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FINAL REPORT

ECONOMIC EVALUATION OF THE SOLANO MULTI-SPECIES HABITAT CONSERVATION PLAN / NATURAL COMMUNITIES CONSERVATION PLAN (HCP/NCCP)

Prepared for:

Solano County Water Agency

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I. SUMMARY OF FINDINGS

The Solano County Water Agency is in the process of developing the Solano Multi-Species Habitat Conservation Plan/Natural Communities Conservation Plan (Solano HCP/NCCP). This plan is both a habitat conservation plan (HCP), as defined by the Federal Endangered Species Act (ESA) and a Natural Communities Conservation Plan (NCCP), as defined by the California Endangered Species Act (CESA). The Solano HCP/NCCP currently plans to cover impacts on 77 species, including federally-listed, State-listed, and other non-listed species. This report evaluates the likely economic effects of the Solano HCP/NCCP, including potential effects on landowners, developers, and homebuyers. The report focuses on (1) the federally- and State-listed vernal pool species and their associated vernal pool complexes and (2) the State-listed Swainson's Hawk and its associated habitat. The report pays particular attention to their interactions with and effect on future land development in Solano County.

SUMMARY OF FINDINGS

Key findings concerning the regulatory differences between the Solano HCP/NCCP and the "No Action Alternative" on mitigation requirements, time delay, and uncertainty are described below, along with the potential economic effects on landowners, developers, and potential homebuyers. The evaluation and results both depend on a number of assumptions concerning future regulation under the No Action Alternative. There is significant uncertainty over such matters and the best available information has been used to develop credible assumptions. The economic benefits of conservation were not evaluated as part of this analysis.

REGULATORY DIFFERENCES

The key regulatory differences between the Solano HCP/ NCCP and the No Action Alternative from the perspective of economic effects are described below for vernal pools and the Swainson's Hawk, and summarized in **Tables 1** and **2**, respectively.

Vernal Pools

- **Vernal pool time delay.** The Solano HCP/NCCP is expected to reduce the time delay associated with obtaining development permits compared to the No Action Alternative. Development projects will save either between 1.5 and 2.5 years or between 3 and 6 months relative to the No Action Alternative, depending on the significance of their impact on vernal pools.
- **Vernal pool mitigation.** The Solano HCP/NCCP is expected to have lower mitigation ratios for wetted acres than the No Action Alternative, but higher requirements for vernal pool uplands. The Solano HCP/NCCP is estimated to

result in the conservation of between 7,220 and 7,440 total acres, including preservation of 550 to 760 acres of vernal pool wetlands. Under the No Action Alternative, between 4,400 and 6,000 total acres are expected to be conserved, including approximately 760 to 1,050 acres of vernal pool wetlands.

- **Vernal pool uncertainty.** The proposed HCP/NCCP is expected to significantly reduce the degree of uncertainty faced by developers, both in terms of mitigation requirements and procedural time delay.

Table 1: Summary of Vernal Pool Regulatory Effects

| Measure | No Action Alternative | HCP/NCCP Alternative |
|-------------------------|-----------------------|----------------------|
| Time Delay per Project* | 1.5 years | None |
| VP wetland creation | 360 – 500 acres | 320 – 440 acres |
| VP wetland preservation | 760 – 1,000 acres | 550 – 760 acres |
| Upland preservation | 3,200 – 4,500 acres** | 6,200 – 6,400 acres |
| Total*** | 4,400 – 6,000 acres | 7,200 – 7,400 acres |

* Represents the estimated time delay in addition to the local entitlement process.

** Upland preservation would not be specifically required under the No Action Alternative; these acreages are an estimate of the uplands that would be set aside by mitigation banks to support vernal pool wetland mitigation credits sold to private developers.

*** Numbers may not sum exactly due to rounding.

Table 2: Summary of Swainson’s Hawk Regulatory Effects

| Measure | No Action Alternative | HCP/NCCP Alternative |
|------------------------|-----------------------|----------------------|
| Preserved acres | 5,800 acres* | 12,150 acres |
| Time Delay per Project | Insignificant | None |
| Uncertainty | Significant | Minimal |

* Average of “Low CEQA Enforcement” and “High CEQA Enforcement” Scenarios.

Swainson’s Hawk

- **Swainson’s Hawk mitigation.** The proposed HCP/NCCP will implement slightly higher overall mitigation ratios than are expected under the No Action Alternative and is expected to implement those ratios more consistently. As a result, the proposed HCP/NCCP is expected to result in the conservation of approximately 12,150 acres of Swainson’s Hawk habitat, while the No Action Alternative is expected to conserve between 2,900 and 8,700 acres, depending on the degree of future mitigation enforcement under the California Environmental Quality Act (CEQA).

- **Swainson's Hawk time delay.** This analysis concludes that developers do not currently experience a significant time delay associated with mitigating Swainson's Hawk impacts through the CEQA process. The proposed HCP/NCCP is therefore not expected to significantly reduce the time delay experienced by developers in areas containing Swainson's Hawk habitat.
- **Swainson's Hawk uncertainty.** The proposed HCP/NCCP will significantly decrease the level of uncertainty faced by developers compared to the No Action Alternative. Because minimal time savings are anticipated on a per-project basis, the increased certainty will primarily be associated with the ability to anticipate known mitigation ratios and the location of habitat zones within which mitigation will be enforced.

ECONOMIC EFFECTS

Developable Land Values (Vernal Pool Habitat)

The most direct effects of changes in the regulatory process will be on the land values and landowners of developable, regulated land. Land values impacts will occur as a result of changes in mitigation costs, uncertainty over regulatory requirements, and expected time delays before development approval.

- **Overall Land Value Difference.** The Solano HCP/ NCCP is estimated to increase the value of developable land with vernal pool habitat covered by the HCP/ NCCP. Land values are expected to increase by approximately \$27 million, or roughly \$4,000 per developed acre, relative to the No Action Alternative.¹ The components of this net increase in land value include increased mitigation costs, decreased time delay costs, and decreased uncertainty costs, as described below and summarized in **Table 3**.
 - **Vernal pool mitigation costs.** The Solano HCP/NCCP is expected to result in an increased mitigation cost of \$9 million compared to the No Action Alternative, equivalent to about \$1,400 per converted acre. This increased cost is primarily due to the requirement that projects under the HCP/NCCP mitigate directly for upland habitat – the proposed HCP/NCCP would conserve between 1,700 and 3,100 more upland acreage than the No Action Alternative. Increased mitigation costs would produce a downward pressure on land values.
 - **Vernal pool time delay effects.** In contrast, the relative time savings under the Solano HCP/NCCP are expected to increase land values. The overall time value saving of the HCP/NCCP relative to the No Action Alternative is expected to be approximately \$17.4 million, equivalent to about \$2,600 per acre.

¹ These are planning-level estimates of the overall impact. Land value differences will vary by parcel depending on its particular circumstances.

- **Vernal pool uncertainty effects.** The reduced uncertainty under the Solano HCP/NCCP will also increase developers' valuation of land. The overall value of the reduced uncertainty is expected to be \$18.5 million, equivalent to about \$2,800 per acre.

Table 3: Summary of Vernal Pool Economic Effects

| Economic Category | | No Action Alternative* | Solano HCP/NCCP Alternative* | HCP/NCCP Savings/(Cost)* |
|-------------------|-----------------|------------------------|------------------------------|--------------------------|
| Mitigation | Total | \$111.1 million | \$120.1 million | (\$9.0 million) |
| | Per Acre | \$16,700 | \$18,100 | (\$1,400) |
| Time Delay | Total | \$17.4 million | n/a | \$17.4 million |
| | Per Acre | \$2,600 | n/a | \$2,600 |
| Uncertainty | Total | \$18.5 million | n/a | \$18.5 million |
| | Per Acre | \$2,800 | n/a | \$2,800 |
| Total | Total | 147.0 million | 120.1 million | \$26.9 million |
| | Per Acre | \$22,100 | \$18,100 | \$4,000 |

* Midpoint of range described in report text. Per-acre values represent cost per developed acre.

Developable Land Values (Swainson's Hawk Habitat)

- **Overall Land Value Difference.** The Solano HCP/ NCCP is estimated to reduce the value of land with Swainson's Hawk habitat covered by the HCP/ NCCP. Land values are expected to be \$27 million (\$2,250 per developed acre) lower due to significantly increased mitigation costs, as described below and summarized in **Table 4**
 - **Swainson's Hawk mitigation costs.** The Solano HCP/NCCP is expected to result in an overall mitigation cost of \$30.1 million higher than under the No Action Alternative, primarily due to the more consistent enforcement of mitigation requirements. This is equivalent to an average of about \$2,500 per converted acre. The increased mitigation costs will translate into a lower land value.
 - **Swainson's Hawk time delay effects.** The time savings under the Solano HCP/NCCP are expected to be relatively small, as current Swainson's Hawk mitigation under CEQA does not add significant time to the overall development approval process.
 - **Swainson's Hawk uncertainty effects.** The Solano HCP/NCCP will reduce the level of uncertainty over mitigation requirements relative to the No Action Alternative. This reduced uncertainty will partially offset the net loss

created by higher mitigation costs. The value of the reduced uncertainty is estimated at \$3.1 million, which results in an overall net land value gain of about \$250 per developed acre.

Table 4: Summary of Swainson’s Hawk Economic Effects

| Economic Category | | No Action Alternative* | Solano HCP/NCCP Alternative | HCP/NCCP Savings/(Cost)* |
|-------------------|-----------------|------------------------|-----------------------------|--------------------------|
| Mitigation | Total | \$18.4 million | \$48.5 million | (\$30.1 million) |
| | Per Acre | \$1,500 | \$4,000 | (\$2,500) |
| Time Delay | Total | negligible | n/a | \$0 |
| | Per Acre | negligible | n/a | \$0 |
| Uncertainty | Total | \$3.1 million | n/a | \$3.1 million |
| | Per Acre | \$250 | n/a | \$250 |
| Total | Total | 21.5 million | 48.5 million | (\$27.0 million) |
| | Per Acre | \$1,750 | \$4,000 | (\$2,250) |

* Midpoint of range described in report text. Per-acre values represent cost per developed acre.

Other Economic Effects

Other economic effects include potential effects on developers, including their returns and quantities of development, on homebuyers, through the real estate prices they face; and on farmers seeking to expand operations, through the agricultural land prices they face.

- **Developer Effects.** Developers that own land will be affected by the changes in land value described above. Beyond this, the imposition of significant additional cost burdens could make development less feasible. In this case, the cost differences between the Solano HCP/NCCP and the No Action Alternative are limited, and are unlikely to have a significant effect on development feasibility.
- **Potential Homebuyer Effects.** In competitive housing markets such as the San Francisco Bay Area, land use regulation will only increase home prices if development costs are increased significantly across a large proportion of new development or if a significant amount of new development is rendered infeasible by the additional cost burdens. The Solano HCP/NCCP will not have this effect.
- **Agricultural Land Buyer Effects.** The Solano HCP/NCCP will require the conservation of about an additional 6,000 acres of Swainson’s Hawk habitat (assuming “average” CEQA enforcement under the No Action Alternative). Whether through the purchase of easements or annual payments to farmers, this land will be restricted from development as well as from certain agricultural uses, including orchards, vineyards, nurseries, livestock production, and processing facilities. Over time, these conservation efforts will reduce the overall

land available to farmers looking to purchase additional land for orchard or vineyard production, potentially resulting in an increase in land values. In Solano County, however, the land available for these purposes is significant and any land prices effects will occur over several decades and are likely to be relatively small.

ORGANIZATION OF REPORT

Chapter I, this chapter, summarizes the findings of the report. **Chapter II** provides important background information on Solano County and the Solano HCP/NCCP that informs the subsequent economic analysis. **Chapter III** describes the process that private land developers face under current regulatory conditions and compares it to the expected process under the Solano HCP/NCCP, in terms of mitigation requirements, time delays, and uncertainties. **Chapter IV** evaluates the economic consequences of these regulatory differences and considers how they might affect landowners, developers, and homebuyers. It also considers some of the potential indirect effects of land conservation under the Solano HCP/NCCP such as land value appreciation.

II. BACKGROUND INFORMATION

This chapter provides background information on Solano County and the Solano HCP/NCCP. This information is primarily from the Solano Multispecies Habitat Conservation Plan and Natural Community Conservation Plan, Working Draft 2.0, July 2004 (Solano HCP/NCCP Working Draft) prepared by LSA Associates as well as other public data sources. This information informs the regulatory comparison and economic analysis in subsequent chapters.

SPECIES AND PLANNING AREA

The Solano HCP/NCCP covers 77 species and their associated habitats. These include 10 federally listed species, 12 species that are both federally and State-listed, 4 State-listed species, and 51 species of special concern. The habitat of these species is primarily in the north and eastern portions of the County, including the agricultural plains surrounding Dixon, the grazing land of the Montezuma Hills, and the wetlands of Jepson Prairie and the Suisun Marsh. This habitat lies around and, in some cases, inside the city limits of Dixon, Fairfield, Vacaville, Suisun City, and Rio Vista. The Solano HCP/NCCP's planning area includes three implementation zones: Zone 1 (Urban Zone) and Zone 2 (SCWA and Irrigation and Reclamation Zone) constitute the primary areas within which covered activities will occur, and together encompass approximately 176,000 acres; and Zone 3 includes the remainder of Solano County, where conservation activities and activities carried out by participating parties will be covered by the proposed HCP/NCCP.

GROWTH AND DEVELOPMENT

Solano County is one of the fastest growing counties in the San Francisco Bay Area. At the start of 2004, it included 412,200 residents, approximately 136,200 households, and is estimated to have about 131,500 jobs.² Over the last 4 years, since 2000, population has grown at a rate of about 4,300 persons each year or 1.1 percent.³ This growth has been accompanied by the continuing urbanization of land in Solano County. Between 2000 and 2002, the California Department of Conservation's Farmland Monitoring and Mapping Program estimated that 1,000 acres of prime farmland in Solano County were lost to urban development, and that an additional 1,700 acres of other farm and grazing land were urbanized.

² Calculated based on data from Department of Finance 2004 and ABAG 2002 Projections.

³ Based on data from Department of Finance years 2000 through 2004.

Available projections by the Association of Bay Area Governments suggest that Solano County will continue to grow at a fast pace. Population is expected to grow by about 71,800 persons over the next 10 years, an average of about 7,200 persons each year and an annual growth rate of 1.5 percent.⁴ Much of this growth is expected to occur in the central and eastern cities of Solano County.

The Solano HCP/NCCP is intended to cover development activities over the next 50 years. The precise location and timing of future development is highly speculative, though jurisdictions' General Plans provide an indication of the likely locations of future growth. Based on an evaluation of these General Plans and taking into account proposed conservation measures, the Solano HCP/ NCCP Working Draft has estimated the conversion of about 12,200 acres of existing Swainson's Hawk habitat and up to 6,800 acres of valley floor and vernal pool grassland habitat, including between 290 and 400 acres of vernal pool wetlands, over the 50-year duration of the Solano HCP/NCCP.

CONSERVATION REQUIREMENTS

This report focuses on vernal pool species and the Swainson's Hawk. The land conservation associated with these species is expected to represent about 60 percent of all land conservation under the Solano HCP/NCCP. This section provides an overview of the expected conservation requirements and strategies for these species.

VERNAL POOL SPECIES

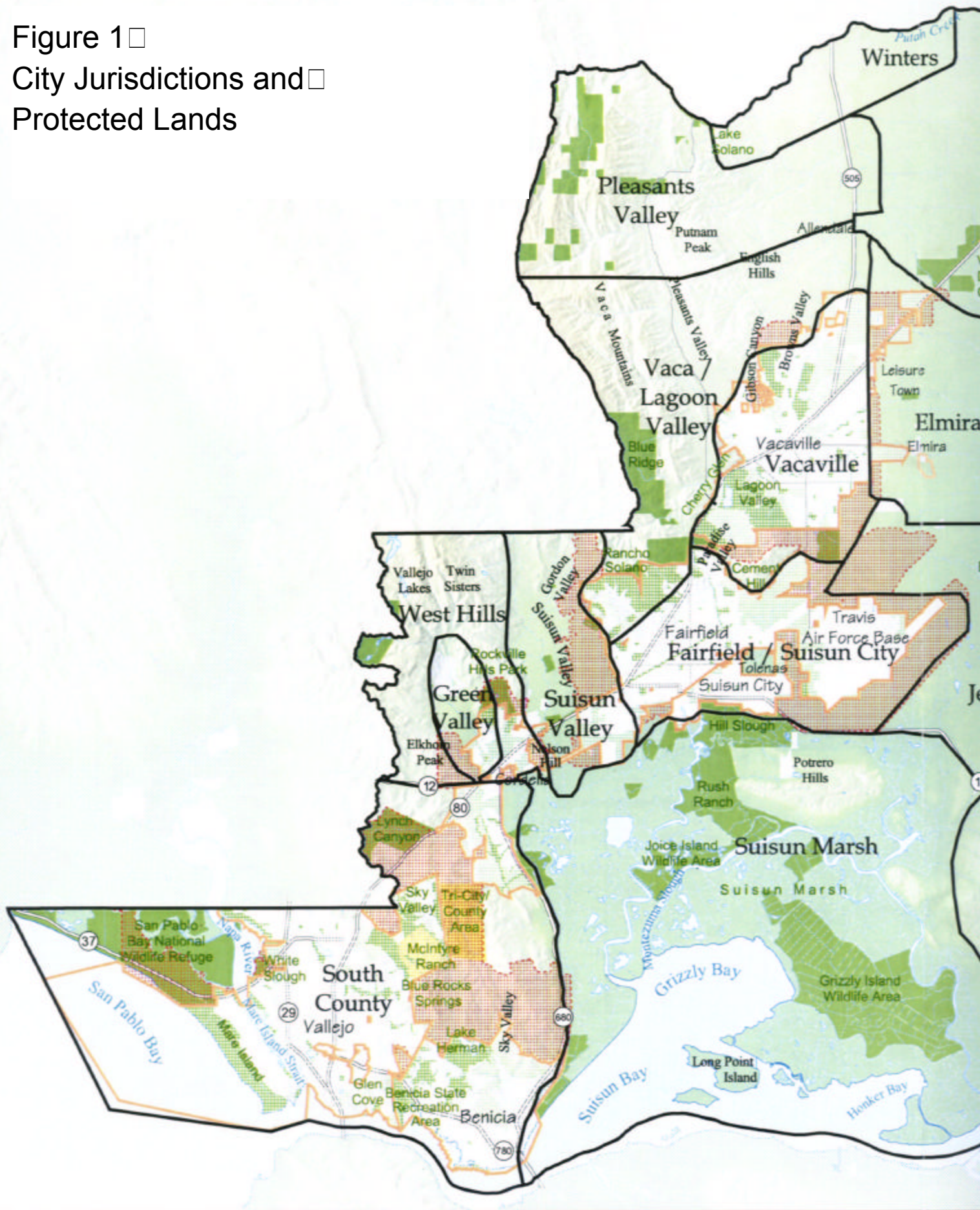
There are a number of different vernal pool species in California. Each of these species has different conservation requirements. Taking the full set of species present in Solano County and some of the uncertainty over development locations into account, this analysis estimates the need for conservation between 7,200 and 7,500 acres of vernal pool habitat (both wetted acres and uplands), including between 320 and 440 acres of newly constructed wetted acres, based on proposed Conservation Measures described in the Solano HCP/NCCP Working Draft.⁵ Vernal pool preservation and construction will primarily occur in areas that have or had vernal pools, including the Jepson Prairie, the edges of the Suisun Marsh, and surrounding areas (see **Figure 1**). Some of this conservation will be required inside the city limits of Fairfield and Suisun City.

The Solano HCP/NCCP intends to rely, primarily, on the efforts of private mitigation bank operators, overseen by the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Game, and the U.S. Fish and Wildlife Service (USFWS), to

⁴ Calculated based on ABAG Projections 2002 data.

⁵ Construction of vernal pools refers to the creation of vernal pools, where none currently exist. This will generally occur in locations where vernal pools previously existed and/or where the surrounding land includes the necessary qualities of vernal pool uplands.

Figure 1 □
 City Jurisdictions and □
 Protected Lands



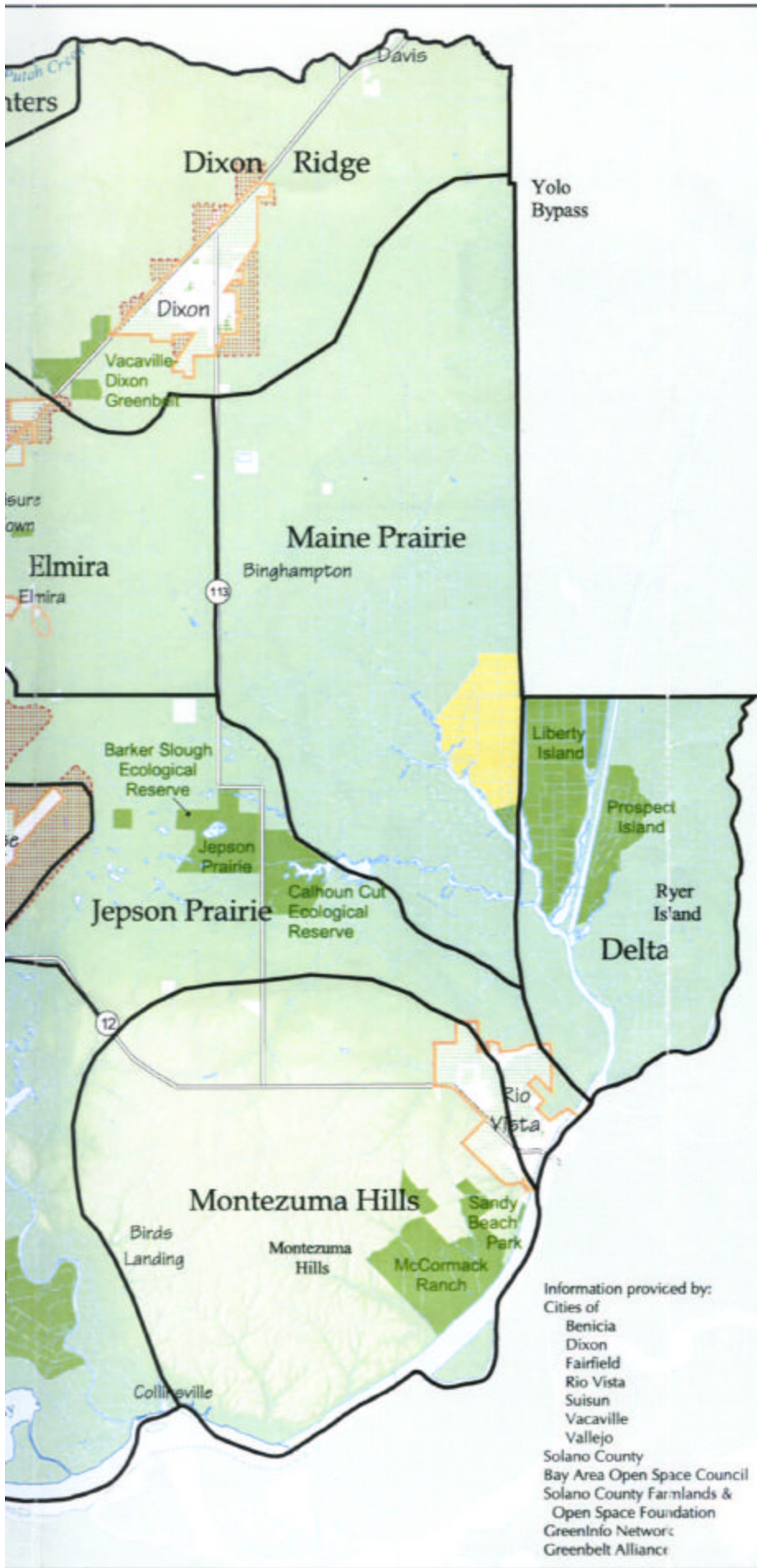


Figure 1 □
 City Jurisdictions and □
 Protected Lands □
 (continued)

Land Status

- Fee Ownership or Conservation Easement
- Identified Acquisition Interest
- Urban Area
- City Jurisdiction
- City Sphere of Influence
- County Boundary
- Highways & Major Roads
- Rivers, Streams, Channels

Solano County Farmlands
 and Open Space Foundation

**AGRICULTURAL CONSERVATION
 EASEMENT PLANNING PROJECT**



STOTT PLANNING ASSOCIATES * AMERICAN FARMLAND TRUST
 ECONOMIC and PLANNING SYSTEMS * CONSERVATION PARTNERS
 GARLAND and ASSOCIATES * GREENINFO NETWORK

August 2, 2001

establish a private market for vernal pools mitigation. Under this system, a land developer will be able to purchase credits at an approved habitat mitigation bank consistent with the level of mitigation/conservation required.

SWAINSON'S HAWK

The Swainson's Hawk depends on habitat for both building nests and for foraging for food. These nests and foraging land generally occur on high quality agricultural lands, generally with Class I and Class II soils.⁶ The Solano HCP/NCCP Working Draft determined the need for conservation of about 12,150 acres of Swainson's Hawk habitat. This conservation is consistent with a number of agricultural uses, though not orchards, vineyards, livestock production, nurseries, or agricultural processing facilities. There is some flexibility over the location of the conserved Swainson's Hawk land. Most of it is expected to occur within the Dixon Ridge, Winters, Elmira, and Maine Prairie subareas, an area of about 120,000 acres (see **Figure 1**). Swainson's Hawk conservation could occur through a number of mechanisms, including the purchase of conservation easements on agricultural land, annual subsidies to farmers to maintain land in certain agricultural uses, and the purchase of mitigation credits from private mitigation bank operators.

⁶ The USDA soils classification systems ranks soils from Class I to Class VIII based on the limitations on soil suitability for field crops. Class I soils have few limitations that restrict their use and Class II soils have moderate restrictions.

III. REGULATORY EFFECTS

This chapter compares the regulatory and entitlement process currently faced by private land developers (i.e., the “No Action Alternative”) to the new process that would be available under the proposed Solano HCP/NCCP. Regulatory effects are estimated and compared, based on the best available information, in terms of mitigation requirements, permitting time, and regulatory uncertainty. The economic effects of the different regulatory processes are considered in the subsequent chapter.

VERNAL POOLS

NO ACTION ALTERNATIVE

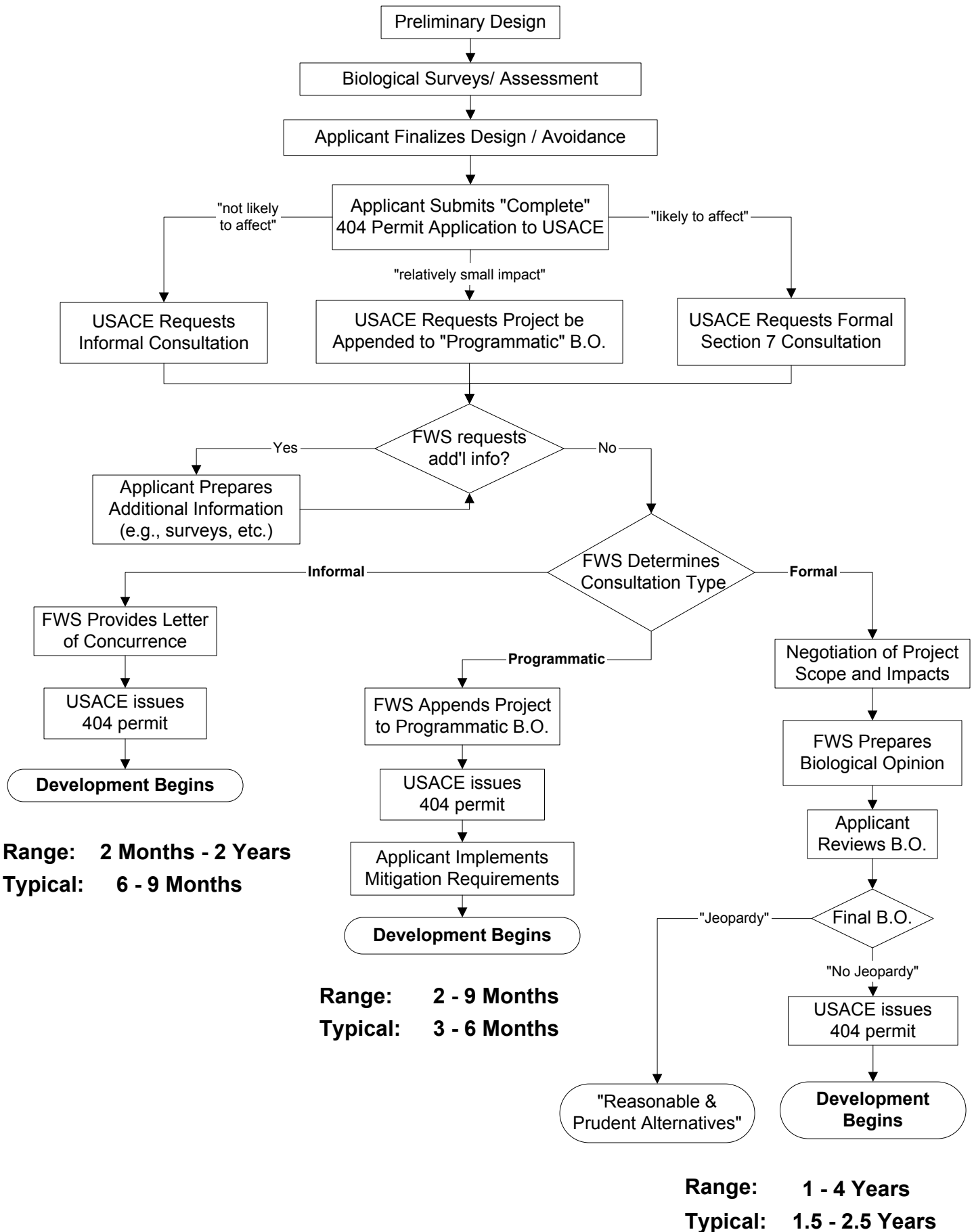
Process and Timing

Vernal pools typically consist of wetland and upland habitat complexes that are regulated by USACE under the Clean Water Act. Development of these jurisdictional “waters of the U.S.” requires approval by the USACE in the form of a 404 permit. Because this permit represents a Federal action, the ESA requires that the USACE initiate a section 7 consultation with the Service if endangered species and/or critical habitat are likely to be affected by the proposed action. The ensuing consultation involves the Service, the USACE, and the project applicant, and the outcome specifies a suite of conservation measures that the applicant must implement to avoid jeopardizing the continued existence of the species or adversely modifying critical habitat. The results of each section 7 consultation are officially recorded by the Service in a Biological Opinion (B.O.), which also provides written approval for “incidental take” of listed species in association with the project.

A schematic flowchart of a “typical” section 7 consultation is shown in **Figure 2**. The right side of the diagram illustrates regulatory steps and timelines associated with “formal” section 7 consultation, which is required when the Service determines that a project is “likely to affect” listed species. The left side of the diagram illustrates regulatory steps typically associated with “informal” section 7 consultation, which results when the Service concurs that a project is “not likely to affect” listed species. Importantly, the Service issued a “Programmatic Biological Opinion” (Programmatic B.O.) in 1996 that addresses certain projects in Solano County with the potential to affect vernal pool species.⁷ That Programmatic B.O. established fixed mitigation and processing requirements for projects that are determined to have “relatively small impacts” to vernal pool species. In practice, project applicants will typically either seek to append their projects to the Programmatic B.O. if they qualify (to streamline and save time) or initiate formal consultation; with the Programmatic B.O. as an option, few applicants pursue the informal consultation route.

⁷ 1996 programmatic consultation on vernal pool crustaceans (1-1-96-F-1).

Figure 2. Current Vernal Pool Regulatory Process (Section 7)



As shown in **Figure 2**, the range and average amount of time to complete a section 7 consultation differ significantly depending on the required regulatory approach. Based on input from LSA Associates and on expected development trends in Solano County, the majority of future development projects are expected to require formal section 7 consultation. This analysis assumes that 75 percent of future projects would require formal consultation and 25 percent would comply with the Programmatic B.O. under the “No Action Alternative.”⁸ As shown, the formal section 7 consultation process for such projects can last anywhere from one to four years, with a “typical” project requiring between 1.5 and 2.5 years to receive joint approval from the Service and the USACE (an average of two years).⁹ Projects that meet the standards of the Programmatic B.O. usually only require a letter of concurrence from the Service, which normally takes between three and six months (an average of 4.5 months). Because the section 7 process typically commences after an applicant has already secured local project approvals (e.g., building permits, CEQA documentation, etc.), these estimated delays would be in addition to the duration of the local approval process.

Mitigation Requirements

The regulatory outcome of the section 7 process is very project-specific, depending largely on the quality of habitat proposed for development and preservation as well as proposed avoidance measures, construction techniques, and a range of other factors. Interviews with Service and USACE staff, developers, and consultants active in Solano County suggest the following “average” consultation outcomes under the “No Action Alternative.” The mitigation ratios summarized below are based on wetland acres; no upland-specific mitigation ratios are currently employed. Mitigation requirements were evaluated for the following three habitat types, with ratios summarized in **Table 5**, below:

- **High-quality vernal pool habitat.** This analysis reviewed historical B.O.s that addressed vernal pool species to estimate likely future mitigation requirements. Only one formal section 7 consultation was identified for private development in Solano County – the North Village Project in Vacaville. According to the April 2004 B.O., the project applicant was required to permanently conserve approximately 73 wetted acres (17.53 acres on-site and 54.15 acres off site) of vernal pool habitat and create about 13.4 acres of vernal pool wetlands as mitigation for conversion of 18.05 acres of vernal pools. These acreages imply mitigation ratios of about 4:1 preservation and 1:1 creation. Mitigation also required preservation of adequate upland habitat to support these vernal pool wetlands.

⁸ While historically, there have been few projects with significant impacts, future development in non-urbanized areas is expected to include an increasing number of large projects with significant impacts.

⁹ The ESA mandates that the Service complete each section 7 consultation in 135 days, from the time the consultation is initiated to the time the final BO is issued; in practice, most consultations exceed this timeframe.

Table 5: Typical Vernal Pool Mitigation Ratios – No Action Alternative

| Habitat Type | Preservation Ratio | Creation Ratio |
|----------------------|--------------------|----------------|
| Seasonal Wetlands* | -- | 2:1 |
| Low Quality Habitat | 2:1 | 1:1 |
| High Quality Habitat | 4:1 | 1:1 |

* Wetlands that do not support Federally listed vernal pool species.

- **Low-quality vernal pool habitat.** Under the “No Action Alternative,” it is assumed that future projects impacting low-quality habitat will qualify for inclusion under the Service’s 1996 Programmatic B.O. for vernal pool crustaceans. Assuming all mitigation occurs at approved mitigation banks, projects processed under this B.O. must mitigate vernal pool impacts at 2:1 preservation and 1:1 creation.
- **Seasonal wetlands.** According to LSA Associates, seasonal wetlands that do not support vernal pool species will be mitigated at an average 2:1 creation ratio under the “No Action Alternative.”

As shown in **Table 6**, a total of 6,640 acres of vernal pool and valley floor grassland habitat is expected to be converted to other uses, including between 290 and 400 wetted acres. Assuming 75 percent of future projects will affect high-quality vernal pool habitat, the resulting mitigation requirements would include construction of between 218 and 300 wetted acres of vernal pools, the preservation of between 757 and 1,044 wetted acres of vernal pools, and the construction of between 145 and 200 wetted acres of seasonal wetlands. This represents a total of between 1,119 and 1,489 wetted acres.

There are no specific upland mitigation requirements under the No Action Alternative, though the wetted acre preservation and creation will only be approved if supported by sufficient uplands preservation. The ultimate number of acres of upland preserved would depend on actual wetland densities, which vary throughout the County. The average wetland density for the likely mitigation banks (including existing vernal pools and potential construction of vernal pools) is expected to be about 25 percent, or three acres of upland for every wetted acre.¹⁰ Under this assumption, a total of between 3,200 and 4,500 acres of uplands will be preserved as part of the wetted-acre preservation, for a total land conservation of between 4,400 and 6,000 acres.¹¹

¹⁰ Personal communication, LSA Associates.

¹¹ It is assumed that 90 percent of created wetlands – both seasonal and vernal pool – will require additional upland acres, while construction of the remaining 10 percent can be incorporated into the design of natural preserved upland/wetland complexes.

Table 6
Vernal Pool Mitigation Summary -- No Action Alternative
Solano HCP/NCCP Economic Evaluation, EPS #13092

| Item | No Action Alternative | |
|--|-----------------------|------------------|
| Estimated Conversion | | |
| Seasonal Wetlands w/o Listed Species (1) | 73 - | 100 |
| <u>VP Wetlands (1)</u> | <u>218</u> - | <u>300</u> |
| Total Wetlands | 290 - | 400 |
| | | |
| <u>VP Upland/Grassland habitat</u> | <u>5,510</u> - | <u>5,400</u> |
| Total VP Wetland/Upland/Grassland | 5,800 | 5,800 |
| | | |
| <u>Historic Ag. Lands w/ VP Habitat (2)</u> | <u>840</u> - | <u>840</u> |
| Total Vernal Pool Habitat Conversion | 6,640 - | 6,640 |
| | | |
| % projects w/ "significant" VP impacts (3) | 75% | |
| Average Mitigation Requirements | | |
| Seasonal Wetlands w/o Listed Species | 2 :1 | creation |
| | | |
| Projects w/ impacts to low value habitat (4) | 2 :1 preservation | |
| | 1 :1 | creation |
| | | |
| Projects w/ significant VP impacts (5) | 4 :1 preservation | |
| | 1 :1 | creation |
| Estimated Conservation | | |
| Seasonal Wetland Creation | 145 - | 200 acres |
| VP Wetland Preservation (6) | 757 - | 1,044 acres |
| <u>VP Wetland Creation</u> | <u>218</u> - | <u>300</u> acres |
| Total Wetland Mitigation | 1,119 - | 1,489 acres |
| | | |
| Associated VP Upland Preservation (7) | 3,248 | 4,481 acres |
| | | |
| Total Conservation | 4,367 | 5,969 acres |

- (1) Assumes between 290 and 400 wetland acres, 25% of which do not support vernal pool species.
- (2) 1,700 acres of historic agricultural lands are projected for conversion. This analysis assumes that 50% of those would actually support VP habitat, and that approximately 98% are uplands (wetland acres are already included in the 290-400 acres summarized above).
- (3) Projects with "significant impacts" are assumed to require formal consultation; others may be appended to the Service's Programmatic Biological Opinion. See report text for further explanation.
- (4) Assumed to be processed by Programmatic Biological Opinion for Vernal Pool Species.
- (5) Mitigation ratios based on North Village Biological Opinion.
- (6) Includes associated upland complexes to support wetted vernal pool acres.
- (7) Assumes 100% of wetland preservation acres and 90% of wetland creation acres will require supporting uplands at a 3:1 upland:wetland ratio.

Source: LSA Associates; Economic & Planning Systems, Inc.

Uncertainty

Significant uncertainty exists in the section 7 process over both the duration of consultation and the ultimate project modifications that will be required. The development community commonly cites these uncertainties as the most problematic aspect of endangered species regulation, making it difficult to secure project financing or gauge project feasibility. The level of uncertainty is difficult to measure quantitatively, however, as the ultimate effect on a developer's willingness or ability to proceed with a project depends on the risk tolerance of the participating individual(s) and/or institution(s). As a surrogate measure of uncertainty, prior USFWS vernal pools analysis has assumed that actual mitigation ratios will vary plus-or-minus 50 percent around the average mitigation ratio, and that a moderately risk averse development community will assume they will have to mitigate at a ratio 16.7 percent above the historical average (one-third of the 50 percent increase above the average).¹² As discussed in **Chapter IV**, uncertainty will therefore cause developers to assume that a project impacting high quality vernal pool habitat will have to mitigate at roughly 4.67:1 preservation and 1.17:1 creation.

SOLANO HCP/NCCP

Process and Timing

If the proposed HCP/NCCP is adopted, the planning area will be divided into zones based on habitat type (e.g., vernal pool, Swainson's Hawk, etc.), with aggregate mitigation ratios assigned to each zone. Future developers will perform targeted biological surveys to provide the implementing agency and the Service with an estimate of the number of acres of each habitat type proposed to be affected by the project. Using the appropriate mitigation ratio for the zone, the implementing agency will require the developer to purchase the appropriate number of mitigation credits from an approved vernal pool mitigation bank. Upon certification of vernal pool credits, the implementing agency will then issue a notice of compliance with the terms and conditions of the HCP/NCCP, which will serve as an incidental take permit for the proposed development.

The regulatory process described above is significantly shorter than the section 7 process (i.e., the "No Action Alternative"). Assuming vernal pool credits are available from private mitigation banks, developers would theoretically be able to secure incidental take permits concurrent with the local development approval process. Because section 7 consultation does not typically begin until the local process is complete, the potential

¹² See "Final Economic Analysis of Critical Habitat Designation for Vernal Pool Species," U.S. Fish & Wildlife Service, July 18, 2003 (CHD Economic Analysis). Most businesses are risk averse. The term risk averse literally refers to concern over the level of risks involved and, when considering business investments, generally refers to the expectation that if an investment involves a higher level of risk there will be a compensating higher return. Land developers are generally considered to be risk averse and will generally discount their willingness to pay for land as uncertainty over their costs and returns increases – the equivalent of assuming an additional cost associated with the uncertainty over mitigation requirements.

time savings to a prospective developer of participating in the proposed HCP/NCCP would be the full duration of the section 7 process. As summarized above, this would be 1.5 to 2.5 years for a “typical” project impacting high quality vernal pool habitat, and 3 to 6 months for a project impacting low quality habitat.

One main factor that significantly affects the net time savings of the proposed HCP/NCCP is the nature of the biological survey component. Under the current section 7 process, the up-front biological survey and project design component can be one of the most time consuming steps in the entire regulatory process. The length of time required to perform surveys under the HCP/NCCP will depend on the quality of habitat proposed for development. Unlike actual section 7 consultation, these surveys can be performed concurrently with the local approval process; to the extent these surveys take longer than the local process, however, the ultimate time savings of the proposed HCP/NCCP would be reduced.¹³

Mitigation Requirements

Though mitigation ratios for the proposed HCP/NCCP have yet to be formally established, this analysis relies on the draft Conservation Measures for Vernal Pool species as described in the Solano HCP/ NCCP Working Draft as indicative of future mitigation under the Plan. As described in draft Vernal Pool Conservation Measure 4.1 and summarized below, vernal pool mitigation under the proposed HCP/NCCP will depend on the quality of the habitat being converted. Proposed mitigation ratios for each habitat type are summarized in **Table 7**.

- **Category 1 Conservation Zone.** Category 1 habitat represents the highest quality vernal pool habitat and includes (a) large tracts of minimally disturbed habitat, (b) smaller tracts of habitat supporting extremely rare (i.e., Contra Costa Goldfields) populations, and (c) essential linkage areas, among others. The majority of the Jepson Prairie and key areas supporting Contra Costa Goldfields are considered Category 1 lands. Required mitigation in Category 1 land is calculated based on total impacts to both vernal pool wetlands and uplands.
- **Category 2 Conservation Zone.** Category 2 lands consist of moderately to highly altered habitat within historic vernal pool grasslands. Though they contain requisite habitat characteristics, Category 2 lands typically do not currently support target species or are inhabited by more common or widespread target species. Vacaville, Fairfield, and the majority of Contra Costa Goldfields “buffer” areas are considered Category 2 lands. The majority of projected urban growth is expected to occur in Category 2 areas. Required mitigation in Category 2 land is calculated based on total impacts to both vernal pool wetlands and uplands.

¹³ High priority vernal pool habitat will likely require one round of seasonal surveys, which can take approximately one year to perform. Medium- and low-priority vernal pool habitat will likely only require wetland delineation surveys, which can take approximately three to four months, including verification by the USACE.

Table 7: Typical Vernal Pool Mitigation Ratios – Proposed HCP/NCCP Alternative

| Habitat Type | Wetland Preservation Ratio | Upland Preservation Ratio | Wetland Creation Ratio |
|---------------|----------------------------|---------------------------|------------------------|
| Category 1 * | 2:1 | 2:1 | 2:1 |
| Category 2 * | 2:1 | 1:1 | 1:1 |
| Category 3 ** | 1:1 | -- | 1:1 |

* Mitigation calculated based on total impacts to wetlands and uplands.

** Mitigation calculated based only on impacts to wetlands.

- **Category 3 Conservation Zone.** Category 3 lands generally consist of small, infill parcels that are surrounded by existing development. Required mitigation in Category 3 land is calculated based only on impacts to vernal pool wetlands.

Based on input from LSA Associates, about 80 percent of the vernal pool land expected to be converted is in the Category 2 Conservation Zone, with about 10 percent each in Category 1 and Category 3 zones. As shown in **Table 8**, the resulting conservation requirements would include the construction of between 320 and 440 wetted acres of vernal pools, the preservation of between 550 and 760 wetted acres of vernal pools, and the preservation of about 6,300 acres of vernal pool uplands. This represents a total of between 870 and 1,200 wetted acres and between 7,270 and 7,440 total acres preserved. This amount of total conservation represents an increase of between 25 and 65 percent compared to the No Action Alternative, primarily related to increased upland preservation.

Uncertainty

The Solano HCP/NCCP will remove most of the uncertainty associated with the application of the Federal and State Endangered Species Acts to land development projects. Some uncertainty may remain if project proponents do not believe Solano HCP/NCCP measures should apply to their projects, or disagree with the Conservation Zone (e.g., Category 1, etc.) that has been applied to their development property. In either case, the applicant may voluntarily assume species presence and/or the highest level of habitat quality in question and mitigate accordingly. This practice would eliminate uncertainty, but would potentially increase ultimate mitigation costs.

Table 8
Vernal Pool Mitigation Summary -- Proposed HCP
Solano HCP/NCCP Economic Evaluation, EPS #13092

| | Proposed HCP / NCCP | |
|--|--------------------------------|--------------------------------------|
| Estimated Conversion | | |
| Seasonal Wetlands w/o Listed Species (1) | 73 | 100 acres |
| <u>VP Wetlands</u> | <u>218</u> | <u>300</u> acres |
| Total Converted Wetlands | 290 | 400 acres |
| | | |
| <u>Upland/Grassland habitat</u> | <u>5,510</u> | <u>5,400</u> acres |
| Subtotal, VP Wetland/Upland Habitat | 5,800 | 5,800 |
| | | |
| <u>Historic Ag. Lands w/ VP Habitat (Upland/Grassland) (1)</u> | <u>840</u> | <u>840</u> |
| Total Converted VP Habitat | 6,640 | 6,640 acres |
| | | |
| Est. new development by habitat zone | 10% | Category 1 |
| | 80% | Category 2 |
| | 10% | Category 3 |
| | | |
| Average Mitigation Requirements (2) | | |
| Category 1 | 2 | :1 upland preservation |
| | 2 | :1 VP preservation |
| | 2 | :1 VP creation matching fee (TBD) |
| | | |
| Category 2 | 1 | :1 upland preservation |
| | 2 | :1 VP preservation |
| | 1 | :1 VP creation matching fee (TBD) |
| | | |
| Category 3 | 0 | :1 upland preservation |
| | 1 | :1 VP preservation |
| | 1 | :1 VP creation |
| | | |
| Estimated Conservation | | |
| VP Wetland Preservation (3) | 551 | 760 acres |
| VP Wetland Creation (4) | 319 | 440 acres |
| <u>VP Upland Preservation (5)</u> | <u>6,350</u> | <u>6,240</u> acres |
| Total Acres | 7,220 | 7,440 acres |

(1) See footnote 2, Table 2.

(2) From Solano HCP/NCCP Working Draft 2.0 (July 2004),

(3) Converted wetland acres distributed among Category 1,2, and 3 zones, and multiplied by corresponding preservation ratio for each zone.

(4) Converted wetland acres distributed among Category 1,2, and 3 zones, and multiplied by corresponding creation ratio for each zone.

(5) Sum of Upland/Grassland and Historic Ag. Land acres, distributed among Category 1, 2, and 3 zones, and multiplied by corresponding preservation ratio for each zone.

Sources: LSA Associates; Economic & Planning Systems, Inc.

Table 8 (con't)
Vernal Pool Mitigation Summary -- Proposed HCP
Solano HCP/NCCP Economic Evaluation, EPS #13092

| | Proposed HCP / NCCP | |
|----------------------------------|--------------------------------|-----------------------|
| Estimated Conservation | | |
| VP Wetland Preservation | 551 | - 760 acres |
| VP Wetland Creation | 319 | - 440 acres |
| <u>VP Upland Preservation</u> | <u>6,350</u> | <u>- 6,240 acres</u> |
| Total Acres | 7,220 | - 7,440 acres |
| Estimated Mitigation Cost | | |
| VP Preservation (1) | \$33,060,000 | - \$45,600,000 |
| VP Creation (2) | \$41,470,000 | - \$57,200,000 |
| <u>Upland preservation (3)</u> | <u>\$31,750,000</u> | <u>- \$31,200,000</u> |
| Total Cost | \$106,280,000 | - \$134,000,000 |
| Cost per Converted Acre | \$16,006 | - \$20,181 |

(1) Per acre cost of \$60,000 for wetland credits only (assumes associated upland habitat is acquired separately).

(2) Per acre cost of \$130,000.

(3) Per acre cost of \$5,000.

Sources: LSA Associates; Economic & Planning Systems, Inc.

VERNAL POOL SUMMARY

Table 9 summarizes the expected time delay and habitat mitigation requirements of the “No Action” and “HCP/NCCP” alternatives. As shown, the proposed Solano HCP/NCCP is expected to result in an average time savings of about 1.5 years, based on a weighted average of the 1.5 to 2.5 years for a “typical” large-scale development project and a three- to six-month time delay for projects with lower impacts. As a result of lower vernal pool preservation ratios, total vernal pool wetland preservation is expected to decrease under the proposed Solano HCP/NCCP versus the “No Action Alternative,” though upland and total preservation would increase. The HCP/NCCP would also implement strategic land acquisition guidelines to create contiguous, connected regional reserve systems.

Table 9: Summary of No Action and HCP/NCCP Alternatives – Vernal Pools

| Measure | No Action Alternative | HCP/NCCP Alternative |
|-------------------------|------------------------------|-----------------------------|
| Time Delay per Project* | 1.5 years | None |
| VP wetland creation | 360 – 500 acres | 320 – 440 acres |
| VP wetland preservation | 760 – 1,000 acres | 550 – 760 acres |
| Upland preservation | 3,200 – 4,500 acres** | 6,200 – 6,400 acres |
| Total | 4,400 – 6,000 acres | 7,200 – 7,400 acres |

* Represents the estimated time delay in addition to the local entitlement process.

** Upland preservation would not be specifically required under the No Action Alternative; these acreages are an estimate of the uplands that would be set aside by mitigation banks to support vernal pool wetland mitigation credits sold to private developers.

In addition to the mitigation described above, habitat impacts in Category 1 and Category 2 land will also be charged a fee to acquire targeted vernal pool habitat. One potential strategy for establishing this fee would be to charge an amount that ensures future development will bear the same total cost burden as current development, taking into account time delay and uncertainty savings under the proposed HCP/NCCP.

Table 10 shows calculations for such a potential strategy. As shown, the total “effective” fee burden under the HCP/NCCP is estimated to be between \$13,000 and \$13,700, including time delay and uncertainty savings. Compared to current cost burdens, this represents a net “savings” of between \$1,400 and \$5,400 per converted acre. The midpoint of the savings of the proposed HCP/NCCP is \$3,384 per converted acre.

Table 10
Net Cost Burden Per Converted Acre -- Vernal Pools
Solano HCP/NCCP Economic Analysis

| Fee Category (per Converted Acre) | Amount | | |
|---|------------------|------------------|------------------|
| | Low | High | Midpoint |
| Calculated HCP Fee | \$16,006 | \$20,181 | \$18,093 |
| Value of HCP Time Savings | (\$600) | (\$3,300) | (\$1,950) |
| <u>Value of HCP Uncertainty Savings</u> | <u>(\$2,403)</u> | <u>(\$3,176)</u> | <u>(\$2,790)</u> |
| Effective Net Cost Burden | \$13,003 | \$13,704 | \$13,354 |
| Existing Cost Burden | \$14,418 | \$19,058 | \$16,738 |
| Net HCP Savings per Converted Acre | \$1,415 | \$5,354 | \$3,384 |

SWAINSON'S HAWK

NO ACTION ALTERNATIVE

Process and Timing

The Swainson's Hawk is listed as a threatened species under the CESA, but is not listed as an endangered or threatened species under the FESA. As a result, conversion of Swainson's Hawk habitat is not regulated by FESA. Two primary State laws regulate impacts to Swainson's Hawk habitat, as described below:

- **California Endangered Species Act.** Incidental take of State-listed species under CESA is primarily regulated by California Department of Fish & Game (DFG) Code 2081. Unlike FESA, however, CESA only address direct take of listed species rather than take and/or adverse habitat modification. Historically, the DFG has only required incidental take permits for direct loss of known Swainson's Hawk nest sites, and most often this regulation has been limited to known occupied nest sites. As a result, CESA has historically regulated Swainson's Hawk habitat conversion in only a small number of cases.
- **California Environmental Quality Act.** CEQA has historically been the primary enforcement mechanism for impacts to Swainson's Hawk habitat. Even so, the degree of enforcement has varied depending on individual lead agencies' tendencies to require mitigation for impacts to unoccupied habitat and/or nesting sites. Under CEQA, each lead agency (most often the Agency issuing development permits – the relevant City or County) has considerable discretion as to whether project impacts are considered "significant," and what measures may be required to reduce impacts to "less than significant."

Under this regulatory framework, applicants with projects in the vicinity of known nests will seek local permit approvals, and will engage local lead agencies through the CEQA process. In the context of preparing a CEQA Initial Study, applicants will identify potential impacts to Swainson's Hawk nests and/or habitat, and the relevant lead agency will determine whether those impacts are potentially "significant" under State law. If so determined, the applicant will further investigate the scale of potential impacts and propose relevant mitigation measures in the draft Environmental Impact Report (EIR) or Negative Declaration. After review and comment by the lead agency, final mitigation measures will be declared in a final EIR or Mitigated Negative Declaration, and the project will be implemented.

The process of complying with CEQA and preparing an EIR, if required, is complex and time consuming. CEQA addresses a range of impacts beyond habitat (e.g., traffic, cultural, noise, historical, etc.), and the length of time required to complete the EIR phase depends entirely on the scale, location, and design of the project. The need to address habitat impacts contributes to this complexity, but CEQA time delay is not solely attributable to the presence of endangered species. While it is likely that having

to address the Swainson's Hawk and negotiate/implement mitigation measures adds to the time it takes to secure local development approvals, insufficient data exists to accurately quantify the scale of this delay. Because the majority of future development projects are expected to be large and require complex EIRs, this analysis assumes that the incremental delay associated with addressing the Swainson's Hawk is negligible from the standpoint of overall project timing.

Mitigation Requirements

Historically, when lead agencies have required Swainson's Hawk mitigation, they have typically relied on the DFG's published draft guidelines for Swainson's Hawk Mitigation.¹⁴ These guidelines recommend various mitigation ratios within distinct radii (e.g., one mile, etc.) of known nesting trees, as summarized in **Table 11**. Although the DFG guidelines establish mitigation ratios as far as 10 miles from known nesting sites, lead agencies in Solano County have very rarely required mitigation for loss of foraging habitat (i.e., habitat located a significant distance from nesting sites). Lead agencies have typically enforced Swainson's Hawk mitigation primarily within the Primary Habitat Zone depicted in Figure 30 of the Working Draft HCP 2.0 (July 2004), which approximately resembles the DFG's 2-mile radius around known nesting sites. Enforcement within this habitat zone has historically been sporadic, though the frequency of lead agency enforcement has appeared to increase in recent years.

Table 11: Swainson's Hawk Mitigation Ratios under the DFG's Draft Guidelines

| Distance from Known Nesting Tree | Mitigation Ratio (Preservation) |
|----------------------------------|---------------------------------|
| Less than 1 mile | 1:1 |
| 1 - 5 miles | 0.75:1 |
| 5 - 10 miles | 0.5:1 |

This analysis investigates several potential outcomes under the "No Action Alternative," reflecting uncertainty over how lead agencies in Solano County will enforce Swainson's Hawk mitigation into the future. The "Low-Enforcement" outcome assumes lead agencies will implement the DFG guidelines in only 25 percent of cases, which is somewhat above historical enforcement levels. The "High-Enforcement" outcome assumes lead agencies will implement DFG guidelines for 75 percent of future projects. Finally, this report analyzes the "Average" enforcement outcome as a mid-point between the Low and High outcomes. In all cases it is assumed lead agencies will only enforce the guidelines for projects within the Primary Habitat Zone.

According to Chapter 6 of the Solano HCP/NCCP Working Draft 2.0, it is expected that approximately 12,150 acres of Swainson's Hawk-compatible agricultural land within the Primary Habitat Zone will be converted over the life of the Plan. Based on existing

¹⁴ "Draft Nonregulatory Guidelines for Determining Appropriate Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California," March 22, 1994.

General Plans and growth projections, LSA Associates estimates that roughly 80 percent of this expected conversion will occur within 1 mile of known sites, with the remaining 20 percent in the 1-5 mile category. As shown in **Table 12**, applying the above mitigation ratios to these conversion estimates yields an estimate that approximately 2,900 acres would be preserved under the “Low Enforcement” outcome, 8,700 acres under the “High Enforcement” outcome, and 5,800 acres under the “Average” outcome.

Uncertainty

As with vernal pool regulation, significant uncertainty exists under the current system over how impacts to Swainson’s Hawk habitat will be regulated, what degree of mitigation will be required, and how these outcomes will affect the timing of the CEQA process. As described above, mitigation outcomes under the No Action Alternative could vary significantly depending on the degree of lead agency enforcement into the future – i.e., whether lead agencies determine Swainson’s Hawk impacts are “significant” in the context of CEQA review. From the perspective of developers engaged in large-scale developments like those projected for Solano County, it is expected that this uncertainty primarily surrounds whether mitigation will be required (and the associated costs) rather than how it might affect the overall project timeline. To the extent that lead agencies exhibit a more consistent enforcement pattern under the No Action Alternative, this perceived uncertainty may decrease over time.

SOLANO HCP/NCCP

Process and Timing

Under the proposed HCP/NCCP, applicants with projects in the Swainson’s Hawk Primary Habitat Zone will be required to mitigate habitat loss through preservation of habitat or payment of a mitigation fee. The implementing agency would use fee revenue to purchase conservation easements and/or provide financial incentives for farmers to manage their agricultural lands in a manner consistent with Swainson’s Hawk conservation goals. Upon certification of mitigation credits and/or payment of the fee, the HCP implementing agency would then issue a notice of compliance with the terms and conditions of the HCP, which would serve as an incidental take permit for the proposed development.

Depending on whether or not the proposed project would have been required to mitigate Swainson’s Hawk habitat impacts in the absence of the proposed Solano HCP/NCCP, the regulatory process described above could be either more or less burdensome than the “No Action Alternative.” The proposed Solano HCP/NCCP is not expected to result in significant time savings over the No Action Alternative – indeed, this analysis determines that addressing the Swainson’s Hawk in the EIR process does not result in significant time delays for the majority of large-scale development projects. The majority of future development projects will still have to prepare relatively complex EIRs following adoption of the proposed Solano HCP/NCCP.

Table 12
Swainson's Hawk Mitigation Summary
Solano HCP/NCCP Economic Evaluation, EPS #13092

| Item | No Action Alternative (1) | | | Proposed HCP/NCCP (2) |
|---|---------------------------|-----------------------|--------------------|-----------------------|
| | Low CEQA Enforcement | High CEQA Enforcement | Average | |
| Estimated Conversion in SH Habitat | | | | |
| Agricultural lands | 6,450 acres | 6,450 acres | 6,450 acres | 6,450 acres |
| <u>Valley floor and VP grasslands</u> | <u>5,700</u> acres | <u>5,700</u> acres | <u>5,700</u> acres | <u>5,700</u> acres |
| Total | 12,150 acres | 12,150 acres | 12,150 acres | 12,150 acres |
| <u>Assumed Distribution of Future Development</u> | | | | |
| < 1 mile from SH nesting sites | 80% | 80% | 80% | 80% |
| 1 - 2 miles from SH nesting sites | 20% | 20% | 20% | 20% |
| 2 - 5 miles from SH nesting sites | 0% | 0% | 0% | 0% |
| 5 - 10 miles from SH nesting sites | 0% | 0% | 0% | 0% |
| Average Mitigation Requirements (Preservation) | | | | |
| <1 mile | 1 :1 | 1 :1 | 1 :1 | -- |
| <2 mile | -- | -- | -- | 1 :1 |
| 1 - 5 mile | 0.75 :1 | 0.75 :1 | 0.75 :1 | -- |
| 5 - 10 mile | 0.5 :1 | 0.5 :1 | 0.5 :1 | -- |
| Assumed CEQA enforcement (1) | 25% | 75% | 50% | 100% |
| Estimated Conservation | | | | |
| Agricultural lands | 1,532 acres | 4,596 acres | 3,064 acres | 6,450 acres |
| <u>Valley floor and VP grasslands</u> | <u>1,354</u> acres | <u>4,061</u> acres | <u>2,708</u> acres | <u>5,700</u> acres |
| Total | 2,886 acres | 8,657 acres | 5,771 acres | 12,150 acres |

(1) Enforcement of Swainson's Hawk mitigation varies based on CEQA lead agency discretion. This analysis posits two "No Action Alternatives" dependent on the level of CEQA enforcement lead agencies in Solano County decide to enact.

(2) According to Chapter 6 of the draft HCP/NCCP, 12,150 acres of habitat will be converted in the Swainson's Hawk primary habitat zone.

Source: LSA Associates; Economic & Planning Systems, Inc.

Required Mitigation

According to Chapter 4 of the Solano HCP/NCCP Working Draft, future impacts to “suitable foraging habitat” within the Primary Habitat Zone will be mitigated at a 1:1 ratio. No mitigation will be required outside the Primary Habitat Zone. Mitigation can be accomplished through preservation of suitable habitat, purchase of mitigation credits at an approved mitigation bank, and/or payment of a mitigation fee. Compared to current enforcement levels (i.e., 1:1 inside 1 mile and 0.75:1 between 1 and 5 miles), the proposed ratio represents a net increase in mitigation for projects in the Primary Habitat Zone. To the extent that lead agencies are not currently enforcing Swainson’s Hawk mitigation, the proposed HCP/NCCP would represent an even larger increase in required mitigation.

As described above, the draft Solano HCP/NCCP estimates that 12,150 acres of suitable Swainson’s Hawk habitat in the Primary Habitat Zone will be converted over the life of the Solano HCP/NCCP. This level of habitat conversion will require preservation of 12,150 acres of habitat, more than double the amount of land preserved under the “Average” No Action Alternative, and a 40 percent increase over the “High Enforcement” outcome.

Uncertainty

The proposed HCP/NCCP would bring a large degree of certainty to a regulatory process that is currently very uncertain. Under the HCP/NCCP, projects within the Primary Habitat Zone, clearly defined on a published map, mitigate at a 1:1 ratio. As in the vernal pool case, it is possible that future applicants within the Primary Habitat Zone would choose to challenge whether their land is characterized as “suitable foraging habitat.” Such a challenge could potentially avoid mitigation costs, but might also reintroduce a level of uncertainty and time delay commensurate with the current process.

SWAINSON’S HAWK SUMMARY

Table 13 summarizes the expected time delay and habitat mitigation requirements of the “No Action” and “HCP/NCCP” alternatives. As shown, the proposed HCP is not expected to result in a significant time savings for “typical” large-scale development projects. As a result of a slightly higher mitigation ratio and more consistent enforcement, the proposed HCP/NCCP is expected to result in the conservation of more than twice as many acres as the “Average” No Action Alternative.

Table 13: Summary of No Action and HCP/NCCP Alternatives—Swainson’s Hawk

| Measure | No Action Alternative | HCP/NCCP Alternative |
|------------------------|------------------------------|-----------------------------|
| Preserved acres | 5,800 acres* | 12,150 acres |
| Time Delay per Project | Insignificant | None |
| Uncertainty | Significant | Minimal |

* Average of “Low CEQA Enforcement” and “High CEQA Enforcement” Scenarios.

IV. ECONOMIC EFFECTS

This chapter considers the potential economic effects of the new regulatory process under the Solano HCP/NCCP. In particular, it considers how the different regulatory process described above might result in impacts on landowners, developers, and potential homeowners. It also considers how the overall level of conservation under the Solano HCP/NCCP could change land availability and land prices. Economic benefits associated with habitat conservation are not evaluated.

POTENTIAL EFFECTS

Environmental land use regulations, like other land use regulations, have the potential to affect land and real estate markets. In the case of the Solano HCP/NCCP, any effects on these markets will be as a result of the regulatory differential between the No Action Alternative and the Solano HCP/NCCP as described in the preceding chapter. The most direct effect of environmental land use regulations is generally on landowners, via impacts on land values. Under some circumstances, environmental land use regulations can limit development or add sufficient development costs to render some developments infeasible, impacting the amount and pricing of new development and affecting both developers and potential property buyers. The parties and manner in which they can be affected are described below.

- **Landowners (Owners of Developable Land).** Additional constraints on the use of land or increases in fees or other payments will make land less appealing to potential land developers. As a result, developers/buyers will generally discount the price of land by the level of the additional fees or the value of the restricted land. Similarly, additional time delays associated with development approvals and permitting will delay the timing of expected returns to land developers. As a result, land developers will reduce their offer for the land by the associated time value loss of money.¹⁵ Finally, higher levels of uncertainty will make land developers more wary of acquiring the land, likely valuing the land at a lower level.
- **Developers** Land developers that already own land at the time of the adoption of the environmental land use regulation will be subject to the same losses as the landowners described above. Developers who do not own land already will likely be able to pass much of the impact of the land use regulation onto the landowner by acquiring land at lower prices. Land prices can, however, be “sticky” downwards, making landowners unwilling to reduce their price expectations as much as the environmental land use regulations may suggest. In these cases, developers who

¹⁵ The time value of money refers to the opportunity cost of holding money over time and not receiving any return. Different actors will evaluate the lost value based on the returns they could expect to receive by investing in alternative projects.

continue to purchase land at or close to the prior prices or that already own the land they intend to develop, will need to be able to accommodate these additional development costs. In most real estate markets, competition is too strong and the number of alternatives too high for individual developers to increase prices in response to increased costs.¹⁶ As a result, developers will need to be able to absorb these cost increases themselves through reduced returns or will refrain from purchasing and developing the land.

- **Potential Real Estate Buyers.** Environmental land use regulation, when applicable to a large area and a large number of projects and significant in nature, can affect the quantity and price of housing in a region. This can occur through two mechanisms. Under the first, as described above, the cost increase is sufficient to make many developments infeasible, resulting in less housing development and as a result, higher prices as available housing becomes more scarce. Under the second, the environmental land use regulation reduces future land and development potential sufficiently to drive up the price of both land and housing.
- **Potential Agricultural Land Buyers.** Agricultural land buyers could also be affected if the environmental regulation results in the removal of a significant proportion of agricultural land from production or provides a market for the conservation value of land that commands higher prices than its value in agricultural use. Under these circumstances, the cost of buying agricultural land would increase, increasing costs to potential land buyers and returns to potential land sellers.
- **Economic Benefits.** Environmental land use regulations can also result in economic benefits, through positive property value impacts on surrounding properties and recreational and existence values, and the provision of a range of ecosystem services.¹⁷ These benefits and their potential incidence are not considered part of this study.

OWNERS OF DEVELOPABLE LAND

Owners of land in the Solano HCP/NCCP planning area that is likely to be developed over the course of the HCP/NCCP will be directly affected by the differential regulatory process, including the different mitigation requirements, different time delays, and different uncertainties. The differential effect on individual landowners will vary depending on the nature of the land they own. Differential mitigation costs, time delays, and uncertainty effects will directly affect land values. The sections below describe the overall effects on land values under the Solano HCP/NCCP versus the No Action Alternative.

¹⁶ The cost increase would need to affect significantly a large number of developers in the regional real estate market to alter the market price.

¹⁷ Existence values refer to the value people associate with the knowledge that habitat and species are being preserved, independent of their use of the land.

VERNAL POOLS

Mitigation Cost

As described above, the No Action Alternative and the Solano HCP/NCCP both have different sets of mitigation ratios and different conservation requirements. Mitigation of vernal pool conversion can occur through the purchase of mitigation bank credits from independent bank operators, through the establishment and funding by developers of preserves along with the other necessary activities, including construction, maintenance and oversight, or through payments to another entity who will take on the mitigation responsibilities. Private mitigation banks are used both under the structure of habitat conservation plans and without them. In either case, the cost of mitigation at private, competitive banks provides the best available market estimate of the cost of vernal pools mitigation.

At the current time, there are relatively few mitigation banks in Solano County. As discussed below, however, a large number of mitigation banks are currently passing through the approval process. Pricing has not yet been set at these banks, though current prices at banks throughout the region, including Sonoma County and Sacramento County, indicate likely pricing of about \$70,000 per wetted acre for vernal pool preservation credits and \$130,000 per wetted acre for vernal pool construction credits at banks in Solano County. Credits associated with seasonal wetlands construction are assumed to cost \$50,000 per wetted acre.¹⁸ These prices cover the cost of any uplands required to support the wetlands. In the case of the Solano HCP/NCCP vernal pool acquisition, vernal pool upland acquisition levels are specified separately from wetland acquisition levels. As a result, it is expected that vernal pool wetted acre preservation credits will be purchased at \$60,000 per acre (with no credit for uplands preservation) and that vernal pools upland credits are purchased separately at \$5,000 per acre.¹⁹

Table 14 shows estimates of the total mitigation cost associated with new development under both alternatives when these cost factors are applied to the respective mitigation ratios. As shown, mitigation costs are estimated to be higher under the No Action Alternative with costs ranging from \$96 million to \$127 million, depending on the footprint of new development. This is equivalent to a range of between \$14,500 and \$19,000 per developed acre. Under the Solano HCP/NCCP costs range from \$106 million to \$134 million. This is equivalent to a range of between \$16,000 and \$20,200 per developed acre, a cost increase of 6 to 11 percent per acre. The mitigation cost increase is primarily due to the higher levels of uplands preservation. Taking the mid-point of the low and high estimates for each alternative, the mitigation cost differential is about \$9.0 million, or about \$1,400 per developed acre.

¹⁸ There is less information available for the price of mitigation credits for these types of wetlands. Credits are assumed to be lower than for the wetted acres with listed species (vernal pools).

¹⁹ This value is based on the estimated fee title cost of purchasing grasslands at \$3,500 per acre plus a 40 percent increment for administrative, management, monitoring, and bank profit.

Table 14
Vernal Pool Mitigation Summary -- No Action Alternative
Solano HCP/NCCP Economic Evaluation, EPS #13092

| Item | No Action Alternative | |
|-----------------------------------|--------------------------|---------------------|
| Estimated Conversion | 6,640 - | 6,640 |
| Estimated Conservation (1) | | |
| Seasonal Wetland Creation | 145 - | 200 acres |
| VP Preservation | 757 - | 1,044 acres |
| <u>VP Creation</u> | <u>218</u> - | <u>300</u> acres |
| Total Wetland Mitigation | 1,119 - | 1,489 acres |
| Associated upland preservation | <u>3,248</u> | <u>4,481</u> acres |
| Total Conservation | 4,367 | 5,969 acres |
| Estimated Mitigation Cost | | |
| Seasonal Wetland Creation (2) | \$14,500,000 - | \$20,000,000 |
| VP Preservation (3) | \$52,958,539 - | \$73,046,260 |
| <u>VP Creation (4)</u> | <u>\$28,275,000</u> - | <u>\$39,000,000</u> |
| Total Cost | \$95,733,539 - | \$126,546,260 |
| Cost per Converted Acre | \$14,418 | \$19,058 |

- (1) See Table 2 for calculations. Upland acreage assumes private mitigation banks achieve 3:1 upland/wetland density.
(2) Per acre cost of \$100,000 (approximately 75% of the cost of vernal pool wetland creation) through private mitigation bank.
(3) Per acre cost of \$70,000 through private mitigation bank.
(4) Per acre cost of \$130,000 through private mitigation bank.

Source: LSA Associates; Economic & Planning Systems, Inc.

Time Delay

Time delay will also vary by project depending on the nature of the land being converted. As described above, on average, projects that impact low-value habitat are expected to save about an average of 4.5 months under the Solano HCP/NCCP, while projects that impact high value habitat are expected to save about 2 years.

The cost impact of this time saving is measured by applying the discount rate to the current value of land, where the discount factor represents the opportunity cost of the financial investment. Land developers generally seek returns of about 12 percent on land development.²⁰ The USFWS CHD Economic Analysis estimated an average, per-acre, raw entitled land cost of \$125,000 in Solano County, which represents the value of an unimproved acre of land that could be developed immediately.²¹ The Solano HCP/NCCP covers 50 years, and for the purposes of this analysis, it is assumed that raw land covered under the plan is 20 years away from development, on average.²² As shown in **Table 15**, this results in a current, average land value estimate of about \$13,000 per acre for land expected to be converted under the plan, assuming a private development discount rate of 12.0 percent.

The time savings under the Solano HCP/NCCP will shorten the average time to development, thereby increasing the current value of the land. For projects that impact low value habitats, this results in a \$600 per-acre saving for a total of about \$1 million. For projects that impact high value habitats, this results in a \$3,300 per-acre savings for a total of about \$16.4 million. The total saving is \$17.4 million and the weighted average saving is about \$2,600 per acre.

Uncertainty

As described above, most of the uncertainty over the mitigation requirements is removed by the establishment of the Solano HCP/NCCP. Under the No Action Alternative conservation requirements and associated mitigation costs are uncertain, potentially lower or higher than the average mitigation requirements. Most land developers will discount land prices due to this uncertainty. For the purposes of this analysis, consistent with the USFWS CHD Economic Analysis, it is assumed that the cost of uncertainty is one-third of the potential incremental cost associated with higher mitigation ratios. As shown in **Table 16**, the cost of uncertainty is estimated at

²⁰ This is consistent with the discount rate applied in the USFWS CHD Economic Analysis. The federal Office of Management and Budget (OMB) requires the application of discount rates of 3 and 7 percent to future inflated-adjusted income streams. In cases where an industry typically uses a different discount rate, such as the land development industry, different discount rates can also be considered.

²¹ See "Final Economic Analysis of Critical Habitat Designation for Vernal Pool Species," U.S. Fish & Wildlife Service, July 18, 2003 (CHD Economic Analysis).

²² Although the plan covers fifty years, a large proportion of the development is expected to have occurred within the next 30 to 40 years. As a result, the average timing of the new development is assumed to be 20 years away.

Table 15
Value of Vernal Pool Time Savings under Solano HCP/ NCCP
Solano HCP/NCCP Economic Evaluation, EPS #13092

| Item | Projects w/ Impacts to Low Value Habitats | Projects w/ Significant VP Impacts | Total |
|---------------------------------------|--|---|---------------------|
| Estimated acres converted (1) | 1,660 | 4,980 | 6,640 |
| Raw Entitled Land Value (2) | \$125,000 /acre | \$125,000 /acre | -- |
| Average Years from Entitlement (3) | 20 | 20 | -- |
| Private development discount rate (4) | 12% | 12% | -- |
| Average Current Land Value (5) | \$13,000 /acre | \$13,000 /acre | -- |
| Average HCP/NCCP time savings (6) | 4.5 months | 24 months | -- |
| Value of Time Saving (7) | \$600 /acre | \$3,300 /acre | \$2,625 /acre |
| Total Value of Time Savings | \$1,000,000 | \$16,430,000 | \$17,430,000 |

(1) See Table 2. Assumes 75 % of projects have "significant" VP impacts.

(2) From USFWS - Final Economic Analysis of Critical Habitat Designation for Vernal Pool Species (July 2003).

(3) Assumes most development covered by the Solano HCP/ NCCP will occur over the next forty years, and that average time to development is 20 years.

(4) Typical land developer discount rate.

(5) Raw entitled land value discounted to average timing of development.

(6) See process and timing discussion in Chapter III. Time savings presented here is an average of estimated time savings.

(7) Value of time saving based on discount rate and current estimated land value.

Source: LSA Associates; Economic & Planning Systems, Inc.

Table 16
Vernal Pool Uncertainty Savings under Solano HCP/ NCCP
Solano HCP/NCCP Economic Evaluation, EPS #13092

| Item | Low | High | Average |
|--|---------------------|---------------------|---------------------|
| Total Conservation Requirement (1) | 4,367 | 5,969 | 5,168 |
| Total Mitigation Cost (2) | \$95,733,539 | \$126,546,260 | \$111,139,900 |
| Average Cost per Conservation Acre | \$21,920 | \$21,200 | \$21,504 |
| Uncertainty Range Assumption +/- (3) | 50% | 50% | 50% |
| Uncertainty Cost (4) | 17% | 17% | 17% |
| Uncertainty Savings associated with Solano HCP/NCCP | \$15,955,590 | \$21,091,043 | \$18,523,317 |
| Converted Acres | 6,640 | 6,640 | 6,640 |
| Uncertainty Savings / Converted Acre | \$2,403 | \$3,176 | \$2,790 |

(1) Under No Action Alternative, see Table 2.

(2) See Table 9.

(3) Assumes that actual mitigation requirements under the No Action Alternative can vary +/- 50% around the average requireme

(4) Assumes developers are risk averse and will discount their willingness to pay for land in situations of regulatory uncertainty.

Specifically, this calculation assumes that developers discount land value by one-third of the 50% uncertainty range (33% * 50% = 17%).

Source: LSA Associates; Economic & Planning Systems, Inc.

17 percent (one-third of 50 percent) of the average mitigation costs, an additional cost of between \$16.0 and \$21.1 million, or an average of \$18.5 million. This represents an additional mitigation cost of approximately \$2,800 per converted acre, on average.

Overall Land Value Impacts

In summary, a number of benefits under the Solano HCP/ NCCP are expected to reduce development costs and increase land values relative to under the No Action Alternative. The proposed Solano HCP/NCCP is expected to result in an overall cost saving of approximately \$27 million, an average of \$4,000 per converted acre. This total cost savings consists of the following components:

- **Mitigation Costs.** An increased cost of \$9.0 million, an average increase of \$1,355 per developed acre under the Solano HCP/ NCCP.
- **Time Delay Savings.** A \$17.4 million savings, about \$2,600 per developed acre, under the Solano HCP/ NCCP.
- **Uncertainty Savings.** An \$18.5 million savings, about \$2,800 per developed acre, under the Solano HCP/ NCCP.

SWAINSON'S HAWK

This section estimates current agricultural land values and likely Swainson's Hawk easement costs to determine the per acre mitigation cost associated with Swainson's Hawk conversion under the Solano HCP/NCCP and the No Action Alternative. These per-acre mitigation costs are then applied to the mitigation requirements under the two alternatives to evaluate the relative mitigation cost impacts. The economic costs of differential time delay and uncertainty are also described.

Swainson's Hawk Easement Cost

Estimates of Swainson's Hawk easement costs follow a four-step approach:

1. Planning level estimates of average per-acre fee title land values,
2. Estimating average per-acre easement values associated with purchasing the development rights of the land,
3. Estimating the per-acre land value associated with the rights to intensify agricultural activities to orchard or vineyard uses, and
4. Adding on a typical, additional cost for other conservation-related costs, including management and monitoring.

Fee Title Land Values

The land value estimates are based on a number of assumptions, including:

- Conservation efforts will focus on agricultural land with Class I and Class II soils that are not currently in uses incompatible with the Swainson's Hawk, such as orchards, vineyards, nurseries, or agricultural processing facilities.
- Conservation efforts will seek larger parcel sizes of over 80 acres as they will tend to be less expensive and have greater conservation value. It is assumed, however, that smaller parcels will also have to be purchased to meet these goals down to 20 acres in size.

Land sales comparables were obtained to determine the current pricing of agricultural land in Solano County. The County Assessor database was searched for records of sales of parcels of over 20 acres, in agricultural use, in the northeastern portion of the County where soils are primarily Class I and Class II, and with minimal improvements. Sales transactions that fit these criteria were obtained going back to 1998. As shown in **Table 17**, prices have increased over the last six years. Between 1998 and 2000, the average sales price for parcels that fit these criteria was about \$2,750 per acre for an average parcel size of 74 acres. By 2001/2002, sales prices had increased to about \$3,900 per acre for an average parcel size of 66 acres, and by 2003/2004 prices averaged \$4,350 per acre for an average parcel size of 76 acres. **Table 18** shows the difference in average land prices per acre between larger and smaller parcels. As shown, the difference is significant with smaller parcels having an average land value of about \$6,400 per acre and larger parcels \$3,200 per acre. Assuming that Swainson's Hawk conservation efforts on agricultural land include a mixture of large and smaller parcels and that there is some continued land price appreciation, a conservative, current estimate of the fee title value of agricultural land is \$5,000 per acre.

A portion of Swainson's Hawk conservation will also occur on grassland, in the Maine Prairie, Jepson Prairie, and Montezuma Hills areas of the County. These areas of the County generally command lower land values, both as their agricultural value is lower and their more isolated locations make development value lower. Early studies of land values in the County found that grasslands in these areas have values of about 70 percent or less of the farmland evaluated.²³ Based on this relationship, the current estimate of the fee title value of agricultural land is \$3,500 per acre.

Swainson's Hawk Easement Value in Solano County

The fee title land values include the development value of the land and the agricultural value of the land. The purchase of a Swainson's Hawk easement will require the acquisition of the development value of the land and a portion of the agricultural land values (i.e., no development will be allowed and only certain agricultural uses will

²³ See Solano County Agricultural Easement Plan, 2001.

Table 17

Northeast Solano County Agricultural Land Transactions, 1998 - 2004
Solano HCP/NCCP Economic Evaluation, EPS #13092

| Sales Date | Lot Size (acres) | Sales Price | Land Value per Acre |
|-----------------------------|---------------------|------------------|------------------------|
| Sales: 2003 - 2004 | | | |
| 4/15/2004 | 26.0 | \$130,000 | \$5,000 |
| 4/30/2004 | 39.0 | \$315,000 | \$8,077 |
| 07/08/2004 | 52.0 | \$257,000 | \$4,942 |
| 1/5/2004 | 157.2 | \$494,000 | \$3,142 |
| 4/23/2004 | 156.0 | \$327,000 | \$2,096 |
| 11/07/2003 | 78.1 | \$323,978 | \$4,151 |
| 10/08/2003 | 66.3 | \$236,555 | \$3,571 |
| 07/28/2003 | 41.0 | \$257,125 | \$6,271 |
| 06/16/2003 | 39.6 | \$395,973 | \$9,997 |
| 07/23/2003 | 31.9 | \$303,408 | \$9,502 |
| 11/4/2003 | 78.0 | \$315,000 | \$4,038 |
| 8/20/2003 | 86.0 | \$380,000 | \$4,419 |
| 12/10/2003 | 111.0 | \$300,000 | \$2,703 |
| 6/19/2003 | 148.5 | \$445,000 | \$2,997 |
| Average | 75.6 | \$328,560 | \$4,346 |
| Average (unweighted) | | | \$5,294 |
| Sales: 2001 - 2002 | | | |
| 12/01/2002 | 65.2 | \$261,175 | \$4,008 |
| 12/12/2002 | 40.3 | \$344,751 | \$8,565 |
| 4/8/2002 | 96.2 | \$300,000 | \$3,118 |
| 06/07/2002 | 28.8 | \$245,505 | \$8,530 |
| 11/8/2001 | 156.9 | \$350,000 | \$2,231 |
| 10/30/01 | 49.6 | \$60,000 | \$1,211 |
| 11/08/01 | 86.5 | \$259,500 | \$3,000 |
| 12/12/01 | 47.5 | \$206,500 | \$4,345 |
| 01/12/01 | 39.7 | \$220,000 | \$5,547 |
| 10/30/01 | 49.6 | \$300,000 | \$6,054 |
| Average | 66.0 | \$254,743 | \$3,859 |
| Average (unweighted) | | | \$4,661 |
| Sales: 1998 - 2000 | | | |
| 08/29/00 | 115.0 | \$264,500 | \$2,300 |
| 08/04/00 | 158.2 | \$425,000 | \$2,687 |
| 12/01/00 | 39.3 | \$290,000 | \$7,387 |
| 01/28/99 | 39.1 | \$125,500 | \$3,211 |
| 08/03/98 | 39.7 | 20,000 | \$504 |
| 04/11/98 | 79.1 | 150,000 | \$1,897 |
| 03/04/98 | 48.2 | 150,000 | \$3,112 |
| Average | 74.1 | \$203,571 | \$2,748 |
| Average (unweighted) | | | \$3,014 |

Source: County Assessor; First American Real Estate Solutions; Economic & Planning Systems, Inc.

Table 18**Northeast Solano County Agricultural Land Transactions, 2003 - 2004
Solano HCP/NCCP Economic Evaluation, EPS #13092**

| Sales Date | Lot Size (acres) | Sales Price (nominal \$\$) | Land Value per Acre (nominal \$\$) |
|-----------------------------|-----------------------------|---------------------------------------|---|
| Less than 75 Acres | | | |
| 4/15/2004 | 26.0 | \$130,000 | \$5,000 |
| 07/23/2003 | 31.9 | \$303,408 | \$9,502 |
| 4/30/2004 | 39.0 | \$315,000 | \$8,077 |
| 06/16/2003 | 39.6 | \$395,973 | \$9,997 |
| 07/28/2003 | 41.0 | \$257,125 | \$6,271 |
| 07/08/2004 | 52.0 | \$257,000 | \$4,942 |
| 10/08/2003 | 66.3 | \$236,555 | \$3,571 |
| Average | 42.3 | \$270,723 | \$6,407 |
| Average (unweighted) | | | \$6,766 |
| More than 75 Acres | | | |
| 11/4/2003 | 78.0 | \$315,000 | \$4,038 |
| 11/07/2003 | 78.1 | \$323,978 | \$4,151 |
| 8/20/2003 | 86.0 | \$380,000 | \$4,419 |
| 12/10/2003 | 111.0 | \$300,000 | \$2,703 |
| 6/19/2003 | 148.5 | \$445,000 | \$2,997 |
| 4/23/2004 | 156.0 | \$327,000 | \$2,096 |
| 1/5/2004 | 157.2 | \$494,000 | \$3,142 |
| Average | 116.4 | \$369,283 | \$3,173 |
| Average (unweighted) | | | \$3,364 |

Source: County Assessor; First American Real Estate Solutions; Economic & Planning Systems, Inc.

be permitted).²⁴ Development value as a proportion of fee title land value will vary based on a number of factors, including zoning, proximity to infrastructure, topography, and site appeal to homebuyers as a development location. The purchase of unrestricted agricultural conservation easement values (purchase of development rights only) throughout the State of California tend to cost between 35 and 75 percent of the fee title land value.²⁵ An average of 60 percent is used for the purposes of this analysis implying an average development value of \$3,000 per acre for the relevant agricultural land.

The remaining land value of about \$2,000 per acre is associated with agricultural values. A Swainson's Hawk easement will limit certain agricultural uses on the land, including orchards, vineyards, nurseries, and agricultural processing facilities. The value of these specific agricultural rights out of the total agricultural value of the land will depend on the nature of the land, the viable agricultural uses on the land, and the state of agricultural markets. The flexibility that comes with maintaining these rights, however, has strong value in the relatively turbulent agricultural market. No research has been able to define this value proportion, though other economic analyses have assumed that 40 percent of agricultural land value is associated with these agricultural rights.²⁶ As a result, the cost of purchasing these agricultural rights is estimated at \$800 per acre.

Overall, the value of the Swainson's Hawk easement is \$3,800 per acre. The cost of the requirement to mitigate for one acre of Swainson's Hawk will, however, also include additional costs, potentially including transaction costs, the cost of monitoring the easement, and the cost of establishing management and defense endowments. These additional costs will vary depending on the circumstances and the division of different costs between the landowner and the easement buyer, though they tend to range from 10 percent to 40 percent.²⁷ For the purposes of this analysis, a 20 percent add-on is assumed for other costs, taking the estimated per-acre easement cost to about \$4,600.

The value of easements on grassland will be different, though the general relationships are expected to be the same. With a fee title value of \$3,500 per acre, the value of the development rights at 60 percent is estimated at \$2,100 per acre. A portion of the agricultural value will be restricted by the easement, estimated at 30 percent, lower than for the agricultural land discussed above due to a lower suitability for use as orchards and vineyards. As a result, an additional \$400 per acre will be included in the easement

²⁴ Absolute exclusions on Swainson's Hawk conservation easements include: 1) crop restrictions (i.e., no orchards, vineyards, cotton, or rice); (2) new construction of buildings; (3) commercial livestock-related industry (e.g., stockyards, poultry, dairy, and swine production); (4) agricultural production facilities (e.g., agricultural good processing plants); and (5) horticultural industry (e.g., commercial flower farms).

²⁵ Per the American Farmland Trust.

²⁶ For example, the recently updated Yolo County habitat mitigation fee uses this assumption concerning these agricultural values.

²⁷ Based on EPS research, including the Sacramento and Yolo County fees described below among others.

value, for a total easement value of about \$2,500 per acre. Similar to the case for agricultural land, about \$800 per acre in other costs are likely to be required, taking the estimated per-acre easement cost to about \$3,300 per acre.

Easement Costs in Other Counties

A number of other counties charge Swainson's Hawk fees. This section describes these efforts to place the Solano County estimates in context.

Yolo County

In 2001, the Yolo County Swainson's Hawk habitat mitigation fee was \$2,509 per developed acre. The fee was intended to allow for a one-to-one, preservation-to-development mitigation ratio, with preservation secured through the purchase of an easement on land. The per-acre fee was the sum of the cost estimates for different cost components of preserving one acre of Swainson's Hawk habitat through time. The largest component, representing about 60 percent of the fee, was the average per-acre cost of purchasing conservation easements, estimated at about \$1,500 per acre, half of the estimated average fee title cost of \$3,000 per acre. The remaining \$1,000, or 40 percent of the fee, was made up of land transaction, habitat enhancement/restoration, administrative, easement monitoring, and land management costs.

In 2004, the Yolo HCP Joint Powers Authority increased the fee to \$4,900 per developed acre. This fee is also intended to allow for a one-to-one, preservation-to-development mitigation ratio, with preservation secured through the purchase of an easement on land. Major changes in the easement value component of the fee resulted from: (1) an estimated increase in per-acre fee title land values from \$3,000 per acre to \$5,000 per acre and (2) the incorporation of the loss of the right of agricultural intensification into the land value estimation. Development value was estimated at 50 percent of fee title value and the value of the agricultural restrictions at 40 percent of the remaining agricultural value. An additional 40 percent was added to the easement costs to cover land transaction, habitat enhancement/restoration, administrative, easement monitoring, and land management costs.

Sacramento County

Sacramento County also charges a Swainson's Hawk mitigation fee, which was recently updated. Up until last year, Sacramento County charged developers \$750 per developed acre in Swainson's Hawk mitigation fees. This fee was established with a 0.5-to-1 preservation ratio in mind, with conservation easements as the preferred land preservation mechanism. The average per-acre fee title land value was estimated at \$3,000 per acre and the average conservation easement at \$1,500 per acre, 50 percent of fee title value. The land mitigation cost per developed acre was \$750 per acre, due to the 0.5 mitigation ratio, and this was the overall mitigation fee. No charge was included for management and operations expenses. The fee ordinance capped the acquisition expenditure of the County at \$1,500 per acre and acquisitions-to-date have benefited from grants from the Wildlife Conservation Board and The Nature Conservancy's willingness to hold and monitor easements at no cost to the County.

In 2003, due to increasing land prices, the limited grant monies available, and the need to start funding management and operations, the County increased the fee to \$2,833 per acre. Of this amount, \$2,500 per acre is allocated for easement acquisition, and an additional \$333 per acre, 13 percent, is allocated to a management and operation endowment. The new fee program also removed its acquisition cost cap and moved away from identifying an across-the-board mitigation ratio.²⁸ The endowment will be given to any agencies that agree to hold and oversee new easement acquisitions.

Natomas Basin

The Natomas Basin Habitat Conservation Plan was originally approved in 1997 and covers 26 species (including the Swainson's Hawk) in a contiguous area that spans parts of the City of Sacramento, unincorporated Sacramento County, and Sutter County. The fee has been revised several times since the plan was approved, currently stands at \$12,270 per acre, and is in the process of being increased to \$16,124 per acre.

Swainson's Hawk Easement Acquisition Challenges

In many of the locations where revenues have been accrued for the purchase of Swainson's Hawk conservation easements, finding willing sellers has been difficult. Many ranchers and farmers are concerned about easements for both known and potential restrictions on their ability to farm. The option of selling easements is often not well known by potential sellers and transaction opportunities are missed. As a result, local jurisdictions, nonprofits, and other entities looking to buy easements have started to adopt additional strategies. These include hiring land brokers and other efforts to market easement programs and inform landowners about their potential benefits. Some entities have sought to purchase land in fee title, avoiding the concerns of current landowners over easements, and then lease or sell the land back to other farmers after placing an easement on the land.

No strategy is guaranteed to work, though a broader program that is open to a range of strategies is more likely to meet its conservation goals. Financially, additional marketing and outreach efforts could add costs to the conservation efforts. The fee title acquisition and lease/ sale of the land could also add some upfronts costs and some additional transactions costs, though all or a portion of the upfront costs would be recouped through the subsequent sale or lease of the land with the easement in place. The proportion of the fee title costs recouped depends on both the proportion of total land value associated with the development rights restricted by the easement at the time of sale as well as the length of time and market movements between fee title purchase and easement sale. The Solano Land Trust has found that in some cases they have been able to recoup all their costs. In these cases, the value of the single remaining homesite entitlement permitted by their easements appreciated significantly or the value of the

²⁸ The \$2,500 easement acquisition cost is mathematically equivalent to a one-to-one mitigation ratio, a \$5,000 per fee title land value, and a 50 percent conservation easement value ratio.

location for wine production appreciated. The subsequent section includes estimates of Swainson's Hawk mitigation costs at the levels estimated above for easements without any adjustments for these other efforts.

Mitigation Costs, Delay, and Uncertainty

Under the Solano HCP/NCCP, developments within a specified area will pay a fee for developing Swainson's Hawk habitat, estimated at about \$4,600 per acre for the relevant agricultural areas and \$3,300 for the relevant valley floor and vernal pool grassland areas. Under the No Action Alternative, as described in the preceding section, land development on potential Swainson's Hawk habitat may be required to mitigate through the EIR process. Historically, most projects have not been required to mitigate, though the numbers are increasing and significant uncertainty remains in terms of what proportion of projects will be required to mitigate. As noted above, for the purposes of this analysis, it is estimated that between 25 percent and 75 percent of land development is expected to be required to mitigate under the No Action Alternative relative to the Solano HCP/NCCP. In addition, mitigations to date have required the set-aside of Swainson's Hawk habitat, equivalent to the payment of the easement cost of the habitat, estimated at \$3,800 per acre in the agricultural land areas and \$2,500 in the grassland areas, and have not required the payment of additional costs.

Table 19 compares the expected mitigation costs under the Solano HCP/NCCP to the range and average mitigation costs under the No Action Alternative. As shown, the total mitigation cost under the Solano HCP/NCCP is about \$48.5 million, \$3,990 per converted acre, while the average mitigation cost under the No Action Alternative is \$18.4 million, \$1,515 per acre. The uncertainty under the No Action Alternative will diminish its cost advantage, with the average cost increasing by \$3.1 million to \$21.5 million, assuming the uncertainty adds one-third of the cost variation.²⁹ The resulting difference is a \$27.0 million mitigation cost/ land value loss under the Solano HCP/NCCP, equivalent to \$2,222 per acre. The Solano HCP/NCCP may also save some time and reduce some preparation costs associated with the project EIR, though these effects are expected to be negligible relative to the mitigation and uncertainty cost differences.

DEVELOPERS

As described above, developers will in many cases be able to pass on the costs of additional environmental land use regulation to landowners. In some cases, however, they may already own the land and in other cases, landowners may not adjust prices downwards. In these cases developers will either need to absorb the additional costs or pass them on to homebuyers or other real estate users. In some cases, development may no longer generate a sufficient return to be undertaken at the given land price.

²⁹ Represents \$18.4 million plus one-third of the \$9.2 million difference between the average cost and the high CEQA enforcement cost.

Table 19
Swainson's Hawk Mitigation Summary
Solano HCP/NCCP Economic Evaluation, EPS #13092

| Item | No Action Alternative | | | Proposed HCP/NCCP |
|--|-----------------------|-----------------------|--------------------|--------------------|
| | Low CEQA Enforcement | High CEQA Enforcement | Average | |
| Estimated Conversion in SH Habitat | | | | |
| Agricultural lands | 6,450 | 6,450 | 6,450 | 6,450 |
| <u>Valley floor and VP grasslands</u> | <u>5,700</u> acres | <u>5,700</u> acres | <u>5,700</u> acres | <u>5,700</u> acres |
| Total | 12,150 | 12,150 | 12,150 | 12,150 |
| Estimated Conservation | | | | |
| Agricultural lands | 1,532 | 4,596 | 3,064 | 6,450 |
| <u>Valley floor and VP grasslands</u> | <u>1,354</u> acres | <u>4,061</u> acres | <u>2,708</u> acres | <u>5,700</u> acres |
| Total | 2,886 | 8,657 | 5,771 | 12,150 |
| Estimated Mitigation Cost | | | | |
| Agricultural land costs (1) | \$5,821,125 | \$17,463,375 | \$11,642,250 | \$24,510,000 |
| Valley floor and VP grassland land costs (2) | \$3,384,375 | \$10,153,125 | \$6,768,750 | \$14,250,000 |
| <u>Other Costs (3)</u> | <u>—</u> | <u>—</u> | <u>—</u> | <u>\$9,720,000</u> |
| Total Cost | \$9,205,500 | \$27,616,500 | \$18,411,000 | \$48,480,000 |
| Cost per Converted Acre | \$758 | \$2,273 | \$1,515 | \$3,990 |

(1) Assumes per acre preservation cost of \$3,800.

(2) Assumes per acre preservation cost of \$2,500.

(3) Other costs include transaction, monitoring, and management costs. Assumes per acre monitoring cost of \$800 under Solanp HCP/ NCCP, and that no additional costs paid under No Action Alternative.

Source: LSA Associates; Economic & Planning Systems, Inc.

The standard methodology for evaluating the effects of the additional “cost burdens” on developers is to consider the overall cost burden faced by developers relative to the market value of the development. The cost burden is defined as the set of development impact fees, special taxes, assessments, conditions of approval, and other charges placed on development to fund a range of public facilities, including water, sewer, school, parks, and open space fees. For residential development, developments can generally accommodate per housing unit cost burdens as high as 15 percent to 20 percent of the unit sales price.³⁰

An evaluation of development impact fees and other charges for public facilities in the cities of Fairfield, Vacaville, Dixon, Suisun City, and Rio Vista in 2003 revealed costs of between \$30,000 and \$50,000 per single-family unit.³¹ A review of new single-family residential projects at the same time in these same cities revealed that new home prices range from roughly \$330,000 to \$470,000.³² As summarized in **Table 20**, these data imply that the current cost burden in these cities ranges from about 8 percent to 11 percent of finished home values. While these cost burdens are high compared to some cities in the San Francisco Bay Area, they do not push cost burdens to the level where development is rendered infeasible.

Total mitigation costs under the No Action Alternative were estimated to range from about \$14,500 to \$19,000 per acre for vernal pools habitat and from \$750 to \$2,300 per acre for Swainson’s Hawk habitat. Assuming an average density of four units per gross acre, this represents an additional cost burden of between \$3,600 and \$4,800 per unit for vernal pools conversion and between \$190 and \$570 per unit for Swainson’s Hawk conversion. As a result, the additional cost burden associated with these mitigation costs is at most 1.4 percent of the average new home (i.e., the “high” vernal pool fee divided by the least expensive home value). These costs push the burden closer to, but not up to, the threshold of concern, except in cases where new development at similar densities is priced at 15 percent below the average price.³³

Under the Solano HCP/NCCP, the mitigation costs would be different. As estimated above, on average, the direct mitigation costs for vernal pool conversion is expected to be slightly higher than under current regulations. On a per-housing-unit basis, the vernal pool mitigation fee is estimated to range from about \$4,000 to \$5,050, which would serve to negatively affect the financial feasibility of future projects based on mitigation costs alone (this comparison does not take into account the cost savings related to time delay and uncertainty considerations). Even so, the maximum estimated

³⁰ These are standard cost burden ratios used by development economists. They were originally developed based on a comparison of costs to market values.

³¹ Impact fees are charged for drainage, sewer and water connection, transportation, parks, public safety, capital facilities, schools, child care, and general administration. Not all cities charge each of these fees.

³² New home market data is taken from product listings on websites of developers active in the listed cities. All prices are for single family units, which range in size from less than 1,000 square feet (SqFt) to over 4,000 SqFt, with an average home size of about 2,400 SqFt.

³³ Homes at the lower end of the price spectrum are less able to bear cost burdens that are levied on a flat, per-unit basis.

Table 20
Cost Burden Summary
Solano HCP/NCCP Economic Evaluation, EPS #13092

| City | Total Impact Fees | Average New Home Price | Current Cost Burden |
|-------------|--------------------------|-------------------------------|----------------------------|
| Fairfield | \$49,000 | \$466,000 | 11% |
| Vacaville | \$37,000 | \$436,000 | 8% |
| Dixon | \$31,000 | \$394,000 | 8% |
| Suisun City | \$35,000 | \$415,000 | 8% |
| Rio Vista | \$34,000 | \$335,000 | 10% |
| Average | \$37,000 | \$409,000 | 9% |

(1) Assumes new development can support a total "fee burden" equal to 15 percent of the home sale price. All values shown are averaged and rounded.

Sources: City planning departments, developer websites, Economic & Planning Systems, Inc.

mitigation fee under the HCP/NCCP represents just 1.5 percent of the lowest average home price in the cities surveyed. Swainson's Hawk mitigation fees are also expected to be higher under the proposed HCP/NCCP, with the maximum fee (about \$1,000 per unit) representing approximately 0.3 percent of the lowest surveyed home price. In the case of both vernal pool and Swainson's Hawk mitigation fees, the net increase in mitigation costs per housing unit under the proposed HCP/NCCP (i.e., the difference between the HCP/NCCP and the No Action alternatives) represents just 0.1 percent of the lowest surveyed home price – an additional cost that is unlikely to affect future development feasibility.

REAL ESTATE BUYERS

Under certain circumstances, environmental land use regulations can affect the pricing of new real estate development, including housing prices and rents and nonresidential lease rates. This will only occur in cases where the regulation affects a large proportion of development in the regional market, either by significantly restricting the amount of developable land or adding significantly to development costs. In these cases, the overall quantity of new development may be reduced, likely increasing prices. As noted above, the development of the Solano HCP/NCCP will change the regulatory process and associated mitigation costs relative to the No Action Alternative. These differences are, however, not significant enough to have a significant impact on the future level of development in the County. As a result, it is highly unlikely that the Solano HCP/NCCP will have a direct impact on real estate prices.

AGRICULTURAL LAND BUYERS

To the extent that the Solano HCP/NCCP increases the number of buyers of agricultural land, it could affect agricultural land prices, making it more challenging for farmers to expand operations if desired.

Vernal pools mitigation under the Solano HCP/NCCP is primarily expected to occur through private mitigation banks. A large number of the likely mitigation banks are already seeking approvals and are expected to cover a large majority of the future demand for mitigation bank credits. In particular, the following potential banks, Gridley (1,800 acres), Muzzy (1,900 acres), North Suisun (612 acres), Burke Ranch (1,290 acres), Campbell Ranch (158 acres), and Fairfield/County of Solano (110 acres), include about 5,900 acres. The Solano HCP/NCCP will likely require mitigation of up to 6,800 acres, including 5,300 acres of uplands. As a result, most of the mitigation-related vernal pools acquisitions have already occurred and future effects on land prices via bank-related acquisitions are likely to be negligible. It should also be noted that, while the development of mitigation banks can be encouraged by the development of HCP/NCCP's, many of these banks would have developed anyway to provide mitigation options for development under the No Action Alternative.

Swainson's Hawk mitigation under the Solano HCP/NCCP is expected to require the preservation of about 12,150 acres of agricultural land within specified agricultural uses. Under the No Action Alternative, the expected conservation varies from 2,900 acres to 8,700 acres, with an average of 5,800 acres. As a result, a net additional 6,400 acres of land will be preserved under the Solano HCP/NCCP over the course of HCP/ NCCP buildout. This additional preservation will reduce agricultural land available for development of new orchards, vineyards, and nurseries among others. At the current time, there are over 100,000 acres of Class I and Class II soils that could potentially support these use changes. As a result, the additional preservation of agricultural land under the Solano HCP/NCCP could restrict uses on about 6 percent of this land over the course of forty to fifty years. Conservatively assuming a 1.0 price elasticity of supply, this 6 percent reduction in available land would increase land prices by 6 percent over forty years, an average increase of 0.15 percent each year, or less than \$10 per acre per year, assuming a current \$5,000 per acre land value.³⁴ To the extent that Swainson's Hawk mitigation is achieved by providing financial incentives to farmers rather than direct land acquisition, this potential price effect would be further reduced.

³⁴ Academic literature is not conclusive on the price effects of a reduction in available land. A 1:1 ratio is very high estimate of potential price effects.