggests that the NEM faculty could meet as a group with PLP, ENT, and WFCB to explore these potential mergers and the implications of moving forward as a unified group or as individuals.

## Nutrition (NUT)

### 16 faculty (3/9/10)

- 14 I&R/AES
- 2 CE

### Majors (fall 2009)

- Clinical nutrition: 299
- Nutrition science: 248

### Graduate students (fall 2009): 76

### APC recommendation: Of concern

The department has high demographic risk. It has valuable core programs and aligns well with the mission. It is recommended that opportunities to strengthen by association and consolidation with other units be explored.

### Demographics (2/1/10): Number greater than 61 years of age:

- 4 I&R/AES
- 0 CE

**Fit with CA&ES Programmatic Areas:** Nutrition aligns well with both the Agricultural and Food Systems and the Human Ecology, Resource Economics, and Policy programmatic areas.

### Strategic Options:

1. **Key academic goal:** Maintain existing disciplinary and research strength and continue to offer accredited majors.
  - a. **Organizational implications:** Maintain existing structure.
  - b. **Strengths:** Currently strong undergraduate education and research programs; highly ranked department nationally.
  - c. **Weaknesses:** With 16 faculty, 5 over age 56, the department has high demographic risk in the future; high utilization of lecturers in the teaching program may be a future risk; loss of opportunities for synergies with other units in the college in multiple aspects of foods, from safety to production to diet to sensory analysis and consumer behavior.
2. **Key academic goal:** Strengthen CA&ES programs in metabolism, nutrition, and toxicology.
  - a. **Organizational implications:** Merge with Environmental Toxicology
  - b. **Strengths:** The departments currently share space and resources in Meyer Hall; some overlap in research focused on human health; both use cutting-edge technologies to study metabolism and how it can be affected by diverse nutrients and toxicants.

- c. **Weaknesses:** Interests of several faculty in Environmental Toxicology do not overlap with those of Nutrition; the programs may not integrate well given different departmental cultures; faculty would resist merger.
3. **Key academic goal:** Integrate research and teaching from foods to human nutrition, with a strong “foods for health” emphasis.
    - a. **Organizational implications:** Merge with Food Science and Technology.
    - b. **Strengths:** Similar emphasis on biochemistry and analytical chemistry; creates unit with focus spanning from food to human nutrition; integrate foods for health efforts.
    - c. **Weaknesses:** Differing research orientations, metabolism and human development versus engineering and food processing; very few synergies in teaching programs, limited opportunities to cross-cover teaching.
  4. **Key academic goal:** Integrate nutritional science with food, fermentation, and sensory science.
    - a. **Organizational implications:** Merge with Viticulture and Enology and with Food Science and Technology.
    - b. **Strengths:** Common themes among these departments; integrate cross-disciplinary teaching.
    - c. **Weaknesses:** Loss of identity for the three departments; substantial differences in academic themes; not all co-located; some faculty (viticulture and enology) may not be a good fit for this unit.
  5. **Key academic goal:** Strengthen CA&ES focus on human health through nutrition.
    - a. **Organizational implications:** Merge with Human Development (e.g., “Healthy Families”)
    - b. **Strengths:** Improved dissemination of nutrition information; aligning prenatal through adulthood development with social and biological sciences of nutrition.
    - c. **Weaknesses:** Loss of focus on clinical nutrition and metabolism; differing research emphases.

**Recommendation:** The College Planning Committee recommends Nutrition maintain its current structure (Option 1).

**Additional Comments:** In addition, the CPC recommends that NUT along with the FST and VEN departments engage in active and ongoing discussions about how they could further integrate their administrative, teaching, extension, and research/infrastructure activities to address the expected FTE reductions.

## Plant Pathology (PLP)

### 19 faculty (3/9/10)

- 15 I&R/AES
- 4 CE

### Majors (fall 2009)

- None
- Administrative home of the Science and Society Program

### Graduate students (fall 2009): 39

### APC recommendation: Stable

The department aligns well with the college's mission, and has pending but not immediate demographic risk — although the wrong combination of faculty attrition could devastate individual programs.

### Demographics (2/1/10): Number greater than 61 years of age:

- 3 I&R/AES
- 1 CE

**Fit with CA&ES programmatic areas:** Plant Pathology fits within both the Agricultural and Food Systems and the Natural Resources and Ecosystem Science and Management programmatic areas.

### Strategic Options:

1. **Key academic goal:** Maintain the department's disciplinary expertise and distinct academic major.
  - a. **Organizational implications:** Maintain current structure.
  - b. **Strengths:** Highly research-focused; well-established departmental graduate program; administrative home of the Science and Society Program; faculty are teaching in other majors and in the College of Biological Sciences.
  - c. **Weaknesses:** If an undergraduate component becomes desirable for all CA&ES departments, the lack of a major may be a strong weakness for this unit.
2. **Key academic goal:** Form a new department focusing on plant organismal interaction.
  - a. **Organizational implications:** Merge with Nematology.
  - b. **Strengths:** Nematology is a small at-risk department (7 faculty), already sharing a building (Hutchison) and administrative offices with Plant Pathology. Natural synergies exist between these departments around plant health and pests. Nematology brings strength in soil-borne disease. Plant Pathology already recognizes the importance of Nematology. A potential combined undergraduate major might be more interesting to students.
  - c. **Weaknesses:** Possible loss of identity and visibility for Nematology. The high demographic risk that Nematology is currently facing would transfer to this

component of a merged department. It's not clear that there's a combined major option; the former integrated pest management major didn't get enough students.

3. **Key academic goal:** Create a center of excellence in pest sciences and systems biology.
  - a. **Organizational implications:** Merge PLP, NEM, and ENT.
  - b. **Strengths:** Shared interests in plant pests among faculty in the three departments. Such a merger would provide a more holistic focus on plant pests and capitalize on existing relationships among some faculty. Portions of Plant Sciences might join, creating a demographically stable unit. Creates an opportunity for a new major in "biological pests." The animal biology major could be administered by the merged department.
  - c. **Weaknesses:** This would be a large department (with about 38 I&R/AES FTE and 9 CE FTE) with less co-location. Departmental cultures differ, and not all faculty share interests.
  
4. **Key academic goal:** Creation of a Plant Systems Biology program
  - a. **Organizational implications:** Merge with and create a sub-track within Plant Sciences of a combined plant pathology and nematology program.
  - b. **Strengths:** Such a merger could leverage activity in areas such as plant-microbe interaction. It would enable a holistic focus on plant health as well as pathology, and might lead to increased interaction with biotechnology. It might also lead to the formation of other strongly focused tracks within Plant Sciences and facilitate recruitment of majors to programs.
  - c. **Weaknesses:** Potential loss of identity of Plant Pathology. Plant Sciences is already a large department that recently reorganized, and this option would necessitate doing it again. Since Plant Sciences is a small undergraduate major, there would be limited opportunities for Plant Pathology faculty to expand undergraduate teaching.

**Recommendation:** The CPC recommendation is either Option 1 (maintain current structure) or Option 2 (merge with Nematology), depending upon the preferences of faculty in NEM. The Plant Pathology department is aligned with the CA&ES vision, contains disciplinary expertise critical to plant agriculture and forestry and can maintain its current structure (Option 1). It already shares administrative resources with Nematology, and is willing to join with those faculty in an expanded department (Option 2). As is discussed for NEM, not all faculty in Nematology work on plant parasitic nematodes, and some or all may wish to join other departments. Thus, the CPC recommends that Plant Pathology engage in discussions with Nematology and other departments to develop a strategy that maintains expertise in nematology in the college without a separate department.

**Additional Comments:** Option 3 is not recommended, as not all Entomology faculty work on plant pests and the proposed merger of PLP and NEM with ENT does not bring new disciplinary strength to Entomology. It would also require additional faculty moves (e.g., from Plant Sciences) to create a unit that would still not match all disciplinary areas well. Option 4 is not recommended as Plant Sciences is already large and broadly interdisciplinary. Adding Plant Pathology faculty would further enlarge this department without obvious added value to either group, as they already interact and collaborate extensively. Alternatively, the committee suggests

that the PLP faculty could meet as a group with NEM, ENT, and perhaps WFCB (given other departmental recommendations) to explore joint academic planning.

## Plant Sciences (PLS)

### 80 faculty (3/9/10)

- 57 I&R/AES
- 23 CE

### Majors (fall 2009)

- Agricultural management and rangeland resource: 12
- Biotechnology: 246
- Crop science and management: 13
- Ecological management and restoration: 6 (new major)
- Environmental horticulture and urban forestry: 43
- Plant sciences: 11 (new major)

### Graduate Students (fall 2009): 155

### APC recommendation: Stable

The department is stable with pending but not immediate demographic risk.

### Demographics (2/1/10): Number greater than 61 years of age:

- 16 I&R/AES
- 6 CE

**Fit with CA&ES programmatic areas:** Plant Sciences fits into both the Agricultural and Food Systems and the Natural Resources and Ecosystem Science and Management programmatic areas.

### Strategic Options:

1. **Key academic goal:** Maintain department's broad-based expertise in plant sciences and existing and newly developed majors.
  - a. **Organizational implications:** Maintain current structure
  - b. **Strengths:** This is a large department, recently created after the merger of four departments. The curriculum has been completely revised in consideration of the composition and focus of the new department. The current departmental structure provides good integration across several areas of study and levels of organization (e.g. agriculture and natural systems, genetics, and ecosystem nutrient dynamics).
  - c. **Weaknesses:** The department has a mix of specializations; some of these overlap with specializations in other departments, and it is therefore possible that some faculty might feel more aligned with other CA&ES departments if there is significant reorganization and creation of new departments in the college.
2. **Key academic goal:** Create departments that focus on 1) plant production and 2) plants as a component of ecosystem science.
  - a. **Organizational implications:** Separate Plant Sciences into agricultural production and natural resource and ecosystem science units.

- b. Strengths:** Would make two smaller units that could then be considered for selective consolidation with other units to create a more overarching focus (e.g. ecosystem science faculty could merge with aligned units like LAWR, ESP, or LDA; or even into a new department with a focus on “earth sciences” or “environmental systems” that could include a number of ecologically oriented departments like ESP, LAWR, and WFCB. The agricultural production faculty could then consider merging with Plant Pathology or Viticulture and Enology, although both of these departments are already considering mergers with other units).

This option could lead to a more even distribution of Cooperative Extension faculty among departments, which would have the benefit of better integration of CE with faculty from departments that lack a CE tradition.

- c. Weaknesses:** Loss of focus on plant science and less integration across diverse areas of study within the plant sciences. The department has just been through a merger and reorganization and any more rearrangement at this time may well be counter-productive in terms of resources, strategic planning, and faculty morale.

**Recommendations:** The CPC recommends that Plant Sciences maintain its current structure (Option 1). The current department has broad-based expertise in plant science, which integrates across areas of study and levels of organization.

**Additional Comments:** Dividing the department (Option 2) could strengthen other departments and result in a more even distribution of Cooperative Extension faculty within the college. However, the CPC believes this would also greatly weaken the key strength of the department, which is that it integrates plant production with ecosystem science.

## Textiles and Clothing (TXC)

### 5 faculty (3/9/10)

- 5 I&R/AES
- 0 CE

### Majors (fall 2009)

- Textiles and clothing: 84
- Fiber and polymer science: 7

### Graduate students (fall 2009): 12

### APC recommendation: Redistribution

This division has medium to high demographic risk and is so small it cannot continue unless substantial resources are invested, which is unlikely given the current fiscal climate. It is recommended that faculty be incorporated into other units where their expertise can be well utilized.

### Demographics (2/1/10): Number greater than 61 years of age:

- 1 I&R/AES

**Fit with CA&ES programmatic areas:** The TXC bio-based materials aspect aligns with the Agricultural and Food Systems area. The social science elements of the TXC major and consumer research aligns with Human Ecology, Resource Economics, and Policy.

### Strategic Options:

- 1. Key academic goal:** Ensure Textiles and Clothing continues to be recognized as a distinct area of teaching and research at the UC Davis campus as this is a unique undergraduate major among all UC campuses.
  - a. Organizational implications:** Maintain current status.
  - b. Strengths:** It will maintain the identity and the excellence in fibrous materials and textile sciences.
  - c. Weaknesses:** TXC remains small and unable to provide needed teaching coverage for its majors.
- 2. Key academic goal:** Integrate textile and clothing with a department that can facilitate pursuing a transition through synergies that offer the prospect for a new biomaterials major and departmental infrastructure that can better support aligned research and outreach programs
  - a. Organization implications:** Merge with Biological and Agricultural Engineering.
  - b. Strengths:** TXC and BAE have already engaged in exploring a merger. A merger with BAE around bio-based materials could create a new area of strength by contributing an organic focus to “materials science” (polymers). Merging provides an opportunity for curriculum restructuring and strategic planning for future faculty teaching loads and majors.

- c. **Weaknesses:** Merging with BAE provides limited resources for covering the continued demand for more FTE that can effectively teach the current textiles major. A merger will further weaken current strengths in consumer cultural studies.
3. **Key academic goal:** Integrate all Textiles and Clothing faculty into a department that can utilize both the chemistry and social scientist expertise to further strengthen already strong programs in Food Science and Technology or Viticulture and Enology.
- a. **Organizational implications:** Merge with ETOX, FST, or VEN.
  - b. **Strengths:** Some existing overlap with ETOX, FST, and VEN around product safety, chemistry, and consumer sciences. Some existing interests in sensory science with FST and VEN. If the fiber and polymer science major and the textiles and clothing major are eliminated, then the current TXC faculty can redistribute their teaching efforts to fill current and future needs that match the academic plan for FST for a food chemist and a consumer scientist. For VEN and ETOX, the need for chemists and social scientists will have less immediate impact on teaching activities which would provide TXC faculty time to implement possible plans for sustaining or eliminating the two existing departmental majors.
  - c. **Weaknesses:** Confusion over how to handle the fiber and polymer science and the textiles and clothing majors is a concern. A lack of strong overlap with other departments would hinder ETOX, FST, or VEN from synergistically enhancing the faculty's ability to share resources for covering the teaching program for the fiber and polymer science and the textiles and clothing majors. The food science and the viticulture and enology majors are large and faculty are unable to take on any additional teaching or curriculum support. ETOX is a small group with limited ability to take on a large major.
4. **Key academic goal:** Align individual faculty with a department to find mutually beneficial synergies for scholarship and outreach activities.
- a. **Organizational implications:** Redistribute department faculty among other departments on campus.
  - b. **Strengths:** Faculty can self identify departments that are best fits for scholarly expertise within the college or possibly another college. Social science faculty might consider departments within the Division of Humanities, Arts, and Cultural Studies (HArCS) in the College of Letters and Science. Chemistry and materials sciences faculty might fit best within BAE where they would have close association with the College of Engineering. FST or VEN might also be a good home some faculty.
  - c. **Weaknesses:** The college could rapidly lose FTE to another college and likely result in the lost of this expertise within the College of Agricultural and Environmental Sciences.

**Recommendation:** The College Planning Committee recommends that Textiles and Clothing pursue merging with Biological and Agricultural Engineering to create a teaching and research

program focusing on bio-materials, an area that the college and campus should strengthen in order to build sustainable agriculture and environment programs (Option 2).

**Additional Comments:** A merger with BAE provides an opportunity for curriculum restructuring and strategic planning for future faculty teaching loads and majors. The fiber and polymer science major could be developed into a new bio-based materials major, while the textiles and clothing major could explore an intercollege model by working with programs in HArCS. A merger with BAE around bio-based materials could create a new area of strength by contributing an organic focus to “materials science” (polymers). Another viable option is to explore merging with FST, ETOX, and VEN to develop synergies in biomaterials, natural products, green and analytical chemistry, and sensory, behavior, and consumer sciences.

## Viticulture and Enology (VEN)

**14 faculty** (3/9/10)

- 12 I&R/AES
- 2 CE

**Majors** (fall 2009)

- Viticulture and enology: 101

**Graduate students** (fall 2009): 42

**APC recommendation:** Demographically of concern

The Department of Viticulture and Enology is a relatively small department and has moderately low demographic risk. It aligns well with the mission. Possible amalgamation with others units should be considered.

**Demographics** (2/1/10): Number greater than 61 years of age:

- 2 I&R/AES
- 0 CE

**Fit with CA&ES programmatic areas:** Fits well within the area of Agricultural and Food Systems.

### Strategic Options:

- 1. Key academic goal:** Maintain department's disciplinary expertise and distinct academic major.
  - a. Organizational implications:** Maintain current structure
  - b. Strengths:** Identity important for financial support from private donors; has a relatively large number of majors and very high SCH counts (per FTE) for both graduate and undergraduate instruction; maintains research and teaching strength in a broad range of topics across both viticulture and enology. A high visibility department that is one of the strongest such programs in the country and an economic engine for California
  - c. Weaknesses:** It is a relatively small department; may not be able to maintain excellence across all current areas.
- 2. Key academic goal:** Maintain a strong, relatively focused program in Viticulture and Enology.
  - a. Organizational implications:** Joint appointments in VEN for new or current faculty.
  - b. Strengths:** Several faculty members within VEN already have joint appointments, including with the College of Engineering; additional opportunities with several departments.
  - c. Weaknesses:** Joint appointments potentially difficult for junior faculty; current faculty likely be reluctant to give up part of an FTE.

3. **Key academic goal:** Create strengthened program in food and fermentation science.
  - a. **Organizational implications:** Merge with Food Science and Technology (and/or Nutrition)
  - b. **Strengths:** Some synergies in research and teaching between VEN and FST and the two units could benefit from closer integration; VEN and FST also share the same building (Robert Mondavi Institute for Wine and Food Science).
  - c. **Weaknesses:** While FST has some overlap with both VEN and NUT, there is very little overlap between VEN and NUT. A three-way merger would lead to significant dilution of VEN, which would be the smallest partner in terms of the number of majors and faculty FTE.
  
4. **Key academic goal:** Create strong program in bioprocessing and bioproducts, uniting CA&ES efforts in biomaterials, biofuels, bioenergy, and biotechnology.
  - a. **Organizational implications:** Merge all (VEN, FST, and TXC) and possibly parts of PLS, and BAE.
  - b. **Strengths:** Plays to campus' strength in sustainability and state's interest in these topics; would provide for support of emerging bio-based state industries; would likely appeal to students; new majors could be envisioned as well as strengthening existing ones; would unite applied chemists, microbiologists and engineering faculty within the college in a single unit with a strong multidisciplinary focus providing for an enhanced ability to cover discipline-based teaching; breadth of disciplines would be a strength not a weakness of such a program.

**Weaknesses:** Complicated reorganization, especially in regards to the parts of departments that may not be included in the new unit; would need a substructure to maintain independence of programs to assure continued accreditation of majors and visibility of merged units; some faculty in current department may feel a stronger affinity to other units such as Nutrition.

**Recommendation:** The CPC recommends Viticulture and Enology maintain its current structure (Option 1).

**Additional Comments:** The CPC encourages the department to explore larger alignments, including with Food Science and Technology and with Nutrition, to see if there is common ground, or with other departments as suggested in Option 4. There are several collaborative graduate courses and research programs between VEN and FST. However the degree of overlap with NUT is insufficient to warrant merger of these three departments (Option 3).

## Wildlife, Fish and Conservation Biology (WFCB)

### 10 faculty (3/9/10)

- 9 I&R/AES
- 1 CE

### Majors (fall 2009)

- Wildlife, fish and conservation biology: 151

### Graduate students (fall 2009): 48

### APC Recommendations: Of concern

The department is a relatively small department and has high demographic risk. It has valuable core programs and aligns well with the mission, but may not be sustainable as a stand-alone department. It is recommended that opportunities to strengthen by association and consolidation with other units be explored.

### Demographics (2/1/10): Number greater than 61 years of age:

- 2 I&R/AES
- 0 CE

**Fit with CA&ES programmatic areas:** Fits well within the area of Natural Resources and Ecosystem Science and Management.

### Strategic Options:

1. **Key academic goal:** Ensure WFCB continues as the cohesive single unit it is now with a unique focus on ecology and conservation of wild vertebrates.
  - a. **Organizational implications:** Maintain current structure
  - b. **Strengths:** The department has a strong shared (unified) vision within the program, and is the only wildlife program in the entire UC system. The existing large, active undergraduate program is well designed and very popular among students, and it is an important focus of the faculty. Has valuable core teaching programs that align well with its mission.
  - c. **Weaknesses:** Demographics of the department and the constraints imposed by the college administration put the department at risk under current college-level plan. However, WFCB could acquire additional members via the self-selection process as the college reorganizes, thereby enhancing its long-term viability.
2. **Key academic goal:** Bring greater cohesion and identity to UC Davis' world-class programs in the environmental sciences and enhance interactions among physical and biological environmental scientists.
  - a. **Organizational implications:** Combine with ESP, ETOX, and LAWR to form an environmental science department with four units; or consider a merger with some subset of these four departments either as stand-alone departments (e.g., ESP and WFCB) or within a larger multiple-unit environmental science department.

**b. Strengths:** A merger of the environmental departments could strengthen the potential for interaction among the physical and biological environmental sciences and may foster broader integration of environmental policy across disciplines. This merger would force a re-thinking of a number of undergraduate majors and may lead to streamlining curriculum delivery and simplify the structure of environmental majors, along the lines of the recently developed ESP–LAWR interdepartmental major. Potential synergies could emerge in a large number of areas (e.g., the impact of environmental change on ecosystems, abiotic-biotic interactions) and the merger could strengthen a biodiversity–conservation theme. The constitution of a very large department could potentially enhance the competitiveness of the department to attract large-scale research funds. The programmatic themes in environmental policy and biodiversity, sustainability, and global climate change resonate with all of the groups.

**c. Weaknesses:** Consolidation with ETOX, LAWR, and ESP would create a department with over 70 faculty, potentially an overly broad and excessively large department that would be difficult to administer. The resulting merger would create a physical- and biological-science dominated department with marginalization of (or overworking of) the policy faculty and perhaps other groups. Efficiencies of scale may be counterbalanced by multiple locations, different fundamental stakeholder groups (e.g., dominant granting agencies) and existing departmental cultures, cumbersome merit reviews, and potential lack of adequate representation of the diverse scholarship at the college level. Some faculty groups (e.g., policy faculty in ESP; ecotoxicology faculty; vertebrate biologists in WFCB) would each represent a small component, and a merged department could be at risk of losing a critical core that can effectively deliver training. Any merger of this magnitude would require re-envisioning of academic plans to assure unity and identity of the various disciplines both within the natural sciences and across the natural and social sciences.

**d. Addendum.** Nearly all pairwise combinations of these four departments have also been considered by the CPC, and each has strengths and weakness that would have to be carefully considered. With respect to WFCB, ESP has the most disciplinary similarity and a merger could create a core biodiversity-conservation group with a solid policy presence, while LAWR has the least thematic and disciplinary overlap.

3. **Key academic goal:** Build a unified college-level program of animal biology and conservation with comprehensive programs dealing with managed populations both wild and domestic.
  - a. **Organizational implications:** Merge with Animal Science
  - b. **Strengths:** This option draws on a common organismal focus of both departments. It would lead to a department integrating biology of vertebrate animals across environments both natural and managed. Strength of ANS in genetics and animal physiology would enhance these areas for WFCB. The addition of avian biologists from ANS would strengthen representation of this organism group for WFCB. The new “department” could provide a stable home for the animal biology major.
  - c. **Weakness:** Because the thematic focus is traditionally separate, this initiative would require a new, shared vision by both departments.

4. **Key academic goal:** Build a unified college-level program dealing with free-living populations of both vertebrates and invertebrates.
  - a. **Organizational implications:** Merge with Entomology
  - b. **Strengths:** This option draws on a common organismal focus of the departments. It would lead to a department emphasizing organismal biology and conservation of vertebrate and invertebrate animals. The new department could provide a stable home for the animal biology major, since these are two of the four departments that currently support that major. There are already strong links between WFCB and Entomology, in areas such as behavior, genetics, conservation, aquatic ecology, and disease ecology, as well as a strong commitment to the value of specimen collections.
  - c. **Weakness:** Because the two departments represent disciplines that traditionally have been considered distinct, this merger would require development of a shared vision.

**Recommendations:** The CPC recommends that Wildlife, Fish and Conservation Biology maintain its current structure (Option 1).

**Additional Comments:** However, we also recommend that WFCB discuss potential synergies and integration related to teaching, outreach, research (and the associated future FTE needs) with ESP, LAWR, and ETOX during the next year. The CPC believes that strategic planning among these departments could help to create a broader college focus on natural resources, conservation and environment. Such an approach could also increase the visibility of the college's environmental programs. Over a 10-year horizon, more-coordinated planning could strengthen programs addressing global environmental change, environmental health, biodiversity, and conservation. The CPC does not recommend a four-department merger now (Option 2). In addition, we recommend that during the coming year WFCB explore other options including merging with ANS (Option 3) or ENT (Option 4), or meet with faculty in ENT and NEM (and perhaps PLP) for joint academic planning.

## VI. Cooperative Extension

Cooperative Extension (CE) specialists are an integral part of academic departments. Therefore, college reorganization may affect the mission of Cooperative Extension. Increasingly, federal, state, and local funding agencies are demanding greater integration of research and outreach. Moreover, California’s increasingly urban population is becoming less aware of the complex interactions between healthy communities, sustainable agriculture, and natural resources. While the need for applied research and information delivery is greater than ever, CE is shrinking and the AES continuum from basic to translational/applied research is becoming more diffuse. There are currently 64 CE specialist FTE in the college (Appendix K): seven departments have 1 or fewer full-time equivalent specialists, five departments have 2 to 3, and five departments have 4 or more CE FTE. Throughout the college, many CE retirements are expected in the near future. The imbalance in CE FTE relative to senate faculty in some departments may be justification for reorganizing departments in order to build critical mass and stimulate the development of innovative new CE positions.

Table 1. Summary of CE FTE by department and association with the programmatic strength areas of the college.

No. of FTE: ≤ 1	No. of FTE: 2–3	No. of FTE: ≥ 4
<b>BAE (1)*</b>	<b>PLP (2.85)</b>	<b><u>PLS (21.9)</u></b>
<u>ETOX (1)</u>	<u>ENT (2.5)</u>	<u>LAWR (9.3)</u>
<u>WFCB (1)</u>	<i>HCD (2)</i>	<b>ANS (8.3)</b>
<b>NEM (0.85)</b>	<b>VEN (2)</b>	<i>FST (5)</i>
<u>ESP (0.8)</u>	<b>NUT (1.5)</b>	<b><u>ARE (4)</u></b>
<b>LDA (0.2)</b>	---	---
<i>TXC (0)</i>	---	---

Actual number of FTE identified in parentheses. \*retiring in June 2010. **Bold** indicates an emphasis in the proposed Agriculture and Food Systems programmatic area; Underlined indicates an emphasis in the proposed Natural Resources and Ecosystem Science and Management programmatic area; Italicized entries indicate an emphasis in the proposed Human Ecology, Resource Economics, and Policy programmatic area. Note that some entries have a combination of these font styles, representing two or three programmatic areas.

There are several advantages to having adequate Cooperative Extension specialist representation within a department, both for CE faculty, as well as for the department as a whole. In light of the fact that very few new CE hires can be expected in the near future, departmental reorganizations

may have a beneficial effect for some programs. Building a critical mass of CE specialist representation through departmental realignments may have the following benefits:

- Foster the expertise and insight to develop, leverage, and lobby for new CE positions through strong departmental relationships with ANR leadership, UC Cooperative Extension county advisors, and stakeholders.
- Strengthen the concept of the AES continuum in the midst of shrinking programs.
- Maintain mentoring opportunities for newly hired CE and senate faculty.
- Ensure quality control in the Term Appointment Review Committee (TARC), the evaluation of AES appointments.
- Provide a peer group within the department needed for merits and promotions, mentoring, and resource allocation.
- Strengthen departmental outreach and extension efforts and academic planning.

As the college shrinks, departments may view Cooperative Extension specialists as a resource to meet the teaching demands within their majors. As a result, future CE specialist hires that are interested in teaching may request joint CE and I&R appointments. In their response to the CPC departmental questionnaire, all departments with four or more CE faculty stated their interests in pursuing joint appointments for CE to teach, and/or have already integrated CE into the classroom to support teaching needs, especially in providing critical teaching needs for core courses across the college. For split appointments (i.e., CE with I&R) to be successful there will have to be clearer guidelines for, and greater understanding by, academic personnel committees concerning the nature and role of the CE component in such positions.

If the combination of external and internal information delivery can be accomplished by CE specialists, this could potentially strengthen the college's extension and outreach efforts by better integrating students, Academic Senate faculty, UCCE advisors, and CE faculty. This holds especially true for departments in environmental science and human science divisions, which traditionally have had low CE representation. Reorganization by way of departmental mergers can significantly increase CE representation within departments, thereby enhancing the college's outreach and extension presence and may help satisfy teaching needs of departments if joint appointments can be achieved.

Strategic planning to address future CE specialist FTE needs is essential when reviewing the college's highest priority areas in statewide Cooperative Extension programs. Planning efforts should be considered collectively by clusters of departments within similar programmatic areas, so as to continue developing extension programs that reflect societal needs. Similarly, college priorities for Cooperative Extension must coincide with those of Agriculture and Natural Resources leadership. While reinvestments in CE specialist FTE must consider the ANR Strategic Plan, the CA&ES vision for the future of Cooperative Extension must also be clearly expressed to ANR.

## **VII. Undergraduate Curriculum and Related Issues**

Throughout its deliberations, the CPC discussed the implications and impacts of college reorganization on undergraduate education. Much of the debate focused on the apparent impossibility of maintaining course offerings given that a reorganized college will have 30 to 40 fewer faculty FTE and less teaching assistant (TA) support. Given that the teaching workload of CA&ES faculty is among the highest among the UC Davis colleges and schools, it is anticipated that a reduction in faculty FTE of the expected magnitude will inevitably impact the quality of undergraduate education in our college.

One major impact will be a reduction in course offerings in undergraduate majors, especially for service courses and other classes that are not essential for teaching the core curriculum of any department. Streamlining of curricula can partly be achieved by cross-departmental planning of course instruction and sharing of faculty expertise; however, in some cases the continued existence of undergraduate majors may be in jeopardy.

The CPC noted the large number of majors currently offered within CA&ES and the fact that this number of majors within general focus areas may be confusing to students. Moreover, as the number of faculty is going to decrease, it might be difficult to sustain the large number of majors. This topic was beyond the scope of the CPC, but we suggest the college address the overall number of majors and consider their alignment with the college's programmatic areas.

Many of these issues arose in our meetings with departmental chairs, whereas others were raised in comments received by e-mail or by the surveys. These and other related issues were topics of concern that we ask the college to address in the coming years, in concert with any realignment scenario.

### **A. The RAC Formula**

There is widespread dissatisfaction with the Resource Allocation Committee (RAC) formula that has been used since 1992 as a way to allocate resources to departments. The RAC formula teaching funds are distributed to each department using criteria that include (a) student enrollment in courses offered by departmental faculty, (b) student majors administrated by the department, and (c) number of students advised by its faculty members. A general criticism of the existing formula is that the allocated funding is too low to cover all costs, especially for departments that offer "service courses" for students in other majors and for departments that hire Unit 18 lecturers to teach selected courses. For those departments, the relatively low RAC-formula allocation is a disincentive to teach, and works against the interdisciplinary ethic of the campus.

The RAC formula is considered insufficient to support interdisciplinary majors, which require dedicated funding such as that provided for departmental majors. In addition, some departments have problems planning their teaching assignments because the RAC allocation uses a three-year average headcount, which can make it difficult to plan for new courses or majors.

## **B. Interdepartmental Majors**

UC Davis hosts two types of undergraduate majors: those administered by a single department or program, and those that are interdepartmental, with no primary departmental home. Interdepartmental majors were developed to deliver undergraduate curricula best served by faculty and courses across multiple departments. Streamlining of courses and majors may result in additional interdepartmental majors in the college.

Interdepartmental majors depend solely on the RAC formula for funding, and so are especially sensitive to RAC budget cuts. A faculty committee was appointed in 2007 to advise the CA&ES Dean's Office on better ways to support interdepartmental majors. This committee recommended a number of changes, including reconsideration of the RAC formula, but these recommendations have not been considered to date.

## **C. Teaching Assistants**

As many classes increase in size, teaching assistant (TA) positions for graduate students become increasingly important to cope with the growing number of discussion and lab sections. Moreover, with rising fees, many graduate students depend on teaching assistantships for support. However, TA support by the Dean's Office has declined recently and may be further reduced in the future. Department chairs are concerned about the potential loss of TA support, especially when class sizes will increase as a result of decreasing faculty FTE and reductions in course offerings and/or course sections. TA support is considered to be particularly important for science courses with lab sections.

## **D. Joint Appointments**

The CPC also discussed the need to prioritize specific areas of expertise that are a high priority across multiple academic programs, but that are not identified as a top FTE need within any single department. Such joint appointments may be desirable when several departments have identified needs that cannot be justified by a full FTE in a single department. If joint appointments are used to meet essential needs, we recommend that the college clarify policy and expectations.

## **E. Difficulty of Teaching Laboratory and Studio Courses**

As teaching support is reduced, it becomes more difficult for departments and teaching faculty to offer laboratory and studio courses that require a smaller number of students per section (typically 10 to 20). Some departments have already reduced the number of required lab classes in their degree programs.

Yet, such hands-on learning is widely viewed as essential to the student's learning experience and elimination of these classes affects the quality of the degree. A discussion on such issues is

warranted. Possible options include revisions of the course materials fee criteria and RAC formula. In addition, departments may need to reconsider and seek ways to streamline their curricula by prioritizing and/or reducing laboratory and studio courses.

## **F. Teaching Load**

Within CA&ES, teaching loads of faculty vary considerably across departments, generally ranging from 1 to 3 courses per year. Although increasing teaching load will reduce research productivity, an increase in teaching load may be a solution for some departments to cover essential core courses. In addition, the expected decrease in the AES portion of faculty appointments in the future may increase teaching expectations to justify the higher fraction of I&R needed to maintain total faculty numbers in the college.

In addition, there is the perception that teaching load expectations vary widely across campus, although research expectations are very similar. This suggests the need for college- and campus-wide guidelines defining teaching expectations.

## **VIII. Graduate Degree Groups and Programs**

As at all research universities, training graduate students is a critical mission of UC Davis and the College of Agricultural and Environmental Sciences. Indeed, graduate students are at the heart of research in the college, and are one component of maintaining an internationally renowned college program. Graduate groups partner with CA&ES by managing college- and campus-wide faculty efforts in various advanced thematic and disciplinary areas. College faculty provide outstanding graduate education and experiential training which places students into activities integral to the college mission. Graduate students directly contribute to:

- Cutting-edge agricultural, environmental, and societal research that benefits AES stakeholders
- Knowledge that forms the basis for successful extramural funding awards that supports all CA&ES and AES activities
- College outreach/extension programs that, with faculty leadership, apply the knowledge derived from AES research activities
- Curriculum delivery supporting undergraduate majors, graduate degree programs, and, in some cases, outreach-related certified extension education programs

The CPC fully recognizes the exceptionally important roles of graduate groups in coordinating graduate student education. As part of the College Planning Committee process, CPC surveyed each graduate group administered within CA&ES and several more with whom CA&ES faculty are affiliated (Appendix F). Factors affecting graduate student education include FTE reduction and the challenging increases in graduate student costs for research support and university fees. In addition, given the interdisciplinary nature of most graduate groups on campus, there is the danger that any reorganization of the college can have negative consequences for graduate education.

### **A. Impacts of faculty reductions across departments**

CA&ES will need to ensure strategic investment to maintain its graduate education programs. The current (2009) CA&ES graduate student population is 925, which is a 15-percent reduction since 2004 and a continuation of a general downward trend (Appendix H).

Reduced faculty numbers will likely contribute to continued declines in graduate training collegewide. It is likely that fewer graduate students can be attracted and advised if faculty numbers decrease, a problem that will affect all graduate groups and programs.

Although nearly all graduate groups were confident that they could continue to offer quality student training, several identified key areas of training that are at risk, thereby leading to an overall loss of quality, breadth or depth of training. Although most programs were optimistic that they could continue teaching their core courses, graduate programs cannot predict whether there will be departmental plans to reduce graduate teaching in order to ensure departmental teaching of undergraduate core courses.

Whereas some large graduate groups are prepared for a future with reduced faculty FTE (e.g., Ecology, Nutritional Biology), many other groups identified possible loss of key courses or programmatic areas as faculty numbers are being reduced. These are listed in Appendix I.

## **B. Strategies to address faculty reductions**

Current Graduate Council policies restrict the participation of Academic Federation (AF) members in graduate groups and their service on advanced degree committees. Allowing AF members to participate fully in graduate groups — without requiring additional appointments or exceptions to policy — would increase graduate student numbers and increase the size of graduate groups. In addition, giving partial I&R appointments to Academic Federation personnel who are interested and dedicated to teaching would increase the number of instructors at both the undergraduate and graduate levels.

Several groups expressed strong interest in encouraging and facilitating graduate training and advising by external Ph.D. scientists, either as adjunct faculty or paid lecturers. Some of the cost-savings from faculty and administrative downsizing could be redirected to paid lecturers and teaching assistants. Advantages of such arrangements include redressing deficits caused by downsizing, and providing students with valuable nonuniversity perspectives on research and outreach. However, there was concern that getting approval and/or funding for such positions is difficult. Currently, adjunct faculty and research scientists must maintain continuous funding to keep their status. State, federal, and foundation funding has become more difficult to attain, thus making it difficult to make such temporary appointments. Appointment policies should become more flexible, with greater emphasis placed upon publication record and teaching evaluations.

As we plan for a future with fewer faculty, consideration could be given to redirect a portion of the teaching budget to graduate students with mentored teaching experiences, and to include these students in course development and teaching. The Chancellor's Teaching Fellowship is a successful model for such an approach. The added teaching experiences will be relevant for those who plan careers in college teaching. Though such teaching programs will take some faculty time, it could certainly help free faculty time to teach graduate courses.

Regarding allocation of new faculty FTE in the future, hires that benefit multiple graduate groups could be prioritized alongside any key disciplinary gaps within departments. There are a few examples provided in Appendix I.

## **C. Cost of graduate education**

Graduate groups and programs expressed widespread concern about maintaining funding for graduate students as fees continue to rise rapidly. The cost of hiring a graduate student is approaching that of hiring a postdoctoral researcher who does not incur tuition or fees expenses. The rising cost of graduate student training, combined with fewer faculty to train graduates, will inevitably lead to diminishment of programs and loss of research productivity at the college and

university level. If this process continues, it is expected that it will lead to loss of competitiveness for external funding. Therefore, graduate funding should remain a priority on campus and for the college, and graduate tuition and fees must be reduced.

Another difficulty in graduate group support for graduate students is that graduate groups do not control teaching assistantships, since these are controlled by departments and funded by the college RAC. This is becoming more relevant since TA funding has been reduced by about 10 percent in the past year, and is expected to be reduced further in the coming years. For graduate students that depend on TA support, reduction in TA funding will result in increasing tuition and fee costs to be paid for by block grant or extramural funding. In addition, reductions in TA support often lead to losses of faculty time that could otherwise be devoted to research and grantwriting. We recommend prioritizing TA funds (i.e., continuation of such support) as a relatively inexpensive but effective way to support graduate students and to assist faculty in coping with downsizing.

#### **D. Opportunities for graduate student training grants**

Many of our graduate groups have obtained graduate student training grants through sources such as the National Institute of Environmental Health Sciences (NIEHS), the U.S. Department of Agriculture (USDA), the National Science Foundation (NSF), the Packard Foundation, and the MacArthur Foundation. Most groups have plans for future training grants.

Some graduate groups also highlighted their creation of academic linkages, for example Community Development is working with UC Extension and other groups to develop a professional master's program in Sustainable Community Development. Writing training grants, administering them, and providing the special courses required by such grants requires faculty and staff time. Because the need for such grants is growing, our college and departments must create ways to release faculty time for these important projects.

#### **E. Attitudes toward future mergers with other graduate groups**

Most of our graduate groups are interdisciplinary and already rely upon other graduate groups, departments, and colleges for some of their course offerings. Almost none of the graduate groups would support graduate group mergers, largely because of concerns associated with loss of identity, thereby impacting success of student recruiting. Instead, administrative mergers of graduate groups may be a cost-effective solution.

#### **F. Graduate program administration**

Graduate program staffing is uneven across programs. While some programs have dedicated staff, many staff members have additional departmental responsibilities within the administering department. Even programs with dedicated staff members rely upon their home departments for auxiliary support (I.T. assistance, accounts, etc.). As departmental staff are downsized or

administrative structures are clustered, we urge that adequate staffing levels are ensured and are equitable among graduate groups.