

1 *Note: The following is Section 3.0 disaggregated from Handout#1 discussed at the May*
2 *29, 2009 Terrestrial Subgroup meeting.*

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5 ~~*Note to Reviewers: Please provide comments by page and line number in the comment*~~
6 ~~*form attached to the email accompanying this handout. To allow for distribution of*~~
7 ~~*comments to the Subgroup before the next meeting, please provide your comment form to*~~
8 ~~*SAIC by 12pm Thursday, May 14.*~~

9 **3.0 Species-Specific Biological Objectives and Conservation Measures**

10 **Riparian Brush Rabbit**

11
12
13 ***Problem Statement:** Riparian brush rabbit is currently known only from two locations,*
14 *one of which is in the Planning Area. Reduction and fragmentation of its habitat are*
15 *hypothesized to have contributed to reduction in species abundance and distribution.*
16 *The two remaining known occupied ~~habitat~~ areas are also susceptible to flooding that*
17 *could substantially reduce or extirpate the populations. Avoiding impacts on individuals*
18 *and occupied habitats and increasing the extent of brush rabbit habitat is expected to*
19 *help maintain the existing populations, and increasing the extent of available habitat will*
20 *provide opportunities for the establishment of additional occupied habitat areas, thus*
21 *reducing the potential for extinction.*

22
23 **Objective RIBR1.1:** Increase the extent of riparian brush rabbit habitat near occupied
24 habitats within the Planning Area.

25
26 **Applicable Conservation Measures:** HRCM11 through HRCM14.

27
28 **Objective RIBR1.2:** Avoid mortality of riparian brush rabbit and removal or
29 degradation of occupied habitat associated with implementation of covered activities and
30 conservation measures.

31
32 **Applicable Avoidance and Minimization Measures:** AMM3

33 **Salt Marsh Harvest Mouse**

34
35
36 ***Problem Statement:** Reduction and fragmentation of salt marsh harvest mouse habitat*
37 *and alteration of hydrological conditions supporting habitat is hypothesized to have*
38 *contributed to reduction in species abundance and distribution. Avoiding impacts on*
39 *individuals and increasing the extent of tidal marsh that supports mouse habitat is*
40 *expected to help maintain and increase the species distribution and abundance.*
41 *Restoration of tidal marsh in the west Delta would be expected to maintain or increase*
42 *mouse habitat availability in future years with conversion of freshwater marsh in the west*
43 *Delta to brackish tidal marsh with sea level rise.*

1 **Objective SMHM1.1:** Increase the extent of tidal salt marsh harvest mouse habitat
2 within Suisun Marsh.

3
4 **Applicable Conservation Measures:** HRCM9
5

6 **Objective SMHM1.2:** Restore tidal marsh in portions of the Planning Area that may
7 support salt marsh harvest mouse habitat in future years with sea level rise.

8
9 **Applicable Conservation Measures:** HRCM6
10

11 **Objective SMHM1.3:** Avoid mortality of salt marsh harvest mouse associated with
12 implementation of covered activities and conservation measures.

13 **Applicable Avoidance and Minimization Measures:** AMM4.
14

15 **Suisun Shrew**
16

17 ***Problem Statement:** Reduction and fragmentation of Suisun shrew habitat and
18 alteration of hydrological conditions supporting habitat is hypothesized to have
19 contributed to reduction in species abundance and distribution. Avoiding impacts on
20 individuals and increasing the extent of tidal marsh that supports shrew habitat is
21 expected to help maintain and increase the species distribution and abundance.
22 Restoration of tidal marsh in the west Delta would be expected to maintain or increase
23 shrew habitat availability in future years with conversion of freshwater marsh in the west
24 Delta to brackish tidal marsh with sea level rise.*
25

26 **Objective SUSH1.1:** Increase the extent of tidal Suisun shrew habitat within Suisun
27 Marsh.

28
29 **Applicable Conservation Measures:** HRCM9.
30

31 **Objective SUSH1.2:** Restore tidal marsh in portions of the Planning Area that may
32 support Suisun shrew habitat in future years with sea level rise.

33
34 **Applicable Conservation Measures:** HRCM6.
35

36
37 **Tricolored Blackbird**
38

39 ***Problem Statement:** Reduction and degradation of tricolored blackbird habitat and
40 alteration of hydrological conditions supporting habitat, excessive levels of predation,
41 and human disturbance of nesting colonies are hypothesized to have contributed to
42 reduction in species abundance and distribution. Increasing the extent of tidal marsh
43 and permanent non-tidal emergent marsh, along with ~~and~~ increasing the extent of
44 protected grasslands and ~~and~~ agricultural lands (including idle lands that) that supports*

1 *tricolored blackbird habitat is expected to help maintain and increase the species*
2 *distribution and abundance.*

3
4 **Objective TRBB1.1:** Increase the extent of tricolored blackbird nesting habitat within
5 the Planning Area and Suisun Marsh.

6
7 **Applicable Conservation Measures:** HRCM 4 through HRCM 14.

8
9 **Objective TRBB1.2:** Maintain or increase the extent of protected tricolored blackbird
10 foraging and nesting habitat within the Planning Area and Suisun Marsh.

11
12 **Applicable Conservation Measures:** HRCM15-17 and HRCM 22-24.

13
14
15 **Yellow-breasted Chat**

16
17 ***Problem Statement:*** *Reduction and fragmentation of riparian forest and scrub and nest*
18 *parasitism is hypothesized to have contributed to reduction in species abundance and*
19 *distribution. Increasing the extent of riparian forest and scrub that supports chat habitat*
20 *is expected to help maintain and increase the species distribution and abundance.*

21 *Restoration of riparian forest and scrub in large patches that minimize edge would also*
22 *be expected to reduce the susceptibility of the chat to cowbird nest parasitism.*

23
24 **Objective YBCH1.1:** Increase the extent of yellow-breasted chat nesting habitat within
25 the Planning Area.

26
27 **Applicable Conservation Measures:** HRCM 10 through HRCM 14.

28
29
30 **Western Burrowing Owl**

31
32 ***Problem Statement:*** *Reduction and fragmentation of grassland native western*
33 *burrowing owl habitats and reduction in prey availability are hypothesized to have*
34 *contributed to a reduction in species abundance and distribution. Preserving and*
35 *restoring grassland and agricultural lands that support western burrowing owl in the*
36 *Planning Area is expected to help maintain and increase its distribution and abundance.*

37
38 **Objective BUOW1.1:** Maintain or increase the extent of protected western burrowing
39 owl foraging and breeding habitat within the Planning Area and Suisun Marsh.

40
41 **Other Applicable Conservation Measures:** HRCM15 through 19

42
43 **BUOW CM1: Acquire and manage grassland or agricultural habitats as**
44 **burrowing owl habitat.** Replace occupied breeding and wintering habitat
45 removed or disturbed by covered activities or conservation measures through

1 acquisition and management of grassland and agricultural land habitat to provide
2 suitable nesting and foraging habitat conditions in approved locations within the
3 Planning Area according to DFG guidelines (see Appendix X)~~current at the time~~
4 ~~that BDCP actions are implemented.~~

5
6
7 **Swainson's Hawk**

8
9 ***Problem Statement:** Reduction and fragmentation of native Swainson's hawk nesting
10 and foraging habitats and reduction in prey availability are hypothesized to have
11 contributed to reduction in species abundance and distribution. Increasing the extent of
12 riparian forest that supports Swainson's hawk nesting habitat and maintaining sufficient
13 foraging habitat to support Swainson's hawk in the Planning Area is expected to help
14 maintain and increase the species distribution and abundance.*

15
16 **Objective SWHA1.1:** Increase the extent of Swainson's hawk nesting habitat within the
17 Planning Area that is located within miles of Swainson's hawk foraging habitat.

18
19 **Applicable Conservation Measures:** HRCM11 through HRCM14.

20
21 **Objective SWHA1.2:** Maintain or increase the extent of protected Swainson's hawk
22 foraging habitat within the Planning Area.

23
24 **Applicable Conservation Measures:** HRCM15 through 18

25
26
27 **Greater Sandhill Crane**

28
29 ***Problem Statement:** The area and quality of wintering greater sandhill crane habitat
30 available to support the abundance of cranes that overwinter in the Planning Area are
31 hypothesized to be important factors that govern the degree of overwinter mortality, the
32 successful return of breeding pairs and juveniles to summer breeding ranges, and
33 subsequent breeding success. Maintaining sufficient crane foraging and roosting
34 habitats to support successful overwintering of the crane population is expected to
35 contribute to maintenance and growth of the Central Valley population of greater
36 sandhill cranes.*

37
38 **Objective SACR1.1:** Maintain or increase the extent of protected greater sandhill crane
39 roosting habitat within the Planning Area.

40
41 **Other Applicable Conservation Measures:** HRCM15

42
43 **SACR CM1: Restore roosting habitat.** Replace occupied roosting habitat
44 removed or disturbed BDCP actions through acquisition of and management of
45 agricultural parcels within the greater sandhill crane winter use area approved by
46 DFG with a minimum size of acres. Selection of agricultural parcels will be

1 based on location within the traditional winter range, past and current use,
2 proximity to other use areas, and other factors that will maximize the potential for
3 use and long-term security.

4 ~~Replace occupied roosting habitat removed or disturbed through covered~~
5 ~~activities through acquisition of approved agricultural parcels within the greater~~
6 ~~sandhill crane winter use area with a minimum size of 160~~

7 **Objective SACR1.2:** Maintain or increase the extent of protected greater sandhill crane
8 foraging habitat within the Planning Area.

9
10 **Applicable Conservation Measures:** HRCM15

11
12 **Objective SACR1.3:** Avoid mortality of greater sandhill crane associated with
13 implementation of covered activities and conservation measures.

14
15 **Applicable Avoidance and Minimization Measures:** AMM5.

16
17 **California Black Rail**

18
19 ***Problem Statement:** Reduction and fragmentation of California black rail habitat and*
20 *alteration of hydrological conditions supporting habitat is hypothesized to have*
21 *contributed to reduction in species abundance and distribution. Avoiding impacts on*
22 *individuals and increasing the extent of tidal marsh that supports rail habitat is expected*
23 *to help maintain and increase the species distribution and abundance.*

24
25 **Objective BLRA1.1:** Increase the extent of tidal California black rail habitat within the
26 Planning Area and Suisun Marsh.

27
28 **Applicable Conservation Measures:** HRCM4 through HRCM9

29
30 **Objective BLRA 1.2:** Avoid mortality of California black rail associated with
31 implementation of covered activities and conservation measures.

32
33 **Applicable Avoidance and Minimization Measures:** AMM6.

34
35
36 **California Clapper Rail**

37
38 ***Problem Statement:** Reduction and fragmentation of California clapper rail habitat and*
39 *alteration of hydrological conditions supporting habitat is hypothesized to have*
40 *contributed to reduction in species abundance and distribution. Predation by non-native*
41 *predators (e.g., red fox, feral cats) is also hypothesized to have reduced population*
42 *growth. Avoiding impacts on individuals, increasing the extent of tidal marsh that*
43 *supports rail habitat, and reducing effects of non-native predation is expected to help*
44 *maintain and increase the species distribution and abundance. Restoration of tidal*
45 *marsh in the west Delta would be expected to maintain or increase rail habitat*

1 *availability in future years with conversion of freshwater marsh in the west Delta to*
2 *brackish tidal marsh with sea level rise.*

3
4 **Objective CLRA1.1:** Increase the extent of tidal California clapper rail habitat within
5 Suisun Marsh.

6
7 **Applicable Conservation Measures:** HRCM9

8
9 **Objective CLRA1.2:** Restore tidal marsh in portions of the Planning Area that may
10 support California clapper rail habitat in future years with sea level rise.

11
12 **Applicable Conservation Measures:** HRCM6

13
14 **Objective CLRA1.3:** Avoid mortality of California clapper rail associated with
15 implementation of covered activities and conservation measures.

16
17 **Applicable Avoidance and Minimization Measures:** AMM6.

18
19
20 **Giant garter snake**

21
22 ***Problem Statement:*** *Loss and fragmentation of wetland habitats that historically*
23 *supported giant garter snake is hypothesized to be the primary cause for reductions in the*
24 *abundance and distribution of giant garter snake. Restoration of non-rice agricultural*
25 *lands in the Planning Area that currently support limited giant garter snake habitat to*
26 *tidal marsh and protection and restoration of non-tidal giant garter snake habitat -is*
27 *expected to help maintain and provide the basis for potentially increasing the distribution*
28 *and abundance of giant garter snake in the Planning Area.*

29
30 **Objective GIGS1.1:** Increase the extent of tidal giant garter snake habitat within the
31 Planning Area.

32
33 **Applicable Conservation Measures:** HRCM4 through HRCM8.

34
35 **Objective GIGS1.2:** Maintain or increase the extent of protected non-tidal giant garter
36 snake habitat within the Planning Area and Suisun Marsh.

37
38 **Other Applicable Conservation Measures:** HRCM15 through ~~24~~

39
40 **GIGS CM2:** **Acquire and manage aquatic and adjacent upland habitat as**
41 **giant garter snake habitat.** Replace **each acre of** non-tidal giant garter snake
42 aquatic and adjacent upland habitat temporarily or permanently lost or disturbed
43 by covered activities or conservation measures **with acre(s) of comparable**
44 **habitat according to standard USFWS guidance ~~lines current at the time BDCP~~**
45 **actions are implemented.**

1
2 **Western Spadefoot Toad**

3
4 ***Problem Statement:*** *Loss, degradation, and fragmentation of wetland and upland*
5 *habitats that historically supported western spadefoot toad (foraging, breeding, and*
6 *hibernation habitat) is hypothesized to be the primary cause for reductions in the*
7 *abundance and distribution of western spadefoot toad. Preservation and restoration of*
8 *seasonal wetlands and grasslands is expected to help maintain and provide the basis for*
9 *potentially increasing the distribution and abundance of western spadefoot toad in the*
10 *Planning Area and Suisun Marsh.*

11
12 **Objective SPTO1.1:** Maintain or increase the extent of protected western spadefoot toad
13 breeding and upland habitats within the Planning Area and Suisun Marsh.

14
15 **Applicable Conservation Measures:** HRCM16 through 24

16
17
18
19 **Valley Elderberry Longhorn Beetle**

20
21 ***Problem Statement:*** *Loss and fragmentation of native riparian and savanna*
22 *communities that historically supported the valley elderberry longhorn beetle's host*
23 *plant, the elderberry, is hypothesized to be the primary cause for reductions in the*
24 *abundance and distribution of the beetle. Establishment of elderberry shrub as a*
25 *component of restoration of riparian habitats within the Planning Area is expected to*
26 *help maintain and provide the basis for potentially increasing the distribution and*
27 *abundance of valley elderberry longhorn beetle in the Planning Area.*

28
29 **Objective VELB1.1:** Increase the extent of valley elderberry longhorn beetle habitat
30 within the Planning Area.

31
32 **Applicable Conservation Measures:** HRCM10 through HRCM14.

33
34 **VELB CM1: Compensate for removal of or disturbance to elderberry**
35 **shrubs.** Compensate for impacts to elderberry shrubs from implementation of
36 covered activities and conservation measures according USFWS guidelines
37 ~~current at the time BDCP actions are implemented~~(see Appendix X).

38
39
40 ***Note:*** *the following conservation measures are newly proposed conservation measures*
41 *for the original covered plant species. Conservation measures for the newly adopted*
42 *covered plant species are under preparation.*

43
44 **Fairy Shrimp (Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp,**
45 **Conservancy Fairy Shrimp, Longhorn Fairy Shrimp, and Mid Valley Fairy Shrimp)**

1
2 **Problem Statement:** *Loss and degradation of vernal pool, vernal pool complex,*
3 *alkaline/saline seasonal wetland, and alkaline sink scrub habitats and their watersheds*
4 *that historically supported fairy shrimp is hypothesized to be the primary cause for*
5 *reductions in the abundance and distribution of fairy shrimp. Preservation and*
6 *restoration of vernal pool, vernal pool complex, alkaline/saline seasonal wetland, and*
7 *alkaline sink scrub habitats and their watersheds is expected to help maintain and*
8 *provide the basis for potentially increasing the distribution and abundance of fairy*
9 *shrimp in the Planning Area.*

10
11 **Objective VPFS1.1:** Maintain or increase the extent of protected vernal pool, vernal
12 pool complex, alkaline/saline seasonal wetlands, and alkaline sink scrub habitats that
13 support fairy shrimp within the Planning Area.

14
15 **Applicable Conservation Measures:** HRCM18 through HRCM20.

16
17 **VPFS CM1: Compensate for loss or degradation of occupied fairy shrimp**
18 **habitats.** Replace occupied fairy shrimp habitats removed or degraded by
19 covered activities and conservation measures by restoring comparable habitat at a
20 ratio of █:1 or preserve █ currently unprotected occupied sites of these
21 species for each occupied site removed or degraded by BDCP actions. To
22 the extent determined to be practicable prior to the impact, salvage and relocate
23 surface soils from affected sites to restored habitats.

24
25
26 **Alkali Milkvetch**

27
28 **Problem Statement:** *Loss and degradation of vernal pool, vernal pool complex,*
29 *alkaline/saline seasonal wetland, and alkaline sink scrub habitats and their watersheds*
30 *that historically supported alkali milk-vetch is hypothesized to be the primary cause for*
31 *reductions in the abundance and distribution of alkali milk-vetch. Preservation and*
32 *restoration of vernal pool, vernal pool complex, alkaline/saline seasonal wetland, and*
33 *alkaline sink scrub habitats and their watersheds is expected to help maintain and*
34 *provide the basis for potentially increasing the distribution and abundance of alkali milk-*
35 *vetch in the Planning Area.*

36
37 **Objective ALMV1.1:** Maintain or increase the extent of protected vernal pool, vernal
38 pool complex, alkaline/saline seasonal wetland, and alkali sink scrub habitats that support
39 alkali milk-vetch habitat within the Planning Area and Suisun Marsh.

40
41 **Applicable Conservation Measures:** HRCM18 through HRCM20.

42
43 **ALMV CM1: Compensate for loss or degradation of alkali milk-vetch**
44 **occurrences.** Replace the extent of occupied alkali milk-vetch habitat removed
45 or degraded by covered activities and conservation measures by restoring

1 comparable habitat at a ratio of []:1 or preserve [] currently unprotected
2 occurrences of this species for each occurrence removed or degraded by BDCP
3 actions. To the extent determined to be practicable prior to the impact, salvage
4 and transplant of seeds from the affected site to restored habitats.
5
6

7 **San Joaquin Spearscale**

8
9 ***Problem Statement:*** *Loss and degradation of vernal pool, alkaline/saline seasonal*
10 *wetland, alkaline sink scrub habitats and their watersheds that historically supported San*
11 *Joaquin spearscale is hypothesized to be the primary cause for reductions in the*
12 *abundance and distribution of San Joaquin spearscale. Preservation and restoration of*
13 *alkaline/saline seasonal wetland, and alkaline sink scrub habitats and their watersheds is*
14 *expected to help maintain and provide the basis for potentially increasing the distribution*
15 *and abundance of San Joaquin spearscale in the Planning Area.*
16

17 **Objective SJSP1.1:** Maintain or increase the extent of protected vernal pool,
18 alkaline/saline seasonal wetland, and alkaline sink scrub, habitats that supports San
19 Joaquin spearscale habitat within the Planning Area and Suisun Marsh.
20

21 **Applicable Conservation Measures:** HRCM18 through HRCM20.
22

23 **SJSP CM1: Compensate for loss or degradation of San Joaquin spearscale**
24 **occurrences.** Replace the extent of occupied San Joaquin spearscale habitat
25 removed or degraded by covered activities and conservation measures by
26 restoring comparable habitat at a ratio of []:1 or preserve [] currently
27 unprotected occurrences of this species for each occurrence removed or degraded
28 by BDCP actions. To the extent determined to be practicable prior to the impact,
29 salvage and transplant vegetative propagules of seed from the affected site to
30 restored habitats.
31
32

33 **Soft Bird's-Beak**

34
35 ***Problem Statement:*** *The loss and degradation of high salt marsh and brackish tidal*
36 *marsh habitats is the primary cause for reductions in the abundance and distribution of*
37 *soft bird's-beak. Preservation and restoration of tidal brackish marsh and tidal fresh*
38 *marsh is expected to help maintain and provide the basis for potentially increasing the*
39 *distribution and abundance soft bird's-beak in the Planning Area and Suisun Marsh.*
40

41 **Objective SOBB1.1:** Increase the extent of brackish tidal marsh habitats that could
42 support soft bird's-beak habitat in Suisun Marsh.
43

44 **Applicable Conservation Measures:** HRCM9.
45

1 **Objective SOBB1.2:** Restore tidal marsh in portions of the Planning Area that may
2 support soft bird's-beak habitat in future years with sea level rise.

3
4 **Applicable Conservation Measures:** HRCM6.

5
6 **Objective SOBB1.3:** Avoid take of soft bird's beak associated with implementation of
7 covered activities and conservation measures.

8
9 **Applicable Avoidance and Mitigation Measures:** AMM16.

10
11
12 **Delta Button-Celery**

13
14 ***Problem Statement:** Loss of natural flooding regimes on the San Joaquin River,
15 conversion of alkaline sink scrub habitat to agriculture, and intensive agriculture are
16 hypothesized to be cause for reductions in the abundance and distribution of Delta
17 button-celery. Preservation and restoration of flood plain and alkaline sink scrub habitat
18 is expected to help maintain and provide the basis for potentially increasing the
19 distribution and abundance Delta button-celery in the project area.*

20
21 **Objective DEBC1.1:** Maintain or increase the extent of protected seasonal floodplain
22 and alkaline sink scrub habitats that support habitat for Delta button-celery within the
23 Planning Area.

24
25 **Applicable Conservation Measures:** HRCM1 and HRCM18 through HRCM20.

26
27 **DEBC CM1: Compensate for loss or degradation of delta button-celery**
28 **occurrences.** Replace the extent of occupied delta button-celery habitat removed
29 or degraded by covered activities and conservation measures by restoring
30 comparable habitat at a ratio of :1 or preserve currently unprotected
31 occurrences of this species for each occurrence removed or degraded by BDCP
32 actions. To the extent determined to be practicable prior to the impact, salvage
33 and transplant ~~of vegetative propagules~~ seed from the affected site to restored
34 habitats.

35
36
37 **Delta Tule Pea**

38
39 ***Problem Statement:** Loss and degradation of tidal fresh marsh and tidal brackish
40 marsh habitat that historically supported Delta tule pea is hypothesized to be the primary
41 cause for reductions in the abundance and distribution of Delta tule pea. Preservation
42 and restoration of fresh tidal marsh, brackish tidal marsh, and channel bank habitat is
43 expected to help maintain and provide the basis for potentially increasing the distribution
44 and abundance of Delta tule pea in the Planning Area and Suisun Marsh.*

45

1 **Objective DETP1.1:** Increase the extent of delta tule pea habitat within the Planning
2 Area and Suisun Marsh.

3
4 **Applicable Habitat Restoration Conservation Measures:** HRCM3 through
5 HRCM10.

6
7 **DETP CM1: Compensate for loss or degradation of delta tule pea and**
8 **Suisun Marsh aster occurrences.** Replace occupied delta tule pea and Suisun
9 marsh aster habitat removed or degraded by covered activities and conservation
10 measures by restoring comparable habitat at a ratio of []:1 or preserve []
11 currently unprotected occurrences of these species for each occurrence removed
12 or degraded by BDCP actions. To the extent determined to be practicable prior to
13 the impact, salvage and transplant ~~vegetative propagules of~~ seed from the affected
14 site to restored habitats.

15
16
17
18 **Legenere**

19
20 ***Problem Statement:*** *Loss and degradation of vernal pool, vernal pool complex,*
21 *alkaline/saline seasonal wetland, and alkaline sink scrub habitats and their watersheds*
22 *that historically supported legenere is hypothesized to be the primary cause for*
23 *reductions in the abundance and distribution of legenere. Preservation and restoration*
24 *of vernal pool, vernal pool complex, alkaline/saline seasonal wetland, and alkaline sink*
25 *scrub habitats and their watersheds is expected to help maintain and provide the basis*
26 *for potentially increasing the distribution and abundance of legenere in the Planning*
27 *Area.*

28
29 **Objective LEGE1.1:** Maintain or increase the extent of protected vernal pool,
30 alkaline/saline seasonal wetland, and alkaline sink scrub habitats that supports legenere
31 habitat within the Planning Area.

32
33 **Applicable Conservation Measures:** HRCM18 through HRCM20.

34
35 **LEGE CM1: Compensate for loss or degradation of legenere occurrences.**
36 Replace the extent of occupied legenere habitat removed or degraded by covered
37 activities and conservation measures by restoring comparable habitat at a ratio of
38 []:1 or preserve [] currently unprotected occurrences of this species for each
39 occurrence removed or degraded by BDCP actions. To the extent determined to
40 be practicable prior to the impact, salvage and transplant ~~vegetative propagules of~~
41 seed from the affected site to restored habitats.

42
43
44 **Heckard's Peppergrass**

1 **Problem Statement:** *Loss and degradation of vernal pool, vernal pool complex,*
2 *alkaline/saline seasonal wetland, and alkaline sink scrub habitats and their watersheds*
3 *that historically supported Heckard's peppergrass is hypothesized to be the primary cause*
4 *for reductions in the abundance and distribution of Heckard's peppergrass. Preservation*
5 *and restoration of vernal pool, vernal pool complex, alkaline/saline seasonal wetland,*
6 *and alkaline sink scrub habitats and their watersheds is expected to help maintain and*
7 *provide the basis for potentially increasing the distribution and abundance of Heckard's*
8 *peppergrass in the Planning Area.*

9
10 **Objective HEPE1.1:** Maintain or increase the extent of protected vernal pool, vernal
11 swale, alkali meadow, and alkali sink habitats that support Heckard's peppergrass habitat
12 within the Planning Area.

13
14 **Applicable Conservation Measures:** HRCM18 through HRCM20.

15
16 **HEPE CM1: Compensate for loss or degradation of Heckard's peppergrass**
17 **occurrences.** Replace the extent of occupied Heckard's peppergrass habitat
18 removed or degraded by covered activities and conservation measures by
19 restoring comparable habitat at a ratio of :1 or preserve currently
20 unprotected occurrences of this species for each occurrence removed or degraded
21 by BDCP actions. To the extent determined to be practicable prior to the impact,
22 salvage and transplant ~~vegetative propagules of seed~~ from the affected site to
23 restored habitats.

24
25
26 **Delta Mudwort**

27
28 **Problem Statement:** *Loss and degradation of mud bank habitat and the hydrology and*
29 *disturbance factors that created mud bank habitat that historically supported Delta*
30 *mudwort is hypothesized to be the primary cause for reductions in the abundance and*
31 *distribution of mudwort. Preservation and restoration of fresh tidal marsh and channel*
32 *bank habitat is expected to help maintain and provide the basis for potentially increasing*
33 *the distribution and abundance of mudwort in the Planning Area.*

34
35 **Objective DEMW1.1:** Increase the extent of delta mudwort habitat within the Planning
36 Area.

37
38 **Applicable Conservation Measures:** HRCM2 through HRCM8, HRCM10,
39 HRCM12, and HRCM13.

40
41 **DEMW CM1: Compensate for loss or degradation of delta mudwort and**
42 **Mason's lilaepsis occurrences.** Replace occupied delta mudwort and Mason's
43 lilaepsis habitat removed or degraded by covered activities and conservation
44 measures by restoring comparable habitat at a ratio of :1 or preserve
45 currently unprotected occurrences of these species for each occurrence removed

1 or degraded by BDCP actions. —To the extent determined to be practicable prior
2 to the impact, salvage and transplant ~~vegetative propagules of seed~~ from the
3 affected site to restored habitats.
4
5

6 **Mason's Lilaepsis**

7
8 ***Problem Statement:*** Loss and degradation of mud bank habitat and the hydrology and
9 disturbance factors that created mud bank habitat that historically supported Mason's
10 lilaepsis is hypothesized to be the primary cause for reductions in the abundance and
11 distribution of Mason's lilaepsis. Preservation and restoration of fresh tidal marsh,
12 brackish tidal marsh, and channel bank habitat is expected to help maintain and provide
13 the basis for potentially increasing the distribution and abundance of Mason's lilaepsis
14 in the Planning Area and Suisun Marsh.
15

16 **Objective MALI1.1:** Increase the extent of Mason's lilaepsis habitat within the
17 Planning Area and Suisun Marsh.
18

19 **Applicable Conservation Measures:** HRCM2 through HRCM9, HRCM10,
20 HRCM12, HRCM13, and DEMW CM1.
21
22

23 **Suisun Marsh Aster**

24
25 ***Problem Statement:*** Loss and degradation of riparian, tidal fresh marsh, and tidal
26 brackish marsh habitat that historically supported Suisun Marsh aster is hypothesized to
27 be the primary cause for reductions in the abundance and distribution of Suisun Marsh
28 aster. Preservation and restoration of fresh tidal marsh, brackish tidal marsh, and
29 channel bank habitat is expected to help maintain and provide the basis for potentially
30 increasing the distribution and abundance of Suisun Marsh aster in the Planning Area
31 and Suisun Marsh.
32

33 **Objective SUMA1.1** Increase the extent of Suisun Marsh aster habitat within the
34 Planning Area and Suisun Marsh.
35

36 **Applicable Habitat Restoration Conservation Measures:** HRCM3 through
37 HRCM11, HRCM14, HRCM24, and DETP CM1.