

**California Department of Food and Agriculture  
ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL**

**MEETING AGENDA**

Conference Room 133  
CA Department of Food and Agriculture Headquarters Building  
1220 N Street  
Sacramento, CA 95833  
(916) 654-0433

January 23, 2012  
1:00 PM to 4:00 PM

**Jeff Dlott, PhD, Chairman**

**Mike Tollstrup, Member**

**Brian Leahy, JD, Member**

**Ann Thrupp, PhD, Member**

**Don Cameron, Member**

**Louise Jackson, PhD, Subject Matter Expert**

**Daniel Mountjoy, PhD, Subject Matter Expert**

Amrith Gunasekara, PhD, CDFA Liaison

1. Introductions – Jeff Dlott
2. Meeting minutes from November 30, 2011 – Amrith Gunasekara
3. Ecosystem Services definition – Amrith Gunasekara and workgroup
  - Public comment
4. Future focus of panel – Jeff Dlott
  - Public Comment
5. Next meeting – Jeff Dlott
6. Adjournment

All meeting facilities are accessible to persons with disabilities. If you require reasonable accommodation as defined by the American with Disabilities Act, or if you have questions regarding this public meeting, please contact Tammy Sulli at (916) 654-0433.

<http://cdfa.ca.gov/Meetings.html>  
[http://www.cdfa.ca.gov/EnvironmentalStewardship/Meetings\\_Presentations.html](http://www.cdfa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html)

\*DRAFT\*

**CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA)  
ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL**

**2800 Gateway Oaks Drive, Room 101  
Sacramento, CA 95833**

**November 7, 2011**

**MEETING MINUTES**

**Panel Members**

Jeff Dlott, PhD, Chairman  
Ann Thrupp, PhD, Member  
Mike Tollstrup, Member  
Brian Leahy, JD, Member  
Don Cameron, Member  
Louise Jackson, PhD, Subject Matter Expert  
Daniel Mountjoy, PhD, Subject Matter Expert

**CDFA Staff**

Karen Ross, Secretary  
Amrith Gunasekara, PhD  
Michele Dias, General Counsel  
Casey Walsh Cady  
Maria Hicks  
Corinne Madison  
Nirmal Saini

**Interested Parties**

Candice Chow Gamboa, Environmental Defense Fund  
Carly Stockman, Kahn. Soares & Conway  
Dave Whitmer, County of Napa, Ag. Commissioner  
Diane Livia, Environmental Defense Fund  
Eric Holst, Environmental Defense Fund  
Jeanne Merrill, CA Climate Agriculture Network  
Kevin Abernathy, CA Dairy Campaign  
Margo Parks, CA Cattlemen's Association  
Noelle Cremers, CA Farm Bureau Federation  
Pablo Garza, Nature Conservancy  
Stacy Carlsen, County of Marin, Ag. Commissioner  
Paul Buttner, CA Rice Commission  
Tracy Schohr, CA Rangeland Conservation Coalition

**INTRODUCTIONS**

The meeting was called to order at 1:15 p.m. by Dr. Amrith Gunasekara. Introductions were made and a quorum was established.

**THE ENVIRONMENTAL FARMING ACT**

Dr. Gunasekara introduced the Environmental Farming Act and referenced the statute, stating that the Act allows the development of a science advisory committee (Food and Agricultural Code Sections 560 and 568). He then explained the purpose of the science advisory panel as specified by the Act. Additional information is available on the California Department of Food and Agriculture's (CDFA) website: <http://www.cdfa.ca.gov/EnvironmentalStewardship/Cannella.html>

**DRAFT BYLAWS**

Dr. Jeff Dlott, Chairperson, opened discussion on the proposed bylaws. Dr. Gunasekara stated that bylaws are adopted from statute. There was flexibility in establishing guidelines, quorums, and subcommittees.

Dr. Daniel Mountjoy requested clarification on sections 1.5 and 4.1; he stated that having the chairperson listed as the principal spokesperson and having the CDFA's Science Advisor listed as the official spokesperson seems contradictory. Ms. Michele Dias, CDFA's General Counsel stated that at convened meetings, Dr. Dlott is the official spokesperson. When a meeting is

not convened, Dr. Gunasekara is the official spokesperson. Dr. Gunasekara stated that CDFA will amend the proposed bylaws to clarify these two sections.

Dr. Ann Thrupp asked how CDFA notifies the public and asked if panel members can forward information to the public. Dr. Gunasekara stated that since the panel meetings are open to the public, information can be disseminated to the public. CDFA notifies the public by posting all media to the website and emailing interested public and stakeholders 10 days prior to a public meeting.

Dr. Mountjoy asked if the subject matter experts are official members. Ms. Dias stated the statute limits the amount of members on the panel, so they are not voting members.

**MOTION:** Mr. Don Cameron moved to approve the bylaws as amended. Dr. Ann Thrupp seconded and the motion passed unanimously.

### **BAGLEY-KEENE OPEN MEETING ACT AND PUBLIC REQUESTS ACT**

A copy of the Act was provided to members. Ms. Dias provided the panel with background on the Bagley-Keene Open Meeting Act and the California Public Requests Act (PRA). She stated that CDFA will ensure that the meeting and noticing requirements are met. She advised the panel to be familiar with certain parts of the Act, such as remembering that anytime a quorum is present, it is considered an official public meeting. Due to PRA requirements, any communication discussing panel business can be requested by anyone. Discussion ensued regarding the requirements of these Acts.

### **ECOSYSTEM SERVICES**

CDFA Secretary Karen Ross stated that this panel has been authorized under California statute for approximately 15 years, and it has taken over one year to activate this panel. She thanked the panel for their time and participation. Secretary Ross stated she would like for the panel to look at key issues including: (a) assigning value to those intangibles that come from working landscapes, (b) creation of yet another revenue stream for farmers through Ecosystem Services, (c) recognition of farmers in rural areas for the services they are providing and, (d) opportunities for regulatory certainty. Secretary Ross stated that all panel members have considerable expertise, and she is really excited that they are willing to provide their scientific expertise and practical on-the-ground farming experience.

#### **i. Amrith Gunasekara – Ecosystem Services Presentation**

Dr. Gunasekara presented information to the panel on Ecosystem Services - he noted that it will be useful for CDFA to define Ecosystem Services in relation to agriculture. The definition should be easy to comprehend for the general public and applicable to the field-grower level so the benefits offered by agriculture can be recognized, thoughtful, and meaningful in order to be used in public policy discussions and the regulatory arena. The Ecosystem Services definition is broadly defined as valued services people get from nature. Numerous applications of Ecosystem Services were discussed. The Millennium Assessment Report has defined Ecosystems Services as benefits people obtain from ecosystems.

**ii. Dr. Thrupp – Ecosystem Services Presentation**

Dr. Thrupp presented information on Ecosystem Services in agriculture to the panel. She stated that many farmers are unfamiliar with the concept of Ecosystem Services but there is scientific literature in this field to recognize the potential and benefits that agriculture can provide. Dr. Thrupp explained current initiatives and how to measure and value ecosystems services. She would like Ecosystem Services to go from a concept to reality.

The meeting consisted of presentations by invited speakers from the Environmental Defense Fund, California Farm Bureau, California Rice Commission, and the Nature Conservancy. The invited speakers discussed how the term “Ecosystem Services” has been used in their respective organizations.

**INVITED SPEAKER PRESENTATIONS**

Mr. Eric Holst stated the Environmental Defense Fund is dedicated to finding ways to create a better balance and delivery of Ecosystem Services on America’s lands. Ecosystem Services focuses on multiple benefits, versus a single benefit. Multiple benefits provide a different perspective of looking at the working landscape. Mr. Holst stated that Ecosystem Services provides services for food and fiber, but can also be the right place for providing provisions or services. This panel is charged with helping California agriculture and getting every farmer to think about how to provide a balanced flow of Ecosystem Services and how to get rewarded for such actions. He recommended the panel should create a strategic plan with a balanced flow.

Mr. Paul Buttner stated that the California Rice Commission (Commission) has been engaged in building Ecosystem Services. The rice industry has water quality control programs for reducing discharges in rivers. The concept of wildlife habitats have become a significant investment over the last 10 years. He noted the Commission made very good strides in 2002 with the creation of the Conservation Security Program. In 2008, it was changed to the Conservation Stewardship Program. The Commission has been working with the Migratory Bird Conservation Partnership for the past four or five years. Annual reports are published at [calrice.org](http://calrice.org). Mr. Buttner stated he would define Ecosystem Services as a creation for a modest revenue stream for environmental benefit.

Ms. Noelle Cremers stated that she works on several wildlife specific issues for the California Farm Bureau Federation (Bureau), including natural resources. Several of the Bureau’s members do not have any understanding of Ecosystem Services. She noted that there needs to be a lot more discussion or consider different terminology. The California Rangeland Conservation Coalition, in partnership with Defenders of Wildlife and the California Cattlemen’s Association, recently conducted a survey of California ranchers about this issue, specifically why and how markets should be developed. When the ranchers understood what Ecosystem Services meant, over 75 percent were interested. Participants were most willing to enter into a contract with a non-governmental organization. If programs can be created that are voluntary, there appears to be much more interest in participating. There are farms and ranches that have created mitigation banks which are an Ecosystem Service that people are capitalizing on as a market. It is not a simple process for most farmers to go through as there are significant

regulatory hurdles. She noted it would be beneficial if the panel could assist in determining ways to provide value to the farmer.

Mr. Pablo Garza stated that the Nature Conservancy (Conservancy) has been working on Ecosystem Services for approximately five years. The Conservancy is using the Millennium Ecosystem Assessment definition that states multiple benefits can be received from one place. He noted the idea of Ecosystem Services has been thought about for over 100 years. Ecosystem Services overlaps with biodiversity. California is the number one agricultural state in terms of value of production. The Conservancy divided up some of the places they thought deserved attention in California and the data showed three different types of Ecosystem Services that dominate. This assisted the conservancy to think about future work with respect to Ecosystem Services.

He stated that if “markets” are developed, a high-degree of accuracy is necessary. Regulatory systems affect markets and create opportunities. The term “Ecosystem Services” was one of the least popular names in a focus group describing this issue. The most popular term was “Natures Benefits.” Farmers and ranchers do several things for which they should receive compensation. The other issue that has not been mentioned today is food safety. Food safety will reduce opportunities to do things related to Ecosystem Services. Things described as benefits by some are seen by others as risks.

Dr. Dlott asked the presenters to sum up their presentations by stating how this panel can contribute to the discussion on Ecosystem Services.

Ms. Cremers stated bringing people together and informing different agencies is valuable.

Mr. Buttner stated there can be a linkage between something that people want to accomplish and public policy. Such a linkage does not exist at the state level.

Mr. Holst stated it would be beneficial if there was a single source for understanding the supply of Ecosystem Services. There is a need to prove to entities that Ecosystem Services are valuable.

Ms. Casey Walsh Cady provided the panel with an update from the California Roundtable on Ag and the Environment (CRAE). She will be the liaison between this panel and CRAE. CRAE works at the policy level; it is an alliance of farm groups, environmental organizations, labor organizations, and state and federal agricultural and environmental agencies. The idea of Ecosystem Services has become an important topic for CRAE to discuss. Starting this year, CRAE identified Ecosystem Services as a powerful tool for supporting agriculture. Additional information regarding CRAE can be found at: <http://aginnovations.org/roundtables/crae/>

Dr. Mountjoy asked if this panel is duplicating efforts by CRAE.

Ms. Cady stated CRAE is working on the policy side of this issue, but not from the same scientific perspective as this panel. CRAE is looking at innovative market solutions to reward agriculture for the Ecosystem Services it provides which will tie into what the panel may do in the future.

Time for public comment was provided. There was discussion on CRAE.

**FREP DATABASE UPDATE**

Dr. Gunasekara stated that CDFA's Fertilizer Research and Education Program (FREP) is working towards making technical data more available by creating a user-friendly online database for growers.

**FUTURE FOCUS OF PANEL**

Due to time constraints, this item was not discussed. This agenda item will be discussed at the next meeting.

**DISCUSSION AND DIRECTION FOR NEXT MEETING**

The panel formed a working group (lacking a quorum) to define Ecosystem Services. The definition will be presented at the next meeting for consideration. Members of the working group include Dr. Thrupp, Mr. Leahy, Mr. Tollstrup, and Dr. Jackson (Subject Matter Expert).

**NEXT MEETING DATE AND TIME**

The next meeting will be in approximately two months. Dr. Dlott adjourned the meeting at 4:15 p.m.

Respectfully submitted by:

\_\_\_\_\_  
Amrith Gunasekara, Ph.D.

\_\_\_\_\_  
Date

## **Proposed Ecosystem Services Definitions for Consideration and Adoption by EFA SAP**

### **Technical definition as proposed by EFA SAP Definitions Working Group**

**Ecosystem services are the benefits that people obtain from ecosystems (MEA, 2005). Agriculture offers many ecosystem services which are known as agroecosystem services. These consist of the benefits that people obtain from farming and ranching. The benefits include the biodiversity of species, conditions and processes pertaining to farming systems that impact not only agricultural production but also the broader environment and society (Daily, 1997).**

MEA. 2005. Millennium Ecosystem Assessment. Ecosystems and Human Well-being. Synthesis. Island Press, Washington, DC.

Daily, G. 1997. Introduction: What are ecosystem services?. In Nature's Services: Societal Dependence on Natural Ecosystems, G. C. Daily (ed.), Island Press, Washington DC.

### **Non-technical definition for growers/ranchers/public**

**In agriculture, an “ecosystem service” is defined as a benefit we gain from farming and ranching. Farms and ranches feed a growing global population and provide clothing, recreational opportunities, wildlife habitat and a wealth of additional environmental benefits. Below are examples of important environmental benefits provided by ecosystem services.**

### **Alternative Non-technical definition for growers/ranchers/public**

**In agriculture, ecosystem services are defined as the multiple benefits we gain from farming and ranching including crop production. In addition to valuable open space and wildlife habitat, the management decisions and conservation practices of farmers and ranchers also enhance environmental quality and provide recreational opportunities. Below are examples of important environmental benefits provided by ecosystem services.**

**Examples of important environmental benefits provided by farms and ranches (Costanza et al., 1997):**

- **Wildlife Habitats (Costanza et al., 1997; Stallman, 2011; Jedlicka et al., 2011)**
  - Provide habitats for resident and transient wildlife populations
- **Nutrient cycling (Costanza et al., 1997; Stallman, 2011; Sandhur et al., 2010)**
  - Provide nutrient storage and cycling
- **Food, fiber, fuel production (Costanza et al., 1997; Stallman, 2011; Sandhur et al., 2010; Swinton et al., 2007)**
  - Provide food, fiber, and fuel to sustain a growing global population
- **Recreation (Costanza et al., 1997; Stallman, 2011; Sandhur et al., 2010)**
  - Provide opportunities for recreational activities
- **Soil structure, formation, and fertility (Stallman, 2011; Sandhur et al., 2010; Swinton et al., 2007; Dale and Polasky, 2007)**
  - Provide opportunities for enhancing the soil system, promotes organic matter buildup/carbon sequestration, and prevent disturbances
- **Biodiversity conservation (Stallman, 2011; Swinton et al., 2007;)**
  - Promote biodiversity
- **Water cycling (Stallman, 2011)**
  - Maintain soil moisture and regulate water movement/cycling
- **Atmospheric gas/climate regulation (Sandhur et al., 2010)**
  - Regulate atmospheric chemical composition.
- **Pest control (Sandhur et al., 2010; Jedlicka et al., 2011; Dale and Polasky, 2007)**
  - Control pests and weeds by natural enemies and weed seed predators, respectively
- **Pollination services (Swinton et al., 2007)**
  - Contribute to fruit, nut, and vegetable production

- Stallman, H. R. 2011. Ecosystem services in agriculture: determining suitability for provision by collective management. *Ecological Economics*, 71: 131-139.
- Sandhur H. S., Wratten S. D., Cullen R. 2010. Organic agriculture and ecosystem services. *Environmental Science and Policy*. 13:1-7.
- Jedlicka J. A., Greenberg R., Letourneau D. K. 2011. Avian conservation practices strengthen ecosystem services in California vineyards. *PloS ONE*. 6: e27347. doi: 10.1371/journal.pone.0027347.
- Swinton S.M., Luip F., Robertson G.P., Hamilton S.K. 2007. Ecosystem services and agriculture: cultivating agricultural ecosystems for diverse benefits. *Ecological Economics*. 64: 245–252.
- Dale V.H., Polasky S. 2007. Measures of the effects of agricultural practices on ecosystem services. *Ecological Economics*. 64: 286–296
- Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R. V., Paruelo, J., Raskin, R. G., Sutton, P., Van den Belt, M. 1997. The value of the world's ecosystem services and natural capital. *Nature*. 387: 253-260.



# ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL

## Ecosystem Services Definitions

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January 18, 2012

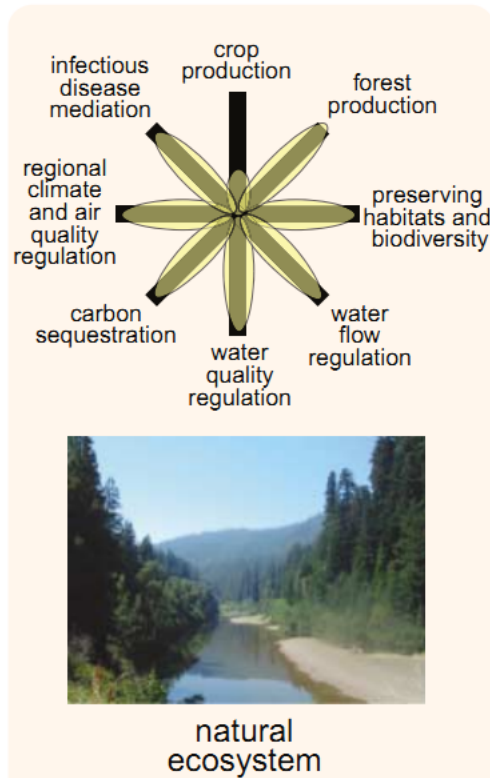
CDFA

Sacramento, CA

Amrith Gunasekara  
Science Advisor to the Secretary

# Definition - Background

- Ecosystem Services is an Ecology principal
- Benefits humans obtain from ecosystems (nature/environment)
- Ecosystem Services has quantitative measures associated

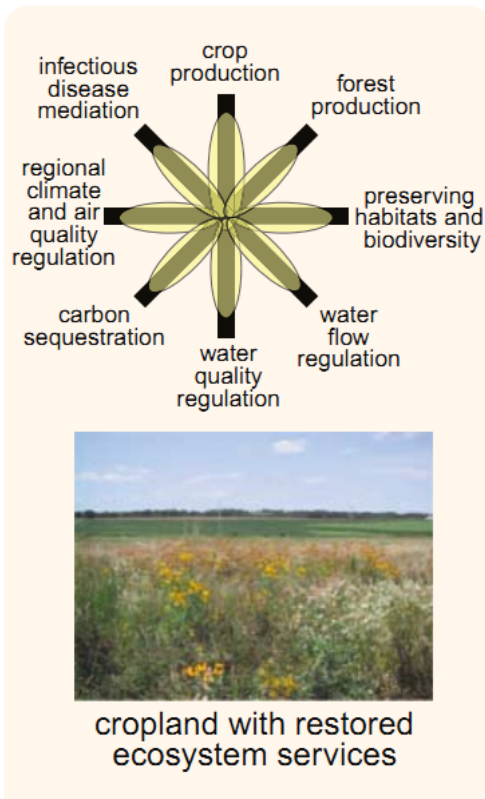


Quantitative Measures:

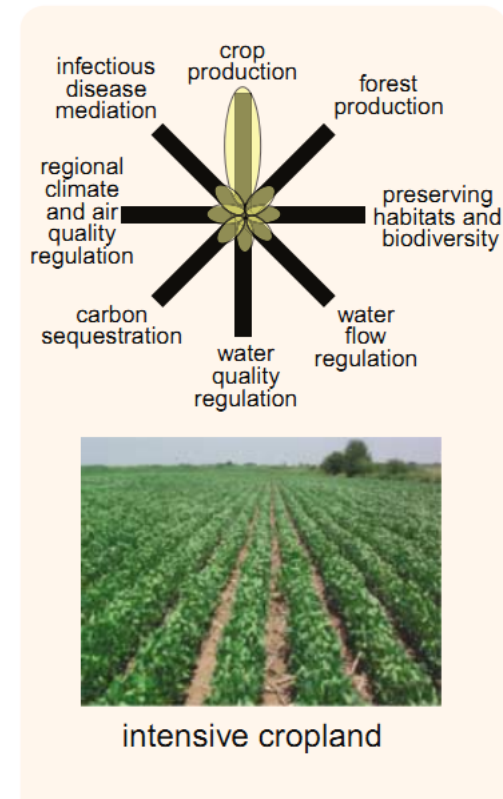
- Recreation  
# of visitors to a national park  
(Larsen et al., 2008)
- Biodiversity data  
Number of species  
(Larsen et al., 2008)
- Carbon Storage  
CO<sub>2</sub> emissions  
(Chan et al., 2006)

# Definition - Background

## Agriculture with Ecosystem Services



## Agriculture

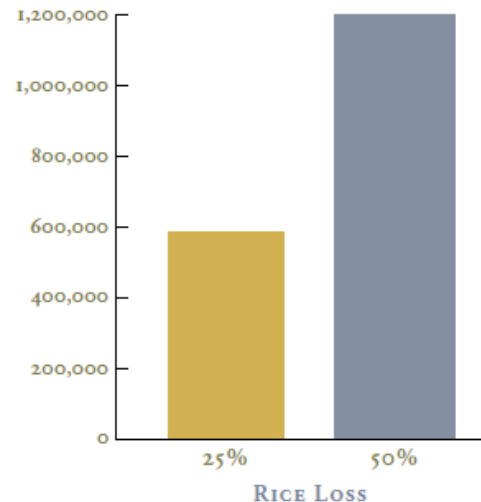


# Definition - Requirements

- Need to establish a definition for Ecosystem Services in terms of agriculture = foundation
- Definition needs to be understood by growers/ranchers and the general public since CDFA is a public service agency



RICE LOSS & DUCK POPULATION



*A 25 percent loss of rice acreage would reduce the capacity to support duck populations by about 600,000 birds. A 50 percent loss would double that figure to 1.2 million ducks.*

# EFA SAP Work Group

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- EFA SAP created working group @ November 30, 2011 meeting
  - Working group tasked with defining Ecosystem Service benefits from agriculture
  - Working group met on December 5, 2011
  - Working group members;
    - Mike Tollstrup
    - Brian Leahy
    - Dr. Ann Thrupp
    - Dr. Louise Jackson (Subject matter expert)

# Proposed Technical Definition

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## Technical definition as proposed by EFA SAP Definitions Working Group

Ecosystem services are the benefits that people obtain from ecosystems (MEA, 2005). Agriculture offers many ecosystem services which are known as agroecosystem services. These consist of the benefits that people obtain from farming and ranching. The benefits include the biodiversity of species, conditions and processes pertaining to farming systems that impact not only agricultural production but also the broader environment and society (Daily, 1997).

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# Proposed Non-Technical Definitions

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## Non-technical definition for growers/ranchers/public

In agriculture, an “ecosystem service” is defined as a benefit we gain from farming and ranching. Farms and ranches feed a growing global population and provide clothing, recreational opportunities, wildlife habitat and a wealth of additional environmental benefits. Below are examples of important environmental benefits provided by ecosystem services.

In agriculture, ecosystem services are defined as the multiple benefits we gain from farming and ranching *including crop production. In addition to valuable open space and wildlife habitat, the management decisions and conservation practices of farmers and ranchers also enhance environmental quality and provide recreational opportunities.* Below are examples of important environmental benefits provided by ecosystem services.

# Example List (1)

**Wildlife Habitats** (Costanza et al., 1997; Stallman, 2011; Jedlicka et al., 2011)

**Provide habitats for resident and transient wildlife populations**

“Between 3 million and 6 million waterfowl, or about 20 percent of waterfowl wintering in North America and 60 percent of those wintering in the Pacific Flyway, winter in the Central Valley each year (Reid and Heitmeyer, 1995).”



Lundberg Family Farms



Shorebirds such as the Long-billed Curlew thrive in California ricelands.



Like ducks, Tundra Swans derive food and habitat from rice fields.



# Example List (2)

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**Nutrient cycling** (Costanza et al., 1997; Stallman, 2011; Sandhur et al., 2010)  
**Provide nutrient storage and cycling**

Buffer along rangeland in Sonoma County, CA.



Fullbelly Farms near Davis

# Example List (3)

Food, fiber, fuel production (Costanza et al., 1997; Stallman, 2011; Sandhur et al., 2010; Swinton et al., 2007)



<http://www.californiastrawberries.com/>

<http://www.energy.ca.gov/2007publications/CEC-999-2007-012/CEC-999-2007-012.PDF>

<http://www.almondboard.com/FoodProfessionals/TechnicalInformation/Pages/GreenAlmonds.aspx>



# Example List (4)

Recreation (Costanza et al., 1997; Stallman, 2011; Sandhur et al., 2010)

Provide opportunities for recreational activities



# Example List (5)

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**Pollination services** (Swinton et al., 2007)

**Contribute to fruit, nut, and vegetable production**



<http://www.almondboard.com/Consumer/AboutAlmonds/Pages/default.aspx>

[http://www.sustainablewinegrowing.org/certifiedparticipant/5/Fetzer\\_Vineyards\\_Bonterra\\_Vineyards.html](http://www.sustainablewinegrowing.org/certifiedparticipant/5/Fetzer_Vineyards_Bonterra_Vineyards.html)

<http://www.benziger.com/>

# Recommendations to Panel

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- Beneficial for CDFA to have a technical and non-technical definition
- Panel may choose one technical definition, for conversations with other sister agencies (Resources Agency), and one non-technical definition, for the general public and growers/ranches

Ecosystem Services Example List (10)

# Proposed Technical Definition

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# Questions

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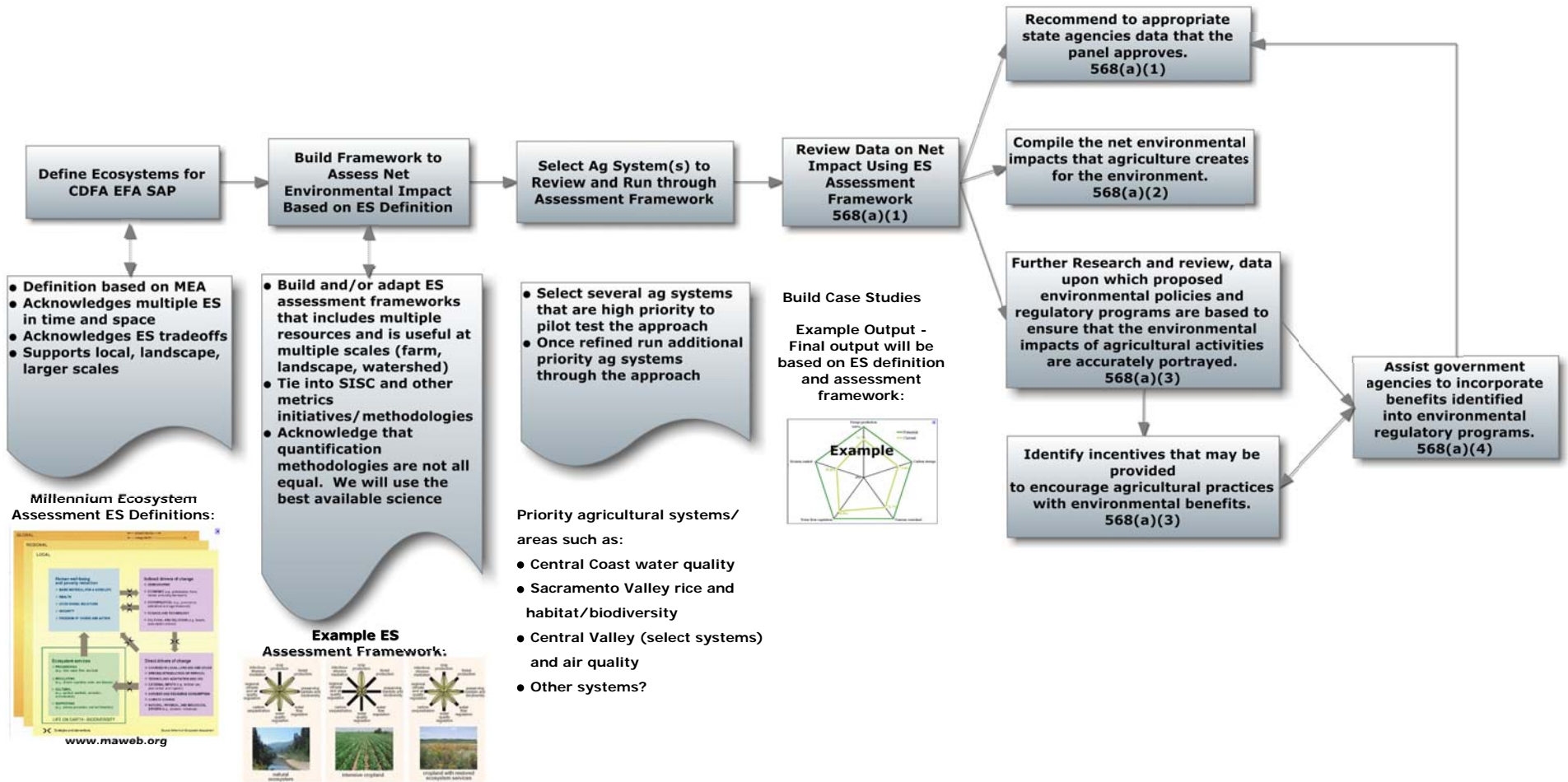
## References

- Foley J.A. et al. 2005. Global consequences of land use. *Nature*. 309: 570-574.
- Chan K.M.A. et al. 2006. Conservation planning for ecosystem services. *PloS Biology*. 11 (e379): 2138-2152.
- Larsen F.W. et al. 2008. A quantitative analysis of biodiversity and the recreational value of potential national parks in Denmark. *Environ. Manage.* 41: 685-695.
- Petrie M. and Petrik K. Assessing waterbird benefits from water use in California ricelands. California Rice Commission, Sacramento, CA. 2010.

Comprehensive list of references provided on handout



DRAFT: CDFA Environmental Farming Act Science Advisory Panel Strategic Plan and Execution Framework



# ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL

## Future Direction and Focus

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January 18, 2012  
CDFA  
Sacramento, CA

Jeff Dlott, Ph.D.  
Chair

# Building a Road Map for EFA SAP

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- Designing an approach to guide the work of the EFA SAP
  - Meets the Act's multiple objectives
  - Supports CDFA goals
  - Establishes an understandable, transparent and science-based process and associated tools

# Addressing the Act's Objectives

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- The EFA includes the following objectives for the SAP:
  - **Recommend to appropriate state agencies data that the panel approves**
    - ✦ Addresses Food and Agriculture Code **568 a 1**

# Addressing the Act's Objectives

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- The EFA includes the following objectives for the SAP:
  - Recommend to appropriate state agencies data that the panel approves
    - ✦ Addresses Food and Agriculture Code **568 a 1**
  - **Compile information on the net environmental impacts that agriculture creates for the environment**
    - ✦ Addresses Food and Agriculture Code **568 a 2**

# Addressing the Act's Objectives

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- The EFA includes the following objectives for the SAP:
  - Recommend to appropriate state agencies data that the panel approves
    - ✦ Addresses Food and Agriculture Code **568 a 1**
  - Compile information on the net environmental impacts that agriculture creates for the environment
    - ✦ Addresses Food and Agriculture Code **568 a 2**
  - **Research and review, data upon which proposed environmental policies and regulatory programs are based to ensure that the environmental impacts of agricultural activities are accurately portrayed**
    - ✦ Addresses Food and Agriculture code **568 a 3**

# Addressing the Act's Objectives

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  - Recommend to appropriate state agencies data that the panel approves
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    - ✦ Addresses Food and Agriculture Code **568 a 2**
  - Research and review, data upon which proposed environmental policies and regulatory programs are based to ensure that the environmental impacts of agricultural activities are accurately portrayed
    - ✦ Addresses Food and Agriculture code **568 a 3**
  - **Identify incentives that may be provided to encourage agricultural practices with environmental benefits**
    - ✦ Addresses Food and Agriculture code **568 a 3**

# Addressing the Act's Objectives

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  - Recommend to appropriate state agencies data that the panel approves
    - ✦ Addresses Food and Agriculture Code **568 a 1**
  - Compile information on the net environmental impacts that agriculture creates for the environment
    - ✦ Addresses Food and Agriculture Code **568 a 2**
  - Research and review, data upon which proposed environmental policies and regulatory programs are based to ensure that the environmental impacts of agricultural activities are accurately portrayed
    - ✦ Addresses Food and Agriculture code **568 a 3**
  - Identify incentives that may be provided to encourage agricultural practices with environmental benefits
    - ✦ Addresses Food and Agriculture code **568 a 3**
  - **Assist government agencies to incorporate benefits identified into environmental regulatory programs**
    - ✦ Addresses Food and Agriculture code **568 a 4**



# Draft Goals

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- Recognize environmental value in agriculture
- Create potential additional sources of revenue and recognition for working landscapes
- Assist in creating regulatory certainty for farmers and ranchers

# Proposed Process and Tools

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**Define Ecosystem Services (ES) for the Environmental Farming Act Science Advisory Panel (EFA SAP)**



# Proposed Process and Tools

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Define Ecosystem Services (ES) for the Environmental Farming Act Science Advisory Panel (EFA SAP)



**Build/Adapt an ES assessment framework based on the ES definition**

# Proposed Process and Tools

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Define Ecosystem Services (ES) for the Environmental Farming Act Science Advisory Panel (EFA SAP)



Build/Adapt an ES assessment framework based on the ES definition



**Work with CDFA to select high priority agricultural systems to pilot approach**



# Proposed Process and Tools

---

Define Ecosystem Services (ES) for the Environmental Farming Act Science Advisory Panel (EFA SAP)



Build/Adapt an ES assessment framework based on the ES definition



Work with CDFA to select high priority agricultural systems to pilot approach



**Review data using the ES assessment framework**



# Proposed Process and Tools

---

Define Ecosystem Services (ES) for the Environmental Farming Act Science Advisory Panel (EFA SAP)



Build/Adapt an ES assessment framework based on the ES definition



Work with CDFA to select high priority agricultural systems to pilot approach



Review data using the ES assessment framework



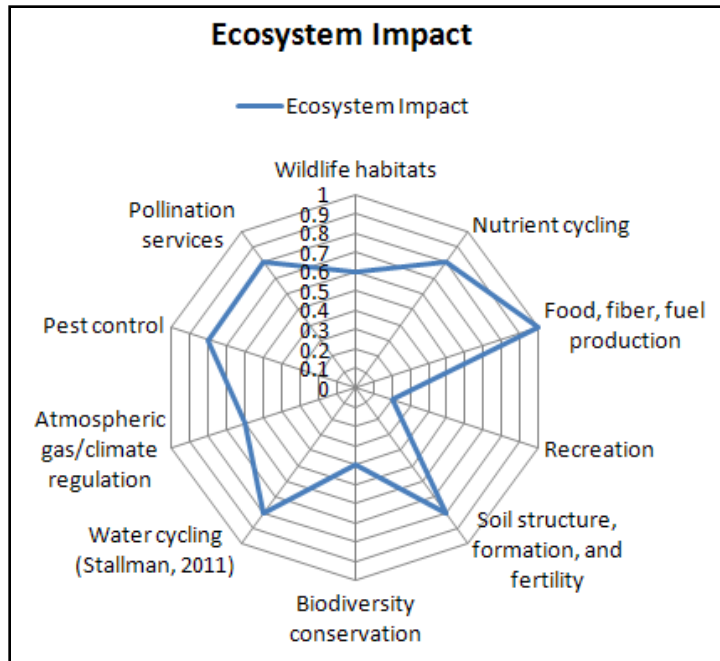
**Use the results for the EFA SAP multiple objectives**

# Proposed Process and Tools

Define Ecosystem Services (ES) for the Environmental Farming Act Science Advisory Panel (EFA SAP)



## Build/Adapt an ES assessment framework based on the ES definition



*Example Only*

- Confirm Ecosystem Services assessed
- Use, adapt or develop measure methods
  - Stewardship Index for Specialty Crops
  - Field to Market
  - Others

# Proposed Process and Tools

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Define Ecosystem Services (ES) for the Environmental Farming Act Science Advisory Panel (EFA SAP)



Build/Adapt an ES assessment framework based on the ES definition



**Work with CDFA to select high priority agricultural systems to pilot approach**

- Select several systems to pilot test approach such as:
  - Sacramento Valley Rice Systems
  - Central Valley and Water Quality
  - Others



# Proposed Process and Tools

Define Ecosystem Services (ES) for the Environmental Farming Act Science Advisory Panel (EFA SAP)



Build/Adapt an ES assessment framework based on the ES definition



Work with CDFA to select high priority agricultural systems to pilot approach

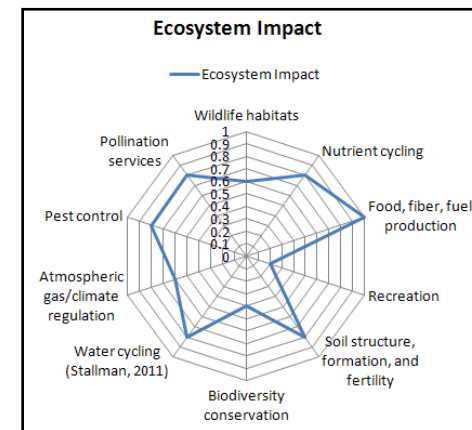
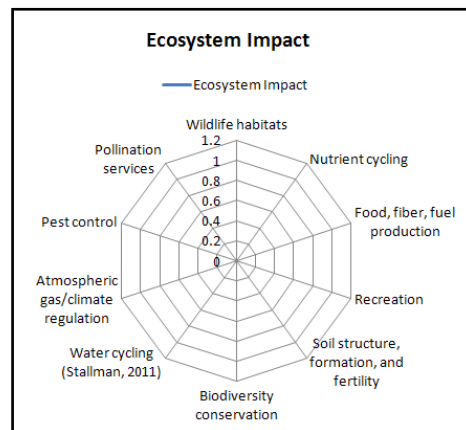


## Review data using the ES assessment framework

Run through assessment

Generate results

Review Data



# Proposed Process and Tools

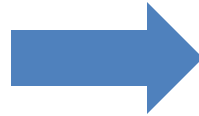
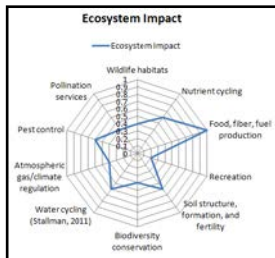
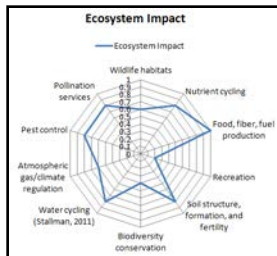
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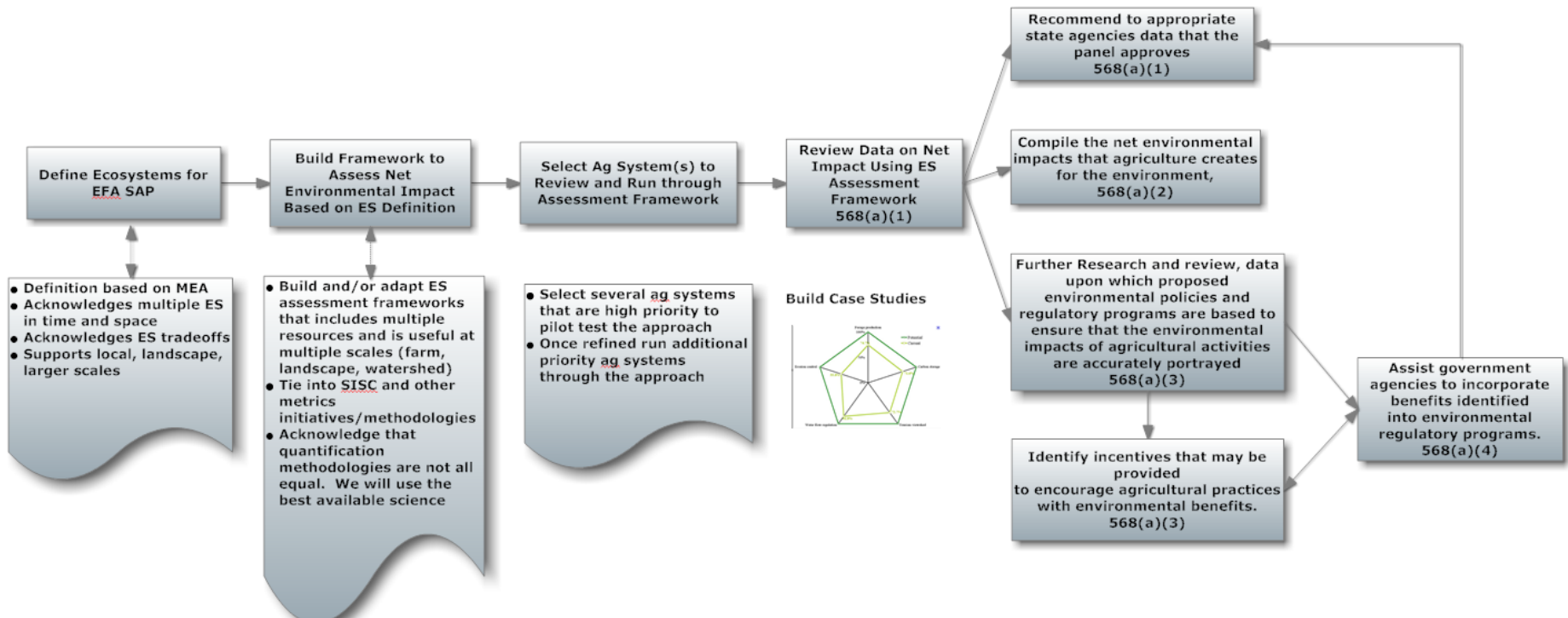
Review data using the ES assessment framework

**Use the results for the EFA SAP multiple objectives**



- EFA SAP Objectives
  - Food and Agriculture Code:
    - 568 a 1
    - 568 a 2
    - 568 a 3
    - 568 a 4

# Summary of Proposed Process and Tools



# Questions, Comments and Next Steps

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- Designing an approach to guide the work of the EFA SAP
  - EFA's SAP multiple objectives
  - Goals
  - Process and tools
- Next Steps
  - Recommendations to proceed