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Memorandum: Coastal Commission Mitigation for Natural Resource Impacts - Background for Caltrans Projects

(Coastal Commission Transportation Program Staff, March 2022)

1. Introduction

This memorandum is intended to provide a general overview of California Coastal Commission (Coastal Commission or Commission) practices on compensatory mitigation¹ as a guide for Caltrans staff in the initial phases of transportation project development. The memorandum is also guided by the recommendations of the AB 1282 Taskforce (see recommendation 1.2) and the Integrated Planning Team Next Steps Recommendations (“Develop programmatic guidelines for common projects.”). The goal is to provide a roadmap for Commission mitigation practices for the benefit of both agencies. Ideally, the Coastal Commission will benefit from the increased understanding of mitigation practices because the mitigation proposed will fully compensate for project impacts in accordance with Coastal Act policies, and these proposals will be developed earlier in the permitting process. Caltrans will benefit because the mitigation proposals that move forward will have early Commission staff input. Such input should enable Caltrans to avoid wasted time and resources spent developing mitigation projects that are unlikely to receive Commission approval, and, by submitting more fully developed and acceptable mitigation proposals for unavoidable impacts earlier in the process, Caltrans can have a more streamlined permitting experience.

This background guidance memorandum is based on examples of Commission actions approving past compensatory mitigation projects as part of a larger development project. As with all coastal development permits (CDPs), it is important to note that Commission staff first prepares a staff report recommending approval, approval with conditions, or denial of a Caltrans project, including its mitigation proposals and requirements. However, the Commission itself must take action at a public hearing to approve or deny these recommendations. Although this memorandum provides general guidance to Caltrans staff for the development of mitigation proposals for projects, Commission staff understands that each project is distinct, and there are site-specific complexities for many projects. In certain circumstances, Commission staff is open to considering more creative or flexible solutions that still have some nexus with projected impacts; however, those proposals typically require more time and effort to detail and develop findings on the nexus with projected impacts.

¹ Please note that use of the term mitigation throughout this document refers to compensatory mitigation for natural resource impacts. Mitigation more broadly also includes avoidance and minimization measures, and could refer to mitigation for impacts to coastal zone resources including public access, agricultural land, or viewsheds.

2. Early Coordination Best Practices

The key to successful mitigation project development is early and ongoing consultation with Coastal Commission staff. A preliminary sense of the nature of transportation project impacts (e.g. habitats and special status species impacted, whether these represent wetlands or ESHA) should be developed in the earliest phases of project development, such as Project Nomination in the Transportation Planning Scoping Information Sheet (TPSIS)), and in K Phase during development of Project Initiation Documents (PIDs) and Preliminary Environmental Analysis Reports (PEARs). Caltrans staff should work with Commission staff early in the project (for example, regularly giving Commission staff the opportunity to review initial environmental characterizations and Natural Environmental Studies) to ensure the affected resources and potential impacts are properly characterized, quantified, and minimized and that sufficient avoidance measures are included in the CEQA phase of the project development (i.e. in Draft and Final Environmental Documents completed in 0 Phase for Project Approval and Environmental Document (PA&ED)). Mitigation opportunities should be sought as soon as Caltrans has identified preliminary impacts and these ideas should be shared with Coastal Commission staff even if they are just conceptual. Coordination around mitigation options to refine proposals should continue at later junctures within project delivery leading up to permit application submission (i.e. throughout 0 Phase and into 1 Phase for Plans Specifications, and Estimates (PS&E)). This early and ongoing coordination will help ensure Caltrans identifies impacts under Coastal Act definitions; pursues mitigation options that do not raise consistency issues with other Coastal Act policies (e.g., if Caltrans proposes habitat conversion in a designated agricultural area or if mitigation is proposed too distant from the site of project impacts); and develops mitigation proposals in a timely fashion. Early coordination is especially critical for any such exploration of more unique mitigation solutions, and such proposals must be fully developed by the time they are presented to the Commission to receive permit approval.

Box 1: Process Best Practices

- As soon as initial biological surveys/wetland delineation are completed and agency jurisdictions on the ground have been determined, Caltrans staff should share their preliminary environmental scoping findings with Commission staff to verify that the impacts are correctly identified and assessed. Even if only preliminary, estimates of coastal resource impacts should be presented to Commission staff in the K Phase.
- Mitigation proposals should be formulated early in the process and presented to Commission staff as soon as possible (e.g., early in the 0 Phase). These proposals may be preliminary, but should include major resource/habitat types that will benefit, identify potential sites, and basic methods.
- Even when advance mitigation options are available, early coordination will still be important to ensure that established advance mitigation is appropriate for the specific transportation projects' impacts. Caltrans staff should not assume that advance mitigation options will be sufficient unless those projects are already fully developed and approved.
- Caltrans staff should continue to work with Commission staff throughout the 0 Phase and beyond to refine and finalize mitigation proposals.

- A complete mitigation proposal should be finalized as much as possible through the environmental and design phases because a Commission CDP application cannot be marked as complete until the full impact assessment and mitigation package has been submitted (including delineation datasheets, reference sites, mitigation locations, restoration methods, etc.). Note that it is a good practice to submit all of this information as part of a pre-application consultation with Commission staff.

Early coordination is important because developing compensatory mitigation plans can also take significant time for larger projects, particularly if it is necessary to acquire land or secure conservation easements. Caltrans should aim to have fully-developed compensatory mitigation plans well before the project permit approval stage, and a fully-developed compensatory mitigation plan is necessary for a CDP application to be marked complete. Insufficient development of fully compensatory, complete mitigation proposals results in serious interruptions of the CDP process and final permit issuance, ultimately delaying Caltrans project delivery.

Finally, it is worth noting that mitigation proposals consistent with past Commission approval actions are more likely to progress readily through the permitting process. Early and substantial coordination will help ensure this project streamlining.

Box 2: Emergency Projects.

This memorandum has discussed general mitigation needs for Caltrans project delivery. However, Caltrans staff should be aware that emergency projects, sometimes including maintenance projects, may also result in impacts to coastal resources that require mitigation. This does not mean that emergency work needs to be delayed to develop mitigation proposals, as the Coastal Act provides for emergency work to proceed with written or verbal authorization from Commission staff (and in some cases only with notice). However, emergency projects require authorization through a follow-up CDP, and proposals for mitigation of coastal resource impacts must be developed and approved through that process. Caltrans staff undertaking an emergency project or maintenance effort should contact Commission staff as soon as possible to discuss anticipated impacts and potential mitigation options. Caltrans staff also should ensure adequate documentation of resources on-the-ground prior to implementation of emergency work (e.g., photos, plant counts, etc.), so that Commission staff can objectively assess the natural resource impacts resulting from the emergency project and fairly determine compensatory mitigation requirements.

3. Protection of Wetlands and Environmentally Sensitive Habitat Areas (ESHA)

The Coastal Act, Local Coastal Plans (LCPs), and Coastal Commission regulations define coastal resources and detail required protections and allowable uses affecting these resources.

These definitions, protections, and impact allowances, which provide the basis of mitigation requirements, are unique to the state’s federally certified coastal program. It is important for Caltrans staff to understand these unique definitions when assessing project impacts and planning appropriate mitigation. Please note that this memorandum focuses on wetlands and ESHA, but there may be other mitigation required under other key biological resource policies, such as Coastal Act Sections 30230 and 30231, which are separate and would not be mitigated as ESHA or wetlands, as well as other mitigation requirements under the Coastal Act for visual, public access, or other impacts.

Wetlands

The Coastal Commission follows the delineation protocol developed by the U.S. Army Corps of Engineers. However, while the Army Corps requires evidence of the presence of all three parameters, (hydrophytic vegetation, hydric soils and wetland hydrology), the Coastal Commission requires evidence of only a single parameter, ultimately indicative of hydrology, to determine that a given area is a wetland. Caltrans staff should ensure that the initial wetlands delineation for the project development maps and characterizes areas that meet the Coastal Commission one parameter definition. Additionally, it is important that properly completed wetland determination data forms² are included as supporting information for the initial wetland delineation and as part of the CDP application. For guidance on designating one-parameter wetlands, see materials from the Commission’s [2016 Wetland Workshop](#).

Box 3: Coastal Commission Definitions of One-Parameter Wetlands

Coastal Act Section 30121 defines the term “wetland” as: *[L]ands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.*

California Code of Regulations Title 14 (14 CCR) establish a “**one parameter definition**” that only requires evidence of a single parameter to determine that an area constitutes a wetland: *Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats. (14 CCR Section 13577)*

Coastal Act Section 30233 details allowable uses in wetlands, which are specifically circumscribed. Caltrans staff should include strong avoidance measures and an in-depth alternatives analysis for any such allowable impacts. Moreover, consultation with Commission

² https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/ - for wetland determinations in the Coastal Zone, either the “Arid West Supplement” or “Western Mountains Supplement”, depending on the location of the project, should be used.

staff early in the process of impact assessment is advised to see if potential wetland impacts would be approvable. For unavoidable impacts that 30233 does allow, Caltrans staff will need to consider compensatory mitigation options that meet Coastal Act or LCP requirements early in the project's development, and Caltrans can look to Commission precedent to get an idea of the type of mitigation that is likely to be sufficient. The Commission has generally only approved projects that achieve no net loss of wetlands,³ so projects should strive to replace any lost wetlands at a ratio of at least 1:1, as well as additional mitigation that is required to achieve the standard wetland mitigation ratio of 4:1 (see section 4 below for more details). Additional information to facilitate interpretation of Coastal Act wetlands definitions and policies can be found on the [Caltrans Coastal Act Policy Resource Information Website](#). Again, early coordination with Commission staff is advised in determining the extent of wetland impacts for a given project and the adequacy of wetland mitigation proposals.

Lastly, the evaluation of wetland impacts or restoration proposals may also need to consider that the exact location and extent of wetlands is often dynamic, seasonal and is expected to change in the future with sea level rise and other climate-induced changes.

Environmentally Sensitive Habitat Area

The Commission has generally required compensatory mitigation for any approvable, unavoidable impacts to designated Environmentally Sensitive Habitat Areas (“ESHA”). ESHA typically includes the associated riparian habitat of creeks/streams/rivers; rare vegetation communities; dune habitats; and habitat that supports rare species. ESHA can also include areas that are especially valuable because of their special nature or role in an ecosystem, such as a stand of non-native trees serving as a monarch overwintering site or a biogeographic boundary area that harbors unique genetic diversity. Coastal Commission designations of specific ESHA types may differ from those of other agencies. While there is no single map/description of ESHA statewide, many LCPs contain detailed policies and some mapping of ESHA for specific sections of the coast, which often identify ESHA categorically (e.g., an LCP may designate all dunes or all monarch roost sites as ESHA). However, ESHA determinations are often made in areas where they are not otherwise mapped, based on on-the-ground conditions and other information that must be made available at the time that a project is being considered.

Box 4: ESHA

Coastal Act Section 30107.5 defines “**environmentally sensitive [habitat] areas**”, frequently referred to as ESHA, by three different attributes: *[A]ny area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*

Coastal Act Section 30240 has significant limitations on any development in and adjacent to ESHA, requiring specific findings under the Coastal Act and that all such impacts must be avoided to the extent possible. Caltrans staff should reach out to Commission staff or consult

³ Coastal Commission's no net loss practice is consistent with the "No Net Loss" policy for the state of California, established through [Executive Order W-59-93](#)

municipal and county-level LCPs for the most up-to-date locational identification of ESHA and policies governing allowable uses in ESHA and appropriate resource buffering. Early consultations with the Commission staff and other agencies will facilitate assessment of the presence of habitats/ESHA, impacts to ESHA and mitigation requirements. For projects in the Commission’s jurisdiction, Commission staff will make the final recommendation as to which resources qualify as ESHA.

Rare plant and animal species and their habitats are also protected under the ESHA policies. In some cases, the Commission may require avoidance measures for species protection that are comparable to other agencies, but the Commission must also factor in more holistic ecological considerations beyond the single species. This is sometimes a different approach than other agencies take under their respective laws, leading to different requirements. These may include larger exclusion zones for marine mammals or nesting bird protection, or larger habitat buffers. Additional information to facilitate interpretation of Coastal Act ESHA definitions and policies can be found on the [Caltrans Coastal Act Policy Resource Information Website](#).

4. Typical Ratios and Habitat Creation or Restoration Requirements

Past Commission actions on compensatory mitigation projects have consistently used standard mitigation ratios (i.e., mitigation acreage: impact acreage) that Caltrans staff should include in their mitigation proposals. The Coastal Commission has also typically defined temporary and permanent impacts in ways that differ from other agencies, with resultant changes to expected mitigation ratios. Understanding these unique ratios and developing mitigation proposals that account for these ratios early in project development will facilitate project planning and permitting. A summary table of temporary and permanent impact ratios is provided below. Ultimately, ratios are developed in consultation with Commission staff for recommendation to the Commission on a case-by-case basis with consideration of the site-specific context and unique aspects of the proposed transportation project and associated mitigation; thus, ratio requirements may fluctuate depending on the project. Note also that LCPs may have specific compensatory mitigation ratio requirements.

Temporary Impacts

The Coastal Commission has generally considered temporary impacts to be only those where 1) there is no significant ground disturbance (i.e., earthwork including grading); and 2) vegetation recovers to comparable size/age class within 12 months from the *initial* disturbance, so that functional recovery is also restored. In recent Commission actions, “initial” refers to the beginning of impacts from the onset of construction or other project activities. Temporary impacts are also typically considered those that are brief and small, on the order of a few weeks and over an area less than 0.25 ac. For impacts that are truly temporary, mitigation at a 1:1 ratio at the location of the impact is expected.

Some recent projects have taken a more flexible approach to characterizing impacts and allowed for “long-term temporary impacts.”⁴ Long-term temporary impacts have been defined as those

⁴ See, e.g., [CDP 3-19-1199, Toro Creek Bridge Replacement, May 2020](#); [CDP 2-20-0282, Gleason Roadway Realignment, November 2020](#); [CC-0001-17](#) and [CC-0001-18](#), San Diego rail improvements.

that may be intermittent or sustained for up to a 24-month period such that vegetation recovery may require more than 12 months from the *initial* point of disturbance. However, vegetation recovery should be no more than 12 months from the *conclusion* of disturbance. Under this definition, a long-term temporary impact could allow for as much as 36 months from the initial impact to full recovery.⁵ These long-term temporary impacts require a higher mitigation ratio than truly temporary impacts (e.g., 1.5:1) in order to account for the temporal loss of the resource, though, note that these are lower than ratios for permanent impacts. All other impacts are considered permanent, as discussed below, and these impacts require higher mitigation ratios to be considered fully compensatory.

In either case, Caltrans staff should understand that some typical restoration measures, such as post-project hydroseeding of disturbed areas, may not fully restore the site within 12 months, and would therefore not be considered a temporary impact. However, additional, more active measures, such as planting container plants, may increase the likelihood that both structural and functional recovery will happen in the necessary timeframe. Caltrans staff should consult with Commission staff at the earliest possibly juncture in project development to determine which project impacts will be considered temporary or permanent.

Box 5: Typical Past Coastal Commission Temporary and Permanent Impacts Ratios*		
Impact Type	Description	Standard Mitigation Ratio
Temporary	1) No significant ground disturbance or killing of native vegetation 2) Vegetation and habitat function recovers to comparable age/size class within 12 months of initial disturbance	1:1
Long-Term Temporary	Impact occurs over no more than 24 months and vegetation recovers to comparable age/size class no more than 12 months following the <i>conclusion</i> of disturbance	1.5:1
Permanent	All other impacts not covered above	4:1 for wetlands; 3:1 for ESHA

*The standard ratios included here assume habitat creation or substantial restoration, and that the project is on-site within the coastal zone and in-kind. Higher ratios will be determined on a case-by-case basis for the use of enhancement or preservation in lieu of creation, and based on other circumstances, as described in the text above and in Attachment B. Additionally, lower ratios may be appropriate in some specific circumstances.

Permanent Impacts

The Coastal Commission has generally accepted that permanent impacts to wetlands are mitigated at a 4:1 ratio, and permanent impacts to ESHA are mitigated at a 3:1 ratio. These

⁵ [Garske-Garcia, L. Impact Definitions and Mitigation Framework for Gleason’s Beach Highway 1 Realignment, October 8, 2020.](#) (Exhibit 24 of permit 2-20-0282)

“standard” mitigation ratios account for: 1) the temporal loss of resources between the start of mitigation activities and the time when habitat structure and function are achieved, and 2) the fact that mitigation efforts are often partially or completely unsuccessful. Caltrans staff should also consult the relevant standard of review (e.g., applicable LCPs) to determine required ratios for any other specific habitat types. Note that these ratios assume full habitat creation or substantial habitat restoration⁶, with long-term monitoring plans (typically at least 5 years)⁷ and strong, definitive success criteria that are statistically assessed. These ratios also assume “in-kind” restoration that matches the resource impacted. For more on these restoration requirements see **Attachment A**, *Suggestions for the Development of Mitigation and Monitoring Plans for the California Coastal Commission* (Dixon & Engel, 2012). Mitigation for impacts to more specific individual rare plants, such as trees, shrubs or bushes, also typically have relied on higher mitigation ratios. The number of plants required, and the size of the planting area also has varied based on the relative rarity of the plant species or any species that depend on it, their time to maturity, and the ease of successful establishment. Finally, note that buffer zones are typically required around mitigation project restoration areas.

Permanent project impacts should also be compensated through mitigation in an appropriate location. The Commission has most frequently approved mitigation projects that are proposed near the site of the impact. If on-site mitigation is not available, mitigation should optimally occur within the same watershed and in the Coastal Zone. In some rare cases, mitigation outside the Coastal Zone may be acceptable, but only if the site of mitigation has direct influence on coastal habitat and usually only if the location is a small distance inland from the Coastal Zone boundary. At times, given site-specific limitations, Commission staff have recommended and the Commission has approved more creative alternatives to complete habitat creation that is on-site and in-kind.

On a case-by-case basis, proximal off-site/out-of-kind habitat work has been approved, and habitat creation/substantial restoration has been supplemented with enhancement⁸ and preservation. Because the Coastal Commission considers habitat enhancement or preservation to be less valuable than habitat creation and substantial restoration, these activities require higher mitigation ratios. The typical mitigation ratios of 3:1 and 4:1 for permanent impacts already account for anticipated challenges with fully compensating for resources using substantial habitat restoration. To further compensate for the level of ecological functions, values, and services lost when using a less direct mitigation approach, recent Commission practice has been to accept greater mitigation ratios developed on a case-by-case basis, often double for any habitat enhancement that is included as part of the mitigation proposal, and triple typical mitigation ratios for any habitat preservation included as part of the compensatory mitigation proposal. Two examples of the Commission approving increased ratios for enhancement or preservation are

⁶ As detailed in a memo by L. Garske-Garcia on Gleason Beach, “*Substantial restoration focuses on areas where habitat exists in a degraded state..... Restoration at this level **generally involves alleviating the system from any such stressors and actively facilitating the return of a full suite of self-sustaining ecological functions.***”

⁷ Note that some projects, such as projects in which complete invasive species eradication is the goal, may require success criteria be maintained in perpetuity, although generally long-term monitoring requirements may be less frequent and intensive once initial success criteria are met.

⁸ As described in L. Garske-Garcia memo on Gleason Beach: “*Enhancement involves improvement of some **limited ecological functions rather than recovery of a full suite...***”

CDP 2-20-0282 and CD-0001-21 (Special Condition 1a). The approach used in the first of these (CDP 2-20-0282) is detailed in **Attachment B, Impact Definitions and Mitigation Framework for Gleason’s Beach Highway 1 Realignment** (as adapted from Garske-Garcia, October 2020).

While these ratio multipliers reflect general Commission practice, higher ratios are developed when situations warrant in consultation with Commission staff to recommend to the Commission for approval under the Coastal Act on a case-by-case basis and with consideration of the site-specific context and unique aspects of a proposed transportation project and associated mitigation. In some cases, Commission staff can also consider the environmental benefits of certain Caltrans projects that contain habitat improvement measures (e.g., fish passage improvements; climate adaptation features such as managed retreat) when assessing the overall mitigation package and determining appropriate compensatory ratios/requirements in making a staff recommendation to the Commission.

The Commission has occasionally demonstrated some flexibility in what constitutes “substantial restoration,” or in weighing the ecological benefit of proposed mitigation activities. For instance, in the 2019 CDP for the Highway 101 Eureka-Arcata Corridor project,⁹ the Commission approved mitigation for wetland impacts through removal of the invasive plant species, *Spartina sp.*, in Humboldt Bay. This unique approach was based on the Commission staff finding that the removal of considerable quantities of *Spartina* amounted to “substantial habitat restoration” given the significant ecological benefits from the completed eradication in perpetuity of *Spartina* in discrete portions of the bay. This project is also an example of out-of-kind mitigation, as benefits to saltmarsh through the removal of invasive *Spartina* were partially used to mitigate for impacts to palustrine/non-tidal wetlands.

5. Advance Mitigation

Recently, Caltrans has been developing an Advance Mitigation Program and at times the Commission has accepted advance mitigation through mitigation banks for projects. This memo does not discuss this approach in detail, but recognizes that these efforts may provide other mitigation opportunities to be considered in project development. As discussed above, mitigation ratios above 1:1 are typically necessary to reflect that compensatory mitigation projects are often not fully successful and to account for temporal loss of the resource. However, in the case of advance mitigation projects, in which mitigation is initiated or demonstrably performing before impacts occur, Commission staff may recommend reduced ratios to reflect the existing, quantifiable success of a habitat creation or restoration project.

However, before relying on an advance mitigation proposal, Caltrans should ensure that the proposal is fully developed and approved so that it can be sufficiently considered as acceptable mitigation. Additionally, as noted above, the Commission has typically relied on onsite mitigation, and for this reason, Commission staff encourages Caltrans to consider advance mitigation for coastal habitats in conjunction with any feasible onsite mitigation whenever possible. Once again, early coordination with Commission staff will best ensure proposed advance mitigation projects are most likely to be accepted by the Commission.

⁹ See CDP 1-18-078, Exhibit 39: <https://documents.coastal.ca.gov/reports/2019/8/W11a/W11a-8-2018-exhibits.pdf>

6. Conclusion

In conclusion, this memorandum has summarized typical compensatory mitigation practices that the Commission has approved in the past. Caltrans staff should endeavor to develop compensatory mitigation project proposals that reflect these historical approaches as they offer the best measures for ensuring timely CDP approvals for Caltrans projects.

When Caltrans can demonstrate that in-kind, on-site or near on-site, mitigation is infeasible at the typically accepted ratios, Commission staff can work with Caltrans on more creative approaches, however this requires substantial early coordination and early work to identify impacts and potential mitigation solutions. In this regard, both Caltrans and Commission staff have increasingly recognized the value of transportation projects that more comprehensively address existing environmental harms and coastal resource impacts and that some of the greatest ecological benefits can be achieved through comprehensive project design that incorporates environmental benefits, such as increasing habitat connectivity or reducing coastal squeeze through managed retreat, into the transportation project design. Commission staff encourages Caltrans to consider these approaches when designing transportation projects, and Commission staff are open to considering these benefits as potential associated mitigation when appropriate for recommendation to the Commission. The Coastal Commission is ultimately looking for compensatory mitigation packages that will be the most ecologically meaningful from a coastal resource perspective, so when regular mitigation options are infeasible, staff is open to considering creative ideas for on-site or off-site mitigation, when related to the project's impacts, offering substantial ecological restoration, and accompanied by rigorous long-term success criteria and plans for success.

Attachment A:

Suggestions for the Development of Mitigation and Monitoring Plans for the California Coastal Commission

(John Dixon and Jonna Engel 05-01-12)

If a proposed project includes mitigation in the form of habitat protection, enhancement, restoration, or management, it is very important that a complete and detailed Mitigation and Monitoring Plan prepared by a qualified restoration ecologist, be part of the application for a Coastal Development Permit or Federal Consistency Determination. For convenience, such plans are generically referred to as Resource Management Plans (RMP) herein. Such applications often include a draft plan that is largely conceptual and lacking in detail. Incomplete plans cannot be evaluated and result in requests for additional information followed by technical responses. There commonly are multiple cycles of request and response before the plan is finalized. At worst, plans are still incomplete at the time of the Commission action, and the issuance of the approved Coastal Development Permit is conditional on the submission of a final plan. This may result in project delays. In order to avoid this situation, the Commission's Technical Services and Legal Divisions both strongly recommend that applications for Coastal Development Permits for projects that require habitat restoration never be deemed complete by permit analysts until the applications are accompanied by a RMP that is technically sound and substantially complete. Nearly all management plans, especially those that include a significant restoration component will require preliminary field sampling and the results of this sampling should be included in the final plan.

The Resource Management Plan should be a stand-alone document. Marginal notes on large format engineering or landscaping plans do not constitute such a plan, nor do tables and bulleted lists. References to information in other planning documents or to literature on field or statistical methods cannot be substituted for the information itself. Reference to "standard methods" or "best management practices" cannot be substituted for a description of the actual methods and practices to be employed. The RMP should enable a technical specialist, who has not been involved in the project, to carry out the plan. It should also be written in such a way that an educated layman could understand and evaluate the plan.

All plans must include a cover page, date of preparation, list of preparers and/or acknowledgements; a purpose statement; goals and objectives; a description of the property setting; a resource inventory summary with maps; open space resource protection provisions; and a plan for implementation, measurable short and long term success criteria; monitoring provisions; adaptation over time; etc. The plan must also include substantive information and implementation measures necessary to restore, protect, enhance, and manage the biological resources/open space area as required by the CDP. An approvable plan needs to clearly account for all such provisions.

Implementation of RMPs must be overseen by a qualified individual (project ecologist) who will be personally responsible for all phases of the plan. Different phases of the plan should not be assigned to different contractors without onsite supervision by the

project manager. The project ecologist should be a qualified restoration biologist, not a project manager with no technical background. If a consulting firm is responsible for the restoration or habitat management, a qualified individual must be named as project ecologist and any changes must be approved by the Executive Director.

An approvable Resource Management Plan will include the following elements:

- Introduction. Including purpose of RMP, overview of the proposed project associated with RMP, and figures and exhibits including location map, proposed project site plan, map of existing biological resources, and map comparing existing vs. future site conditions.
- Goals of the Biological Resource Protection, Enhancement, Restoration, or Management. A clear statement of the goals of the RMP, including the desired habitat types, major vegetation components, hydrological regime for wetlands, and wildlife support functions. There should be a clear narrative description of the characteristics of the habitat type that the protection, enhancement, or restoration is intended to provide.
- Characterization of the Desired Habitat. Although the characteristics of the model habitat may be based on descriptions in the literature, the best approach is to identify an actual habitat that can act both as a model for the required enhancement, restoration, or management and as a reference site for developing success criteria. Reference habitats should be sampled using the methods that will be applied to the management site. The resultant data should be included in the RMP.
- Description of Existing Habitats. The RMP should include quantitative descriptions of existing biological resource conditions. If the project site includes wetlands, there should be a wetland delineation of the proposed site. This information is necessary in order to determine appropriate management and to assess whether the site is suitable for any proposed enhancement or restoration.
- Grading Plan. If there is a restoration component to the plan that requires topographic alterations, a formal grading plan should be included.
- Erosion Control. Methods to control erosion and maintain water quality should be included if soil or other substrate will be significantly disturbed for any reason.
- Weed Eradication Plan. One of the greatest threats to the success of enhancement and restoration projects and for management of natural habitats is invasion by exotic species. If the management site is currently seriously degraded by weeds, weed eradication should be part of the plan and precede any further enhancement or restoration. If the area is dominated by annual grasses and forbs, a “grow and kill” approach using spot application of herbicides might be necessary for several years in order to reduce the exotic seed bank in preparation for any planned restoration activities. After enhancement or restoration takes place, weeding should be very frequent (usually monthly and then quarterly) and intense (zero tolerance) until the native vegetation is

sufficiently well-established to resist continued colonization by exotics. Weeding should generally be done by hand and must be supervised by the project ecologist to insure that native plants are not disturbed.

- Planting Plan. The RMP should identify the natural habitat types that are the model for management and any planned enhancement or restoration, and describe the desired relative abundance of particular species in each habitat type that is to be enhanced or restored. Based on these goals, the RMP should identify the species that are to be planted (plant “palette”), and provide a rationale for and describe the size and number of container plants and the rate and method of seed application. Plant propagules should come from local native stock. If plants, cuttings, or seed are obtained from a nursery, the nursery must certify that they are of local origin and are not cultivars and the planting plan should provide specifications for preparation of nursery stock (e.g., container size & shape to develop proper root form, hardening techniques, watering regime, etc.) Technical details of planting methods (e.g., spacing, micorrhyzal inoculation, etc.) should also be included.
- Irrigation Plan. If supplemental watering is planned, the method and timing of watering should be described. All irrigation infrastructure must be removed by the end of the monitoring period.
- Monitoring. There are two basic purposes for a monitoring program. The first is to provide data that will guide the enhancement or restoration and enable an adaptive management plan that will increase the likelihood that those activities will be successful. The second is to provide the data that will allow regulatory agencies to determine if there has been compliance with the terms and conditions of the permit. The permit applicant is responsible for the success of the restoration components of the plan, so the requirements for interim monitoring are generally less stringent than the requirements for final monitoring to assess “success.”
- Interim Monitoring Plan. An interim monitoring plan should include maintenance and remediation activities, interim performance goals, assessment methods, and schedule. In general, monitoring should be monthly until plants are established and quarterly thereafter. Weeding should be frequent, with a “zero tolerance” policy throughout the monitoring period. Photographs should be taken from fixed points on fixed azimuths during each monitoring period. Quantitative monitoring should take place once a year.
- Final Monitoring Plan. Final monitoring is intended to determine whether management and any required enhancement or restoration has been successful. In order to help insure that the habitats are self-sustaining, final monitoring for success should take place after at least 3 years with no remediation or maintenance activities other than weeding. The RMP should include a statement to that effect. The final monitoring plan will include specific ecological performance or “success” criteria that relate logically to the goals of the required management, enhancement or restoration.. Generally, these criteria will include standards for species diversity of both perennial and annual plants, vegetative

cover, and approximate dispersion patterns of major species. Success criteria should insure that the major structure-producing species that characterize the habitats are present and that there is an appropriate diversity of species in the vegetation layers of each habitat type. In some cases, habitat elements necessary for particular wildlife species may be specified. Wetlands should have hydrological criteria.

- Basis for Selection of Performance Criteria. The basis for the selection of each performance criterion should be explained. Commonly, performance criteria take the form of, for example, “85% vegetative cover at the end of 5 years” without explanation. For some habitat types, this is too high, and for others it is too low. There must be some empirical basis for the selection of each performance criterion.
- Types of Performance Criteria. Where there is sufficient information to provide a strong scientific rationale, the performance criteria may be absolute or fixed (e.g., a specified percentage ground cover or relative diversity of species, or a specified average height for a species). Alternatively, relative performance criteria may be specified. Relative criteria are those that require a comparison of the managed, enhanced or restored site with appropriate reference sites. In the case of relative performance criteria, the rationale for the selection of reference sites should be described. These sites must be selected and identified in the RMP. In addition, a preliminary field sample should be taken and the results included in the plan. Large projects with a significant enhancement or restoration component should always incorporate the use of reference sites.
- Procedure for Judging Success. Regardless of whether performance criteria are absolute or relative, the comparison procedure, and the basis for judging differences to be significant should be specified. In other words, how does one know if the success criteria are achieved? Small projects could potentially be evaluated using a census based on direct examination or on analysis of an aerial photograph. The evaluation of larger projects will require inferences based on sampling. If the comparison requires a statistical test (e.g., a one-sample or two-sample t-test), the test should be described, including the desired magnitude of difference to be detected, the desired statistical power of the test, and the alpha level at which the test will be conducted.
- Formal Sampling Design. The design of the field sampling program should relate logically to the performance criteria and chosen methods of comparison. The sampling design and the sampling methods should be described in sufficient detail to enable an independent scientist to duplicate it. If the sampling methods have not been proven in the field, they must be tested and the results demonstrating their feasibility included in the plan. Developing field methods should precede the preparation of a RMP. The development of field methods should not be part of the RMP. Monitoring plans based on untested field methods are not acceptable.
- Sample Size. The estimated sample size for final performance monitoring should be based on a statistical power analysis conducted using data from the

preliminary sampling. The results of the preliminary sample and the power analysis should be included in the plan. Generally, there should be sufficient replication to provide 90% power at an alpha of 0.10 to detect a difference that is biologically significant.

- Final Report. A final monitoring report should be submitted for the review and approval of the Executive Director of the Coastal Commission at the end of the monitoring period. The final report should be prepared by a qualified ecologist. The report must evaluate whether the required management, enhancement or restoration has achieved the goals and success criteria set forth in the approved RMP.
- Provision for Possible Further Action. If the final monitoring report indicates that the project has been unsuccessful, in part or in whole, based on the approved success criteria, the applicant shall submit within 90 days a revised or supplemental plan to compensate for those portions of the original plan which did not meet the approved success criteria. The revised plan shall be processed as an amendment to the coastal development permit unless the Executive Director determines that no permit amendment is required.

Attachment B:

Impact Definitions and Mitigation Framework for Gleason's Beach Highway 1 Realignment, excerpt adapted from Lauren Garske-Garcia, October 8, 2020 (Exhibit 24 of 2-20-0282)

Different mitigation strategies (i.e. habitat creation, substantial restoration, enhancement, or preservation) vary in their degrees of ecological uplift and benefits to the landscape and thus, should not be considered equivalent. While the Commission has generally used mitigation ratios of 3:1 (acres where mitigation occurs: acres impacted) for permanent ESHA impacts and 4:1 for permanent wetland impacts, these ratios assume that resources are being compensated for through either habitat creation or substantial restoration. **With wetlands, there is an added expectation of no net loss of acreage¹**, and the underlying principle remains good practice for all habitat types. These ratios are intended to account for the spatial losses of habitat due to development, temporal losses of ecological function due to lags in mitigation implementation and final achievement of success criteria, assumptions made through reliance on limited post-implementation monitoring, the potential for failure of some parts of the mitigation, and the improbability of truly or fully replacing ecosystem functions, values, and services at a rate of 100% per acre mitigated. In other words, the ratios include an acceptance of uncertainty that is balanced by the robust spatial replacement of key ecological components.

While these typical ratios and strategies are aimed at ensuring full suites of ecological functions are replaced, there are situations where less involved approaches to mitigation may be acceptable; however, to compensate adequately for the level of ecological functions, values, and services lost, ratios should be increased. **Accordingly, recent Commission practice has been to double mitigation ratios when enhancement is used and triple ratios when preservation is used.** In addition, mitigation packages should never rely on preservation strategies alone.

It is feasible that multiple mitigation strategies may be used within a single package. **Using the ratios above, staff has recommended a framework that allows for the flexibility of employing multiple mitigation strategies and establishes a mathematical discount approach² to ensure that the impacted habitats are fairly compensated for.** In addition to doubling or tripling ratios for enhancement and preservation fractions, respectively, it is recommended that any necessary **out-of-kind enhancement is carried out at triple the typical ratios.** This framework then reflects the differences in ecological benefits provided by various mitigation strategies while ensuring robust compensation for the realignment Project's impacts.

Example

To illustrate how the compensatory mitigation framework would be applied, the following example uses wetlands and the typical 4:1 mitigation ratio. In each of the five scenarios (A-E), the impact area is 3 acres and there is a minimum 1:1 requirement for

¹ State of California Executive Order W-59-93

² The discount approach begins with the typical mitigation ratio that would be expected by the Commission, 3:1 for ESHA or 4:1 for wetlands, and subtracts the fraction that is completed via primary mitigation strategies (i.e. creation or substantial restoration). The remainder is the discounted ratio, which is then either doubled or tripled per the secondary strategy employed (i.e. enhancement or preservation), and then applied to the impact acreage to determine the remaining acreage required via the secondary strategy.

habitat creation in order to ensure there is no net loss of wetlands; however, the remaining 3:1 of the requirement could be met in various ways.

Scenario	Requirement	Impact (ac)	Ratios Applied	Mitigation Approach	Mitigation (ac)
A	4:1	3	1:1	creation	3
			3:1	creation or substantial restoration	9
B	4:1	3	1:1	creation	3
			6:1	enhancement	18
C	4:1	3	1:1	creation	3
			9:1	preservation	27
D	4:1	3	1.5:1	creation*	4.5
			5:1	enhancement	15
E	4:1	3	1.5:1	creation*	4.5
			7.5:1	preservation	22.5

* including up to 0.5 ac as substantial restoration

- **Scenario A** represents the Commission’s typical expectation that wetlands will be mitigated at 4:1 via creation and substantial restoration, so 3 acres of impacts requires 12 acres of mitigation with at least three of those being newly created.
- **Scenario B** fulfills the required 1:1 minimum of creation but the remaining 3:1 is achieved through on-site enhancement at double the discounted ratio (4:1 – 1:1 = 3:1, 3:1 x 2 = 6:1, 3 ac x 6:1 = 18 ac); 3 acres of impacts requires 3 acres creation and 18 acres of enhancement.
- **Scenario C** also fulfills the required 1:1 minimum of creation but instead addresses the remaining 3:1 is through preservation at triple the discounted ratio (4:1 – 1:1 = 3:1, 3:1 x 3 = 9:1, 3 ac x 9:1 = 27 ac), so 3 acres of impacts requires 3 acres creation and 27 acres of preservation.
- **Scenario D** represents having achieved more than the minimum creation needed to ensure no net loss of wetlands at 1.5:1, leaving a discounted ratio of 2.5:1 (4:1 – 1.5:1 = 2.5:1), which would be doubled for on-site enhancement (2.5:1 x 2 = 5:1, 3 ac x 5:1 = 15 ac) and result in 3 acres creation with 15 acres of enhancement.
- **Scenario E** alternatively addresses the remainder via preservation at triple the rate (4:1 – 1.5:1 = 2.5:1, 2.5:1 x 3 = 7.5:1, 7.5:1 x 3 ac = 22.5 ac), resulting in 3 acres creation and 22.5 acres of preservation.