



California Protected  
Areas Database

CPAD PROJECT WORKING PAPER

## REVIEW OF PROTECTED AREAS DATABASES

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## SUMMARY

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The California Protected Areas Database (CPAD) is a statewide inventory of parks and other protected open lands owned by agencies and organizations for the purpose of maintaining these open space uses (see [www.CALands.org](http://www.CALands.org) for more information). In late 2012, GreenInfo Network, the originator of CPAD, began a two year project to improve this data set, with funding support from the California Strategic Growth Council through the USGS Gap Analysis Program. This report is one of a series being issued through this project.

The purpose of this memo is to extract from these reviews of others' data designs and practices key lessons that can inform future directions for the development of CPAD.

Key findings are:

1. Prior data gathering efforts on protected lands in California are all too old for useful comparison. However, the most recent of these (PCTL) took a general approach that is consistent with CPAD, though it included some types of lands not in CPAD (military, tribal, now in separate datasets).
2. Few other states have comprehensive, integrated inventories of protected areas. Compared with those that do, CPAD is very similar in structure, attributes and base alignment (parcels). Many other states maintain protected areas data primarily to support habitat conservation assessment and use data structures appropriate for that purpose, but not easily adapted to many other purposes.
3. CPAD is generally consistent with the national inventory, PAD-US (USGS), though PAD-US is not yet primarily focused on ownership as a starting point (it also includes lands that are subject to certain management categories, even if private). CPAD is the California element of PAD-US, although some of these other categories of lands have been added by USGS for its biodiversity rank-focused product. PAD-US is beginning assessment of its basic approach and may be shifting to a CPAD-like framework in the coming years.
4. The global data set on protected areas is not a useful comparison to CPAD as it only contains selected elements of California's protected lands.
5. CPAD still needs major improvements to become more reliable and useful, particularly in spatial and attribute accuracy, source agency coordination and basic coverage of all protected land polygons.

## I. INTRODUCTION

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The California Protected Areas Database (CPAD ) is the most extensive statewide GIS inventory of park and open space lands in the continental United States. The size, landscape variation and jurisdictional complexity of the state are great and the data framework required to integrate all these elements must be similarly robust.

Any data project, however, benefits greatly by being assessed in relation to similar other efforts. This report looks at four types of these:

- 1) Other similar data within California
- 2) Statewide databases in selected other states
- 3) The Protected Areas Database of the United States (PAD-US)
- 4) Global Protected Area Database - WDPA

In order to place these in perspective, the report starts with a review of the dimensions and history of CPAD.

The purpose of this memo is to extract from these reviews of others' data designs and practices key lessons that can inform future directions for the development of CPAD.

## II. An Overview of CPAD

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CPAD is designed to provide highly accurate boundary and attribute information on lands protected for open space uses. Key characteristics:

- Contains land owned in fee by public agencies and certain nongovernmental associations – a related database, the CPAD-Easement Edition, covers lands secured under conservation easements
- Land is dedicated to any of a wide range of open space uses (i.e., not a military base or a sewage treatment plant, etc. – can be a park, a national forest, a wetland preserver or any of many other open space uses, though sites may have developed areas incidental to the open space use)
- Includes holdings ranging from small urban parks to large wilderness areas, in order to support wide range of users
- Defines owner and manager (if any) as separate data attributes

### CPAD DATABASE DESIGN AND STRUCTURE

Technically, CPAD is organized around three levels of ownership delineation. CPAD primarily uses assessor parcels to define these ownership boundaries.

1. Holdings: the most basic level, equivalent to parcels of ownership, though not all CPAD holdings have all interior parcel ownership lines
2. Units: aggregations of holdings under a common name (“Mt. Diablo State Park”), within a single county
3. Super Units: aggregations of holdings under a common name without regard to county boundaries (Units and Super Units are primarily used for cartography but may be used for some types of analysis)

CPAD also includes data on access levels of holdings – whether they are open to public use without restriction; require a permit for use; or are closed to public use. CPAD does not have biodiversity ranking scores (gap ranks), but a process is underway to create a derivative product with that ranking, in collaboration with the USGS Gap Analysis Program.

Much more detail on CPAD data structure is available in the database manual at [www.calands.org](http://www.calands.org).

## **DATA COVERAGE/QUALITY**

As of early 2013, CPAD included the following:

- 48,159,007 total acres (fee ownerships)
- 13,554 Super Units (parks under common name/owner)
- 55,486 Holdings (individual parcels of protected lands)
- 981 Owning agencies (governmental, non-profit and some private)
- 100 Largest land owning agencies/organizations have 99% of all CPAD acres
- Other 800+ agencies have 65% of the number of parks/preserves (many of these are cities and local park districts)

While precise numbers are not possible to provide, GreenInfo estimates that the latest (March 2013, v1.9 release) CPAD includes well over 95 percent of all fee-owned protected areas in California – that actual coverage is probably closer to 99 percent.

The data quality of CPAD data is described in a separate memo, but in general, CPAD is widely aligned to assessor parcels, particularly in metropolitan regions – rural areas are more complex, as assessor parcels are not always accurate in these areas. The most recent release of CPAD and subsequent editing has corrected many legacy issues (some stemming from when CPAD data had to be digitized from USGS quad maps), to the point where current data is almost all of high standard.

## **EXTERNAL REVIEWS**

Prior to initiating this project in late 2012, the State of California CERES program asked several state agencies to review CPAD as it existed in mid-2011, with responses coming from Calif. Dept. of Fish & Wildlife and CAL FIRE. Details on those survey results and narrative responses to points made are included in the appendix to this report.

Highlights from points made:

- Protocols for following source agency data in creating CPAD features and attributes
- How to integrate Dept. of Defense (DoD) and BIA lands with CPAD (to create a more complete publicly owned land dataset)
- How to integrate or account for recreation or wilderness designations of protected lands
- Whether CPAD needs the complete list of then-current data fields, including a need to review utility of land/water designations

Other comments involved metadata, need for better parcel data and other less significant factors. GreenInfo assessment of and recommendations on all these items will be made in the CPAD Design report, being prepared separately.

## **DIRECTIONS**

Through late 2012 grant support from the Strategic Growth Council, GreenInfo Network has been able to initiate a 20-month program of improving CPAD data and structure, better engage users and develop recommendations for ongoing support of CPAD. See other reports from this project for specific directions.

In terms of data quality, GreenInfo continues to parcel align data, review agency data records for needed updates and otherwise correct missing parks and preserves, and extend key attributes (such as agency manager) to more records.

## **IMPLICATIONS FOR CALIFORNIA**

While not without needs for improvement in accuracy, source agency data coordination and other aspects, CPAD is the most extensive statewide protected areas database in the United States. In terms of acres inventoried, extent of accuracy and number and type of agencies covered, it far exceeds any other state's related database. All of this means that agencies, organizations, businesses and even citizens in California can have access to an almost complete inventory of parks and other open lands for use in a wide range of planning, program and other purposes.

### III. PCTL - California Public Conservation Trust Lands

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PCTL was developed by the Resources Agency in the early 2000s as a statewide data inventory of protected areas, primarily focusing on federal, state and large regional or other local holdings, including some easements. For its time and the resources available to develop it, it was an excellent effort and was actively used in the development of CPAD to focus data gathering and review.

PCTL was last published in 2005 and is a legacy data set, as it was not further developed from that time. In PCTL documentation language:

The State of California's Public, Conservation and Trust Lands (PCTL) GIS data layer has been developed to identify lands that are held in the public interest for conservation of natural resources purposes. Lands owned in fee title by federal, state, and local governments as well as conservation lands owned by Non Governmental Organizations (NGO's) are currently included. The PCTL data layer is critical to departments and programs within the California Resources Agency, including the California Legacy Project, and to the State and Federal government GIS user community. The data are used to identify public ownership and identify protected lands, as well as to serve a host of other more general uses such creating maps, deriving other data sets, and conducting analysis on a statewide basis.

Attributes in PCTL are basic, including site name, and codes for owning and managing agencies.

PCTL was preceded by two GIS data development and maintenance efforts:

1. A GIS data set representing publicly owned lands initially developed by the California Department of Forestry and Fire Protection that was later maintained and enhanced by the Teale Data Center GIS Lab (now closed); and,
2. A GIS data set ("GOVINT" – Government Interests) intended to be a major revision to the Teale public lands data set that was initiated by the U.S. Bureau of Reclamation to support analysis and mapping for the CalFed program, and focused primarily on State and Federal ownership.

Both of these datasets – along with PCTL – are legacy data at this point, not useful for any current GIS data uses.

## PCTL DATA STRUCTURE

PCTL was developed in four iterations from 2003-2005. It was a 1:100,000 polygon features class with a set of 15 primary attributes:

Field	Description
OBJECTID	Internal feature number.
PROPID	Unique identifier for each property/feature in the data layer, used as a primary key to line to detailed property information.
PROPNAME	Commonly used name for property, if it exists.
ADMINAREA	Name of administrative area that property is part of, if it exists.
OWNERCODE	Agency or group that possess PRIMARY ownership rights to the property.
ABBRVCODE	Accepted abbreviation for primary owning entity.
MNGRCODE	PRIMARY managing group or agency for property.
UPDTPDATE	Date that the feature was last updated/edited within the ownership dataset.
SRCCODE	Numeric code indicating the source for the data.
MAINCODE	Categorization indicating general administrative level of owning entity.
SRC_JOINID	ID number or code to link back to the source dataset.
RCRDDATE	Date that property transaction was recorded with the county assessor.
GISDATE	Date that property was mapped into the source.
OWNGRPCODE	Generalized ownership code for cartographic purposes.

## COMPARISON WITH CPAD

The 2005 version of PCTL compared with the 2012 version of CPAD shows this comparison:

FACTOR	PCTL 2005	CPAD 2012
Acres included*	46,600,000	49,000,000
Holdings	39,500	51,000
Agencies	107	900

\*Does not include 4 million acres of Dept. of Defense lands, for more accurate comparison with CPAD

The main differences between CPAD and PCTL are:

- PCTL included primarily the largest landowning agencies, and relatively few local agencies
- It also included military and other public lands that were not primarily open space sites
- It was not able to be based significantly on parcel aligned geometry
- Easements were intermixed in the data set (an advantage at one level, but ultimately disadvantageous)
- PCTL did not indicate public access levels and had relatively few data management attributes
- PCTL was not build on a holdings-units relational framework

## PCTL DIRECTIONS

As noted above, PCTL is a legacy data effort at this point and since 2005, no longer active. However, PCTL did develop an interesting design document for possible future uses in 2004 (“California Public Lands Geodatabase: A Collaborative Statewide Data Maintenance Process”, Resources Agency, June 25, 2004). This report proposed a system for key state agencies to submit lands data to an integrated common database. While thoroughly presented, the approach did not provide a framework for the including data from the hundreds of other land owning agencies (as well as major federal agencies), and probably would have faced complications in gaining this level of cooperation from even the major state level land-owning agencies.

## IV. SELECT STATE PROTECTED AREAS DATABASES

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More in-depth work comparing how various states manage protected areas data is being done in a separate task and due in early fall 2013. The following are the states with the most complete data, from quick comparison to CPAD – but note that only half a dozen or so states have datasets similar to CPAD in covering all levels of government:

**Massachusetts** – MassGIS is the statewide organization responsible for a wide range of geodata, including the Protected and Recreational Open Space (PROS) layer. PROS is a robust database, mapped mainly at parcel level and with extensive attribute structure (approximately 75 variables). Attributes include ownership/management, access, protection level (term, includes easements), funding sources, assessor record references (Massachusetts maintains a statewide parcel data framework). Data is generally kept up to date, though staffing has been reduced to a part-time person from a high of 1.5 several years ago.

Reference: <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/osp.html>

**Colorado** – COMaP is the statewide database of protected areas and was created and managed by the Colorado State University. COMaP is not actively maintained but covers most of the areas of the state with fair coverage in cities, but not comprehensive there. Attributes covered are robust, including ownership and management, access, protection level/type, and funding information. Alignment is intended to be parcel, but it is unclear whether this is widely used/available in Colorado. Database structure is flat file and includes easements.

Reference: [www.nrel.colostate.edu/projects/comap](http://www.nrel.colostate.edu/projects/comap)

**Montana** - Montana has statewide land ownership data, but in terms of protected areas has primarily focused this information on its Managed Areas data layer (for their Natural Heritage Program) which has very limited information on just managing agencies, and no other use attributes and which does not relate well to actual ownerships. Montana has a special program for gathering easement data on public and private lands into separate databases.

Reference: [http://apps.msl.mt.gov/Geographic\\_Information/Data/DataList/](http://apps.msl.mt.gov/Geographic_Information/Data/DataList/)

**Maryland** - Maryland has a set of GIS layers that comprise protected areas data for the state – two categories of fee lands (county/city and a state program – but not including state parks data or other state agencies) and six types of easements.

Reference: <http://dnrweb.dnr.state.md.us/gis/data/data.asp>

## **IMPLICATIONS FOR CALIFORNIA**

- 1) Few states have a unified and comprehensive approach to protected areas data. Those that do (Massachusetts, Colorado) very similar to California and CPAD, with core attributes being reasonably consistent (Massachusetts contains more funding data) and values similar. Most states have a collection of data sets (individual files by agency, or by funding program, data sets on land management, etc. – all with different attribute structures. This lack of integration makes it difficult to quickly get an overall view, though it provides some advantages for detailed data tracking of some topics.
- 2) Related to data approach, only Massachusetts and Colorado have a single point of entry web site for information about this data. For many states, only catalog search and metadata records in GIS clearinghouses are available.
- 3) While not always fully implemented, there is a general agreement in most states assessed on the desirability of using parcel ownership lines for boundaries.
- 4) Some of the states assessed and many others have a focus on inventorying areas managed for habitat conservation, usually as part of their Natural Heritage Programs. These data layers often have only managing agency information (vs. owning) and may not include lands (city parks, etc.) that have low biodiversity value from a statewide perspective.
- 5) Several states include easement data in their protected areas data, while others maintain it separately. The emerging best practice appears to be to keep these separate but related as there are distribution/confidentiality questions and different other attributes that argue for this, along with the fact that easements sometimes overlap fee data.

Discussion of resources needed to maintain and funding available for this will be done in a separate memo.

## V. PAD-US

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### OVERVIEW

The Protected Areas Database of the United States (PAD-US) is compiled and published by the U.S. Geological Survey's Gap Analysis Program (GAP). Based on a number of years of data gathering under the published title "GAP Stewardship Layer", GAP in 2010 published the first PAD-US and has since updated it at approximately annual intervals.

The GAP program is modest in size, with the equivalent of four staff, but has an extensive set of cooperators and contractors who extend GAP's capacities. GAP has a long history of partnership-building and support of state organizations and efforts,

### THE DATA

PAD-US includes mainly fee-owned open or other natural resource lands, maintained in a geodatabase. Almost a billion acres of land are inventoried in PAD-US, which contains a mix of fee owned lands as well as some private lands covered by resource management designations.

### PRIMARY USES

PAD-US has been primarily used to support conservation analysis using "gap ranks" (measures of the degree to which land is conserved for biodiversity purposes, based on a four class ranking). More information on PAD-US is available at: <http://gapanalysis.usgs.gov/padus>

The main users of PAD-US are federal and state land resource agencies, along with national conservation organizations and some regional organizations. PAD-US is also the U.S. contribution to the World Database of Protected Areas, compiled and published by the International Union for the Conservation of Nature (IUCN).

PAD-US data allows users view and analyze fee lands for ownership and conservation rank (though PAD-US is not strictly an ownership based data set).

### DATABASE DESIGN APPROACH

PAD-US is a collection of many different databases, including federal, state, local, national nonprofits and other organizations. As such, PAD-US is based on the accuracy and comprehensiveness of its source agencies' data – GAP does not attempt to rectify source data. However, GAP works actively to ensure that source data contains consistent core attributes that can be more easily "rolled up" into a national collection, and to inform and cooperate with contributing agencies wishing to improve their data.

The land in PAD-US is primarily defined by how it is managed, using conservation focus as the primary lens. This leads to PAD-US including some lands that are designated for management treatment but not always owned outright by a public agency. PAD-US also contains the inverse of protected lands, namely all private land that surrounds protected lands (this is done for use as a conservation planning tool and no attribute details are provided about these private lands).

GAP is gradually moving toward PAD-US being based more purely in land ownership boundaries, with gap ranks being an additional analysis that generates the management-focused data noted above. The advantage of this approach is that it opens up PAD-US to a wider range of users, not all of whom are focused on conservation uses.

GAP is also working closely with federal agencies to develop common policy on how land boundaries are defined in these types of database aggregations.

PAD-US is evolving to meet a strategy defined in a 2009 report, “A Map for the Future”, published by GAP and a small consortium of organizations. This strategy defines a state by state “stewards” program in which GAP will support, to the extent feasible, designated organizations for each state that can assemble and contribute collections of protected areas for their states. These stewards can be state agencies, universities, or nonprofits. GAP has a small grants program to aid stewards who are ready to contribute solid data sets – over 25 such grants have been awarded in the past two years.

## **DATA STRUCTURE**

PAD-US is a flat-file geographic database, with one record for each unit of land inventoried. Core attributes include owner name, unit name, designation, gap rank and others, along with a number of data management attributes. See next page for a table of PAD-US attributes.

The complexity of PAD-US comes mainly in the extensive processing required to incorporate many disparate data sets and to combine them into the national PAD-US attribute framework.

## **DATA COVERAGE/QUALITY**

PAD-US is based on source data accuracy, with GAP staff coding protection status onto that source data. If a state has minimal data, GAP staff attempt to locate alternative authoritative sources, but these do not usually extend below state agency level.

For California, PAD-US actually includes more land than is in CPAD, due to the fact that GAP includes privately owned areas covered under several federal management designations in its totals (even though those designations do not compel conservation

outcomes), plus it also has Marine Protection zones (not the state MPLA data) – this is a function of the core purposes of PAD-US noted above. Other than this, PAD-US uses CPAD data.

### **DIRECTIONS**

GAP is working to improve both the extent of data in each state and the ease of incorporating that data into PAD-US. In addition, it is working with federal agencies to more efficiently ensure their data integrates well with PAD-US. GAP sees California as a leader in the scope of data being collected and in working with it to improve integration procedures noted.

### **IMPLICATIONS FOR CALIFORNIA**

PAD-US is the national inventory of protected areas, built from source data – for California, CPAD is the primary source for PAD-US. Because CPAD is comprehensive and highly accurate as to ownership boundaries, it meets GAP's needs well. However, since CPAD does not as of yet contain gap ranks, GAP staff add this data themselves and there is room to improve how CPAD is set up to do this. CPAD is already relatively well integrated in terms of data structure for the purposes, though there are some aspects that could use additional work.

## **VI. GLOBAL PROTECTED AREAS DATABASES**

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The World Database of Protected Areas (WDPA) is a GIS inventory of nationally and globally significant protected lands areas, managed by the United Nations Environment Program's World Conservation Monitoring Center (<http://wdpa.org>). A separate dataset exists for Marine Protected Areas.

The USGS Protected Areas Database of the U.S. (PAD-US) is the main U.S. contribution to WDPA (and CPAD is the California element of PAD-US).

### **DATABASE DESIGN APPROACH, STRUCTURE**

WDPA has a very robust database structure for managing input from scores of countries – description of this structure is available on the WDPA site.

### **DATA COVERAGE/QUALITY**

WDPA contains 25 million acres in approximately 160,000 sites. In general, data quality is very good, given a global perspective.

### **DIRECTIONS**

The future of WDPA is uncertain in early 2013.

### **IMPLICATIONS FOR CALIFORNIA**

WDPA is of limited interest for California purposes – because it is globally defined, it only includes a selected set of protected areas in California.

## **IV. EASEMENTS – NCED, CCED**

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Easement data for California and the U.S. has now moved to a system where it is maintained alongside, rather than as an integral part of, fee lands protected areas data. A separate working paper describes the current state and next steps for California easement data (the California Conservation Easement Database, or CCED).

### **RELATION TO NATIONAL DATA**

CCED is being designed to be the California element of the National Conservation Easement Database (NCED).

In 2010, an initiative was launched to compile a GIS inventory of all available data on conservation easements, held by governmental or private parties. This effort was sponsored by the U.S. Endowment for Forestry and Communities which invited a consortium of conservation nonprofits to develop a program to conduct and maintain this inventory.

The National Conservation Easement Database (NCED) Consortium was formed by Ducks Unlimited, The Trust for Public Land, the Conservation Biology Institute, Defenders of Wildlife and NatureServe.

In 2011, NCED published its first inventory. While it is working on updates in 2013, it has no secure ongoing source of funding, though it has had some success at building support for funding among some philanthropies and some public agencies.

### **THE DATA**

NCED has gathered available GIS easement data using a state-by-state and federal agency approach. Currently, NCED has 40 million of what is generally expected to be approximately 100 million acres in easements nationally. The key feature of the data is that it is based on permission: data is gathered by allowing those holding easements to define whether their holdings are in at all, and if they are in, whether the geometry can be displayed at detailed geographic scales (private owner names are not collected or displayed unless directly provided by sources).

### **PRIMARY USES**

NCED is a valuable look at private land conservation in the U.S. and it is an essential complement to PAD-US which covers fee owned lands (and vice-versa).

NCED is available at the Defenders of Wildlife Conservation Registry portal, where users can access reports as well as download the data directly, but only data for which permission exists for sharing.

#### **DATABASE DESIGN APPROACH**

NCED was designed to contain a data structure appropriate for easements, and to have reasonable consistency with PAD-US. In general, efforts are made to align geometries between the two data sets (though some easements do occur over fee lands and not all geometries are aligned due to resource limits).

NCED is maintained in a flat file geodatabase, with a set of attributes that contain important details for analyzing easements – for example, NCED has start/end dates, allowing for time-limited easements, and it has a structure for indicating multiple interest holders in easements.

#### **DATA STRUCTURE**

Data structure is discussed further in the CCED Review/Policy paper.

#### **DATA COVERAGE/QUALITY**

NCED for California contains approximately one million acres in 1,800 separate holdings, held by just under 50 agencies and organization. NCED does not include the largest easement holder, the California Rangeland Trust, which holds over 250,000 easement acres. GreenInfo estimates there are over 150 agencies and organizations holding conservation easements in California, most of them with very small acreages (under 250 acres).

#### **DIRECTIONS**

Directions for CCED are discussed in the CCED Review/Policy paper.

#### **IMPLICATIONS FOR CALIFORNIA**

A national strategy and standard exists for easement data, which fits well with efforts in California. Further work in California is needed to enable all easement data to be in CCED and available to qualified users.

## **APPENDIX: Agency Notes From CERES 2011 Questionnaire Regarding CPAD**

In 2011, CERES published a survey about CPAD usefulness that, as far as is possible to determine, received two agency responses – Calif. Dept. Fish & Wildlife and CAL FIRE. The key responses about CPAD issues and needs are summarized below. All of these responses were regarding CPAD as of early 2011

### **From California Dept. Fish & Wildlife**

**OVERALL DATA QUALITY:** The quality of the data needs improvement. Specifically, data integrity needs to be improved, as well as database management practices for consistency of data entry and representation. DFG staff has gone through many revisions to correct the naming of its properties, missing properties, and other misinformation. On many occasions, existing errors persist after DFG review and comment. Repeated review of dataset requires many hours of staff time, greatly exceeding what would be necessary if standard data management and practices were adhered to.

*RESPONSE: Agree that data quality needs improvement. DFG(W) lands have now been fully coordinated with CPAD data as of 2013 and no significant issues appear to be present. DFW has been moving to parcel alignments over the past several years and this also helps data synchronization.*

**AGENCY DATA NAMING PREVAILS:** GreenInfo has been responsive to working on DFG's changes, however as a general practice, GreenInfo should use what the agency provides and should not interpret the data. For example: if there is a "name" field in the dataset, they should use the exact spelling and naming of that property and should not use other outside sources to enter that information.

*RESPONSE: Agree, this is now the current practice. However, CPAD also includes a separate short names field for ease of use in cartography and GreenInfo defines these using its own standards.*

**LAND AND WATER** \*note: CPAD currently breaks holdings on whether they are land or water, in order to provide for more effective user applications, particularly in the San Francisco and San Diego bays where large areas are underwater (federal and state lands):

Remove "land or water" field, as that information is available from a hydro or land cover dataset. That field does not enhance the dataset and there is inconsistency in what is considered as a "land" or "water" feature. For example, Bracut Tidelands is entered as "land" in the "land or water" field and if adhering to the field definition of water as features labeled as "water" are actually dry lakebeds or streambeds, which creates being tidal or submerged lands, it should be entered as "water." In addition, many confusion on the part of users. GreenInfo's attempt to differentiate between water and land also causes confusion in the naming of the property.

*RESPONSE: This issue needs further consideration – points well taken, but there are use cases for having this distinction. This issue will be moved into assessment in later 2013.*

TOO MANY DATA FIELDS: Data attempts to be too detailed with too many fields (ie: Site Name, Alternate Site Name, Unit Name, Label Name [abbreviated unit name], Holdings, Units, Super Units) causing inaccuracies, duplication of names with minor differences (i.e. hyphen, no hyphen in name). For example, Ballona Wetlands – Expanded Wetlands Area is entered in “site name” and Ballona Wetlands Ecological Reserve is entered in “unit name”. The “site name” should be entered as Ballona Wetlands Ecological Reserve, as provided by the source agency.

*RESPONSE: With a large number of agencies to consider there are many variations in how names are defined. In order to meet a wide range of user needs, CPAD needs to allow for several approaches to naming. Many agencies name particular elements of a unit with distinct names while also maintaining a different overall name. CPAD needs to reflect these to manage source agency coordination. In general, the utility of fields should be frequently evaluated (see the CPAD Database Design memo for more extended discussion of this).*

REGION FIELD: Remove the “region” field since there is a county and city field. Regions can be a natural feature or defined in various ways by an agency or organization and it should be left up to the user to define regions important to analyses they conduct. Examples of CPAD regions include: Bay Area, Lake County, Central Valley, San Joaquin Valley, Sierras, Central Coast, North Coast, and Southern California. GreenInfo does not define the boundaries of their regions and they seem to vary in scale and specificity. These may not be the classifications commonly used by agencies.

*RESPONSE: Agree, “Region” has been dropped from CPAD as of early 2012.*

PURPOSE FIELD: “Primary purpose” field appears to have assumptions based on the property name (i.e. DFG properties known as DWR Mitigation, and Rector Reservoir Wildlife Area are given a purpose code of “water supply” which is inaccurate). For DFG lands, GreenInfo has populated some with a purpose code of “plant and animal habitat” and others incorrectly as “parks and recreation”, “open space”, “forestry”, “water supply”, and “access way”. DFG recommends consulting with source agencies prior to populating purpose fields.

*RESPONSE: Agree, primary purpose has been removed from published CPAD in September 2013, but is being kept in core data set for possible future use. Purpose was originally developed in the Bay Area, where there was agreement when it was created back in 2005, but has not been maintained since. The designation fields are a useful alternative for investigating uses.*

METADATA: Include all code descriptions in the metadata document.

*RESPONSE: Metadata was greatly improved in early 2013.*

SOURCE DATA CONTROL: This dataset should be a public dataset under the condition that each data contributor has the final say on how land attributed to them is presented, regardless of the source of that data.

*RESPONSE: In general, CPAD is guided by source agency data. However, alignment and sometimes even correct interpretation of ownership (vs. management) can become issues. For agencies that do not use assessor parcel boundaries this creates challenges, especially in metropolitan areas where there are often many mixed ownership areas – our approach on this is explained in the spatial accuracy memo. For ownership/management, in the past several years data everywhere has improved and prior judgments that needed to be made when there were conflicts between agencies' records have mostly disappeared. Overall, for the larger agencies, CPAD follows key field content (ownership, name, access, etc.) almost completely.*

## **From CAL FIRE**

OTHER PUBLIC LANDS: CPAD omits BIA and DoD which are important to our needs for State/Federal Responsibility Area determinations – this data needs to be available in one place.

*RESPONSE: GreenInfo has developed separate data sets for these two ownership types and will be updating them in the CPAD project in late 2013 (they are, however, reasonably accurate at present). The rationale for separation is that CPAD is a protected areas database, not a public land database per se (older efforts with PCTL pointed in this direction but were only focused on the large federal and state agencies, not the full suite of 1,000 public agencies and nonprofits now in CPAD). BIA lands are mostly sovereign and not conserved (if they are, they are eligible to be in CPAD); DoD lands are similarly maintained for other than conservation purposes, even if they are important to conservation. The most flexible strategy seems to be to maintain all three data sets so that they “fit” well together.*

OTHER DESIGNATIONS: CPAD does not identify recreation designations within USFS or BLM lands. Can CPAD be used to identify critical wildlife areas as well? Can CPAD show wilderness areas as well?

*RESPONSE: These are important issues. CPAD currently is ownership based – lands are coded into CPAD by parcel or other boundaries by ownership, rather than by management designation. CPAD has been extended quite a bit through the use of the Designation fields, which attempt to capture the type of holding that the owning agency defines it as (“national forest”, “state park”, “ecological preserve”, etc.). For nonfederal lands, these designations are relatively robust. For federal lands, tracking management designations is not feasible at this time – however, in mid-2013, BLM has developed a first version of their Surface Management Agency (SMA) data set for federal holdings, which can help as it is not ownership based, but management based. Due to CPAD project focus on supporting local and regional needs, we’ve not been able to do more on this at this point. One option is similar to the DoD/BIA lands approach, particularly for Wilderness, which is to maintain access to a related authoritative data layer of these lands (currently available from Wilderness.net) which can be used by GIS operators in relation to CPAD – Wilderness is particularly difficult as its boundaries are legislatively set through very detailed mapping that often does not at all follow ownership boundaries, or may be minutely different from ownership, creating huge numbers of slivers and other remnant data elements. Critical Wildlife Habitat is administered by USFWS and is not possible to include in CPAD, vs. helping users access that data from USFWS.*

UPDATES: Update cycle irregular, needs to be more frequent (eg, twice yearly) – *agree, driven by available funding.*

PARCEL DATA: Lack of access to parcel data limits CPAD for some counties – *situation much better now, but still not ideal, as GreenInfo does not have access parcel data in one product, and does not have ownership information for all counties, due to local policies and pricing.*

Metadata should be improved re data sources – *Metadata has been improved, with much broader coverage in attributes of source, alignment and other quality validation fields. Release notes in the CPAD Manual also are good sources of information on this. With so many agencies, however, using Metadata-based change fields is not feasible, so summaries will continue to be used.*