Appendix S

Notice of Preparation and Responses

Humboldt County General Plan Update DEIR

Appendix S – Notice of Preparation and Responses

NOTICE OF PREPARATION

To:

From: **Humboldt County**
Department of Community Development Services
3015 H Street
Eureka, CA 95501

Subject: ***Notice of Preparation*** **of a Draft Environmental Impact Report for the Humboldt County General Plan Update**

Humboldt County Department of Community Development Services will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study is not attached. ***The Department has determined that the project may have significant effects and that an EIR will clearly be required. Attached is a listing of probable effects of the project.***

General Plan Overview: The Humboldt County General Plan addresses present and future land use and development criteria for the unincorporated portion of Humboldt County. Under state planning law, counties and cities are required to prepare and adopt comprehensive long-range general plans for the physical development within their jurisdictions. The general plan must include discussion of land use, circulation, housing, conservation, open space, noise, and safety issues either in distinct "elements" or combined as deemed appropriate. The Humboldt County General Plan Update project will include associated zoning amendments.

The Humboldt County General Plan establishes the kinds, locations and intensities of land uses as well as applicable resource protection and development policies within the unincorporated areas of the County. The associated zoning, including zone reclassifications and zoning ordinance text amendments as may be found consistent with the Plan will provide specific implementation of the land use plan.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Michael E. Wheeler at the address shown above. We will need the name, phone number, and email address of a contact person in your agency. Your comments may also be transmitted electronically to mwheeler@co.humboldt.ca.us. The County's EIR preparation team may wish to directly contact NOP respondents for assistance in preparing the Draft EIR. Please identify the name(s) of the person(s) to contact in the event there are questions about your agency's comments.

Project Title: Humboldt County General Plan Update.

Project Applicant: County of Humboldt, Department of Community Development Services

Date

Signature _____
Kirk Girard
Title: Director of Community Development Services

Telephone (707) 445-7541

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

Humboldt County General Plan Update
Project Description

Project Description

The Project consists of updating the Humboldt County General Plan through selection of the Preferred Plan Alternative along with a suite of policy options that go with that alternative and an implementation program. The Preferred Plan Alternative will designate land uses within the unincorporated area of Humboldt County consistent with the goals of the alternative. The land use designations will be based on meeting ranges of residential density or for conservation of resource lands and be supported by an assessment of impacts related to traffic and circulation, infrastructure needs, housing goals, open space, environmental concerns, and safety concerns.

Background - State Requirements

California state law requires each city and county to adopt a general plan "for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (§65300). The California Supreme Court has called the general plan the "constitution for future development." The general plan expresses the community's development goals and embodies public policy relative to the distribution of future land uses, both public and private.

The policies of the general plan are intended to underlie most land use decisions. Pursuant to state law, subdivisions, capital improvements, development agreements, and many other land use actions must all be consistent with the adopted general plan. Zoning and specific plans are also required to conform to the general plan.

In addition, preparing, adopting, implementing, and maintaining the general plan serves to:

- Identify the community's land use, circulation, environmental, economic, and social goals and policies as they relate to land use and development.
- Provide a basis for local government decision-making, including decisions on development approvals and exactions.
- Provide citizens with opportunities to participate in the planning and decision-making processes of their communities.
- Inform citizens, developers, decision-makers, and other cities and counties of the ground rules that guide development within a particular community.

The general plan covers the County's entire planning area and addresses the broad range of issues associated with development in the County.

Background - Humboldt County General Plan Update

Humboldt County last revised its General Plan in 1984. In the Spring of 2000, the County initiated a comprehensive General Plan Update, with a multi-phased work program. Phase I, which was completed in early 2001, focused on an extensive public outreach effort to engage the public in the General Plan effort. Through a series of over 40 public meetings, public input was received on land use issues and policy concerns. Additional public outreach efforts included development of a web site, newsletter publication, and community survey. Phase I culminated in a compilation of public concerns and issues entitled the *Critical Choices Report*. The issues

identified in the Critical Choices Report provide the direction for Phase II data collection and analysis.

Phase I - Identifying Issues and Scope of Work for the Plan Update

Phase I was primarily a public outreach effort to engage the public's interests, listen to major concerns, and scope out the most important policy areas. Over 40 meetings were held, with more than 700 people and organizations contacted. The Planning Division developed a web site, published a newsletter, undertook a community survey, and created a variety of activities and information pieces to elicit public input. The County owes a debt of gratitude to all those that participated in Phase I.

This first phase successfully captured many key concerns on a broad range of topics. To highlight some key findings:

- The Plan must work to preserve the unique character of Humboldt and the quality of life we enjoy. People believe that development in the next twenty years has the potential of changing our character and diminishing our quality of life.
- The Plan must protect forest and agricultural lands from conversion to other uses. The economic forces behind conversion must be understood.
- Long-range environmental planning, based on regional or watershed analysis, should be conducted to understand and plan for the cumulative environmental effects of land use activities.
- Traffic congestion on Highway 101 through Eureka, movement of goods via rail, marine and highway, non-motorized transportation and long-term maintenance of roads are the most significant transportation issues.
- The Plan must help implement Prosperity! The North Coast Economic Development Strategy.
- People do not want a new layer of regulations. Regulations that serve a specific community interest should be retained. Those that don't should be modified or discarded. People want incentive-based approaches, pro-active implementation programs and improved regulatory processes. Wherever possible, Plan policies should seek to achieve economic, community and environmental goals simultaneously. At a minimum, policies should reflect a thoughtful and strategic balancing of interests.
- People want the Plan to reflect the interests of the entire County. The County should work closely with other jurisdictions in developing and implementing the Plan.

The input received during Phase I was organized into four major themes:

- Building Communities
- Moving Goods and People
- Managing Natural Resources
- Planning for Hazards

Phase 2 - Writing Background Technical Studies

In Phase 2, Technical Background Reports were prepare for each of these themes. Supplemental Reports were prepared on Agricultural Resources and Forest Resources. These technical background reports constitute the basis and will be used for defining the environmental setting of the General Plan Update as required under CEQA and for refinement of policy options to go along with the Plan alternatives. The following reports were prepared as part of Phase 2:

Building Communities
Moving Goods and People
Natural Resources and Hazards
Agricultural Resources Report
Forest Resources Report
Transportation Analysis

Phase 3 - Selecting a Preferred Plan Alternative

Phase 3 was initiated in October of 2003 with a series of deliberative dialogue workshops and the development of several Plan Alternatives which were described as Sketch Plans. The Sketch Plans that were developed during this phase include the following, with Sketch Plan B selected as the Preferred Plan Alternative:

Sketch Plan A. A lower residential capacity scenario.

Sketch Plan A would meet the County's fair share Regional Housing Needs solely through infill development served by existing water and sewer lines. The Plan would include resource land protections and significant limitations on large lot residential development. This carefully controlled and urban focused growth plan would be the "environmentally superior" alternative as defined by CEQA.

Sketch Plan B. A scalable residential capacity sketch plan with the following characteristics:

a. Focused development within existing urbanized areas serviced by water and sewer.
b. Specific urbanization expansion plans including precise land use maps, urban boundary adjustments and water, sewer, road and drainage system improvements.
c. Land use designations that support high density urban development including use of alternative subdivision standards, density bonuses, second unit incentives, live-work commercial centers, etc.
d. Reduction in existing large lot residential subdivision potential outside of community planning areas
e. Increased resource land protection from residential and other conversion using a range of planning tools such as; clustered development incentives, minimum lot-sizes, patent parcel development standards, conservation easements and regulatory reform.
f. An "exit strategy" plan for alternative land use on large resource production lands proven to be no longer economically viable.

Sketch Plan C. A high residential capacity scenario.

Sketch Plan C would accommodate the demand for approximately 18,000 new dwelling units at an average density of 3 units/acre. This average density would be attained through infilling existing water and sewered areas and extension of water and sewer services to lands adjacent to existing urbanized areas. Existing entitlements for large lot residential development would remain but would not be increased. Industrial and commercial lands would be made available in proportion to residential development.

In addition, a "no project" alternative required under CEQA (i.e. continuation of the existing Framework Plan) will be considered.

The General Plan Update will include policy development on the following issues (all other required policy topics will be addressed as well):

Forest Resource Policy Options

- Additional policies to ensure adjacent uses are compatible with industrial timber operations
- A policy statement to support for long term continued timber production
- A policy statement to protect beneficial uses of sensitive watersheds and critical water supply areas
- A policy to address urban interface / timber issues in urban fringe areas.

Agricultural Resource Policy Options

- A policy that the County take a proactive approach to conservation of working resource lands landscapes.
- A policy to ensure lot line adjustments and other development are consistent with the General Plan densities notwithstanding underlying land units.
- A policy to allow flexibility for additional development at original homesite areas (similar to RCC standards) for large ranches.

Open Space Policy Options

- A policy that supports establishment of greenbelts and agricultural buffers to insure separation of existing communities.
- A policy directing the County to take a proactive approach to conservation of open space.
- A policy that establishes an open space classification system to serve as a framework for land use planning and environmental resource management programs.

Water & Biological Resource Policy Options

- A policy to provide erosion control measures consistent with TMDL target reductions

- A policy to provide a riparian canopy retention standard in TMDL temperature impaired areas
- A policy to limit impacts of water withdrawals in impaired watersheds
- A policy to establish uniform stormwater management standards
- Update the County's water export policies
- A policy to promote conservation easements for sensitive resource areas

Cultural & Scenic Resource Policy Options

- A policy to protect "heritage landscapes"
- A policy set to provide inland scenic resource protection

Hazard Policy Options

- A policy to provide hillside development standards
- A policy which requires increased levels of geological review for certain discretionary projects.
- A policy to direct floodway and flood fringe combining zone be added to lands in the floodplain.
- A policy to direct improved flood hazard rating to secure reduced flood insurance rates.

Mineral Resources

- A mineral resource extraction overlay to protect regionally important extraction sites from incompatible adjacent uses

Building Communities

- A policy that establishes sewer service areas and water service areas.
- A policy to require infill development prior to expanding into resource areas.
- A policy that promotes mixed uses (either by monetary incentives or non-monetary incentives)
- A policy that promotes "re-use" of brownfield sites.
- A policy that supports design standards that protect neighborhood and community characteristics.
- A policy to broaden opportunities for second units.
- A policy to ensure that the size and scale of new multi-family development is compatible with community character.

- A policy that provides broader allowance of residential uses within commercial districts.
- A policy to require coordination with the service providers to ensure that adequate funding mechanisms are available for infrastructure.

Moving Goods and People

- A policy to support transportation improvements to truck routes countywide.
- A policy to ensure that planned improvements to the County's road system support improved access to port facilities.
- A policy to support the Port's efforts to attract new shippers through its facilities.
- A policy and implementation program to update the County trails plan.

Governance

- Make general plan amendment process more responsive and strategic. Re-focus from multi-year community planning efforts to implementation of existing plans and more rapid small-scale town plan updates.
- Amend criteria for accepting individual plans amendments to primarily consider the public interest
- Establish criteria and performance standards to provide a simplified and faster project review process.

In addition to the mandatory General Plan Elements the General Plan Update will include the following optional elements:

- Capital Improvements/Public Facilities (including Telecommunications)
- Economic/Fiscal Development
- Energy

Service Capacity and Infrastructure Needs

The General Plan Update will address additional infrastructure planning and analysis. The project includes a summarization of City and Service District capabilities and constraints and development of precise mapping of water and sewer service areas within the districts. This will be followed by an assessment of the feasibility of various sketch plans, and identification of policies and implementation measures necessary to address delivery of water and sewer services.

Humboldt County General Plan Update
Probable Environmental Effects

Pursuant to the California Environmental Quality Act (CEQA) Section 15082(a)(1)(C), the following is a preliminary scoping of the project impact categories for assessment of probable environmental effects. The following list describes tasks to address probable environmental effects and identifies special studies to be undertaken in preparing documents pursuant to the California Environmental Quality Act (CEQA) on behalf of the County. This list will be modified based on responses to the Notice of Preparation. It is assumed that the project could have potentially significant effects in each category. The proposed project will contain policies, standards, and implementation that mitigate the anticipated effects, and will reduce them to less than significant levels in most cases. Some alternatives under consideration would result in higher, potentially significant impacts. Pursuant to CEQA Section 15063(a), the County as lead agency has determined that an EIR will clearly be required and an initial study has not been prepared.

General Plan Elements

Land Use Effects. The EIR and supporting technical background studies will identify and discuss direct and indirect effects of the project alternatives on land use, including inducement of new growth. The EIR will identify policies and other mitigation measures to reduce impacts on land use from the project.

Open Space. The EIR and supporting technical background studies will identify the extent of streamside management areas, wetlands and other environmentally sensitive habitat areas and the occurrence of protected species on and in the vicinity of the project site (the unincorporated areas of Humboldt County). Direct and indirect impacts to those areas resulting from past and future development will be discussed and policies and mitigation measures will be proposed to reduce impacts of the project on open space areas. The effects of proposed alternatives on agricultural and forest lands will be included in the analysis.

Conservation. The EIR and supporting technical background studies will identify and discuss direct and indirect effects of the project on conservation of resource lands resulting from each of the project alternatives. Appropriate policy options and mitigation measures will be identified to reduce impacts from the project on natural resources. The effects of proposed alternatives on agricultural and forest resources will be included.

Traffic and Circulation. The EIR and supporting technical background studies will identify and discuss direct and indirect effects of the project on vehicular, bicycle and pedestrian traffic and safety, and circulation patterns. Appropriate policy options and mitigation measures will be identified to reduce impacts of the project on traffic and circulation.

Housing. The EIR and supporting technical background studies will identify and discuss fully direct and indirect effects of the project on housing as it may be impacted under different development alternatives. This analysis, in large part, is included in the 2003 Housing Element Update and environmental document and follow current state guidelines for development of a Housing Element. Appropriate policies and mitigation measures will be included to reduce impacts of the project on housing.

Safety. The EIR and supporting technical background studies will include an evaluation of flood, fire, earthquake, geological hazards and soil erosion potential based on a review of the published literature, mapping, aerial photographs, consultation with local specialists, and site reconnaissance. Policies and mitigation measures to reduce impacts of the project on public safety will be included

Noise. The EIR and supporting technical background studies will assess effects of the proposed project on the noise environment. The EIR will identify appropriate policy options and mitigation measures to reduce noise impacts of the project.

Cumulative Effects. The EIR and supporting technical background studies will identify cumulative effects of the proposed project alternatives and other past, present, and reasonably foreseeable future projects of adjacent jurisdictions and within the county jurisdictional area.

Potential Effects:

AESTHETICS. The project allows the construction of new residential, commercial and industrial buildings, which may affect scenic vistas, scenic resources, visual character and quality, and create new light and glare that could adversely affect day or nighttime views in the County. The General Plan will include policies related to aesthetics, designation of scenic areas with view protection policies, and adoption of standards to minimize visual impacts of the project.

AGRICULTURAL RESOURCES. Each alternative considered in the EIR involve impacts to agricultural resources. Agricultural operations and agricultural resources may be affected by encouraging new residential, commercial and industrial uses in areas used for or suitable for agriculture. Policy options and land use designations will be considered that reduce impacts to agricultural resources.

AIR QUALITY. Construction and use of new residential, commercial and industrial buildings which may occur as an indirect result of implementing this General Plan may cause air quality impacts. The EIR will consider policies and other mitigation measures to reduce these air quality impacts of the project.

The project provides for all aspects of development, conservation and maintenance of residential, commercial and industrial buildings, often involving the use of chemicals and heavy equipment, that can cause problems for people living nearby sensitive to chemicals, and dust. Existing regulations address potential health impacts that may result from chemicals, and dust related to these uses.

Implementation of this General Plan may indirectly result in increases to the number of vehicle miles traveled by Humboldt County residents and the number of open fireplaces used for heating homes. As new residential, commercial and industrial buildings are constructed in outlying areas, emissions from open fireplaces and vehicles used by persons commuting to and from these areas will likely increase. Similarly the dust from vehicular traffic will likely increase.

Since the County has already exceeded the allowable limits for emissions of suspended particulate matter (PM_{10}), any increase in emissions will violate air quality standards for PM_{10}. Alternatives that reduce the number of vehicle miles traveled, and adherence to air emission standards for vehicles, restrictions on open fireplaces, and air quality permit requirements for industries may reduce such impacts.

BIOLOGICAL RESOURCES. New residential, commercial and industrial building construction indirectly resulting from the implementation of the General Plan could potentially impact endangered, threatened or rare species of their habitats unless measures are taken during project review to mitigate these potential impacts. Such measures might include identification and mapping of such species and their habitats and adoption of protective measures recommended by trustee agencies.

Locally designated natural communities, such as beach and dunes areas or riparian forests along the Eel River may be impacted by new development indirectly resulting from this General Plan. Existing policies and land use restrictions will be assessed, and new policies, land use restrictions and other mitigation measures may be necessary to avoid substantial impacts on sensitive habitats from new development allowed by this General Plan.

The construction of residential, commercial and industrial buildings indirectly resulting from the implementation of this General Plan may impact wildlife dispersal, disrupt migration corridors or the use of native wildlife nursery sites. The need for new policies, land use restrictions and other mitigation measures will be assessed to reduce this potential impacts of the project to less than significant levels, although measures necessary to reduce the adverse biological impacts of this project to less than significant levels are, for the most part, already mandated locally through existing ordinances and policies protecting biological resources.

CULTURAL RESOURCES. The project could indirectly result in the loss of historic character if demolition of historic structures occurs when building sites are prepared for new construction or renovation. Likewise, archaeological resources, unique paleontological resources, unique geologic features, and even human remains may be adversely affected by grading or residential, commercial and industrial building construction activities allowed by this General Plan. Protection strategies, policies and other mitigation measures may include identification of historic and cultural resource areas, referral of projects for archaeological and historic resource clearances to appropriate agencies and inclusion of recommendations to protect such resources.

GEOLOGY AND SOILS. There are no expansive soil types in Humboldt County according to the Chief Building Inspector. This item is not discussed further in the DEIR. The project may potentially expose people or structures to

potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Policy options and land use restrictions may be used to address this impact category. Clearing residential, commercial and industrial building sites under the provisions of this project may also result in substantial soil erosion or the loss of topsoil. Adherence to existing requirements of the Grading Ordinance (slope setbacks and Sedimentation/Erosion Control Plans) will serve to address these potential impacts.

Virtually all of Humboldt County has the potential for loss of life and property due to fault rupture and strong seismic ground shaking, and there are many areas subject to liquefaction and landslide hazards. Increasing population within the area can be viewed as increasing the exposure of people to geologic hazards. Since this General Plan and the related ordinances may indirectly result in an increase of population in the unincorporated areas, they may be viewed as potentially increasing the risk to life and property from seismic ground shaking and fault rupture. Maps showing areas of strong seismic ground shaking, or seismic-related ground failure, including liquefaction, or landslides are used during planning review of discretionary permits. Also, such maps are used in the determination of suitability for lands to be designated for residential uses or for uses which involve human occupancy under the General Plan land use designations. These and other proposed mitigation measures could reduce these geologic hazard impacts to a level of insignificance in new areas used for residential or other purposes that involve human occupancy.

HAZARDS AND HAZARDOUS MATERIALS. Construction of residential, commercial and industrial buildings that may indirectly result from the implementation of this General Plan does not normally involve a risk of accidental explosion or release of hazardous substances. However there are some commercial and industrial uses that could involve such risks, which if not mitigated may be potentially significant. Existing hazardous materials management and safety programs are in place to address these risks.

New development indirectly resulting from this General Plan may be located on a site which is included on a list of hazardous materials sites. State and federal regulations require assessment of such sites and management for reuse such that redevelopment would not create significant hazardous materials hazards to the public or the environment. Adherence to existing policies and safety programs, will help ensure that new development allowed by this General Plan would not result in hazardous materials safety hazards for people residing or working in or near the new buildings.

HYDROLOGY AND WATER QUALITY. The existing setting involves implementation of stormwater management plans in urban areas and adherence to State waste water discharge requirements. The development of new residential, commercial and industrial buildings pursuant to the policies of this General Plan will take place within existing water quality regulations. Existing County health and safety regulations are used to minimize the impact of new development. Adherence to existing policies and requirements will make it unlikely that development under the plan would violate water quality standards or waste discharge requirements, or result in significant impacts to water supplies and water quality from new construction.

Since this General Plan and the implementing ordinances may indirectly allow development both within and outside areas with public water and sewer, they have the potential for substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site. Existing or new policies and development restrictions may be required to address this potential impact category. Policies, ordinance implementation and development restrictions may also address the creation or contribution of runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, or otherwise substantially degrade water quality.

The project would involve a review of mapped flood hazard areas and will avoid any land use designation changes which would place additional housing within these areas. Further policies and development restrictions would prohibit placement of structures which would impede or redirect flood flows, or would expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or inundation by mudflow. Policies, land use designations and implementation measures will be incorporated to address these risks.

Likewise, approval of this General Plan and the implementing ordinances may indirectly result in more residential, commercial and industrial buildings being developed in low-lying coastal areas. Since these areas are subject to seiche and tsunami hazards, they may indirectly contribute to the exposure of people and property to such impacts. Appropriate land use designation and restrictions and policies options will be considered to address these potential impacts.

Some development outside areas served by public water systems may use wells or surface water for their water supply. Since both this General Plan and the implementing ordinances allow new residential, commercial and industrial development, they may indirectly impact the amount of surface water and groundwater in areas with limited water supply. Technical Background studies will be used to assess surface water or groundwater supplies and determine if impacts to such areas may be mitigated to less than significant levels.

LAND USE AND PLANNING. The project may indirectly lead to residential, commercial and industrial building construction that blocks direct access from one neighborhood to another. However, adherence to current standards and review procedures reduce this potential effect to less than significant levels.

The project involves the adoption of ordinance and plan changes necessary for consistency with other applicable land use plans, policies and regulations. For example, by allowing more concentrated development, the project may potentially conflict with approved community plans since the community plans used the existing General Plan densities as a baseline to measure potential environmental impacts of Plan implementation. The General Plan Update and environmental review will address the consistency with approved community plans and address any additional environmental analysis required under the proposed plan alternatives.

The General Plan adoption process and EIR review process includes measures to notify other agencies and organizations of proposed land use designations and related development considerations. Any potential impacts indirectly resulting from this project will be assessed for potential conflict with applicable habitat conservation plans or natural community conservation plans administered by other agencies.

MINERAL RESOURCES. The project is unlikely to result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Technical Background Studies show that gravel and rock quarries are the only significant mineral resources currently utilized in the County. In-stream gravel mines are managed on a sustained yield basis under the existing adaptive management strategy. It is unlikely new residential, commercial and industrial buildings construction would be allowed to significantly detract from the ability of the local surface mining industry to provide goods, particularly locally-important mineral resources. Many of the existing mine sites have vested rights for mining operations and rock quarries are considered an acceptable and compatible use on resource lands.

NOISE. The project may indirectly cause new development to occur in areas that are now vacant. This would likely result in temporary increases in existing noise levels during construction, and permanent increases in noise levels afterwards. During construction, noise levels may be excessive at times when heavy equipment or power tools are being used. And new residential, commercial and industrial buildings near private airstrips may expose residents to noise from aircraft using the airports. New development allowed by this General Plan may occur in areas with existing severe noise levels, such as areas near freeways and public airports. Potential noise impacts will be assessed for their significance and new policy options, development restrictions, or standards to mitigate these impacts will be proposed.

POPULATION AND HOUSING. The project will not displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere, nor displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. The project targets new housing construction over the existing levels, so there is not likely to be any displacement of housing or people as a result. The General Plan and implementing ordinances allow the development of residential, commercial and industrial buildings. The project identifies policies and programs to meet the needs of the projected population increase over the next twenty five (25) years.

PUBLIC SERVICES. New residential, commercial and industrial buildings developed as an indirect result of this project will undoubtedly necessitate additional fire protection, police protection, schools, parks, and other public facilities. New facility construction to meet the higher demands may involve significant environmental impacts, and will be assessed in the environmental review process.

RECREATION. The project allows the construction of new residential, commercial and industrial buildings. Pursuant to its policies and programs, person using the new developments may increase the use of parks such that they cause substantial deterioration or trigger the need for the expansion or construction of new facilities. These potential adverse impacts may be significant unless mitigated. An assessment of parkland and recreation needs will be included in the Technical Background Reports and the environmental document.

TRANSPORTATION / TRAFFIC. The project will not likely result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial air traffic safety risks. The County's Airport Land Use Plans address anticipated population increases consistent with the future growth anticipated with this General Plan. New policies in the plan will also not likely conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks), although additional mitigation measures may be necessary to reduce the impacts of the project on alternative transportation to less than significant levels.

Through implementation of this General Plan, residential, commercial and industrial building development will likely increase the number of vehicle trips in the unincorporated areas. Where there are existing congestion problems, approval of this General Plan and its associated ordinances may indirectly make things worse unless this issue is addressed though appropriate infrastructure and capital improvements planning. Such planning will be included in the capital improvements/public facilities element.

The environmental review will include an assessment of traffic and circulation utilizing a modeling approach to determine the impact of the various alternatives on traffic, circulation and emergency access. New development indirectly resulting from this General Plan is unlikely to result in lack of sufficient parking. Parking requirements and potential impacts are currently and will continue to be mitigated through implementation of zoning requirements addressing parking for new development.

UTILITIES AND SERVICE SYSTEMS. The project is not likely to result in new or expanded entitlements for water supply. According to the 2002 Building Communities Report[1], the total water demand in the year 2025 (15+ years beyond the timeframe for this Element) is projected to be only at 62% of the current capacity.

The project may require or result in the construction of new storm water drainage facilities or expansion of existing facilities to mitigate potential environmental effects. New development encouraged by the Plan as well as road and driveway construction could reduce the infiltration and absorption of rainfall on or near new development. These impacts could overburden the existing drainage facility infrastructure. However, existing procedures for review of new development includes, where appropriate, requirement for submittal and approval of a preliminary hydrology and drainage plan which would be used to assess, design and size required drainage facilities.

As stated previously, this General Plan will likely indirectly result in the development of new residential, commercial and industrial development. Additional wastewater treatment services will be necessary for the new development allowed by the General Plan. Presently the McKinleyville Community Services District is responding to Regional Water Quality Control Board charges that they exceeded the capacity of their sewage disposal system in several instances. However, this issue is bigger than just the McKinleyville CSD; other public agencies, such as the City of Eureka and the Humboldt Community Services district, are also having to cope with sewer treatment capacity limitations. The Building Communities Report[1] recognizes that sewer capacity problems are a constraint to development opportunities when it states that 1) the projected 2025 sewer flows are 94% of capacity, 2) many sewer systems are in a state of disrepair that allows rainwater to seep in, pushing sewer systems closer to their limits, and 3) expansion efforts, many of which are already underway, will continue to be necessary to keep systems from overflowing.

Based on this evidence, the environmental review needs to assess those facilities that have had past problems with exceeding wastewater treatment requirements of the applicable Regional Water Quality Control Board. Additionally, there needs to be an assessment of the need for the construction of new or expanded water or wastewater treatment facilities and the adequacy of capacity to serve the project's projected demand in addition to the provider's existing commitments.

MANDATORY FINDINGS OF SIGNIFICANCE. The project allows construction of new residential, commercial and industrial buildings Countywide, which could degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. The building of new residential, commercial and industrial buildings indirectly resulting from the policies and programs in the General Plan may also have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly. Policies, appropriate land use designations and restrictions and mitigation measures will be necessary to reduce these potential impacts.

---

[1] The 2002 Building Communities Report is a technical background study for the General Plan Update written by the consulting firm Dyett and Bhatia, and available at the Department of Community Development Services and at www.planupdate.org.

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

Notice of Preparation

January 22, 2007

To: Reviewing Agencies

Re: Humboldt County General Plan Update
SCH# 2007012089

Attached for your review and comment is the Notice of Preparation (NOP) for the Humboldt County General Plan Update draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Michael E. Wheeler
Humboldt County Planning Division
3015 H Street
Eureka, CA 95501

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Senior Planner, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2007012089
Project Title Humboldt County General Plan Update
Lead Agency Humboldt County Planning Department

Type NOP Notice of Preparation

Description The project consists of updating the Humboldt County General Plan through selection of the Preferred Plan Alternative along with a suite of policy options that go with that alternative and an implementation program. The Preferred Plan Alternative will designate land uses within the unincorporated area of Humboldt County consistent with the goals of the alternative. The land use designations will be based on meeting ranges of residential density or for conservation of resource lands and be supported by an assessment of impacts related to traffic and circulation, infrastructure needs, housing goals, open space, environmental concerns, and safety concerns.

Lead Agency Contact

Name Michael E. Wheeler
Agency Humboldt County Planning Division
Phone (707) 445-7541 **Fax**
email mwheeler@co.humboldt.ca.us
Address 3015 H Street
City Eureka **State** CA **Zip** 95501

Project Location

County Humboldt
City
Region
Cross Streets
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways
Airports
Railways
Waterways
Schools
Land Use

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Landuse; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Soil Erosion/Compaction/Grading; Toxic/Hazardous; Traffic/Circulation; Water Quality; Water Supply; Wildlife

Reviewing Agencies Resources Agency; Regional Water Quality Control Board, Region 1; Department of Parks and Recreation; Native American Heritage Commission; Department of Housing and Community Development; Department of Health Services; Office of Emergency Services; Office of Historic Preservation; Department of Forestry and Fire Protection; Department of Fish and Game, Region 1; Department of Conservation; California Coastal Commission; California Highway Patrol; Caltrans, District 1; Caltrans, Division of Aeronautics; Department of Water Resources; Department of Fish and Game, Marine Region; State Lands Commission; Integrated Waste Management Board; Department of Toxic Substances Control

Date Received 01/22/2007 **Start of Review** 01/22/2007 **End of Review** 02/20/2007

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: Humboldt

SCH#

Resources Agency

- [ ] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  David Johnson
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
  Roseanne Taylor
- [ ] **California Energy Commission**
  Paul Richins
- [ ] **Dept. of Forestry & Fire Protection**
  Allen Robertson
- [ ] **Office of Historic Preservation**
  Wayne Donaldson
- [ ] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [ ] **Reclamation Board**
  DeeDee Jones
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [ ] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou
- [ ] _____
  Conservancy

Fish and Game

- [ ] **Depart. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Game Region 1**
  Donald Koch
- [ ] **Fish & Game Region 1E**
  Laurie Harnsberger
- [ ] **Fish & Game Region 2**
  Banky Curtis
- [ ] **Fish & Game Region 3**
  Robert Floerke
- [ ] **Fish & Game Region 4**
  Julie Vance
- [ ] **Fish & Game Region 5**
  Don Chadwick
  Habitat Conservation Program
- [ ] **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
  Gabrina Getchel
  Inyo/Mono, Habitat Conservation Program
- [x] **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Robert Sleppy
  Environmental Services Section
- [ ] **Dept. of Health Services**
  Veronica Malloy
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Debby Eddy
- [ ] **Office of Emergency Services**
  Dennis Castrillo
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse
- [ ] **Native American Heritage Comm.**
  Debbie Treadway
- [ ] **Public Utilities Commission**
  Ken Lewis
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [x] **State Lands Commission**
  Jean Sarino
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [ ] **California Highway Patrol**
  Shirley Kelly
  Office of Special Projects
- [ ] **Housing & Community Development**
  Lisa Nichols
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [ ] **Caltrans, District 3**
  Jeff Pulverman
- [ ] **Caltrans, District 4**
  Tim Sable
- [ ] **Caltrans, District 5**
  David Murray
- [ ] **Caltrans, District 6**
  Marc Birnbaum
- [ ] **Caltrans, District 7**
  Cheryl J. Powell
- [ ] **Caltrans, District 8**
  Dan Kopulsky
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Mario Orso
- [ ] **Caltrans, District 12**
  Bob Joseph

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
  - [ ] Transportation Projects
    Ravi Ramalingam
  - [ ] Industrial Projects
    Mike Tollstrup
- [x] **California Integrated Waste Management Board**
  Sue O'Leary
- [ ] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- [x] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____

Last Updated on 01/11/07

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
Arcata Area Office
1655 Heindon Rd.
Arcata, California 95521
Tel: (707) 825-5163; FAX: (707) 825-4840

In response refer to:
151415SWR2007AR00101

Michael E. Wheeler
Humboldt County Department of Community Development Services
3015 H Street
Eureka, CA 95501

NOAA's National Marine Fisheries Service (NMFS) received a letter from the Humboldt County Department of Community Development Services ("County") on January 26, 2007, notifying NMFS of the County's intention to prepare a Draft Environmental Impact Report (EIR) for the Humboldt County General Plan Update ("Plan Update"). The County's letter requests the views of NMFS as to the "scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project."

As the County is aware, NMFS is the federal agency charged with protecting and managing the nation's living marine resources. Under this charge, NMFS is responsible for administering the Endangered Species Act (ESA) of 1973, as amended, for Federally listed anadromous salmonids, marine species, and their designated critical habitat. The following federally threatened species and their designated critical habitat under NMFS jurisdiction occur in Humboldt County: Southern Oregon/Northern California Coast (SONCC) coho salmon (*Onchorhynchus kisutch*), California Coastal (CC) Chinook salmon (*Onchorynchus tshawytscha*), Northern California (NC) steelhead trout (*Onchorynchus mykiss*), and the Southern Distinct Population Segment (DPS) of green sturgeon (*Acipenser medirostris*). NMFS is also responsible for administering the Marine Mammal Protection Act (MMPA) which prohibits the "taking" of marine mammals. Harassing marine mammals is a prohibition of the MMPA.

NMFS commented on the Draft Supplemental EIR for the Proposed 2003 Update of Housing Element of the General Plan for Humboldt County in November of 2003 (see enclosed letter). We have the following comments and concerns with expanded residential, commercial, and industrial development within Humboldt County which is likely to occur as a result of the General Plan Update:

- We recommend the County develop a water budget for each of the planning watersheds within the General Plan area to ensure that water supply for future development guided by the General Plan Update can meet demands for salmonids as well as humans.

- NMFS recommends the Draft EIR evaluate the effects of potential increased waste discharge volumes into the habitat of all life stages of listed salmonids and green sturgeon (e.g. streams and estuaries). Potential negative effects from increased waste discharge into streams and estuaries that could affect listed salmonids and green sturgeon may include, but is not limited to, increased incidence of eutrophication and inadequate dissolved oxygen levels, increased incidence of disease outbreak, decreased light penetration in water columns, and changes in vegetative and biological communities.

- NMFS recommends the Draft EIR evaluate the effects of potential conversion of timberlands to other land uses on salmonids. Potential effects from land conversion could include elevated stream temperatures, loss of long-term recruitment of large woody debris, and alteration of watershed flood frequency and magnitude.

- NMFS recommends the Draft EIR evaluate the effects of current County ordinances regarding grading and Streamside Management Area (SMAs) on listed salmonids. NMFS recommends any proposed changes to grading and SMA's ordinances also be evaluated for their effectiveness in protecting salmonids and their critical habitat. In particular, NMFS is most interested in how SMA's and grading limitations provide for adequate long-term instream large woody debris, maintain stream temperatures for proper salmonid growth and survival, substantially reduce or eliminate the contribution of sediment to salmon-bearing streams, and maintain or improve stream channel characteristics such as sinuosity, peak flow, and stream discharge.

- NMFS recommends the County consider the long-term effects of global climate change on the ability of salmonids to respond to changes in air temperature, changes in regional snow pack levels, and changes in precipitation patterns. We recommend the County review and consider a recent report published by the Intergovernmental Panel on Climate Change and reviewed and supported by NOAA, on global climate predictions; the report can be viewed at http://www.noaa.gov. The County should consider the effects of climate change in the cumulative effects analysis of the preferred County alternative for the General Plan Update.

- NMFS recommends the County evaluate the potential effects of expanding development on marine mammals (e.g. harbor seals). For example, potential negative effects of expanding development could be increased harassment or injury via increased levels of activity in Humboldt Bay.

- NMFS recommends the County evaluate the potential effects of expanding development on all other living marine resources inhabiting the waters of Humboldt County.

NMFS supports the County's interest in finding mechanisms to streamline environmental permitting through the General Plan Update. NMFS believes salmonid habitat protection can be accomplished through the cooperative development of protection and mitigation measures to

minimize impacts to listed salmonids while allowing for development in Humboldt County. NMFS recommends the County consider integrating valuable information gathered for several management plans under development such as the Humboldt Bay Management Plan, coordinated through University of California Sea Grant Program, and management efforts underway for the Eel River.

Another useful natural resource planning tool the County has already identified is the Natural Communities Conservation Planning (NCCP) program which is administered by the California Department of Fish and Game (DFG). Many counties throughout California are engaged in a cooperative NCCP effort to address the impacts of County growth on sensitive species and their habitats. Page 2-50 of the County's Natural Resources and Hazards Report prepared for the General Plan Update, lists as **Option 2.3** the possibility of obtaining a Natural Communities Habitat Conservation Plan (NCCHCP) as a means to address impacts of development on special status species. As it has been 23 years since the County last revised the General Plan, NMFS believes this long-term planning effort, with a focus on species conservation, can address both the needs of the human element of the County as well as the fish, wildlife, and plants that occupy habitats within the County. Additionally, engaging in a NCCP effort will open opportunities to the County to seek and obtain state and federal funding for planning and conservation purposes. Further information on the NCCP can be found at http://www.dfg.ca.gov/nccp/.

NMFS is committed to dedicating staff to such a cooperative conservation planning effort. In our efforts working with the Humboldt Bay Municipal Water District, NMFS has demonstrated that we can effectively work with local organizations and municipalities to cooperatively develop an HCP for listed salmonids in a reasonable timeframe. We anticipate that the draft recovery plans for listed salmonids, which are due for release in 2007 and 2008, would be quite helpful in this long-term planning endeavor. Please contact Mr. John Clancy at (707) 825-5175 or via e-mail at john.p.clancy@noaa.gov if you have any questions, need further clarification, or would like to discuss opportunities for long-term salmonid conservation.

Sincerely,

Irma Lagomarsino
Arcata Area Office Supervisor

Enclosure: NMFS November 21, 2003 letter to Michael Richardson

cc: Mr. Bill Condon, CDFG, Eureka, CA
Mr. Mike Long, USFWS, Arcata, CA
Mr. David Ammerman, USACE, Eureka, CA
Regional Water Quality Control Board, Santa Rosa, CA
Humboldt County Board of Supervisors

DEPARTMENT OF TRANSPORTATION
DISTRICT 1, P.O. BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 441-2009
FAX (707) 441-5869
TTY (Teletypewriter #707-445-6463)

Flex your power!
Be energy efficient!

February 15, 2007

1-HUM-General
Humboldt County General Plan Update

Michael Wheeler, Senior Planner
Department of Community Development Services
County of Humboldt
3015 H Street
Eureka, CA 95501

Dear Mr. Wheeler:

Thank you for giving us the opportunity to comment on Part 1 of the Hearing Draft for the Humboldt County General Plan Update. This portion of the plan includes General Plan policies regarding public participation, plan maintenance, and intergovernmental coordination. We have the following comment:

We recommend that a policy be added to Section 3.3 (pp 1.23-24) that addresses coordination with State planning efforts. The proposed policy would recognize the existing cooperative relationship between the County and our Department through the Local Development-Intergovernmental Review (LD-IGR) program, where the Department reviews local general plan level and site-specific land use proposals for consistency with State planning priorities. We offer the following draft policy for your consideration:

State-County Coordination. The County should promote coordination between state and county planning efforts pursuant to Gov. Code §65103(f).

We look forward to continued cooperation with the County on this project. If you have questions or need further assistance, please contact me at the number above or contact Lezlie Kimura of District 1 Community Planning at (707) 441-4542.

Sincerely,

Jesse Robertson
Associate Transportation Planner
District 1 Community Planning

"Caltrans improves mobility across California"

DEPARTMENT OF CONSERVATION

DIVISION OF LAND RESOURCE PROTECTION

801 K STREET • MS 18-01 • SACRAMENTO, CALIFORNIA 95814

PHONE 916 / 324-0850 • FAX 916 / 327-3430 • TDD 916 / 324-2555 • WEBSITE conservation.ca.gov

February 20, 2007

Michael E. Wheeler
Humboldt County Planning Division
3015 H Street
Eureka, CA 95501

Subject: Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Humboldt County General Plan Update **SCH# 2007012089**

Dear Mr. Wheeler:

The Department of Conservation's Division of Land Resource Protection (Division) monitors farmland conversion on a statewide basis and administers the California Land Conservation (Williamson) Act and other agricultural land conservation programs. The Division has reviewed the above NOP and offers the following recommendations for the DEIR with respect to the project's potential impacts on agricultural land.

The proposed project involves a comprehensive update of the 1984 General Plan which began in Spring 2000. The NOP notes that key concerns identified during the public outreach efforts included protection of forest and agricultural lands from conversion to other uses and understanding of forces behind conversion. The General Plan Update would also address policy topics related to agricultural resources, open space and infrastructure planning and analysis. The Division recommends that the following issues be included in the DEIR to provide an adequate discussion of potential project impacts on agricultural land and agricultural activities.

Agricultural Setting of the Project

The DEIR should describe the project setting in terms of the actual and potential agricultural productivity of the land. The Division's Important Farmland Maps, which define farmland according to soil attributes and land use, have not been completed for Humboldt County due to lack of a published modern soil survey for the county. Therefore, we recommend that the DEIR describe the agricultural soil quality of the site using the Williamson Act's definition of prime agricultural land (Government Code Section 51201(c)).

In addition, we recommend including the following information to characterize the agricultural land resource setting of the planning area.

- Current and past agricultural use of the project area. Include data on the types of crops grown, and crop yields and farmgate sales values
- To help describe the full agricultural resource value of the soils in the area, we recommend the use of economic multipliers to assess the total contribution of potential or actual agricultural production to the local, regional and state economies. State and Federal agencies such as the UC Cooperative Extension Service and USDA are sources of economic multipliers.

Project Impacts on Agricultural Land

- Type, amount, and location of farmland conversion resulting directly and indirectly (growth-inducement) from project implementation. The extension of infrastructure and utilities into unserved areas also has the potential to result in growth inducement.
- Impacts on current and future agricultural operations; e.g., land-use conflicts, increases in land values and taxes, vandalism, etc.
- Incremental project impacts leading to cumulatively considerable impacts on agricultural land. This would include impacts from the proposed project as well as impacts from past, current and probable future projects.

Impacts on agricultural resources may also be quantified and qualified by use of established thresholds of significance (California Code of Regulations Section 15064.7). The Division has developed a California version of the USDA Land Evaluation and Site Assessment (LESA) Model, a semi-quantitative rating system for establishing the environmental significance of project-specific impacts on farmland. The model may also be used to rate the relative value of alternative project sites. The LESA Model is available on the Division's website noted later in this letter.

Williamson Act Lands

A project is deemed to be of statewide, regional or area-wide significance if it will result in cancellation of a Williamson Act contract for a parcel of 100 or more acres [California Code of Regulations Section 15206(b)(3)]. Since lands under Williamson Act contract and in agricultural preserves exist in the planning area, the Department recommends that the following information be provided in the DEIR:

- A map detailing the location of agricultural preserves and contracted land within each preserve. The DEIR should also tabulate the number of Williamson Act acres, according to land type (e.g., prime or non-prime agricultural land), which could be impacted directly or indirectly by the project.

- A discussion of Williamson Act contracts that may be terminated in order to implement the project. The DEIR should discuss the impacts that termination of Williamson Act contracts would have on nearby properties also under contract; i.e., growth-inducing impacts (in the sense that the removal of contract protection not only lifts a barrier to development, but results in higher property taxes, and thus, an incentive to shift to a more intensive land use, such as urban development.)

  As a general rule, land can be withdrawn from Williamson Act contract only through the nine-year nonrenewal process. Immediate termination via cancellation is reserved for "extraordinary", unforeseen situations (See Sierra Club v. City of Hayward (1981) 28 Cal.3d 840, 852-855). The City or County of jurisdiction must approve a request for contract cancellation, and base that approval on specific findings that are supported by substantial evidence (Government Code Section 51282). When Williamson Act contract cancellation is proposed, we recommend that a discussion of the findings be included in the DEIR. Finally, the notice of the hearing to approve the tentative cancellation, and a copy of the landowner's petition, must be mailed to the Director of the Department of Conservation ten (10) working days prior to the hearing. (The notice should be mailed to Bridgett Luther, Director, Department of Conservation, c/o Division of Land Resource Protection, 801 K Street MS 18-01, Sacramento, CA 95814-3528.)

- Any policies, for example lot line adjustments or additional development at original homesites, affecting lands in agricultural preserves or under Williamson Act contract should be consistent with the provisions of Williamson Act.
- Use of agricultural preserve land must be restricted by zoning or other means so as not to be incompatible with the agricultural use of contracted land within the preserve (Government Code Section 51230). Therefore, the DEIR should also discuss any proposed general plan designation or zoning within agricultural preserves affected by the project.

Mitigation Measures and Alternatives

Feasible alternatives to the project's location or configuration that would lessen or avoid farmland conversion impacts should be considered in the DEIR. Similarly, while the direct conversion of agricultural land is often deemed to be an unavoidable impact by California Environmental Quality Act (CEQA) analyses, mitigation measures must nevertheless be considered.

The Division recommends that the purchase of agricultural conservation easements on land of at least equal quality and size be considered as partial compensation for the

direct loss of agricultural land, as well as for the mitigation of growth inducing and cumulative impacts on agricultural land. We highlight this measure because of its growing acceptance and use by lead agencies as mitigation under CEQA.

Mitigation using conservation easements can be implemented by at least two alternative approaches: the outright purchase of conservation easements tied to the project, or via the donation of mitigation fees to a local, regional or statewide organization or agency, including land trusts and conservancies, whose purpose includes the purchase, holding and maintenance of agricultural conservation easements. For example, the California Farmland Conservancy Program is authorized to accept donations of funds if the Department of Conservation is the designated beneficiary and it agrees to use the funds for purposes of the program in a county specified by the donor. Whatever the approach, the conversion of agricultural land should be deemed an impact of at least regional significance and the search for mitigation lands conducted regionally, and not limited strictly to lands within Humboldt County.

Information about conservation easements is available on the Division's website, or by contacting the Division at the address and phone number listed below. The Division's website address is:

http://www.conservation.ca.gov/DLRP/

Of course, the use of conservation easements is only one form of mitigation that should be considered. The following mitigation measures could also be considered:

- Increasing home density or clustering residential units to allow a greater portion of the development site to remain in agricultural production.
- Protecting nearby farmland from *premature* conversion through the use of less than permanent long-term restrictions on use such as 20-year Farmland Security Zone contracts (Government Code Section 51296) or 10-year Williamson Act contracts (Government Code Section 51200 et seq.).
- Establishing buffers such as setbacks, berms, greenbelts, and open space areas to separate farmland from incompatible urban uses.
- Investing in the commercial viability of the remaining agricultural land in the project area through a mitigation bank which invests in agricultural infrastructure, water supplies and marketing.

The Department believes that the most effective approach to farmland conservation and impact mitigation is one that is integrated with general plan policies. For example, the measures suggested above could be most effectively applied as part of a comprehensive agricultural land conservation element in the General Plan. Mitigation

policies could then be applied systematically toward larger goals of sustaining an agricultural land resource base and economy. Within the context of a general plan mitigation strategy, other measures could be considered, such as the use of transfer of development credits, mitigation banking, and economic incentives for continuing agricultural uses.

Thank you for the opportunity to comment on the NOP. If you have questions on our comments, or require technical assistance or information on agricultural land conservation, please contact the Division at 801 K Street, MS 18-01, Sacramento, California 95814; or, phone (916) 324-0850.

Sincerely,

Brian Leahy
Assistant Director

cc: Humboldt County RCD
5630 South Broadway
Eureka, California 95503

VIA EMAIL: **mwheeler@co.humboldt.ca.us**

STATE OF CALIFORNIA
Arnold Schwarzenegger, *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

February 6, 2007

Michael E. Wheeler
Humboldt County Planning Division
3015 H Street
Eureka, CA 95501

RE: Humboldt County General Plan Update, SCH# 2007012089

Dear Mr. Wheeler:

As the state agency responsible for rail safety within California, we recommend that any development projects planned adjacent to or near the rail corridor in the County be planned with the safety of the rail corridor in mind. New developments may increase traffic volumes not only on streets and at intersections, but also at at-grade highway-rail crossings. This includes considering pedestrian circulation patterns/destinations with respect to railroad right-of-way.

Safety factors to consider include, but are not limited to, the planning for grade separations for major thoroughfares, improvements to existing at-grade highway-rail crossings due to increase in traffic volumes and appropriate fencing to limit the access of trespassers onto the railroad right-of-way. Any project that includes a modification to an exiting crossing or proposes a new crossing is legally required to obtain authority to construct from the Commission. If the project includes a proposed new crossing, the Commission will be a responsible party under CEQA and the impacts of the crossing must be discussed within the environmental documents.

The above-mentioned safety improvements should be considered when approval is sought for the new development. Working with Commission staff early in the conceptual design phase will help improve the safety to motorists and pedestrians in the County.

If you have any questions in this matter, please call me at (415) 703-2795.

Very truly yours,

Kevin Boles
Environmental Specialist
Rail Crossings Engineering Section
Consumer Protection and Safety Division

cc: Mitch Stogner, North Coast Railroad

STATE OF CALIFORNIA — Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
www.nahc.ca.gov
ds_nahc@pacbell.net

March 8, 2007

Mr. Michael Wheeler
Humboldt County Planning Department
3015 "H" Street
Eureka, CA 95501

Re: SCH# 2007012089; CEQA Notice of Preparation (NOP) for General Plan Update draft Environmental Impact Report (DEIR); Humboldt County

Dear Mr. Wheeler:

Thank you for the opportunity to comment on the above-referenced document. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR per CEQA guidelines § 15064.5(b)(c). In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE),' and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action:

√ Contact the appropriate California Historic Resources Information Center (CHRIS). The record search will determine:

- If a part or the entire (APE) has been previously surveyed for cultural resources.
- If any known cultural resources have already been recorded in or adjacent to the APE.
- If the probability is low, moderate, or high that cultural resources are located in the APE.
- If a survey is required to determine whether previously unrecorded cultural resources are present.

√ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.
- The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.

√ Contact the Native American Heritage Commission (NAHC) for:

* A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity who may have information on cultural resources in or near the APE. Please provide us site identification as follows: USGS 7.5-minute quadrangle citation with name, township, range and section. This will assist us with the SLF.

- Also, we recommend that you contact the Native American contacts on the attached list to get their input on the effect of potential project (e.g. APE) impact.

√ Lack of surface evidence of archeological resources does not preclude their subsurface existence.

- Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
- Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.

√ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigation plans.

* CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens.

√ Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the CEQA Guidelines mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

√ Lead agencies should consider avoidance, as defined in § 15370 of the CEQA Guidelines, when significant cultural resources are discovered during the course of project planning.

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Cc: State Clearinghouse
Attachment: List of Native American Contacts

Native American Contacts
Humboldt County
March 8, 2007

Big Lagoon Rancheria
Virgil Moorehead, Chairperson
P. O. Box 3060
Trinidad , CA 95570
vmoorehead@earthlink.net
(707) 826-2079
(707) 826-1737 - Fax

Yurok
Tolowa

Blue Lake Rancheria
Claudia Brundin, Chairperson
P.O. Box 428
Blue Lake , CA 95525
blrt@tidepool.com
(707) 668-5101
(707) 668-4272 Fax

Wiyot
Yurok
Tolowa

Hoopa Valley Tribe
Clifford L. Marshall, Chairperson
P.O. Box 1348
Hoopa , CA 95546
marshalllaw@pcweb.net
(530) 625-4211
(530) 625-4594 Fax

Hoopa - Hupa

Bear River Band of Rohnerville Rancheria
Len Bowman, Jr., Chairperson
32 Bear River Drive
Loleta , CA 95551
lbowman@bearriver.com
(707) 733-1900
(707) 733-1972 Fax

Wiyot
Mattole

Wiyot Tribe
Cheryl Seidner, Chairperson
1000 Wiyot Drive
Loleta , CA 95551
wiyotone@yahoo.com
(707) 733-5055
(707) 733-5601 Fax

Wiyot

Trinidad Rancheria/Cher-Ae Heights Indian
Garth Sundberg, Chairperson
P.O. Box 630
Trinidad , CA 95570
susie@trinidadrancheria.com
(707) 677-0211
(707) 677-3921 Fax

Yurok
Miwok
Tolowa

Yurok Tribe of California
Maria Tripp, Chairperson
PO Box 1027
Klamath , CA 95548
mtripp@yuroktribe.nsn.us
(707) 482-1350
(707) 482-1377 or 1373- Fax

Yurok

LaVerne Glaze
P.O. Box 295
Orleans , CA 95556
(916) 627-3112

Karok
Yurok

This list is current only as of the date of this document.

Distribution of this list does not relieve any person **of statutory** responsibility **as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public** Resources **Code and Section** 5097.**98 of the Public Resources Code.**

This list is only applicable **for contacting local Native Americans with regard to cultural resources for the** proposed **SCH#2007012089; CEQA Notice** of Preparation **for Humboldt County General Plan Update; draft** Environmental **Impact Report (DEIR); Humboldt** County, **California.**

Native American Contacts
Humboldt County
March 8, 2007

InterTribal Sinkyone Wilderness Council
Hawk Rosales, Executive Director
PO Box 1523
Ukiah , CA 95482
(707) 463-6745
Mattole Sinkyone

Tsnungwe Council
Paul Ammon, Chairperson
P.O. Box 373
Salyer , CA 95563
(530) 629-3356
(530) 629-3356 FAX
Southern Hoopa

Yurok Tribe of California THPO
Thomas Gates, Tribal Heritage Perservation Officer
15900 Hwy 101 N.
Klamath , CA 95548
ythpo@yahoo.com
(707) 482-1350
(707) 482-1822
Fax: (707) 482-1722
Yurok

Wiyot Tribe THPO
Helene Rouvier, Tribal Historic Preservation Officer
1000 Wiyot Drive
Loleta , CA 95551
cultural@wiyot.us
(707) 733-5055
(707) 733-5601 Fax
Wiyot

Karuk Tribe of California, Department of Natural Resources
Attn: Leaf Hillman
P.O. Box 282
Orleans , CA 95556
(530) 627-3446
(530) 627-3448
Karuk / Karok

Tsurai Ancestral Society
Parris Lundgren
PO Box 276
Trinidad , CA 95570
707-677-3954 - Home
707-822-6519 - Work
Yurok

Walt Laura
15900 Hwy 101 N.
Klamath , CA 95548
707 482-2841 - work
Yurok

Cassandra Hensher
320 Hilltop Drive, #224
Redding , CA 96003
916-813-8468 -CELL
hensher@mail.com
Karuk

This list is current only as of the date of this document.

Distribution of this list does not relieve any person **of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public** Resources **Code and Section** 5097.98 **of the Public Resources Code.**

This list is only applicable for **contacting local Native Americans with regard to cultural resources for the** proposed **SCH#2007012089; CEQA Notice of Preparation for Humboldt County General Plan Update; draft** Environmental **Impact Report** (DEIR); **Humboldt County, California.**

Native American Contacts
Humboldt County
March 8, 2007

Blue Lake Rancheria
Paul Angell, Cultural Resources Coordinator
P.O. Box 428 Wiyot
Blue Lake , CA 95525 Yurok
pangell@bluelakerancheria-nsn.gov Tolowa
(707) 668-5101
(707) 668-4272 Fax

Eel River Nation of Sovereign Wailaki
Ken Horn, President
PO Box 156 Wailaki
Redway , Ca 95560
707-923-2797
707-223-2797

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2007012089; CEQA Notice of Preparation for Humboldt County General Plan Update; draft Environmental Impact Report (DEIR); Humboldt County, California.

HUMBOLDT BAY MUNICIPAL WATER DISTRICT

828 SEVENTH STREET, PO BOX 95 • EUREKA, CALIFORNIA 95502
OFFICE 707-443-5018 ESSEX 707-822-2918
FAX 707-443-5731 707-822-8245
EMAIL OFFICE@HBMWD.COM

February 8, 2007

Michael E. Wheeler
County of Humboldt
3015 H Street
Eureka, CA 95501

Subject: Draft Environmental Impact Report for Humboldt County General Plan Update

Dear Mr. Wheeler:

The purpose of this letter is to respond to the County's Notice of Preparation of a Draft Environmental Impact Report (EIR) for the Humboldt County General Plan Update. The District's comments are in regards to the scope and content of the environmental report stemming from our agency's statutory responsibilities related to the proposed project.

The County's General Plan update will trigger the need to address, and likely upgrade, components of the District's regional domestic water system. The District is also interested in, and may be impacted by, the Water Resources policies of the plan.

Therefore, the District is a Responsible Agency under CEQA with respect to any discretionary modifications to the District's facilities needed as a result of this project. As defined in the State CEQA Guidelines, Section 15381, the term "Responsible Agency" includes all public agencies other than the Lead Agency having discretionary approval power over the project. The District will have discretionary authority over whether and how the District's facilities will be modified.

Background Information

The District operates a regional water system, which provides domestic water service on a wholesale basis to seven Municipal agencies in and around Humboldt Bay. The District supplies drinking water to the cities of Eureka, Arcata, and Blue Lake, and the Fieldbrook-Glendale, Humboldt, Manila, and McKinleyville Community Services Districts. The District also serves a small number of retail customers directly. Additionally, the District supplies untreated "raw" water to industrial customer(s) on the Samoa Peninsula.

The District's source of supply is the Mad River. The District has appropriative water rights for storage (at Ruth Lake) and diversion (at Essex northeast of Arcata), which rights provide a firm year-round water supply of 75 million gallons per day (MGD). Given the closure of the Simpson pulp mill and reductions in use at the one remaining mill, only 25 -30 MGD of the District's 75 MGD water supply is currently utilized.

At historical growth rates, the District has ample water supply under permit to meet the needs of the Humboldt Bay region for many years. However, if growth rates increase significantly, and/or new industrial customer(s) locate here and use the District's available industrial water, the availability of the District's water supply to meet growth stemming from the General Plan update may need to be addressed.

Furthermore, infrastructure additions will likely be necessary in the not-to-distant future on the domestic water system to accommodate increased water demands associated with growth and development. This will be discussed below.

Comments on the Proposed Project

a) Water Resources Policies

The NOP for the EIR did not provide sufficient detail for the District to provide comments on potential impacts to the District. The District may be affected by the Water Resource policies, especially as it relates to the following items listed in the NOP:

i. a policy to limit impacts of water withdrawals in impaired watershed;

ii. update to the County's water export policies; and

iii. a policy to provide for a riparian canopy retention standard in TMDL temperature impaired areas.

If these policies would affect the District, in particular its water supply and diversion operations, the EIR should address such impacts.

b) Mineral Resource Element

The NOP states that "Technical Background Studies show that gravel and rock quarries are the only significant mineral resources currently utilized in the County. In-stream gravel mines are managed on a sustained yield basis under existing adaptive management strategies."

This statement appears to indicate that gravel mining extraction will not be addressed in this element. If gravel mining extraction on the Mad River is addressed – and in particular quantities thereof - the District may potentially be affected as it relates to bed-level degradation.

c) Capital Improvements/Public Facilities Element

Infrastructure additions will likely be necessary in the not-to-distant future on the domestic water system to accommodate increased water demands associated with growth and development. In general, the assessments noted under the heading "Service Capacity and Infrastructure Needs" in the NOP are essential and should be specific to the pertinent existing water supply and delivery systems. Following are the areas which will likely need to be addressed:

i. Diversion Facilities on the Mad River (which provides the source of supply)

The majority of the pumping and transmission capacity from the District's source of supply is in the industrial water system. The industrial system is capable of supplying 60 MGD.

The capacity of the Ranney Collectors which supply the domestic water system is approximately 20-21 MGD. Annual average domestic demands are currently 10-11 MGD (so adequate supply capacity exists for average demands); however, peak demands have been approaching 16-17 MGD. Therefore, as development is planned and approved, careful consideration of water demands, especially peak demands, must be addressed. Additional water storage and conservation measures are important tools which should be considered to address peak demands. Ultimately, additional water supply will be necessary which will likely involve installing additional laterals in the existing Ranney Collectors.

ii. Domestic Water Delivery System on Samoa Peninsula

The original design of the regional water system included 4 MGD of capacity for domestic water needs on the Samoa Peninsula. The balance of the pipeline capacity on the peninsula – originally 38 MGD and subsequently increased to 60 MGD – was dedicated for industrial use at the pulp mills. The domestic water system on the peninsula originally terminated near the Simpson pulp mill. However, in the early 1970s, the domestic system was extended further down the peninsula, and an under-bay crossing was installed, to initiate drinking water service to the Humboldt Community Services District and to provide the City of Eureka a secondary connection for emergency back-up.

The current capacity of the District's domestic water pipeline on the Samoa Peninsula is approximately 4.5 MGD. Under peak demands, the domestic water system is operating near the system's current maximum capacity.

The District is aware of potential development at the following locations, which may increase water demands in the Samoa Peninsula pipeline system: the Town of Samoa; at the former Simpson Pulp Mill site; within the Humboldt Community Services District's service area (e.g. proposed Forster-Gill project), and now given the County's proposed General Plan update and Urban Study Area at the Eureka/HCSD interface.

Public Water Systems must comply with Title 22 of the California Code of Regulations. Title 22 requires that Public Water Systems "provide a reliable and adequate supply of pure, wholesome, healthful, and potable water." With respect to providing an adequate supply of water, Title 22 requires that "Sufficient water shall be available from the water sources and distribution reservoirs to supply adequately, dependably, and safely the total requirements of all users under maximum demand conditions before agreement is made to permit additional service connections to the system."

The EIR should evaluate what, if any, transmission level upgrades on the Samoa Peninsula will be required to serve this project, in conjunction with other projects for which the District has provided comments on draft EIRs. In particular, the system downstream of Manila where the District's domestic water pipeline decreases from 27-inches to 15-inches, and also downstream of the Samoa Booster Pump Station where constraints exist due to the presence of an 18-inch pipeline made of techite, should be addressed.

iii. Pipeline Serving Blue Lake and Fieldbrook-Glendale CSD

The District's domestic water pipeline which serves the City of Blue Lake and the Fieldbrook-Glendale Community Services District (FG CSD) is operating near capacity. Residents on the suction side of FG CSD's Lyman Pump Station, as well as residents in Glendale Heights, at times experience low water pressure. FG CSD completed a preliminary hydraulic study which determined that a new booster pump station would be necessary in the near future to maintain adequate delivery pressures. If development occurs in this area, a new booster pump station, such as that identified in FCSD's study, will be required. The draft EIR should address this.

iv. Storage

The District cannot mandate that additional storage be developed; however, the District encourages that additional water storage be considered at strategic locations. Storage is an important component in the overall design of a Public Water System. Storage can provide many benefits such as : a) supply for fire flows, b) supply reliability in the event of planned or unplanned outages on the transmission system, c) a reduction in peak water supply needs, thereby minimizing capital investments and reducing energy costs.

We very much appreciate the opportunity to comment on this project.

Sincerely,

Randy Turner
Vice-President, Board of Directors

Cc: District's Municipal Customers

DEPARTMENT OF FORESTRY AND FIRE PROTECTION

Humboldt – Del Norte Unit
118 Fortuna Blvd.
Fortuna, CA 95540
Website: www.fire.ca.gov
(707) 725-4413

Ref: 9000 Fire Prevention
Date: February 21, 2007

Kirk A. Girard, Director
Community Development Services Department
3015 H Street
Eureka, CA 95501

Project: Humboldt County General Plan Update Draft EIR
SCH#: 2007012089
Area: County-wide
Attention: Michael Wheeler

Mr. Girard,

The California Department of Forestry and Fire Protection (CDF) staff reviewed and provided the following input:

The Humboldt – Del Norte Unit staff has participated in numerous meetings regarding the General Plan Update over the last several years. We strongly support the work and findings of the Draft Fire Protection Master Plan, a product prompted by the General Plan Update process. The current General Plan provided a general treatment of issues relating to fire hazard and protection. CDF recommends an extensive evaluation and embodiment of the issues raised in the Fire Protection Master Plan in the Safety element of the General Plan Update. The Fire Protection Master Plan should be considered for adoption as a component of the General Plan Update.

The county Fire Safe Ordinance 1952 (Title 3 Land Use and Development, Division 11, Sections 3111 through 3116) work with the Building Codes to regulate wildland fire safety standards. Revisiting Fire Safe Ordinance 1952 is recommended to assess its' efficacy. Requests for exceptions to the Fire Safe Ordinance include a range of alternative mitigation measures. Some measures are commonly used (hardy board siding) and others not (residential sprinkler systems). With changes pending in the Building Codes, these measures should be reevaluated. The CDF also sees services provided unevenly in the following areas: 1) plan inspection and compliance, 2) fire investigation, and 3) fire prevention. These services are provided by a few fire departments in the County, but citizens do not have a consistent source for this assistance.

Approximately 54 percent (1,245,000 acres) of Humboldt County is not served by local fire service districts. Such service is either non-existent, or provided on a "good will" basis by an adjacent fire department. Rarely does a responsible agency conduct a fire investigation in under-served areas. CDF has performed non-wildland fire investigations inconsistently, on an "as available" basis, as assistance to Humboldt County. Good-will response on medical aid, fire, rescue, and other similar calls should have costs reimbursed. The County should consider the formation of a county-wide service area to cover the costs of, and improve these services.

CDF is a strong supporter of local fire services. Our success in meeting our mission can be compromised where local growth out-strips the local fire departments infrastructure and their ability to support that growth. Deterioration of local fire services can have an adverse effect on CDF's level of service. Development should be focused in areas where services are currently provided and can be appropriately enhanced to support such growth. Development should consider the adequacy of the fire / emergency response infrastructure, and limited where it is inadequate.

Timberland is an important resource in California. The State Board of Forestry and Fire Protection, by policy, does not support any activity that reduces the productive timberland resources of the State. Humboldt County hosts some of the most productive timber growing lands in the State. Key findings in the General Plan Scoping support the protection of forest lands from conversion to other uses.

State of California – The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
NORTHERN REGION
601 Locust Street
Redding, CA 96001
(530) 225-2300

ARNOLD SCHWARZENEGGER, Governor

July 17, 2007

Mr. Michael E. Wheeler, Supervisor Planner
Humboldt County Community Development Services
3015 H Street
Eureka, California 95501-4484

Dear Mr. Wheeler:

Humboldt County General Plan Update

On January 25, 2007, the Department of Fish and Game (DFG) received from the Humboldt County Department of Community Development Services a notice of preparation (NOP) of a draft environmental impact report (DEIR) for the Humboldt County General Plan Update (Update). This Update is a long-term policy document with a 20-year planning horizon. Its purpose is to guide the County's public policies and conservation goals relative to designated land uses and community development within unincorporated areas of the County. Because the fish and wildlife habitats within the County and the species that use them extend well beyond the borders of the County, the impacts of this Update will have significant regional environmental importance.

The Update projects that by the year 2025, the County population will increase by more than 16,000 people. To accommodate this projected population increase, the County anticipates a demand for 274 additional acres of commercial/industrial lands, approximately 6,000 new housing units, and the development of 2,100 additional acres of residential space by the year 2025. The Update Public Services Report anticipates water demand over this period will increase 62% from 30 million gallons a day (mgd) to 49 mgd.

DFG has reviewed the DEIR NOP, and Update supporting technical background reports and related documents and is providing comments on the Update and DEIR as both a trustee and responsible agency pursuant to the California Environmental Quality Act (CEQA). As a trustee for the State's fish and wildlife resources, DFG has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants and the habitat necessary to sustain their populations. As a responsible agency, DFG administers the California Endangered Species Act (CESA) and other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife public trust resources.

DFG commends the County for developing supporting technical background reports that adequately describe the County's extensive and diverse biological resources, the current and projected threats and impacts to these resources, and potential policy recommendations to protect, enhance, or restore them, as the County continues to grow and develop.

Support for Sketch Plan A

The County has determined the Update DEIR "Sketch Plan A" is the environmentally superior project alternative because it focuses future growth and development into areas where there is existing infrastructure, such as roads, domestic water and sewer, and services such as schools, retail shopping, police and fire protection. By encouraging future development where urban services are already in place, Sketch Plan A would minimize the need for future construction of transportation, sewer, water and electrical distribution infrastructure and stream crossings, as well as minimize the fragmentation and loss of agricultural and forest lands ("resources lands"), which are important fish and wildlife habitat. As such, Sketch Plan A would, among the alternatives under consideration, most feasibly minimize the significant environmental effects of urbanization (listed below) and therefore would have the least impacts on fish and wildlife habitat. For these reasons, DFG supports the adoption of Sketch Plan A.

Habitat fragmentation from urban development has substantial environmental effects on fish and wildlife habitats. Encroachment effects of roads and structures into natural areas include wildlife road-kill, increased garbage and roadside dumping, light and noise disturbance, the introduction of invasive species, the killing of and disturbance to wildlife by domestic animals, and an increase in urban predator fauna such as corvids (jays, crows, and ravens). These affect the long-term sustainability of wildlife populations, e.g., northern spotted owl and marbled murrelet. Furthermore, the placement of residential developments in natural areas typically leads to human conflict with wildlife such as black bear, mountain lion, and fox. This conflict often results in depredation of these animals. DFG therefore recommends the DEIR specifically evaluate the direct and indirect impacts of habitat fragmentation that will result from the Update.

Standards and Ordinances

DFG understands the County intends to develop implementing standards and ordinances concurrent with the drafting of the Update and DEIR so that when the Update is approved, it will be fully enforceable. To best protect fish and wildlife resources and to give the public regulatory certainty and clarity, DFG supports the County's effort to establish clear, specific, and enforceable implementation standards and ordinances concurrent with preparation of the DEIR.

Understanding these specific implementation standards and ordinances is critical to evaluating the effectiveness and potential impacts of Update policies on fish and wildlife resources. DFG therefore requests continued opportunities to review and comment during their development. DFG recommends that the standards and ordinances developed for the Update be incorporated into approved community plans, such as the 2002 McKinleyville and 1995 Eureka Community Plans, if they currently lack the enforceable standards or ordinances developed in this Update.

Guiding Principles

According to Chapter 1 of the Preliminary Hearing Draft for the February 15, 2007, Update Workshop, nine guiding principles were developed to guide the drafting of the goals and policies of the Update, as well as to create a desired future vision. Of these nine guiding principles, four are directly related to the conservation of fish and wildlife resources. DFG applauds the inclusion and use of the following guiding principles and supports their retention in the final Update:

> "3) The plan must ensure the efficient use of water and sewer services and focus development in those areas and discourage low density residential conversion of resources lands and open space."
>
> "6) The plan must contain long-term agricultural and timber land protections such as increased restrictions on resource land subdivisions and patent parcel development."
>
> "7) The plan must include unambiguous natural resource protections; especially for open space, water resources, water quality, scenic beauty, and salmonids."
>
> "9) The plan must provide a clear statement of County land values and policies to provide clarity in the County's permitting processing system and to simplify review of projects that are consistent with the General Plan."

Significance of Humboldt County's Aquatic and Riparian Habitats

As noted in the Update Natural Resources and Hazards Report (NR &H Report), Humboldt County has numerous ecologically and economically important aquatic resources, including wetlands, lagoons, streams, rivers, estuaries and the Pacific Ocean. These resources have both regional and statewide significance. Humboldt Bay for instance, is California's second largest estuary, and combined with surrounding agricultural lands and the Eel River estuary, is one of the most important migratory waterfowl stopovers along the Pacific Flyway. Humboldt County also has some of the largest and most ecologically important coastal lagoons in the state. The NR &H Report

notes that two of California's three largest river systems flow through the County and that County streams, rivers and estuaries are habitat for more than 20 State-and-Federally-listed threatened and endangered species. Even smaller streams adjacent to urban areas can have significant fisheries values. For instance, DFG 2005 stream survey data for Freshwater Slough records the presence of 28 fish species, many with important commercial and recreational fisheries value.

A sampling of the listed species occurring in Humboldt County and their listing status include: coho salmon (*Oncorhynchus kisutch*) a State-and-Federally-threatened species; Chinook salmon (*Oncorhynchus tshawytscha*) a Federally-threatened species; coastal cutthroat trout (*Oncorhynchus clarki clarki*), a California species of special concern; steelhead trout (*Oncorhynchus mykiss*) a Federally-threatened species; tidewater goby (*Eucyclogobius newberryi*) a Federally-endangered species and California species of special concern; green sturgeon (*Acipenser medirostris*) a Federally-threatened species and California species of special concern; and willow flycatcher (*Empidonax traillii*) a State-endangered species.

The anadromous salmonids listed above are iconic species that help define California's north coast and form an integral part of the County's natural ecosystems, cultural heritage, and local economy. California's commercial salmon fishery is an estimated $100 million-a-year industry. Yet despite their importance, salmonids are also some of the County's most imperiled species. Most of the County's anadromous salmonid stocks have, for multiple reasons, precipitously declined over the past 100 years. Coho salmon, for example, have undergone at least a 70% decline in abundance since the 1960s, and is currently at 6 to 15% of its abundance during the 1940s (DFG 2004). The region's commercial and recreational fishing industry have been severely impacted by this decline. In 2006, the US Commerce Department declared a commercial fishery failure for coastal Oregon and California, and recently the US Congress approved and President Bush signed, a $60 million emergency disaster relief package for the pacific salmon Industry.

Many of the County's larger water bodies, such as Humboldt Bay, Freshwater, Jacoby, and Redwood creeks, and the Eel, Elk, Klamath, Mad, Mattole, Trinity and Van Duzen rivers are designated by the US Environmental Protection Agency as sediment-impaired pursuant to the Clean Water Act §303(d) or are otherwise impaired by high water temperatures, water diversions, loss of riparian habitat, or barriers to fish passage. A number of these waters, such as Humboldt Bay and its principal tributaries and the lower Eel, Mad, and Van Duzen rivers maintain important coho salmon populations that

have been designated by DFG as key populations to maintain or improve (DFG 2004). Humboldt Bay and many of these important fish-bearing rivers and streams are situated in or adjacent to areas serviced by existing water and sewer services and therefore are in the areas most likely to be impacted by the future development envisioned in the Update.

Impacts to Aquatic and Riparian Habitats

Given the regional importance of the County's riparian and aquatic habitats, DFG recommends the DEIR thoroughly evaluate potential direct and indirect impacts to aquatic and riparian habitats and give special attention to impacts to all salmonid life stages. The DEIR should specifically address the impacts from the indirect effects of urbanization and the conversion of agricultural and timber lands on these resources.

Urbanization has adverse effects on streams and other aquatic habitats. These impacts fall into four general categories: hydrologic, physical, water quality, and biological. In short, without effective mitigations, urbanization and increased impervious surfaces in a watershed lead to increased peak flows and decreased summer low flows, increased water diversions, bank erosion, flooding, sedimentation and the filling of cold-water pools, habitat simplification, loss of functional riparian habitat (including decreases in large wood inputs and habitat complexity), decreased shade leading to higher water temperatures, increases in point source and non-point pollution, and in barriers to fish passage.

DFG finds, with some exceptions, much of the information in the Update Water Resources Technical Background Report (Water Report) appears to be useful and accurate. Notable exceptions include the following statements in the Trinidad Planning Watershed assessment. Regarding current sediment runoff, the Water Report states: "Due to low-volume and slow-moving streamflow through the Trinidad Watershed, sediment is negligible." Regarding Watershed Management Problems, the Water Report states: "No problems are in evidence. The vast majority of the watershed is zoned TPZ, but no timber-related problems are in evidence."

DFG disagrees with this characterization. Streams in the Trinidad and Westhaven area have documented water quality impairments including sediment from forest and unpaved residential roads, antiquated septic systems functioning below current standards, and residential stream diversions which in some cases have dewatered streams. The City of Trinidad and a multiple stakeholder team including DFG, the Coastal Commission and the Redwood Community Action Agency are currently working to characterize, monitor, and rectify these impairments.

Natural Communities Conservation Plan and Habitat Conservation Plan

To provide for the conservation, management, and ultimate recovery of listed and potentially listed species, the California Legislature enacted the Natural Communities Conservation Planning Act, (Fish and Game Code §2800 *et seq)*. This act allows for the development of a Natural Communities Conservation Plan (NCCP), which conserves natural communities at the ecosystem scale while accommodating compatible land use. The NR&H Report discusses the potential for County-permitted rural subdivisions in areas with habitat for special status species to be covered under an NCCP. Typically, NCCPs are developed in conjunction with a Federal Habitat Conservation Plan (HCP).

DFG finds that over the life of the Update, the County is likely to undertake or permit projects pursuant to CEQA that may result in the incidental take of listed salmonids, such as coho salmon. Pursuant to CESA, the incidental take of State-listed species requires project proponents obtain an incidental take permit (ITP) from DFG. The issuance of an ITP is typically a lengthy and complicated process best incorporated into an NCCP/HCP process rather than on a project by project basis.

The NCCP program is a voluntary cooperative effort that seeks to anticipate and prevent the controversies caused by species' listings by focusing on the long-term stability of wildlife and plant communities and by including key stakeholders in the process. Presently, Contra Costa, Placer, Santa Clara, and Yolo Counties are developing NCCPs and a number of other California counties are already implementing them. DFG recommends the County meet with DFG, the National Marine Fisheries Service, and the US Fish and Wildlife Service to explore developing a County-wide NCCP/HCP.

Master Lake or Streambed Alteration Agreement

Pursuant to Fish and Game Code §1600 *et seq*, if a project will result in the substantial modification to a lake or streambed, bank, or channel, DFG must be notified, and in a majority of cases, a Lake or Streambed Alteration Agreement (LSAA) issued. DFG is the "responsible agency" under CEQA for the issuance of LSAAs. Given the County maintains more than 1,500 miles of roads, 100 bridges, and three levee systems, and the frequency in which the County requests LSAAs, DFG recommends the County, pursuant to Fish and Game Code §1600 *et seq.*, work with DFG to develop a county-wide master LSAA. A long-term master LSAA would provide the County with greater operational flexibility, certainty, and cost savings, while better protecting aquatic resources.

Stormwater Quality and Intensification

Development that results in the covering of permeable soil on vegetated land with impervious surfaces such as structures, streets, sidewalks, and parking lots, tends to intensify storm water runoff volumes and velocities. These effects typically result in higher stream peak flows, increased bank instability, erosion, channel incision, flooding, discharge of fine sediment, and the introduction of pollutants such as hydrocarbons, heavy metals, garbage, pathogens, nutrients, pesticides, and domestic animal feces.

The nonpoint point source pollution found in urban runoff is now a leading threat to the nation's water quality (US EPA 1999). A significant overall reduction in stream and wetland quality indicators when impervious cover in a watershed exceeds 10%, with severe degradation expected beyond 25% impervious cover (Arnold and Gibbons 1996; Watershed Protection Research Monograph No. 1, 2003). The following statement in the NR &H Report demonstrates the County's awareness of the adverse effects that urbanization has on local water quality:

> "Although water quality is relatively high, many water bodies are sediment, temperature, or pollution impaired. Nonpoint source pollution from stormwater and agricultural runoff is the greatest cause of water quality problems in the county."

The following warning on the County Division of Environmental Health, Ocean Monitoring Program website also demonstrates the County's public health concerns over stormwater impairment to local waters:

> "After a significant rainfall, stormwater runoff draining into creeks and the ocean can contain high levels of bacteria and pollutants. Please avoid contact with ocean and creek water until at least 3 days after a heavy rainfall."

In addition to stormwater pollution, development projects are often designed to rapidly discharge storm and flood water offsite and into natural drainage features such as streams or Humboldt Bay. Unless intentionally designed to do so, development typically leads to decreases in groundwater and local aquifer recharge. Since on the North Coast, groundwater is the principal summer water source for streams, rivers, and wetlands, increases in impervious surfaces and stormwater facilities designed for rapid drainage of

stormwater off-site tend to result in decreased summer low flows, higher stream temperatures, and loss or even elimination of aquatic habitat during the summer. DFG therefore recommends the DEIR thoroughly evaluate potential direct and indirect impacts of increased stormwater runoff and altered hydrology to receiving waters.

DFG recommends the County include a clear policy and implementation ordinances or standards which require developments be designed and managed to minimize the introduction of pollutants and increases in runoff to receiving waters. DFG recommends these standards prohibit developments, to the maximum extent practicable, from altering the hydrologic regime of streams by increasing peak flows or decreasing summer low flows.

To accomplish these objectives, DFG recommends the Update include a standard that requires the use of low-impact development (LID) elements such as pervious surface technologies for driveways and walkways, vegetated (green) roofs (Hutchinson et al. 2006, Voelz 2006), disconnected downspouts, water gardens and grassy swales to maximize pervious surfaces and capture and maintain on-site stormwater percolation and treatment, thus maintaining to the greatest extent practicable, post-project pervious surfaces. Utilizing LID elements will benefit aquatic resources by: 1) filtering out pollution and increasing the quality of stormwater runoff, 2) decreasing peak flows and erosion in downstream waters and 3) increasing ground water recharge and therefore helping maintain biologically-important summer low flows. DFG recommends that the Update, require projects to the maximum extent practicable, treat all stormwater from at least two-year rain events (Q2) on-site through detention and percolation.

The City of Portland, Oregon, Bureau of Environmental Services internet site (http://www.portlandonline.com/bes/index.cfm?c=29323) provides good examples of LID designs and urban stormwater enhancement policies and technologies, which, given its Pacific Northwest climate, may also be appropriate for Humboldt County. Sonoma County, the City of Santa Rosa, and the Russian River Watershed Counsel have also jointly developed a comprehensive set of urban stormwater mitigation guidelines for the Santa Rosa area (Sonoma County 2005).

The Update Preliminary Hearing Draft, April 19th, 2007, Workshop Safety Element policy (S-P12 Natural Vegetation) states: "Natural vegetation within and immediately adjacent to the bankfull stream channel shall be maintained except for flood control and public safety purposes." Riparian and wetland vegetation provide important wildlife

habitat values as well as flood water storage capacity which helps ameliorate the down-stream effects of flooding. DFG recommends the County standards allow riparian vegetation removal only in very limited circumstances. In all cases, the substantial removal of riparian vegetation from the bed, bank, or channel of a stream will require a LSAA.

Riparian Habitat Protection and Streamside Management Areas

As mentioned above, many County streams and rivers are documented to be significantly impaired. Because these impairments are, in part, a consequence of the degradation or removal of riparian habitat, DFG finds the maintenance, restoration, and enhancement of waters of the State is largely dependant upon improving riparian habitat conditions.

Numerous regional planning and recovery reports describe the current status of the County's aquatic habitats, identify their causes of impairment, and make recommendations to address these causes (DFG 2004; RCAA 2005, 2006; WQCB 2005; University of California Cooperative Extension 1998). A wide diversity of stakeholders, including DFG, Coastal Commission, National Marine Fisheries Service, The Pacific Lumber Company, Green Diamond Resource Company, Humboldt State University, the Redwood Community Action Agency, and the County itself, contributed to one or more of these reports. These reports support the use of Streamside Management Area (SMA) buffers to protect waters of the State, and support evaluating their effectiveness and revising them, as necessary.

No-disturbance riparian buffers have been widely used for many years as a principal tool to protect sensitive habitats such as wetlands and streams, as well as help maintain public health and safety. Since 1994, DFG Region 1 has promoted a suite of no-disturbance buffer zone recommendations to maintain and protect aquatic and riparian habitats from the impacts of adjacent development. These riparian habitat recommendations are currently under review and revision.

DFG has evaluated the County's current SMA buffers and related grading ordinance and finds that they should be modified if they are to be consistently effective in adequately minimizing the impacts of development on riparian and aquatic habitats. The current SMA buffer widths are, in some circumstances, significantly narrower than DFG-recommended riparian habitat buffers. For instance, DFG recommends a 150-foot no-disturbance buffer on major rivers such as the Eel, Mad, and Trinity rivers; 100-foot buffers on smaller tributaries that provide habitat for fish; and 50-foot buffers on non-fish

habitat streams. The current County SMA standard provides for 100-foot buffers on perennial streams and 50-foot buffers on intermittent streams outside urban development and expansion areas (urban areas), and 50-foot and 25-foot buffers, respectively for streams inside urban development and expansion areas.

DFG finds the current County SMA buffers are unlikely to effectively minimize significant impacts of development projects on streams and rivers. Without more effective mitigations, these projects may result in take of listed species such as coho salmon due to increased water temperatures, loss and degradation of habitat, non-point source pollution inputs, and altered hydrology. These impacts will likely result in cumulatively considerable impacts on riparian and aquatic species, as defined in CEQA §15065(a)(3). Furthermore, DFG finds no biological rational to reduce the SMA width by half within urban areas, versus outside urban areas, for streams with the same habitat, the same listed species present, and the same need for riparian buffer protection. DFG finds that by adopting effective SMA buffers, such as those in DFG's 1994 riparian habitat recommendations, the Update will be implementing feasible mitigation measures which are likely to minimize impacts to streams and rivers to a less than significant level.

To put the County's SMA buffers in perspective, streams with listed salmonids, flowing through timberlands are subject to the Forest Practice Rules, Title 14, California Code of Regulations, §916.9 Protection and Restoration in Watersheds with Threatened or Impaired Values (known as T&I Rules). Pursuant to the T&I Rules, these streams receive a 150-foot buffer, where in the first 75 feet nearest the streams, at least 85% of the forest canopy must be retained, and in the outer 75 feet, at least 65% of post-harvest overstory canopy must be retained.

Under the current County SMA riparian buffers, and using Elk River as an example, in the Coastal Zone it would receive at least a 100-foot buffer; lower reaches adjacent to the Eureka urban area but outside the Coastal Zone would receive a 50-foot buffer; further up-stream and outside the urban area, it would receive a 100-foot buffer; and once in timberlands, it would receive a 150-foot buffer.

Thus development projects that are likely to cause a permanent conversion of vegetated open space to a hard-surface urban setting of buildings, roads, and other infrastructure, would have the narrowest buffers, while headwater areas which are most likely to remain in a forested condition would have the widest buffers. Consequently, DFG recommends that at a minimum, the County incorporate the DFG Region 1, 1994 no-disturbance riparian buffer recommendations into the County SMA ordinance.

The County Grading Ordinance uses so-called "blue line streams" as identified on US Geological Survey (USGS) maps as one means to designate streams during project review. Use of USGS blue line streams is a coarse, and often erroneous means to determine the existence or habitat values of a stream, e.g., whether a stream is perennial or intermittent, or fish bearing or not. To implement County SMA standards, DFG recommends that stream designations be determined by qualified biologists in the field, in addition to using the most recently available stream and fish habitat data, such as the DFG Eureka Office stream files, and "CalFish," the multi-agency cooperative fish and aquatic habitat on-line data program. When habitat determinations for a given stream reach are in question, we recommend the County consult with DFG.

Encroachment and Development within Floodplains

The NR &H Report includes a policy option to update the flood hazard regulations to restrict development in floodplains. DFG finds the floodplains of wetlands, streams and rivers provide significant biological functions to these waters and that development within floodplains is largely incompatible with the maintenance and enhancement of riparian, wetland, and aquatic habitats.

Development within floodplains is at significant risk from flood damage. Regional climate change models for California and the Pacific Northwest predict higher sea levels, wetter winters, increased high runoff events and a higher frequency of flooding (Kim et al. 2002, Snyder et al. 2002, Bell et al.. 2004, Kim 2005, Projecting Future Sea Level 2005). The northern California Coast Range and the Sierra Nevada are expected to experience the largest increase in "heavy and extreme precipitation events" and the largest increases in annual precipitation in the region (Kim et al. 2002, Kim 2005). It is therefore reasonable to expect more frequent and more severe flood events over the life of the Update.

Development within floodplains often results in future flood control measures such as channel dredging, bank armoring, riparian vegetation removal, and berm or dike construction, intended to protect floodplain property, but deleterious for the maintenance of functional riparian and floodplain habitat. To minimize the potential impacts of future projects on Humboldt Bay and County streams and rivers, DFG supports Update standards which restrict development in floodplains.

Climate Change and Sea Level Rise

Current models predict climate change effects during the life of the Update that will result in warmer conditions and drier summers in California and the western United States (IPCC 2001, Schlenker et al. 2007, Bell et al. 2004, Vanrheenen et al. 2004). A warmer, drier climate is predicted to result in an increased frequency (i.e., shorter return period) and more severe summer droughts in California. This in turn is likely to result in lower stream flows during the dry summer period, and summer water shortages (Schlenker et al. 2007) as well as a greater frequency and intensity of wildfires. DFG therefore recommends the DEIR cumulative effects analysis evaluate the effects of climate change on aquatic and forest ecosystems in combination with the effects of development and conversion of agricultural and forest lands.

Average sea level rise, determined from several climate models, ranges from 10-80 cm over the 2000-2100 period (Projecting Future Sea Level 2005). A higher sea level will have significant effects on the County, including more coastal land occurring within flood-prone areas and salt water intrusion into previously freshwater areas. Increased sea levels, especially in combination with storm-driven surges, extreme waves, intense low-pressure autumn or winter storms, and high tides, is predicted to result in extensive flooding in coastal regions of California (Projecting Future Sea Level 2005).

While assessing the effects of sea level rise on the County's coastal ecosystems is beyond the scope of the DEIR, changing environmental conditions during the life of the Update are foreseeable. Therefore, DFG recommends the DEIR evaluate the Update's anticipated landscape changes and impacts to coastal fish and wildlife species and their habitats in the context of the sea level rise predictions included in Projecting Future Sea Level (2005). Specific habitats to be evaluated should include coastal dunes, estuaries, and adjacent brackish and freshwater wetlands.

Water Budget

Currently many rural residences permitted by the county draw their water supplies from local streams. Increasingly, the County will encounter the well-documented problem of unpermitted diversions and State Water Code violations so prevalent in counties to the south (Guidelines 2002). Stream water diversions can result in significantly decreased flows, higher water temperatures, diminished aquatic habitat values, and in extreme cases, dewatering of stream reaches. The County currently takes the majority of its commercial and residential water from streams and rivers. According to the Update Public Services Report, the Humboldt Bay Municipal Water District, which takes its water from the Mad River, serves 77,000 residents, or 59% of the County.

As stated above, the Public Services Report anticipates County water demand will increase from approximately 30 mgd in the year 2000 to 49 mgd by 2025, an increase of 62% over current capacity. However, the County bases its projected 2025 water capacity on the 2000 (current) capacity. Given future climate projections, at mentioned above, which anticipate a warmer and drier summers than at present, and the increasingly chronic problem of illegal water diversions, DFG recommends the County reevaluate its 2025 water capacity assumption.

DFG disagrees with the statement in the Water Resources Report (page I-53): "Water resources are plentiful enough in the County that withdrawal of any kind is not considered an issue of great importance for the foreseeable future." On the contrary, DFG staff have direct experience with headwater streams being entirely dewatered or with significantly impaired flows resulting from domestic or agricultural water diversions. Unpermitted homes, especially in southern areas of the County, combined with illegal stream diversions for marijuana growing and other agricultural uses, is a significant, yet difficult to quantify problem. DFG notes that although they do require the issuance of an LSAA, water diversions pursuant to riparian rights do not require a permit from the State and actual diversion rates are largely unregulated and unknown.

Based on the above, DFG finds there are compelling reasons to believe that too much water is diverted from many headwater streams in the County. Furthermore, water diversions are likely to become an increasingly significant issue for fish, wildlife and rural residents during the life of the Update, as water rights applications increase.

To maintain adequate stream and river flows for fish and wildlife species during the Update period, DFG recommends the County develop a water budget for each of the County's 12 planning watersheds. DFG recommends the County develop enforceable standards requiring proposed projects provide evidence of adequate long-term water availability prior to approval. DFG supports the development of a County policy that ensures stream water diversions for rural development and agriculture maintain sufficient stream flows for fish and wildlife species. To maintain adequate water supplies for fish and wildlife species, DFG supports a County policy prohibiting the large-scale export of river water. DFG also recommends the Update include specific policies and standards for water conservation and reuse.

Impacts to Wetlands

Over the past 200 years, the contiguous 48 states have lost an estimated 53% of their original wetlands, with California loosing the largest percentage (91%) (Dahl 1990). In Humboldt County, this trend also holds; due to diking and filling, Humboldt Bay salt

marsh habitat has been reduced by 85-90% since 1897 (Barnhart et al. 1992). The Fish and Game Commission (Commission) finds that California's remaining wetlands provide significant and essential habitat for a wide variety of important resident and migratory fish and wildlife species. The Commission also finds that projects that impact wetlands are damaging to fish and wildlife resources if they result in a net loss of wetland acreage or wetland habitat value. Therefore, it is the policy of the Commission to seek to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California.

It is DFG's policy to ensure that proposed projects will result in no net loss of wetland habitat values or acreage. DFG disagrees with the NR &H Report assertion that very few potential development sites in the County are situated on wetlands. On the contrary, DFG finds the County has permitted projects that impact wetlands. DFG recommends the DEIR analyze the Update's potential impacts to wetlands and sensitive wetland species including an evaluation of the potential for direct, indirect, and cumulative impacts to these habitats. Potential direct and indirect effects from development adjacent to wetlands include, but are not limited to: altered hydrology; diminished water quality from the discharge of pollutants such as sediment, pesticides, petroleum products, pathogens and other toxic substances; vegetation removal; disturbance to wildlife from noise, night lighting, and domestic animals; introduced invasive plant and animal species; altered microclimate; and human intrusion such as off-road vehicle use, homeless encampments, trash dumping, and illegal filling.

To best protect wetland habitat values, DFG recommends the Update include a clear wetland protection ordinance or standard that incorporates no-disturbance wetland buffers where no structures, grading, pavement, vegetation removal, septic systems, stormwater facilities, or other development would be permitted. These wetland buffers must minimize project impacts on wetlands to a less than significant level. Although currently under review and revision, DFG recommends that at a minimum, the County implement the DFG Region 1, 1994 wetland buffer recommendations.

Wetland Banking

In working with County Community Development Services staff, builders, developers, and environmental consultants to prevent the loss of wetlands and wetland habitat values, DFG has determined there is a strong interest and need for a wetland mitigation bank in the Humboldt Bay-Eel River Delta area. While it is DFG's policy to provide for the protection, preservation, restoration, enhancement and expansion of natural wetland habitat, DFG finds that in certain limited instances, utilization of a local wetland bank may be the most environmentally sound, feasible, and cost-effectiive approach to mitigate for impacts to wetlands. DFG therefore recommends the County

consider working with local, State, and Federal agencies and private stakeholders in promoting or facilitating the development of a wetland bank for the Humboldt Bay-Eel River Delta area. DFG supports the Biological Resources Report Option 2.5 (establishment of a habitat mitigation banking program) and is willing to provide technical support for the creation of a local wetland bank.

Pharmaceutical and Personal Care Product Disposal

DFG finds the Preliminary Hearing Draft Waste Management Chapter 18, makes no mention of the disposal of household pharmaceuticals and personal care products (PPCPs). DFG recommends that the Update address this issue by developing a feasible program for the proper disposal of unwanted PPCPs. A 1996 survey on the expired medication disposal habits of 500 patients and 100 pharmacies, found 35% of those surveyed flushed their expired medicines down the toilet, and only 5% of pharmacies had a consistent recommendation for patients on drug disposal (Kuspis and Krenzelok 1996).

Pharmaceuticals flushed down the toilet often enter surface waters such as streams, rivers, Humboldt Bay, and the ocean. Even after passing through wastewater treatment facilities, many pharmaceutical compounds remain biologically active and can be semi-persistent in aquatic environments. Once in these environments, these pollutants can affect a wide range of organisms and have acute and chronic toxic effects on fish and wildlife. For example, antibiotic-resistant bacterial strains now occur in American streams and rivers due to the presence of antibiotics in waste water, and many forms of hormone-disrupting environmental pollutants, such as from pharmaceuticals, in aquatic ecosystems are demonstrated to have significant adverse effects on amphibian development and reproduction.

In March 2007, DFG Environmental Scientist Gordon Leppig called 10 pharmacies in Humboldt County and the Humboldt Waste Management Authority (HWMA) to assess local residential PPCPs disposal options and pharmacy recommendations. Of the 10 pharmacies queried, three recommended disposal by flushing unwanted medications down the toilet. Only one pharmacy would take back all pharmaceuticals for disposal. The HWMA Household Hazardous waste collection facility will accept PPCPs, but for various reasons, they do not advertise, promote or encourage people to use the HWMA as a PPCP collection facility.

San Mateo County has developed a convenient, inexpensive, year-round, and permanent program for the proper disposal of household PPCPs. This program was launched in September 2006, and by the end of 2006, had collected more than 250 pounds of unwanted medicines that otherwise could have ended up in the wrong hands or the wastewater stream and eventually in the environment. DFG recommends the County, perhaps working with the HWMA, develop a PPCPs waste disposal program that will help avoid the improper disposal of these pollutants into waters of the State.

Exterior Lighting Standards and Photo-pollution

The adverse ecological effects of artificial night lighting on terrestrial and aquatic resources such as fish, birds, mammals, and plants are well documented (Rich and Longcore 2006). Some of these effects include altered migration patterns and reproductive rates, changes in foraging behavior and predator-prey interactions, altered wildlife species richness and community composition, and phototaxis (attraction and movement towards light). Much of the future development envisioned in the Update will take place on land in close proximity to resources areas with significant wildlife habitat values. DFG therefore recommends the DEIR evaluate the direct and cumulative effects that photo-pollution from artificial night lighting will have on fish and wildlife species.

To minimize the ecological consequences of artificial night lighting and glare on wildlife species and their habitats, DFG recommends the County adopt a standard that requires exterior lighting fixtures and street standards (both for residential and commercial areas) be fully-shielded and designed and installed to minimize off-site photo-pollution. DFG supports the Update Public Services Report Policy Option (8.7.a) that proposes establishing exterior lighting performance standards. As an example, DFG recommends the County consider the McKinleyville Community Services District Ordinance 51.07, adopted on June 30, 2000:

> "Street lighting fixture standards shall be in accordance with the recommendation of the International Dark-Sky Society [sic], specifically selected and specified to minimize the potential for light pollution, and shall include external glare shields, and/or internal louvers to controlled [sic] direct glare and/or uplight."

Locally Significant Populations and Natural Communities

State planning priorities are intended to promote protecting, preserving, and enhancing the State's most valuable natural resources, including "...landscapes with locally unique features and areas identified by the State as deserving protection," according to Government Code §65041.1, State Planning and Zoning Law. CEQA Guidelines §15125(c), states "Knowledge of the regional setting is critical to the assessment of environmental impacts. Special emphasis should be placed on environmental resources that are rare or unique to that region and would be affected by the project."

Plant and wildlife populations and natural communities that are rare or unique to a region can have significant biological value because of their high potential for genetic divergence from other populations or unusual community structure and composition. Consequently, plant and wildlife populations that are locally rare or unique can provide the following environmental services: unusual evolutionary potential, enhanced local biodiversity and community structure, maintenance of genetic variation within a species, and contribution to long-term species survival (Leppig and White 2006).

For examples of county ordinances and policies that protect locally rare or significant populations, DFG recommends the County review the natural resource elements of the Santa Cruz and Ventura counties general plans. Santa Cruz County has a "Sensitive Habitats Protection Ordinance" that requires that no development activities or land disturbance that results in disturbance to "....locally unique plants and animals or their habitats" can occur until a biotic review is conducted and necessary mitigation measures are developed to protect the habitat (Santa Cruz County Planning Department 2005). The Ventura County General Plan specifies that "locally important species/communities" are a significant biological resource to preserve and protect, and provides for protection measures (Ventura County 1988). DFG recommends the Update include a policy and standard, similar to Santa Cruz and Ventura counties that provides for the evaluation of impacts to locally rare or significant populations and requires mitigations, when necessary.

Heritage Landscapes

The DEIR notice of preparation states the Update will include a policy to protect "heritage landscapes." DFG supports the inclusion of a heritage landscapes protection policy in the Update because certain areas of the county have unusually significant or multiple biological resources (biological hotspots). Projects proposed in these areas therefore merit heightened environmental review. Because of their unusual habitats, wildlife values, or concentrations of listed species, DFG recommends the County consider the following for heritage landscape status: Humboldt Bay, coastal dune systems, the Humboldt Lagoons area (Big, Dry, Stone and Freshwater lagoons), Table Bluff, and the High Prairie/Lake Prairie area. DFG wishes to assist the County in the development of its heritage landscapes protection policy and recommends the US Fish and Wildlife Service also be invited to participate.

Fire Safe Zones, Vegetation Management, and Invasive Species Introductions

Recent changes to Public Recourses Code §4291 expand the defensible space clearance requirement maintained around buildings and structures from 30 feet to a distance of 100 feet. These guidelines also recommend more vegetation (fuels) clearing on lands with steeper terrain and larger and more dense fuels. County Fire Safe

regulations require that developments which propose greenbelts must locate them strategically as a separation between wildland fuels and structures. Defensible space areas, typically require on-going vegetation management to reduce fuel loads. For subdivisions and other development projects proposed in forestlands, defensible space areas increases the ecological footprint and environmental effects of these projects.

The NR &H Report notes that more than 80% of Humboldt County is forested; the County is one of the most seismically active areas in the country; and that more than half of the County's land is on slopes of 30% or greater. DFG is concerned that designating defensible space areas that coincide with steep slopes and requiring periodic fuels-reducing vegetation removal will result in increased surface erosion and gullies and slope instability.

Furthermore, areas routinely managed for vegetation removal are prone to infestation by invasive exotic species and noxious weeds. Invasive plant species are widely regarded as one of the most significant global threats to biodiversity. Horticultural plants used for landscaping are a principal cause of invasive plant introductions, and a recent estimate puts economic cost of invasive plants in the United States at $35 billion per year (Mack and Lonsdale 2001; Reichard and White 2001). Ironically, one way invasive plants can affect native ecosystems is by changing fuel properties, which can in turn affect fire behavior and, ultimately, alter fire regime characteristics such as frequency, intensity, extent, type, and seasonality of fire (Brooks et al. 2004).

For the above reasons, DFG recommends the Update incorporate defensible space standards that minimize the risk of erosion, slope instability, and the introduction of invasive plants. DFG recommends the Update include landscaping guidelines or recommendations that assist developers, landscapers, and the public in minimizing the risk of invasive exotic and noxious weed introductions from developments requiring defensible space areas. Because of the need for routine vegetation clearing within defensible space areas, DFG recommends the County develop a standard that requires fire safe zones be placed outside of SMAs and wetland buffers.

Oak Woodlands Conservation

Oak woodlands are a diverse, ecologically important and widely distributed habitat type in Humboldt County. According to the Biological Resources Report, oak woodlands comprise at least 20% of seven of the County's twelve planning watersheds. Oak woodlands provide habitat for numerous game and non-game species such as black-tailed deer, Roosevelt elk, black bear, squirrels, quail, turkey, band-tailed pigeons and a diversity of other migratory bird species. However, the distribution, acreage, and quality of the County's oak woodlands, like much for the rest of California, have declined

considerably over the past 150 years. The reasons for this decline include fire suppression and encroachment by conifers, wood cutting, and conversion to industrial timberlands, other agricultural uses and residential and commercial development. Statewide more than a third of all oak woodlands have been lost since the settlement of California by Europeans; of an estimated 10-12 million original acres, seven million remain. Of the remaining oak woodlands, most have been modified or degraded, and only about four percent are formally protected.

Based upon recent trends in Sonoma and Mendocino counties, vineyard conversions of southern Humboldt County's oak woodlands and associated coastal prairies appears likely to accelerate during the Update time period. Sudden Oak Death, detected in 2002, in the Redway-Garberville area, is another potentially serious threat to County oak woodlands.

In recognizing both the importance of oak woodlands and their continuing statewide loss, the California Legislature in 2002, passed the Oak Woodlands Conservation Act (Oak Act) Fish and Game Code §1360-1375. The legislative intent of this act is to support and encourage the voluntary, long-term, private stewardship and conservation of California's oak woodlands. The Oak Act encourages local land use planning that is consistent with the preservation of oak woodlands and provides incentives to protect and encourage farming and ranching that promotes healthy oak woodlands.

As part of the Oak Act, the Oak Woodlands Conservation Fund was established to provide grant funds for: 1) public education and outreach, 2) the purchase of oak woodland conservation easements, 3) land improvement, and 4) for cost-sharing incentive payments to private landowners who enter into long-term conservation agreements. To qualify for this grant funding, the County would need to meet the conditions set forth in Fish and Game Code §1366. DFG finds the County, in developing the Update and related environmental reports, may have already met, or will meet, some of these conditions. DFG encourages the County to satisfy the requirements of Fish and Game Code §1366 to allow participation in the Oak Woodlands Conservation Fund and to facilitate coordination with local organizations such as the Buckeye Conservancy, land trusts, and the Humboldt County Resource Conservation District to promote the conservation of this valuable and dwindling resource.

County Staff Biologist or Environmental Scientist

The diversity and ubiquity of significant fish and wildlife resources in Humboldt County, often makes the evaluation and, where necessary, mitigation of potential impacts to them a large component of the County's permitting process pursuant to CEQA. Given staff limitations, DFG often cannot provide the County Community Development Services staff and project consultants the degree of technical support or consultation that recurring resources issues merit.

DFG recommends the County Community Development Services department hire a broadly trained biologist or environmental scientist to assist permitting staff in the project review and permitting process. By interfacing and coordinating with County planners, project proponents and their environmental consultants, and the wildlife agencies, this scientist could facilitate the protection of trust resources while expediting the review and permitting of projects.

Specific Recommendations:

1) Implement "Sketch Plan A" of the four Update alternatives because it is defined by the County, pursuant to CEQA, as the most environmentally superior alternative.

2) Establish clear, unambiguous, and enforceable standards and ordinances to enforce the Update's policies. These standards and ordinances should be developed concurrently with the DEIR or as soon as practicable.

3) Utilize guiding principles 3, 6, 7, and 9 to draft the Update and retain them in the final Update.

4) Meet with DFG, the National Marine Fisheries Service, and the US Fish and Wildlife Service to explore developing a County-wide Natural Communities Conservation Plan/Habitat Conservation Plan (NCCP/HCP).

5) Work with DFG to develop a county-wide master lake or streambed alteration agreement (LSAA).

6) Include in the DEIR a thorough evaluation of potential direct and indirect impacts of increased stormwater runoff and altered hydrology on waters of the State.

7) Include Update standards that prohibit projects from altering the hydrologic regimes of streams by increasing peak flows or decreasing summer low flows by treating all stormwater from at least a two-year rain event (Q2) on-site through detention and percolation.

8) Include Update standards requiring low-impact design elements that maintain, to the greatest extent feasible, post-project pervious surfaces.

9) Incorporate no-disturbance riparian buffers into the County SMA ordinance which are at least as protective as the DFG Region 1, 1994 riparian habitat recommendations.

10) Eliminate use of the term "blue line streams" as identified on US Geological Survey maps, to define or evaluate county streams.

11) Develop and strengthen flood hazard regulations to restrict development in floodplains.

12) The DEIR cumulative effects analysis should evaluate the effects of climate change on aquatic and forest ecosystems in combination with the effects of development and conversion of agricultural and forest lands.

13) The DEIR should evaluate the Update's anticipated landscape changes and impacts to coastal fish and wildlife species and their habitats in the context of current sea level rise predictions.

14) The Update and DEIR should reevaluate the 2025 water capacity assumption.

15) Develop a water budget for each planning watershed to ensure that stream water diversions for rural development and agriculture maintain sufficient stream flows for fish and wildlife species.

16) Include in the Update enforceable standards which require a proposed project provide evidence of adequate long-term water availability prior to approval.

17) Include in the Update a policy prohibiting the large-scale export of river water.

18) Include in the DEIR an analysis of the Update's potential impacts to wetlands and sensitive wetland species including an evaluation of the potential for direct, indirect, and cumulative impacts to these habitats.

19) Strengthen the County wetland protection policy and standards to include an effective no-disturbance buffer where grading, vegetation removal and other development shall be prohibited.

20) Consider working with DFG and other state, local, and federal agencies and private stake holders in promoting or facilitating the development of a wetland bank for the Humboldt Bay-Eel River Delta area.

21) Include in the Update a program for the proper disposal of unwanted household pharmaceuticals and personal care products.

22) Include in the Update a standard that requires exterior lighting fixtures and street standards (both for residential and commercial areas) be fully-shielded and designed and installed to minimize off-site photo-pollution.

23) Include in the Update a standard that provides for the evaluation of impacts to locally significant populations and natural communities and requires mitigations, when necessary.

24) Include in the Update a heritage landscapes protection policy that includes, among other sensitive landscapes, coastal dunes, Humboldt Bay, the Humboldt Lagoons area (Big, Dry, Stone and Freshwater lagoons), Table Bluff, and the High Prairie/Lake Prairie areas.

25) Incorporate defensible space standards in the Update that minimize the risk of erosion, slope instability, and the introduction of invasive plants.

26) Include in the Update landscaping guidelines or recommendations that assist developers, landscapers, and the public in minimizing the risk of invasive exotic and noxious weed introductions.

27) Include in the Update a standard that requires fire safe zones be placed outside of SMA and wetland buffers.

28) Satisfy the requirements of the Oak Woodlands Conservation Fund to allow for grant funding that encourages the voluntary, long-term, private stewardship and conservation of the County's oak woodlands.

29) Hire a broadly-trained biologist or environmental scientist for the Community Development Services Department to work with the wildlife agencies and assist County permitting staff in the project review and permitting process.

By adopting the recommendations set forth in this letter, DFG finds the County will feasibly minimize potentially significant impacts to fish and wildlife resources from the future development and land use changes anticipated in the Update. Furthermore, DFG

finds that by implementing the riparian and aquatic protection measures listed above, the County will likely avoid take of listed anadromous salmonids, will actively help bring about their recovery and eventual down-listing, and consequently, spur a revival of the regional commercial and recreational fishing industries.

If you have any questions or comments regarding this matter, please contact Staff Environmental Scientist Gordon Leppig at 619 Second Street, Eureka, California, 95501 or telephone (707) 441-2062.

Sincerely,

GARY B. STACEY
Regional Manager

References

Arnold, C.L. and C.J. Gibbons. 1996. Impervious surface coverage, the emergence of a key environmental indicator. Journal of the American Planning Association 62:247-258.

Barnhart, R.A, M.J. Boyd, and J.E. Pequegnat. 1992. The ecology of Humboldt Bay, California: an estuarine profile. U.S. Fish and Wildlife Service, Biological Report 1.

Bell, J.L., L.C. Sloan, and M.A. Snyder. 2004. Regional changes in extreme climate events: a future climate scenario. Journal of Climate 17:81-87.

Brooks, M.L. C.M. D'antonio, D.M. Richarson, J.B.Grace, J.E. Keeley, J.M. DiTomaso, R.J. Hobbs, M. Pellant, and D. Pike. 2004. Effects of invasive alien plants on fire regimes. BioScience 54:677–688.

DFG. 2004. Recovery Strategy for California Coho Salmon. Report to the California Fish and Game Commission. Sacramento, CA.

Guidelines. 2002. Guidelines for maintaining instream flows to protect fisheries resources downstream of water diversions in mid-California coastal streams. California Department of Fish and Game. Sacramento, CA. and National Marine Fisheries Service Southwest Region, Santa Rosa, CA.

Hutchinson, D.P. Abrams, R. Retzlaff, and T. Liptan. 2006. Stormwater monitoring two ecoroofs in Portland, Oregon, USA. City of Portland, Bureau of Environmental Services. http://www.portlandonline.com/bes/index.cfm?c=29323. Portland, OR.

IPCC. 2001. Climate Change 2001: The scientific basis. Contribution of Working Group 1 to the third assessment report of the Intergovernmental Panel on climate change. Houghtin, J.T., Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson (eds.) Cambridge University Press. Cambridge, United Kingdom and New York, NY.

Kim, J., T. Kim, R.W. Arritt, and N.L. Miller. 2002. Impacts of increased CO2 on the hydroclimate of the western United States. Journal of Climate 15:1926-1942.

Kim, J. 2005. A projection of the effects of the climate change induced by increased CO2 on extreme hydrologic events in the western U.S. Climate Change 68:153-168.

Kuspis, D.A. and E.P. Krenzelok. 1996. What happens to expired medications? A survey of community medicine disposal (abstract). Veterinary and Human Toxicology 38:48-49.

Leppig, G. and J.W. White. 2006. Conservation of peripheral plant populations in California. Madrono 53:264-274.

Mack, R.N. and W.M. Lonsdale. 2001. Humans as global plant dispersers: getting more than we bargained for. BioScience 51:95-102.

Projecting Future Sea Level. 2005. A report from: California Climate Change Center, California Energy Commision, CEC-500-2005-202-SD. Sacramento, CA.

RCAA. 2005. Humboldt Bay Watershed salmon and steelhead conservation plan. Redwood Community Action Agency, Natural Resources Services Division. Eureka, CA.

RCAA. 2006. Linking land and sea: northern California coastal conservation needs assessment. Redwood Community Action Agency, Natural Resources Services Division. Eureka, CA.

Reichard, S.H. and P. White. 2001. Horticulture as a pathway of invasive plant introductions in the United States. BioScience 51:103-113.

Rich, C. and T. Longcore. 2006. Ecological consequences of artificial night lighting. Island Press. Washington, DC.

Santa Cruz County Planning Department. 2005. The sensitive habitats protection ordinance. Santa Cruz County Code, Title 16, Chapter 16.32. Santa Cruz, CA. http://www.sccoplanning.com/.

Schlenker, W., W.M. Hanemann, and A.C. Fisher. 2007. Water availability, degree days, and the potential impact of climate change on irrigated agriculture in California. Climate Change 81:19-38.

Snyder, M.A., J.L. Bell,. L.C. Sloan, P.B. Duffy, and B. Govindasamy. 2002. Climate responses to a doubling of atmospheric carbon dioxide for a climatically vulnerable region. Geophysical Research Letters 29:1-4.

Sonoma County. 2005. Guidelines for the standard urban stormwater mitigation plan, stormwater best management practices for new development and redevelopment for the Santa Rosa Area and unincorporated areas around Petaluma and Sonoma. County of Sonoma, City of Santa Rosa, Russian River Watershed Association. Santa Rosa, CA.

University of California Cooperative Extension. 1998. Effects of county land use regulations and management on anadromous salmonids and their habitats: Humboldt, Del Norte, Mendocino, Siskiyou, and Trinity Counties, California, Final report to the five county planning group in the north coast coho salmon transboundary evolutionarily significant unit. University of California Cooperative Extension. Berkeley, CA.

US Environmental Protection Agency. 1998. Status of pesticides in special review and reregistration. Office of pesticides program reregistration eligibility decisions. Washington, DC. http://cfpub.epa.gov/oppref/rereg/status.cfm?show=rereg.

US Environmental Protection Agency. 1999. Preliminary data summary of urban stormwater best management practices. EPA-821-R-99-012. Washington, DC.

Vanrheenen, N.T., A.W. Wood, R.N. Palmer, and D.P. Lettenmaier. 2004. Potential implications of PCM climate change scenarios for Sacramento-San Joaquin River Basin hydrology and water resources. Climate Change 62: 257-281.

Ventura County. 1988. Ventura County General Plan Goals, Policies, and Programs. Amended 16 September 1997. Ventura County Board of Supervisors, Ventura, CA.

Voelz, J. 2006. The characteristics and benefits of green roofs in urban environments. University of California, Davis Extension. Davis, CA.

Watershed Protection Research Monograph No. 1. 2003. Impacts of impervious cover on aquatic ecosystems. Center for Watershed Protection. Ellicott City, MD.

WQCB. 2005. Integrated plan for implementation of the watershed management initiative, Watershed planning chapter. North Coast Water Quality Control Board, Santa Rosa, CA.

cc: Humboldt County Board of Supervisors,
825 Fifth Street
Eureka, California 95501

Ms. Irma Lagomarsino,
National Marine Fisheries Service
Arcata Area Office
1655 Heindon Road
Arcata, California 95521

Mr. Mike Long,
United States Fish and Wildlife Service
1655 Heindon Road
Arcata, California 95521

Mr. Kelley Reid,
Army Corps of Engineers
Eureka Project Office
601Startare Drive
Eureka, California 95501

Ms. Laurie Harnsberger,
Department of Fish and Game
619 Second Street
Eureka, California 95501

ec: Messrs. Mark Stopher, William Condon, Ken Moore, Eric Haney, Bruce Webb, Scott Bauer, and Gordon Leppig
Mss. Karen Kovacs, Vicky Frey, Michelle Gilroy, Jane Vorpagel, and Laurie Harnsberger
Dr. Gayle Garman
Department of Fish and Game
mstopher@dfg.ca.gov, wcondon@dfg.ca.gov, kmoore@dfg.ca.gov, ehaney@dfg.ca.gov, bwebb@dfg.ca.gov, sbauer@dfg.ca.gov, gleppig@dfg.ca.gov, kkovacs@dfg.ca.gov, vfrey@dfg.ca.gov, mgilroy@dfg.ca.gov, jvorpagel@dfg.ca.gov, lharnsberger@dfg.ca.gov, ggarman@dfg.ca.gov

Messrs. John Short, Bruce Ho, and Paul Keiran
North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403
jshort@waterboards.ca.gov, bho@waterboards.gov, pkeiran@waterboards.gov

Mr. Bob Merrill
California Coastal Commission
bmerrill@coastal.ca.gov

Appendix T - Assumptions Used in Development Projections

Appendix U - Forecasts of Unincorporated Area Energy Consumption

Appendix T - Assumptions Used in Preparing Development Projections

As stated in Chapter 2, future growth in the General Plan Planning Area and Period is guided by the land uses identified in the General Plan Land Use Diagram (See General Plan Update Appendix F, Map Book). In this EIR, impact analysis of both temporary [i.e. construction-related] and operational effects is based on these proposed land use patterns. However, because the estimated maximum feasible development potential of the General Plan Update land uses is extraordinarily high and virtually unattainable within the planning period of the General Plan (2016-2040), This EIR analyzes the environmental impacts of the residential and non-residential growth projected between 2010 and 2040.

The following table shows the projected population for Humboldt County for the 2010 - 2040 time period from the Department of Finance:

Table T-1 Humboldt County Total Population Projections, 2010 - 2060

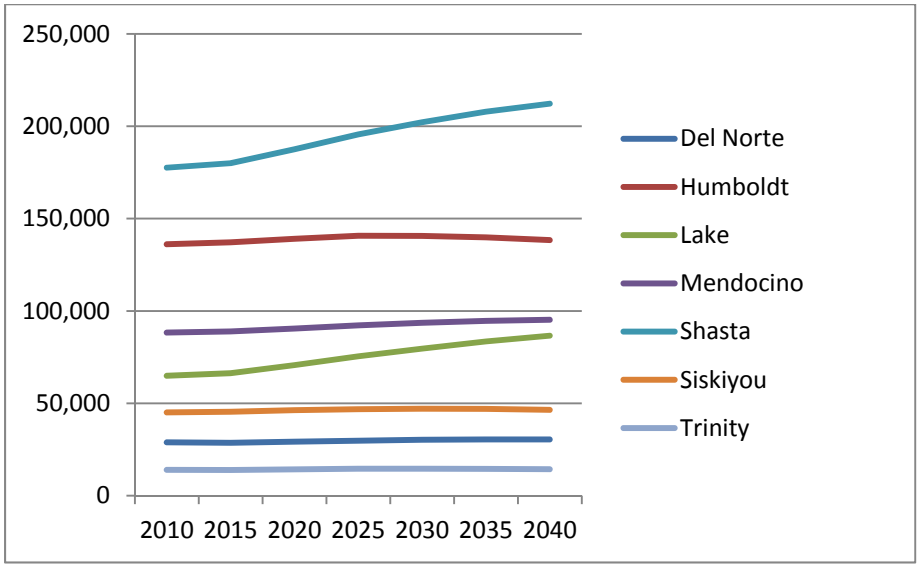
	2010	2020	2028	2030	2040	2050	2060
Population[1]	134,623	139,033	141,441	140,608	138,307	134,509	134,398

Source: DOF *Reports and Research Papers - P1 Population Projections, December 2014, and P2 State and County Population Projections by Race/Ethnicity and Age, December 2014*

Notes: 1) Population includes each of the seven incorporated cities

The table shows a peak population of 141,441 persons in 2028. After that, Humboldt County's population is projected to decline slightly to the year 2040. This is similar to the trends projected for most of the neighboring counties as shown below in Figure T-1.

Figure T-1. Population Projections for Counties in Northern California, 2010 - 2040



Source: DOF *Reports and Research Papers - P1 Population Projections, December 2014*

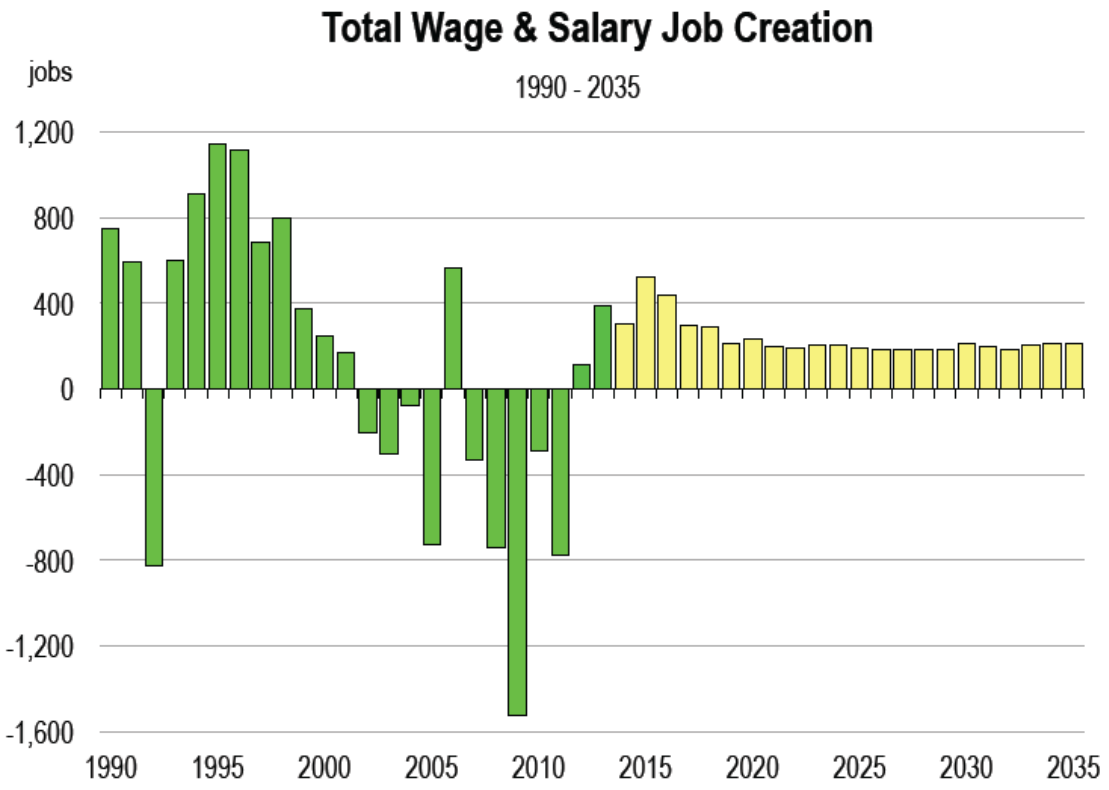
Employment is projected by Caltrans to grow continuously from 2010 to 2040. As shown below, employment for Humboldt County will grow by almost 6,000 jobs between 2010 and 2040.

Table T-2. Projected Employment for Humboldt County, 2010 - 2040

Year	# Jobs
2010	47,180
2015	47,740
2020	49,210
2025	50,200
2030	51,140
2035	52,160
2040	53,160

Source: Caltrans; County Level Economic Forecast 2014 - 2040; 2014

Figure T-2. Employment Projections for Humboldt County, 1990 - 2040



Source: Caltrans; County Level Economic Forecast 2014 - 2040; 2014

To evaluate the impacts associated with the General Plan, and to compare it to the existing General Plan, the population and employment increases were converted into housing units and commercial / industrial space and allocated on a parcel specific basis using the methodology described in the following paragraphs.

Methodology Used for Conversion of Population to Housing Units

The 2010 Census reported that 134,623 persons lived in Humboldt County, and that there were 33,972 housing units in the unincorporated areas. As mentioned above, the Department of Finance projects population for the County as a whole to be 141,441 persons in 2028. Applying the 2010 ratio of countywide population to unincorporated area housing units (0.252 housing units per person) and applying it to the projected 2028 population of 141,441 persons results in a projection of 35,093 housing units in the unincorporated areas, which is 1,721 more housing units than existed in 2010. The equations used for this calculation are shown below:

Step 1: Derive the ratio of housing units per person	Housing Units in Unincorporated Areas in 2010		Persons living in Humboldt County in 2010		Ratio of housing units per person
	33,972	÷	134,623	=	0.252

Step 2: Apply the ratio to the 2028 population	Ratio of housing units per person		Persons living in Humboldt County in 2028		Housing Units in Unincorporated Areas in 2028
	0.252	x	141,441	=	35,093

Step 3: Calculate the number of housing units added	Housing Units in Unincorporated Areas in 2028		Housing Units in Unincorporated Areas in 2010		New Housing Units in Unincorporated Areas in 2028
	35,093	-	33,972	=	1,721

Methodology Used for Allocating Housing Units to Parcels Allocating these 1,721 new housing units to specific parcels was done in several steps described in the following paragraphs. Basically it involved using historic building permit records to distribute the new homes.

Step 1 - Calculate the Percentage of Building Permits Issued by Land Use Designation. In this first step, building permit records from 1972 through 2015 were used to aggregate the number of new homes permitted by land use designation. We know, for example, that of the 3,119[1] homes permitted since 1972 most of them (66 percent) occurred on parcels with an "RL - Residential Low Density" General Plan designation. The following table shows the percentage of building permits issued between 1972 and 2015 by land use designation:

Table T-3. Percentage of Building Permits Issued Between 1972 and 2015 by Land Use Designation.

Land Use Designation	Percent of Building Permits Issued 1972 - 2015
AE - Agriculture Exclusive	2.18%
AG - Agriculture Grazing	2.82%

[1] There are 3,119 homes permitted since 1972 on parcels within the County's GIS system. Homes that were permitted on older parcels that are not represented in the County's GIS system were not evaluated.

Table T-3. Percentage of Building Permits Issued Between 1972 and 2015 by Land Use Designation.

Land Use Designation	Percent of Building Permits Issued 1972 - 2015
T - Timber Production	2.95%
RM - Residential Medium Density	4.42%
RE - Residential Estates	7.95%
RA - Residential Agriculture	12.50%
RL - Residential Low Density	65.73%
Other	1.45%
Total	**100%**

Source: Humboldt County Planning and Building Department, 2017

Building permit percentages were used in this step because past development patterns are most likely to continue into the future based on access, availability of infrastructure (water, sewer, schools), distance to work and shopping, etc. that influence cost and market desirability.

Step 2 - Calculate the Estimated Maximum Feasible Development Potential of Each Parcel. In this step, the County's Geographic Information System (GIS) was used to calculate the maximum feasible development potential of each parcel. The assumptions used and programming language used is detailed in Exhibit A of this Appendix. Basically it involved multiplying the maximum allowed density of the GPU land use designation by the developable acres of the parcel to calculate the maximum feasible development potential for that parcel.

As described on page 24 of Chapter 2 - Project Description, the maximum feasible development potential of all parcels in the County is 38,972 additional units. What this means is that if all the properties were developed at the maximum density allowed by the GPU, 38,972 new homes could be built. This development potential figure excludes those areas of the county that have physical constraints, and are likely undevelopable given the steep slopes (slopes >30 percent), 100-year flood zones, wetlands, streamside management areas, earthquake fault zones, and areas of historic landslide occurrence.

Step 3 - Combine Together the Percentage of Building Permits Issued by Land Use Designation and the Estimated Maximum Feasible Development Potential of Each Parcel. In this step, a spreadsheet was used to multiply together the Percentage of Building Permits Issued by Land Use Designation and the Estimated Maximum Feasible Development Potential for each parcel. This resulted in a total of 8,903 units, which is more than five times the projected number of units projected by the DOF.

Step 4 - Reflect the Estimated Development Potential of 1,721 units. In this step, a spreadsheet was used again to reflect the proportion of development expected during the planning period (1,721 units rather than 8,903 units). This was done by multiplying the results from Step 3 by (1,721 ÷ 8,903) units, which equals 0.19330563.

Example:
As an example, in the paragraphs below we track the calculations for allocating a portion of the 1,721 total new housing units projected for 2028 to one of the vacant developable parcels, Assessor's Parcel Number (APN) 015-221-018. This is a 5.28 acre parcel near Humboldt Bay that

has an "RL - Residential Low Density" General Plan designation on one side and an "RM - Residential Medium Density" on the other.

Step 1: Based on our building permit history, we know that 66 percent of the new homes constructed between 1972 and 2015 were on parcels with an RL Plan designation, and four percent of the new homes constructed between 1972 and 2015 were on parcels with an RM Plan designation.

Step 2: The RL Plan designation has a maximum density of seven units per acre. The RL portion of the site has 1.42 acres with physical constraints, leaving 2.99 developable acres. Multiplying the developable acres times the maximum Plan density yields an estimated maximum feasible development potential of 20 housing units on the RL portion (2.99 * 7 = 20 units).

The RM Plan designation has a maximum density of 30 units per acre. The RM portion of the site has 0.05 acres with physical constraints, leaving 0.52 developable acres. Multiplying the developable acres times the maximum Plan density yields an estimated maximum feasible development potential of 15 housing units on the RM portion (30 x 0.52 = 15 units).

Step 3: Multiplying the 20 unit estimated maximum feasible development potential of the RL portion times 66 percent yields 13.2 housing units (20 x 0.66 = 13.2 units). Multiplying the 15 unit estimated maximum feasible development potential of the RM portion times four percent yields 0.6 housing units (15 x 0.04 = 0.6 units).

Step 4: Multiplying the RL units by 0.19330563 results in 2.54 of the 1,721 total housing units allocated to the RL portion of APN 015-221-018. Multiplying the RM units by 0.19330563 results in 0.11 of the 1,721 total housing units allocated to the RM portion of APN 015-221-018. A table showing those calculations for each land use designation is presented at the end of this appendix.

Conceptually it is difficult to understand how a parcel could be allocated a fraction of a housing unit when homes are not built that way. One way to perhaps better understand this fractional allocation is to look at it in terms of probability - two parcels with an allocation of 0.5 housing units will have one home developed between them by 2028 (0.5 + 0.5 = 1). In other words, there is a 50% chance that a home will be developed on one of the parcels by 2028.

Methodology Used for Calculating Commercial and Industrial Square Footage, and Allocating Commercial and Industrial Square Footage to Parcels. Commercial and Industrial development is typically described in terms of square footage of commercial and industrial space. This EIR uses employment figures projected by CalTrans to the year 2040 to estimate future development of commercial and industrial space. , which is 401,861. Basically it involved the following three steps:

1) Use the regional Humboldt County Travel Demand Model's distribution of employment growth by Traffic Analysis Zone (TAZ) to distribute the countywide employment growth projected by CalTrans,
2) Distribute the TAZ employment growth to each parcel based on the acreage designated commercial or industrial, and
3) Convert employment growth for each parcel into commercial and industrial square feet based on the parking standards of the Zoning Ordinance, which require one new employee parking space for each 300 square feet of commercial space, and 2,500 square feet of industrial space.

Step 1 - Use the Regional Humboldt County Travel Demand Model's Distribution of Employment Growth by Traffic Analysis Zone (TAZ) to Distribute the Countywide Employment Growth Projected by CalTrans. As discussed above, CalTrans projects that there will be 5,980 jobs added countywide between 2010 and 2040. The HCDTM distributes these jobs by TAZ such that 2,440 jobs are added in the unincorporated areas (40.8% of the total), and 3,540 jobs are added in the cities (59.2% of the total). The following table shows the distribution of jobs added between 2010 and 2040 in the unincorporated areas by TAZ.

Table T4. Jobs Added by TAZ 2010 - 2040

TAZ	Jobs Added	TAZ	Jobs Added	TAZ	Jobs Added
104	19.89	217	30.89	691	0.34
130	22.79	218	5.13	696	0.02
131	1.19	225	16.42	702	0.63
144	9.71	226	21.78	713	0.06
145	72.99	227	1.90	718	0.78
146	7.46	228	0.51	719	0.24
150	17.39	267	3.62	723	38.28
156	34.49	268	10.36	724	29.63
157	0.15	285	0.35	727	0.21
162	2.47	287	1.72	730	48.09
165	7.33	298	23.61	731	17.39
166	0.70	300	29.57	737	7.63
168	1.68	303	28.32	738	6.42
169	5.45	306	6.81	739	6.53
170	9.99	307	156.32	741	5.15
171	32.51	400	0.36	742	0.60
172	0.84	401	0.29	747	11.45
175	27.50	467	239.08	750	45.25
176	1.22	505	1.08	751	4.20
179	12.68	506	1.12	753	2.67
182	5.32	507	1.27	764	0.46
183	0.29	511	0.27	765	6.66
184	1.55	513	1.59	767	18.85
185	2.17	514	1.70	776	21.30
186	2.71	515	0.10	784	11.33
187	2.33	517	0.19	798	6.41
189	13.85	560	2.71	799	13.85
190	2.25	561	0.41	804	53.48
191	12.24	562	0.04	806	2.00
193	0.32	563	0.06	807	3.75
194	4.65	564	0.66	809	6.61
195	123.97	565	7.05	810	91.00
197	0.14	602	0.24	811	18.41
198	14.22	603	4.61	819	1.30
202	15.37	604	0.52	821	34.31
203	12.31	644	5.12	822	4.68
204	6.77	662	14.93	823	9.01

Table T4. Jobs Added by TAZ 2010 - 2040

TAZ	Jobs Added	TAZ	Jobs Added	TAZ	Jobs Added
205	0.46	663	0.33	824	17.37
208	1.36	678	1.60	825	75.16
209	4.35	679	0.23	827	31.51
214	3.75	686	0.14	829	12.32
216	7.07	690	1.05	830	11.77
831	43.90	848	46.75	896	3.89
832	163.18	849	17.97	897	6.52
833	14.19	850	2.30	898	6.75
834	16.18	851	5.98	899	1.47
836	1.04	852	11.30	900	1.28
837	20.14	853	17.20	901	22.08
839	0.76	857	2.44	902	1.41
840	6.51	858	5.91	916	29.81
841	0.72	878	3.43	917	39.15
842	1.36	883	0.52	918	38.19
843	3.53	885	0.89	919	11.09
844	4.37	893	1.88	839001	19.58
845	0.72	894	0.89		
846	0.02	895	3.07		

Source: TJKM, 2017

Step 2 - Distribute the TAZ employment growth to each parcel based on the acreage designated commercial or industrial

The total developable area designated commercial and industrial by the Plan was calculated by adding together the developable commercial and industrial land area of each individual parcel within the TAZ. From there, the percent of the total area from each parcel was calculated, and multiplied by the employment growth to derive the fraction of the total TAZ employment allocated to each parcel.

For example, TAZ #899 is comprised of two parcels that total 7.8 acres in size, one of them is 2.3 acres (29 percent of the total area), and the other is 5.5 (71 percent of the total area). The HCDTM projects 1.47 additional jobs will be created in this TAZ. Employment was calculated for the smaller parcel by multiplying 1.47 jobs by 29 percent to arrive at 0.42 jobs added on that parcel. Similarly, employment was calculated for the larger parcel by multiplying 1.47 jobs by 71 percent to arrive at 1.05 jobs added on that parcel.

Step 3 - Convert employment growth for each parcel into commercial and industrial square feet based on the parking standards of the Zoning Ordinance,

The jobs added per parcel calculated in step 2 was converted into commercial and industrial square footage using the parking standards in the Zoning ordinance, which require one new employee parking space for each 300 square feet of commercial space, and 2,500 square feet of industrial space. Simply put, if a parcel has a commercial or mixed use land use designation, the number of jobs added was multiplied by 300 to estimate the commercial square footage that will be developed on that property.

Using the above example for TAZ #899, the smaller parcel was calculated to have 0.42 jobs added, so the commercial square footage added is calculated as 0.42 times 300, or 126 square feet. Similarly, the larger parcel was calculated to have 1.05 jobs added, so the commercial square footage added is calculated as 1.05 times 300, or 315 square feet. If a parcel has an industrial land use designation, the multiplier used was 2,500 rather than 300 because the parking standards in the Zoning Ordinance specify that one additional parking space is required for every 2,500 square feet of industrial space added.

Exhibit A

Detail of Assumptions and Programming Language Used to Calculate Parcel Specific Estimated Maximum Feasible Development Potential

This Exhibit describes the methodology for calculating the Estimated Maximum Feasible Development Potential of the proposed General Plan Update and the current General Plan, and the Alternatives. For purposes of this analysis, the Estimated Maximum Feasible Development Potential of the General Plan is defined as the theoretical maximum number of housing units allowable based on the maximum density of General Plan Land Use Designation applied to the developable area of the portion of the parcel to which the Land Use Designation is applied.

The Assessor's Use Code and assessed value data were used to identify vacant and improved parcels within the unincorporated areas of the County. The developable acreage of each parcel and the acreage of the Land Use Designations were determined using the County geographic information systems (GIS) database. There may be minor differences between the GIS acreage and the parcel acreage contained in the Assessor's database, because the GIS data has been developed for planning purposes and not for assessment purposes. Parcel status, vacant or improved, is used in calculating maximum allowable density. Improved parcels that are greater than ¼ acre and are at least three times the maximum allowable density are assumed to be underdeveloped and included in Estimated Maximum Feasible Development Potential calculations.

The "developable" parcel acreage, or the developable acreage of each Land Use Designation within a parcel, was used in calculating Estimated Maximum Feasible Development Potential. The developable parcel acreage does not include areas with certain environmental constraints because they effectually preclude almost all residential, commercial or industrial development. The following physical features are assumed eliminate any development potential: 100-year flood zones, wetlands, streamside management areas, earthquake fault zones, areas of historic landslide occurrence, and areas with slopes in excess of 30 percent. Areas with these physical constraints were excluded from the parcel acreage in calculating the Estimated Maximum Feasible Development Potential.

Methodology

Vacant Developable Parcel Assumptions

1. Parcels must have at least 2,500 square feet of developable area to have development potential.

Improved Developable Parcel Assumptions

1. Developable land must be equal to at least three times the minimum density.
2. Improved parcels that are less than ¼ acres are not considered developable.

Residential development is assumed to occur on land planned for commercial development and on land planned for mixed uses. Given that residential development on commercial land has been permitted with a use permit for years and there has been little or no interest in carrying out such development, little or no residential development is expected to occur on commercial

land. Up to 50 percent of land planned for mixed uses is expected to be used for residential development.

It should be noted that the current General Plan is comprised of land use designations from the Framework General Plan, numerous Local Coastal Programs and Community Plans as well as several antiquated planning documents from the 1960's. In addition, Estimated Maximum Feasible Development Potential was calculated at the parcel level and many parcels are split between different current land use designations. As a result, in some instances the current land use designations were generalized to simplify Estimated Maximum Feasible Development Potential calculations.

The following tables show the densities that were used in calculating buildout for proposed General Plan Update and the current General Plan.

Proposed General Plan and Alternatives:

Proposed Land Use Designation	Acres per Dwelling Unit
AE	20
AE20	20
AE60	60
AEG	160
AEG160	160
AEG600	600
AG	20
AG20-60	20
CF	0
CG	0.0625
CG/RA	5
CG/RE	1
CR	0.0625
CR/CG	0.0625
CR/PF/PR	0.0625
CR/PR	0.0625
CS	0.0625
CS/IG	0
IG	0
IR	0
MB	0
MC	0
MG	0
MR/CG	0
MR/CR	0
MR/MC	0
MR/MG	0
MR/RL	0.125
MU	0.0625

Proposed Land Use Designation	Acres per Dwelling Unit
NR	0
NR/MR	0
NR/PF	0
NR/PR	0
OS	0
P	0
PF	0
PF/PR	0
PR	0
RCC	0.25
RA	5
RA 5-20	5
RA10	10
RA10-20	10
RA160	160
RA20	20
RA20-160	20
RA40	40
RA40-160	40
RA5	5
RA5-10	5
RA5-20	5
RA5-20\UR	5
RA60	60
RE	1
RE1-5	1
RE1.5	1.5
RE2.5-5	2.5
RE2-5	2
RE2.5	2.5
RE3-5	3
RE5	5
RL	0.125
RL(700 UNIT MAX)	0
RL/UR	0.125
RL0-2	0.5
RL0-4	0.25
RL1	1
RL1-2	0.5
RL1-4	0.25
RL1-5	1
RL1-7	0.1429

Proposed Land Use Designation	Acres per Dwelling Unit
RL1-7 (240 MAX)	240 units
RL1-7 (300 MAX)	300 units
RL1-7 (320 MAX)	320 units
RL1-7 (700 MAX)	700 units
RL3-7	0.1429
RM	0.0333
RM/UR	0.0333
T	40
TC	40
TC(160)	160
Tribal Lands	40
UR	0.125
VC	0.25

Current General Plan:

General Plan Land Use Designation	Grouping	Acres per Dwelling Unit
(blank)	P	0
(RAILROAD)	Public or Recreation	0
E-A	AE	20
AE	AE	20
AE (HBAP)	AE	20
AE (MCCP)	AE	20
AE(55)	AE	55
AE(HBAP);EXCL AGRI(ARC66)	AE	20
AEG	AG	600
AEG(160)	AG	160
AEG(2)	AG	600
AEG(SCAP);P(FRWK)	AEG/P	160
AEP	AE	60
AEP(60)	AE	60
AEP(MCAP);AE(MCCP)	AE	60
AG	AG	20
AG EX;GRAZ;NR;DISP HOUSES (N	Open Space Desig/Disp Houses	10
AG(20)	AG	20
AG(5)	AG	5
AGRI (MGP77)	Open Space	20
AGRICULTURE (MGP77)	Open Space	20
AGRICULTURE (MGP77);EST RES(	Open Space Desig/Disp Houses	10
AL	AL	20
AL 20	AL	20
AL 40	AL	40
AL(20)	AL	20
AL(40)	AL	40
AL160	AL	160
AL160;P(FRWK);CON-T(SHGP)	Open Space	20
AL20	AL	20
AL40	AL	40
AL60	AL	60
AR	AR	5
AR (5-20)	AR	5
AR (MCCP)	AR	5
AR 20-5	AR	5
AR(10 ac. min.)	AR	10
AR(10AC)	AR	10
AR(12)	AR	12
AR(5 AC)	AR	5
AR(5)	AR	5
AR(5-20)	AR	5
AR(5-20) (NHGP)	AR	5
AR(5AC)	AR	5
AR(8)	AR	8
AR;T(MCCP);LD RES;FOREST(65)	Open Space Desig/Disp Houses	10
AR-10	AR	10
AR10 (NHGP)	AR10	10
AR20-5	AR	5
AR40	AR	40

General Plan Land Use Designation	Grouping	Acres per Dwelling Unit
AR-5	AR	5
AR5-20	AR	5
AS	AS	2.5
AS 5 - 2 1/2	AS	2.5
AS(1-5)	AS	1
AS(3AC)	AS	3
AS(5)	AS	5
AS2 (NHGP)	AS2	2
AS5-2.5 (NHGP)	AS5-2.5	2.5
Big Lagoon Indian Reserva	Tribal	0
C-C (SHGP)	Commercial/Industrial	0
C-C;R-L (SHGP)	Commercial/Disp Houses	5
CEMETERY (NHGP)	Public or Recreation	0
CF	CF	0
CFR	CFR	0
CG	CG	0.0625
CG(5)	CG	0
CG(8)	CG	0
CG/AS	CG	2.5
CG/RR	CG	2
COMM (NHGP)	Commercial/Industrial	0
COMM;GRAZING (NHGP)	Open Space	20
COMMERCIAL (NHGP)	Commercial/Industrial	0
CON-F	CF	5
CON-F-R	PR	5
CON-R	PR	0
CON-R (SHGP)	Public or Recreation	0
CON-T (SHGP)	Open Space	20
CON-T(SHGP);AEG(SCAP)	Open Space	20
CON-T-R	T	2.5
CR	CR	0
CR/CG	CR	0.0625
CS	CS	0.0625
CS/IG	CS	0
DISP HOUSES (NHGP)	Dispersed Houses	1
DISP HOUSES;GRAZING (NHGP)	Open Space Desig/Disp Houses	10
DISP HOUSING;GRAZING (NHGP)	Open Space Desig/Disp Houses	10
DISP HS (NHGP)	Dispersed Houses	1
DISP HS(NHGP);RRC(TAP)	Dispersed Houses	1
DISP HS(NHGP);T(MCCP)	Dispersed Houses	1
DISP HS;COMM (NHGP)	Commercial/Disp Houses	5
DISP HS;GRAZING (NHGP)	Open Space Desig/Disp Houses	10
DISP HS;GRAZING;COMM(NHGP)	Open Space Desig/Disp Houses	10
DISP HS;GRAZING;REC (NHGP)	Open Space Desig/Disp Houses	10
DISP HS;RECREATION (NHGP)	Open Space Desig/Disp Houses	10
DISP HS;REDWOOD (NHGP)	Open Space Desig/Disp Houses	10
DISP HS;RES EST;TIMBER(NHGP)	Open Space Desig/Disp Houses	10

General Plan Land Use Designation	Grouping	Acres per Dwelling Unit
DISP HS;TIMBER (NHGP)	Open Space Desig/Disp Houses	10
DISP HS;TIMBER;GRAZING(NHGP)	Open Space Desig/Disp Houses	10
DISPERSED HOUSES (NHGP)	Dispersed Houses	1
DISPERSED HOUSES(NHGP)	Dispersed Houses	1
DISPERSED HOUSING (NHGP)	Dispersed Houses	1
EST RES (ARC66) TIMBER(NHGP)	Open Space Desig/Disp Houses	10
EST RES (ARC66);TIMBER(NHGP)	Open Space Desig/Disp Houses	10
EST RES;OPEN;LUMBER (ARC66)	Open Space Desig/Disp Houses	10
EST RES;OPEN;VL DENS (ARC66)	Open Space Desig/Disp Houses	10
EST RES;VL DENS (ARC66)	Dispersed Houses	1
EST RES;VLD;LUMBER (ARC66)	Open Space Desig/Disp Houses	10
ESTATE RES;OPEN (ARC66)	Open Space Desig/Disp Houses	10
ESTATE RESIDENTIAL (ARC66)	Dispersed Houses	1
EXCL AG (ARC66);AE (MCCP)	Open Space	20
EXCL AG(ARC66);FOREST(MC65)	Open Space	20
EXCL AGRI (ARC66)	Open Space	20
EXCL AGRI (ARC66);AE (HBAP)	Open Space	20
EXCL AGRI (NHGP)	Open Space	20
EXCL AGRI;GRAZING (NHGP)	Open Space	20
FOREST(MC65)	Open Space	20
FOREST(MC65);EST RES(ARC66)	Open Space Desig/Disp Houses	10
FOREST(MC65);EXCL AG(ARC66)	Open Space	20
FOREST(MC65);T(NHGP);T(MCCP)	Open Space	20
GEN INDSTRY;EXCL AG(ARC66)	Commercial/Industrial	0
GENERAL INDUSTRIAL (ARC66)	Commercial/Industrial	0
golf course	OTHER	0
GRAZING (NHGP)	Open Space	20
GRAZING;DISP HOUSES (NHGP)	Open Space Desig/Disp Houses	10
GRAZING;NATR RES (NHGP)	Open Space	20
GRAZING;NR;DISP HSE (NHGP)	Open Space Desig/Disp Houses	10
GRAZING;NR;DISPHSE;IND (NHGP	Open Space Desig/Disp Houses	20
GRAZING;REC(NHGP);P(FRWK)	Open Space	20
GRAZING;RECREATION (NHGP)	Open Space	20
GRAZING;TOURISM (NHGP)	Open Space	20
green gulch	OTHER	0
Hoopa Valley	OTHER	0
HWY	OTHER	0
HWY 101	OTHER	0
HWY 299	OTHER	0
HWY 96	OTHER	0
IG	IG	0
IND	IG	0
INDUSTRIAL (NHGP)	Commercial/Industrial	0

General Plan Land Use Designation	Grouping	Acres per Dwelling Unit
INDUSTRIAL RESERVE (NHGP)	Commercial/Industrial	0
INDUSTRIAL RESV;GRAZ(NHGP)	Commercial/Industrial	0
IR	IR	0
LOW DENSITY (ARC66)	Low Density	0.25
LOW DENSITY (NHGP)	Low Density	0.25
LOW DENSITY;GRAZING (NHGP)	Open Space Desig/Disp Houses	10
LOW DENSITY;NATR RES (NHGP)	Open Space Desig/Disp Houses	10
MB	MB	0
MC	MC	0
MED DENSITY;GRAZING (NHGP)	Open Space Desig/Disp Houses	10
MEDIUM DENSITY (ARC66)	Medium Density	0.143
MG	MG	0
MH	IG	0
MR/CG	NR	0
MR/CR	NR	0
MR/MC	NR	0
MR/MG	NR	0
MR/RL	NR	1
NATR RES;GRAZING (NHGP)	Open Space	20
NATR RES;RECREATION (NHGP)	Public or Recreation	0
NATR RES;TIMBER;GRAZ(NHGP)	Public or Recreation	0
NATR RES;WATER AREAS (NHGP)	Public or Recreation	0
NATURAL RESOURCES (NHGP)	Public or Recreation	0
NR	NR	0
NR (SCAP)	Public or Recreation	0
NR(SCAP)	Public or Recreation	0
NR(SCAP);CON-R(SHGP)	Public or Recreation	0
NR(SCAP);R-L(SHGP)	Dispersed Houses	1
OPEN (ARC66)	Open Space	20
OPEN;PARKS (ARC66)	Public or Recreation	0
P	P	0
P (FRWK)	Public or Recreation	0
PARKS (ARC66)	Public or Recreation	0
PF	PF	0
PF (FRWK)	Public or Recreation	0
PF(TAP);DISP HS(NHGP)	Open Space Desig/Disp Houses	10
PL/PR	P	0
P-M (SHGP)	Public or Recreation	0
PR	PR	0
PUBLIC FACILITI	P	0
PUBLIC(NHGP)	Public or Recreation	0
R	PR	0
RAILROAD	P	0
RCC	RCC	2.5
RE	RE	2.5
RE(1)	RE	1
RE(TAP);RES EST(NHGP)	Dispersed Houses	1
RE(TAP);RES EST;TIMBER(NHGP)	Open Space Desig/Disp Houses	10
REC;TIMBER;WATER AREA(NHGP)	Public or Recreation	0
RECREATION (NHGP)	Public or Recreation	0

General Plan Land Use Designation	Grouping	Acres per Dwelling Unit
RECREATION;TIMBER (NHGP)	Open Space	20
REDWOOD (NHGP)	Open Space	20
REDWOOD(NHGP);TC(TAP)	Open Space	20
REDWOOD;GRAZ;TIMBER(NHGP)	Open Space	20
REDWOOD;GRAZING (NHGP)	Open Space	20
REDWOOD;TIMBER (NHGP)	Open Space	20
RES EST;GRAZ;TIMBER;NR(NHGP)	Open Space Desig/Disp Houses	10
RES EST;GRAZING;REC (NHGP)	Open Space Desig/Disp Houses	10
RES EST;LOW DENSITY (NHGP)	Dispersed Houses	1
RES EST;REC;TIMBER (NHGP)	Open Space Desig/Disp Houses	10
RES EST;TIMB;GRAZ;REC (NHGP)	Open Space Desig/Disp Houses	10
RES EST;TIMB;NATR RES(NHGP)	Open Space Desig/Disp Houses	10
RES EST;TIMBER;GRAZ (NHGP)	Open Space Desig/Disp Houses	10
RES EST;TIMBER;REC (NHGP)	Open Space Desig/Disp Houses	10
RES ESTATES (NHGP)	Dispersed Houses	1
RES ESTATES(NHGP)	Dispersed Houses	1
RES ESTATES(NHGP);RRC(TAP)	Dispersed Houses	1
RES ESTATES;COMM (NHGP)	Commercial/Disp Houses	5
RES ESTATES;GRAZING (NHGP)	Open Space Desig/Disp Houses	10
RES ESTATES;REC (NHGP)	Open Space Desig/Disp Houses	10
RES ESTATES;TIMBER (NHGP)	Open Space Desig/Disp Houses	10
RES ESTATES;TOURISM (NHGP)	Open Space Desig/Disp Houses	10
RES.ESTATE (NHGP)	Dispersed Houses	1
RES.ESTATES (NHGP)	Dispersed Houses	1
RESIDENTIAL ESTATES (ARC66)	Dispersed Houses	1
RESORT(NHGP)	Public or Recreation	0
RESORT;TIMBER;GRAZING (NHGP)	Open Space	20
RL	RL	0.1429
R-L	RL	0.2
RL (1-5)	RL	1
RL (HBAP)	RL	0.143
RL (SCAP)	RL	0.143
R-L (SHGP)	Dispersed Houses	1
RL(0.5AC)	RL	0.5
RL(1)	RL	1
RL(1AC)	RL	1
RL(2)	RL	2
RL(240)	RL	0
RL(300 UNIT MAX)	RL	0
RL(3-7 U/AC)	RL	0.1429
RL(700 UNIT MAX)	RL	0
RL(SCAP);R-L(SHGP)	Dispersed Houses	1
R-L;C-C (SHGP)	Open Space Desig/Disp Houses	10

General Plan Land Use Designation	Grouping	Acres per Dwelling Unit
R-L;C-C(SHGP)	Open Space Desig/Disp Houses	10
R-L;CON-R (SHGP)	Open Space Desig/Disp Houses	10
RL1	RL	1
RLA	RL	0.5
RLB	RL	0.5
RM	RM	0.0333
ROAD	P	0
RR	RR	5
R-R	RR	1
RR(10)	RR	10
RR(2.5)	RR	2
RR(4)	RR	4
RR(5)	RR	5
RR(A)	RR	2
RR(B)	RR	5
RR(C)	RR	2.5
RR(D)	RR	5
RR(E)	RR	1
RR(F)	RR	5
RRA(TAP);RES EST;TIMB(NHGP)	Open Space Desig/Disp Houses	10
RRA(TAP);RES ESTATES (NHGP)	Dispersed Houses	1
RRA(TAP);T(NHGP)	Open Space	20
RRB	RR	5
RRC (TAP)	RR(C)	2.5
RRC(TAP);RES EST (NHGP)	Dispersed Houses	1
RRC(TAP);RES EST;TIMB(NHGP)	Open Space Desig/Disp Houses	10
RRC(TAP);RES ESTATES (NHGP)	Dispersed Houses	1
RRC(TAP);TIMBER(NHGP)	Open Space	20
RRC(TAP);TIMBER;REC(NHGP)	Open Space	20
RS	RS	2.5
RV	UR	2.5
RV (TAP)	RCC	2.5
RV(TAP);TIMBER(NHGP)	Open Space	20
RV/RE	RV	2.5
RV/RL	RV	2
RV/RL(HBAP);MED DENS(ARC66)		0.14285714
RX	RS	2
RX(2.5)	RS	2.5
RX2.5	RS	2.5
SCENIC HWY	Public or Recreation	0
SCHOOL(NHGP)	Public or Recreation	0
SUBURBAN (NHGP)	Dispersed Houses	1
SUBURBAN;GRAZING (NHGP)	Open Space Desig/Disp Houses	10
T	T	40
T (FRWK)	T	40
T (JCCP)	T	40
T (MCCP)	T	40
T (MCCP);FOREST (MC65)	Open Space	20
T(FRWK);TIMBER;GRAZING(NHGP)	Open Space	20
T(JCCP);EST RES(ARC66)	Dispersed Houses	1

General Plan Land Use Designation	Grouping	Acres per Dwelling Unit
T(MCCP);FOREST(MC65)	Open Space	20
T(MCCP);TIMBER(NHGP)	Open Space	20
T;AG (FRWK)	T;AG	40
TC	T	40
TC(160)	T	160
TC(TAP);TIMBER(NHGP)	Open Space	20
TIMB;NATR RES;INDL RSV(NHGP)	Public or Recreation	0
TIMBER (NHGP)	Open Space	20
TIMBER (NHGP);RRC (TAP)	Open Space	20
TIMBER (NHGP);RV (TAP)	Open Space	20
TIMBER(NHGP)	Open Space	20
TIMBER(NHGP);AR10(MCCP)	Open Space	20
TIMBER(NHGP);EST RES(ARC66)	Open Space Desig/Disp Houses	10
TIMBER(NHGP);RR(C)(TAP)	Open Space	20
TIMBER(NHGP);RRC(TAP)	Open Space	20
TIMBER(NHGP);T(FRWK)	Open Space	20
TIMBER(NHGP);T(MCCP)	Open Space	20
TIMBER(NHGP);VL DENS(ARC66)	Open Space Desig/Disp Houses	10
TIMBER(NHGP);VLD;ESTR(ARC66)	Open Space Desig/Disp Houses	10
TIMBER;DISP HS(NHGP);T(MCCP)	Open Space Desig/Disp Houses	10
TIMBER;DISPERSED HOUSES (NHG	Open Space Desig/Disp Houses	10
TIMBER;GRAZ;NATR RES(NHGP)	Open Space	20
TIMBER;GRAZ;TOURISM (NHGP)	Open Space	20
TIMBER;GRAZING (NHGP)	Open Space	20
TIMBER;REC;GRAZING(NHGP)	Open Space	20
TIMBER;REC;RES EST (NHGP)	Open Space	20
TIMBER;RECREATION (NHGP)	Open Space	20
TIMBER;RES EST (NHGP)	Open Space Desig/Disp Houses	10
TOURISM (NHGP)	Public or Recreation	0
TPZ	T	40
U	OTHER	0
URBAN EXPANSION	UR	0.5
VERY LOW DENSITY (ARC 66)	Very Low Density	1
VERY LOW DENSITY (ARC66)	Very Low Density	1
VERY LOW DENSITY (NHGP)	Very Low Density	1
VL DENSITY;LUMBER (ARC66)	Open Space Desig/Disp Houses	10
VL DENSITY;OPEN (ARC66)	Open Space Desig/Disp Houses	10
VL DENSITY;OPEN;PARK(ARC66)	Open Space Desig/Disp Houses	10
VL DENSITY;PARK (ARC66)	Open Space Desig/Disp Houses	10
WATER AREA (NHGP)	Public or Recreation	0
WATER AREA;GRAZING (NHGP)	Public or Recreation	0
WATER AREA;RECREATION(NHGP)	Public or Recreation	0
WATER AREAS;GRAZING (NHGP)	Public or Recreation	0

Development projections were calculated using ESRI ArcView GIS 3.2 and compiled into tables using Excel pivot tables. The following is a listing of the each of the database queries and formulas for the maximum allowable buildout projections.

Estimated Maximum Feasible Development Potential ("Maximum Buildout Level")

ALTERNATIVE BOS

DENSITY ADJUSTMENTS

Minimum density where type is water-only is 1.0 acres, where there are no municipal services minimum density is 2.0 acres.

RESIDENTIAL PROPERTIES
([Bos_201510] = "AE*") or ([Bos_201510] = "AG*") or ([Bos_201510] = "RE*")
or ([Bos_201510] = "RL*") or ([Bos_201510] = "RM*") or ([Bos_201510] = "RA*") or
([Bos_201510] = "T*") or ([Bos_201510] = "TC*")

Calculate:
{BOS_Use} = "residential"

MIXED USE PROPERTIES
([Bos_201510] = "CR*") or ([Bos_201510] = "CS*") or ([Bos_201510] = "CG*") or ([Bos_201510] = "MU*") or ([Bos_201510] = "VC") or ([Bos_201510] = "RCC")

Calculate:
{BOS_Use} = "mixed use"

URAN RESERVE AREAS
([Bos_201510] = "*UR*")

Calculate:
{BOS_Use} = "urban reserve"

VACANT DEVELOPABLE RESIDENTIAL PROPERTY

#1 Where "vacant" = <= $5,000 improvement value; Query to calculate development potential for parcels larger than minimum density, prior to application of minimum parcel size assumptions relating to onsite water and wastewater (see below).

([BOS_Use] = "residential") and ([BOS_max_de] > 0) and ([Status] = "vacant") and
([Dev_ac]/[BOS_max_de] >= 1)
>>New Set

Calculate:
{BOS_exp} =

([Dev_ac] / [BOS_max_de]).Truncate

#2 Query establishing development potential prior to application of minimum parcel size

([BOS_Use] = "residential") and ([BOS_max_de] > 0) and ([Status] = "vacant") and ([Dev_ac]/[BOS_max_de] < 1)
>>New Set

Calculate:
{BOS_exp} =

([Dev_ac] / [BOS_max_de]).Ceiling

#3 Query for minimum parcel size in areas served by sewer and water (2,500 square feet or 0.057392 acres), areas with water service (1.0 acres), and in rural areas (2.0 acres).

([BOS_Use] = "residential") and ((([BOS_max_de] > 0) and ([Status] = "vacant") and ([Dev_ac] <= 0.057392) and ([Serv_type] = "water/sewer")) or (([BOS_max_de] > 0) and ([Status] = "vacant") and ([Dev_ac] <= 1.0) and ([Serv_type] = "water")) or (([BOS_max_de] > 0) and ([Status] = "vacant") and ([Dev_ac] <= 2.0) and ([Serv_type] = "")))

Calculate:
{BOS_exp} = 0

IMPROVED RESIDENTIAL PROPERTY

#4 Where "improved" > $5,000 improvement value; Query to determine the development potential of parcels containing land equal to at least three times the minimum density.

([BOS_Use] = "residential") and ([BOS_max_de] > 0) and ([Dev_ac] > 0) and ([Status] = "improved") and (([Dev_ac]-([BOS_max_de]*3))/[BOS_max_de] >= 1)
>>New Set

Calculate:
{BOS_exp} =

(([Dev_ac] - [BOS_max_de])/ [BOS_max_de]).Truncate

#5 Query to eliminate improved parcels that do not contain developable land equal to at least three times the minimum density, or that are less than 1/4 acres, or that are in water service areas and less than 1.0 acre, or in rural areas and less than 2.0 acres, or that contain high value improvements (>$100,000).

([BOS_Use] = "residential") and ((([BOS_max_de] > 0) and ([Dev_ac] > 0) and ([Status] = "improved") and (([Dev_ac]-([BOS_max_de]*3))/[BOS_max_de] < 1)) or (([BOS_max_de] > 0) and ([Dev_ac] > 0) and ([Status] = "improved") and ([Acres] < 0.25)) or (([BOS_max_de] > 0) and ([Dev_ac] <= 1.0) and ([Status] = "improved") and ([Serv_type] = "water")) or (([BOS_max_de] > 0) and ([Status] = "improved") and ([Dev_ac] <= 2.0) and ([Serv_type] = "")) or (([BOS_max_de] > 0) and ([Dev_ac] > 0) and ([Status] = "improved") and (([Dev_ac]-([BOS_max_de]*3))/[BOS_max_de] >= 1) and ([Impr] > 100000)))

Calculate
{BOS_exp} = 0

URAN RESERVE AREAS
#6 Query to calculate development potential of areas planned UR. Such areas can develop at one dwelling unit per parcel.

([BOS_Use] = "urban reserve") and ([Dev_ac] > 2.0) and ([Status] = "vacant")
>>New Set

Calculate:
{BOS_exp} = 1

VACANT DEVELOPABLE MIXED USE PROPERTY

#2 Query to calculate expected residential and commercial development potential for parcels larger than 2,500 square feet with sewer service.

([Status] = "vacant") and ([Desg_ac] > 0.057392) and ([Bos_use] = "mixed use") and
(([Bos_201510] <> "mu") and ([Bos_201510] <> "rcc") and ([Bos_201510] <> "vc"))

Calculate:
{BOS_max} =

(([Dev_ac] / [BOS_max_de])*0.25).Truncate

([Status] = "vacant") and ([Desg_ac] > 0.057392) and ([Bos_use] = "mixed use") and
(([Bos_201510] = "mu") or ([Bos_201510] = "rcc") or ([Bos_201510] = "vc"))

Calculate:
{BOS_max} =

(([Dev_ac]/[BOS_max_de])).Truncate

Table T-5. Calculations Used to Derive New Housing Units Added in the Unincorporated Areas, 2017 - 2028

Column A	Column B	Column C	Column D	Column E	Column F	Col. G	Column H
Land Use Designation	**Developable Acres**	**Estimated Maximum Feasible Development Potential**	**New Home Building Permits 1972-2015**	**% of Building Permits**	**Column C * Column E**	**1721 / 8903**	**Projected New Units 2028**
AE	15,425	419	68	2.18%	9	0.1933	2
AG	159,976	6,713	88	2.82%	189	0.1933	37
CF	325	0	5	0.16%	0	0.1933	0
CG	274	176	8	0.26%	0	0.1933	0
CI	1	0	0	0.00%	0	0.1933	0
CR	952	806	6	0.19%	2	0.1933	0
CS	362	239	2	0.06%	0	0.1933	0
IG	987	0	0	0.00%	0	0.1933	0
IR	78	0	0	0.00%	0	0.1933	0
MB	12	0	0	0.00%	0	0.1933	0
MC	739	0	0	0.00%	0	0.1933	0
MG	3	0	0	0.00%	0	0.1933	0
MR	54	0	0	0.00%	0	0.1933	0
MU	158	925	1	0.03%	0	0.1933	0
NR	2,603	0	1	0.03%	0	0.1933	0
OS	91	0	1	0.03%	0	0.1933	0
P	143,205	0	0	0.00%	0	0.1933	0
PF	2,288	0	1	0.03%	0	0.1933	0
PR	5,686	0	1	0.03%	0	0.1933	0
RA	61,929	2,092	390	12.50%	262	0.1933	51
RCC	966	920	13	0.42%	4	0.1933	1
RE	8,408	1,165	248	7.95%	93	0.1933	18
RL	6,507	12,004	2,050	65.73%	7,890	0.1933	1,525
RM	495	5,158	138	4.42%	228	0.1933	44
T	297,240	7,640	92	2.95%	225	0.1933	44
TC	6,913	174	3	0.10%	0	0.1933	0
Tribal Lands	32,814	461	0	0.00%	0	0.1933	0
UR	118	2	3	0.10%	0	0.1933	0
VC	70	78	0	0.00%	0	0.1933	0
(blank)	183	0	0	0.00%	0	0.1933	0
Total	**748,861**	**38,972**	**3,119**	**100.00%**	**8,903**		**1,721**

REDWOOD COAST EnergyAuthority

Humboldt County • Arcata • Blue Lake • Eureka • Ferndale • Fortuna • Rio Dell • Trinidad • Humboldt Bay Municipal Water District

Humboldt County Energy Consumption Forecast

Calculation Methodology

4/7/2017

Authored By:
Pierce Schwalb, Redwood Coast Energy Authority

In Consultation With:
Jerome Carman, Environmental Indicator Accounting Services

Striving to develop and implement sustainable energy initiatives that reduce energy demand, increase energy efficiency, and advance the use of clean, efficient and renewable resources available in the region.

www.redwoodenergy.org
633 3rd Street – Eureka, CA 95501
707.269.1700 (local) – 800.931-RCEA (toll-free) – 707.269.1777 (fax)

This Methodology Report is written to accompany the County-Wide Energy Consumption forecasts found on the “Energy Consumption Facts” Tab in the “2005 County-Wide Community Inventory v1” spreadsheet (“Inventory”). It details the methodology used to estimate energy consumption for unincorporated county in support of the general planning process.

The County requested 2016, 2028, 2030 and 2040 energy consumption forecasts. The latest detailed County-specific energy consumption estimates available to RCEA are associated with the 2005 GHG inventories developed for both incorporated and unincorporated areas in Humboldt County (shown in Appendix A). Furthermore, the County provided growth metrics of households, population, employment, and vehicle miles traveled (VMT) for the years 2010, 2028, and 2040 (shown in Appendix A).

Energy consumption results from the 2005 County-Wide Community GHG Inventory were converted to MMBtu (Million British Thermal Units) to enable aggregating consumption across different fuel types. The MMBtu results were used from the following sectors: Residential, Commercial, Industrial, and Transportation, as shown in Appendix A and listed in the Inventory under the “Energy Consumption Facts” Tab. Using the MMBtu totals from the Inventory as a baseline, estimated energy consumption for the requested years was forecasted using Compound Annual Growth Rates (CAGR) developed using the provided growth metrics. Details of this approach are provided in the following sections.

1 Compound Annual Growth Rates

To forecast energy consumption for the requested years, sector-specific CAGRs were calculated for the periods of 2005-2010, 2010-2016, 2016-2028, 2028-2030, and 2030-2040. CAGRs were calculated using data provided by the County for 2010, 2028, and 2040, and then extrapolating/interpolating for 2005, 2016, and 2030. Because the County requested CAGRs that reflect projected growth for Unincorporated County, the following data was either provided by the County for Unincorporated County, or a calculation was applied to County-Wide data to estimate the fraction attributable to Unincorporated County. Sector-specific CAGRs were calculated based on the following data:

- Residential energy consumption growth – Unincorporated household estimates
- Commercial energy consumption growth – Unincorporated commercial and industrial square footage estimates calculated using employment data. Employment data by sector was provided for Unincorporated County. The number of jobs for each sector was then multiplied by the estimated square footage per employee, as provided by the County and shown in Appendix A. Estimated square footage for each employment sector was summed to produce a total square footage estimate each year.
- Industrial energy consumption growth – Identical to estimates used for Commercial energy consumption growth.
- Transportation energy consumption growth – Unincorporated vehicle miles traveled

2 Extrapolating/Interpolating

Because data provided by the County specified population, households, employment, and VMT forecasts for 2010, 2028, and 2040, equivalent values needed to be extrapolated to 2005 (to calculate the 2005-2010 CAGR), interpolated for 2016 (to calculate the 2010-2016 CAGR), and interpolated for 2030 (to calculate the 2028-2030 CAGR). The following equations were used to linearly extrapolate and interpolate values:

Extrapolation (used for 2005)

$$M_{y_0} = M_{y_1} + \left(\frac{y_0 - y_1}{y_2 - y_1}\right)\left(M_{y_2} - M_{y_1}\right)$$

Interpolation (used for 2016 and 2030)

$$M_{y_1} = M_{y_0} + \left(\frac{y_1 - y_0}{y_2 - y_0}\right)\left(M_{y_2} - M_{y_0}\right)$$

where M_y is a metric for year y, and y is the actual year such as 2005 or 2010.

The specific equations used to extrapolate the 2005 values and interpolate the 2016 and 2030 values are included below:

- **2005**
  - **Residential** (Unincorporated Households):

$$2005\ households = 56{,}031 + \left(\frac{2005 - 2010}{2028 - 2010}\right)(58{,}868 - 56{,}031)$$

  - **Commercial** (Total Unincorporated SQF):

$$2005\ SQF = 17{,}761{,}500 + \left(\frac{2005 - 2010}{2028 - 2010}\right)(18{,}906{,}800 - 17{,}761{,}500)$$

  - **Industrial** (Total Unincorporated SQF):

$$2005\ SQF = 17{,}761{,}500 + \left(\frac{2005 - 2010}{2028 - 2010}\right)(18{,}906{,}800 - 17{,}761{,}500)$$

  - **Transportation** (Total Unincorporated VMT):

$$2005\ VMT = 3{,}541{,}683 + \left(\frac{2005 - 2010}{2028 - 2010}\right)(3{,}848{,}756 - 3{,}541{,}683)$$

- **2016**
  - **Residential** (Unincorporated Households):

$$2016\ households = 56{,}031 + (2016 - 2010)\left(\frac{58{,}868 - 56{,}031}{2028 - 2010}\right)$$

  - **Commercial** (Total Unincorporated SQF):

$$2016\ SQF = 17{,}761{,}500 + (2016 - 2010)\left(\frac{18{,}906{,}800 - 17{,}761{,}500}{2028 - 2010}\right)$$

  - **Industrial** (Total Unincorporated SQF):

$$2016\ SQF = 17{,}761{,}500 + (2016 - 2010)\left(\frac{18{,}906{,}800 - 17{,}761{,}500}{2028 - 2010}\right)$$

  - **Transportation** (Total Unincorporated VMT):

$$2016\ VMT = 3{,}541{,}683 + (2016 - 2010)\left(\frac{3{,}848{,}756 - 3{,}541{,}683}{2028 - 2010}\right)$$

- **2030**
  - **Residential** (Unincorporated Households):

$$2030\ households = 58{,}868 + (2030 - 2028)\left(\frac{57{,}567 - 58{,}868}{2040 - 2028}\right)$$

  - **Commercial** (Total Unincorporated SQF):

$$2030\ SQF = 18{,}906{,}800 + (2030 - 2028)\left(\frac{20{,}116{,}300 - 18{,}906{,}800}{2040 - 2028}\right)$$

  - **Industrial** (Total Unincorporated SQF):

$$2030\ SQF = 18{,}906{,}800 + (2030 - 2028)\left(\frac{20{,}116{,}300 - 18{,}906{,}800}{2040 - 2028}\right)$$

  - **Transportation** (Total Unincorporated VMT):

$$2030\ VMT = 3{,}541{,}683 + (2030 - 2028)\left(\frac{3{,}848{,}756 - 3{,}541{,}683}{2040 - 2028}\right)$$

The "UPDATED COUNTY FORECASTING" Tab in the Inventory contains all of the extrapolated/interpolated values, along with the CAGRs for each time period.

Using both the estimates provided by the County and the extrapolated/interpolated values, sector-specific CAGRs for each time period were calculated using the following equation:

$$CAGR_{y_0 \text{ to } y_1} = \left(\frac{M_{y_1}}{M_{y_0}}\right)^{\frac{1}{y_1 - y_0}} - 1\ ,$$

where M and y are as defined above.

The equations used for the residential CAGRs are provided for example. These equations were used for all other sectors, with Households replaced by Total SQF for Commercial and Industrial, and VMT for Transportation.

2005-2010 Residential CAGR

$$CAGR_{2005\ to\ 2010} = \left(\frac{Households_{2010}}{Households_{2005}}\right)^{\frac{1}{5}} - 1$$

2010-2016 Residential CAGR

$$CAGR_{2010\ to\ 2016} = \left(\frac{Households_{2016}}{Households_{2010}}\right)^{\frac{1}{6}} - 1$$

2016-2028 Residential CAGR

$$CAGR_{2016\ to\ 2028} = \left(\frac{Households_{2028}}{Households_{2016}}\right)^{\frac{1}{12}} - 1$$

2028-2030 Residential CAGR

$$CAGR_{2028\ to\ 2030} = \left(\frac{Households_{2030}}{Households_{2028}}\right)^{\frac{1}{2}} - 1$$

2030-2040 Residential CAGR

$$CAGR_{2030\ to\ 2040} = \left(\frac{Households_{2040}}{Households_{2030}}\right)^{\frac{1}{10}} - 1$$

3 Total Energy Consumption Forecasts

The CAGRs for each time period were applied to 2005 Unincorporated County energy consumption estimates from the 2005 County-Wide Community Inventory. Using the following equations, energy consumption forecasts for 2010, 2016, 2028, 2030, and 2040 were calculated.

- **2010:** $MMBtu_{2005}(1 + CAGR_{2005\ to\ 2010})^{5} = MMBtu_{2010}$
- **2016:** $MMBtu_{2010}(1 + CAGR_{2010\ to\ 2016})^{6} = MMBtu_{2016}$
- **2028:** $MMBtu_{2016}(1 + CAGR_{2016\ to\ 2028})^{12} = MMBtu_{2028}$
- **2030:** $MMBtu_{2028}(1 + CAGR_{2028\ to\ 2030})^{2} = MMBtu_{2030}$
- **2040:** $MMBtu_{2030}(1 + CAGR_{2030\ to\ 2040})^{10} = MMBtu_{2040}$

4 Results

The outputs from these equations are included in the "2005 County-Wide Community Inventory v1" spreadsheet, under the Energy Consumption Facts tab. Results are also shown below.

Table 1: Energy consumption projections for unincorporated Humboldt County.

		Unincorporated County Energy Consumption (MMBtu)[1]					
		2005	2010	2016	2028	2030	2040
Residential	Electricity	766,840	777,780	790,909	817,167	814,154	799,091
	Natural Gas	861,015	873,299	888,040	917,522	914,139	897,226
	Propane	180,753	183,332	186,426	192,616	191,905	188,355
	Wood	231,109	234,406	238,363	246,276	245,368	240,829
Commercial	Electricity	517,714	527,157	538,487	561,149	567,132	597,046
	Natural Gas	1,484,301	1,511,372	1,543,858	1,608,829	1,625,982	1,711,749
Industrial	Electricity	21,915	22,315	22,794	23,754	24,007	25,273
	Natural Gas	19,602	19,960	20,389	21,247	21,473	22,606
Transportation	Gasoline	3,648,759	3,738,804	3,846,859	4,062,968	4,054,859	4,014,315
	Diesel[2]	1,472,529	1,508,868	1,552,476	1,639,691	1,636,419	1,620,056
	Total	9,204,536	9,397,293	9,628,601	10,091,217	10,095,439	10,116,546

[1] Note that the number of significant figures reported do not indicate precision, but are provided for transparency in calculation results. A formal error analysis was not conducted for these projections.

[2] Projected diesel consumption for 2005 in the Inventory was roughly 18% less than tracked fuel sales provided by the North Coast Unified Air Quality Management District for the year 2005. The source of this discrepancy has not been addressed. The potential impact to total MMBtu values shown here is roughly 3%.

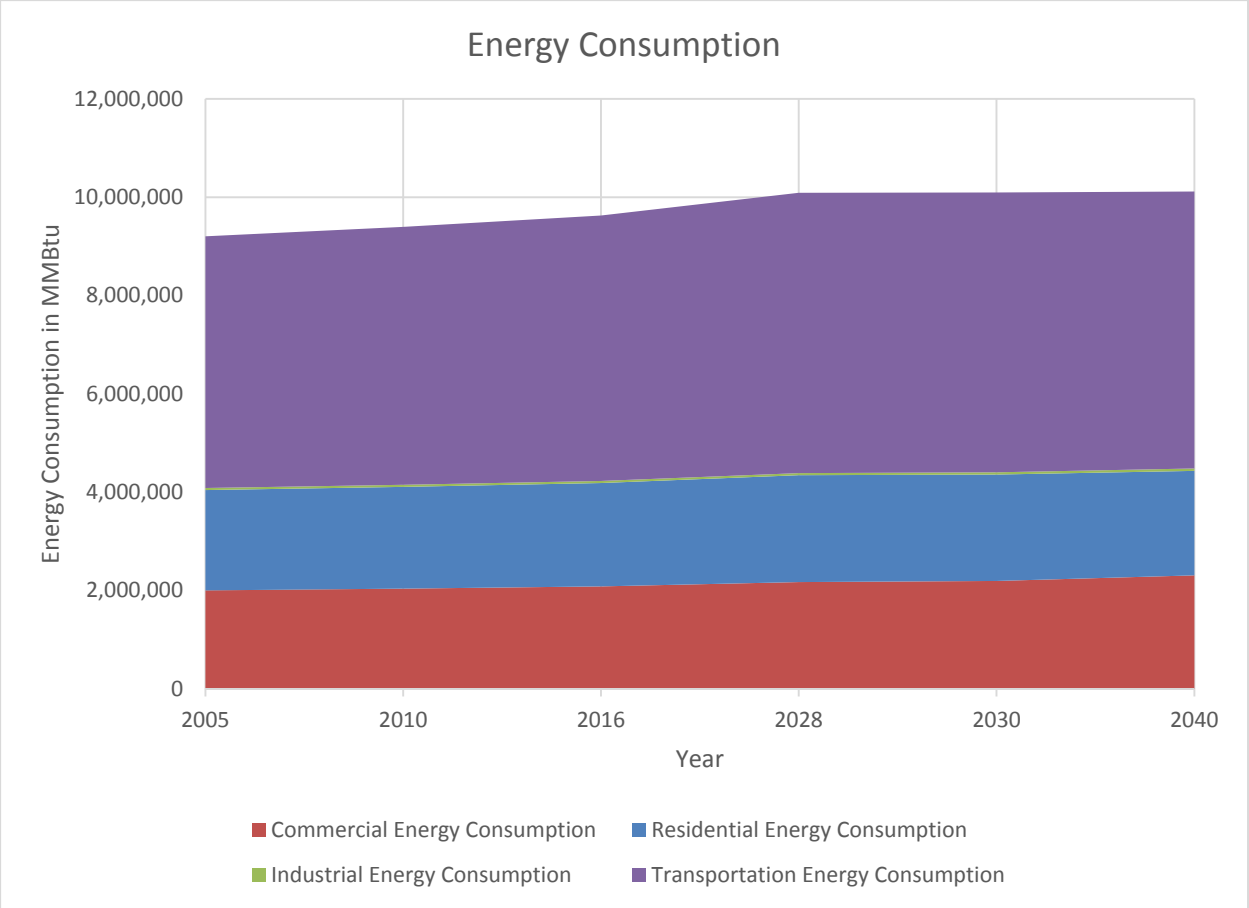


Figure 1: Energy consumption projections for unincorporated Humboldt County.

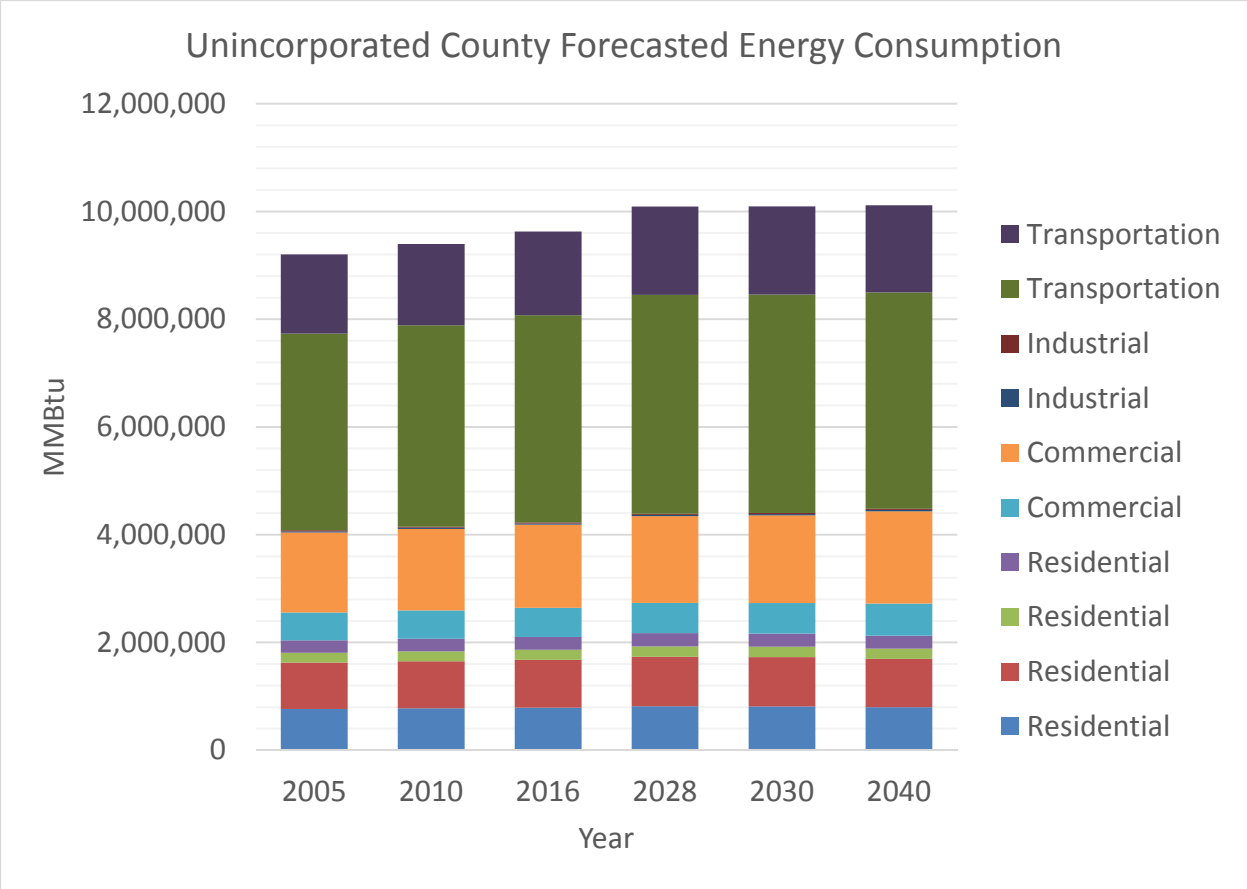


Figure 2: Energy consumption projections for unincorporated Humboldt County.

Appendix A Raw Data Utilized in this Analysis

The following tables show raw and calculated data used in this analysis. Table cells that are highlighted indicate values calculated using the methods outlined in this report. Table cells that are not highlighted indicate data provided by the County for this analysis.

Table 2: Energy consumption calculations for 2005 Unincorporated County. All energy units were converted to Million British Thermal Units (MMBtu).

2005 Unincorporated County Energy Consumption			
Category	2005 Unincorporated County Energy Consumption	MMBtu Conversion Factor	Energy Consumption in MMBtu
Residential Electricity (total kWh/year)	224,747,923	0.003412	766,840
Residential Natural Gas Consumption (total thm/year)	8,612,212	0.099976	861,015
Residential Propane (gal/year)	1,973,286	0.0916	180,753
Residential Firewood (cord/year)	10,749	21.5	216,060
Commercial Electricity Consumption (total kWh/year)	151,733,404	0.003412	517,714
Commercial Natural Gas Consumption (total thm/year)	14,846,575	0.099976	1,484,301
Industrial Electricity Consumption (total kWh/year)	6,422,902	0.003412	21,915
Industrial Natural Gas Consumption (total thm/year)	196,068	0.099976	19,602
Trans. Fuel Consumed: Light Duty, Gas (gal/year)	28,243,988	0.120405	3,400,717
Trans. Fuel Consumed: Light Duty, Diesel (gal/year)	1,209,539	0.137381	166,168
Trans. Fuel Consumed: Heavy Duty, Gas (gal/year)	1,098,595	0.120405	132,276
Trans. Fuel Consumed: Heavy Duty, Diesel (gal/year)	4,431,095	0.137381	608,748
Trans. Fuel Consumed: Off-Road, Gas (gal/year)	961,462	0.120405	115,765
Trans. Fuel Consumed: Off-Road, Diesel (gal/year)	5,077,942	0.137381	697,613

Table 3: Total projected households and employees. Highlighted values were calculated via interpolation or extrapolation.

	Households		Employees	
Year	Cities	Unincorporated	Cities	Unincorporated
2005	22,534	32,709	29,000	18,394
2010	22,855	33,176	29,478	18,724
2016	23,241	33,736	30,052	19,120
2028	24,012	34,856	31,199	19,911
2030	23,924	34,728	31,502	20,120
2040	23,482	34,085	33,018	21,164

Table 4: Total projected VMT within unincorporated Humboldt County. Highlighted values were calculated via interpolation or extrapolation.

Trip Origin	Trip Destination	2005	2010	2016	2028	2030	2040
Inside UC	Inside UC	1,057,118	1,070,071	1,085,614	1,116,701	1,113,424	1,097,038
Inside UC	Outside UC	828,054	851,484	879,600	935,833	934,774	929,479
Outside UC	Inside UC	864,744	888,993	918,092	976,290	975,088	969,080
Outside UC	Outside UC	706,469	731,135	760,734	819,932	817,788	807,070
	Total	3,456,385	3,541,683	3,644,041	3,848,756	3,841,075	3,802,668

Table 5: Total projected employees by job sector for the entire County. Highlighted values were calculated via interpolation or extrapolation.

Employees - County-wide									
Model Year	**Retail**	**Service**	**Manufacturing**	**Government**	**Finance**	**Wholesale**	**Agricultural**	**Other**	**Health Care**
2005	10,116	17,649	1,842	2,816	1,514	1,932	2,083	3,085	6,378
2010	10,286	17,950	1,870	2,865	1,537	1,970	2,119	3,143	6,463
2016	10,490	18,311	1,904	2,923	1,565	2,016	2,162	3,212	6,565
2028	10,899	19,034	1,972	3,040	1,620	2,108	2,249	3,351	6,769
2030	11,007	19,225	1,990	3,071	1,635	2,132	2,272	3,388	6,823
2040	11,547	20,179	2,080	3,226	1,708	2,253	2,386	3,571	7,093

Table 6: Projected employment by job sector for unincorporated Humboldt County. All values were calculated.

Employment - Unincorporated County									
Model Year	**Retail**	**Service**	**Manufacturing**	**Government**	**Finance**	**Wholesale**	**Agricultural**	**Other**	**Health Care**
2005	3,126	7,388	1,144	540	268	1,035	1,399	1,840	1,676
2010	3,181	7,520	1,161	551	270	1,058	1,424	1,877	1,683
2016	3,247	7,678	1,181	565	273	1,086	1,454	1,922	1,692
2028	3,380	7,995	1,222	592	279	1,142	1,513	2,011	1,710
2030	3,415	8,079	1,233	599	281	1,157	1,529	2,035	1,715
2040	3,589	8,496	1,286	634	288	1,231	1,607	2,153	1,739

Table 7: Projected infrastructure square footage by job sector using values from Table 5 and Table 7. All values were calculated.

Square Footage - Unincorporated County										
Model Year	**Retail**	**Service**	**Manufacturing**	**Government**	**Finance**	**Wholesale**	**Agricultural**	**Other**	**Health Care**	**Total**
2005	937,717	2,216,417	2,860,139	161,883	80,250	2,586,667	3,498,194	4,599,444	502,650	17,443,361
2010	954,300	2,256,000	2,902,500	165,300	81,000	2,645,000	3,560,000	4,692,500	504,900	17,761,500
2016	974,200	2,303,500	2,953,333	169,400	81,900	2,715,000	3,634,167	4,804,167	507,600	18,143,267
2028	1,014,000	2,398,500	3,055,000	177,600	83,700	2,855,000	3,782,500	5,027,500	513,000	18,906,800
2030	1,024,450	2,423,550	3,081,667	179,700	84,150	2,892,083	3,821,667	5,086,667	514,450	19,108,383
2040	1,076,700	2,548,800	3,215,000	190,200	86,400	3,077,500	4,017,500	5,382,500	521,700	20,116,300

Table 8: Average commercial square footage space per employee by job sector. Data provided by the County.

Building Square Feet	
SECTOR	**SF/emp**
Retail	300
Service	300
Manufacturing	2500
Government	300
Finance	300
Wholesale	2500
Agricultural	2500
Other	2500
Health Care	300

Appendix V - Comparison of Alternatives

Note: In this Appendix, the term "Project" refers to the March 19, 2012 Planning Commission Approved Draft General Plan. Appendix A of this EIR compares the 2016 Board of Supervisors Tentatively Approved Draft General Plan with the March 19, 2012 Planning Commission Approved Draft General Plan.