Appendix A

Quino Checkerspot Butterfly Conservation Strategy for Otay Ranch Village 14 and Planning Areas 16/19

QUINO CHECKERSPOT BUTTERFLY CONSERVATION STRATEGY FOR OTAY RANCH VILLAGE 14 AND PLANNING AREAS 16/19

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(March 3, 2020)

The following Conservation Strategy for the Quino checkerspot butterfly (QCB) addresses potential impacts to QCB and its potential habitat to the extent such impacts may result from development of Otay Ranch Village 14 and Planning Areas 16/19, located in the unincorporated area of San Diego County.

ASSUMPTIONS

1. On June 26, 2019, the project applicant (GDCI Proctor Valley LP or "Applicant") secured County approval for the Otay Ranch Village 14 and Planning Area 16/19 Project (the "Approved Project"), which contemplates development on 809.1 acres, including 794.7 acres of potential[1] QCB habitat. This same 809.1-acre Development Footprint includes 502.4 acres of federally designated critical habitat for the species. Through a combination of conveyance of land to the Otay Ranch RMP Preserve ("Preserve") and biological conservation easements, the Approved Project would preserve approximately 827.3 acres of QCB potential habitat.
2. The Approved Project Development Footprint includes areas within Village 14 known as PV1 and PV3, which, are considered by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) (collectively termed Wildlife Agencies) to be biologically important to the QCB[2].
3. The Applicant and the County have agreed to process a revised project design through a process described in the Dispute Resolution Agreement (DRA), dated June 26, 2019, and is referred to herein as the "Proposed Project Amendment". The DRA was negotiated, prepared and executed jointly by the Applicant, the Wildlife Agencies, and the County.
4. The Proposed Project Amendment is contingent on successful completion of three processes: (1) County approval of a revised Tentative Map; (2) County approval, and

[1] The term "Potential Habitat" means all areas meeting the definition of habitat areas requiring surveys under the 2016 survey protocol developed in coordination with the USFWS, County of San Diego and Building Industry Association. This 794.7 acres includes 5.3 acres of impacts within the City of Chula Vista.
[2] See comment letter from CDFW, dated April 16, 2018, describing importance of PV1 and PV3 to QCB migration and conservation.

CDFW and USFWS concurrence, of a County-initiated amendment to the County's MSCP Subarea Plan; and (3) approval by the California Wildlife Conservation Board (WCB), and USFWS consent to, the land exchange proposed in the DRA, through which the Applicant and the CDFW would exchange property and thereby allow for a more consolidated and biologically sensitive development.

5. Under the DRA, the Applicant retains the right to terminate any of the three processes described above and pursue the Approved Project.

6. The Proposed Project Amendment contemplates development on 578.6 acres, including 527.1 acres[3] of potential QCB habitat and 500.2 acres of QCB critical habitat. Through a combination of conservation mechanisms, the Proposed Project Amendment would permanently preserve 765.8 acres[4] of QCB potential habitat. The Proposed Project Amendment's contribution for the purpose of the USFWS QCB analysis[5] is the permanent preservation of approximately 613.7 acres of potential QCB habitat.

7. Some of the lands exchanged under the DRA provide (or may provide in the future) potential habitat for QCB. As such, those lands are subject to this QCB Conservation Strategy and are acknowledged in the 765.8 acre calculation, and will be considered in the Proposed Project Amendment's overall mitigation and land conservation obligations for purposes of QCB take authorization. In other words, all 765.8 acres are available for QCB restoration activities per this QCB Strategy.

8. No protocol-level surveys for QCB individuals are required under the QCB Management Plan or by this Conservation Strategy. Enough survey data exist to conclude that QCB individuals have used the Proposed Project Amendment project area in the past and may use it in the future, especially if the quality and functionality of the potential QCB habitat is protected, enhanced, and managed. Surveys are expensive and are not necessary to inform the management decisions associated with this Conservation Strategy. However, QCB monitoring is included as part of the Framework Management Strategy and will be conducted as part of the adaptive management component of the program. Additionally, surveys will be conducted every 5 years under the long-term management provided by the Otay Ranch Preserve Owner/Manager (POM). QCB sightings will be documented and shared with the POM, County, and Wildlife Agencies.

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[3] Impacts to potential habitat for Quino checkerspot butterfly include impacts to City of San Diego Cornerstone Lands, but exclude 5.3 acres of impacts associated with the improvement of Proctor Valley Road within the City of Chula Vista, as those impacts were already addressed in the City of Chula Vista's MSCP Subarea Plan as part of the Rolling Hills Ranch project. The amount of critical habitat reported does not include areas of habitat deemed unsuitable for QCB (i.e., no physical or biological features for the species), and thus not included as a part of protocol surveys.

[4] This 765.8 acres includes Otay Ranch RMP Preserve owned by the Applicant, Conserved Open Space, the R-14 Conservation Easement, as well as the excess transferred to CDFW via the land exchange. This 765.8 acres is not to be confused with the 1.188:1 RMP Conveyance Requirement, which is estimated at 556.6 acres.

[5] The USFWS calculates the conservation-to-impact ratio based on how much potential QCB habitat would be conserved *after* the land exchange proposed in the DRA occurs. Based on this approach, the Proposed Project Amendment, following the land exchange, would conserve 613.7 acres of potential QCB habitat, resulting in a conservation-to-impact ratio of **1.16 to 1**.

CURRENT QCB APPLICABLE MITIGATION MEASURES

In conjunction with the Approved Project, the County certified a Final Environmental Impact Report and adopted the following seven mitigation measures to reduce potential impacts to QCB. Each of these mitigation measures would apply equally to the Proposed Project Amendment if it were approved pursuant to the processes outlined in the DRA. The following is a summary of each of the seven mitigation measures described above for the Final Environmental Impact Report for the Approved Project (the full text of the mitigation measures is provided in the Final Environmental Impact Report). These same mitigation measures would also be applicable to the Proposed Project Amendment:

1. M-BI-1: Impacts will be minimized during construction through implementation of Best Management Practices (BMPs).
2. M-BI-3: The applicant shall convey land within the Otay Ranch RMP Preserve to the Otay Ranch Preserve Owner/Manager (POM) or its designee at 1.188 acres for each "developable acre" impacted, as defined by the Otay Ranch RMP. (Estimated at 556.6 acres for the Proposed Project Amendment[6]).
3. M-BI-4: The applicant shall record a biological open space easement for areas of Conserved Open Space, which allows for selective fire clearing by hand, and shall prepare a Resource Management Plan for those areas.
4. M-BI-5: The applicant shall install permanent fencing and signage between housing and open space.
5. M-BI-8: The applicant shall consult with the USFWS to determine if take authorization is required for impacts to potential QCB habitat.
6. M-BI-9: The applicant shall provide mitigation acreage at a ratio in excess of 1:1 (preservation of 1 acre for every 1 acres of impact) and shall adequately mitigate impacts to potential QCB habitat.
7. M-BI-10: The applicant shall prepare and implement a long-term QCB Management/Enhancement Plan that includes perpetual monitoring and management of habitat areas of potential QCB habitat, including habitat that could be restored or enhanced to provide support for the species.

[6] Represents the conveyance requirement of the Proposed Project Amendment pursuant to the Otay Ranch RMP conveyance formula and illustrates one of the mechanisms that provides for potential QCB habitat conservation. As noted above, the total potential QCB habitat conservation is 765.8 acres.

RECOMMENDED CONSERVATION STRATEGY

As indicated above, the Applicant has secured land use approvals from the County to pursue the Approved Project, and these approvals remain in place. Nevertheless, through the DRA, the Applicant has elected to prepare and pursue a revised project – the Proposed Project Amendment – as a means of addressing Wildlife Agency requests to improve preserve design and develop a Conservation Strategy that would enhance the recovery potential of QCB. Section 3.1.9 of the DRA recognizes that the Proposed Project Amendment, and in particular the designation of PV1, PV3, and Planning Area 16 as hardline preserve through a County-initiated amendment to its MSCP Subarea Plan, "contributes to the conservation of the QCB and its habitat." The next step is to develop an effective Conservation Strategy that incorporates the DRA's effort to reduce impacts on QCB potential habitat, improve preserve design, and improve recovery potential for QCB.

This Conservation Strategy consists of the following four imperatives: (1) reduce the amount of potential QCB habitat proposed for development; (2) maintain and enhance potential QCB habitat connectivity, thereby protecting QCB movement and "live in" habitat within and throughout Otay Ranch; (3) create "functional uplift" within conserved potential QCB habitat; and (4) commit to assessment, adaptation, and management of QCB habitat within the project area to ensure perpetual conservation of QCB, leading to improved recovery status. Each of these four tasks is explained in more detail below. Note that although the four imperatives listed above and discussed below were developed for application to the Proposed Project Amendment, these same imperatives, and the strategies for satisfying them, could be applied to the Approved Project as well, in the event the Proposed Project Amendment is ultimately not adopted.

1. Reduce Development within Potential QCB Habitat

The Approved Project would disturb approximately 789.4 acres[7] of potential QCB habitat. By contrast, the Proposed Project Amendment, if approved, would disturb 527.1 acres of potential QCB habitat, reflecting a 262.3-acre reduction in potential QCB habitat impacts (Table 1).

In addition, the Proposed Project Amendment, as compared to the Approved Project, would improve the conservation-to-impact ratio for suitable QCB habitat. Specifically, the Approved Project would conserve 827.3 acres of potential QCB habitat while disturbing 789.4 acres, resulting in a conservation-to-impact ratio of **1.05 to 1**. By contrast, the Proposed Project Amendment would conserve 765.8 acres of potential QCB habitat, while disturbing 527.1 acres,

[7] The Final EIR for the Approved Project states that development would impact a total of 794.7 acres of potential QCB habitat. This acreage includes the 5.3 acres of development associated with the improvement of Proctor Valley Road within the City of Chula Vista. Since QCB is a covered species within the Chula Vista Subarea Plan, this Conservation Strategy is basing the impact comparison on 789.4 acres (794.7 acres minus 5.3 acres). Potential habitat is defined as the areas of the project that meet the criteria specified by USFWS's survey protocol for protocol-level surveys for QCB.

resulting in a conservation-to-impact ratio of **1.45 to 1**. This level of preservation results in a conservation-to-impact ratio comfortably beyond the 1:1 ratio required by the County under M-BI-9. Note, however, that USFWS calculates the conservation-to-impact ratio slightly differently. Specifically, USFWS calculates the ratio based on how much potential QCB habitat would be conserved ***after*** the land exchange proposed in the DRA occurs. Based on this approach, the Proposed Project Amendment, following the land exchange, would conserve 613.7 acres of potential QCB habitat, resulting in a conservation-to-impact ratio of **1.16 to 1**. Table 2 provides a summary of the QCB habitat conservation acreage for the Proposed Project Amendment.

Table 1. Comparison of Approved Project and Proposed Project Amendment for Potential QCB Habitat Impacts and Conservation

Project Area	**Approved Project**		**Proposed Project Amendment**	
	Impacts (ac)*	Conservation (ac)	Impacts (ac)*	Conservation (ac)
Village 14	402.6		454.7	
PA 16/19	272.3		17.5	
Offsites	80.1		34.8	
LDA Impacted	12.6		-	
MSCP Preserve	21.8		20.1	
On-site Conveyance		404.8		397.7**
Conserved Open Space		72.4		24.5
Biological Open Space Easement		-		191.5
Off-site Conveyance		350.1		-
Subtotal	789.4	827.3	527.1	613.7
Land Exchange Net Conservation	NA	NA	NA	152.1***
TOTAL	**789.4**	**827.3**	**527.1**	**765.8**

*The 5.3 acres that occurs in the City of Chula Vista has been excluded from the potential QCB habitat for the Approved Project (see footnote 7 above) and has been excluded from the Proposed Project Amendment.
**This acreage excludes the portion of the Preserve that is isolated by a connector road, as shown in Figure 1 of the QCB Framework Management Plan (see Appendix A).
***The 152.1 acres of net conservation refers to the difference of potential QCB habitat owned by the Applicant within PV1, PV3, R-15, and R-16 (336.5 acres) that would be exchanged to the state and the potential QCB habitat owned by the state within Parcels A, B, C, and E (184.4 acres) that would be exchanged to the Applicant.

Thus, the Proposed Project Amendment satisfies the first imperative of this Conservation Strategy, in that it reduces the amount of potential QCB habitat that would be developed. Note also that by consolidating the development footprint in Village 14, the Proposed Project Amendment would eliminate 13.1 miles of "edge" at the development/preserve interface compared to the Approved Project.

At the request of the Wildlife Agencies, the Applicant re-evaluated the alignment of a project road (identified as Street I on the Revised TM) that is intended to provide a water transmission line and access to a water reservoir located within the RMP Preserve[8]. The current alignment of the access road, as contemplated in the Proposed Project Amendment, would result in approximately 12.6 acres of impacts (temporary and permanent) to potential QCB habitat. In an effort to reduce these impacts, the project applicant developed an optional road alignment that would locate the road directly adjacent to the Development Footprint, removing most of the road from the Preserve. The applicant, in consultation with the project engineers, has determined that this optional road alignment is feasible and would reduce impacts to potential QCB habitat by 8.3 acres. The optional road realignment would also reduce fragmentation and edge effects as compared to the alignment that would occur as part of the Proposed Project Amendment. The optional road alignment will be evaluated by the County for approval, therefore the acreages in this QCB Conservation Strategy reflect the current design for the Proposed Project Amendment. Should the County approve the optional road alignment, the acreages in this QCB Conservation Strategy will be adjusted accordingly.

Table 2. QCB Conservation Acreage Summary – Proposed Project Amendment

Project Area[1]	QCB Conservation Acres[2]
Village 14 RMP Preserve	
I	5.5
II	42.3
III	26.2
IV	162.0
V	14.9
Subtotal	250.9
PA 16/19 RMP Preserve	
VI	13.9
VII	51.3
VIII	23.3
IX	10.5
X	47.8
Subtotal	146.8
Conserved Open Space	
XI	1.2
XII	9.4
XIII	6.3
XIV	6.2
XV	1.1
XVI	0.3
Subtotal	24.5

[8] The reservoir and the water transmission line are approved facilities within the RMP Preserve.

Table 2. QCB Conservation Acreage Summary (cont.)

Project Area[1]	QCB Conservation Acres[2]
R-14 Conservation Easement	
XVII	191.5
Subtotal	191.5
TOTAL	**613.7**

[1]Project Area refers to the 17 project areas identified on Figure 1 of the Framework Management Plan.
[2]QCB Conservation Acreage refers to the amount of potential QCB habitat that occurs within each of the 17 project areas and excludes portions that do not contain physical or biological features of QCB habitat, as shown on Figure 1 of the QCB Framework Management Plan (see Appendix A). Subtotals may be off slightly due to rounding.

2. Maintain and Enhance Potential QCB Habitat Connectivity

PV1: PV1 contains important patches of QCB host plant and also lies adjacent to potential QCB habitat where QCB sightings had occurred during past surveys. One QCB larva was observed on PV1 on December 12, 2019. Therefore, where the Approved Project allows development of PV1, the Proposed Project Amendment would not. Instead, the DRA includes a process to amend the County's MSCP Subarea Plan that would designate all of PV1 – approximately 18.9 acres – as hardline preserve, thus providing for expansion of existing wildlife corridor buffer areas and additional live-in potential habitat for QCB. In addition, by including PV1 in the Preserve, the Proposed Project Amendment would eliminate the Approved Project's proposed road crossing within wildlife corridor L4, thereby enhancing QCB and wildlife movement opportunities in this area.

PV3: The Approved Project contemplates development on 120.5 acres of the 134.5 total acres within the PV3 site. The DRA includes a process to amend the County's MSCP Subarea Plan to designate hardline preserve on approximately 95% of PV3, excepting only a small 6.1-acre area of the parcel needed for a stormwater detention basin, and a short segment of Proctor Valley Road. Note that Proctor Valley Road is a County mobility element road and an essential public facility in the MSCP. Preserving approximately 95% of PV3 further enhances the existing connectivity between the QCB habitat areas to the south (Village 13) and the QCB habitat areas to the northwest (San Miguel Mountain). Preservation of PV3 would not only preserve the unrestricted QCB movement provided by the Approved Project design, it would also further expand unrestricted QCB movement along a lower elevation route to upper Otay Reservoir, as well as a broader connection to the more rugged ridgeline north of Lower Otay Reservoir.

3. Create "Functional Uplift" Within Conserved Potential QCB Habitat

Currently, no part of the Approved Project site is being managed specifically for the benefit of the QCB. Likewise, no part of the Proposed Project Amendment project area – including that portion currently owned by CDFW – is currently being actively managed for the benefit of QCB.

Through the long-term QCB Management Plan, this element of the Conservation Strategy mandates that qualified biologists monitor and report on the quality and functionality of the conserved potential QCB habitat, including status of host plant. To assist in this effort, and to comply with County mitigation measure M-BI-10, the Applicant or its designee/transferee shall prepare and implement a QCB Management Plan, which will require that the Applicant or designee (i.e., the preserve owner/manager [POM]) implement an adaptive management strategy to ensure that the functionality of the conserved potential QCB habitat be maintained in the face of changed conditions or unexpected events. The QCB Management Plan shall be subject to Wildlife Agency review and approval and shall address potential QCB habitat within those areas placed into Preserve or otherwise conserved by virtue of the Proposed Project Amendment, and shall focus on the higher quality extant QCB host plant patches and those areas targeted for restoration.

Preparation and implementation of a long-term QCB Management Plan for the Proposed Project Amendment, as required by M-BI-10, would alter this situation to create "functional uplift" within the conserved potential QCB habitat. This plan would involve, at a minimum, the following four tasks: (1) controlling invasive species and allowing for the expansion of existing host plant resources within QCB habitat nodes or other areas targeted for weeding and enhancement as identified in the QCB Framework Management Plan (Appendix A). This will include a minimum of two (2.0) acres of QCB host plant expansion; (2) seeding of more host plant (e.g., *Plantago erecta*) in Preserve areas with the proper soil and topographic characteristics; (3) monitoring and reporting as to the quality and functionality of the conserved potential QCB habitat and (4) implementing an adaptive management strategy.

As contemplated herein, the effort to control invasive species would target existing higher quality QCB host plant patches as well as areas most suitable for restoration, and the monitoring and potential replacement of newly seeded host plant would become new and perpetual responsibilities of the POM.

The goal of the plan should be to enhance the potential QCB habitat within the Preserve and thereby provide conditions suitable to support the species in perpetuity. The plan should include the following:

- Host plant seeding and removal of non-native plants in the Preserve shall take place first within QCB high density host plant areas (nodes) and in areas identified for enhancement based on QCB host plant mapping.

- A requirement to monitor the status of QCB habitat and high density QCB host plant in perpetuity.

- A requirement to monitor the status of QCB and periodically survey (non-protocol surveys) for QCB in perpetuity.

- A requirement to compare habitat monitoring data every 6 years to identify any new or significant changes to habitat. If habitat quality or functionality has significantly decreased or if it appears to be under threat based on host plant mapping and habitat assessment, the Applicant or its designee (i.e., the POM) shall initiate discussions with QCB experts, the County, and Wildlife Agencies to determine whether and to what extent management actions must be taken to prevent further degradation. Such discussions should focus on identifying specific management actions to improve habitat function, such as non-native plant removal, de-thatching, seeding of host plants and/or nectar plants, and focused habitat restoration.

- Adaptive management.

4. Fund Management and Enhancement

This element of the Conservation Strategy outlines the funding commitment. The most essential component is that the Applicant establish a Community Facilities District (CFD) or similar mechanism to fund all QCB-related management activities described herein and related to M-BI-10. As a prerequisite of CFD funding, the County, the Applicant, CDFW and/or USFWS must enter into a joint community facilities agreement or similar arrangement for management activities that would occur on State lands (the joint community facilities agreement would not apply to POM-managed lands). The timing of the CFD funding will occur upon issuance of the grading permit for the Proposed Project Amendment.

Separately, the Applicant shall provide funding for re-establishment of two acres of QCB host plant patches within the context of the larger long-term management strategy outlined in the QCB Management Plan. Funding shall include 5 years of maintenance and monitoring to ensure the successful establishment of these two acres of habitat.

5. Framework QCB Management Plan

A QCB Framework Management Plan collaboratively developed by USFWS, CDFW, the County and HELIX, is incorporated into this Conservation Strategy as Appendix A. The Framework Management Plan, this Conservation Strategy, and the Biological Assessment (to be prepared as part of the permitting with U.S. Army Corps of Engineers) shall serve as the basis for QCB Take Authorization.

6. Conclusion

To offset the Proposed Project Amendment's impacts to 527.1 acres of QCB Potential Habitat and 4.21 acres of QCB host plants, this QCB Conservation Strategy will provide the following:

- 613.7 acres of QCB Potential Habitat would be conserved
- 2.60 acres of QCB host plants would be conserved
- 1.23 acre of QCB host plants would be maintained and enhanced as part of the QCB Framework Management Plan. The acreage of QCB host plants is expected to change over time as part of adaptive management.
- 2.0 acre of QCB host plants would be established/re-established as part of a separate QCB habitat restoration effort.

The details of the 1.23-acre QCB host plant enhancement and the 2.0-acre QCB habitat restoration are provided in the QCB Framework Management Plan (Appendix A).

Memorandum

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APPENDIX A

OTAY RANCH VILLAGE 14 AND PLANNING AREA 16/19

QCB FRAMEWORK MANAGEMENT PLAN

March 3, 2020

PURPOSE: This Framework Management Plan (FMP) for Otay Ranch Village 14 and Planning Area 16/19 summarizes the management approach for Quino checkerspot butterfly (QCB), discusses three focused management scenarios, identifies the selected management scenario, and discusses long-term management based on an adaptive management approach within the Quino Checkerspot Butterfly Conservation Area (QACA)[1]. This FMP summarizes the approach collaboratively developed by USFWS, CDFW, the County, and HELIX.

There are three overall goals for long-term management:

1) Maintain and enhance habitat connectivity between core QCB populations south of the Approved Project with QCB populations northwest of the project;

2) Maintain adequate QCB host plant resources to support a viable long-term QCB occurrence complex within the Proctor Valley region in perpetuity; and

3) Assure that 4.21 acres of QCB habitat are preserved and/or restored for impacts to 4.21 acres of QCB host plant resulting from implementation of the Proposed Project Alternative[2].

The goals will be met through the following objectives. A general summary of the objectives is provided below, and the QCB Management Plan that will be provided separately will provide greater detail of each of the objectives:

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[1] The Quino Checkerspot Butterfly Conservation Area (QACA) is defined as the Otay Ranch Village 14 and Planning Area 16/19 Preserve Areas and areas exchanged from the state (i.e., PV1, PV3, R-14, R-15, and R-16), which are defined in Figure 1.

[2] The Applicant and the County have agreed to process a revised project design through a process described in the Dispute Resolution Agreement (DRA), and is referred to herein as the "Proposed Project Amendment". The DRA was negotiated, prepared and executed jointly by the Applicant, CDFW, USFWS and the County.

- Objective 1: Maintain and enhance 1.23 acres of host plants within existing nodes of QCB resources in the western portion of the QACA. This will occur through management and monitoring of 25.5 acres within node clusters. Nodes and node clusters are defined on page 3 below. Node clusters will be managed within the larger context of suitable habitat within the QACA. The long-term goal shall be to manage all 6 node clusters until they reach a low management level as defined on page 3 of this plan similar to node clusters 1 and 2. The expectation is that these 6 node clusters would reach a low management level within 10 years of implementation of the QHCP. Objective 1 would help to meet Goals 1 and 2.

- Objective 2: Expand the number of node clusters to be managed as Objective 1 is being met. For example, once a node cluster is moved from moderate maintenance to low maintenance, the management funding that is freed up can be spent on a new node cluster. The long-term goal will be to add management of 20 nodes within R-14 or other area prioritized by the habitat manager. Objective 2 would help to meet Goals 1 and 2.
- Objective 3: Provide monitoring to track the success of achieving performance standards 1 and 2. This will be accomplished through: a) Host plant mapping every 3 years to demonstrate that 1.23 acres of host plants occur within the 20 nodes and to identify host plant distribution across the QACA bearing in mind that host plant expression is highly dependent on environmental conditions, especially rainfall, and the increase will need to be considered over multiple years; b) QCB adult flight monitoring of the habitat nodes to assess occupation of the nodes (assumed 2 of every 5 years during good QCB flight years); c) Surveys of the QACA within the Otay Ranch preserve by the Otay Ranch Preserve Operator Manager (POM) every 5 years; d) Provide photo-documentation of the node clusters as part of the annual report; and e) Prepare an annual report and work plan. Objective 3 would help to meet Goals 1, 2, and 3.
- Objective 4: Re-establish 2 acres of host plant patches as part of a 5-year maintenance and monitoring effort. Host plant mapping as part of the restoration work will need to demonstrate a net increase of 2 acres within the restoration site(s). Objective 4 would help to meet Goals 1, 2, and 3.

This FMP outlines the mechanisms to assure that Goals 1, 2, and 3 are met. The detailed long-term Quino Checkerspot Butterfly Management/Enhancement Plan (QCB Management Plan), which satisfies Bio Condition M-BI-10, will be prepared, as required by the County, utilizing the FMP provided below. Note that although the FMP discussed herein was developed for application to the Proposed Project Amendment, the FMP, with some modification, could be applied to the Approved Project as well, in the event the Proposed Project Amendment is ultimately not adopted.[3]

[3] The term "Approved Project" refers to the Village 14/Planning Areas 16 and 19 project that the County Board of Supervisors approved on June 26, 2019. The applicant currently possesses County land use entitlements to develop the Approved Project. The Proposed Project Amendment, if approved, would modify the Approved Project.

PART 1 - BIOLOGIST EFFORTS

Based on these three goals, existing host plant mapping on the project area and QCB sightings for the region were reviewed, and higher density QCB host plant areas (hereafter referred to as nodes) were identified. These generally consisted of *Plantago erecta* point data and polygons that were either 100-999 individuals or 1,000-9,999 individuals in size that also occurred within close proximity of other higher host plant locations. A 50-foot buffer was then added to these point data or polygons to create each node. Where the 50-foot buffer overlapped with another node, the buffer for the two nodes was collapsed into a single polygon, and the acreage value for both nodes was combined when determining weeding requirements for both nodes (hereafter referred to as host plant node clusters). Independently, USFWS also modeled host plant data and identified polygons of higher host plant values, and these lined up well with the nodes identified by HELIX. HELIX identified a total of 41 potential host plant nodes (Figure 2).

Based on discussions with USFWS and CDFW staff, as well as a review of literature on species population viability, it was agreed that in order to meet Goals 1 and 2, a minimum of 20 nodes would need to be targeted for preservation and enhancement, and that these nodes should occur in clusters of at least 3 or 4 nodes to allow for year to year variability in weather and habitat conditions. In other words, if each node cluster consisted of 4 nodes, there would need to be a total of 5 node clusters (20 nodes divided by 4 = 5 node clusters). The area between nodes within the cluster and, where appropriate, additional habitat areas beyond the 50-foot buffer, were combined into a single boundary to form the area to be maintained for any given cluster. The area beyond the nodes within a cluster is identified as the "interstitial management area" for costing purposes. It is anticipated that goal three will be met through enhancement and expansion of existing habitat patches within these 20 habitat nodes and corresponding node clusters and through implementation of a two-acre QCB host plant rehabilitation/re-establishment plan.

HELIX, USFWS, and CDFW then conducted a site visit on December 12, 2019 to look at existing nodes and potential node clusters in the project area, and to discuss the existing conditions and management expectations in these areas. PV-1 and several sites within the southern portion of the project preserve were visited. HELIX staff further reviewed all 41 potential host plant nodes on December 18 and 20, 2019 to assess the management level for each node. HELIX and USFWS conducted an additional site visit on December 20, 2019 of the "Bus-stop" restoration site currently being restored and monitored within USFWS refuge lands northwest of the project area. HELIX then incorporated feedback from USFWS and CDFW to refine and prioritize node clusters and to develop annual maintenance costs for each of the three potential management scenarios (described in more detail below). The levels of management have been categorized into three tiers to reflect the level of effort that would be needed in the different areas:

- Low maintenance areas are nodes that are considered to be in good condition and would require minimal weeding. Efforts will focus on maintaining the existing condition.

- Moderate maintenance areas are nodes that would require a greater level of weed control as compared to low maintenance sites. These would include areas generally in good condition where QCB host plants are the dominant species present, but non-native grasses or other weed species are present and would need to be controlled. It is anticipated that moderate maintenance areas will transition over to low maintenance areas over time, and that the existing host plant polygons will expand over time as a result of weeding efforts within the 50-foot buffer area.

- High maintenance areas are nodes that would require a much higher level of focus for weed control as compared to low and moderate maintenance sites. These would include areas where non-native grasses and other weed species are more prevalent and would require more weed maintenance to remove. Seeding with host plants may be needed in these areas. It is anticipated that high maintenance areas will transition over to moderate, and eventually low maintenance areas over time, and that the existing host plant polygons will expand over time as a result of weeding efforts within the 50-foot buffer area.

- Interstitial management areas will be weeded to remove high priority target species at a lower overall effort initially than the host plant nodes and 50-foot buffer (except for the two acres of rehabilitation/re-establishment noted below). It is anticipated that these areas will be able to be weeded more intensively if needed as the 50-foot buffers become less weedy through their more intensive weeding effort.

The classification scale is intended to allow for changes in the habitat quality mapping through time. As weed maintenance occurs on an annual basis in moderate and high maintenance areas, the expectation is that these nodes will be on a trajectory towards a low maintenance classification tier.

PART 2 - MANAGEMENT AND ENHANCEMENT SCENARIOS

The following is a description of three potential management scenarios. Note, however, that other scenarios could also be identified, and that the scenarios will change over time as weeding efforts allow for additional nodes to be added to the weeding program. This is considered in the adaptive management component of the QCB Management Plan. As part of any of the management scenarios, the lands that would be managed for QCB will improve through time as active management occurs and as weed cover decreases. As areas improve through time, less management efforts will be needed for those areas, which will allow for additional areas to be added to the QCB Management Plan. It is important to bear in mind that the management scenarios described below are ***in addition to*** the QCB Management that is independently funded and performed by the Otay Ranch Preserve Operator Manager (POM) within the Otay Ranch RMP Preserve.

Furthermore, other potential management scenarios could be developed, including scenarios that could be applied to the Approved Project as well as the Proposed Project Amendment, and these would follow the methodologies included in this FMP and satisfy the four imperatives outlined in the QCB Conservation Strategy.

Scenario A – Improved/Enhanced Western Linkage

Scenario A was developed to improve connectivity and population viability in the western portion of the site beyond what was shown for the Approved Project (Figure 3). The 20 nodes include the following node clusters:

- PV-1 (5 nodes)
- Preserve Corridor (4 nodes)
- PV-3 Central (6 nodes)
- PV-3 South (5 nodes)

The total area for Scenario A node clusters is 25.5 acres.

Scenario B – Improved/Enhanced Western Linkage and R-14 Linkage

Scenario B was developed to improve connectivity and population viability in the western portion of the site beyond what was shown for the Approved Project and also enhance connectivity and population viability through R-14. The 20 nodes include the following node clusters:

- PV-1 (5 nodes)
- PV-3 Central (5 nodes)
- PV-3 South (4 nodes)
- R-14 (6 nodes)

The total area for Scenario B node clusters is 21.6 acres.

Scenario C – Preserve Enhancement

Scenario C was developed to improve population viability in the Approved Project preserve, PV-1, and R-14. The 21 nodes include the following node clusters:

- PV-1 (5 nodes)
- Preserve Corridor (5 nodes)
- PV-3 South (5 nodes)
- Preserve Southeast (4 nodes)
- Preserve Central (2 nodes)

The total area for Scenario C node clusters is 22.5 acres.

PART 3 - ESTIMATED MANAGEMENT AND ENHANCEMENT COSTS

Scenario A Cost Assumptions

Upon further discussions with USFWS and CDFW staff, it was decided to focus on Scenario A (Figure 3) for the FMP. Scenarios B and C, however, do provide illustrative examples of adaptive management options over time. Based on the above, a preliminary cost estimate for weeding was developed for Scenario A with the following assumptions:

- Low maintenance areas could be weeded at a rate of three acres per day;
- Moderate maintenance areas could be weeded at a rate of one acre per day;
- High maintenance areas could be weeded at a rate of 0.5 acre per day;
- Interstitial management areas can be weeded at a rate of four acres per day;
- The cost per crew day, including 4 crew members and a biological monitor, is $2,760;
- Two visits are assumed each year;
- Nodes 1-5 meet the criteria for low maintenance;
- Nodes 6-9, 11-15, 17, and 22-26 meet the criteria for moderate maintenance;

- There were no nodes requiring high maintenance;
- The total area receiving treatment is 25.5 acres;
- The total area of plantago patches and points is 1.23 acres;
- Nodes 1-5 (low) are in close proximity, require hiking approximately 0.2 miles to access, total 3.3 acres and can be accomplished in 1 crew day per visit;
- Nodes 6-9 (moderate) are in close proximity, have ready access, total 1.43 acres and can be accomplished in 1.5 crew days per visit;
- Nodes 11-15 and 17 (moderate) are in close proximity, have reasonable access, total 2.06 acres and can be accomplished in 2.5 crew days per visit;
- Nodes 22-26 (moderate) are in close proximity, require hiking approximately 0.6 miles to access, total 1.20 acres and can be accomplished in 1.5 crew days per visit. For cost purposes it is assumed that nodes 11-15, 17, and 22-26 will be accomplished in 4 days (2.5 for 11-15 and 17 and 1.5 for 22-26);
- Interstitial management areas total approximately 16 acres and would be accomplished in 4 days; and
- Total crew days per visit is 11 days. 11 crew days x two visits is 22 crew days.

Based on the assumptions above, the weeding costs would be approximately $60,720. This would allow for remaining funds ($14,280 based on the $75,000 funding proposed through the CFD) to be used for management, monitoring, and other activities that would benefit QCB. These are discussed under "Other Management Costs" below. See Attachment A for detailed cost estimates.

Additional Management and Enhancement Tasks and Cost Assumptions

The following additional management tasks are included in this FMP. The annual cost and funding mechanism for each is provided in parentheses as appropriate. Please note that these are separate from management activities such as access control, weeding of the preserve, focused QCB surveys every 5 years, and general biological monitoring that will be provided by the POM under the Otay Ranch RMP.

1. QCB Host Plant Mapping ($1,133; CFD). During the first year and every three years thereafter[4], map the extent and abundance of host plants within high host plant areas and adjacent moderate host plant areas for the QACA. For areas with dense patches of host plants, record the boundaries with a GPS device, number the location, and estimate population size and density (i.e., percent cover), and percent cover of invasive species, and other threats. For both the high and moderate host plant areas, conduct a visual assessment of host plant and nectaring resources, along with non-native weed cover and threats using a methodology similar to the SDMMP rare plant monitoring protocol. Based on this data, in coordination with SDMMP and other regional efforts as needed, identify host plant enhancement areas where additional non-native plant removal and/or future seeding needs to occur, as well as monitor long-term trends of overall habitat quality for the QCB. A portion of the QCB host plant mapping will be completed by the QCB monitoring biologist as part of the 20 days of full time monitoring to be conducted as part of

[4] Surveys will be planned to occur in years of rainfall/climatic conditions that maximize QCB host plant observations

the weed maintenance program. This task budget allows for an additional 20 hours of time to complete the QCB host plant mapping within the QACA.

2. Prepare and Submit Annual Reports ($3,150; CFD). Prepare and submit information regarding management and monitoring for the QCB Management Plan for inclusion in the Otay Ranch Resource Management Plan (RMP) annual report that summarizes management activities and monitoring results conducted during the year for each objective, an assessment of the success of those management tasks, and measures recommended for the coming year to achieve the goals of the QCB Management Plan.

3. Prepare and Submit Annual Workplan ($2,520; CFD). Prepare and submit information regarding the QCB Management Plan in the RMP annual workplan that spells out the specific tasks that will be implemented in the coming year to achieve the recommendations outlined in the annual report.

4. Financial Tracking ($600, CFD). Provide information regarding the QCB Management Plan funding in the RMP annual report including an accounting of funds used for management that year, a proposed budget for management in the coming year, and a summary statement of the status of the endowment fund.

5. Photo Point Monitoring ($240; CFD). During the first year of management, the designated Resource Manager will select 4 photo locations for each node cluster that can be used as photo points to document the visual status of the habitat. The photo points will be recorded using GPS and shown on a figure in the annual report. Photos will be taken once a year at each of the photo points and submitted in print and/or electronically with each annual report. Any changes observed in the photos will be explained in the report and addressed as necessary. The majority of the photo point monitoring will be completed as part of the 20 days of biological monitoring to be completed for the weed maintenance program. This task budget allows for an additional 2 hours of time to organize and complete the monitoring described in this task.

6. Update QCB Management Plan ($1,326; CFD). Conduct a review of the QCB Management Plan goals, objectives, and tasks every five years and make the appropriate modifications. Submit proposed QCB Management Plan modifications to the Wildlife Agencies for review and concurrence prior to finalizing changes.

7. Coordinate with Adjacent Property Owners ($1,200; CFD). The designated Resource manager will meet at least annually with adjacent property owners such as the POM, USFWS, CDFW, and City of San Diego to coordinate weed control actions, fire management, and public access control.

8. Additional Monitoring ($1,536; CFD). Conduct additional QCB adult surveys within high priority areas (node clusters being managed and areas with higher QCB host plant resources) of the QACA as needed to help refine management approaches, collect additional data to inform future management, conduct focused searches for QCB and/or host plants, and/or evaluate effectiveness of management. Two surveys would be performed at the peak of the flight season in good flight season years. It is assumed that there would be two days per survey event (4 days per flight year), and that the surveys would be conducted 2 out of every 5 years to account for variability of flight years.

9. Habitat Rehabilitation/Re-Establishment (Not to Exceed $250,000; Applicant). In addition to weeding and enhancement noted above, the FMP includes habitat rehabilitation/re-establishment of two (2.0) acres of QCB host plants within the 16.3 acres of interstitial management areas or another two-acre area, or combination thereof, as acceptable to the County and Wildlife Agencies. This, in combination with 2.1

acres of onsite preservation and enhancement of existing habitat patches will result in a 1:1 ratio of long-term preservation to host plant impacts for the Proposed Project Amendment. The rehabilitation/re-establishment plan shall include initial site treatment and seeding, five years of maintenance and 5 years of biological monitoring. Funding for this rehabilitation/re-establishment plan will be separate from long-term management funding and is estimated not to exceed $250,000. This FMP specifies that such funding will be secured as required by the County.

The not-to-exceed budget of $250,000 is based on the following cost assumptions

- The cost per crew day, without a biological monitor, is $1,800;
- Site preparation and installation will require 12 crew days ($21,600);
- Seed costs assume $120/pound of seed at 21 pounds per acre ($5,040);
- Three weed control visits are assumed each year, which would be a total of 75 crew days ($135,000);
- 5-year monitoring and reporting ($87,000).

Financial Reserve/Contingency

In addition to the management and enhancement tasks that would be funded above, the CFD will include a 10 percent contingency budget on an annual basis ($7,243). The "contingency" reserve funds would only be utilized in response to extraordinary, unexpected circumstances, such as efforts to shift management focus following a wildfire or vandalism. Those "contingency" reserve funds would not be used to cover cost overruns. The balance of the "contingency" funds will be tracked, and the balance will be included in each annual report. The contingency accrual will not exceed $7,243 (10 percent of the annual CFD) on an annual basis, consistent with CFD requirements.

It is also worth noting that additional funds will be earmarked on an annual basis as future financial reserve. For example, certain management tasks are not completed annually, such as QCB host plant mapping, updates to the QCB management plan, and QCB surveys. Therefore, in years when the host plant mapping is not conducted, the $1,133 that is earmarked in the annual budget will be placed in the reserve for every third year when host plant mapping is conducted.

Lastly, in years when not all tasks are completed, the unused funds will be earmarked for future financial reserve funds. For example, in drought years when not as much weed maintenance is required, the unused funds will be placed in the reserve and saved for future years when additional weeding might be needed. The balance of the reserve funds will also be tracked on an annual basis and included in the annual reports. The balance of the reserve funds will be tracked separately from the balance of the "contingency" funds.

Cost Recap

Additional Management Tasks 1 through 8 above total $11,705 and when combined with the Scenario A weeding costs of $60,720 and the 10 percent contingency costs of $7,243, the total annual cost funded in perpetuity would be $79,668. The Applicant will also directly fund habitat rehabilitation/re-establishment to assure no net loss of host plant resources. Additionally, the POM will provide funding and management in the Otay Ranch RMP preserve. These three efforts, in combination, assure that the stated QCB Conservation Strategy goals are met.

Attachments:

Attachment A: Scenario A Plus Additional Management Tasks 1-8 Cost Assumptions

Figures:

Figure 1: QCB Conservation Area Acreages

Figure 2: QCB Host Plant Nodes

Figure 3: QCB Host Plant Node Clusters

Attachment A - Scenario A Plus Additional Management Tasks 1-8 Cost Assumptions
3/3/2020

Crew Day Cost

	Crew day	Biologist	Daily Rate
Assumptions	$ 1,800	$ 960	$ 2,760

Scenario A - Improved Western Linkage Adding Interstitial Areas

			Crew Days			
Level of effort	**Acres**	**Acres/Day**	**Single Visit**	**Two Visits**	**Total**	**Cost**
Low	3.3	3.0	1.0	2.0	2.0	$ 5,520
Insterstitial	3.3	4.0	1.0	2.0	2.0	$ 5,520
Moderate	4.7	1.0	6.0	12.0	12.0	$ 33,120
Insterstitial	13	4.0	3.0	6.0	6.0	$ 16,560
High	0	0.5	0.0	0.0	0.0	$ -
Total	**24.3**		**11.0**	**22.0**	**22.0**	**$ 60,720**

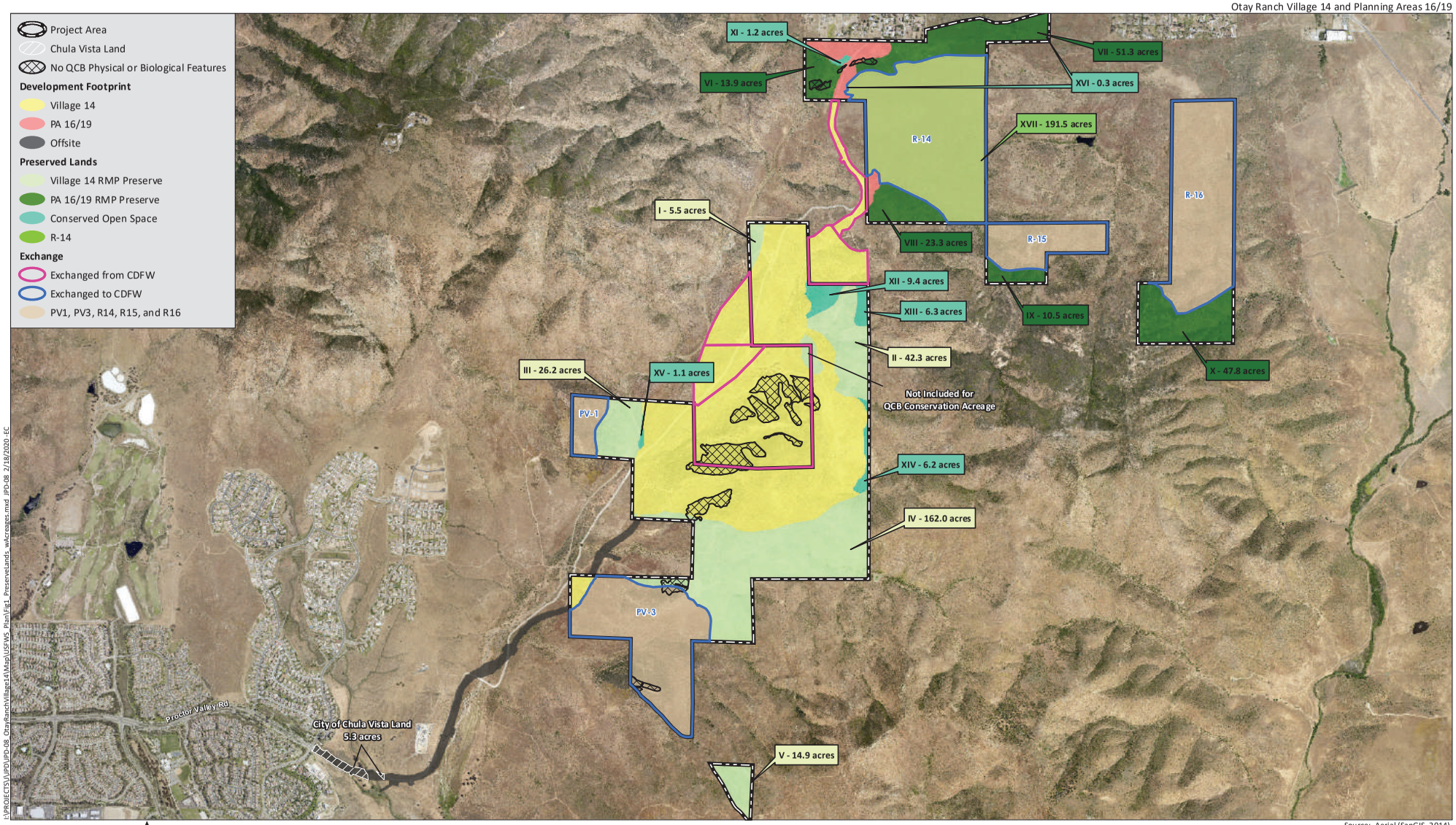
Additional Managment Tasks

Task	**Hours**	**Hourly**	**Total Cost**	**Frequency (# of Years)**	**Annual Cost**
1. Host Plant mapping	20	$ 120	$ 2,400	3	$ 800
GIS	10	$ 100	$ 1,000	3	$ 333
2. Annual report	20	$ 120	$ 2,400	1	$ 2,400
	5	$ 150	$ 750	1	$ 750
3. Annual work plan	16	$ 120	$ 1,920	1	$ 1,920
	4	$ 150	$ 600	1	$ 600
4. Financial tracking	4	$ 150	$ 600	1	$ 600
5. Photo documentation	2	$ 120	$ 240	1	$ 240
6. Update QCBMP	24	$ 120	$ 2,880	5	$ 576
	5	$ 150	$ 750	1	$ 750
7. Coordination with Adjacent Property Owners	8	$ 150	$ 1,200	1	$ 1,200
8. Additional Monitoring	32	$ 120	$ 3,840	2.5	$ 1,536
Total					**$ 11,705**

Annual Financial Reserve/Contingency (10% of Annual Budget) **$ 7,243**

GRAND TOTAL **$ 79,668**

Otay Ranch Village 14 and Planning Areas 16/19



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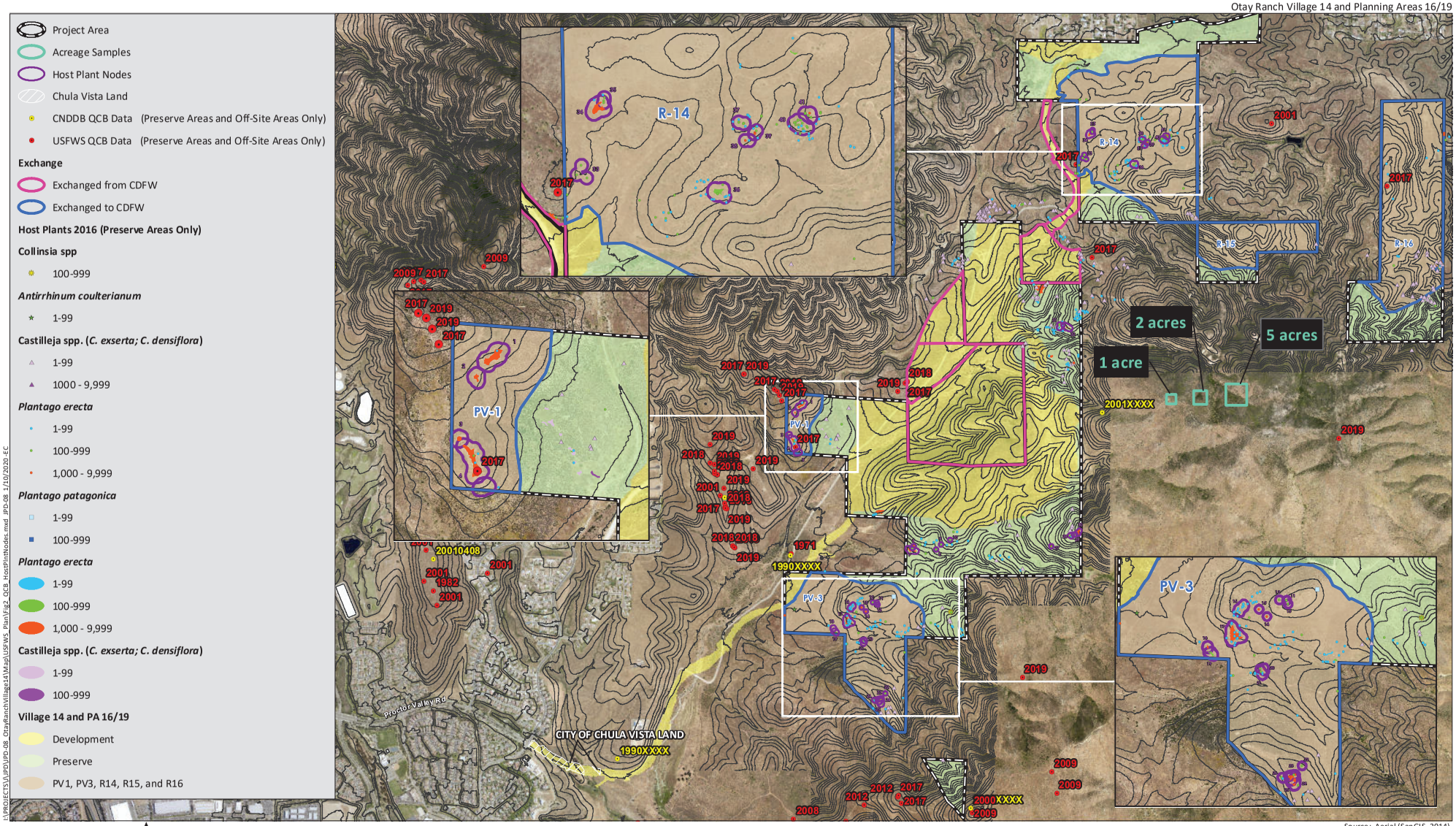
Source: Aerial (SanGIS, 2014).

HELIX Environmental Planning

QCB Conservation Area Acreages

Figure 1

Otay Ranch Village 14 and Planning Areas 16/19



Source: Aerial (SanGIS, 2014).

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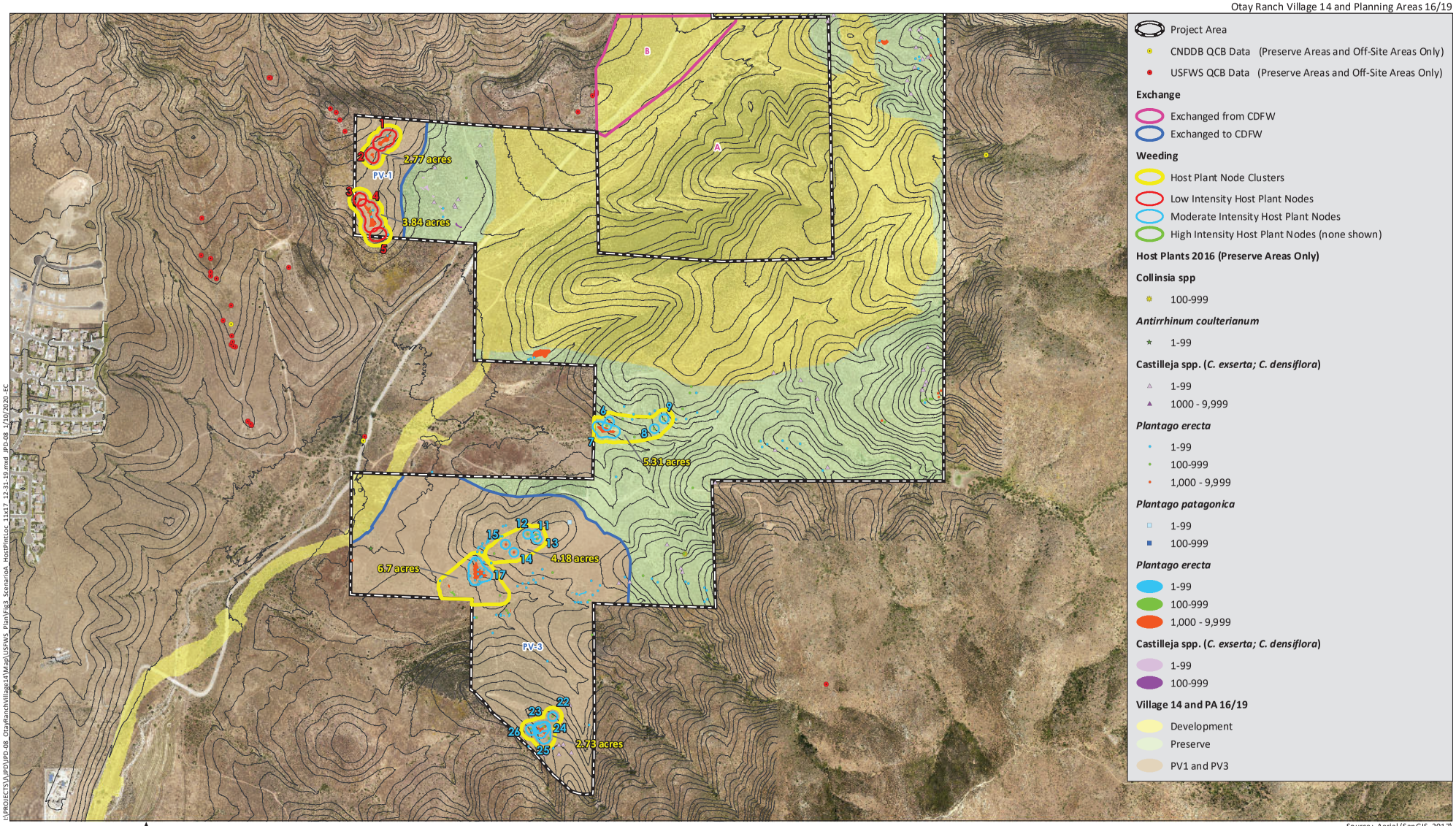
QCB Host Plant Nodes

Figure 2



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Scenario A Host Plant Node Cluster Locations

Figure 3