2023 ANNUAL REPORT
FORMER FORT ORD SITE 39 HABITAT RESTORATION
CONTRACT NO. W91238-18-D-0007
TASK ORDER W9123822F0026

FORMER FORT ORD

Prepared for:
US Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Prepared by:
Burleson Consulting Inc., A Terracon Company
1900 Garden Road, Suite 210
Monterey, CA 93940

BURLESON CONSULTING INC.
A Terracon Company

April 2024

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ACRONYMS AND ABBREVIATIONS

2022 Annual Report	2022 Habitat Restoration Annual Report
Army	US Department of the Army
AMP	Adaptive Management Plan
BRAC	Base Realignment and Closure
Burleson	Burleson Consulting Inc., A Terracon Company
BMP	Best Management Practice
CDFA	California Department of Food and Agriculture
Kemron	Kemron Environmental Services, Inc.
HA	Historic Area
HA 27A North	Northern polygons located at HA 27A
HA 27A South	Southern polygon located at HA 27A
HMP	Habitat Management Plan
HRP	Habitat Restoration Plan
lb	Pound
Monitoring Protocol	Protocol for Conducting Vegetation Monitoring in Compliance with the Installation-Wide Multispecies Habitat Management Plan at Former Fort Ord
NA	Not Applicable
NF	Native Forb (Annual Herbs/Forbs)
NNF	Non-Native Forb
NNP	Non-Native Perennial (Shrubs and Perennial Herbs/Forbs)
NP	Native Perennial
Propagation Protocol	Site 39 Plant Material Collection, Storage, and Propagation Protocols
PWS	Performance Work Statement
Site 39	Site 39 Inland Ranges
SSRP	Site Specific Restoration Plan
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service
UXO	Unexploded Ordnance
°F	Degrees Fahrenheit

SPECIES LIST AND CODES

Scientific Name	Common Name	Code	Category
Acacia sp.	acacia	AC	NNP
Achillea millefolium	common yarrow	ACMI	NP
Acmispon americanus var. americanus	Spanish clover	ACAMA	NF
Acmispon glaber	deerweed	ACGL	NP
Acmispon heermannii var. orbicularis	Heermann's lotus	ACHEO	NP
Acmispon parviflorus	hill lotus	ACPA	NF
Acmispon strigosus	Bishop's lotus	ACST	NF
Acmispon wrangelianus	Chile lotus	ACWR	NF
Adenostoma fasciculatum	chamise	ADFA	NP
Agoseris apargioides	coast dandelion	AGAP	NP
Agoseris grandiflora	large-flowered agoseris	AGGR	NP
Agoseris heterophylla var. cryptopleura	California annual agoseris	AGHEC	NF
Agoseris sp.	agoseris	AG	
Agrostis avenacea	Pacific bent grass	AGAV	NNP
Agrostis exarata	spike bent grass	AGEX	NP
Agrostis hallii	Hall's bent grass	AGHA	NP
Agrostis pallens	leafy bent grass	AGPA	NP
Aira caryophyllea	silver hair grass	AICA	NNF
Amsinckia intermedia	common fiddleneck	AMIN	NF
Amsinckia spectabilis var. spectabilis	Seaside fiddleneck	AMSPS	NF
Anaphalis margaritacea	pearly everlasting	ANMA	NP
Aphanes occidentalis	Western lady's mantle	APOC	NF
Aphyllon sp.	broomrape	AP	NP
Arbutus menziesii	Pacific madrone	ARME	NP
*Arctostaphylos hookeri**	Hooker's manzanita	ARHO	NP
*Arctostaphylos montereyensis**	Monterey manzanita	ARMO	NP
*Arctostaphylos pumila**	sandmat manzanita	ARPU	NP
Arctostaphylos tomentosa	shaggy-bark manzanita	ARTO	NP
Artemisia californica	California sagebrush	ARCA	NP
Artemisia douglasiana	mugwort	ARDO	NP
Artemisia pycnocephala	coastal sagewort	ARPY	NP
Asteraceae sp.	daisy species	AS	
Atriplex semibaccata	Australian saltbush	ATSE	NNP
Avena barbata	slender wild oat	AVBA	NNF
Avena fatua	wild oat	AVFA	NNF
Avena sp.	wild oat	AV	NNF
Baccharis glutinosa	salt marsh baccharis	BAGL	NP
Baccharis pilularis	coyote brush	BAPI	NP
Baccharis salicifolia	mule fat	BASA4	NP
Bowlesia incana	hoary bowlesia	BOIN3	NF

Scientific Name	Common Name	Code	Category
Brassica nigra	black mustard	BRNI	NNF
Briza maxima	rattlesnake grass	BRMA	NNF
Briza minor	small quaking grass	BRMI	NNF
Brodiaea terrestris ssp. terrestris	dwarf brodiaea	BRTET	NP
Bromus carinatus	California brome	BRCA	NF
Bromus diandrus	ripgut brome	BRDI	NNF
Bromus hordeaceus	soft chess	BRHO	NNF
Bromus madritensis ssp. rubens	foxtail chess	BRMAR	NNF
Calandrinia breweri	Brewer's redmaids	CABR3	NF
Calandrinia menziesii	red maids	CAME	NF
Callitriche heterophylla	water starwort	CAHE3	NP
Calochortus albus	white globe lily	CAAL	NP
Calyptridium monandrum	common pussypaws	CAMO	NF
Camissonia contorta	contorted primrose	CACO	NF
Camissonia strigulosa	sandysoil suncup	CAST20	NF
Camissoniopsis cheiranthifolia	beach evening primrose	CACH	NP
Camissoniopsis micrantha	small primrose	CAMI	NF
Cardionema ramosissimum	sand mat	CARA	NP
Carduus pycnocephalus ssp. pycnocephalus	Italian thistle	CAPYP	NNF
Carex barbarae	Santa Barbara sedge	CABA	NP
Carex brevicaulis	short stem sedge	CABR8	NP
Carex globosa	round-fruited sedge	CAGL	NP
Carex praegracilis	clustered field sedge	CAPR	NP
Carex sp.	sedge	CA	NP
Carex tumulicola	foothill sedge	CATU	NP
Carpobrotus edulis	hottentot fig	CAED	NNP
Castilleja affinis	coast paint-brush	CAAF	NP
Castilleja ambigua ssp. ambigua	Johnny nip	CAAMA3	NF
Castilleja attenuata	narrow leaved owl's clover	CAAT	NF
Castilleja densiflora	owl's clover	CADE	NF
Castilleja exserta ssp. exserta	purple owl's-clover	CAEX	NF
Castilleja foliolosa	woolly indian paintbrush	CAFO2	NP
Ceanothus dentatus	dwarf ceanothus	CEDE	NP
*Ceanothus rigidus**	Monterey ceanothus	CERI	NP
Ceanothus thyrsiflorus	blueblossom	CETH	NP
Ceanothus thyrsiflorus var. griseus	Carmel ceanothus	CETHG	NP
Centaurea melitensis	tocalote	CEME	NNF
Cerastium glomeratum	sticky mouse-ear chickweed	CEGL	NNF
Chenopodium californicum	California goosefoot	CHCA	NP
Chlorogalum pomeridianum	wavyleaf soap plant	CHPO	NP
Chorizanthe diffusa	diffuse spineflower	CHDI	NF
Chorizanthe douglasii	Douglas's spineflower	CHDO	NF

Scientific Name	Common Name	Code	Category
*Chorizanthe pungens var. pungens**	Monterey spineflower	CHPUP	NF
Cirsium occidentale	cobwebby thistle	CIOC	NP
Cirsium occidentale var. candidissimum	snowy thistle	CIOCC	NP
Cirsium sp.	thistle	CI	
Cirsium vulgare	bull thistle	CIVU	NNP
Cistus incanus	rock-rose	CIIN	NNP
Clarkia lewisii	Lewis' clarkia	CLLE	NF
Clarkia purpurea ssp. quadrivulnera	winecup clarkia	CLPUQ	NF
Clarkia sp.	clarkia	CL	NF
Clarkia unguiculata	elegant clarkia	CLUN	NF
Claytonia parviflora	narrow leaved miner's lettuce	CLPA	NF
Claytonia perfoliata	miner's lettuce	CLPE	NF
Clinopodium douglasii	yerba buena	CLDO	NP
Collinsia heterophylla var. heterophylla	Chinese-houses	COHEH	NF
Conicosia pugioniformis	narrowleaf iceplant	COPU	NNP
Conium maculatum	poison hemlock	COMA	NNP
*Cordylanthus rigidus ssp. littoralis**	seaside bird's-beak	CORIL	NF
Corethrogyne filaginifolia	common sandaster	COFI	NP
Cortaderia jubata	jubata grass	COJU	NNP
Crassula aquatica	water pygmy-weed	CRAQ	NF
Crassula connata	pygmy-weed	CRCO	NF
Crassula tillaea	moss pygmy-weed	CRTI	NNF
Crocanthemum scoparium	peak rush-rose	CRSC	NP
Croton californicus	California croton	CRCA	NP
Cryptantha clevelandii	Cleveland's cryptantha	CRCL	NF
Cryptantha intermedia	common cryptantha	CRIN	NF
Cryptantha intermedia var. intermedia	common cryptantha	CRINI	NF
Cryptantha micromeres	minute-flowered cryptantha	CRMI	NF
Cryptantha sp.	cryptantha	CR	NF
Cyperus eragrostis	tall cyperus	CYER	NP
Danthonia californica	California oat grass	DACA	NP
Daucus pusillus	wild carrot	DAPU	NF
Deinandra corymbosa	coastal tarweed	DECO	NF
Deschampsia danthonioides	annual hairgrass	DEDA	NF
Delphinium hutchinsoniae	Hutchinson's larkspur	DEHU	NP
Dichelostemma capitatum	blue dicks	DICA	NP
Diplacus aurantiacus	sticky monkeyflower	DIAU	NP
Distichlis spicata	salt grass	DISP	NP
Dittrichia graveolens	stinkwort	DIGR3	NNF
Drymocallis glandulosa var. wrangelliana	sticky cinquefoil	DRGLW	NP
Dudleya farinosa	bluff lettuce	DUFA	NP
Elatine californica	California waterwort	ELCA	NF

Scientific Name	Common Name	Code	Category
Eleocharis acicularis	needle spikerush	ELAC	NP
Eleocharis macrostachya	spike rush	ELMA	NP
Elymus condensatus	giant wild-rye	ELCO	NP
Elymus glaucus	blue wild-rye	ELGL	NP
Elymus triticoides	beardless wild rye	ELTR	NP
Epilobium ciliatum	fringed willowherb	EPCI	NF
Eriastrum virgatum	virgate eriastrum	ERVI	NF
Ericameria ericoides	mock heather	ERER	NP
*Ericameria fasciculata**	Eastwood's goldenbush	ERFA	NP
Erigeron canadensis	horseweed	ERCA	NF
Eriodictyon californicum	yerba santa	ERCA6	NP
Eriogonum nudum	naked buckwheat	ERNU	NP
Eriophyllum confertiflorum	golden yarrow	ERCO	NP
Erodium botrys	long-beaked filaree	ERBO	NNF
Erodium cicutarium	red-stemmed filaree	ERCI	NNF
*Erysimum ammophilum**	coast wallflower	ERAM	NP
Eschscholzia californica	California poppy	ESCA	NF
Eurybia radulina	roughleaf aster	EURA	NP
Euthamia occidentalis	western goldenrod	EUOC	NP
Festuca bromoides	brome fescue	FEBR	NNF
Festuca myuros	rattail sixweeks grass	FEMY	NNF
Festuca octoflora	sixweeks grass	FEOC	NF
Festuca perennis	Italian rye grass	FEPE	NNF
Frangula californica	California coffeeberry	FRCA	NP
Fritillaria affinis	checker lily	FRAF2	NF
Galium andrewsii	phlox-leaved bedstraw	GAAN	NP
Galium angustifolium	narrowly leaved bedstraw	GAAN2	NP
Galium aparine	goose grass	GAAP	NF
Galium californicum	California bedstraw	GACA	NP
Galium porrigens	climbing bedstraw	GAPO	NF
Galium porrigens var. porrigens	climbing bedstraw	GAPOP	NP
Gallium nuttallii	climbing bedstraw	GANU	NP
Gamochaeta ustulata	purple cudweed	GAUS	NP
Garrya elliptica	coast silk tassel	GAEL	NP
Gastridium phleoides	nit grass	GAPH	NNF
Genista monspessulana	French broom	GEMO	NNP
Geranium dissectum	cut-leaved geranium	GEDI	NNF
*Gilia tenuiflora ssp. arenaria**	sand gilia	GITEA	NF
Githopsis specularioides	common bluecup	GISP	NF
Gnaphalium palustre	lowland cudweed	GNPA	NF
Heliotropium curassavicum var. oculatum	seaside heliotrope	HECUO	NP
Hesperocyparis macrocarpa	Monterey cypress	HEMA22	NP

Scientific Name	Common Name	Code	Category
Heteromeles arbutifolia	toyon	HEAR	NP
Heterotheca grandiflora	telegraph weed	HEGR	NF
Hordeum brachyantherum	meadow barley	HOBR	NP
Hordeum sp.	sterile barley	HO	NNF
Horkelia cuneata	wedge-leaved horkelia	HOCU	NP
Horkelia cuneata var. cuneata	wedge-leaved horkelia	HOCUC	NP
Hypochaeris glabra	smooth cat's ear	HYGL	NNF
Hypochaeris radicata	rough cat's ear	HYRA	NNP
Iris douglasiana	douglas iris	IRDO	NF
Isocoma menziesii var. vernonioides	Menzies' goldenbush	ISMEV	NP
Isoetes howellii	Howell's quillwort	ISHO	NF
Juncus balticus ssp. ater	baltic rush	JUBAA	NP
Juncus bufonius	toad rush	JUBU	NF
Juncus bufonius var. bufonius	common toad rush	JUBUB	NF
Juncus bufonius var. congestus	clustered toad rush	JUBUC2	NF
Juncus bufonius var. occidentalis	western toad rush	JUBUO	NP
Juncus capitatus	Dwarf rush	JUCA	NNF
Juncus occidentalis	western rush	JUOC	NP
Juncus patens	spreading rush	JUPA	NP
Juncus phaeocephalus	brown-headed rush	JUPH	NP
Juncus sp.	rush	JU	
Koeleria macrantha	june grass	KOMA	NP
Lastarriaea coriacea	leather spineflower	LACO	NF
Lasthenia glaberrima	smooth goldfields	LAGL3	NF
Lasthenia gracilis	common goldfields	LAGR	NF
Lathyrus angulatus	angled pea vine	LAAN	NNP
Layia platyglossa	tidy-tips	LAPL	NF
Lepechinia calycina	pitcher sage	LECA	NP
Lessingia pectinata	common lessingia	LEPE	NF
Logfia filaginoides	California cottonrose	LOFI	NF
Logfia gallica	daggerleaf cottonrose	LOGA	NNF
Logfia sp.	cottonrose	LO	
Lomatium parvifolium	coastal biscuitroot	LOPA	NP
Lupinus arboreus	yellow bush lupine	LUAR	NP
Lupinus bicolor	miniature lupine	LUBI	NF
Lupinus chamissonis/albifrons	silver bush lupine	LUCH/LUAL	NP
Lupinus concinnus	bajada lupine	LUCO	NF
Lupinus nanus	sky lupine	LUNA	NF
Lupinus truncatus	Nuttall's annual lupine	LUTR	NF
Luzula comosa var. comosa	Pacific wood rush	LUCOC	NP
Lysimachia arvensis	scarlet pimpernel	LYAR	NNF
Lysimachia minima	chaffweed	LYMI	NF

Scientific Name	Common Name	Code	Category
Lysimachia monelli	flaxleaf pimpernel	LYMO	NNP
Lythrum hyssopifolia	grass poly	LYHY	NNF
Madia elegans	common madia	MAEL	NF
Madia exigua	little tarweed	MAEX	NF
Madia gracilis	slender tarweed	MAGR	NF
Madia sativa	coast tarweed	MASA	NF
Madia sp.	tarweed	MA	NF
Marah fabacea	wild cucumber	MAFA	NP
Matricaria discoidea	pineapple weed	MADI6	NF
Medicago polymorpha	California burclover	MEPO	NNF
Medicago sativa	alfalfa	MESA	NNP
Melica imperfecta	coast range melic	MEIM	NP
Melica sp.	melic	ME	NP
Melica torreyana	Torrey's melic	METO	NP
Melilotus albus	white sweetclover	MEAL	NNF
Melilotus indicus	yellow sweetclover	MEIN	NNF
Microseris paludosa	Marsh microseris	MIPA	NP
Minuartia californica	sandwort	MICA	NF
Monardella sinuata ssp. nigrescens	curly-leaved monardella	MOSIN	NF
Morella californica	wax myrtle	MOCA6	NP
Navarretia atractyloides	Holly-leaf navarretia	NAAT	NF
Navarretia hamata	hooked navarretia	NAHA	NF
Navarretia hamata ssp. parviloba	hooked navarretia	NAHAP	NF
Navarretia mellita	skunk navarretia	NAME	NF
Navarretia sp.	navarretia	NA	NF
Navarretia squarrosa	skunkweed	NASQ	NF
Nemophila menziesii	baby blue eyes	NEME	NF
Nuttallanthus texanus	blue toadflax	NUTE	NF
Orobanche californica ssp. californica	broomrape	ORCAC	NP
Pectocarya sp.	combseed	PE	NF
Pennisetum clandestinum	Kikuyu grass	PECL	NNP
Pentagramma triangularis	gold back fern	PETR	NP
Persicaria lapathifolia	willow weed	PELA	NF
Petrorhagia dubia	hairypink	PEDU	NNF
Petrorhagia prolifera	pink grass	PEPR	NNF
Phacelia douglasii	Douglas phacelia	PHDO	NF
Phacelia malvifolia	stinging phacelia	PHMA	NF
Phalaris lemmonii	Lemmon's cannarygrass	PHLE	NF
Phalaris sp.	canary grass	PH	
Phalaris arundincea	reed canarygrass	PHAR	NP
Pinus radiata	Monterey pine	PIRA	NP
Piperia michaelii	Michael's rein orchid	PIMI6	NP

Scientific Name	Common Name	Code	Category
Piperia sp.	rein orchid	PI	NP
Plagiobothrys chorisianus var. hickmanii	Hickman's popcornflower	PLCHH	NF
Plagiobothrys sp.	popcorn flower	PL	NF
Plantago coronopus	cut-leaved plantain	PLCO	NNF
Plantago erecta	California plantain	PLER	NF
Plantago lanceolata	English plantain	PLLA	NNF
Plantago major	common plantain	PLMA	NNP
Platystemon californicus	cream cups	PLCA	NF
Poa annua	annual bluegrass	POAN	NNF
Poa pratensis	Kentucky bluegrass	POPR	NNP
Poaceae sp.	Unknown grass	PO	
Polycarpon tetraphyllum var. tetraphyllum	four-leaved allseed	POTET	NNF
Polygala californica	California milkwort	POCA	NP
Polypogon monspeliensis	rabbitsfoot grass	POMO	NNF
Populus trichocarpa	black cottonwood	POTR	NP
Prunus sp.	unknown cherry	PR	
Primula clevelandii	padre's shootingstar	PRCL	NF
Pseudognaphalium beneolens	fragrant everlasting	PSBE	NP
Pseudognaphalium californicum	California everlasting	PSCA	NP
Pseudognaphalium luteoalbum	weedy cudweed	PSLU	NNF
Pseudognaphalium ramosissimum	pink everlasting	PSRA	NP
Pseudognaphalium sp.	cudweed	PS	
Pseudognaphalium stramineum	cotton-batting plant	PSST	NP
Psilocarphus tenellus	slender woolly-marbles	PSTE	NF
Pteridium aquilinum var. pubescens	western bracken fern	PTAQP	NP
Pterostegia drymarioides	woodland threadstem	PTDR	NF
Quercus agrifolia	coast live oak	QUAG	NP
Ranunculus californicus var. californicus	common buttercup	RACAC	NP
Ribes malvaceum	chaparral currant	RIMA	NP
Ribes speciosum	fuchsia-flowered gooseberry	RISP	NP
Rubus ursinus	California blackberry	RUUR	NP
Rumex acetosella	sheep sorrel	RUAC	NNP
Rumex crassus	willow leaved dock	RUCR4	NP
Rumex crispus	curly dock	RUCR	NNP
Rumex salicifolius	willow leaved dock	RUSA	NP
Rumex sp.	dock	RU	
Sagina decumbens ssp. occidentalis	Western pearlwort	SADEO	NF
Salix laevigata	red willow	SALA3	NP
Salix lasiolepis	arroyo willow	SALA6	NP
Salix sp.	willow	SA	NP
Salvia mellifera	black sage	SAME	NP
Sanicula crassicaulis	Pacific sanicle	SACR	NP

Scientific Name	Common Name	Code	Category
Sanicula laciniata	coast sanicle	SALA7	NP
Schismus barbatus	old han schismus	SCBA	NNF
Senecio glomeratus	cutleaf burnweed	SEGL	NNF
Senecio sylvaticus	woodland groundsel	SESY	NNF
Senecio vulgaris	common groundsel	SEVU	NNF
Silene gallica	small-flower catchfly	SIGA	NNF
Sisyrinchium bellum	western blue-eyed grass	SIBE	NP
Solanum umbelliferum	blue witch	SOUM	NP
Solidago velutina ssp. californica	California goldenrod	SOVEC	NP
Sonchus asper	prickly sow thistle	SOAS	NNF
Sonchus oleraceus	common sow thistle	SOOL	NNF
Sonchus sp.	sow thistle	SO	NNF
Spergula arvensis	corn spurry	SPAR	NNF
Spergularia rubra	red sand-spurrey	SPRU	NNF
Spergularia sp.	sand-spurrey	SP	
Spergularia villosa	hairy sand-spurrey	SPVI	NNP
Stachys ajugoides	bugle hedge-nettle	STAJ	NP
Stachys bullata	wood mint	STBU	NP
Stipa cernua	nodding needle grass	STCE	NP
Stipa pulchra	purple needle grass	STPU	NP
Stipa sp.	needle grass	ST	NP
Stylocline gnaphaloides	everlasting neststraw	STGN	NF
Symphoricarpos albus var. laevigatus	common snowberry	SYALL	NP
Taraxia ovata	sun cup	TAOV	NP
Thysanocarpus laciniatus	narrow leaved fringe pod	THLA	NF
Toxicodendron diversilobum	poison oak	TODI	NP
Toxicoscordion fremontii	Fremont's deathcamas	TOFR	NP
Tribolium obliterum	Capetown grass	TROB	NNF
Trifolium albopurpureum	rancheria clover	TRAL	NF
Trifolium angustifolium	narrow-leaved clover	TRAN	NNF
Trifolium campestre	hop clover	TRCA	NNF
Trifolium ciliolatum	foothill clover	TRCI	NF
Trifolium depauperatum var. truncatum	truncate sack clover	TRDET	NF
Trifolium dubium	little hop clover	TRDU	NNF
Trifolium gracilentum	pinpoint clover	TRGR	NF
Trifolium hirtum	rose clover	TRHI	NNF
Trifolium macraei	Macrae's clover	TRMA	NF
Trifolium microcephalum	small-head clover	TRMI	NF
Trifolium sp.	clover	TR	
Trifolium willdenovii	tomcat clover	TRWI	NF
Triglochin scilloides	flowering-quillwort	TRSC	NF
Triphysaria pusilla	dwarf owl's clover	TRPU	NF

Scientific Name	Common Name	Code	Category
Triteleia ixioides	pretty face	TRIX	NP
Triteleia sp.	Triteleia	TRI	
Uropappus lindleyi	silver puffs	URLI	NF
Verbena bracteata	bracted verbena	VEBR	NP
Verbena lasiostachys var. lasiostachys	western vervain	VELAL	NP
Vicia americana ssp. americana	American vetch	VIAMA	NP
Vicia benghalensis	purple vetch	VIBE	NNF
Vicia hassei	slender vetch	VIHA	NF
Vicia ludoviciana ssp. ludoviciana	slender vetch	VILUL	NF
Vicia sativa	spring vetch	VISA	NNF
Vicia sativa ssp. nigra	narrow-leaved vetch	VISAN	NNF
Vicia sativa ssp. sativa	spring vetch	VISAS	NNF
Vicia sp.	vetch	VI	
Xanthium strumarium	rough cockleburr	XAST	NF
Zeltnera davyi	Davy's centaury	ZEDA	NF
	bare ground	BG	BG
	thatch	TH	TH

* HMP species
NP = Native Perennial (Shrubs and Perennial Herbs/Forbs)
NF = Native Forb (Annual Herbs/Forbs
NNP = Non-Native Perennial
NNF = Non-Native Forb

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1. INTRODUCTION

Burleson Consulting Inc., A Terracon Company (Burleson) was issued ID/IQ Contract Number W91238-18-D-0007 by the US Army Corps of Engineers (USACE) to continue habitat restoration at Site 39 Remedial Action Areas at former Fort Ord, Monterey, California. This annual report summarizes habitat restoration completed from January 2023 through December 31, 2023, a progress summary for each Historic Area (HA), and the likelihood if the HA will meet its success criteria by monitoring year 13.

1.1 Purpose

Former military ranges underwent soil remediation and subsequent habitat restoration in areas that ranged in size from 0.05 to 14 acres and were scattered around the perimeter of the Site 39 Inland Ranges area (Site 39) of former Fort Ord. Approximately 62 acres of soil remediation area needed restoration at HAs 18, 19, 22, 23, 26, 27, 27A, 28, 29, 33, 34, 36, 37, 38, 39/40, 43, 44, 48, and Austin Road Stockpile. Burleson's objective was to provide seed/plant material collection, propagation, planting, and minor erosion control repairs necessary to restore the area to the requirements of the *Site 39 Habitat Restoration Plan* (HRP) (Shaw, 2009b). The restoration areas contain primarily rare central maritime chaparral habitat with smaller inclusions of coastal sage scrub, oak woodland, grassland, and vernal pool habitats.

Burleson developed Site Specific Restoration Plans (SSRP) for HAs 18, 19, 22, 23, 26, 27, 27A, 28, 29, 33, 34, 36, 37, 38, 39/40, 43, 44, 48, and Austin Road Stockpile which provide detailed information (site conditions, baseline vegetation, targets, and collection/propagation requirements) for each HA (Burleson, 2013). In 2010, Burleson prepared the *Plant Material, Collection, Storage, and Propagation Protocols for Site Restoration at Site 39* (Propagation Protocol) (Burleson, 2010). These documents provide necessary information and guidance to conduct restoration activities at Site 39. This annual report details tasks involved with the execution of habitat restoration on Site 39 in 2023, a progress summary for each HA, and recommendations when altered restoration or monitoring tactics are required.

Work performed in 2023 consisted of:

- Storage of previously collected plant material
- Seed production plots
- Passive restoration activities (seed broadcast)
- Invasive species removal as part of Caretaker of Previous HA task
- Monitoring restoration sites to evaluate vegetative establishment
- HMP annual species monitoring
- Photo point documentation
- Erosion control activities

1.2 General Site Conditions

Site 39 is dominated by maritime chaparral; a regionally rare, fire-dependent plant community found within the coastal fog zone on sandy to rocky soils. Chaparral habitats are dominated by drought-deciduous or evergreen sclerophyllous shrubs. This unique species-rich plant community changes in species composition from the western edges of Site 39, which are frequently foggy and cool, to the eastern edges which are less foggy, warmer, and drier.

1.3 Site 39 Restoration Progress

Site Specific Restoration Plans were developed for 18 HAs and one stockpile area requiring habitat restoration for 61.71 acres. The 19 SSRPs prescribed passive restoration (seeding) for 61.71 acres and active restoration (planting) for 29.84 acres. Active restoration requires installation of approximately 52,000 plants. Figure 1-1 presents the status of restoration sites within Site 39.

Both active and passive restoration activities began in 2011. Approximately 61.26 acres were seeded (passive restoration) and 68,732 plants were installed (active restoration) since 2011. Of the 19 restoration sites, 18 received their full SSRP restoration prescription and are in a monitoring phase (see Figure 1-1). Austin Road Stockpile is the only site that is not complete and has not received any restoration to date. Additional passive restoration activities are ongoing while active restoration activites were complete as of February 3, 2023.

HAs 26 and 48 were in year 8 of monitoring in 2023. In year 8 of monitoring, HA status is evaluated compared to success criteria to determine if the site is on a trajectory towards meeting criteria in year 13.

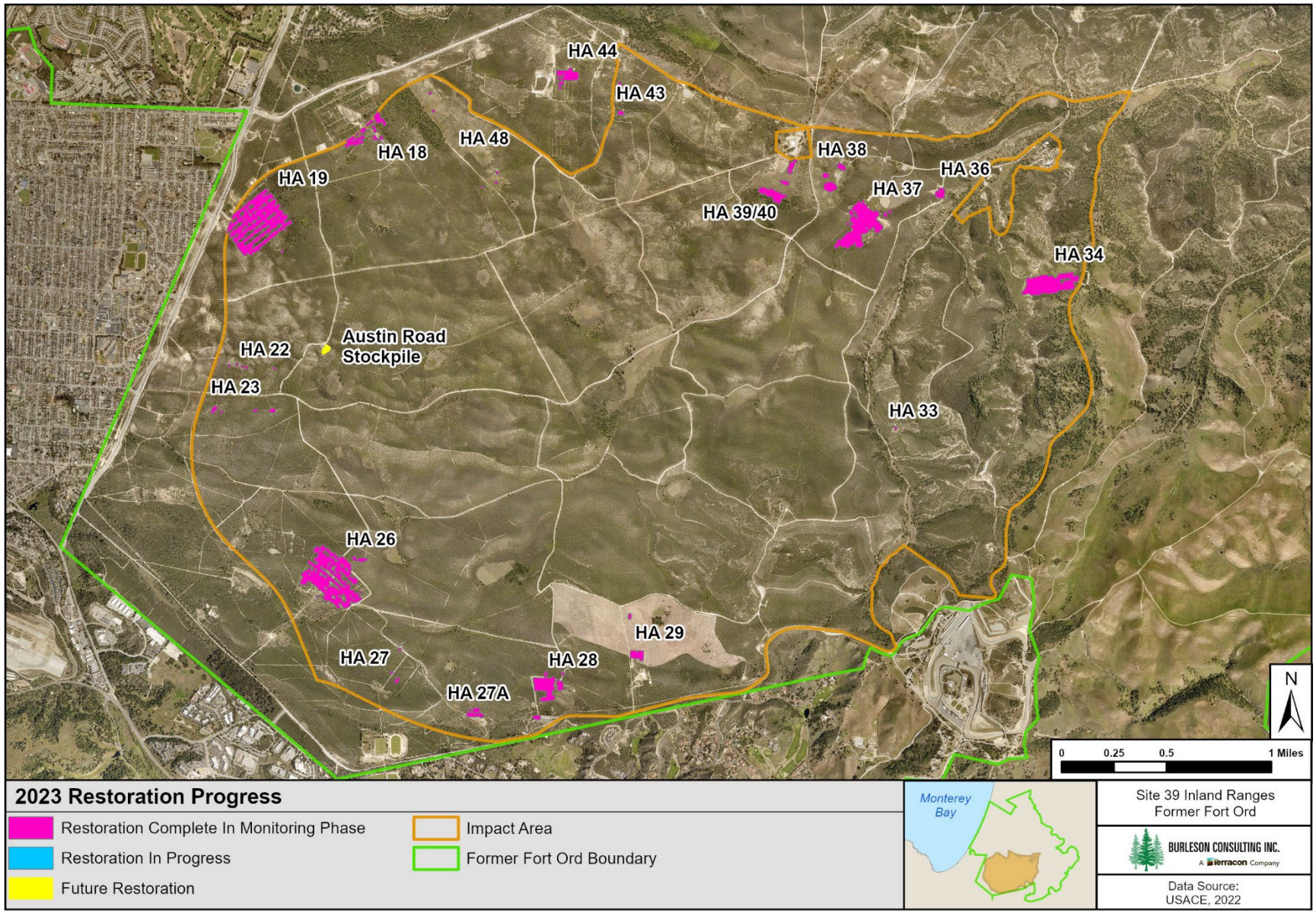

Figure 1-1. Restoration Progress Map

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2. RESTORATION PROTOCOLS AND SITE-SPECIFIC RESTORATION PLANS

The protocols developed by Burleson detail quantities, types of plant material to be collected, and specific salvage and propagation techniques to be followed by field crews for former Fort Ord (Burleson, 2010; Burleson, 2013). Additionally, S&S Seed, a native seed company, supports Burleson with seed production, which will be discussed further in Section 3.1. There were no active restoration activities in 2023, however these protocols guide the restoration effort in past years and are relevant for any future restoration prescriptions.

In accordance with the protocol (Burleson, 2010), field crews collect Habitat Management Plan (HMP) species within a 1-kilometer radius centered on each HA. Common species are collected within a 10-mile radius of each HA. Collected seeds are processed manually to remove residual hulls, stems, leaves, and chaff, as much as possible. Seed weight totals are entered into the plant inventory database after seed processing is completed.

The plant material collected is dried and processed at Burleson's native plant nursery in Carmel Valley. The plant material is stored at Burleson's Monterey office in a cool, dry environment until ready to be broadcast. Labeling and tracking of all plant material follows the storage protocol (Burleson, 2010). Burleson maintains a spreadsheet database that is regularly updated so that plant and seed inventories are readily available. The database contains the following information:

- Scientific name and common name
- Container size (if applicable)
- Quantity (in nursery)
- Quantity (delivered)
- Seed/cutting origin
- Client
- Batch name and date sown
- Experimental treatments used during propagation (when applicable)

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3. SEED PRODUCTION

Seed surplus inventory and seed production plots provided an adequate supply of seed to complete the planned seed broadcast activities. There was no seed collection required for Task Order 26 in 2023.

3.1 Seed Production

Burleson contracted S&S Seeds to grow former Fort Ord-specific bulk seed for purple needlegrass (*Stipa pulchra*). The 2023 production seed yield of purple needlegrass is presented in Table 3-1. The total production seed inventory can be found in Table A-2 in Appendix A. Photographs C-1 through C-3 in Appendix C show production seed plots.

Table 3-1. 2023 Production Plot Seed Yield

Species	Bulk Seed (lb)	Pure Live Seed (lb)
Stipa pulchra **(purple needlegrass)**	497.5	413.1

Bulk seed contains seed, inert matter, and other crop material. Pure Live Seed, a measure of seed quality, is the quantity in pounds (lb) of viable seed within the bulk seed and is calculated by multiplying bulk seed times the purity from a germination test. Seed test results for production species are presented in Table A-2, Appendix A. The purple needlegrass plot will not be continued in 2024.

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4. RESTORATION ACTIVITIES

The objective of restoration activities is to return areas impacted by remediation treatment to a natural landscape that resembles adjacent habitat in accordance with each SSRP. Restoration activities completed in 2023 included passive restoration at HA 36 with production seed broadcast, as well as production seed broadcast in areas of erosion repair at HA's 26, 27A, 28, 34, and 37. There were no active restoration activities completed in 2023 in addition to those reported in the 2022 Habitat Restoration Annual Report (Burleson, 2023).

4.1 Passive Restoration

Generally, passive restoration activities occur annually between October and February, spanning two calendar years. Only HA 36 received passive restoration during the 2023 calendar year. Additional seed broadcast activities associated with erosion control and repair are detailed in section 7.

4.1.1 HA 36 Passive Restoration Activities

In November 2023, Burleson applied 0.5 acre-worth of production seed mix, over 0.52 acres at HA 36 (see Appendix B Figure B-5, Table B-8). Photograph C-9 in Appendix C shows passive restoration efforts at HA 36.

4.2 Active Restoration

All active restoration that occurred in 2023 was completed in early January and was reported in the 2022 Habitat Restoration Annual Report. There was no additional active restoration that occurred in 2023.

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5. CARETAKER OF PREVIOUS HA

Burleson completed several activities under the Caretaker of Previous HA (Caretaker) task in 2023, including invasive species removal, herbicide spray, and the publication of the *Propagation Protocol for Hard to Grow Species*. This document serves as a public resource for future restoration practitioners that may benefit from learning the processes employed during propagation of several difficult-to-grow species occurring on former Fort Ord lands.

Invasive species removal took place at HAs 19, 26, 27, 27A, 28, 34, 36, and 37. Hand pulling efforts focused on species including pampas grass (*Cortaderia* sp.), iceplant (*Carpobrotus* sp.), French broom (*Genista* monspessulana), and sparse occurrences of hairy rockrose (*Cistus incanus*). Tree removal work targeted mostly Monterey pine (*Pinus radiata*), as well as a few isolated occurrences of Monterey cypress (*Hesperocyparis macrocarpa*), and golden wattle (*Acacia longifolia*). Smaller saplings were removed by hand or with the aid of a shovel when feasible. Larger trees, up to six inches in diameter at breast height, were felled with an electric chainsaw; and herbicide was applied to cut stumps. Locations of small individuals removed by hand were not docmented with GPS, however all individuals that required a chainsaw and herbicide application were mapped.

All trees removed, particularly the Monterey pines, were encroaching on maritime chaparral habitat within or bordering open areas within the boundary of Site 39's HAs. These trees can shade out open sandy areas where HMP annual species could germinate (Steers et al., 2013). Additionally, resin acids in pine needles can be allelopathic and inhibit the germination and growth of annual plants (Hisashi Kato-Noguchi et al., 2017). Safety protocols in line with OSHA chainsaw safety guidelines (OSHA, 2013) were implemented and all appropriate PPE, including wearing safetly goggles, cut-resistant gloves, and chainsaw chaps, were donned. The tree removal process consisted of cutting a wedge on one side of the trunk, followed by a secondary cut on the opposite side to fell it. After felling a tree, Burleson biologists removed the remaining trunk by cutting as low to the ground as possible and applying a 20% glyphosate solution to the remaining stump.

Herbicide spray was mixed safely at the Monterey Burleson office and transported in the bed of the work vehicle within an enclosed spill free storage container. Mark It Blue® dye was added to herbicide solution to easily trace the application. This dye dissipates with exposure to sunlight. In 2023 a total of 36 fluid ounces of glyphosate was applied to cut tree stumps, as well as any other invasive species deemed too large for manual removal. Table 5-1 shows the numbers of trees removed (by chainsaw) by HA and Figure 5-1 shows these HAs on a map. See Appendix C (photographs C-10 through C-15) for various Caretaker activities that occurred in 2023.

Table 5-1. 2023 Caretaker Tree Removal by HA

HA	Individual Trees Removed
19	101
26	8
27	6
27A	2
34	2
Total	**117**

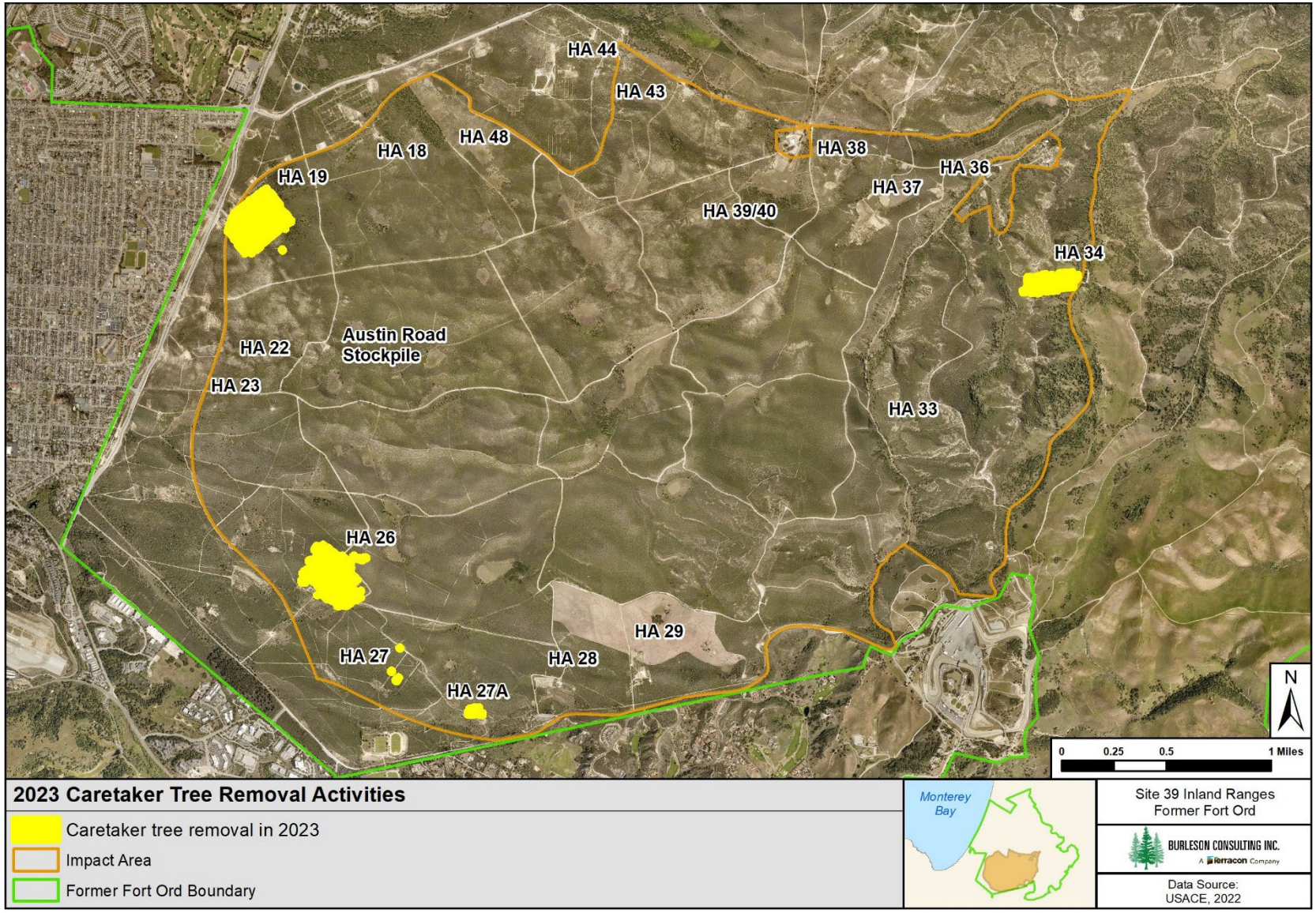


Figure 5-1. 2023 Caretaker Tree Removal Locations

6. MONITORING

Burleson conducted photo point documentation, HMP annual density, species richness, vegetative cover, and plant survivorship surveys at relevant HAs in 2023. Monitoring activities were guided by the HRP and the *Protocol for Conducting Vegetation Monitoring in Compliance with the Installation-Wide Multispecies Habitat Management Plan at Former Fort Ord* (Monitoring Protocol) (Shaw, 2009b; Burleson, 2009). Monitoring activities conducted in 2023 are summarized in Table 6-1 by HA. Section 6.1 describes monitoring methodology. Monitoring results for 2023 are presented in Section 9 on a site-by-site basis. Photographs C-16 through C-23 in Appendix C illustrate various monitoring tasks.

Table 6-1. 2023 Summary of Monitoring Activities by HA

HA	Photo Point	HMP Annual Density	Species Richness	Vegetative Cover	Plant Survivorship
18	●				
19	●				
22	●				
23	●				
26	●	●	●	●	●
27	●				
27A	●				
28	●				
29	●				
33	●				
34	●				●
36	●				
37	●	●	●		●
38	●	●	●		
39/40	●				
43	●				
44	●				
48	●	●	●	●	
Austin Rd. Stockpile	●	●	●		

Vegetative monitoring data, including species richness, vegetative cover, and HMP annual density, were compared to the success criteria associated with each objective outlined in the SSRPs (Burleson, 2013). Success criteria are summarized in Table 6-2.

Table 6-2. Success Criteria

Success Criterion	Category	Data Used for Comparison
Objective 1 – No. 1	Species richness	Meandering transect survey and 10-feet on either side of line-intercept transect
Objective 1 – No. 2	Native vegetation cover	Line-intercept transect percent cover
Objective 2 – No. 3	Non-native target weed cover	Line-intercept transect percent cover
Objective 3 – No. 4	HMP shrub cover	Line-intercept transect percent cover
Objective 3 – No. 4	HMP shrub cover by species	Line-intercept transect percent cover
Objective 3 – No. 4	HMP annual density	HMP annual plot density surveys and meandering transect survey to map discrete patches of HMP annuals outside of HMP annual restoration plots

6.1 Monitoring Methodology

6.1.1 Photo Points and Photo Documentation

Multiple permanent photo points were established at each restoration site to document progress. Photos were taken annually in the spring at every photo point and again in the fall at select photo points. Additionally, photo documentation of restoration activities occurred throughout the year. See Appendix C for a photo log of 2023 activities, Appendix D for photo point comparisons for all sites, and Appendix E for photos illustrating restoration progress of HAs in year 8 of monitoring in 2023.

6.1.2 HMP Annual Density Surveys at Restoration Plots and Across the Historic Area

Plot density surveys for HMP annuals (Monterey spineflower [*Chorizanthe pungens* var. *pungens*], sand gilia [*Gilia tenuiflora* ssp. *arenaria*], and seaside bird's beak [*Cordylanthus rigidus* ssp. *littoralis*]) are performed at restoration sites in years 1, 2, 3, 4, 5, and 8 during peak bloom for each species according to the HRP (Shaw, 2009b). Any additional monitoring beyond the required years is conducted on a voluntary and opportunistic basis when required monitoring is already being conducted at the same HA. HMP annual density was obtained by counting every individual within an HMP annual restoration plot and calculating the number of plants per 100 square feet. Density classes were derived from the HRP (see Table 6-3).

Table 6-3. HMP Annual Density Classes

Density Class	Plants Counted per 100 Square Feet
Not Present	0
Low	1-50
Medium	51-100
High	101-500
Very High	>500

Discrete patches of HMP annuals within the HA but outside of HMP annual restoration plots were mapped during meandering transect surveys using a Trimble® Juno® T41/5B Series GPS unit with an external Trimble® R1 GNSS receiver. Discrete patches were assigned a density class or population count

dependent on feasibility. If the HMP annual occupied area was larger than one acre in size, density would be obtained by sub-sampling the population with circle plot surveys as described in the Monitoring Protocol (Burleson, 2009). There were no HMP annuals that occupied an area larger than one acre in size and therefore no circle plot surveys were conducted. HMP annual restoration plot and discrete patch densities were evaluated together to compare to the Objective 3 success criterion. For a given year, the combination of plots and discrete patches monitored that year were compared to baseline density requirements. The success criterion was met if plots and discrete patches combined indicated that the site maintained or exceeded baseline densities for each applicable HMP annual species. It was not necessary for HMP annuals to meet baseline density in all plots if discrete patches were present. At year 8, data for all monitoring years is evaluated together to determine whether the site met the success criterion.

The method used to measure HMP annual cover for Objective 3 was changed in 2017 from what was described in the SSRPs to a more appropriate evaluation method. Prior to 2017, the success criterion for monitoring HMP annuals required greater than or equal to 1% transect cover for Monterey spineflower, sand gilia, and/or seaside bird's beak. However, transects were designed to measure shrub and perennial plants with cover greater than 0.1 meters. HMP annual cover was underrepresented by transect surveys because patches of HMP annuals are often less than 0.1 meter across and have variable peak bloom times. In August 2017, the US Fish and Wildlife Service (USFWS) approved the abandonment of transect percent cover as a measure of HMP annual cover and the associated success criterion (USFWS, 2017). Instead of using transect surveys to assess HMP annuals, USFWS approved comparing HMP annual seeded plot densities and discrete patches to the success criterion as recommended in the 2016 Habitat Restoration Annual Report (Burleson, 2017).

6.1.3 Plant Survivorship Monitoring

Annual plant survivorship surveys were completed for three years after plant installation. A random sample of at least 10% of each shrub species were tagged and monitored annually. Survivorship monitoring events occurred in the fall at the end of the dry season when plant mortality rates were highest. During monitoring events, all tagged plants were counted as alive or dead to calculate survivorship percentages. All plants monitored were evergreens that should have live leaves year-round. Plants with live leaves were recorded as alive. Plants with no leaves or leaves that appeared dead were recorded as dead. Plant survivorship data are not compared to success criteria. Plant survivorship classifications are presented in Table 6-4.

Table 6-4. Plant Survivorship Classifications

Plant Survivorship	Percent Alive
High	80-100%
Moderate	50-79%
Low	≤49%

In reports preceding 2018, plants in poor condition or plants not found were considered dead. From 2018 onward, plant survivorship for all years was recalculated to consider plants in poor condition as alive, and plants not found were excluded from the percent alive calculation.

6.1.4 Vegetative Cover

Vegetative cover is monitored in years 1, 2, 3, 4, 5, 8, and 13 following restoration, typically from May to July. Prior to 2016, sites were visually assessed for cover. Beginning in 2016, cover of vegetation, thatch,

and bare ground were measured using line-intercept transect surveys, as described in the Monitoring Protocol (Burleson, 2009). In 2016, HAs 22, 23, 27, 33, and 43 were surveyed using randomly placed quadrats to provide a preliminary idea of vegetative cover with a limited amount of effort. From 2017 onward, line-intercept transect surveys were completed for compatibility with SSRP objectives. Fifty-meter transects were placed randomly throughout each HA at a rate of one transect per acre; transects were not placed across roads or berms. For HAs that were less than 1 acre, shortened transects were placed diagonally through each plot. The corners of each plot were numbered 1-4, and the start point was determined using a random number generator. Quadrat sampling along transects was completed when annual herbaceous cover on the transect line was 10% or greater.

Vegetative cover was calculated to compare to the success criteria outlined in each SSRP. For all transects, the vegetative cover was calculated by summing the distance along the transect for each species and dividing by the length of the transect. Percent cover for all transects was then averaged to calculate average site cover by species, native shrubs and perennials, and other categories (Shaw, 2009b). To calculate the site average, the distance along transects was summed for each species and divided by the total transect length.

For each HA, native vegetative cover, non-native vegetative cover, total HMP shrub cover, and HMP shrub cover by species were evaluated against baseline objectives specified in the SSRPs. Results were compared to previous years to discern trends over time. Native vegetative cover was calculated by summing the percent cover of all species listed in Table 2 of the SSRPs for each site. The success criteria for native vegetative cover and HMP shrub cover were met if percent cover met or exceeded baseline percent cover (Objectives 1 and 3). For non-native vegetative cover, the success criterion was met if percent cover was less than the acceptable limit (Objective 2). In addition, the five species with the greatest percent cover for each HA were compared graphically across monitoring years.

At HAs 37, 38, 39/40, 44, and 48, silver bush lupine was identified as *Lupinus chamissonis* in Table 2 of the SSRPs. However, according to the Jepson Manual, Calflora, and *The Plants of Monterey County,* silver bush lupine is identified as *Lupinus albifrons* var. *albifrons* (Baldwin *et al.*, 2012; CalFlora, 2017; Matthews and Mitchell, 2015). Both species are present on Fort Ord and are difficult to identify unless flowers are present. Silver beach lupine (*Lupinus chamissonis*) can be differentiated from silver bush lupine (*Lupinus albifrons* var. *albifrons*) by the absence of hairs on the upper keel margin; silver bush lupine has hairs on the upper keel margin. For analysis of transect data and comparison to the success criteria, silver beach lupine and silver bush lupine data were combined.

6.1.5 Species Richness

A species list for each HA is developed by conducting meandering transects in years 1, 2, 3, 4, 5, 8, and 13 and by recording all species observed within 10 feet on either side of line-intercept transects, if applicable. Species richness was evaluated by comparing the quantities of native shrubs and perennials, native annual and herbaceous species, and non-native species observed to the quantities observed in previous years. The success criterion for species richness was met if all species listed in Table 3 of the SSRPs were present on site (Objective 1).

7. EROSION CONTROL ACTIVITIES

During the 2023 calendar year, Burleson conducted erosion control repairs at HAs 26, 27A, 28, 34, 36, and 37 Production seed was broadcast in areas where erosion repairs occurred and in barren areas of each site. Areas where HMP annual species were historically present outside of HMP restoration plots were avoided. Erosion control/production seed mix details can be found in Appendix B. Photographs C-24 through C-38 in Appendix C document erosion control field activities. The following work was performed in 2023:

HA 26:

- February 2023
  - Broadcast erosion control seed mix over 0.01 acre
- March 2023
  - Broadcast erosion control seed mix over 0.25 acre
- November 2023
  - Broadcast erosion control seed mix over 0.09 acre
- October 2023
  - Installed 100 linear feet of straw wattles
  - Collapsed approximately 90 linear feet of rill erosion

HA 27A:

- February 2023
  - Broadcast erosion control seed mix and straw over 0.02 acre
- November 2023
  - Broadcast erosion control seed mix over 0.15 acre
- October 2023
  - Installed 175 linear feet of straw wattles
  - Collapsed approximately 30 linear feet of rill erosion

HA 28:

- August 2023
  - Installed 100 linear feet of straw wattles
  - Collapsed approximately 50 linear feet of rill erosion
- November 2023
  - Broadcast erosion control seed mix over 0.02 acre

HA 34:

- August 2023
  - Monitored and maintained 200 linear feet of water bars
  - Installed 50 linear feet of straw wattles
  - Installed 136 square feet of coir fabric
- September 2023
  - Installed 560 square feet of coir fabric
- October 2023
  - Installed 10 linear feet of coconut fiber coir log
- November 2023

  - Broadcast erosion control seed mix over 0.78 acre

HA 36:

- March 2023
  - Broadcast erosion control seed mix over 0.31 acre

HA 37:

- February – March 2023
  - Broadcast erosion control seed mix over 0.41 acre
- September – October 2023
  - Installed 175 linear feet of straw wattle
  - Collapsed approximately 250 linear feet of rill erosion
  - Installed 735 square feet of coir fabric
- November 2023
  - Broadcast erosion control seed mix over 0.19 acre

8. RESTORATION SUMMARY AND MONITORING RESULTS BY HA

To understand restoration progress and discuss future efforts for each HA, it was important to compare the current status of each HA to its specific success criteria. This section is an overview of all restoration efforts through December 31, 2023: including monitoring results, comparison to the success criteria, and recommendations for each HA in a benchmark monitoring year.

8.1 HA 18

HA 18 was used by the US Department of the Army (Army) as a long-distance small-arms firing range that consisted of seven target lanes approximately 165 feet apart. Soil remediation was completed in 2010 and resulted in 2,750 cubic yards of lead-contaminated soil being excavated from 1.4 acres (Shaw, 2008). HA 18 rests within unprotected maritime chaparral with mean annual temperatures ranging between 56° and 58°F (Fahrenheit) and regular fog typical of maritime climates (USFS, 2007). HA 18 is relatively flat with northwest and west aspects. Adjacent lands are high quality habitat with intact native vegetation that may promote natural recruitment within restoration areas.

HA 18 is located on the northwestern portion of Site 39, occurring within the sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 18 consisted of hand broadcast of a non-irrigated seed mix and annual weed management. HA 18 is relatively flat with little potential for erosion.

Restoration at HA 18 occurred in 2011, 2012, 2019, 2020, and 2022 and quantitative monitoring began in 2013. The HA was monitored for 13 years by photo documentation and site visits, seven years for HMP annual density in plots, and four years for HMP annual density across the HA, species richness, and vegetative cover (see Table 8-1). Figure 8-1 shows the passive restoration area, photo documentation locations, and transect monitoring locations. Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Success criteria for HA 18 are summarized in Table 8-2.

Table 8-1. Historic Summary of Restoration and Monitoring Activities at HA 18

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Active, Passive, and Erosion Control	●	●							●	●		●		
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●	●		●				
HMP Annual Density across HA						●	●	●		●				
Species Richness						●	●	●		●				●
Vegetative Cover						●	●	●		●				●

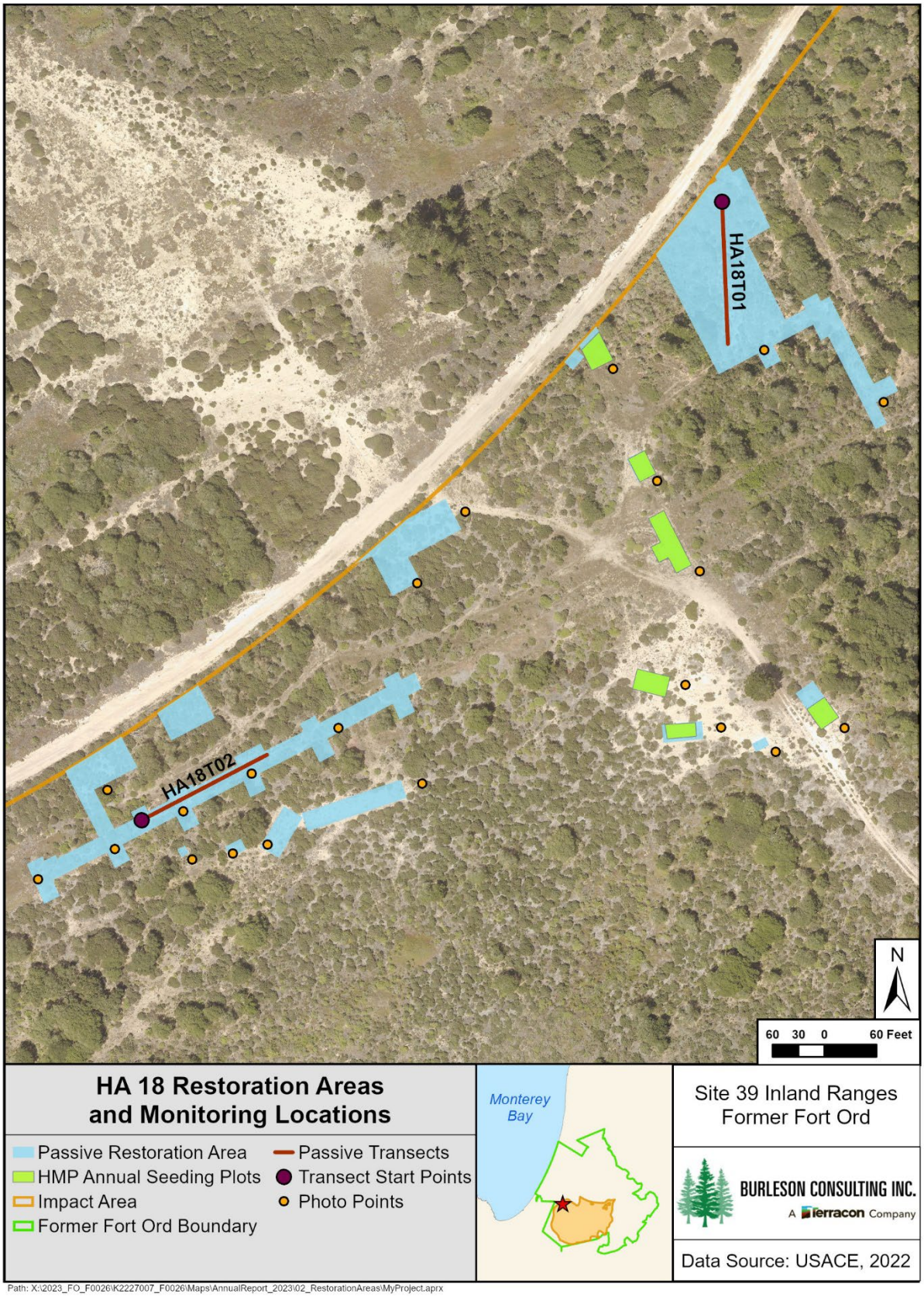


Figure 8-1. HA 18 Restoration Areas and Monitoring Locations Map

Table 8-2. Success Criteria and Acceptable Limits for Restoration of HA 18

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise shaggy-bark manzanita California sage brush coyote brush Monterey ceanothus† dwarf ceanothus mock heather Eastwood's goldenbush† golden yarrow peak rush-rose deerweed sticky monkeyflower coast live oak black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data did not indicate non-native target weed species. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 2 (1-5% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Monterey ceanothus percent cover, as an average of transect data, must be equal to or greater than 4.
			Sandmat manzanita percent cover, as an average of transect data, must be present however, less than 1 percent is acceptable.
			Eastwood's goldenbush percent cover, as an average of transect data, must be present however, less than 1 percent is acceptable.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

8.1.1 Restoration Activities

No restoration activities occurred at HA 18 in 2023. See 2022 Habitat Restoration Annual Report (2022 Annual Report) for a comprehensive summary of restoration activities including historic planting and seed broadcast data for each HA (Burleson, 2023).

8.1.2 Monitoring Results

HA 18 was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-1).

8.1.3 Discussion

8.1.3.1 HA 18 Status

There are no updates to the HA 18 status discussion; see Table 8-3 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2025 (see Table 8-1).

Table 8-3. Status for Achieving Success Criteria at HA 18

Success Criterion	Category	Acceptable Limit	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	14 required species: ACGL, ADFA, ARCA, ARTO, BAPI, CERI, CEDE, CRSC, DIAU, ERER, ERFA, ERCO, QUAG, SAME	No	No	HIGH	**Year 5:** ADFA absent **Year 8:** CEDE absent (ADFA planted in 2018/2019, CEDE planted in 2022/2023)**
Objective 1 – No. 2	Native vegetation cover	≥ 40%	Yes	Yes	HIGH	**Year 5**: 45.34% **Year 8**: 52.59%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.80% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 2: 1-5%	No	Yes	HIGH	**Year 5**: 0.69% **Year 8**: 4.13%
Objective 3 – No. 4	HMP shrub cover by species	CERI ≥ 4%, ARPU = present ERFA = present	No	No	LOW for CERI HIGH for ARPU HIGH for ERFA	**Year 5**: CERI 0.00% ARPU 0.56% ERFA 0.13% **Year 8**: CERI 0.10% ARPU 3.27% ERFA 0.76% (CERI, ARPU, ERFA planted in 2019/2020. CERI planted in 2022/2023)**
Objective 3 – No. 4	HMP annual density	Low density for CHPUP	Yes	Yes	NA	**Year 5**: met **Year 8**: met (Year 13 monitoring not required)

**Planted as part of Adaptive Management Plan

8.2 HA 19

HA 19 was used by the Army as a small-arms firing range. Soil remediation was completed in 2010 and resulted in the excavation of 23,000 cubic yards of lead-contaminated soil from approximately 14 acres (Shaw, 2008). HA 19 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 19 is relatively flat with a western aspect. Adjacent lands are high quality habitat with intact native vegetation that may promote natural recruitment within restoration areas.

HA 19 is located on the western portion of Site 39, occurring within the sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. The vegetative habitat at HA 19 prior to remediation was predominantly very high-quality maritime chaparral. The HA 19 SSRP includes a detailed list of the typical vegetation identified at the HA.

The SSRP restoration procedure for HA 19 included both passive and active restoration consisting of hand broadcast non-irrigated seed mix and installing container-grown plants. Areas within HA 19 which were less than 1.0 acre, or larger than 1.0 acre but less than 100 feet wide, were restored passively using broadcast seed. Areas larger than 1.0 acre and greater than 100 feet across received both active and passive restoration efforts.

Restoration at HA 19 occurred in 2012 through 2016, 2019, and 2020 and quantitative monitoring began in 2013. The site was monitored for 12 years by photo documentation and site visits, eight years for HMP annual density in plots, six years for HMP annual density across the HA, four years for species richness, vegetative cover, and plant survivorship (see Table 8-4). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-2 shows the HA footprint, passive restoration area, active restoration area, and transect monitoring locations. The success criteria for HA 19 are summarized in Table 8-5.

Table 8-4. Historic Summary of Restoration and Monitoring Activities at HA 19

Activity	Monitoring Years												
			1	2	3	4	5	6	7	8	9	10	13
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2026
Restoration: Active and Passive	●	●	●	●	●			●	●				
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●		●	●	●			●			
Sand Gilia Plots				●	●	●	●	●			●		
HMP Annual Density across HA					●	●	●	●		●	●		
Species Richness					●	●	●			●			●
Vegetative Cover					●	●	●			●			●
Plant Survivorship		●	●	●	●								

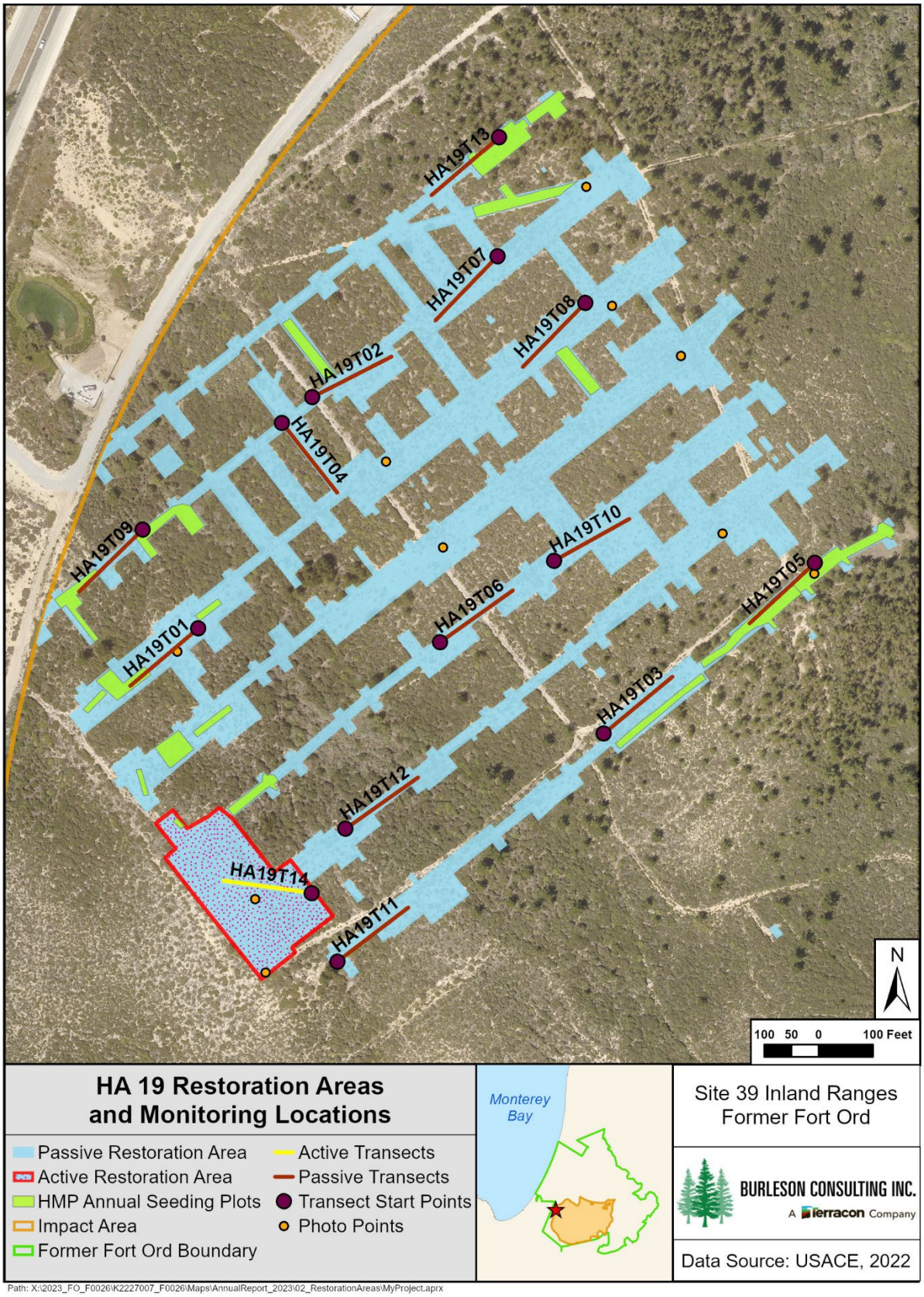


Figure 8-2. HA 19 Restoration Areas and Monitoring Locations Map

Table 8-5. Success Criteria and Acceptable Limits for Restoration of HA 19

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness: chamise sandmat manzanita† shaggy-bark manzanita California sagebrush coyote brush Monterey ceanothus† mock heather Eastwood's goldenbush† golden yarrow pitcher sage deerweed sticky monkeyflower coast live oak black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40% for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data did not indicate non-native target weed species. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 16.
			Monterey ceanothus percent cover, as an average of transect data, must be present however, less than 1 percent is acceptable.
			Eastwood's goldenbush percent cover, as an average of transect data, must be present however, less than 1 percent is acceptable.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low Sand gilia density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

8.2.1 Restoration Activities

No restoration activities occurred at HA 19 in 2023. See 2022 Annual Report for a comprehensive summary of restoration activities including historic planting and seed broadcast data for each HA (Burleson, 2023).

8.2.2 Monitoring Results

HA 19 was in year 10 of monitoring in 2023. Year 10 does not require quantitative monitoring; only visits and photo documentation were completed (see Appendix D, page D-2).

8.2.3 Caretaker of Previous HA

Monterey pine removal and herbicide application of cut stumps occurred throughout HA 19 in 2023. One hundred and one trees were felled in total, including 100 Monterey pines and one golden wattle (*Acacia longifolia*). Tree removal locations are shown in Figure 8-3. Photographs C-10 through C-15 in Appendix C show Caretaker activities that occured in 2023.

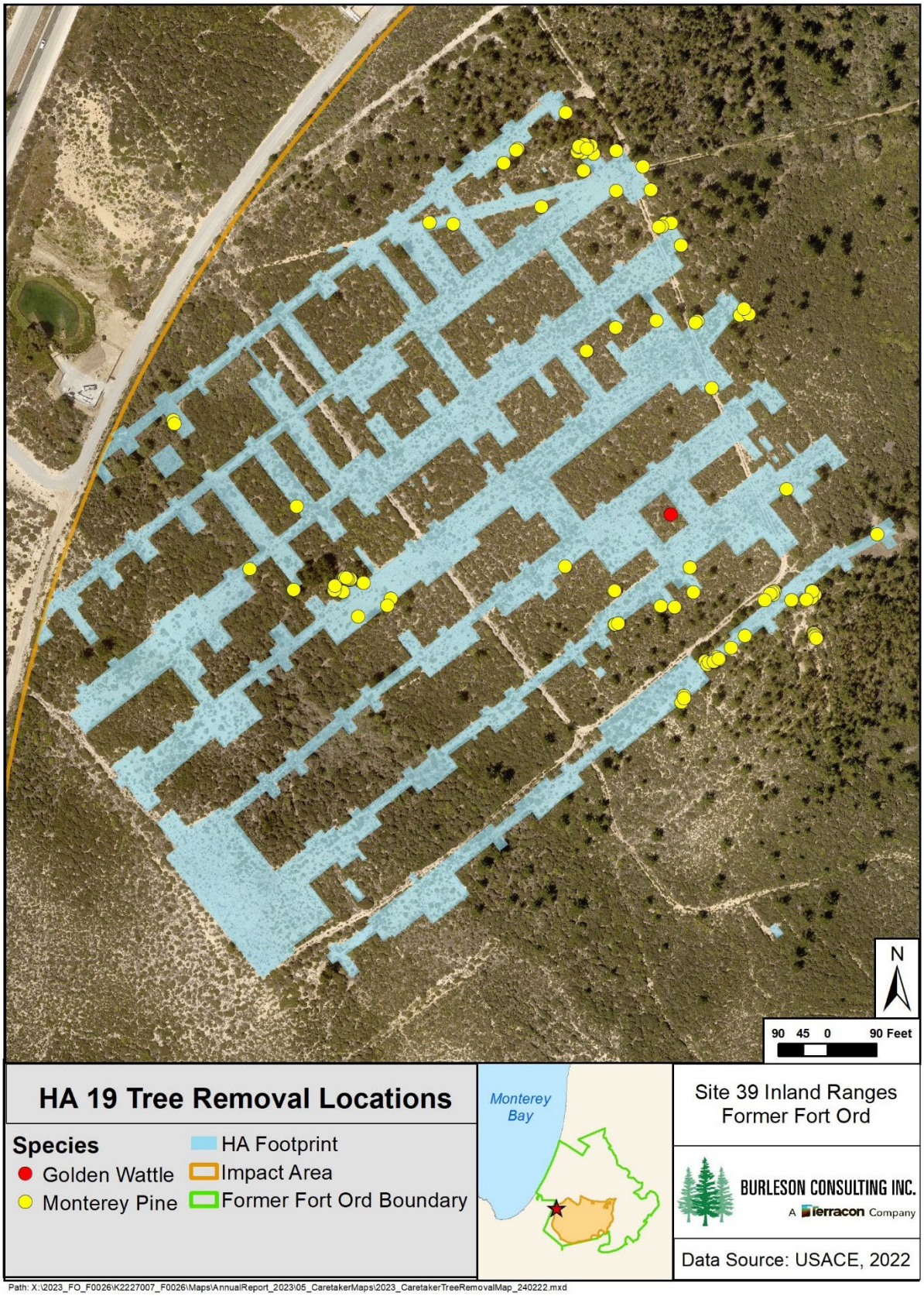


Figure 8-3. 2023 Tree Removal Locations at HA 19

8.2.4 Discussion

8.2.4.1 HA 19 Status

There are no updates to the HA 19 status discussion; see Table 8-6 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in year 13, 2026 (see Table 8-4).

Table 8-6. Status for Achieving Success Criteria at HA 19

Success Criterion	Category	Acceptable Limit	Year 5 (2018) Met	Year 8 (2021) Met	Likelihood of Achieving Success by Year 13 (2026)	Notes
Objective 1 – No. 1	Species richness	14 required species: ADFA, ARTO, ARCA, BAPI, CERI, ERER, ERFA, ERCO, LECA, ACGL, DIAU, QUAG, SAME	No	Yes	HIGH	**Year 5**: LECA absent **Year 8**: met (LECA planted in 2018/2019)**
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	HIGH	**Year 5**: 34.98% **Year 8**: 36.29%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	Yes	Yes	HIGH	**Year 5**: 10.91% **Year 8**: 18.86%
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 16% CERI present ERFA present	No	Yes	HIGH for ARPU HIGH for CERI HIGH for ERFA	**Year 5**: ARPU 10.59% CERI 0.08% ERFA 0.25% **Year 8**: ARPU 18.09% CERI 0.34% ERFA 0.43% (ARPU planted in 2019/2020)**
Objective 3 – No. 4	HMP annual density	Low density for CHUPUP and GITEA	Yes	Yes	NA	**Year 5**: met **Year 8**: met (Year 13 monitoring not required)

**Planted as part of Adaptive Management Plan

8.3 HA 22

HA 22 was used by the Army as a long-distance small-arms firing range with targets and no berm. Soil remediation was completed in 2010; 100 cubic yards of lead-contaminated soil were excavated from 0.05 acre (Shaw, 2008). HA 22 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 22 is relatively flat with northwest and west aspects. Adjacent lands were not developed and contain intact native vegetation that may promote natural recruitment within restoration areas.

HA 22 is located on the western portion of Site 39 within sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 22 consisted of hand-broadcast non-irrigated seed and annual weed management activities. HA 22 is relatively flat with little potential for erosion.

Restoration at HA 22 occurred in 2011, 2012, 2019, and 2022 and quantitative monitoring began in 2013. The site was monitored for 13 years by photo documentation and site visits, seven years for HMP annual density in plots, and four years for HMP annual density across the HA, species richness, and vegetative cover (see Table 8-7). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-4 shows the historic area footprint, passive restoration area and transect monitoring locations. Success criteria for HA 22 are summarized in Table 8-8.

Table 8-7. Historic Summary of Restoration and Monitoring Activities at HA 22

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Active and Passive	●	●							●			●		
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●	●		●				
HMP Annual Density across HA						●	●	●		●				
Species Richness						●	●	●		●				●
Vegetative Cover						●†	●	●		●				●

† Vegetative cover was monitored using quadrats in 2016

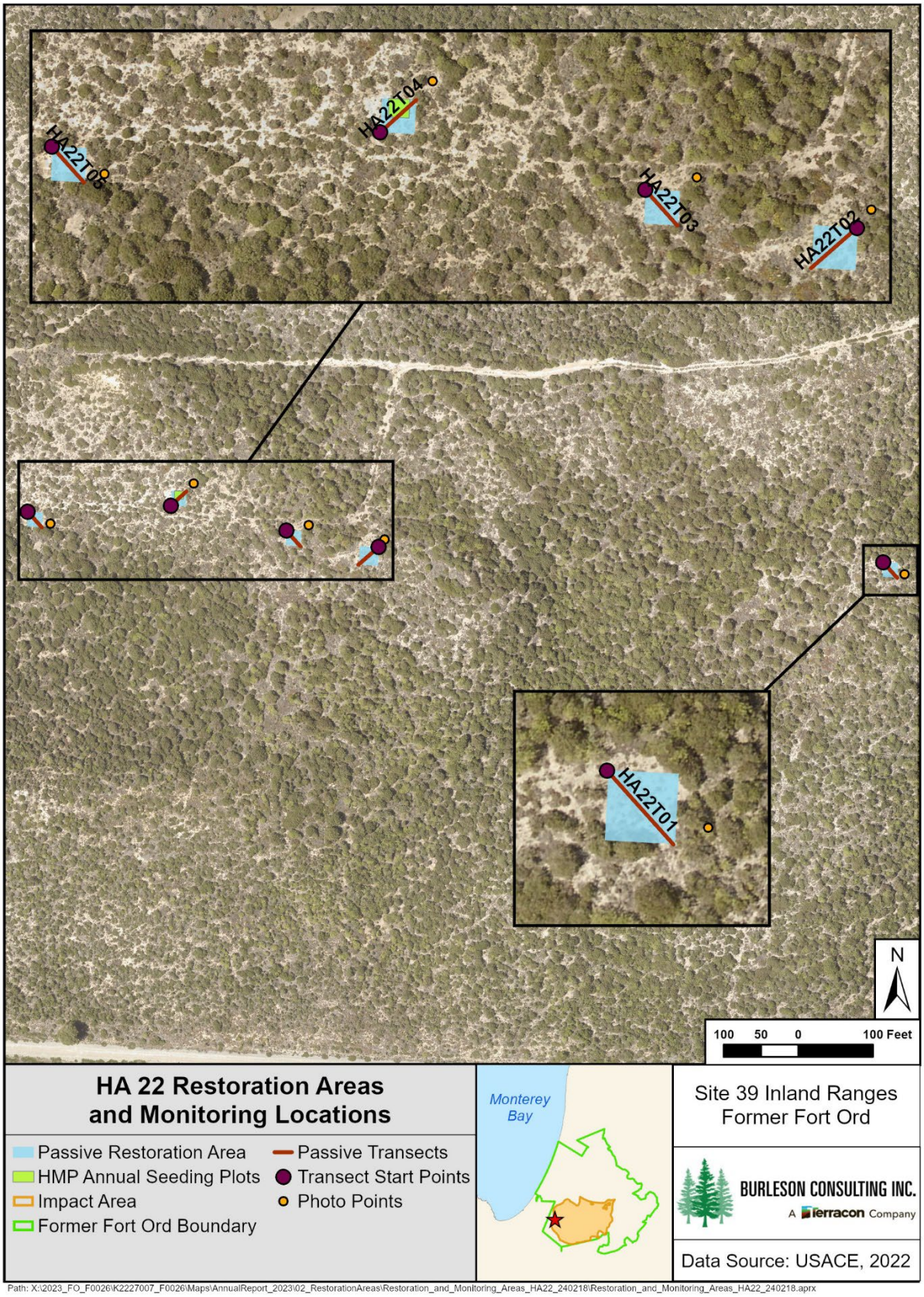


Figure 8-4. HA 22 Restoration Areas and Monitoring Locations Map

Table 8-8. Success Criteria and Acceptable Limits for Restoration of HA 22

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness: chamise shaggy-bark manzanita sandmat manzanita† coyote brush Monterey ceanothus† dwarf ceanothus Monterey spineflower† mock heather Eastwood's goldenbush† golden yarrow peak rush-rose deerweed sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or lessthan 5 percent [whichever is lower]	Baseline data did not indicate non-native target weed species. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25%)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 20.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 4.
			Eastwood's goldenbush percent cover, as an average of transect data, must be equal or greater than 1.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low

* Objectives presented in HRP (Shaw, 2009b)
† HMP Species

8.3.1 Restoration Activities

No restoration activities occurred at HA 19 in 2023. See 2022 Annual Report for a comprehensive summary of restoration activities including historic planting and seed broadcast data at HA 19 (Burleson, 2023).

8.3.2 Monitoring Results

HA 22 was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-3).

8.3.3 Discussion

8.3.3.1 HA 22 Status

There are no updates to the HA 22 status discussion; see Table 8-9 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2025 (see Table 8-7).

Table 8-9. Status for Achieving Success Criteria at HA 22

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	14 required species: ADFA, ARTO, ARPU, BAPI, CERI, CEDE, CHPUP, ERER, ERFA, ERCO, CRSC, ACGL, DIAU, SAME	No	Yes	HIGH	**Year 5:** 5 required species absent **Year 8:** met (Planted absent species in 2018/2019)**
Objective 1 – No. 2	Native vegetation cover	≥ 40%	Yes	Yes	HIGH	**Year 5:** 43.49% **Year 8:** 48.40%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5:** 0.00% **Year 8:** 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	No	No	MODERATE	**Year 5:** 1.16% **Year 8:** 2.65% (AMP planting in 2019 and 2022)
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 20% CERI ≥ 4% ERFA ≥ 1%	No	No	LOW for ARPU LOW for CERI LOW for ERFA	**Year 5:** ARPU 1.16%, CERI 0.00%, ERFA 0.00% **Year 8:** ARPU 2.65% CERI 0.00% ERFA 0.00% (Planted ARPU, CERI, and ERFA in 2018/2019 and 2022/2023)**
Objective 3 – No. 4	HMP annual density	Low density for CHPUP	Yes	Yes	NA	**Year 5:** met **Year 8:** met (Year 13 monitoring not required)

**Planted as part of Adaptive Management Plan

8.4 HA 23

HA 23 was used by the Army as a small-arms firing range. Soil remediation was completed in 2010; 450 cubic yards of lead-contaminated soil were excavated from 0.3 acres (Shaw, 2008). HA 23 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 23 is relatively flat with a west aspect. Adjacent lands were not developed and contain intact native vegetation that may promote natural recruitment within restoration areas.

HA 23 is located on the western portion of Site 39, occurring within sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 23 consisted of hand broadcast non-irrigated seed and annual weed management activities. HA 23 is relatively flat with little potential for erosion.

Restoration at HA 23 occurred in 2011, 2012, 2019, 2020, and 2023 and quantitative monitoring began in 2014. The HA was monitored for 13 years by photo documentation and site visits, six years for HMP annual density in plots, and four years for HMP annual density across the HA, species richness, and vegetative cover (see Table 8-10). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-5 shows the HA footprint, passive restoration area, and transect monitoring locations. Success criteria for HA 23 are summarized in Table 8-11.

Table 8-10. Historic Summary of Restoration and Monitoring Activities at HA 23

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Active and Passive	●	●							●	●			●	
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			†	●	●	●	●	●		●				
HMP Annual Density across HA						●	●	●		●				
Species Richness						●	●	●		●				●
Vegetative Cover						●‡	●	●		●				●

† Monterey spineflower was not monitored in year 1 (2013) because of UXO presence and mastication activities

‡ Vegetative cover was monitored using quadrats in 2016

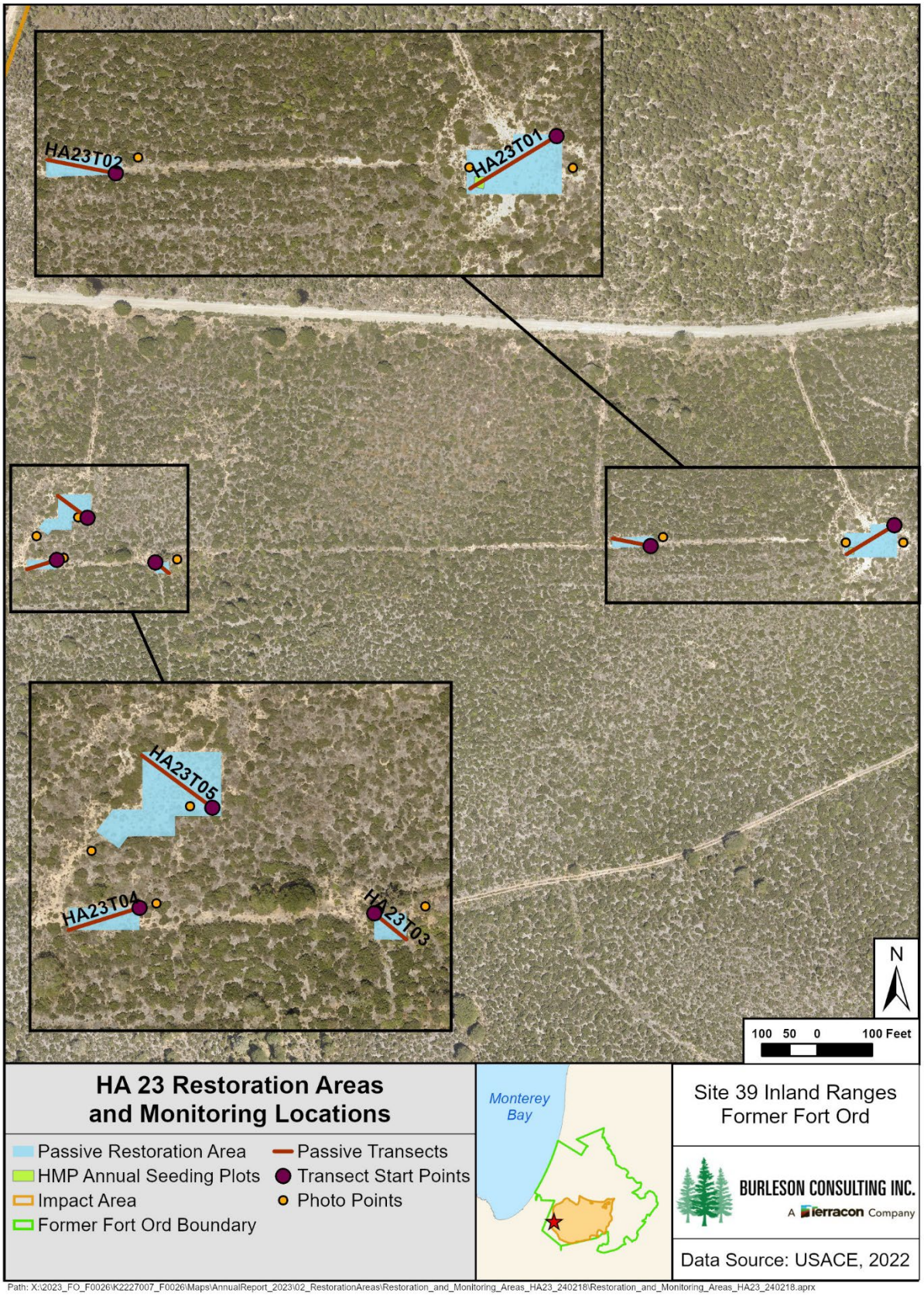


Figure 8-5. HA 23 Restoration Areas and Monitoring Locations Map

Table 8-11. Success Criteria and Acceptable Limits for Restoration of HA 23

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise shaggy-bark manzanita sandmat manzanita† coyote brush Monterey ceanothus† dwarf ceanothus Monterey spineflower† mock heather Eastwood's goldenbush† golden yarrow peak rush-rose deerweed sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data did not indicate non-native target weed species. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 20.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 4.
			Eastwood's goldenbush percent cover, as an average of transect data, must be equal or greater than 1.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low

* Objectives presented in HRP (Shaw, 2009b)
† HMP Species

8.4.1 Restoration Activities

No restoration activities occurred at HA 23 in 2023. See 2022 Annual Report for a comprehensive summary of restoration activities including historic planting and seed broadcast data for each HA (Burleson, 2023).

8.4.2 Monitoring Results

HA 23 was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-4).

8.4.3 Discussion

8.4.3.1 HA 23 Status

There are no updates to the HA 23 status discussion; see Table 8-12 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in year 13, 2025 (see Table 8-10).

Table 8-12. Status for Achieving Success Criteria at HA 23

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	14 required species: ADFA, ARTO, ARPU, BAPI, CERI, CEDE, CHPUP, ERER, ERFA, ERCO, CRSC, ACGL, DIAU, SAME	Yes	Yes	HIGH	**Year 5:** met **Year 8:** met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	HIGH	**Year 5:** 22.99% **Year 8:** 30.66%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5:** 0.00% **Year 8:** 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	Yes	Yes	HIGH	**Year 5:** 7.46% **Year 8:** 16.34%
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 20% CERI ≥ 4% ERFA ≥ 1%	No	No	HIGH for ARPU MODERATE for CERI LOW for ERFA	**Year 5:** ARPU 7.04% CERI 0.42% ERFA 0.00% **Year 8:** ARPU 15.19% CERI 1.14% ERFA 0.00% (CERI and ERFA planted in 2018/2019 and 2022/2023)**
Objective 3 – No. 4	HMP annual density	Low density for CHPUP	Yes	Yes	NA	**Year 5:** met **Year 8:** met (Year 13 monitoring not required)

**Planted as part of Adaptive Management Plan

8.5 HA 26

HA 26 was used by the Army as an intermittent machine gun range, a dry fire movement course, and later as a squad automatic weapon range. An estimated total of 22,400 cubic yards of soil was excavated over approximately 14 acres. Much of the site was dominated by invasive species. The excavation removed many areas of invasive species and possibly aided in the revegetation effort for this range (Mactec, 2008). HA 26 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 26 is relatively flat with a northeast aspect and contains low to medium quality habitat.

HA 26 is located on the western portion of Site 39, within the sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP restoration procedure for HA 26 included both passive and active restoration consisting of hand broadcast non-irrigated seed, annual weed management activities, and container-grown plant installation.

Restoration at HA 26 occurred from 2016 through 2022 and quantitative monitoring began in 2016. The HA was monitored for ten years by photo documentation and site visits; six years for HMP annual density in plots, HMP annual density across the HA, species richness, and plant survivorship; and five years for vegetative cover (see Table 8-13). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-6 shows the HA footprint, passive restoration area, and active restoration area. Success criteria for HA 26 are summarized in Table 8-14.

Table 8-13. Historic Summary of Restoration and Monitoring Activities at HA 26

Activity	Monitoring Years										
			1	2	3	4	5	6	7	8	13
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2028
Restoration: Active, Passive, Erosion Control, and Irrigation			●	●	●	●	●	●	●	●	
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●			●	
HMP Annual Density across HA			●	●	●	●	●			●	
Species Richness			●	●	●	●	●			●	●
Vegetative Cover				●	●	●	●			●	●
Plant Survivorship					●	●	●	●	●	●	

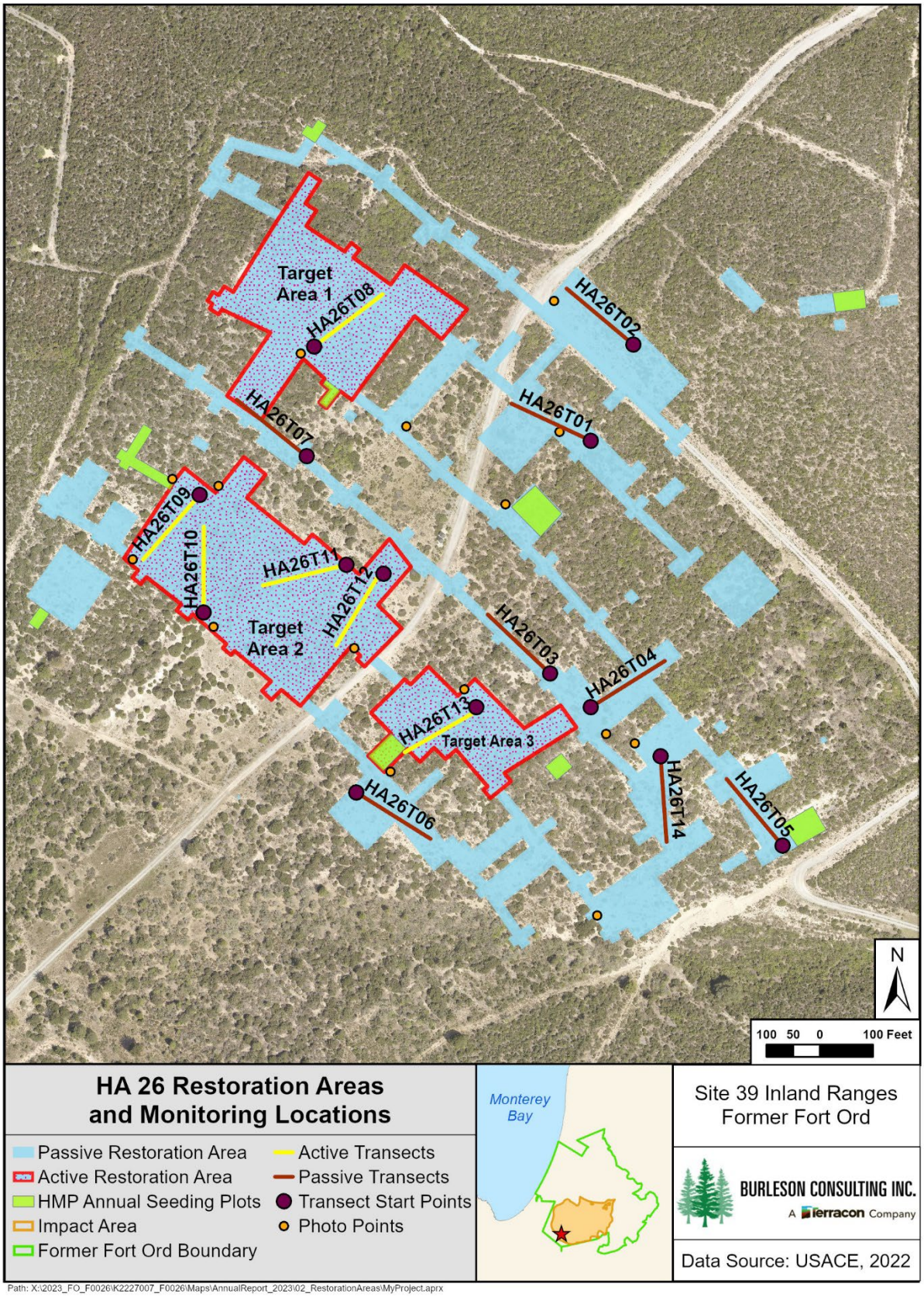


Figure 8-6. HA 26 Restoration Areas and Monitoring Locations Map

Table 8-14. Success Criteria and Acceptable Limits for Restoration of HA 26

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness: chamise sandmat manzanita† shaggy-bark manzanita Monterey ceanothus† Eastwood's goldenbush† sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 20 percent for native species‡	For the restoration area, percent cover monitoring data must meet or exceed 20 percent for native species listed as part of the plant palette in Table 2 of the SSRP‡.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data did indicate presence of non-native target weed species jubata grass. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 2.
			Monterey ceanothus percent cover, as an average of transect data, must be present however, less than 1 percent is acceptable.
			Eastwood's goldenbush percent cover, as an average of transect data, must be present however, less than 1 percent is acceptable.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

‡ 20 percent cover of native species is the revised success criteria due to the degraded conditions of the site prior to remediation – low quality habitat. However, the same restoration methods will be used and results will likely be similar to all restored areas.

8.5.1 Restoration Activities

Burleson performed passive restoration at HA 26 each year from 2016 to 2023. The total amount of seed broadcast on site was 743.17 lb compared to the 303.10 lb prescribed in the SSRP. Total seed broadcast exceeded the SSRP prescription because additional seed was broadcast for erosion control activities. Table 8-15 summarizes the SSRP seed target and the amount of seed applied by year and species. Burleson performed passive restoration for the HMP annual species Monterey spineflower. Nine plots were chosen in the HA based on having suitable habitat for Monterey spineflower and adjacent extant populations (see Figure 8-6).

Table 8-15. Summary of Passive Restoration Activities for HA 26

Species	Pounds of Seed Broadcast									
	SSRP Target	2016	2017	2018	2019	2020	2021	2022	2023	Total by Species
ACMI	14.00	5.24	18.05	9.35	3.30	37.20	3.62	1.00	2.69	80.45
ACGL	28.00	10.48	10.17	4.00	7.00	43.20	8.25	2.00	1.63	86.73
BAPI	2.10	1.05	0.45	0.80	0.20	0.20	0.20	-	-	2.90
CERI*	14.00	5.24	2.27	4.00	1.00	1.00	1.01	-	-	14.52
CHPUP*	2.10	0.84	-	0.21	0.21	0.21	0.21	-	-	1.68
CRSC	10.50	4.20	1.81	3.20	0.80	0.80	0.81	-	-	11.62
DIAU	7.00	2.62	1.13	2.00	0.50	0.50	0.51	-	-	7.26
ELGL	42.00	15.72	81.36	36.40	11.30	65.80	26.66	8.10	3.44	248.78
ERFA*	1.40	0.52	0.23	0.40	0.10	0.10	0.10	-	-	1.45
ERCO	14.00	5.24	2.27	4.00	1.00	1.00	1.01	-	-	14.52
FRCA	-	-	-	0.60	0.15	0.15	0.15	-	-	1.05
GAEL	-	-	-	1.60	0.15	0.15	0.15	-	-	2.05
HO	126.00	47.20	22.65	41.20	10.00	20.00	18.50	8.40	1.25	169.2
HOCU	28.00	10.48	9.04	17.80	0.40	-	8.08	-	-	45.80
SAME	14.00	5.24	2.27	4.00	1.00	1.00	1.01	-	-	14.52
STPU	-	-	-	22.75	8.00	-	13.30	3.20	3.44	50.65
TOTAL	**303.10**	**114.07**	**151.70**	**152.31**	**45.11**	**171.31**	**83.57**	**22.70**	**12.45**	**753.22**

* HMP species

No active restoration activities were conducted at HA 26 in 2023. See 2022 Annual Report for a comprehensive summary of active restoration activities including historic planting data for each HA (Burleson, 2023).

8.5.2 Monitoring Results

HA 26 was in year 8 of monitoring in 2023. Year 8 requires species richness, HMP annual density, and vegetative cover transect monitoring. Site visits, plant survivorship surveys, and photo documentation were also completed in 2023 at HA 26 (see Appendix D, page D-5).

8.5.2.1 Plant Survivorship

Plant survivorship monitoring was conducted at HA 26 for plants installed in 2018, 2019, 2020, 2021, 2022, and 2023. A total of eight shrub species and 711 individual plants were monitored for survivorship. In the 2018, 2019, and 2021 plantings, there were irrigated and non-irrigated plants. In the

2020, 2022, and 2023 plantings, all plants were non-irrigated. By year 3 of monitoring, survivorship was 73% for the 2018 planting, 70% for the 2019 planting, 56% for the 2020 planting, and 70% for the 2021 planting. By year 2 of monitoring for the 2022 planting survivorship was 74%. Table 8-16 through Table 8-20 present results by species.

Table 8-16. Plant Survivorship Monitoring Summary for 2018 Plantings at HA 26

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2018)	Year Two (2019)	Year Three (2020)
			Alive (%)	Alive (%)	Alive (%)
ADFA	723	72	94	91	90
ARPU*	955	92	96	95	96
ARTO	457	46	96	91	91
BAPI	202	18	83	83	84
CERI*	414	41	34	30	25
ERFA*	475	45	42	41	40
SAME	368	34	76	56	47
Total	**3,594**	**348**	**79**	**74**	**73**

*HMP Species

Table 8-17. Plant Survivorship Monitoring Summary for 2019 Plantings at HA 26

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2019)	Year Two (2020)	Year Three (2021)
			Alive (%)	Alive (%)	Alive (%)
ADFA	67	10	90	89	89
ARPU*	88	10	100	100	100
ARTO	69	10	100	100	100
BAPI	31	10	100	100	100
CERI	92	10	70	70	60
ERFA*	65	10	40	40	33
LUAR	15	9	22	0	0
SAME	63	10	100	90	90
Total	**490**	**79**	**78**	**74**	**70**

*HMP Species

Table 8-18. Plant Survivorship Monitoring Summary for 2020 Plantings at HA 26

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2020)	Year Two (2021)	Year Three (2022)
			Alive (%)	Alive (%)	Alive (%)
ADFA	134	13	92	92	91
ARPU*	125	13	100	92	91
ARTO	138	14	100	86	83
BAPI	61	10	100	70	60
CERI*	125	13	46	33	17
ERFA*	100	10	40	30	30
LUAR	15	10	0	0	0
SAME	125	13	92	77	69
Total	**823**	**96**	**74**	**63**	**56**

*HMP Species

Table 8-19. Plant Survivorship Monitoring Summary for 2021 Plantings at HA 26

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2021)	Year Two (2022)	Year Three (2023)
			Alive (%)	Alive (%)	Alive (%)
ADFA	123	11	100	100	100
ARPU	151	12	100	100	100
ARTO	138	12	93	93	92
BAPI	61	10	90	80	80
CERI	130	13	77	58	54
ERFA	150	9	40	40	33
LUAR	15	10	0	0	0
SAME	125	9	90	89	89
Total	**893**	**94**	**77**	**73**	**70**

Table 8-20. Plant Survivorship Monitoring Summary for 2022 Plantings at HA 26

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2022)	Year Two (2023)	Year Three (2024)
			Alive (%)	Alive (%)	Alive (%)
ADFA	135	14	86	86	
ARPU*	128	13	92	92	
ARTO	139	14	93	86	
BAPI	62	10	56	60	
CERI*	126	10	92	80	
ERFA*	101	10	80	70	
LUAR	15	9	0	0	
SAME	126	10	100	100	
Total	**832**	**94**	**79**	**74**	

*HMP Species

8.5.2.2 HMP Annual Density

Nine Monterey spineflower restoration plots were surveyed for year 8 density at HA 26 in 2023. The plots are numbered 1-9 on Figure 8-7 and are primarily located on the southwestern portion of the site. Monterey spineflower densities were low at Plots 1, 2, 4, 5, 6, 8, and 9. Monterey spineflower density was medium at Plot 3 and was not present at Plot 7. Figure 8-8 shows restoration plot densities for Monterey spineflower at HA 26.

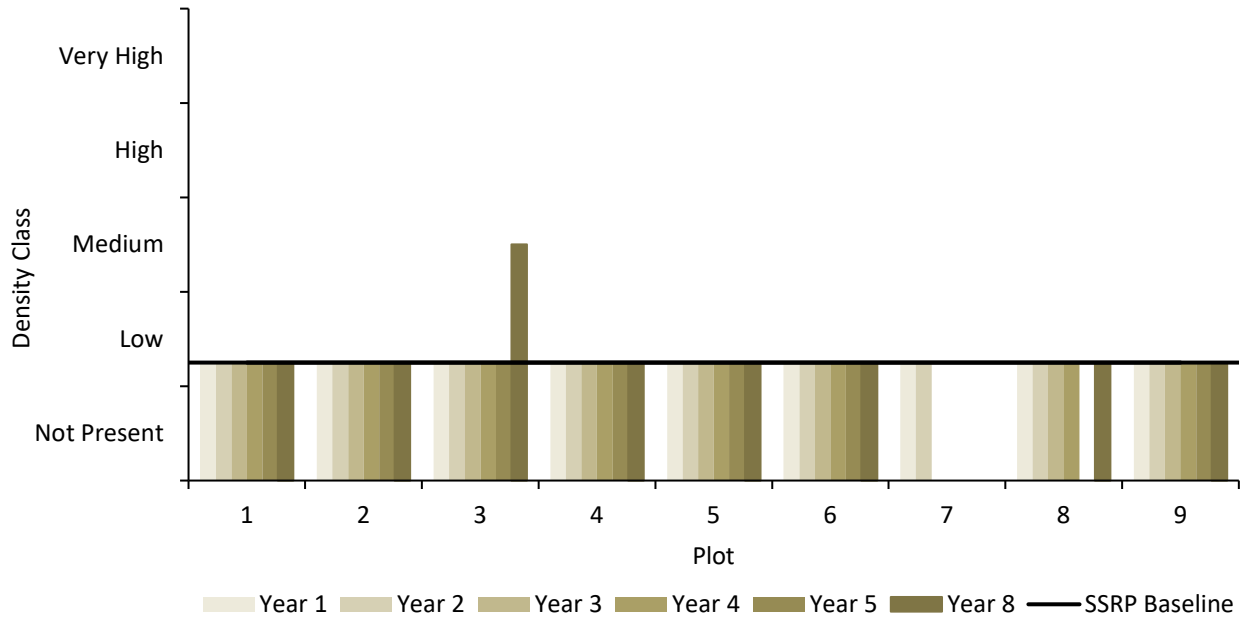


Figure 8-7. HA 26 Comparison of Monterey Spineflower Density Classes to the SSRP Baseline for Plots 1-9

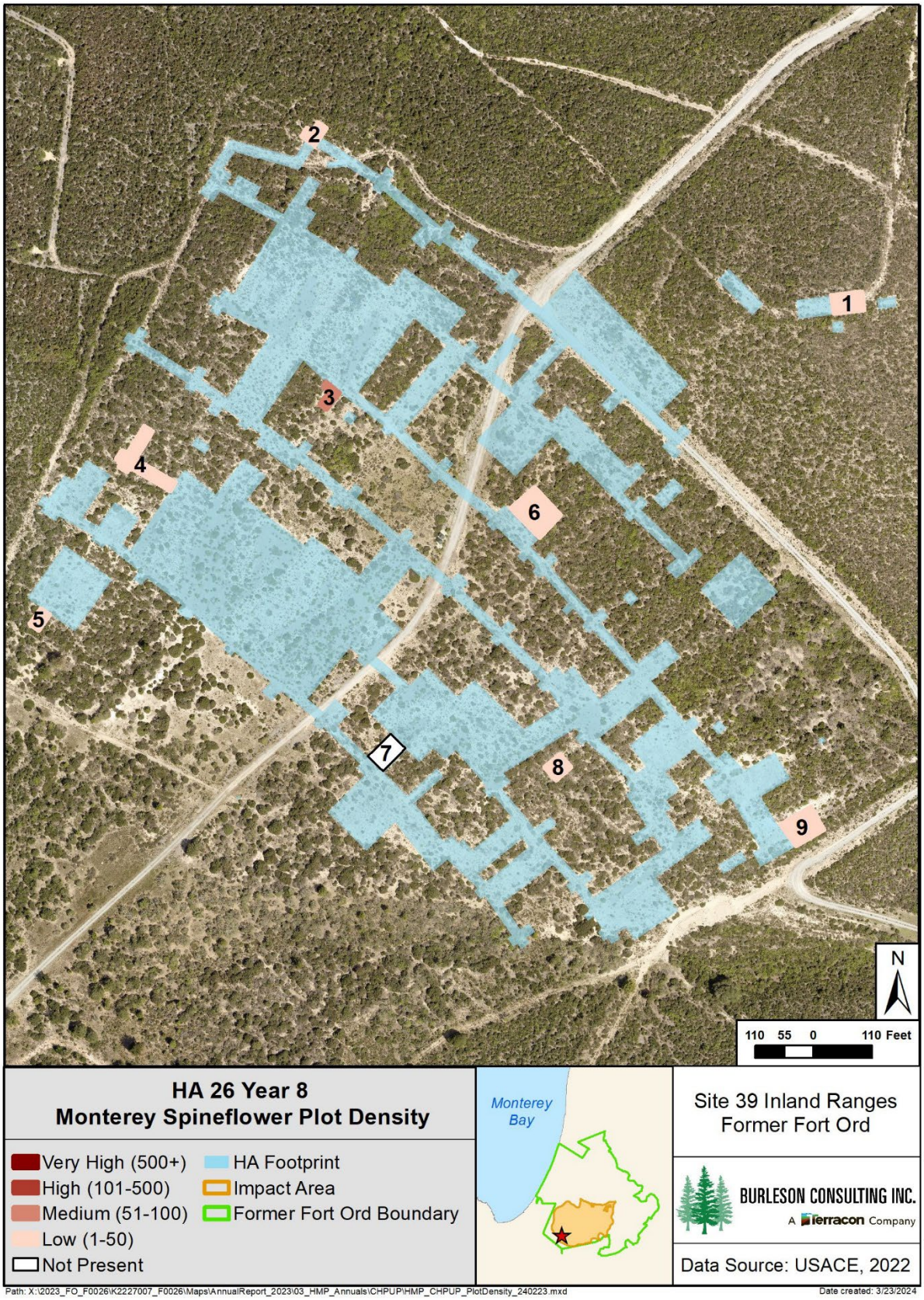


Figure 8-8. HA 26 Year 8 Monterey Spineflower Plot Density Map

HMP annual density monitoring included mapping discrete patches of HMP annuals within the restoration area but outside of the HMP annual restoration plots. This survey was completed for Monterey spineflower and seaside bird's beak at HA 26.

Three individual plants and six discrete patches of Monterey spineflower were mapped and individual plants were counted within each patch (see Figure 8-9). The density ranged from low to medium and the total acreage of Monterey spineflower patches with a density at or above the SSRP baseline density class of low was 0.01 acre. From 2020 to 2023, the density range and acreage above the SSRP baseline decreased.

Seaside bird's beak was not detected in 2023 despite conducting meandering transects throughout the HA, and a thorough search where it was previously observed in 2020. In 2020, the density was low and the total acreage of seaside bird's beak patches with a density at or above the low density class was 0.02 acre. Densities and acreages were not calculated in 2019 because no discrete patches were observed. Seaside bird's beak is not an SSRP required species at HA 26.

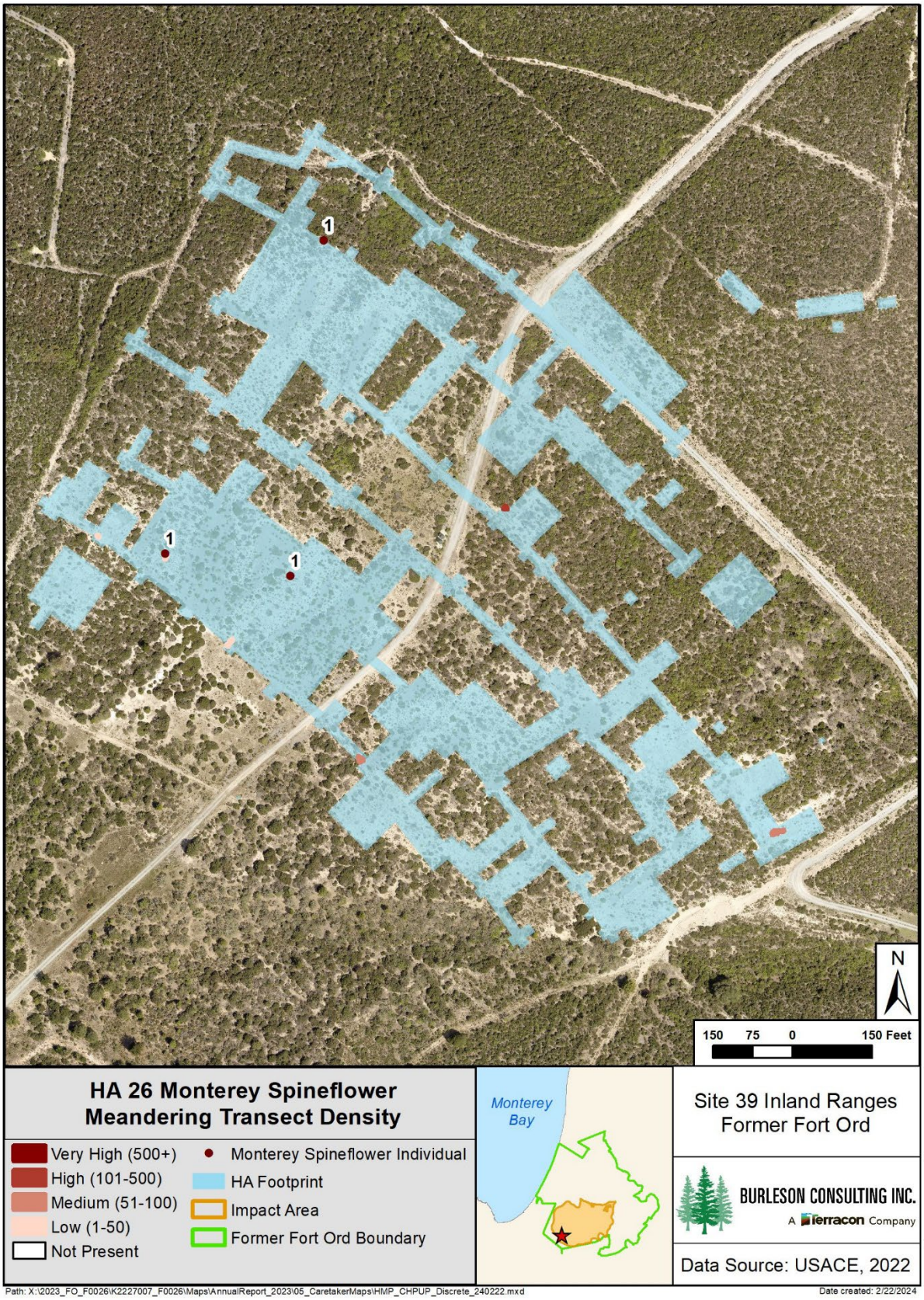


Figure 8-9. HA 26 Monterey Spineflower Meandering Transect Density Map

8.5.2.3 Vegetative Cover

Burleson surveyed 14 50-meter line-intercept transects at HA 26. The transect survey results indicated that the mean vegetative cover by native shrubs and perennials was 32.84%. The mean vegetative cover by native shrubs and perennials was 14.96% greater in 2023 than in 2020. Table 8-21 summarizes vegetative cover and Table 8-22 presents vegetative cover by species. Figure 8-10 presents the percent cover of dominant species at HA 26 in 2016, 2017, 2018, 2019 and 2022.

Table 8-21. Transect Survey Summary for HA 26

Transect ID	Total Vegetative Cover (%)	Native Vegetative Cover (%)	Non-Native Vegetative Cover (%)	Thatch (%)	Bare Ground (%)
HA26T08	43.72	43.14	0.20	41.28	46.80
HA26T09	63.78	63.78	0.00	59.98	26.86
HA26T10	42.28	42.28	0.00	99.40	0.60
HA26T11	58.36	58.16	0.20	55.54	28.26
HA26T12	38.66	38.66	0.00	100.00	0.00
HA26T13	35.22	35.22	0.00	79.06	21.22
Active Average	**47.00**	**46.87**	**0.07**	**72.54**	**20.62**
HA26T01	30.00	30.00	0.00	51.98	41.36
HA26T02	53.30	53.06	0.24	49.86	41.86
HA26T03	31.94	31.94	0.00	30.82	57.22
HA26T04	22.84	22.84	0.00	42.80	52.68
HA26T05	25.12	25.12	0.00	30.44	64.68
HA26T06	32.66	32.66	0.00	53.80	36.62
HA26T07	40.14	40.14	0.00	56.42	34.66
HA26T14	44.60	44.60	0.00	49.40	41.24
Passive Average	**35.08**	**35.04**	**0.03**	**45.69**	**46.29**
Site Average	**40.19**	**40.11**	**0.05**	**57.20**	**35.29**

Table 8-22. Transect Survey Results for HA 26 by Species

TRANSECT	ACGL (%)	ACMI (%)	ADFA (%)	ARHO (%)	ARPU (%)	ARTO (%)	BAPI (%)	CATU (%)	CEDE (%)	CERI (%)	CHDI (%)	COFI (%)	CRCO (%)	CRSC (%)
HA26T01	6.48	0.00	0.00	0.00	0.00	4.72	0.00	0.00	5.62	0.00	0.00	0.00	0.00	4.86
HA26T02	2.72	0.00	4.32	0.00	0.00	21.00	1.08	0.22	9.50	0.00	0.24	0.00	0.00	3.22
HA26T03	9.82	0.00	0.00	0.00	0.00	6.38	2.22	0.00	6.48	1.20	0.00	0.00	0.00	1.24
HA26T04	8.92	0.00	0.00	0.00	0.00	6.12	0.20	0.00	0.00	0.00	0.20	0.00	0.00	1.22
HA26T05	1.76	0.00	0.00	0.00	13.24	1.28	0.00	0.42	4.54	0.00	0.00	0.00	0.00	1.72
HA26T06	6.64	0.00	0.00	0.00	0.00	5.66	0.00	0.54	4.86	2.44	0.00	0.00	0.00	6.60
HA26T07	6.88	0.00	0.00	0.00	0.44	6.42	0.00	0.00	15.34	0.00	0.00	0.00	0.00	8.22
HA26T08	13.34	0.38	0.00	0.64	0.00	5.50	0.00	0.92	11.12	0.00	0.00	0.00	1.58	9.04
HA26T09	12.22	0.00	2.28	0.00	8.38	7.04	0.00	0.00	13.30	8.14	0.00	0.00	0.00	6.44
HA26T10	4.08	0.00	0.80	0.00	5.86	8.30	7.02	0.00	0.32	0.00	0.00	0.00	0.00	1.36
HA26T11	12.34	0.00	3.20	0.00	14.20	13.96	1.82	0.00	5.60	0.00	0.00	0.00	0.20	5.00
HA26T12	2.98	0.00	1.94	0.00	22.74	0.62	0.60	0.00	2.52	6.94	0.00	0.00	0.00	0.00
HA26T13	1.94	0.00	0.00	0.00	3.62	3.74	0.00	0.34	11.12	1.84	0.00	0.20	0.00	8.78
HA26T14	0.42	0.00	0.00	0.00	4.50	15.56	3.08	0.74	1.80	0.00	0.00	0.00	0.00	6.94
SITE AVERAGE	**6.47**	**0.03**	**0.90**	**0.05**	**5.21**	**7.59**	**1.14**	**0.23**	**6.58**	**1.47**	**0.03**	**0.01**	**0.13**	**4.62**

Table 8-22. (continued) Transect Survey Results for HA 26 by Species

TRANSECT	DIAU (%)	ERCA (%)	ERFA (%)	HOCU (%)	HYRA (%)	LOPA (%)	LYAR (%)	NAHA (%)	PO (%)	SAME (%)	STPU (%)	TODI (%)	TH (%)	BG (%)
HA26T01	1.56	0.00	0.00	6.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.98	41.36
HA26T02	0.00	0.00	0.00	7.62	0.00	0.00	0.24	0.00	0.00	2.90	0.00	0.24	49.86	41.86
HA26T03	0.20	0.00	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.82	57.22
HA26T04	0.00	0.00	1.48	4.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.80	52.68
HA26T05	0.00	0.00	0.00	1.96	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	30.44	64.68
HA26T06	0.00	0.74	0.78	3.64	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.56	53.80	36.62
HA26T07	0.00	0.00	0.00	2.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.42	34.66
HA26T08	0.00	0.00	0.00	0.42	0.20	0.00	0.00	0.20	0.38	0.00	0.00	0.00	41.28	46.80
HA26T09	0.24	0.00	0.36	4.72	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	59.98	26.86
HA26T10	11.46	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	2.74	0.00	0.00	99.40	0.60
HA26T11	0.00	0.00	0.88	0.56	0.20	0.00	0.00	0.00	0.00	0.40	0.00	0.00	55.54	28.26
HA26T12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	100.00	0.00
HA26T13	1.22	0.00	0.00	2.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.06	21.22
HA26T14	0.00	0.00	0.00	11.16	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	49.40	41.24
SITE AVERAGE	**1.05**	**0.05**	**0.25**	**3.68**	**0.03**	**0.01**	**0.02**	**0.10**	**0.03**	**0.43**	**0.02**	**0.06**	**57.20**	**35.29**

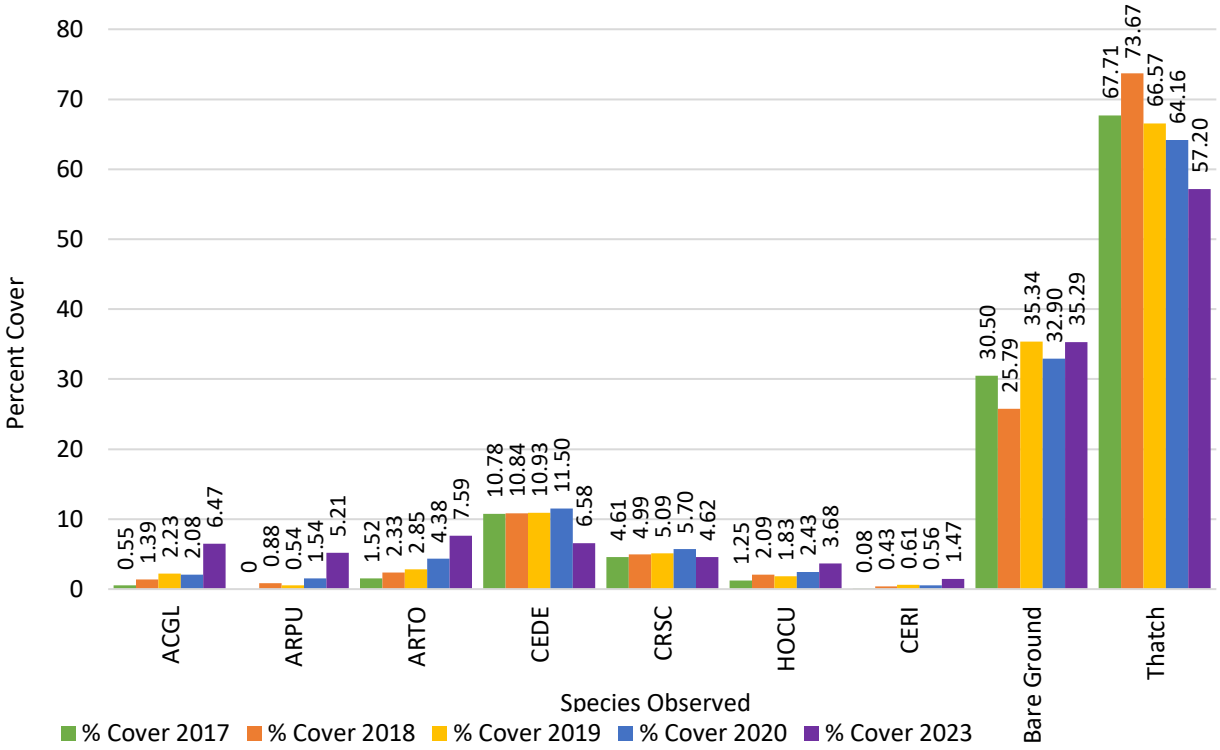


Figure 8-10. Percent cover of dominant species at HA 26 in 2017, 2018, 2019, 2020, and 2023

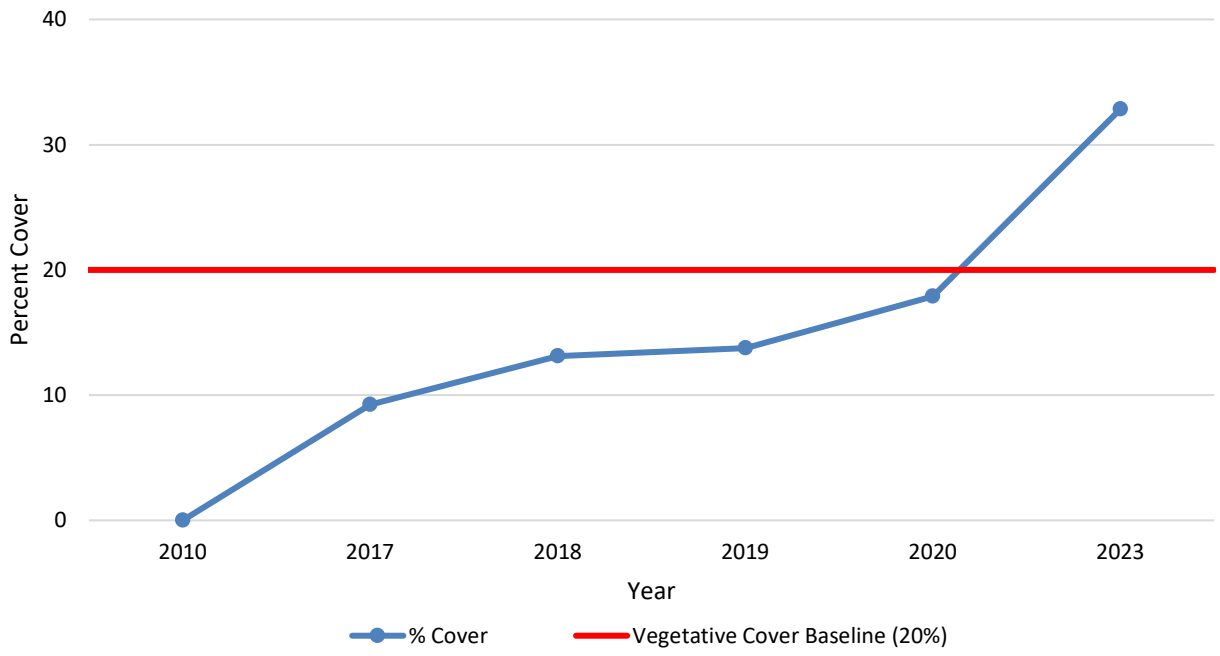


Figure 8-11. Native Vegetation Cover Compared to Success Criteria at HA 26

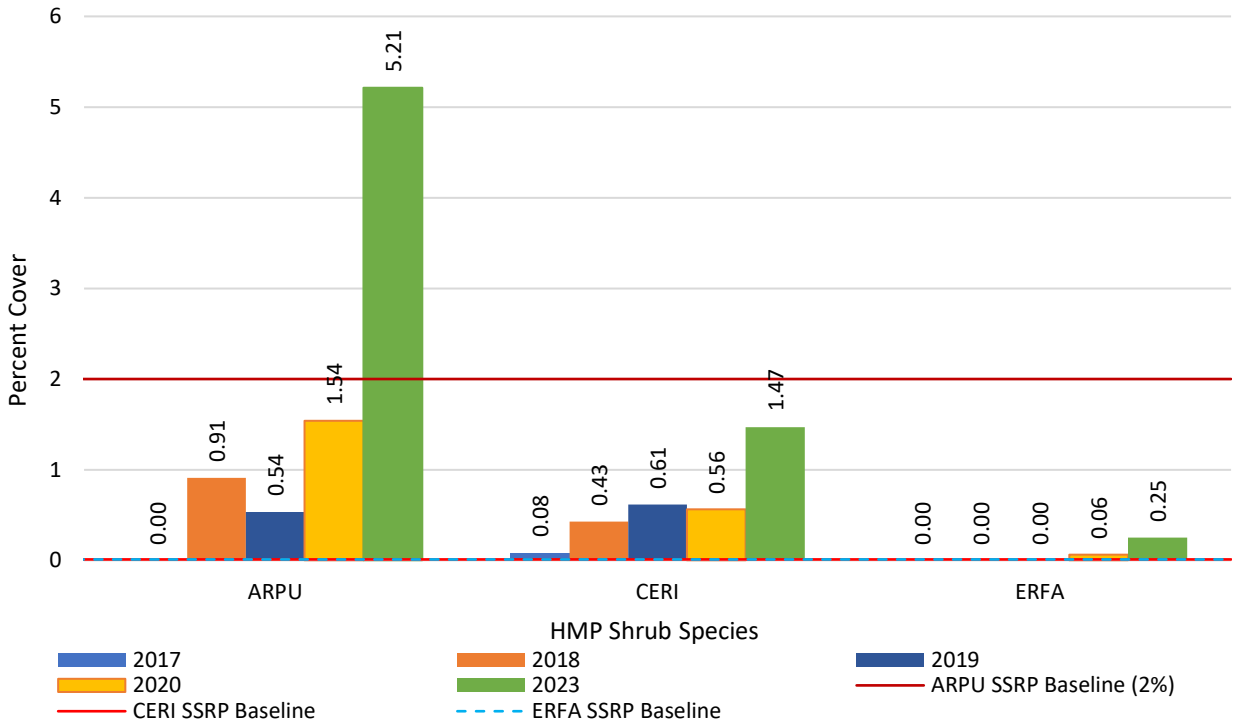


Figure 8-12. HMP Shrub Species Compared to Success Criteria at HA 26

8.5.2.4 Species Richness

Seventy-nine species were observed at HA 26. Of those, 37 were native shrubs or perennials, 15 were native annual herbaceous species, 26 were non-native species, and one was not categorized as it was only identified to genus (see Table 8-23). Species richness has increased by eight since 2022. Native shrub and perennial species richness increased by six, native herbaceous species richness increased by two, non-native species richness did not change, and uncategorized species richness did not change either. Due to subtle phenological differences between *Lupinus albifrons* var. *albifrons* and *Lupinus chamissonis* and the timing of surveys, the two species were combined for analysis of species richness and comparison to the success criteria (see section 6.1.4).

Table 8-23. Species Observed on HA 26, 2023

Scientific Name	Common Name	Code	Category
Achillea millefolium	common yarrow	ACMI	NP
Acmispon glaber	deerweed	ACGL	NP
Acmispon heermannii var. orbicularis	Heermann's lotus	ACHEO	NP
Acmispon strigosus	Bishop's lotus	ACST	NF
Adenostoma fasciculatum	chamise	ADFA	NP
Aira caryophyllea	silver hair grass	AICA	NNF
Arbutus menziesii	Pacific madrone	ARME	NP
*Arctostaphylos hookeri**	Hooker's manzanita	ARHO	NP
*Arctostaphylos montereyensis**	Monterey manzanita	ARMO	NP
*Arctostaphylos pumila**	sandmat manzanita	ARPU	NP
Arctostaphylos tomentosa	shaggy-bark manzanita	ARTO	NP
Avena barbata	slender wild oat	AVBA	NNF
Baccharis pilularis	coyote brush	BAPI	NP

Scientific Name	Common Name	Code	Category
Briza maxima	rattlesnake grass	BRMA	NNF
Bromus diandrus	ripgut brome	BRDI	NNF
Bromus madritensis ssp. rubens	foxtail chess	BRMAR	NNF
Calochortus albus	white globe lily	CAAL	NP
Carex tumulicola	foothill sedge	CATU	NP
Carpobrotus edulis	hottentot fig	CAED	NNP
Ceanothus dentatus	dwarf ceanothus	CEDE	NP
*Ceanothus rigidus**	Monterey ceanothus	CERI	NP
Ceanothus thyrsiflorus	blueblossom	CETH	NP
Centaurea melitensis	tocalote	CEME	NNF
Chorizanthe diffusa	diffuse spineflower	CHDI	NF
*Chorizanthe pungens var. pungens**	Monterey spineflower	CHPUP	NF
Cistus incanus	rock-rose	CIIN	NNP
Corethrogyne filaginifolia	common sandaster	COFI	NP
Cortaderia jubata	jubata grass	COJU	NNP
Crassula connata	pygmy-weed	CRCO	NF
Crocanthemum scoparium	peak rush-rose	CRSC	NP
Diplacus aurantiacus	sticky monkeyflower	DIAU	NP
Ericameria ericoides	mock heather	ERER	NP
*Ericameria fasciculata**	Eastwood's goldenbush	ERFA	NP
Erigeron canadensis	horseweed	ERCA	NF
Eriophyllum confertiflorum	golden yarrow	ERCO	NP
Erodium botrys	long-beaked filaree	ERBO	NNF
Erodium cicutarium	red-stemmed filaree	ERCI	NNF
Festuca myuros	rattail sixweeks grass	FEMY	NNF
Festuca octoflora	sixweeks grass	FEOC	NF
Frangula californica	California coffeeberry	FRCA	NP
Gamochaeta ustulata	purple cudweed	GAUS	NP
Gastridium phleoides	nit grass	GAPH	NNF
Heteromeles arbutifolia	toyon	HEAR	NP
Heterotheca grandiflora	telegraph weed	HEGR	NF
Horkelia cuneata	wedge-leaved horkelia	HOCU	NP
Hypochaeris glabra	smooth cat's ear	HYGL	NNF
Hypochaeris radicata	rough cat's ear	HYRA	NNP
Lepechinia calycina	pitcher sage	LECA	NP
Logfia gallica	daggerleaf cottonrose	LOGA	NNF
Lomatium parvifolium	coastal biscuitroot	LOPA	NP
Lysimachia arvensis	scarlet pimpernel	LYAR	NNF
Madia exigua	little tarweed	MAEX	NF
Marah fabacea	wild cucumber	MAFA	NP
Navarretia hamata ssp. parviloba	hooked navarretia	NAHAP	NF
Nuttallanthus texanus	blue toadflax	NUTE	NF
Petrorhagia dubia	hairypink	PEDU	NNF
Phacelia malvifolia	stinging phacelia	PHMA	NF
Pinus radiata	Monterey pine	PIRA	NP
Plantago erecta	California plantain	PLER	NF

Scientific Name	Common Name	Code	Category
Polygala californica	California milkwort	POCA	NP
Polypogon monspeliensis	rabbitsfoot grass	POMO	NNF
Pseudognaphalium beneolens	fragrant everlasting	PSBE	NP
Pseudognaphalium ramosissimum	pink everlasting	PSRA	NP
Pseudognaphalium sp.	cudweed	PS	0
Pseudognaphalium stramineum	cotton-batting plant	PSST	NP
Psilocarphus tenellus	slender woolly-marbles	PSTE	NF
Quercus agrifolia	coast live oak	QUAG	NP
Rumex acetosella	sheep sorrel	RUAC	NNP
Salvia mellifera	black sage	SAME	NP
Senecio glomeratus	cutleaf burnweed	SEGL	NNF
Silene gallica	small-flower catchfly	SIGA	NNF
Sonchus asper	prickly sow thistle	SOAS	NNF
Stipa pulchra	purple needle grass	STPU	NP
Stylocline gnaphaloides	everlasting neststraw	STGN	NF
Toxicodendron diversilobum	poison oak	TODI	NP
Tribolium obliterum	Capetown grass	TROB	NNF
Trifolium angustifolium	narrow-leaved clover	TRAN	NNF
Trifolium hirtum	rose clover	TRHI	NNF
Zeltnera davyi	Davy's centaury	ZEDA	NF

*HMP Species

8.5.3 Caretaker of Previous HA

Tree removal and herbicide application of cut stumps occurred throughout HA 26 in 2023. Six Monterey pines and two Monterey cypress trees were felled at HA 26. Tree removal locations are shown in Figure 8-13. Photographs C-10 through C-15 in Appendix C show Caretaker activities that occured in 2023.

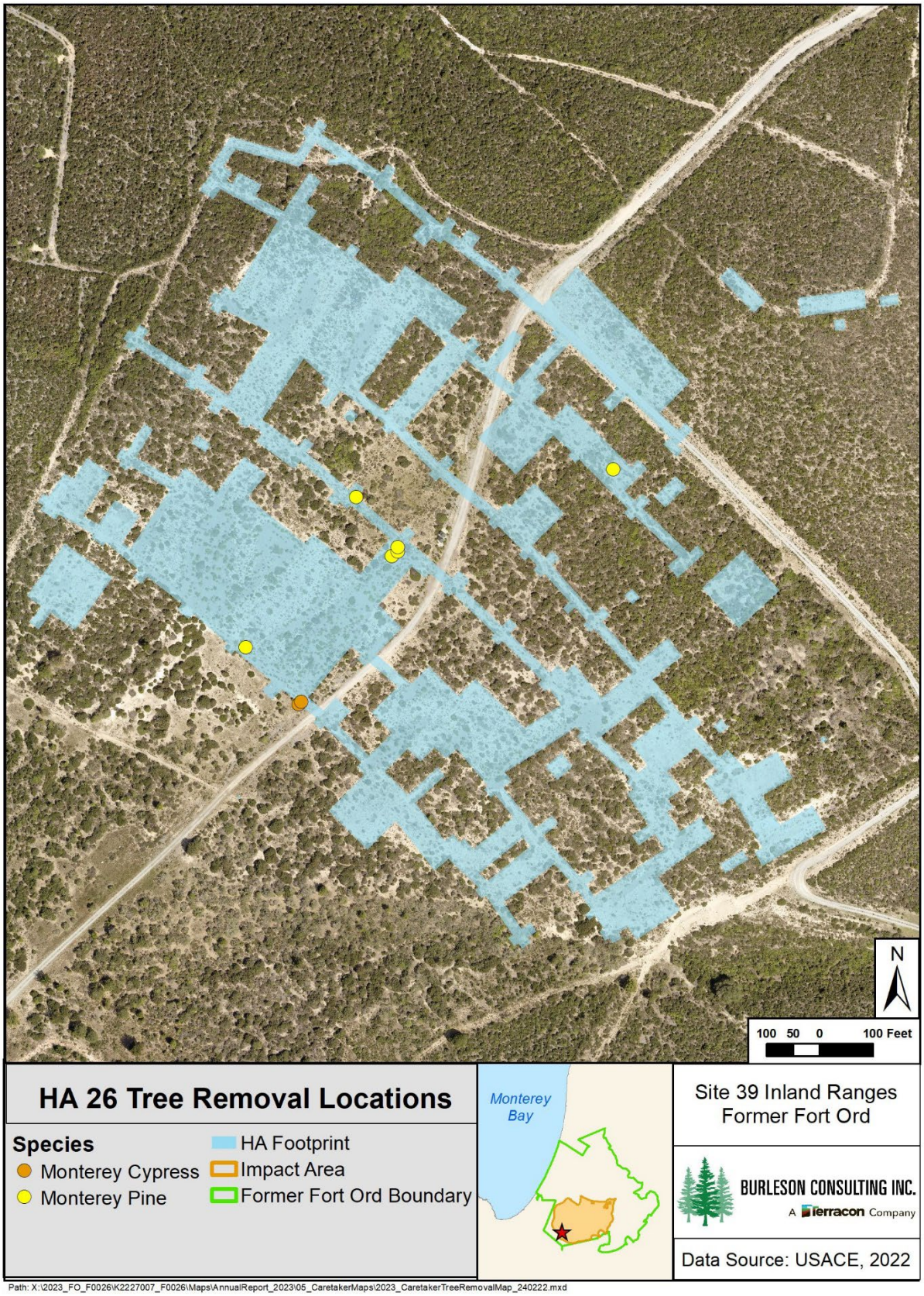


Figure 8-13. 2023 Tree Removal Locations at HA 26

8.5.4 Discussion

8.5.4.1 Plant Survivorship

Overall plant survivorship was moderate for the 2018, 2019, 2020, and 2021 planting events and high for 2022 planting events at HA 26. For plant survivorship classifications of each species by planting year, see Table 8-24. Low survivorship for yellow bush lupine (*Lupinus arboreus*) and Monterey ceanothus (*Ceanothus rigidus*) has been seen at multiple sites where plant surviviorship monitoring occurred. HA 26 lacks topsoil and has fine, silty soil which contributes to sheet flow and inhibits water infiltration. Several areas at HA 26 were mulched which prevented erosion and helped with water retention (Kemron, 2018). Survivorship will be monitored for one more year for the 2021 planting and two more years for the 2022 planting.

Table 8-24. Plant Survivorship Classifications for All Planting Years at HA 26

Species	Planting Year				
	2018	2019	2020	2021	2022
ADFA	high	high	high	high	high
ARPU*	high	high	high	high	high
ARTO	high	high	high	high	high
BAPI	high	high	moderate	high	moderate
CERI*	low	moderate	low	moderate	high
ERFA*	low	low	low	low	moderate
LUAR	-	low	low	low	low
SAME	low	high	moderate	high	high

* HMP Species

8.5.4.2 HMP Annual Density

Monterey spineflower density was within the acceptable limit for HMP annual density at HA 26. The SSRP baseline density class for Monterey spineflower was low. Year 8 Monterey spineflower restoration plot survey results show that eight out of nine plot densities met the success criterion under Objective 3. In addition, Monterey spineflower was present outside the restoration plots. Discrete observations, with density that met or exceeded the success criterion, covered 0.01 acre of HA 26.

8.5.4.3 Vegetative Cover

Native vegetative cover increased by 14.96% between 2020 and 2023 monitoring due largely to percent cover increases from deerweed (4.38%), sandmat manzanita (*Arctostaphylos pumila*) (3.67%), and shaggy-bark manzanita (3.21%). Absolute cover of HMP shrubs increased by 4.77% from 2020 to 2023, and all three species included in this category showed increases in percent cover individually as well.

Although the above average rainfall of the 2022-2023 wet season may have influenced increases in shorter-lived sub shrubs such as deerweed, peak rush-rose (*Crocanthemum scoparium*), and wedge-leaved horkelia (*Horkelia cuneata*), it should not be attributed as the sole driver of the increase in native vegetative cover. The vegetative cover increases for long-lived woody shrubs such as sandmat manzanita and shaggy-bark manzanita serves as evidence for a longer-term increase in native vegetative cover regardless of the 2022-2023 rain year.

8.5.4.4 Species Richness

Chamise (*Adenostoma fasciculatum*), Monterey manzanita (*Arctostaphylos montereyensis*), shaggy-bark manzanita (*Arctostaphylos tomentosa*), Monterey ceanothus, Eastwood's goldenbush (*Ericameria fasciculata*), sticky monkeyflower (*Diplacus aurantiacus)*, and black sage (*Salvia mellifera*) were present. HA 26 included 37 native shrub and perennial species and met the success criterion for Objective 1.

8.5.4.5 HA 26 Status

HA 26 was in year 8 of monitoring in 2023 and responded well to restoration efforts. In 2020, year 5 of monitoring, the site met three of six success criteria (see Table 8-25). In 2023, year 8 of monitoring, the site met six of six success criteria.

Per previous recommendations, an irrigation system was installed in 2018 and there was a focused effort to irrigate HMP shrubs to improve survivorship and HMP shrub cover (Burleson, 2019). The Army has no further recommendations at this time. A qualitative overview was documented by photo points (see Appendix D, page D-5).

Table 8-25. Status for Achieving Success Criteria at HA 26

Success Criterion	Category	Acceptable Limits	Year 5 (2020) Met	Year 8 (2023) Met	Likelihood of Achieving Success by Year 13 (2027)	Notes
Objective 1 – No. 1	Species richness	7 required species: ADFA, ARPU, ARTO, CERI, ERFA, DIAU, SAME	Yes	Yes	HIGH	**Year 5**: met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	≥ 20%	No	Yes	HIGH	**Year 5**: 17.88% **Year 8**: 32.84%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.15% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	No	Yes	HIGH	**Year 5**: 2.16% **Year 8**: 6.93%
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 2% CERI = present ERFA = present	No	Yes	HIGH for ARPU, CERI, and ERFA	**Year 5**: ARPU 1.54% CERI 0.56% ERFA 0.06% **Year 8**: ARPU 5.21% CERI 1.47% ERFA 0.25%
Objective 3 – No. 4	HMP annual density	Low density for CHPUP	Yes	Yes	NA	(Year 13 monitoring not required)

8.6 HA 27

HA 27 was used by the Army as a small-arms firing range. Soil remediation was completed in 2010; 100 cubic yards of lead-contaminated soil was excavated from 0.06 acre (Shaw, 2008). HA 27 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 27 is relatively flat and sits on exposed bedrock with surface water runoff in its western portion. Adjacent lands were not developed and contain intact native vegetation that may promote natural recruitment within restoration areas.

HA 27 is located on the southern portion of Site 39, occurring within Aromas formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 27 consisted of hand-broadcast non-irrigated seed and annual weed management activities.

Restoration at HA 27 occurred in 2011, 2012, 2019, 2020, 2022, and 2023 and quantitative monitoring began in 2016. HA 27 was monitored for 13 years by photo documentation and site visits and four years for species richness and vegetative cover (see Table 8-26). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-14 shows the HA footprint, passive restoration area, and transect monitoring locations. Success criteria for HA 27 are summarized in Table 8-27.

Table 8-26. Historic Summary of Restoration and Monitoring Activities at HA 27

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Active and Passive	●	●							●	●		●	●	
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Species Richness						●	●	●		●				●
Vegetative Cover						●†	●	●		●				●

† Vegetative cover was monitored using quadrats in 2016

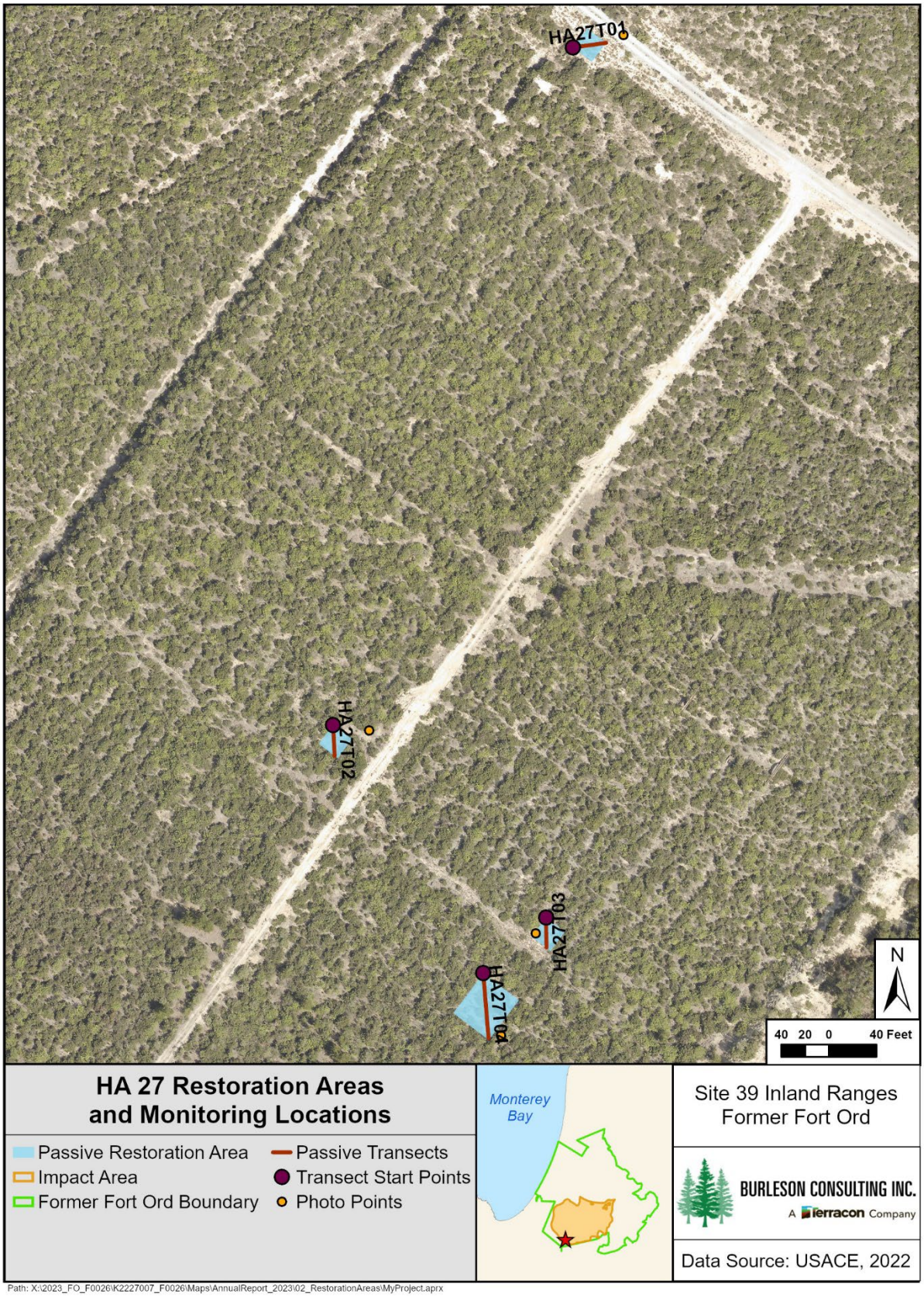


Figure 8-14. HA 27 Restoration Areas and Monitoring Locations Map

Table 8-27. Success Criteria and Acceptable Limits for Restoration of HA 27

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			Monterey manzanita† shaggy-bark manzanita sandmat manzanita† coyote brush Monterey ceanothus† golden yarrow peak rush-rose wedge-leaved horkelia deerweed sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicated the non-native target weed species jubata grass at 50 percent cover. Therefore, the non-native target weed may be present at less than or equal to 5 percent.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 4 (26-50% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 25.
			Monterey manzanita percent cover, as an average of transect data, must be equal or greater than 2.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 1.
4	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Density class: Not applicable

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

8.6.1 Restoration Activities

No restoration activities occurred at HA 27 in 2023. See 2022 Annual Report for a comprehensive summary of restoration activities including historic planting and seed broadcast data for each HA (Burleson, 2023).

8.6.2 Monitoring Results

HA 27 was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-6).

8.6.3 Caretaker of Previous HA

Monterey pine removal and herbicide application of cut stumps occurred throughout HA 27 in 2023. Six Montrey pine trees were felled at HA 27. Tree removal locations are shown in Figure 8-15. Photographs C-10 through C-15 in Appendix C show Caretaker activities that occured in 2023.

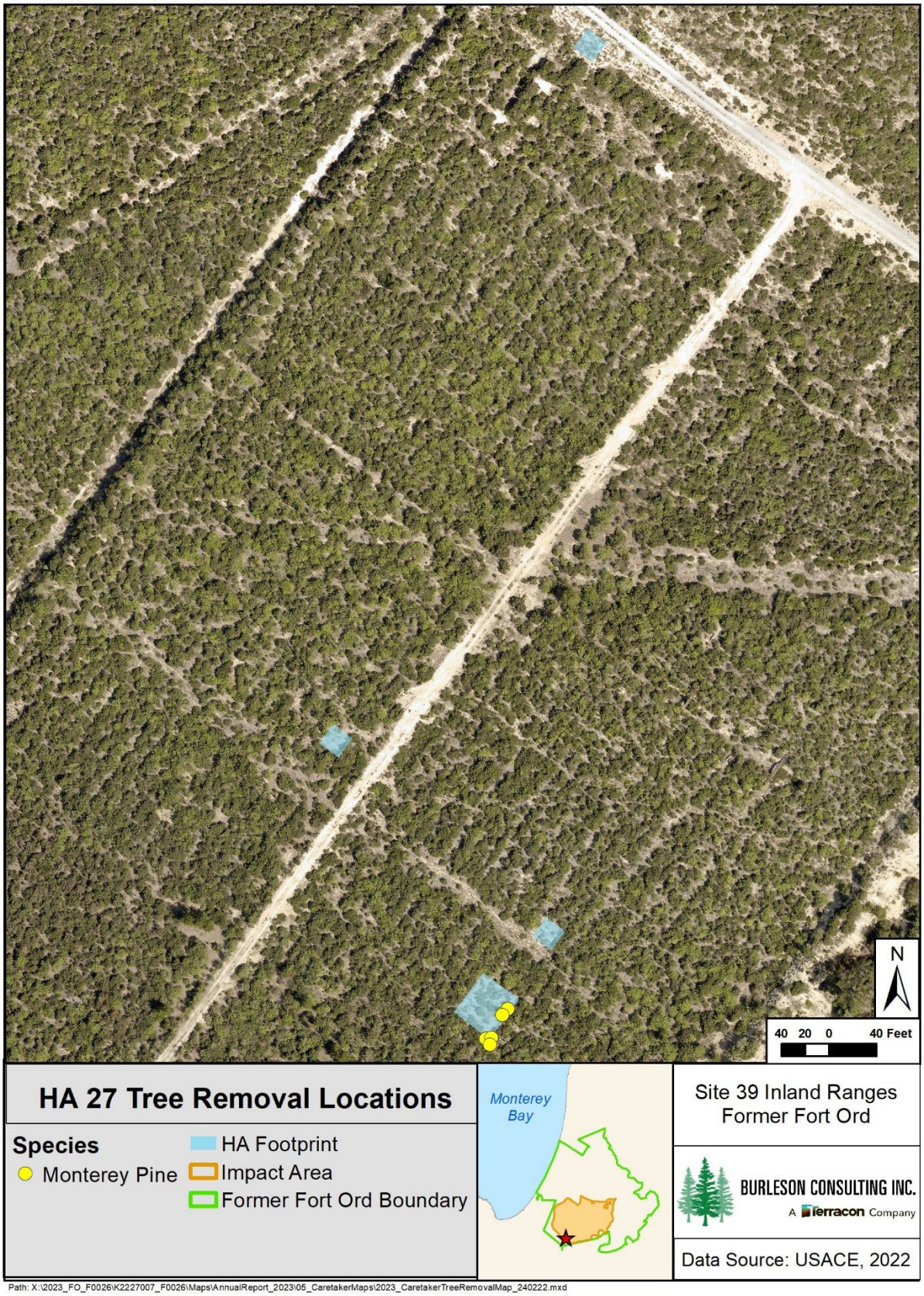


Figure 8-15. 2023 Tree Removal Locations at HA 27

8.6.4 Discussion

8.6.4.1 HA 27 Status

There are no updates to the HA 27 status discussion; see Table 8-28 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2025 (see Table 8-26).

Table 8-28. Status for Achieving Success Criteria at HA 27

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	11 Required species: ARMO, ARTO, ARPU, BAPI, CERI, ERCO, CRSC, HOCU, ACGL, DIAU, SAME	No	Yes	HIGH	**Year 5**: ERCO absent **Year 8**: met (ERCO planted in 2018/2019)**
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	HIGH	**Year 5**: 32.69% **Year 8**: 34.48% (AMP planting occurred in 2018/2019, 2021/2022, and 2022/2023)
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 1.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 4: 26-50%	No	No	LOW	**Year 5**: 0.00% **Year 8**: 6.60% (AMP planting occurred in 2018/2019, 2021/2022, and 2022/2023)
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 25% ARMO ≥ 2% CERI ≥ 1%	No	No	LOW for ARPU HIGH for ARMO HIGH for CERI	**Year 5**: ARPU 0.00% ARMO 0.00% CERI 0.00% **Year 8**: ARPU 0.00% ARMO 2.19% CERI 4.40% (ARMO planted in 2018/2019, ARPU planted in 2021/2022 and 2022/2023)**
Objective 3 – No. 4	HMP annual density	NA	NA	NA	NA	No HMP annuals in baseline data

**Planted as part of Adaptive Management Plan

8.7 HA 27A

HA 27A was used by the Army as a small-arms firing range. Soil remediation was completed in 2010; 1,100 cubic yards of lead-contaminated soil were excavated from 0.6 acres (Shaw, 2008). HA 27A rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 27A is relatively flat with a west aspect. Adjacent lands were not developed and contain intact native vegetation that may promote natural recruitment within restoration areas.

HA 27A is made up of three distinct polygons that are located on the southern portion of Site 39, occurring within Aromas formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In the southern most polygon, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 27A consisted of hand broadcast non-irrigated seed and annual weed management activities. The southern polygon at HA 27A lacks topsoil, has exposed hardpan sandstone, and ongoing erosion issues. This area is a transitional vegetative zone between maritime chaparral and grassland.

In 2019, the success criteria for HA 27A was revised due to the marginal response to restoration efforts. Under the revised success criteria, the southern polygon (HA 27A South) will resemble the early successional stages of a maritime chaparral habitat and the existing success criteria will continue to be applied to the two northern polygons (HA 27A North) (USFWS, 2019). HA 27A North and South are now evaluated separately for the species richness and non-native target weed cover success criteria. HA 27A North is the only area of the site to be evaluated for native vegetation cover, HMP shrub cover, and HMP shrub cover by species criteria.

Restoration at HA 27A occurred in 2011, 2012, 2016, 2018, 2019, 2020, 2021, and 2022 and quantitative monitoring began in 2016. HA 27A was monitored for 13 years by photo documentation and site visits and four years for species richness and vegetative cover (see Table 8-29). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-16 shows the HA footprint, passive restoration area, and transect locations. Success criteria for HA 27A are summarized in Table 8-30 and Table 8-31.

Table 8-29. Historic Summary of Restoration and Monitoring Activities at HA 27A

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Passive and Erosion Control	●	●				●		●	●	●	●	●	●	
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Species Richness						●	●	●		●				●
Vegetative Cover						●	●	●		●				●

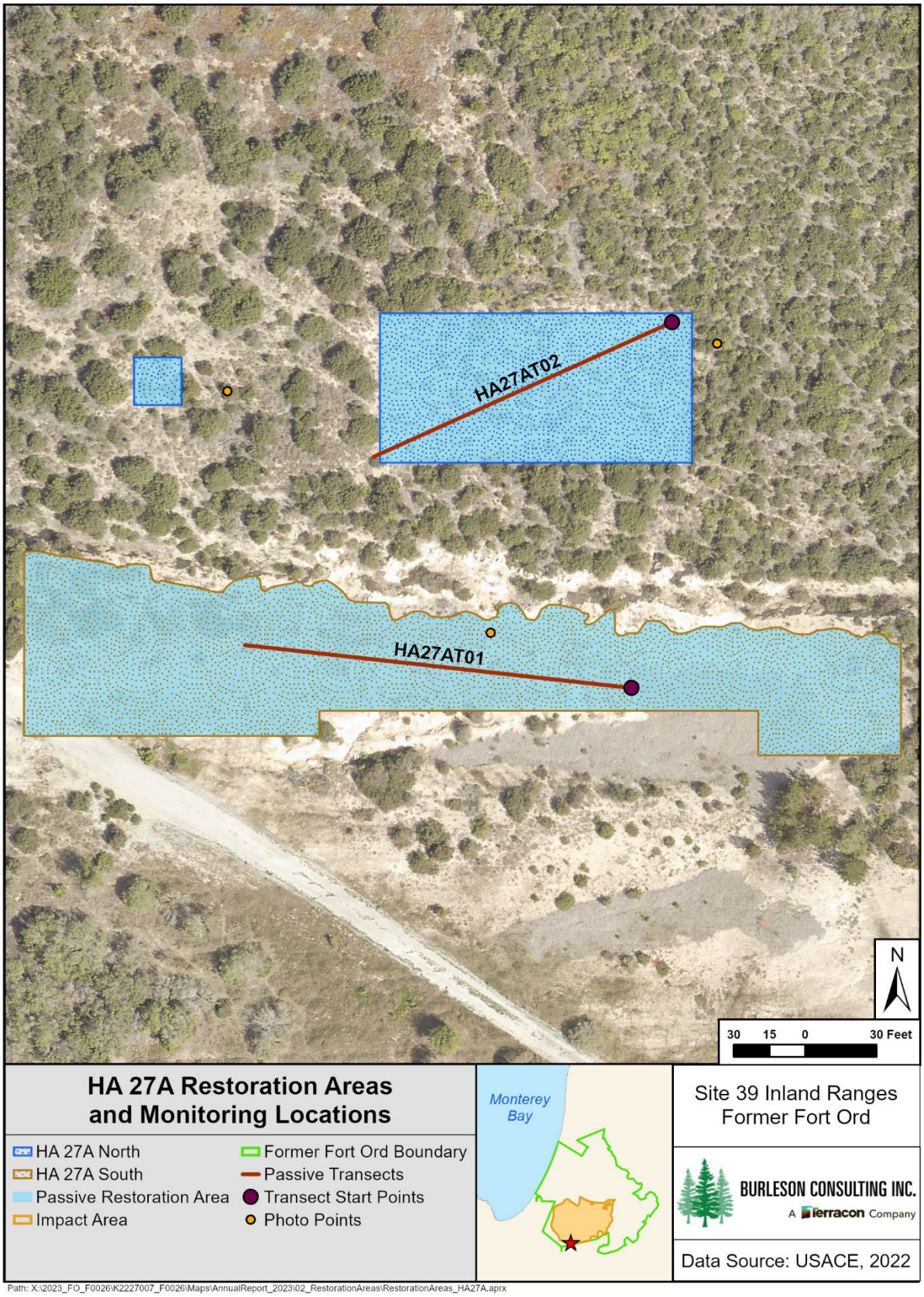


Figure 8-16. HA 27A Restoration Areas and Monitoring Location Map

Table 8-30. Success Criteria and Acceptable Limits for Restoration of HA 27A North

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise Monterey manzanita† shaggy-bark manzanita sandmat manzanita† coyote brush Monterey ceanothus† golden yarrow peak rush-rose wedge-leaved horkelia deerweed sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicated the non-native target weed species jubata grass at 10 percent cover. Therefore, the non-native target weed may be present at less than or equal to 5 percent.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 4 (26-50% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 25.
			Monterey manzanita percent cover, as an average of transect data, must be equal or greater than 2.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 1.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Density class: Not applicable

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

Table 8-31. Success Criteria and Acceptable Limits for Restoration of HA 27A South‡

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness: coyote brush peak rush-rose wedge-leaved horkelia deerweed sticky monkeyflower
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicated the non-native target weed species jubata grass at 10 percent cover. Therefore, the non-native target weed may be present at less than or equal to 5 percent.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity (North only)	HMP shrub cover class must meet or exceed baseline data	Cover class: Not applicable
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Not applicable
4	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Density class: Not applicable

* Objectives presented in HRP (Shaw, 2009b)

‡ Success criteria for HA 27A South updated in consultation with USFWS (USFWS, 2019)

8.7.1 Restoration Activities

Burleson performed passive restoration in 2011, 2012, 2016, 2018, 2019, 2020, 2022, and 2023 throughout HA 27A North and South. The total amount of seed broadcast on site was 70.306 lb compared to 13.530 lb prescribed in the SSRP. Total seed broadcast exceeded the SSRP prescription because additional seed was broadcast for erosion control activities. Table 8-32 summarizes the SSRP seed target and the amount of seed applied by year and species.

Table 8-32. Summary of Passive Restoration Activities for HA 27A

Species	Pounds of Seed Broadcast									
	SSRP Target	2011	2012	2016	2018	2019 (Feb - March)	2020	2022	2023	Total by Species
ACMI	-	-	-	0.400	0.750	0.600	2.000	0.200	1.310	5.260
ACGL	1.200	0.600	0.608	0.800	-	-	2.000	0.400	1.120	5.528
ADFA	0.600	0.300	0.308	-	-	-	-	-	-	0.608
ARMO*	1.200	0.600	0.611	-	-	-	-	-	-	1.211
ARPU*	0.600	0.300	0.308	-	-	-	-	-	-	0.608
ARTO	1.200	0.600	0.612	-	-	-	-	-	-	1.212
BAPI	0.090	-	0.046	-	-	-	-	-	-	0.046
CERI*	0.600	-	0.314	-	-	-	-	-	-	0.314
CRSC	0.600	0.300	0.303	-	-	-	-	-	-	0.603
DIAU	0.060	0.200	0.183	-	-	-	-	-	-	0.383
ELGL	-	-	-	14.400	2.000	1.600	-	1.300	2.550	21.850
ERCO	0.180	0.093	0.093	-	-	-	-	-	-	0.186
HOCU	1.200	0.600	0.600	11.400	1.000	0.800	-	-	-	14.400
HO	5.400	-	5.421	2.000	-	-	-	1.200	0.500	9.121
SAME	0.600	0.300	0.306	-	-	-	-	-	-	0.606
STPU	-	-	-	7.000	1.250	1.000	-	0.600	2.550	12.400
TOTAL	**13.530**	**3.893**	**9.713**	**36.000**	**5.000**	**4.000**	**4.000**	**3.700**	**8.03**	**74.336**

* HMP Species

No active restoration activities occurred at HA 27A in 2023. See 2022 Annual Report for a comprehensive summary of active restoration activities including historic planting data for each HA (Burleson, 2023).

8.7.2 HA 27A North Monitoring Results

HA 27A North was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-7).

8.7.3 HA 27A South Monitoring Results

HA 27A South was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-8).

8.7.4 Caretaker of Previous HA

Monterey pine removal and herbicide application of cut stumps occurred at HA 27A South in 2023. Two Montrey pine trees were felled at HA 27A South, both of which were very close to the HA boundary. Tree removal locations are shown in Figure 8-17. We plan to remove additional trees from this location

in future caretaker efforts to prevent the spread of an isolated stand of pines onto the HA footprint. Photographs C-10 through C-15 in Appendix C show Caretaker activities that occured in 2023.

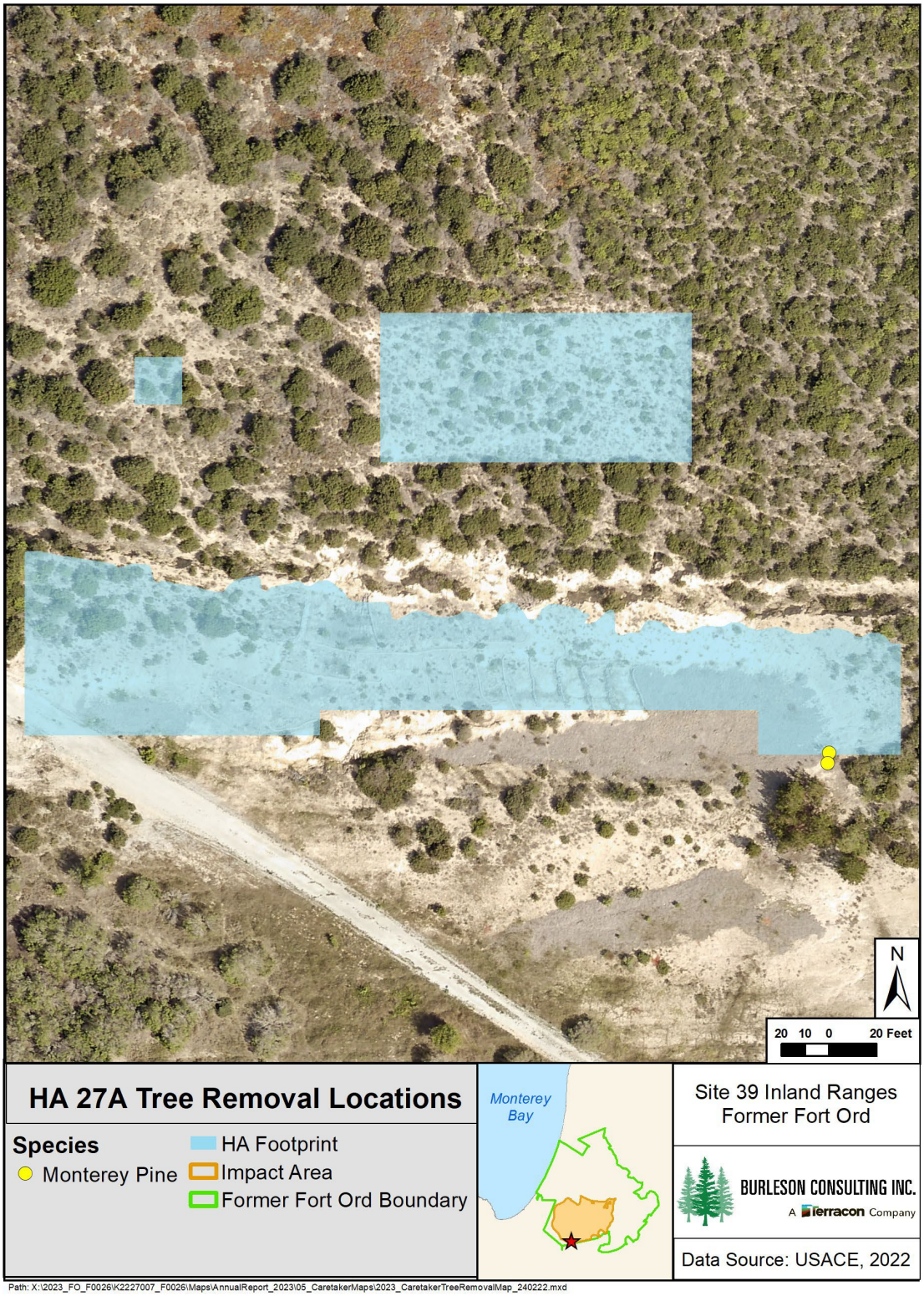


Figure 8-17. 2023 Tree Removal Locations at HA 27A

8.7.5 Discussion

8.7.5.1 HA 27A North Status

There are no updates to the HA 27A North status discussion; see Table 8-33 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2025 (see Table 8-29).

Table 8-33. Status for Achieving Success Criteria at HA 27A North

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met*	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	12 Required species: ADFA, ARMO, ARTO, ARPU, BAPI, CERI, ERCO, CRSC, HOCU, ACGL, DIAU, SAME	Yes	Yes	HIGH	**Year 5**: met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	High	**Year 5**: 23.34%, **Year 8**: 33.18%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	High	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 4: 26-50%	No	No	LOW	**Year 5**: 0.62% **Year 8**: 2.80% (ARPU and CERI planted in 2020/2021, ARMO planted in 2021/2022)**
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 25% ARMO ≥ 2% CERI ≥ 1%	No	No	LOW for ARPU LOW for ARMO LOW for CERI	**Year 5**: ARPU 0.62% ARMO 0.00% CERI 0.00% **Year 8**: ARPU 2.20% ARMO 0.59% CERI 0.00% (ARPU and CERI planted in 2020/2021, ARMO planted in 2021/2022)**
Objective 3 – No. 4	HMP annual density	NA	NA	NA	NA	NA

*Prior to HA 27A being split into distinct North and South sections for monitoring purposes
**Planted as part of Adaptive Management Plan

8.7.5.2 HA 27A South Status

In 2017, year 5 of monitoring, HA 27A met two of five success criteria before it was split into two sites. In year 8, HA 27A South met both relevant success criteria. The site is on trajectory to continue meeting both success criteria by year 13 of monitoring, 2025 (see Table 8-34).

Per recommendations in the 2017 Annual Report, the Army implemented two actions to support HA 27A South in achieving success criteria in future years: 1) continue erosion control efforts, including the use of mulch (Kemron applied mulch to the eastern portion of the polygon in 2018) and 2) manage the site in two distinct areas and reevaluate the success criteria for the southern polygon (Burleson, 2018). HA 27A South is now evaluated only for species richness and non-native target weed cover with the goal of resembling the early successional stages of a maritime chaparral habitat. The Army planted deerweed, coyote brush (*Baccharis pilularis*), and purple needlegrass in the 2020/2021 season to support these goals. The updated success criteria are reflected in Tables Table 8-30 and Table **8-31**. The Army has no further recommendations at this time. A qualitative overview was documented by photo points (see Appendix D, page D-8).

The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2025 (see Table 8-29).

Table 8-34. Status for Achieving Success Criteria at HA 27A South

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met*	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	12 Required species: ADFA, ARMO, ARTO, ARPU, BAPI, CERI, ERCO, CRSC, HOCU, ACGL, DIAU, SAME	Yes	Yes	HIGH	**Year 5**: met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	NA	NA	NA	NA	NA
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	YES	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	NA	NA	NA	NA	NA
Objective 3 – No. 4	HMP shrub cover by species	NA	NA	NA	NA	NA
Objective 3 – No. 4	HMP annual density	NA	NA	NA	NA	NA

*Prior to HA 27A being split into distinct North and South sections for monitoring purposes

8.8 HA 28

HA 28 was used by the Army as a range for automatic rifles. Soil was excavated over 4.3 acres. A vernal pool comprised ponds 30A, 30B, and 30C and partially extends into HA 28. California tiger salamander (*Ambystoma californiense*) and other aquatic species have been documented within the vernal pool. HA 28 rests within unprotected maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 28 is surrounded by medium to very high-quality habitat.

HA 28 is located on the southern portion of Site 39, within the sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for HA 28 included both passive and active restoration consisting of hand broadcast non-irrigated seed, annual weed management activities, and installing native container-grown plants. HA 28 is moderately sloped with some potential for erosion.

Restoration activities at HA 28 occurred from 2013 to 2020 and quantitative monitoring began in 2015. The HA was monitored for 11 years by photo documentation and site visits; six years for HMP annual density in plots; seven years for plant survivorship; and five years for HMP annual density across the HA, species richness, and vegetative cover (seeTable 8-35). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-18 shows the HA footprint, passive restoration area, active restoration area, and transect monitoring locations. Success criteria for HA 28 are summarized in Table 8-36.

Table 8-35. Historic Summary of Restoration and Monitoring Activities at HA 28

Activity	Monitoring Years											
			1	2	3	4	5	6	7	8	9	13
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Restoration: Active, Passive, and Erosion Control	●	●	●	●	●	●	●	●				
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●			●		
HMP Annual Density across HA				●	●	●	●			●		
Species Richness				●	●	●	●			●		●
Vegetative Cover				●	●	●	●			●		●
Plant Survivorship			●	●	●	●	●	●	●			

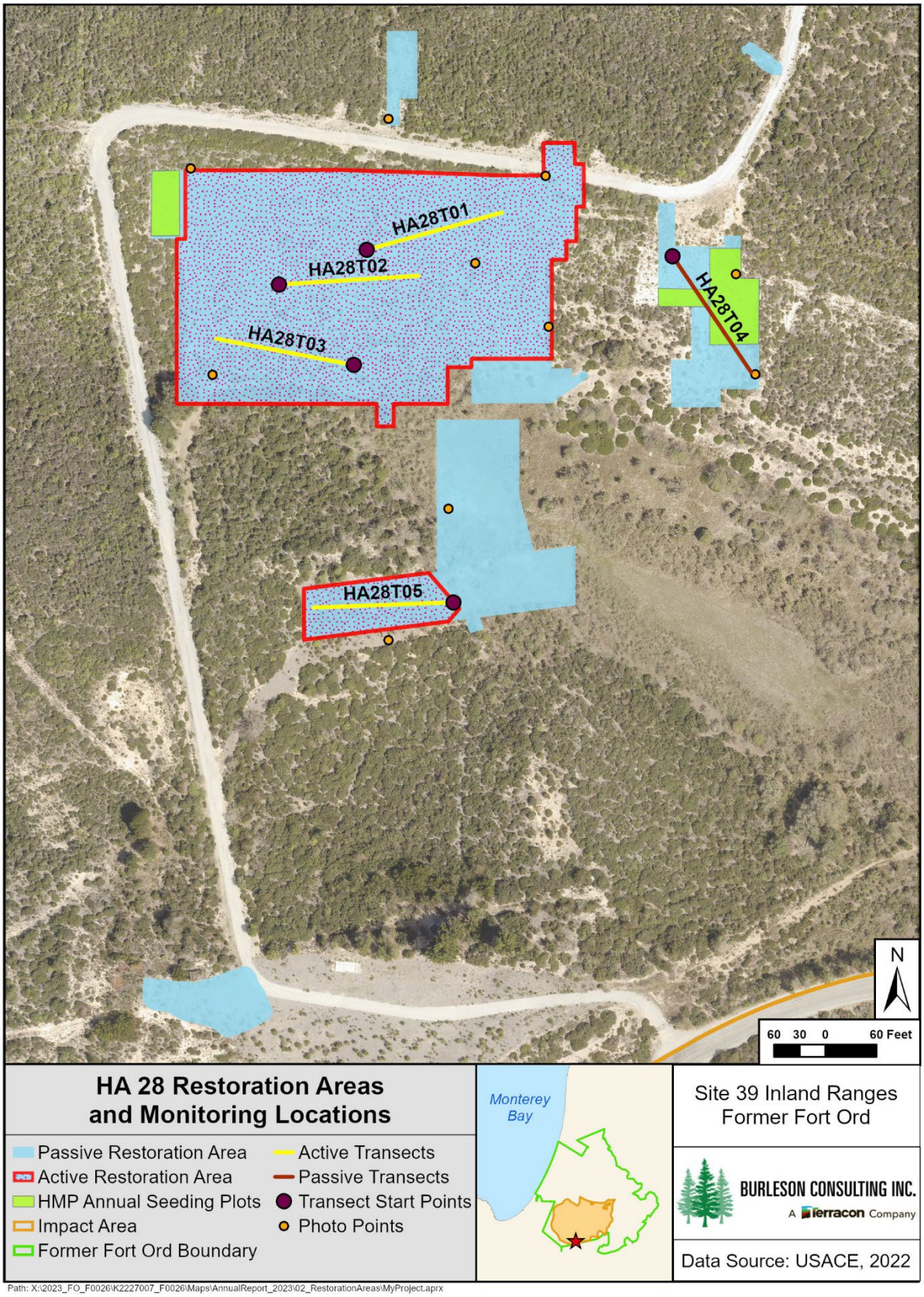


Figure 8-18. HA 28 Restoration Areas and Monitoring Locations Map

Table 8-36. Success Criteria and Acceptable Limits for Restoration of HA 28

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise Monterey manzanita† sandmat manzanita† shaggy-bark manzanita Monterey ceanothus† wedge-leaved horkelia black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicated presence of non-native target weed species jubata grass. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 35.
			Monterey ceanothus percent cover, as an average of transect data, must be present however, less than 1 percent is acceptable.
			Monterey manzanita percent cover, as an average of transect data, must be present however, less than 2 percent is acceptable.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

8.8.1 Restoration Activities

Burleson performed passive restoration at HA 28 in 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, and 2023. The total amount of seed broadcast on site was 329.20 lb compared to 115.80 lb prescribed in the SSRP. Total seed broadcast exceeded the SSRP prescription because additional seed was broadcast for erosion control activities. Table 8-37summarizes the SSRP seed target and the amount of seed applied by year and species. Burleson performed passive restoration for the HMP annual species Monterey spineflower in 2014 and 2017. Three plots were chosen in the HA based on having suitable habitat for Monterey spineflower and adjacent extant populations (see Figure 8-18).

Table 8-37. Summary of Passive Restoration Activities for HA 28

Species	Pounds of Seed Broadcast										
	SSRP Target	2013	2014	2015	2016	2017	2018	2019	2020	2023	Total by Species
ACMI	3.40	4.40	-	3.14	-	-	2.10	0.30	17.20	0.03	27.17
ACGL	6.80	8.50	-	3.72	-	-	-	-	18.40	0.07	30.69
BAPI	0.50	1.00	-	0.07	-	-	-	-	-	-	1.07
CERI*	1.70	1.70	-	0.36	-	-	-	-	-	-	2.06
CHPUP*	0.10	-	0.03	-	-	0.03	-	-	-	-	0.06
CRSC	2.60	3.50	-	0.29	-	-	-	-	-	-	3.79
DIAU	0.50	3.60	-	0.18	-	-	-	-	-	-	3.78
ELGL	13.60	33.60	-	15.70	1.20	-	5.60	0.80	3.00	0.20	60.10
ERCO	4.30	5.30	-	0.36	-	-	-	-	-	-	5.66
ERER	-	3.10	-	-	-	-	-	-	-	-	3.10
ERFA*	0.70	0.70	-	0.04	-	-	-	-	-	-	0.74
HO	68.00	118.00	-	36.40	0.80	-	10.00	-	-	-	165.20
HOCU	6.80	8.80	-	0.72	-	-	2.80	0.40	-	-	12.72
SAME	6.80	7.70	-	0.36	-	-	-	-	-	-	8.06
STPU	-	-	-	-	-	-	3.50	0.50	0.90	0.20	5.10
TOTAL	**115.80**	**199.90**	**0.03**	**61.34**	**2.00**	**0.03**	**24.00**	**2.00**	**39.50**	**0.40**	**329.20**

* HMP species

No active restoration activities occurred at HA 27A in 2023. See 2022 Annual Report for a comprehensive summary of active restoration activities including historic planting data for each HA (Burleson, 2023).

8.8.2 Monitoring Results

HA 28 was in year 9 of monitoring in 2023. Year 9 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-7).

8.8.3 Discussion

8.8.3.1 HA 28 Status

There are no updates to the HA 28 status discussion; see Table 8-38 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in year 13, 2027 (see Table 8-35).

Table 8-38. Status for Achieving Success Criteria at HA 28

Success Criterion	Category	Acceptable Limits	Year 5 (2019) Met	Year 8 (2022) Met	Likelihood of Achieving Success by Year 13 (2027)	Notes
Objective 1 – No. 1	Species richness	7 required species: ADFA, ARMO, ARPU, ARTO, CERI, HOCU, SAME	Yes	Yes	HIGH	**Year 5**: met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	Yes	HIGH	**Year 5**: 29.01% **Year 8**: 40.82%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	Yes	Yes	HIGH	**Year 5**: 9.66% **Year 8**: 17.38%
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 35% ARMO = present CERI = present	No	No	LOW for ARPU HIGH for ARMO HIGH for CERI	**Year 5**: ARPU 6.51% ARMO 0.67% CERI 2.49% **Year 8**: ARPU 11.96% ARMO 2.38% CERI 3.03%
Objective 3 – No. 4	HMP annual density	Low density for CHPUP	Yes	Yes	NA	(Year 13 monitoring not required)

8.9 HA 29

HA 29 was used by the Army as a small-arms firing range. Soil remediation was completed in 2010; 1,700 cubic yards of soil were excavated from 1.0 acre (Shaw, 2008). HA 29 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 29 varies in elevation with a west aspect. Adjacent lands were not developed and contain substantial amounts of intact native vegetation that may promote natural recruitment in restoration areas. HA 29 was heavily disturbed and covered with jubata grass (*Cortaderia jubata*) prior to soil remediation. Approximately half of HA 29 has compacted soil.

HA 29 is located on the southern portion of Site 39 within Aromas formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for HA 29 included both passive and active restoration consisting of hand broadcast non-irrigated seed, annual weed management activities, and installing native container-grown plants, cuttings, and burls. Areas within HA 29 which are less than 1.0 acre or larger than 1.0 acre but less than 100 feet wide were restored passively using broadcast seed only. Areas larger than 1.0 acre and greater than 100 feet across received both active and passive restoration efforts. The potential for erosion at HA 29 exists along slopes surrounding excavated areas.

Restoration at HA 29 occurred from 2011 to 2013 and quantitative monitoring began in 2013. Additional seed was broadcast in 2016, 2018, 2019, 2020, and 2022 and additional plants were installed in 2019 and 2021. The HA was monitored for 13 years by photo documentation and site visits, three years for plant survivorship, and four years for species richness and vegetative cover (see Table 8-39). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-19 shows the HA footprint, passive restoration area, active restoration area, and transect monitoring locations. Success criteria for HA 29 are summarized in Table 8-40.

Table 8-39. Historic Summary of Restoration and Monitoring Activities at HA 29

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Active, Passive, Erosion Control, and Corrective Measures	●	●	●			●		●	●	●	●	●		
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Species Richness						●	●	●		●				●
Vegetative Cover						●	●	●		●				●
Plant Survivorship			●	●	●									

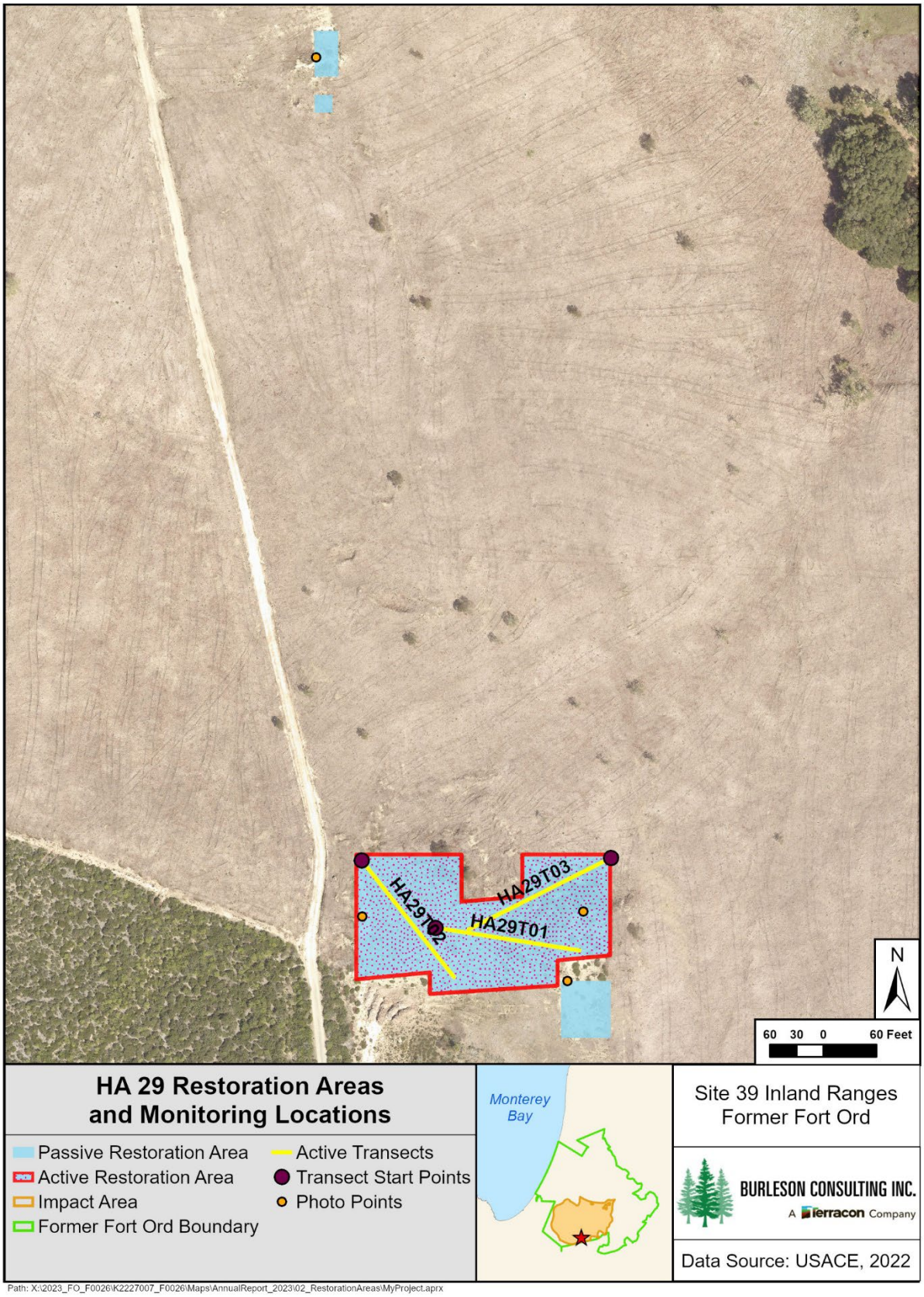


Figure 8-19. HA 29 Restoration Areas and Monitoring Locations Map

Table 8-40. Success Criteria and Acceptable Limits for Restoration of HA 29

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise Hooker's manzanita† Monterey manzanita† shaggy-bark manzanita sandmat manzanita† coyote brush Monterey ceanothus† Eastwood's goldenbush† golden yarrow toyon peak rush-rose wedge-leaved horkelia deerweed sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicated that jubata grass was present at 11%. Therefore, no more than 5% non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 4 (26-50% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Hooker's manzanita percent cover, as an average of transect data, must be equal or greater than 2.
			Monterey manzanita percent cover, as an average of transect data, must be equal or greater than 7.
			Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 27.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 1.

No.	Success Element	Decision Rule	Acceptable Limits
			Eastwood gold fleece percent cover, as an average of transect data, must be equal or greater than 2.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Density class: Not applicable

* Objectives presented in HRP (Shaw, 2009b)
† HMP Species

8.9.1 Restoration Activities

No restoration activities occurred at HA 29 in 2023. See 2022 Annual Report for a comprehensive summary of restoration activities including historic planting and seed broadcast data for each HA (Burleson, 2023).

8.9.2 Monitoring Results

HA 29 was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-10).

8.9.3 Discussion

8.9.3.1 HA 29 Status

There are no updates to the HA 29 status discussion; see Table 8-41 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2025 (see Table 8-39).

Table 8-41. Status for Achieving Success Criteria at HA 29

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	15 required species: ADFA, ARHO, ARMO, ARTO, ARPU, BAPI, CERI, ERFA, ERCO, HEAR, CRSC, HOCU, ACGL, DIAU, SAME	No	Yes	HIGH	**Year 5**: HEAR absent **Year 8**: met (AMP planting occurred in 2018/2019)
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	HIGH	**Year 5**: 12.32% **Year 8**: 29.87% (AMP planting occurred in 2021)
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.70% **Year 8**: 0.21%
Objective 3 – No. 4	HMP shrub cover	Cover class 4: 26-50%	No	No	LOW	**Year 5**: 0.62% **Year 8**: 8.35% (AMP planting occurred in 2021)
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 27% ARMO ≥ 7% ARHO ≥ 2% CERI ≥ 1% ERFA ≥ 2%	No	No	LOW for ARPU LOW for ARMO LOW for ARHO HIGH for CERI LOW for ERFA	**Year 5**: ARPU 3.14% ARMO 0.00% ARHO 0.00% CERI 0.00% ERFA 0.00% **Year 8**: ARPU 6.83% ARMO 0.96% ARHO 0.00% CERI 0.56% ERFA 0.00% (ARPU, ARMO, CERI, and ERFA were planted in 2021)**
Objective 3 – No. 4	HMP annual density	NA	NA	NA	NA	NA

**Planted as part of Adaptive Management Plan

8.10 HA 33

HA 33 was used by the Army as a demolitions range. Soil remediation was completed in 2010; 20 cubic yards of soil were excavated from 0.01 acre (Shaw, 2008). HA 33 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 33 is relatively flat with southwest and west aspects. Adjacent lands are heavily dominated by hottentot fig (*Carpobrotus edulis*) and other non-native species and disturbed central maritime chaparral.

HA 33 is located on the eastern portion of Site 39, occurring within Aromas formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 33 consisted of hand broadcast non-irrigated seed and annual weed management activities. HA 33 is relatively flat with little potential for erosion.

Restoration at HA 33 occurred in 2011, 2012, 2016, 2019, and 2020 and quantitative monitoring began in 2013. The HA was monitored for 13 years by photo documentation and site visits; seven years for HMP annual density in plots; and four years for HMP annual density across the HA, species richness, and vegetative cover (see Table 8-42). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-20 shows the HA footprint, passive restoration area, and transect survey locations. Success criteria for HA 33 are summarized in Table 8-43.

Table 8-42. Historic Summary of Restoration and Monitoring Activities at HA 33

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Active and Passive	●	●				●			●	●				
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●	●		●				
HMP Annual Density across HA						●	●	●		●				
Species Richness						●	●	●		●				●
Vegetative Cover						●†	●	●		●				●

† Vegetative cover was monitored using quadrats in 2016

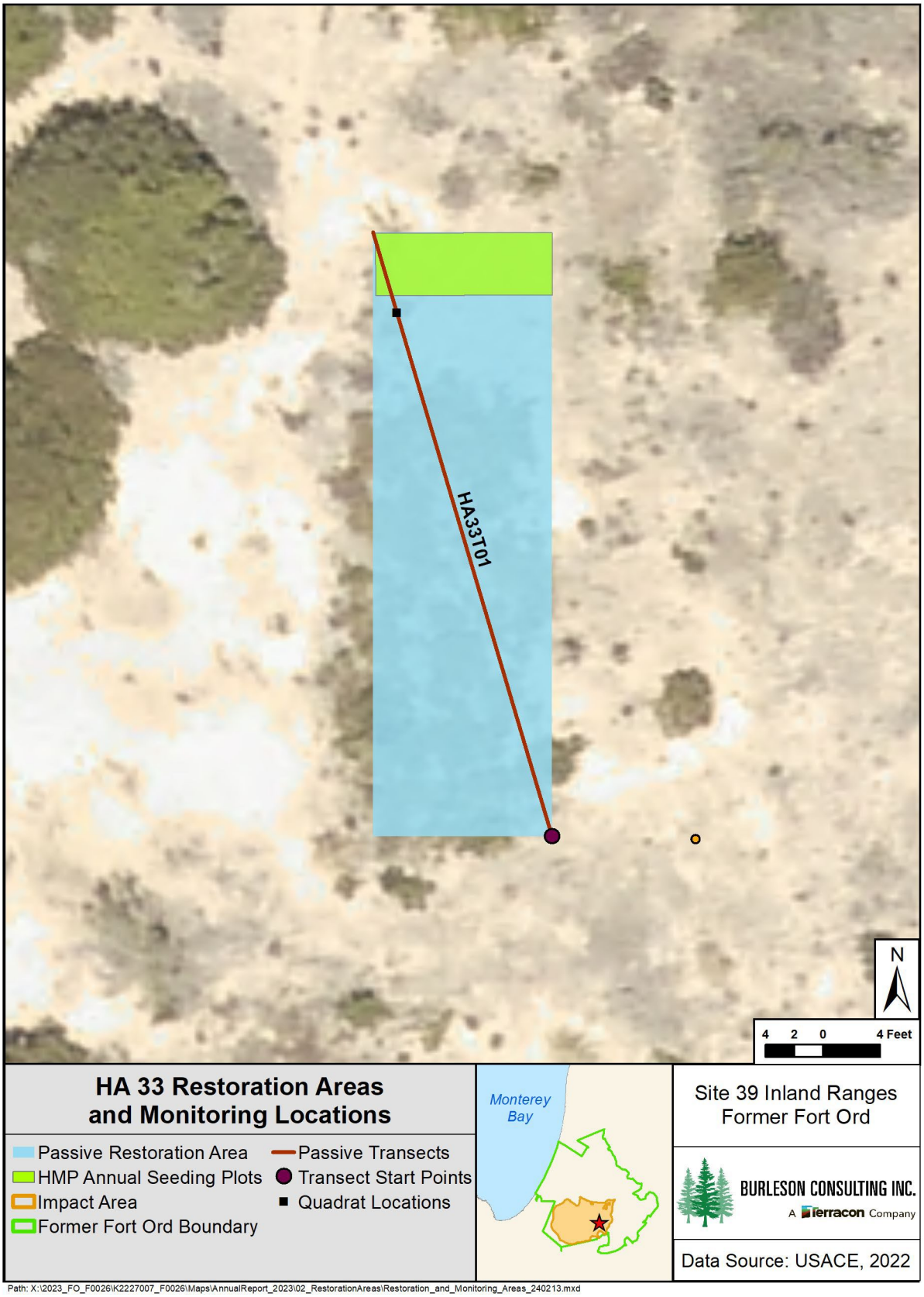


Figure 8-20. HA 33 Restoration Areas and Monitoring Locations Map

Table 8-43. Success Criteria and Acceptable Limits for Restoration of HA 33

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness: common yarrow Monterey manzanita† shaggy-bark manzanita coyote brush Monterey ceanothus† dwarf ceanothus golden yarrow toyon peak rush-rose wedge-leaved horkelia deerweed sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline surveys indicated that ice plant was present at HA-33 but was not available in transect data‡. Therefore, no more than 5% non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 4 (26-50% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Monterey manzanita percent cover, as an average of transect data, must be equal or greater than 30.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 5.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

‡ Source: Shaw 2009a

8.10.1 Restoration Activities

No restoration activities occurred at HA 33 in 2023. See 2022 Annual Report for a comprehensive summary of restoration activities including historic planting and seed broadcast data for each HA (Burleson, 2023).

8.10.2 Monitoring Results

HA 33 was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-11).

8.10.3 Discussion

8.10.3.1 HA 33 Status

There are no updates to the HA 33 status discussion; see Table 8-44 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2025 (see Table 8-42).

Table 8-44. Status for Achieving Success Criteria at HA 33

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	13 Required species: ACMI, ARMO, ARTO, BAPI, CERI, CEDE, ERCO, HEAR, CRSC, HOCU, ACGL, DIAU, SAME	No	Yes	HIGH	**Year 5**: DIAU, ERCO, HEAR, and SAME absent **Year 8**: met (AMP planting occurred in 2018/2019 and 2019/2020)
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	MODERATE	**Year 5**: 4.92% **Year 8**: 12.25% (AMP planting occurred in 2018/2019, 2019/2020)
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 4: 26-50%	No	No	LOW	**Year 5:** 0.00% **Year 8:** 0.00% (ARMO and CERI planted in 2018/2019 and 2019/2020)**
Objective 3 – No. 4	HMP shrub cover by species	ARMO ≥ 30% CERI ≥ 5%	No	No	LOW	**Year 5**: ARMO 0.00% CERI 0.00% **Year 8**: ARMO 0.00% CERI 0.00% (ARMO and CERI planted in 2018/2019 and 2019/2020)**
Objective 3 – No. 4	HMP annual density	Low density for CHPUP	Yes	Yes	NA	**Year 5**: met **Year 8**: met (Year 13 monitoring not required)

**Planted as part of Adaptive Management Plan

8.11 HA 34

HA 34 was used by the Army as a multi-use range that included a closed combat course, machine gun assault course, and mortar range. An estimated total of 26,300 cubic yards of soil were excavated, including erosion control activities, over approximately 9.7 acres. HA 34 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). The lower portion of HA 34 is moderately sloped and oriented east-west with a ridge in the center of the range. The upper portion of HA 34 is steep and highly susceptible to erosion. Adjacent lands range from low to very high-quality habitat.

HA 34 is located on the northeastern portion of Site 39, within the Aromas formation containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for HA 34 included both passive and active restoration consisting of hand broadcast non-irrigated seed, annual weed management activities, and installing native container-grown plants. In 2020, the success criteria for HA 34 were revised due to the marginal response to restoration efforts. Under the revised success criteria: HMP shrub cover class was reduced from three to two and HMP shrub cover by species was reduced for Monterey manzanita, Monterey ceanothus, and Hooker's manzanita (*Arctostaphylos hookeri*) from 31%, 7%, and 4% respectively, to equal or greater than 1 percent for each species (USFWS, 2020).

Restoration at HA 34 occurred from 2012 to early 2023 and quantitative monitoring began in 2016. HA 34 was monitored for 12 years by photo documentation and site visits, eight years for plant survivorship, and five years for species richness and vegetative cover (see Table 8-45). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-21 shows the HA footprint, passive restoration area, active restoration area, and transect survey locations. Success criteria for HA 34 are summarized in Table 8-46.

Table 8-45. Historic Summary of Restoration and Monitoring Activities at HA 34

Activity	Monitoring Years												
				1	2	3	4	5	6	7	8	9	13
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Restoration: Active, Passive, and Erosion Control	●	●	●	●	●	●	●	●	●	●	●	●	
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●
Species Richness					●	●	●	●			●		●
Vegetative Cover					●	●	●	●			●		●
Plant Survivorship					●	●	●	●	●	●	●	●	

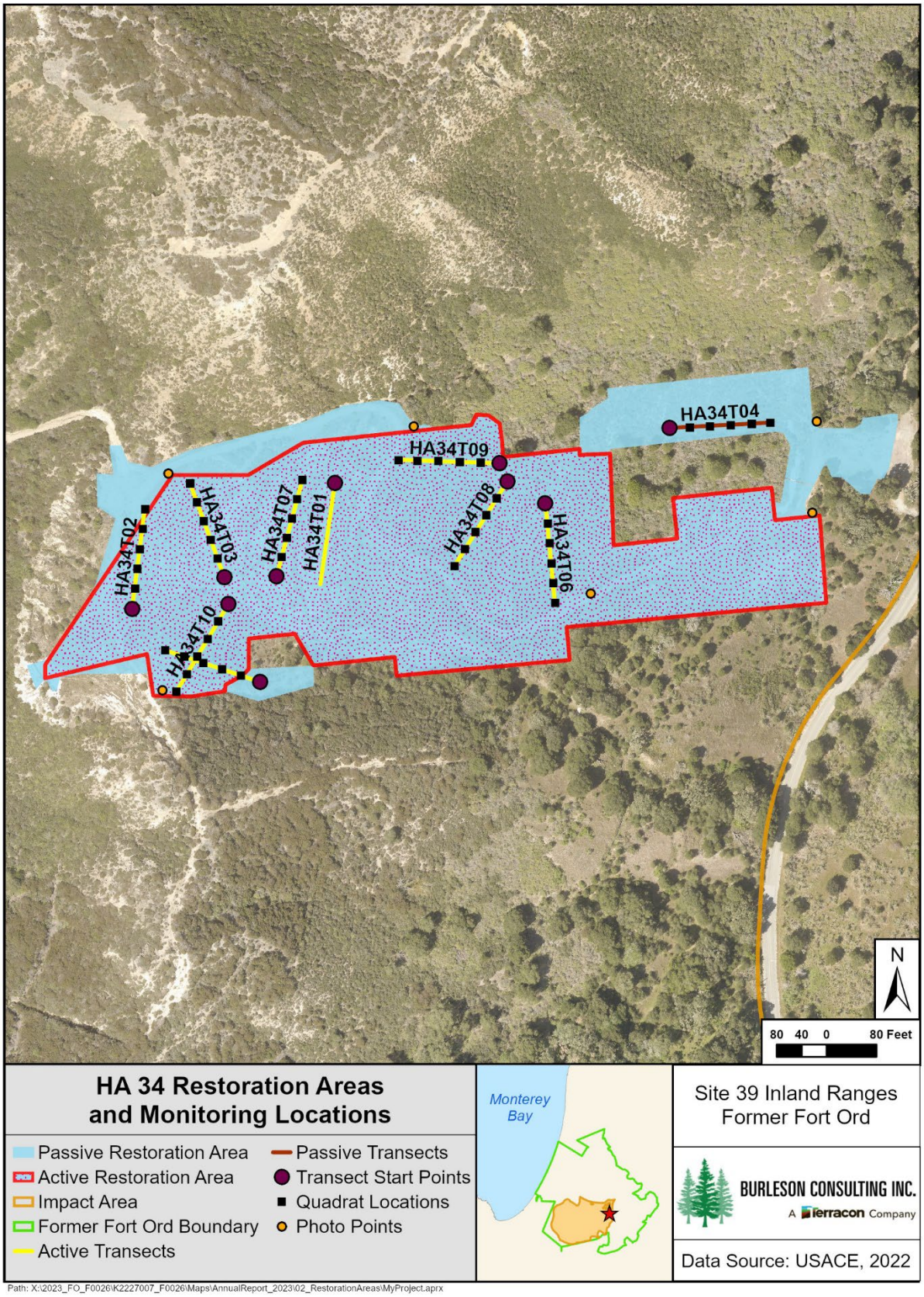


Figure 8-21. HA 34 Restoration Areas and Monitoring Locations Map

Table 8-46. Success Criteria and Acceptable Limits for Restoration of HA 34

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise Monterey manzanita† shaggy-bark manzanita Hooker's manzanita† Monterey ceanothus† sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicated the non-native target weed species iceplant. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 2‡ (1-5% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Monterey manzanita percent cover, as an average of transect data, must be equal or greater than 1‡.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 1‡.
			Hooker's manzanita percent cover, as an average of transect data, must be equal or greater than 1‡.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Density class: Not applicable

* Objectives presented in HRP (Shaw, 2009b)
† HMP Species
‡ Updated success criteria approved by USFWS (USFWS, 2020)

8.11.1 Restoration Activities

Burleson performed passive restoration at HA 34 each year from 2012 to 2023. The total amount of seed broadcast on site was 1,401.64 lb compared to the 320.41 lb prescribed in the SSRP. Due to high erosion rates on the site, we conducted multiple years of additional seeding that eventually more than tripled the SSRP prescription. After an initial broadcast of approximately 400 lbs of seed in 2012, heavy erosion events occurred that warranted regrading of the site. This nullified the original application of seed and an additional broadcast of approximately 400 additional pounds was applied. In the years following, additional seed was broadcast when subsequent erosion repair activities were performed, as well as in barren areas to improve vegetative cover and prevent erosion where container plant installation was less successful. Table 8-47 summarizes the SSRP seed target and the amount of seed applied by year and species.

Table 8-47. Summary of Passive Restoration Activities for HA 34

Species	Pounds of Seed Broadcast													
	SSRP Target	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total by Species
ACMI	15.41	9.51	-	1.69	1.00	5.72	0.50	2.00	2.85	10.00	2.20	8.60	1.60	45.67
ACGL	19.40	18.29	-	3.37	2.00	11.40	1.00	0.20	-	13.50	3.60	12.65	3.10	69.11
ADFA	-	9.50	-	-	-	-	-	-	-	-	-	-	-	9.50
ARCA	15.50	9.50	4.60	-	1.00	-	-	-	-	1.25	0.80	0.80	-	17.95
ARHO*	-	9.50	-	-	-	-	-	-	-	-	-	-	-	9.50
ARMO*	-	9.50	-	-	-	-	-	-	-	-	-	-	-	9.50
ARTO	-	19.00	-	-	-	-	-	-	-	-	-	-	-	19.00
BAPI	1.90	1.40	1.35	0.25	0.20	-	-	-	-	0.25	0.16	0.16	-	3.77
CERI*	15.50	9.50	3.30	-	1.00	-	-	-	-	1.25	0.80	0.80	-	16.65
CRSC	15.50	9.15	-	1.26	1.00	-	-	-	-	1.25	0.80	0.80	-	14.26
DIAU	1.50	0.95	-	0.25	0.10	-	-	-	-	0.13	0.08	0.08	-	1.59
ELGL	87.30	85.50	46.00	80.34	9.00	14.88	27.05	6.40	8.40	33.00	16.80	32.70	7.80	367.87
ERCO	2.90	2.85	-	2.11	0.30	-	-	-	-	0.38	0.24	0.24	-	6.12
HO	87.30	150.00	245.00	33.70	9.00	2.32	101.20	17.40	1.20	15.50	8.00	26.25	-	609.57
HOCU	19.40	18.29	4.60	46.97	2.00	11.40	1.00	2.80	3.80	-	1.60	1.60	-	94.06
LUAR	9.70	9.50	-	-	1.00	-	-	-	-	1.25	0.80	0.80	-	13.35
SAME	9.70	9.51	0.60	3.37	1.00	-	-	-	-	1.25	0.80	0.80	-	17.33
STPU	19.40	19.00	-	-	2.00	6.99	1.25	4.00	5.25	2.35	6.40	21.70	7.80	76.74
TOTAL	**320.41**	**400.45**	**305.45**	**173.31**	**30.60**	**52.71**	**132.00**	**32.80**	**21.50**	**81.36**	**43.08**	**107.98**	**20.40**	**1,401.64**

* HMP species

Active restoration was conducted in 2016, 2017, 2019, 2021, 2022, and 2023. 2023 planting was completed in early January and included in the 2022 Annual Report (Burleson, 2023). No restoration activities occurred at HA 34 in 2023. See 2022 Annual Report for a comprehensive summary of restoration activities including historic planting and seed broadcast data for each HA (Burleson, 2023).

8.11.2 Monitoring Results

HA 34 was in year 9 of monitoring in 2023. Plant survivorship monitoring was conducted in addition to species richness, photo points, and site visits.

8.11.2.1 Plant Survivorship

Plant survivorship monitoring was conducted at HA 34 for plants installed in 2016, 2017, 2019, 2021, 2022, and 2023. A total of 13 shrub species and 963 individual plants were monitored for survivorship. By year 3 of monitoring, survivorship was 60% for the 2016 planting, 23% for the 2017 planting, 16% for the 2019 planting, and 14% for the 2021 planting. By year 2 of monitoring for the 2022 planting, survivorship was 14%. By year 1 of monitoring for the 2023 planting, survivorship was 72%. Tables Table 8-48 through Table 8-53 present results by species.

Table 8-48. Plant Survivorship Monitoring Summary for 2016 Plantings at HA 34

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2016)	Year Two (2017)	Year Three (2018)
			Alive (%)	Alive (%)	Alive (%)
ADFA	158	16	100	94	94
ARCA	135	14	86	92	79
ARHO*	76	8	62	62	62
ARMO*	76	8	75	75	62
ARTO	76	8	75	38	38
BAPI	95	10	90	90	90
CERI*	132	13	38	25	15
LUAR	95	10	60	10	0
SAME	45	5	100	100	100
Total	**888**	**92**	76	66	60

*HMP Species

Table 8-49. Plant Survivorship Monitoring Summary for 2017 Plantings at HA 34

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2017)	Year Two (2018)	Year Three (2019)
			Alive (%)	Alive (%)	Alive (%)
ADFA	372	37	22	20	18
ARCA	208	22	55	38	32
ARHO*	286	32	50	38	33
ARMO*	277	28	36	25	19
ARTO	118	12	33	20	12
BAPI	270	28	86	86	81
CERI*	556	56	27	12	9
LUAL	108	11	18	0	0
LUAR	236	24	21	4	0
SAME	330	34	24	18	16
Total	**2,761**	**284**	**37**	**27**	**23**

*HMP Species

Table 8-50. Plant Survivorship Monitoring Summary for 2019 Plantings at HA 34

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2019)	Year Two (2020)	Year Three (2021)
			Alive (%)	Alive (%)	Alive (%)
ADFA	223	21	48	19	19
ARCA	210	21	57	14	19
ARHO*	272	18	56	28	22
ARMO*	148	15	33	20	13
ARTO	199	20	40	5	0
BAPI	248	24	75	52	42
CERI*	266	22	64	36	23
FRCA	10	10	0	0	0
GAEL	9	8	38	0	0
LECA	25	10	20	0	0
LUAR	185	19	5	5	0
SAME	324	32	38	16	16
Total	**2,119**	**220**	**43**	**19**	**16**

*HMP Species

Table 8-51. Plant Survivorship Monitoring Summary for 2021 Plantings at HA 34

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2021)	Year Two (2022)	Year Three (2023)
			Alive (%)	Alive (%)	Alive (%)
ADFA	74	9	30	12	22
ARCA	92	10	70	70	60
ARHO*	237	24	4	4	4
ARMO*	171	17	0	0	0
ARTO	94	9	11	0	0
BAPI	92	9	80	50	33
CERI*	227	22	26	14	14
LUAR	92	10	0	0	0
SAME	147	15	27	20	20
Total	**1,226**	**128**	**23**	**16**	**14**

*HMP Species

Table 8-52. Plant Survivorship Monitoring Summary for 2022 Plantings at HA 34

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2022)	Year Two (2023)	Year Three (2024)
			Alive (%)	Alive (%)	Alive (%)
ADFA	48	8	78	50	
ARCA	60	10	33	40	
ARHO*	48	10	0	0	
ARMO*	48	10	22	10	
ARTO	48	10	30	0	
BAPI	60	8	11	0	
CERI*	60	10	20	20	
LUAR	60	10	0	0	
SAME	94	9	40	11	
Total	**526**	**85**	**26**	**14**	

*HMP Species

Table 8-53. Plant Survivorship Monitoring Summary for 2023 Plantings at HA 34

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2023)	Year Two (2024)	Year Three (2025)
			Alive (%)	Alive (%)	Alive (%)
ADFA	156	10	70		
ARCA	70	9	44		
ARHO*	114	10	100		
ARMO*	89	10	100		
ARTO	66	9	100		
BAPI	60	9	100		
CERI*	119	10	70		
CRSC	213	17	71		
DIAU	118	12	67		
ERCO	104	10	70		
HOCU	189	18	83		
LUAR	65	16	12		
SAME	193	14	79		
Total	**1,556**	**154**	**72**		

*HMP Species

8.11.3 Caretaker of Previous HA

Monterey cypress removal and herbicide application of cut stumps occurred at HA 34 in 2023. Two Montrey cypress trees were felled at HA 34. Tree removal locations are shown in Figure 8-22. Approximately 100 additional small Monterey cypress saplings were removed by hand throughout areas where mulch was added to the former roads and drainage swaths. We will continue to remove cypress trees that emerge from the mulch, as there were no cypresses trees historically at HA 34 or nearby.

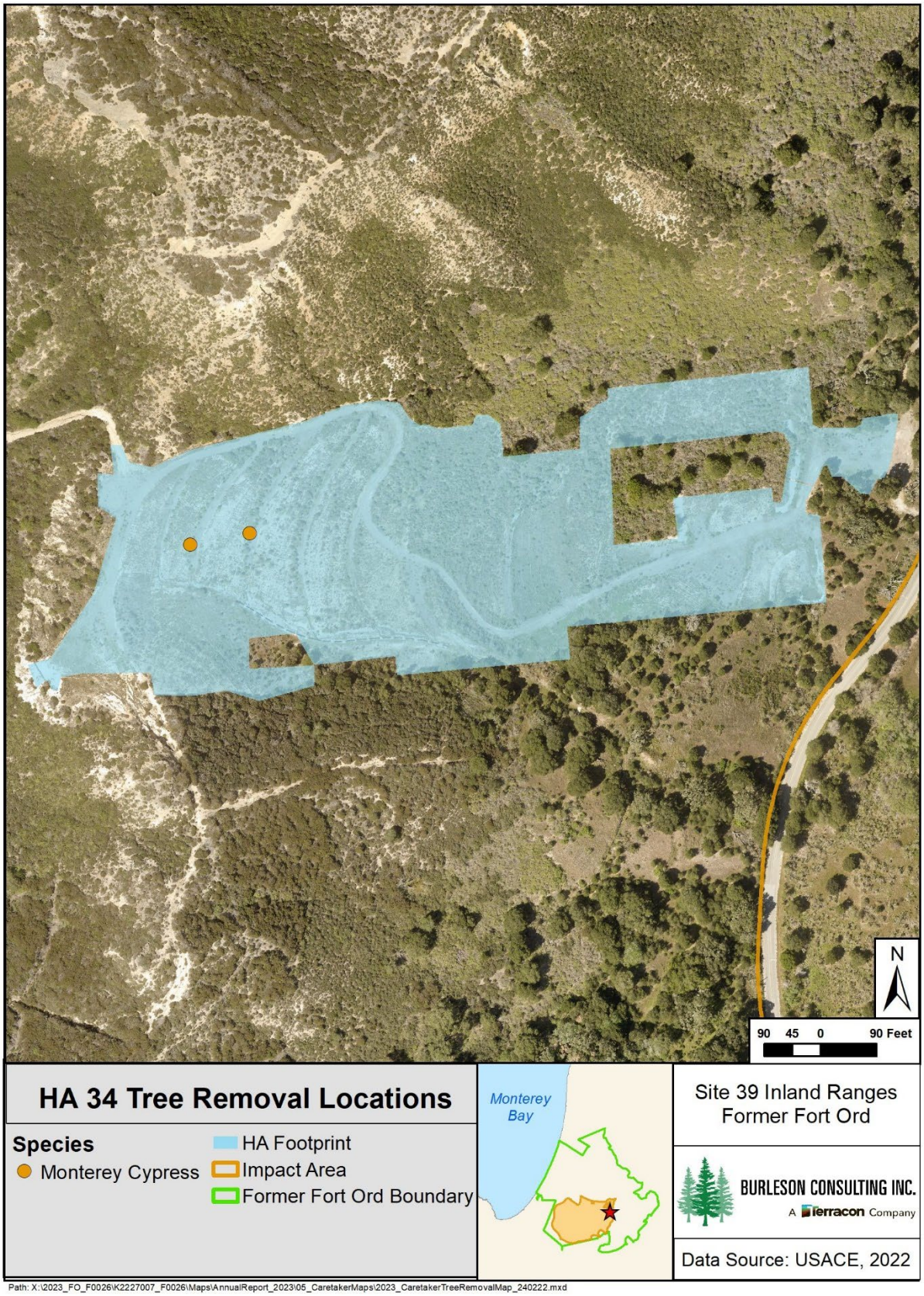


Figure 8-22. 2023 Tree Removal at HA 34

8.11.4 Discussion

8.11.4.1 Plant Survivorship

Plant survivorship was moderate for the 2016 planting and low for the 2017, 2019, 2021, and 2022 planting events at HA 34. For plant survivorship classifications of each species by planting year, see Table 8-54. Low survivorship for lupine species has been seen at other sites where plant survivorship monitoring occurred; however, there are species (i.e., chamise and black sage) that had low survivorship at HA 34 but had high survivorship elsewhere. The low plant survivorship is likely due to site conditions that are not conducive to plant growth. HA 34 lacks topsoil and is highly compacted; these factors contribute to sheet flow and inhibit water infiltration. 2016 plantings showed higher survivorship for some species compared to other years, but an explanation for this remains inconclusive. Planting locations in 2016 were also used in subsequent years, therefore the soil type was not unique. July to June precipitation totals for 2015-2016, 2016-2017, and 2018-2019 rain years were relatively similar at 24.00 inches, 25.32 inches, and 24.81 inches respectively (NPSDM, 2023). The sample size of individuals planted and monitored was smaller in 2016 than 2017 and 2019, and this could contribute to less representative survivorship percentages; however, at least 10% of planted individuals were monitored for survivorship in all years.

Several areas at HA 34 were mulched which should prevent erosion and help with water retention (Kemron, 2018). The 2021 planting will be monitored for one more year. The 2022 planting will be monitored for two more years.

Table 8-54. Plant Survivorship Classifications for All Planting Years at HA 34

Species	Planting Year					
	2016	2017	2019	2021	2022	2023
ADFA	high	low	low	low	moderate	moderate
ARCA	moderate	low	low	moderate	low	low
ARHO*	moderate	low	low	low	low	high
ARMO*	moderate	low	low	low	low	high
ARTO	low	low	low	low	low	high
BAPI	high	high	low	low	low	high
CERI*	low	low	low	low	low	moderate
FRCA	-	-	low	-	-	moderate
GAEL	-	-	low	-	-	moderate
LECA	-	-	low	-	-	moderate
LUAL	-	low	-	-	-	moderate
LUAR	low	low	low	low	low	low
SAME	high	low	low	low	low	moderate

*HMP Species

8.11.4.2 HA 34 Status

There are no updates to the HA 34 status discussion; see Table 8-55 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2027 (see Table 8-45).

Table 8-55. Status for Achieving Success Criteria at HA 34

Success Criterion	Category	Acceptable Limits	Year 5 (2019) Met	Year 8 (2022) Met	Likelihood of Achieving Success by Year 13 (2027)	Notes
Objective 1 – No. 1	Species richness	7 required species: ADFA, ARMO, ARTO, ARHO, CERI, DIAU, SAME	Yes	Yes	HIGH	**Year 5**: met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	Yes	Yes	HIGH	**Year 5**: 55.17% **Year 8**: 56.04%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover‡	Cover class 2: 1-5%	No	No	LOW	**Year 5**: 0.11% **Year 8**: 0.10% (ARMO, CERI, and ARHO were planted in 2020/2021, 2021/2022, and 2022/2023)**
Objective 3 – No. 4	HMP shrub cover by species‡	ARMO ≥ 1% CERI ≥ 1% ARHO ≥ 1%	No	No	LOW for ARMO LOW for CERI LOW for ARHO	**Year 5:** ARMO 0.04% CERI 0.00%% ARHO 0.07% **Year 8:** ARMO 0.00% CERI 0.00% ARHO 0.10% (ARMO, CERI, and ARHO were planted in 2020/2021, 2021/2022, and 2022/2023)**
Objective 3 – No. 4	HMP annual density	NA	NA	NA	NA	NA

‡ Success criteria modified in consultation with USFWS (USFWS, 2020)
**Planted as part of Adaptive Management Plan

8.12 HA 36

HA 36 was used by the Army as a grenade and explosive ordnance disposal range. Soil remediation was completed in 2010; 2,750 cubic yards of soil were excavated from 0.5 acres (Shaw, 2008). HA 36 rests within unprotected maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 36 is relatively flat with an east aspect. Adjacent lands are disturbed central maritime chaparral.

HA 36 is located on the northeastern portion of Site 39, occurring within the Aromas formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 36 consisted of hand broadcast non-irrigated seed and annual weed management activities. HA 36 has some potential for erosion.

Restoration at HA 36 occurred in 2011, 2012, 2016, 2018, 2019, 2020, 2022, and 2023. Quantitative monitoring began in 2016. HA 36 was monitored for 13 years by photo documentation and site visits and four years for species richness and vegetative cover (see Table 8-56). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-23 shows the HA footprint, passive restoration area, and transect monitoring locations. Success criteria for HA 36 are summarized in Table 8-57.

Table 8-56. Historic Summary of Restoration and Monitoring Activities at HA 36

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Active, Passive, and Erosion Control	●	●				●		●	●	●		●	●	
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Species Richness						●	●	●		●				●
Vegetative Cover						●	●	●		●				●

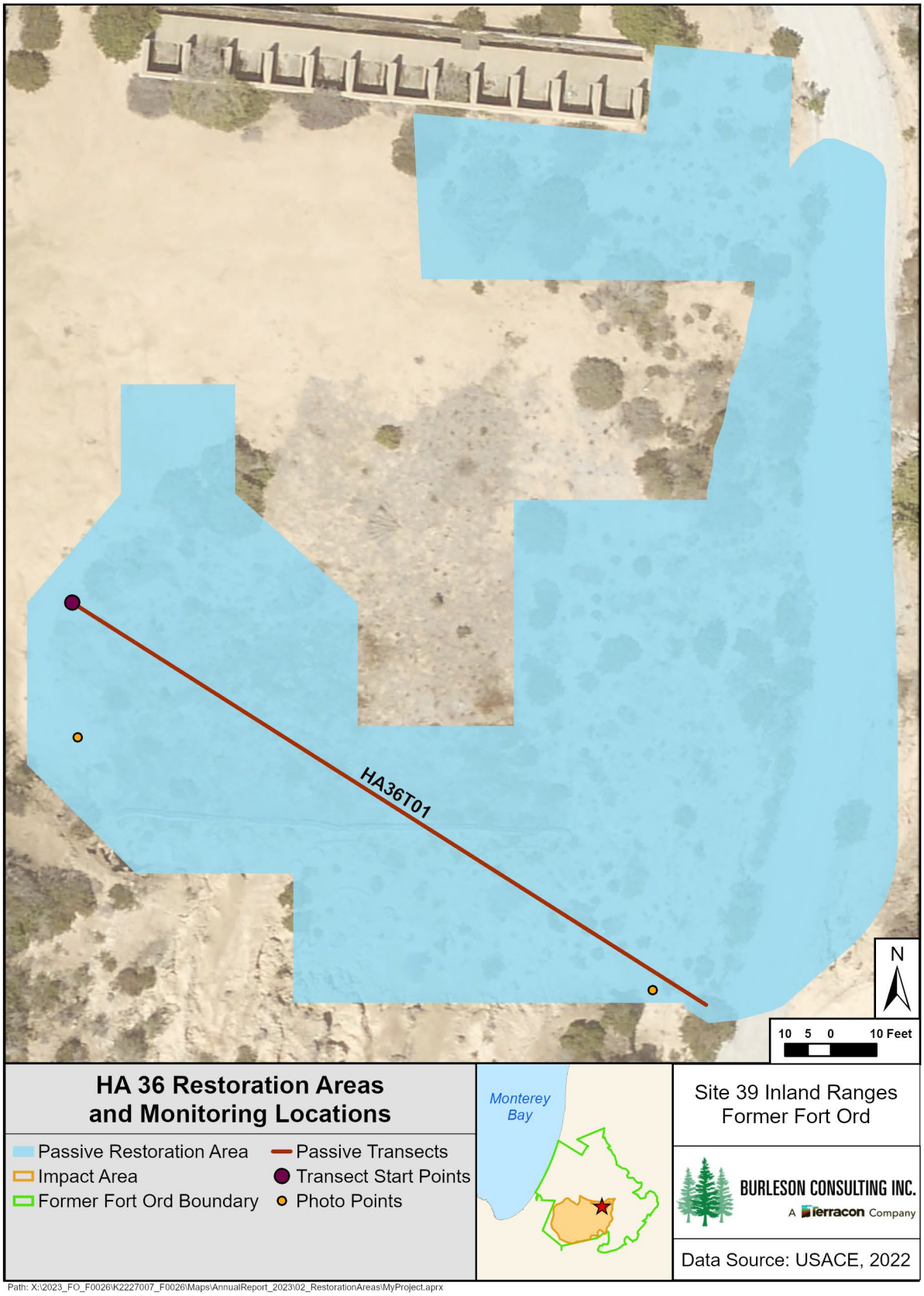


Figure 8-23. HA 36 Restoration Areas and Monitoring Locations Map

Table 8-57. Success Criteria and Acceptable Limits for Restoration of HA 36

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise sandmat manzanita† Monterey manzanita† shaggy-bark manzanita coyote brush Monterey ceanothus† golden yarrow peak rush-rose wedge-leaved horkelia deerweed black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data did not indicate non-native target weed species. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 2.
			Monterey manzanita percent cover, as an average of transect data, must be equal or greater than 9.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 12.
			Hooker's manzanita percent cover, as an average of transect data, must be equal or greater than 1.
			Eastwood’s goldenbush percent cover, as an average of transect data, must be equal or greater than 1.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Density class: Not applicable

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

8.12.1 Restoration Activities

Burleson performed passive restoration at HA 36 in 2012, 2016, 2018, 2019, 2020, 2022, and 2023. The total amount of seed broadcast on site was 61.265 lb compared to the 12.775 lb prescribed in the SSRP. Total seed broadcast exceeded the SSRP prescription because additional seed was broadcast for erosion control activities and to increase native vegetative cover. Table 8-58 summarizes the SSRP seed target and the amount of seed applied by year and species. In 2017, Base Realignment and Closure (BRAC) also broadcast approximately 5 lb of production seed and completed some minor erosion control repairs.

Table 8-58. Summary of Passive Restoration Activities for HA 36

Species	Pounds of Seed Broadcast									
	SSRP Target	2012 (Jan)	2012 (Dec)	2016	2018	2019	2020	2022	2023	Total by Species
ACGL	1.000	0.500	0.507	1.800	-	-	4.800	0.800	3.630	12.037
ACMI	-	-	-	0.900	1.200	0.300	4.400	0.400	4.140	11.340
ADFA	0.500	0.300	0.254	-	-	-	-	-	-	0.554
ARHO*	1.000	0.500	0.518	-	-	-	-	-	-	1.018
ARMO*	1.000	0.500	0.507	-	-	-	-	-	-	1.007
ARPU*	0.500	0.300	0.263	-	-	-	-	-	-	0.563
ARTO	1.000	0.500	0.514	-	-	-	-	-	-	1.014
BAPI	0.075	-	0.037	-	-	-	-	-	-	0.037
CERI*	0.500	-	0.252	-	-	-	-	-	-	0.252
CRSC	0.500	0.300	0.251	-	-	-	-	-	-	0.551
ELGL	-	-	-	1.800	4.000	1.200	1.000	1.000	8.310	17.310
ERCO	0.150	0.077	0.077	-	-	-	-	-	-	0.154
ERFA*	0.050	0.025	0.064	-	-	-	-	-	-	0.089
FRCA	0.500	0.300	0.251	-	-	-	-	-	-	0.551
HOCU	1.000	0.500	0.500	1.800	1.600	0.400	-	-	-	4.800
HO	4.500	-	4.510	-	1.200	0.600	-	-	1.550	7.860
SAME	0.500	0.300	0.251	-	-	-	-	-	-	0.551
STPU	-	-	-	1.100	2.500	0.750	0.300	1.000	8.310	13.960
TOTAL	**12.775**	**4.102**	**8.756**	**7.400**	**10.500**	**3.250**	**10.500**	**3.200**	**25.940**	**73.648**

* HMP species

No active restoration activities occurred at HA 36 in 2023. See 2022 Annual Report for a comprehensive summary of active restoration activities including historic planting data for each HA (Burleson, 2023).

8.12.2 Monitoring Results

HA 36 was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-13).

8.12.3 Discussion

8.12.3.1 HA 36 Status

There are no updates to the HA 36 status discussion; see Table 8-59 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be

monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in year 13, 2025 (see Table 8-56).

Table 8-59. Status for Achieving Success Criteria at HA 36

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	11 required species: ADFA, ARPU, ARMO, ARTO, BAPI, CERI, ERCO, CRSC, HOCU, ACGL, SAME	Yes	Yes	HIGH	**Year 5:** met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	LOW	**Year 5**: 16.08% **Year 8**: 5.98% (ACGL cover decreased by 10.62% from 2017 to 2020)
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	No	Yes	HIGH	**Year 5**: 5.42% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	No	No	MODERATE	**Year 5**: 0.00% **Year 8**: 2.82% (AMP planting occurred in 2021/22 and 2022/23)
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥2% ARMO ≥ 9% CERI ≥ 12% ARHO ≥ 1% ERFA ≥ 1%	No	No	LOW for ARPU LOW for ARMO LOW for CERI HIGH for ARHO LOW for ERFA	**Year 5**: ARPU 0.00% ARMO 0.00% CERI 0.00% ARHO 0.00% ERFA 0.00% **Year 8**: ARPU 0.00% ARMO 0.00% CERI 0.00% ARHO 2.82% ERFA 0.00% (AMP planting occurred in 2021/22 and 2022/23
Objective 3 – No. 4	HMP annual density	NA	NA	NA	NA	NA

8.13 HA 37

HA 37 was used by the Army as a short distance firing range, bazooka range, and rifle grenade range. An estimated total of 19,500 cubic yards of soil were excavated over approximately 11.2 acres. HA 37 rests within unprotected maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 37 is relatively flat and surrounded by low to very high-quality habitat with documented occurrences of California tiger salamander on the range.

HA 37 is located on the northeastern portion of Site 39, within the Aromas formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for HA 37 included both passive and active restoration consisting of hand broadcast non-irrigated seed, annual weed management activities, and installing native container-grown plants. HA 37 has some potential for erosion.

Restoration at HA 37 occurred from 2013 to 2022 and quantitative monitoring began in 2014. HA 37 was monitored for 11 years by photo documentation and site visits; seven years for HMP annual density in plots; six years for HMP annual density across the HA; five years for species richness and vegetative cover; and ten years for plant survivorship (see Table 8-60). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-24 shows the HA footprint, restoration areas, and transect survey locations. Success criteria for HA 37 are summarized in Table 8-61.

Table 8-60. Historic Summary of Restoration and Monitoring Activities at HA 37

Activity	Monitoring Years											
			1	2	3	4	5	6	7	8	9	13
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Restoration: Active, Passive, and Erosion Control	●	●	●	●	●	●	●	●	●	●		
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●	●		●		
HMP Annual Density across HA				●	●	●	●	●		●		
Species Richness				●	●	●	●			●		●
Vegetative Cover				●	●	●	●			●		●
Plant Survivorship		●	●	●	●	●	●	●	●	●	●	

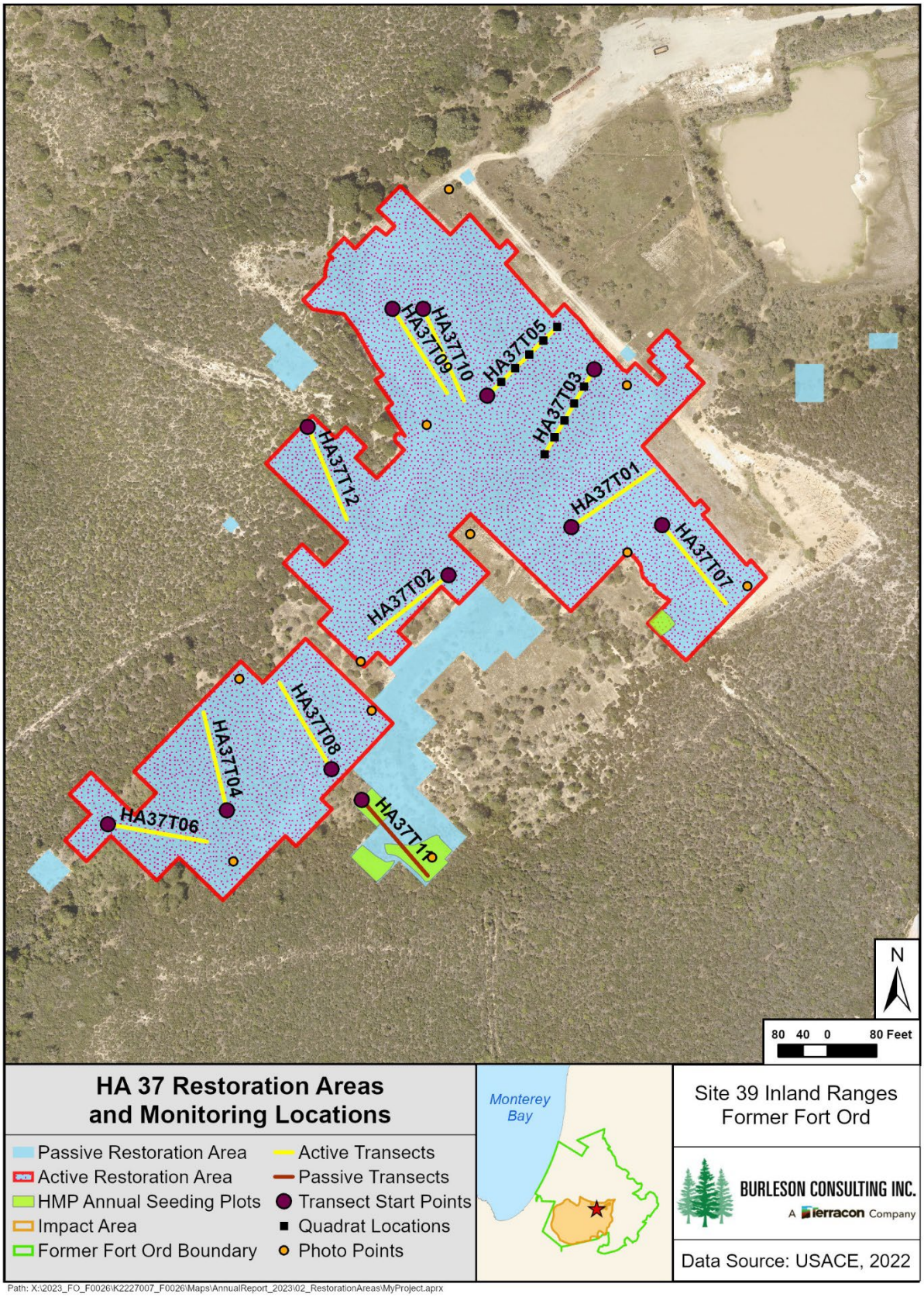


Figure 8-24. HA 37 Restoration Areas and Monitoring Locations Map

Table 8-61. Success Criteria and Acceptable Limits for Restoration of HA 37

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness: shaggy-bark manzanita chamise black sage coast silk tassel Monterey manzanita† Monterey ceanothus† sandmat manzanita† coyote brush Hooker's manzanita†
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicates presence of non-native target weed species jubata grass, broom (*Genista* sp.), and ice plant. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Monterey manzanita percent cover, as an average of transect data, must be equal or greater than 4.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 2.
			Hooker's manzanita percent cover, as an average of transect data, must be equal or greater than 1.
			Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 2.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

8.13.1 Restoration Activities

Burleson performed passive restoration at HA 37 each year from 2014 to 2023. The total amount of seed broadcast on site was 984.48 lb compared to 247.00 lb prescribed in the SSRP. Total seed broadcast exceeded the SSRP prescription because additional seed was broadcast for erosion control activities. Table 8-62 summarizes the SSRP seed target and the amount of seed applied by year and species. Burleson performed passive restoration for the HMP annual species Monterey spineflower. Four plots were chosen in the HA because they had suitable habitat for Monterey spineflower and adjacent populations (see Figure 8-24).

Table 8-62. Summary of Passive Restoration Activities for HA 37

Species		Pounds of Seed Broadcast											
	SSRP Target	2014 (Jan)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total by Species
ACMI	9.40	4.80	2.00	8.07	8.14	8.70	1.80	2.95	17.60	0.40	2.90	4.40	61.76
ACGL	18.70	8.70	4.00	10.34	16.10	5.90	-	1.50	20.80	0.65	5.80	2.00	75.79
ADFA	-	3.30	-	-	-	-	-	-	-	-	-	-	3.3
ARCA	-	-	-	2.40	-	-	-	-	-	-	-	-	2.4
BAPI	1.40	1.40	0.32	0.52	-	0.15	-	0.08	0.12	0.02	-	-	2.61
CERI*	9.40	-	2.00	2.67	-	1.00	-	0.50	0.80	0.15	-	-	7.12
CHPUP*	1.40	-	0.32	0.04	-	-	-	-	1.04	1.04	-	-	2.44
CRSC	7.00	5.20	1.52	2.60	-	0.75	-	0.38	0.60	0.11	-	-	11.16
DIAU	1.40	0.10	0.32	0.28	-	0.15	-	0.08	0.12	0.02	-	-	1.07
ELGL	28.10	100.00	69.00	69.01	19.58	40.74	7.20	6.70	28.80	1.30	10.85	5.90	359.08
ERCO	11.70	5.00	1.44	1.06	-	1.25	-	0.63	1.00	0.19	-	-	10.57
ERER	-	4.20	-	-	-	-	-	-	-	-	-	-	4.2
ERFA*	1.90	-	1.40	0.05	-	0.20	-	0.10	0.16	0.03	-	-	1.94
GAEL	-	-	-	-	-	1.00	-	0.50	-	0.15	-	-	1.65
HO	93.50	50.00	20.00	52.70	3.12	113.00	3.60	5.00	8.00	2.10	5.40	2.00	264.92
HOCU	18.70	16.10	47.60	5.34	16.10	5.40	2.40	1.53	-	0.30	-	-	94.77
LUAR	-	-	1.52	2.40	-	-	-	-	-	-	-	-	3.92
LUCH/LUAL	7.00	-	-	-	-	0.75	-	0.38	0.60	0.11	-	-	1.84
LUNA	-	-	-	0.27	-	1.00	-	0.28	1.02	0.15	-	-	2.72
SAME	18.70	7.10	4.00	2.94	-	2.00	-	1.00	1.60	0.30	-	-	18.94
STCE	-	-	-	0.54	-	2.00	-	-	-	-	-	-	2.54
STPU	18.70	-	-	5.34	10.10	9.75	4.50	5.25	-	1.20	7.70	5.90	49.74
TOTAL	**247.00**	**205.90**	**155.44**	**166.57**	**73.14**	**193.74**	**19.50**	**26.86**	**82.26**	**8.22**	**32.65**	**20.20**	**984.48**

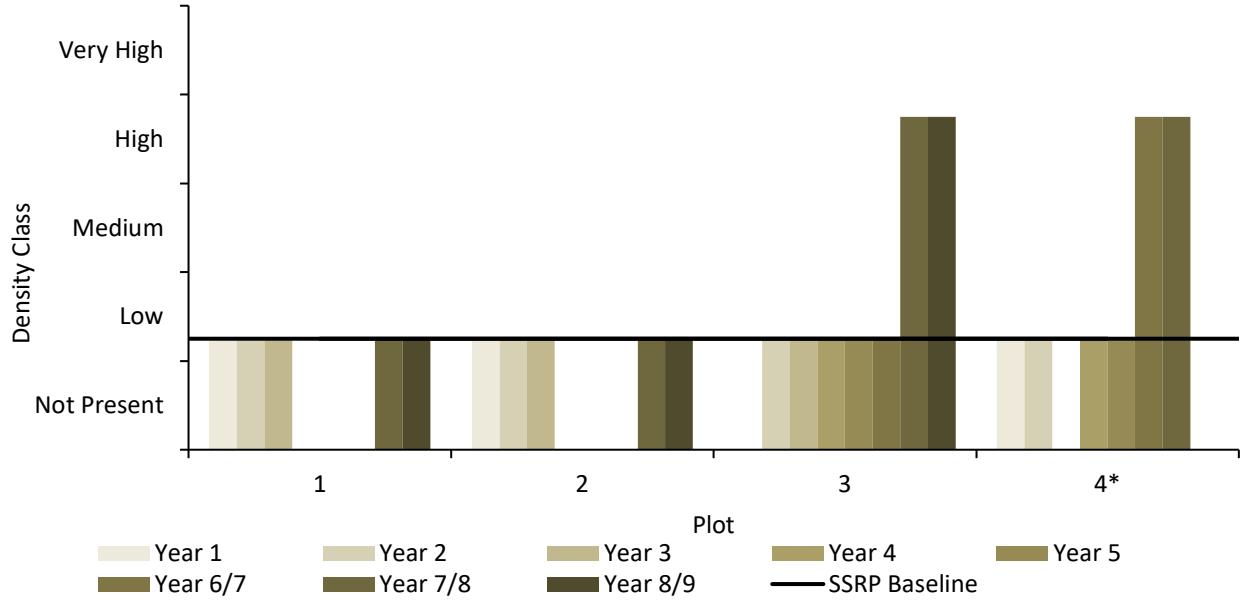
* HMP species

8.13.2 Monitoring Results

8.13.2.1 HMP Annual Density

Monterey spineflower restoration plots were monitored for density at HA 37.

Four Monterey spineflower restoration plots were monitored for year 8 (Plot 4) and year 9 (Plots 1-3) density at HA 37 in 2023. The plots are numbered 1-4 on Figure 8-25 and are located throughout HA 37. Monterey spineflower density was low at Plots 1 and 2 and high at Plots 3 and 4. Figure 8-26Figure 8-19 represents Monterey spineflower restoration plot densities for HA 37.



* Plot 4 was established in Nov 2015 and has only been monitored for years 1-7.

Figure 8-25. HA 37 Comparison of Monterey Spineflower Density Classes to the SSRP Baseline for Plots 1-4

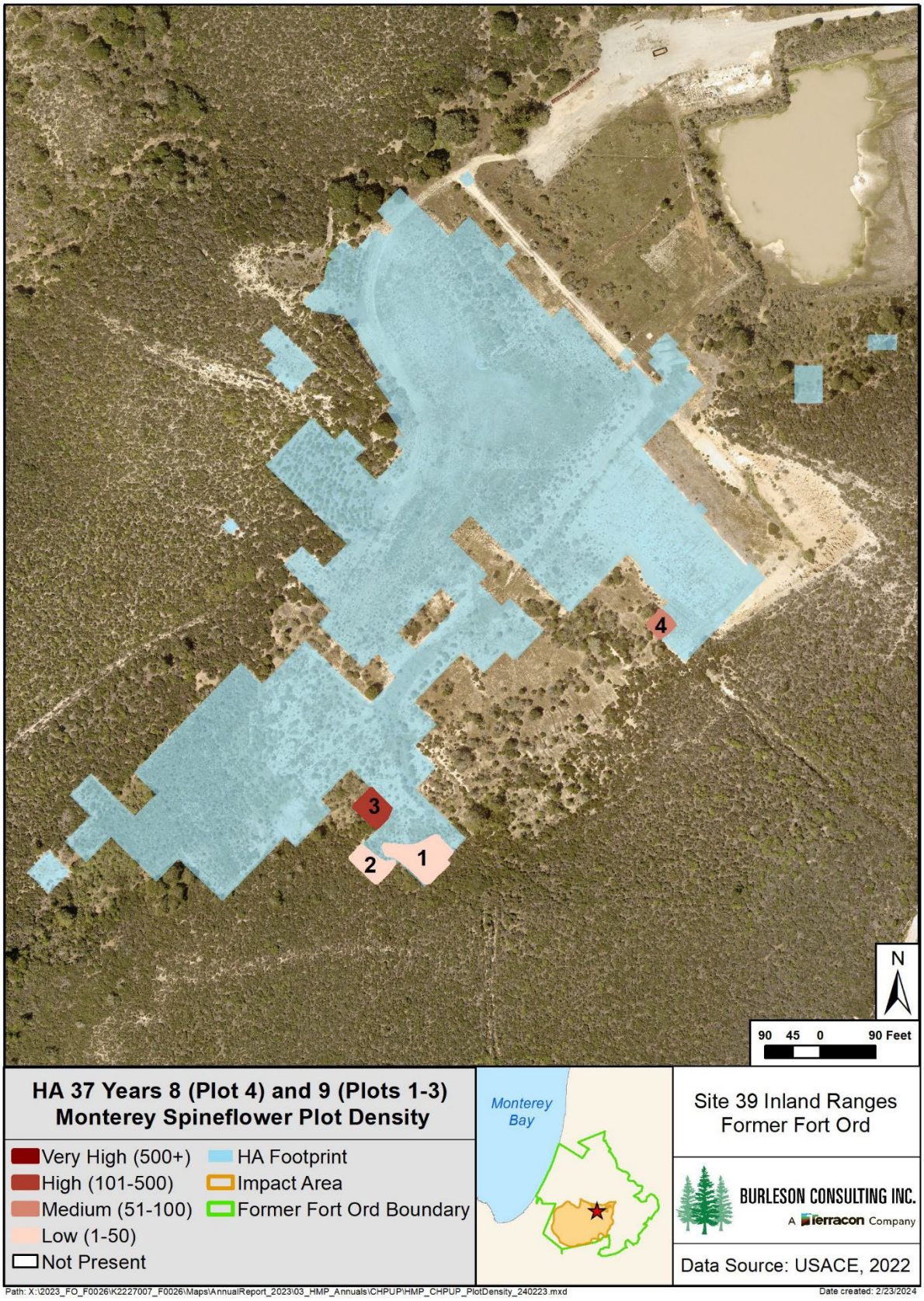


Figure 8-26. HA 37 Year 8 (Plot 4) and Year 9 (Plots 1-3) Monterey Spineflower Plot Density Map

HMP annual density monitoring includes mapping discrete patches of HMP annuals within the restoration site but outside of the HMP annual restoration plots. This survey was completed for Monterey spineflower at HA 37.

Fifteen individual plants and seven discrete patches of Monterey spineflower were mapped and individual plants were counted within the patch (see Figure 8-27). The density ranged from low to high and the total acreage of Monterey spineflower patches with a density at or above the SSRP baseline density class of low was 0.026 acre. From 2020 to 2023, the density range and the acreage above the SSRP baseline increased.

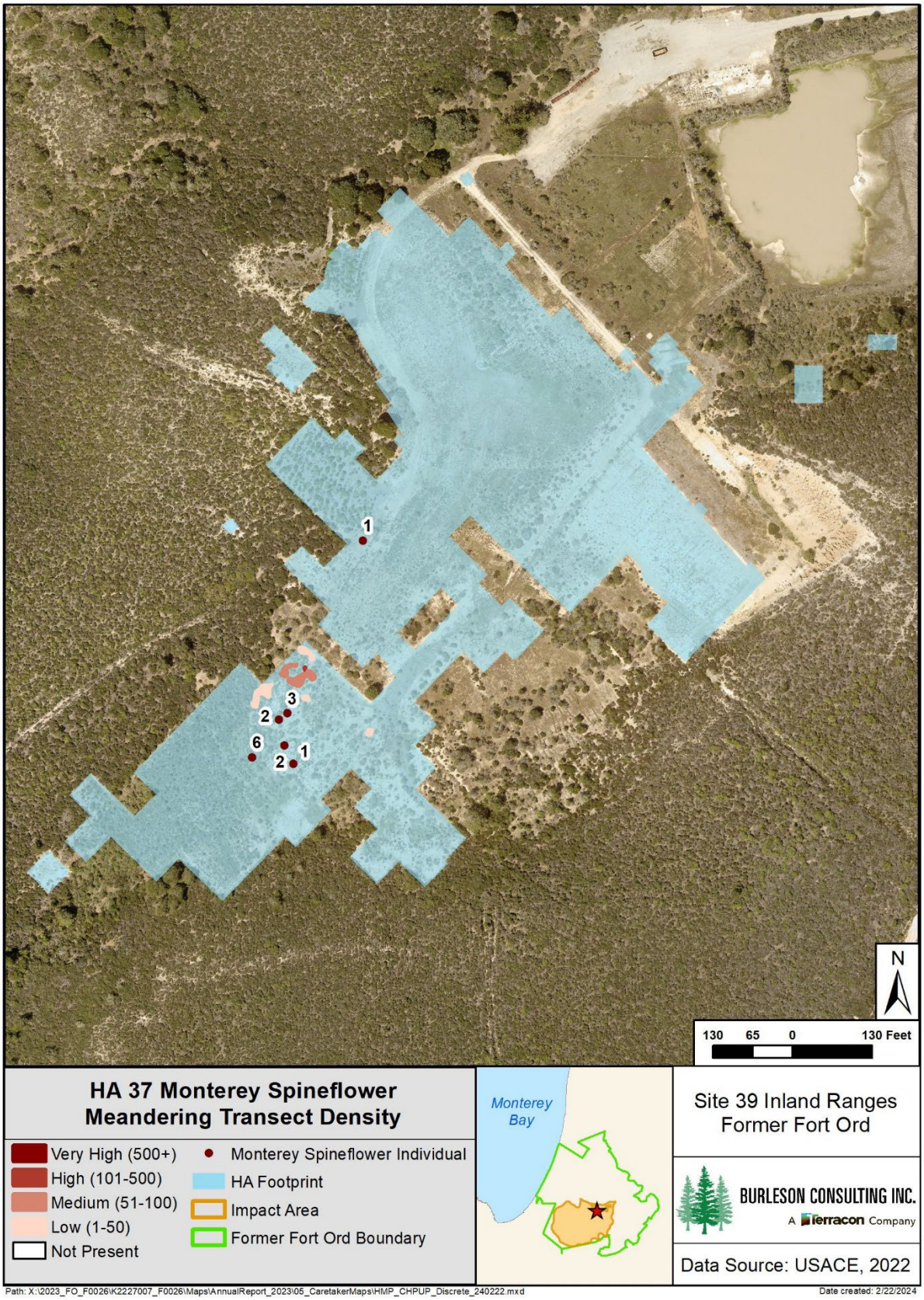


Figure 8-27. HA 37 Monterey Spineflower Meandering Transect Density Map

8.13.2.2 Plant Survivorship

Plant survivorship monitoring was conducted at HA 37 for plants installed in 2014, 2015, 2016, 2017, 2020, 2021, 2022, and 2023. A total of 13 shrub species and 1,462 individual plants were monitored for survivorship. By year 3 of monitoring, survivorship was 67% for the 2014 planting, 38% for the 2015 planting, 45% for the 2016 planting, 50% for the 2017 planting, 46% for 2020 planting, and 51% for the 2021 planting. By year 2 of monitoring for the 2022 planting, survivorship was 32%. Table 8-63 through Table 8-69 present results by species.

Table 8-63. Plant Survivorship Monitoring Summary for 2014 Plantings at HA 37

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2014)	Year Two (2015)	Year Three (2016)
			Alive (%)	Alive (%)	Alive (%)
ADFA	636	61	97	93	90
ARHO*	234	23	87	70	65
ARMO*	389	39	82	62	56
ARTO	621	62	74	68	65
BAPI	234	24	100	100	83
CERI*	315	32	56	44	38
LUAR	208	16	81	31	31
SAME	362	25	100	100	84
Total	**2,999**	**282**	**84**	**73**	**67**

*HMP Species

Table 8-64. Plant Survivorship Monitoring Summary for 2015 Plantings at HA 37

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2015)	Year Two (2016)	Year Three (2017)
			Alive (%)	Alive (%)	Alive (%)
ADFA	363	36	97	88	81
ARHO*	325	33	67	61	58
ARMO*	370	37	51	27	27
ARTO	554	54	48	35	33
BAPI	284	28	82	64	50
CERI*	652	65	40	18	20
LUCH/LUAL	165	17	71	47	24
LUAR	243	24	38	17	4
SAME	250	25	92	52	52
Total	**3,206**	**319**	**61**	**42**	**38**

*HMP Species

Table 8-65. Plant Survivorship Monitoring Summary for 2016 Plantings at HA 37

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2016)	Year Two (2017)	Year Three (2018)
			Alive (%)	Alive (%)	Alive (%)
ADFA	316	30	93	93	90
ARHO*	270	26	73	72	72
ARMO*	141	14	64	64	43
ARPU*	220	23	70	64	58
ARTO	497	49	57	53	49
BAPI	431	41	46	41	34
CERI*	239	20	30	20	15
GAEL	17	4	25	25	25
LUCH/LUAL	146	15	67	20	0
LUAR	175	18	6	6	0
SAME	15	2	50	50	0
Total	**2,467**	**242**	**57**	**51**	**45**

*HMP Species

Table 8-66. Plant Survivorship Monitoring Summary for 2017 Plantings at HA 37

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2017)	Year Two (2018)	Year Three (2019)
			Alive (%)	Alive (%)	Alive (%)
ADFA	140	14	36	29	29
ARCA	155	16	56	88	76
ARHO*	157	16	100	100	100
ARMO*	206	21	76	70	74
ARPU*	237	24	75	48	45
ARTO	356	36	94	77	77
BAPI	329	33	52	50	41
CERI*	140	14	36	14	14
GAEL	2	2	50	100	50
LUCH/LUAL	242	24	25	29	21
LUAR	262	26	35	12	0
SAME	258	26	73	77	77
Total	**2,484**	**252**	**62**	**55**	**50**

*HMP Species

Table 8-67. Plant Survivorship Monitoring Summary for 2020 Plantings at HA 37

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2020)	Year Two (2021)	Year Three (2022)
			Alive (%)	Alive (%)	Alive (%)
ADFA	118	10	70	60	70
ARHO*	19	10	70	56	50
ARMO*	33	10	80	60	50
ARPU*	25	10	60	60	60
ARTO	95	10	90	80	70
BAPI	71	10	100	80	50
CERI*	32	10	60	70	50
GAEL	25	10	30	30	30
LUAR	33	10	30	0	0
LUCH/LUAL	33	10	30	20	11
SAME	40	10	60	60	60
Total	**524**	**110**	**62**	**52**	**46**

*HMP Species

Table 8-68. Plant Survivorship Monitoring Summary for 2021 Plantings at HA 37

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2021)	Year Two (2022)	Year Three (2023)
			Alive (%)	Alive (%)	Alive (%)
ADFA	100	9	90	80	67
ARHO*	71	10	50	50	50
ARMO*	161	16	50	50	50
ARPU*	129	12	42	27	33
ARTO	279	25	63	62	60
BAPI	80	8	89	78	62
CERI*	128	12	77	77	67
GAEL	80	10	60	60	50
LUAR	100	10	0	0	0
LUCH/LUAL	100	10	40	33	30
SAME	120	12	91	83	75
Total	**1,348**	**138**	**59**	**56**	**51**

*HMP Species

Table 8-69. Plant Survivorship Monitoring Summary for 2022 Plantings at HA 37

Species	Planted (# ind.)	Monitored (# ind.)	Year One (2022)	Year Two (2023)	Year Three (2024)
			Alive (%)	Alive (%)	Alive (%)
ADFA	40	10	90	80	
ARHO*	11	10	40	40	
ARMO*	19	10	80	40	
ARPU*	15	10	50	10	
ARTO	52	9	56	11	
BAPI	25	9	70	56	
CERI*	19	7	80	43	
FRCA	10	10	60	40	
GAEL	15	10	70	30	
LUCH/LUAL	19	10	0	0	
LUAR	26	10	0	0	
SAME	23	9	70	33	
Total	**274**	**119**	**55**	**32**	

*HMP Species

8.13.2.3 Species Richness

One hundred and six species were observed at HA 37. Of those, 50 were native shrubs or perennials, 21 were native annual herbaceous species, 34 were non-native species, and one was not categorized as it was only identified to genus (see Table 8-70). Species richness has increased by 10 since 2022. Native shrub and perennial species richness increased by five, native herbaceous species richness decreased by three, non-native species richness increased by eight, and uncategorized species richness has not changed. Due to subtle phenological differences between *Lupinus albifrons* var. *albifrons* and *Lupinus chamissonis* and the timing of surveys, the two species were combined for analysis of species richness and comparison to the success criteria (see section 6.1.4).

Table 8-70. Species Observed on HA 37, 2023

Scientific Name	Common Name	Code	Category
Acmispon americanus var. americanus	Spanish clover	ACAMA	NF
Acmispon glaber	deerweed	ACGL	NP
Acmispon heermannii var. orbicularis	Heermann's lotus	ACHEO	NP
Acmispon parviflorus	hill lotus	ACPA	NF
Acmispon strigosus	Bishop's lotus	ACST	NF
Adenostoma fasciculatum	chamise	ADFA	NP
Agoseris grandiflora	large-flowered agoseris	AGGR	NP
Aira caryophyllea	silver hair grass	AICA	NNF
*Arctostaphylos hookeri**	Hooker's manzanita	ARHO	NP
*Arctostaphylos montereyensis**	Monterey manzanita	ARMO	NP
*Arctostaphylos pumila**	sandmat manzanita	ARPU	NP
Arctostaphylos tomentosa	shaggy-bark manzanita	ARTO	NP
Artemisia californica	California sagebrush	ARCA	NP
Avena barbata	slender wild oat	AVBA	NNF
Baccharis pilularis	coyote brush	BAPI	NP
Briza maxima	rattlesnake grass	BRMA	NNF
Bromus diandrus	ripgut brome	BRDI	NNF
Bromus hordeaceus	soft chess	BRHO	NNF
Bromus madritensis ssp. *rubens*	foxtail chess	BRMAR	NNF
Calochortus albus	white globe lily	CAAL	NP
Carex tumulicola	foothill sedge	CATU	NP
Carpobrotus edulis	hottentot fig	CAED	NNP
Ceanothus dentatus	dwarf ceanothus	CEDE	NP
*Ceanothus rigidus**	Monterey ceanothus	CERI	NP
Centaurea melitensis	tocalote	CEME	NNF
Chlorogalum pomeridianum	wavyleaf soap plant	CHPO	NP
*Chorizanthe pungens var. pungens**	Monterey spineflower	CHPUP	NF
Crocanthemum scoparium	peak rush-rose	CRSC	NP
Danthonia californica	California oat grass	DACA	NP
Daucus pusillus	wild carrot	DAPU	NF
Deinandra corymbosa	coastal tarweed	DECO	NF
Diplacus aurantiacus	sticky monkeyflower	DIAU	NP
Drymocallis glandulosa var. wrangelliana	sticky cinquefoil	DRGLW	NP
Elymus glaucus	blue wild-rye	ELGL	NP
Eriophyllum confertiflorum	golden yarrow	ERCO	NP

Scientific Name	Common Name	Code	Category
Erodium botrys	long-beaked filaree	ERBO	NNF
Erodium cicutarium	red-stemmed filaree	ERCI	NNF
Eurybia radulina	roughleaf aster	EURA	NP
Festuca myuros	rattail sixweeks grass	FEMY	NNF
Festuca perennis	Italian rye grass	FEPE	NNF
Galium porrigens	climbing bedstraw	GAPO	NF
Gamochaeta ustulata	purple cudweed	GAUS	NP
Garrya elliptica	coast silk tassel	GAEL	NP
Genista monspessulana	French broom	GEMO	NNP
Heteromeles arbutifolia	toyon	HEAR	NP
Heterotheca grandiflora	telegraph weed	HEGR	NF
Horkelia cuneata	wedge-leaved horkelia	HOCU	NP
Hypochaeris glabra	smooth cat's ear	HYGL	NNF
Hypochaeris radicata	rough cat's ear	HYRA	NNP
Juncus bufonius var. bufonius	common toad rush	JUBUB	NF
Juncus capitatus	Dwarf rush	JUCA	NNF
Juncus occidentalis	western rush	JUOC	NP
Juncus phaeocephalus	brown-headed rush	JUPH	NP
Lepechinia calycina	pitcher sage	LECA	NP
Logfia gallica	daggerleaf cottonrose	LOGA	NNF
Lupinus arboreus	yellow bush lupine	LUAR	NP
Lupinus bicolor	miniature lupine	LUBI	NF
Lupinus chamissonis/albifrons	silver bush lupine	LUCH/LUAL	NP
Lupinus concinnus	bajada lupine	LUCO	NF
Lupinus nanus	sky lupine	LUNA	NF
Luzula comosa var. comosa	Pacific wood rush	LUCOC	NP
Lysimachia arvensis	scarlet pimpernel	LYAR	NNF
Madia exigua	little tarweed	MAEX	NF
Madia gracilis	slender tarweed	MAGR	NF
Madia sativa	coast tarweed	MASA	NF
Microseris paludosa	Marsh microseris	MIPA	NP
Pentagramma triangularis	gold back fern	PETR	NP
Petrorhagia dubia	hairypink	PEDU	NNF
Phalaris arundincea	reed canarygrass	PHAR	NP
Plantago coronopus	cut-leaved plantain	PLCO	NNF
Plantago erecta	California plantain	PLER	NF
Poa annua	annual bluegrass	POAN	NNF
Polycarpon tetraphyllum var. tetraphyllum	four-leaved allseed	POTET	NNF
Polygala californica	California milkwort	POCA	NP
Polypogon monspeliensis	rabbitsfoot grass	POMO	NNF
Primula clevelandii	padre's shootingstar	PRCL	NF
Pseudognaphalium luteoalbum	weedy cudweed	PSLU	NNF
Pseudognaphalium ramosissimum	pink everlasting	PSRA	NP
Pseudognaphalium sp.	cudweed	PS	0
Pseudognaphalium stramineum	cotton-batting plant	PSST	NP
Psilocarphus tenellus	slender woolly-marbles	PSTE	NF

Scientific Name	Common Name	Code	Category
Quercus agrifolia	coast live oak	QUAG	NP
Rubus ursinus	California blackberry	RUUR	NP
Rumex acetosella	sheep sorrel	RUAC	NNP
Salix sp.	willow	SA	NP
Salvia mellifera	black sage	SAME	NP
Sanicula laciniata	coast sanicle	SALA7	NP
Senecio glomeratus	cutleaf burnweed	SEGL	NNF
Silene gallica	small-flower catchfly	SIGA	NNF
Sisyrinchium bellum	western blue-eyed grass	SIBE	NP
Solanum umbelliferum	blue witch	SOUM	NP
Sonchus asper	prickly sow thistle	SOAS	NNF
Sonchus oleraceus	common sow thistle	SOOL	NNF
Stipa pulchra	purple needle grass	STPU	NP
Symphoricarpos albus var. laevigatus	common snowberry	SYALL	NP
Toxicodendron diversilobum	poison oak	TODI	NP
Toxicoscordion fremontii	Fremont's deathcamas	TOFR	NP
Trifolium angustifolium	narrow-leaved clover	TRAN	NNF
Trifolium campestre	hop clover	TRCA	NNF
Trifolium dubium	little hop clover	TRDU	NNF
Trifolium gracilentum	pinpoint clover	TRGR	NF
Trifolium hirtum	rose clover	TRHI	NNF
Trifolium microcephalum	small-head clover	TRMI	NF
Trifolium willdenovii	tomcat clover	TRWI	NF
Triteleia sp.	Triteleia	TRI	NP
Vicia sativa ssp. nigra	narrow-leaved vetch	VISAN	NNF

*HMP Species

8.13.3 Discussion

8.13.3.1 Plant Survivorship

Plant survivorship was moderate for the 2014, 2017, 2020, and 2021 planting events and low for the 2015, 2016, and 2022 planting events at HA 37. For plant survivorship classifications of each species by planting year, see Table 8-71. Low survivorship for Monterey ceanothus, coast silk tassel (*Garrya elliptica*), silver bush lupine (*Lupinus chamissonis/albifrons*), and yellow bush lupine has been seen at other sites where plant survivorship monitoring occurred. The 2022 planting will be monitored for one more year.

Table 8-71. Plant Survivorship Classifications for All Planting Years at HA 37

Species	Planting Year						
	2014	2015	2016	2017	2020	2021	2022
ADFA	high	high	high	low	moderate	moderate	high
ARCA	-	-	-	moderate	-	-	-
ARHO*	moderate	moderate	moderate	high	moderate	moderate	low
ARMO*	moderate	low	low	moderate	moderate	moderate	low
ARPU*	-	-	moderate	low	moderate	low	low
ARTO	moderate	low	low	moderate	moderate	moderate	low
BAPI	high	moderate	low	low	moderate	moderate	moderate
CERI*	low	low	low	low	moderate	moderate	low
FRCA	-	-	-	-	-	-	low
GAEL	-	-	low	low	low	moderate	low
LUCH/LUAL	-	-	low	low	-	low	low
LUAR	low	low	low	low	low	low	low
SAME	high	moderate	low	moderate	moderate	moderate	low

* HMP species

8.13.3.2 HMP Annual Density

Monterey spineflower density was within the acceptable limit for HMP annual density at HA 37. The SSRP baseline density class for Monterey spineflower was low. Year 8 and Year 9 Monterey spineflower restoration plot results show that the density met the success criterion under Objective 3 for all four plots. In addition, Monterey spineflower was present outside the restoration plots. Discrete observations, with density that met or exceeded the success criterion, covered 0.026 acre of HA 37.

8.13.3.3 Species Richness

Chamise, Hooker's manzanita, Monterey manzanita, sandmat manzanita, shaggy-bark manzanita, coyote brush, Monterey ceanothus, coast silk tassel and black sage were present. HA 37 included 50 native shrub and perennial species and met the success criterion for Objective 1.

8.13.3.4 HA 37 Status

HA 37 was in year 9 of monitoring in 2023. HMP annual density and survivorship monitoring were conducted in addition to site visits and photo documentation (See Appendix D, page D-14).

The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in year 13, 2027 (see Table 8-60). Table 8-72 summarizes the status of HA 37 including which success criteria were met and projections for meeting criteria at year 13 of monitoring.

Table 8-72. Status for Achieving Success Criteria at HA 37

Success Criterion	Category	Acceptable Limits	Year 5 (2019) Met	Year 8 (2022) Met	Likelihood of Achieving Success by Year 13 (2027)	Notes
Objective 1 – No. 1	Species richness	9 Required species: ADFA, ARHO, ARMO, ARPU, ARTO, BAPI, CERI, GAEL, SAME	Yes	Yes	HIGH	**Year 5**: met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	HIGH	**Year 5**: 27.01% **Year 8**: 36.60%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5:** 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	No	Yes	HIGH	**Year 5**: 3.56% **Year 8**: 6.55%
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 2% ARMO ≥ 4% CERI ≥ 2% ARHO ≥ 1%	No	No	MODERATE for ARPU HIGH for ARMO HIGH for CERI HIGH for ARHO	**Year 5**: ARPU 0.31% ARMO 0.88% CERI 1.73% ARHO 0.64% **Year 8**: ARPU 0.85% ARMO 2.18% CERI 2.29% ARHO 1.24% (ARPU, ARMO, CERI, and ARHO planted in 2021/2022)**
Objective 3 – No. 4	HMP annual density	Low density for CHPUP	Yes	Yes	NA	(Year 13 monitoring not required)

**Planted as part of Adaptive Management Plan

8.14 HA 38

HA 38 was used by the Army as a firing range. Soil was excavated over 1.01 acres. HA 38 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 38 is moderately sloped and surrounded by low to very high-quality habitat.

HA 38 is located on the northeastern portion of Site 39, occurring within the Aromas formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for HA 38 included both passive and active restoration consisting of hand broadcast non-irrigated seed, annual weed management activities, and installing native container-grown plants. HA 38 is moderately sloped and has little potential for erosion.

Restoration at HA 38 occurred between 2013 and 2017 and quantitative monitoring began in 2014. Additional seed was broadcast in 2020 and 2021 and additional plants were installed in 2021. HA 38 was monitored for 11 years by photo documentation and site visits, eight years for HMP annual density in plots, seven years for HMP annual density across the HA, four years for plant survivorship, and five years for species richness and vegetative cover (see). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-28 shows the HA footprint, passive restoration area, active restoration area, and transect survey locations. Success criteria for HA 38 are summarized in Table 8-74.

Table 8-73. Historic Summary of Restoration and Monitoring Activities at HA 38

Activity	Monitoring Years											
			1	2	3	4	5	6	7	8	9	13
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Restoration: Active and Passive	●	●	●		●			●	●			
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●	●	●	●		
Sand Gilia Plots						●	●	●	●	●	●	
Seaside Bird's Beak Plot									●	●	●	
HMP Annual Density across HA				●	●	●	●	●	●	●		
Species Richness				●	●	●	●			●	●	●
Vegetative Cover				●	●	●	●			●		●
Plant Survivorship		●	●	●	●							

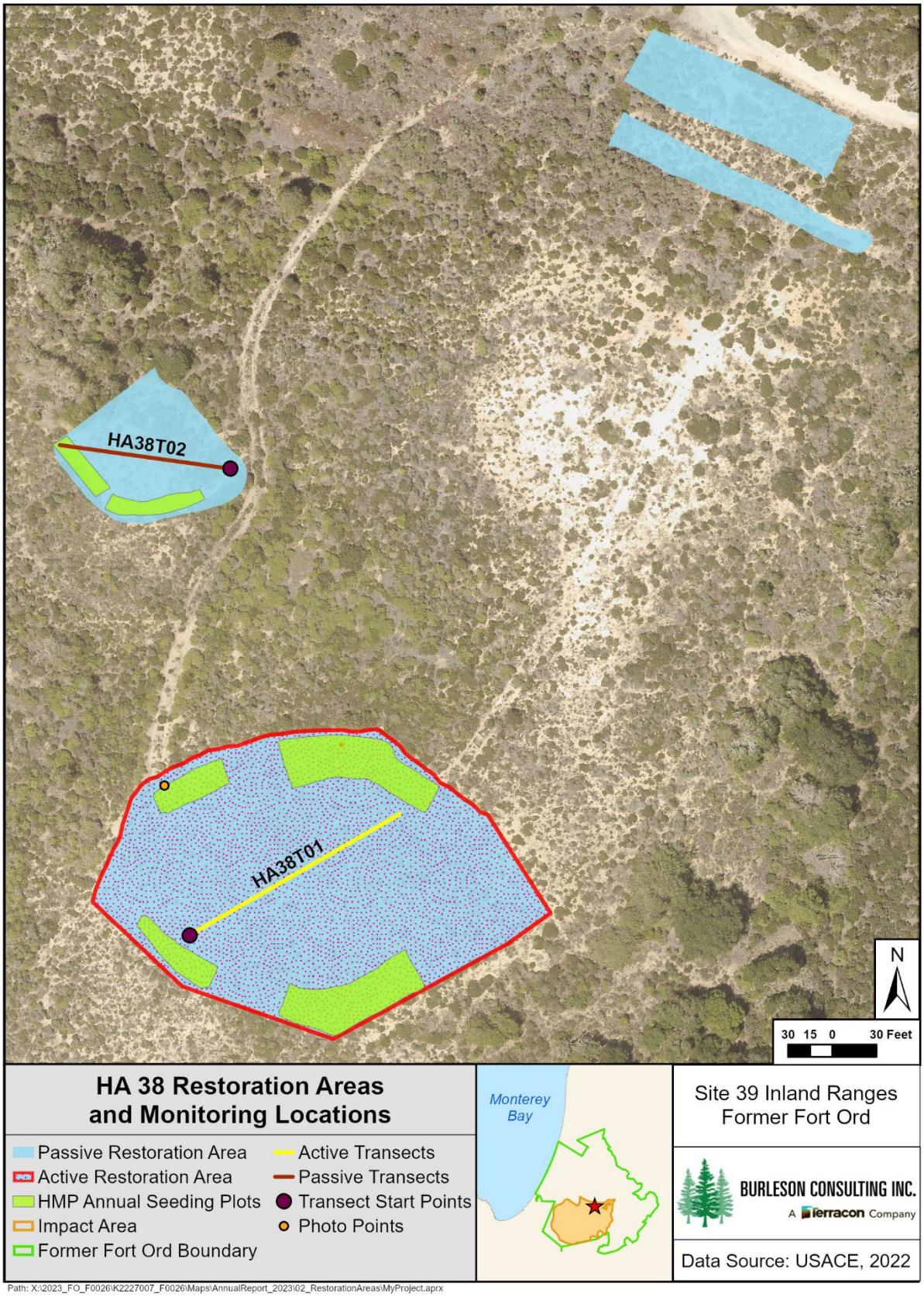


Figure 8-28. HA 38 Restoration Areas and Monitoring Locations Map

Table 8-74. Success Criteria and Acceptable Limits for Restoration of HA 38

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness: shaggy-bark manzanita chamise coyote brush deerweed black sage Monterey manzanita† Monterey ceanothus† sandmat manzanita† Hooker's manzanita†
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 20 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicates presence of non-native target weed species *Carpobrotus edulis* (ice plant). No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 2 (1-5% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Monterey manzanita percent cover, as an average of transect data, must be equal or greater than 1.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 1.
			Hooker's manzanita percent cover, as an average of transect data, must be equal or greater than 1.
			Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 4.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low Sand gilia density class: Low Seaside bird's beak density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

8.14.1 Restoration Activities

No passive or active restoration activities were conducted at HA 38 in 2023. See 2022 Habitat Restoration Annual Report for historic planting and seed broadcast data (Burleson, 2023).

8.14.2 Monitoring Results

8.14.2.1 HMP Annual Density

Monterey spineflower, Sand gilia, and seaside bird's beak restoration plots were monitored for density at HA 38 in 2023.

Five Monterey spineflower restoration plots were monitored for year 6 (Plots 2-5) and year 9 (Plot 1) density at HA 38 in 2023. The plots are numbered 1-5 on Figure 8-29 and are located throughout HA 38. Monterey spineflower density was low at Plots 1 and 4 and was not detected at Plots 2, 3, and 5. Figure 8-30. HA 38 Year 6 (Plots 2-5) and Year 9 (Plot 1) Monterey Spineflower Plot Density MapFigure 8-30 shows restoration plot densities for Monterey spineflower at HA 38.

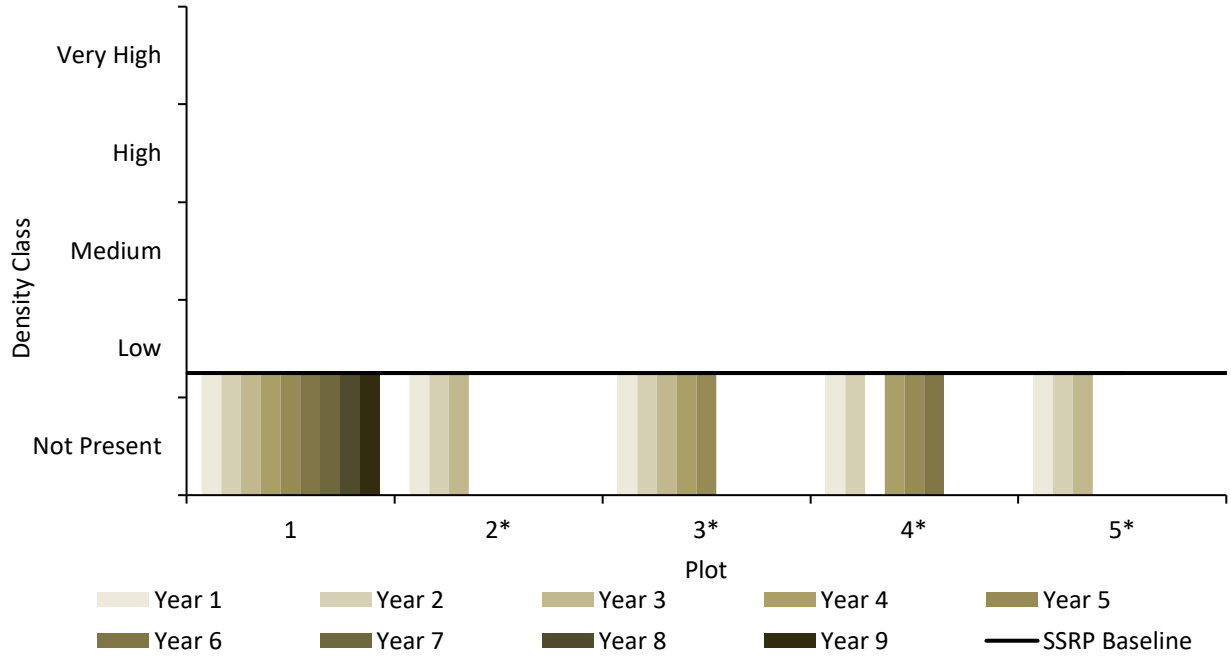


Figure 8-29. HA 38 Comparison of Monterey Spineflower Density Classes to the SSRP Baseline for Plots 1-5

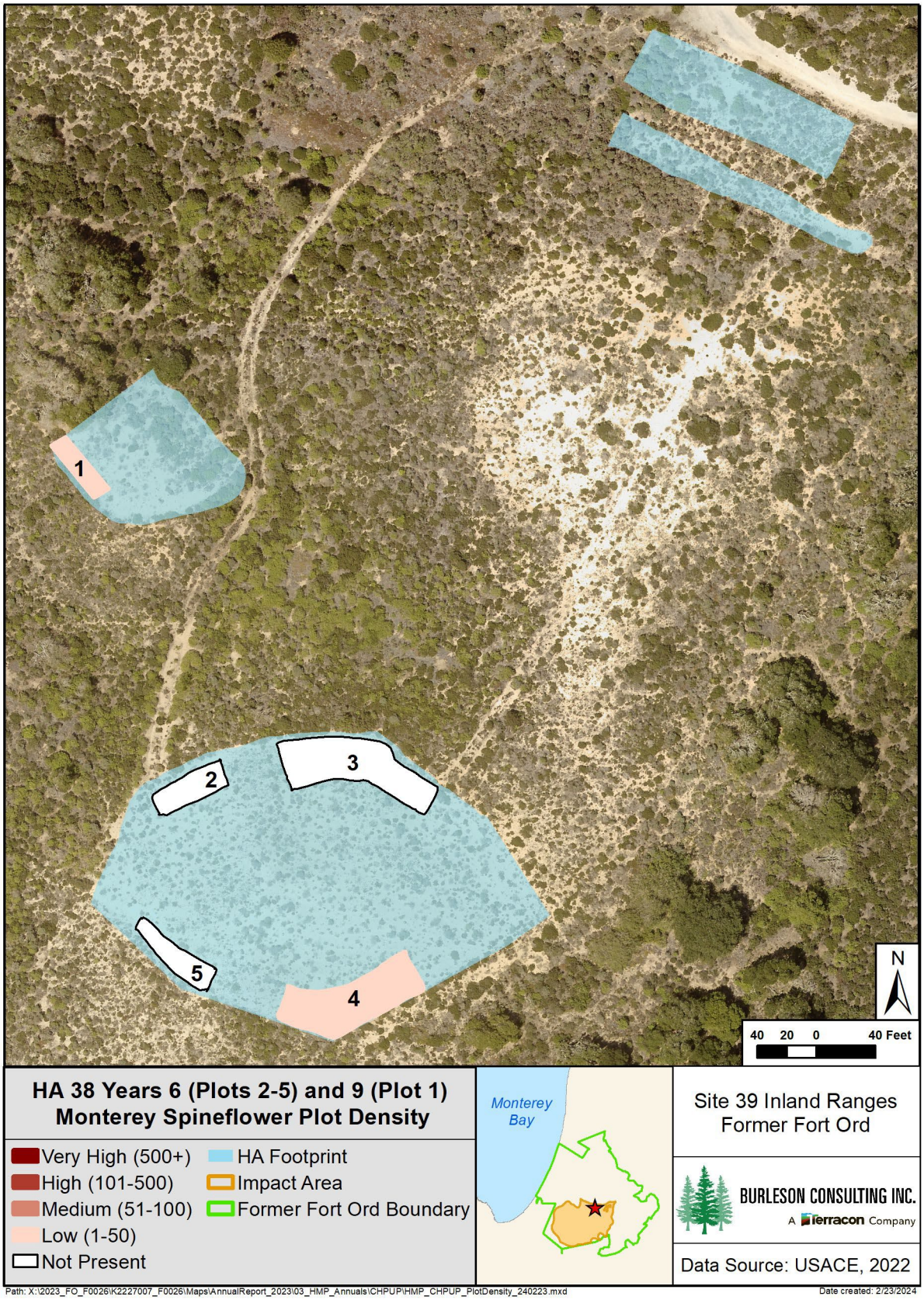
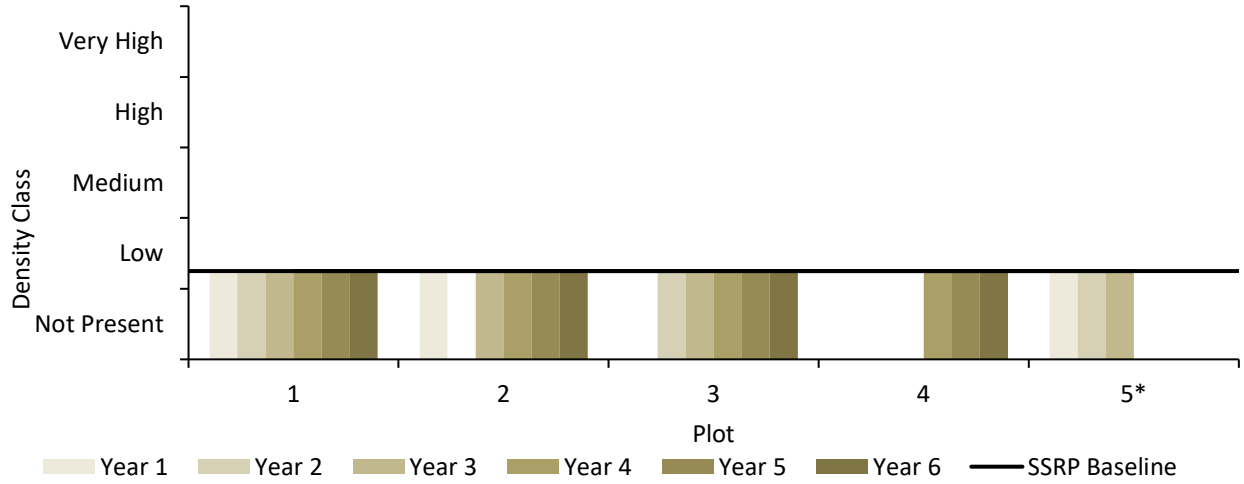


Figure 8-30. HA 38 Year 6 (Plots 2-5) and Year 9 (Plot 1) Monterey Spineflower Plot Density Map

Five sand gilia restoration plots were monitored for year 3 (Plot 5) and year 6 (Plots 1-4) density at HA 38 in 2023. The plots are numbered 1-5 on Figure 8-32 and are located throughout HA 38. Sand gilia density was low at Plots 1-5. Figure 8-31 presents sand gilia restoration plot densities for HA 38.



* Plot 5 was established in 2020 and has only been monitored for years 1-3.

Figure 8-31. HA 38 Comparison of Sand Gilia Density Classes to the SSRP Baseline for Plots 1-5

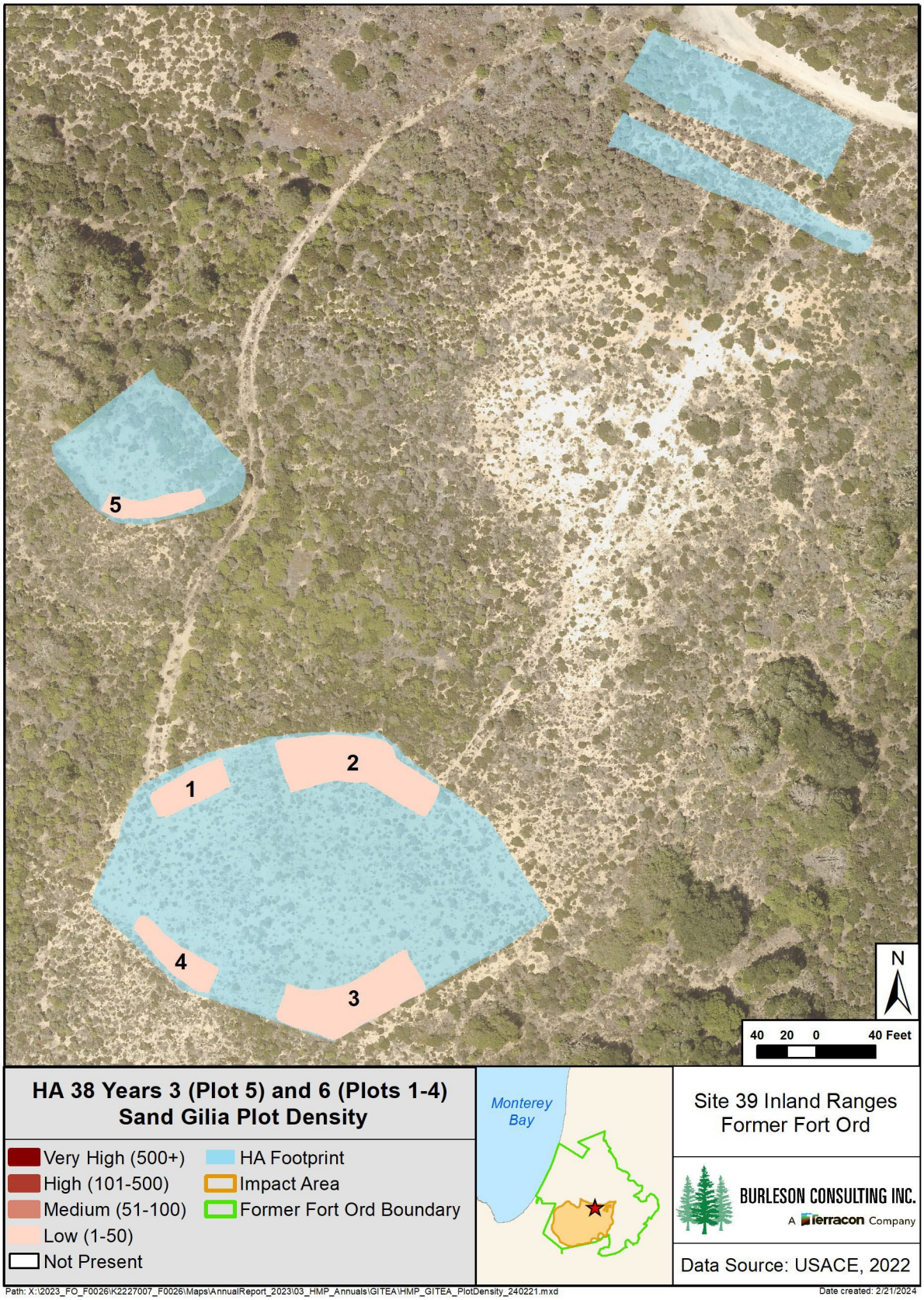


Figure 8-32. HA 38 Year 3 (Plot 5) and Year 6 (Plots 1-4) Sand Gilia Plot Density Map

One seaside bird's beak restoration plot was monitored for year 3 density at HA 38 in 2023. The plot is numbered 1 on Figure 8-34 and is located in the southern part of the site. Seaside bird's beak density was low at Plot 1. Figure 8-33 presents seaside bird's beak restoration plot densities for HA 38.

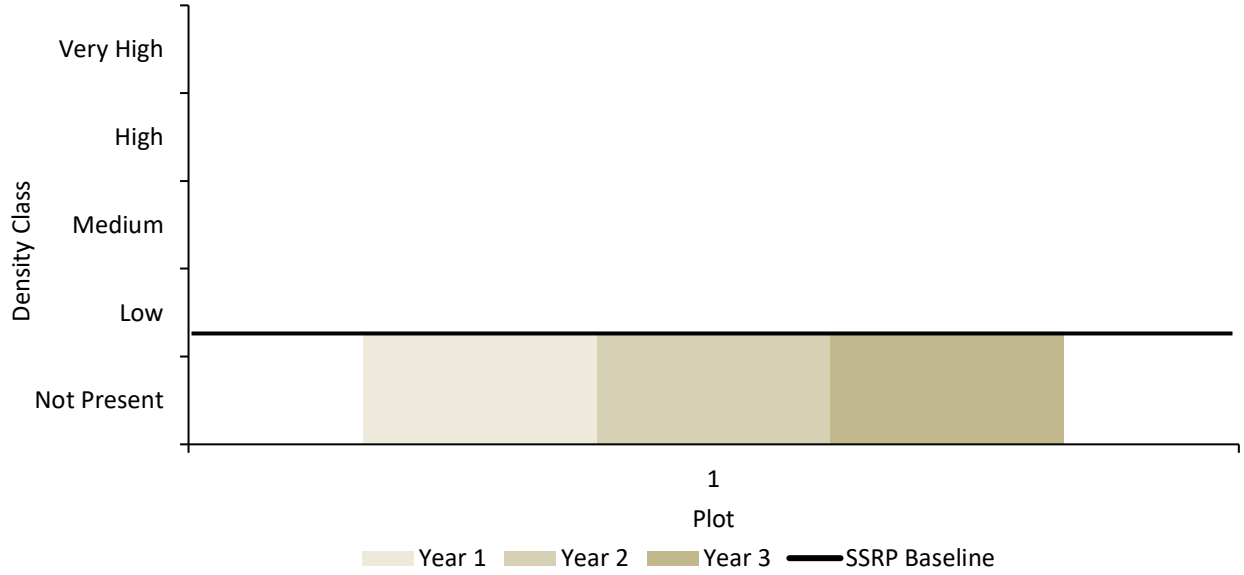


Figure 8-33. HA 38 Comparison of Seaside Bird's Beak Density Classes to the SSRP Baseline for Plot 1

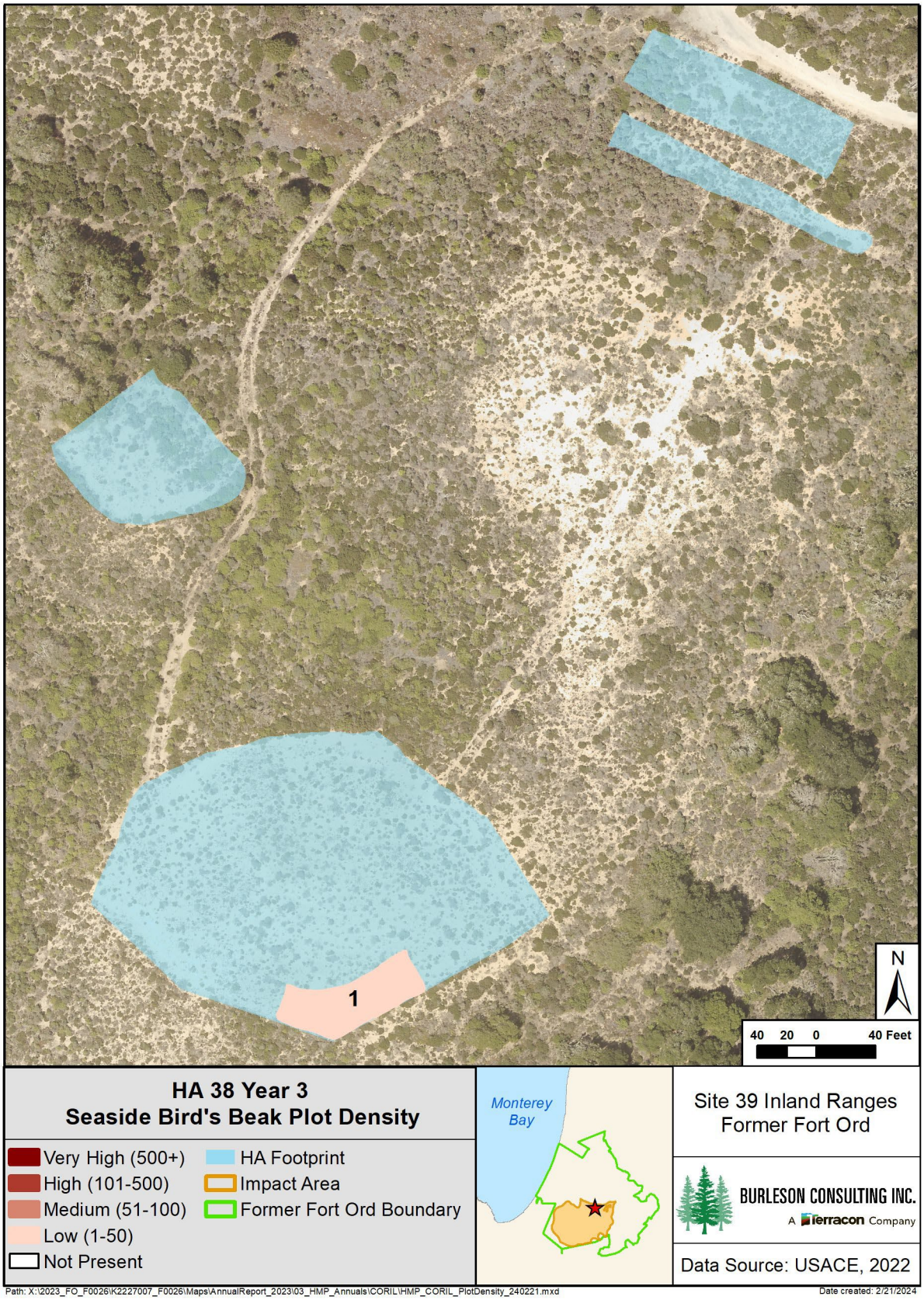


Figure 8-34. HA 38 Year 3 Seaside Bird's Beak Density Map

HMP annual density monitoring included mapping discrete patches of HMP annuals within the restoration area but outside of the HMP annual restoration plots. This survey was completed for Monterey spineflower, sand gilia, and seaside bird's beak at HA 38.

Fifty-six individual plants and 10 discrete patches of Monterey spineflower were mapped and individual plants were counted within each patch (see Figure 8-35). The densities ranged from low to high and the total acreage of Monterey spineflower patches with a density at or above the SSRP baseline density class of low was 0.069 acre. From 2022 to 2023, the density range and acreage above the SSRP baseline increased.

Twenty-five individual plants and two discrete patch of sand gilia were mapped and individual plants were counted within the patch (see Figure 8-36). The densities ranged from low to high and the total acreage of sand gilia patches with a density at or above the SSRP baseline density class of low was 0.001 acre. From 2022 to 2023, the density range increased and the acreage above the SSRP baseline was the same.

Seaside bird's beak was not observed outside of the restoration plot at HA 38 in 2023 which is consistent with previous monitoring years.

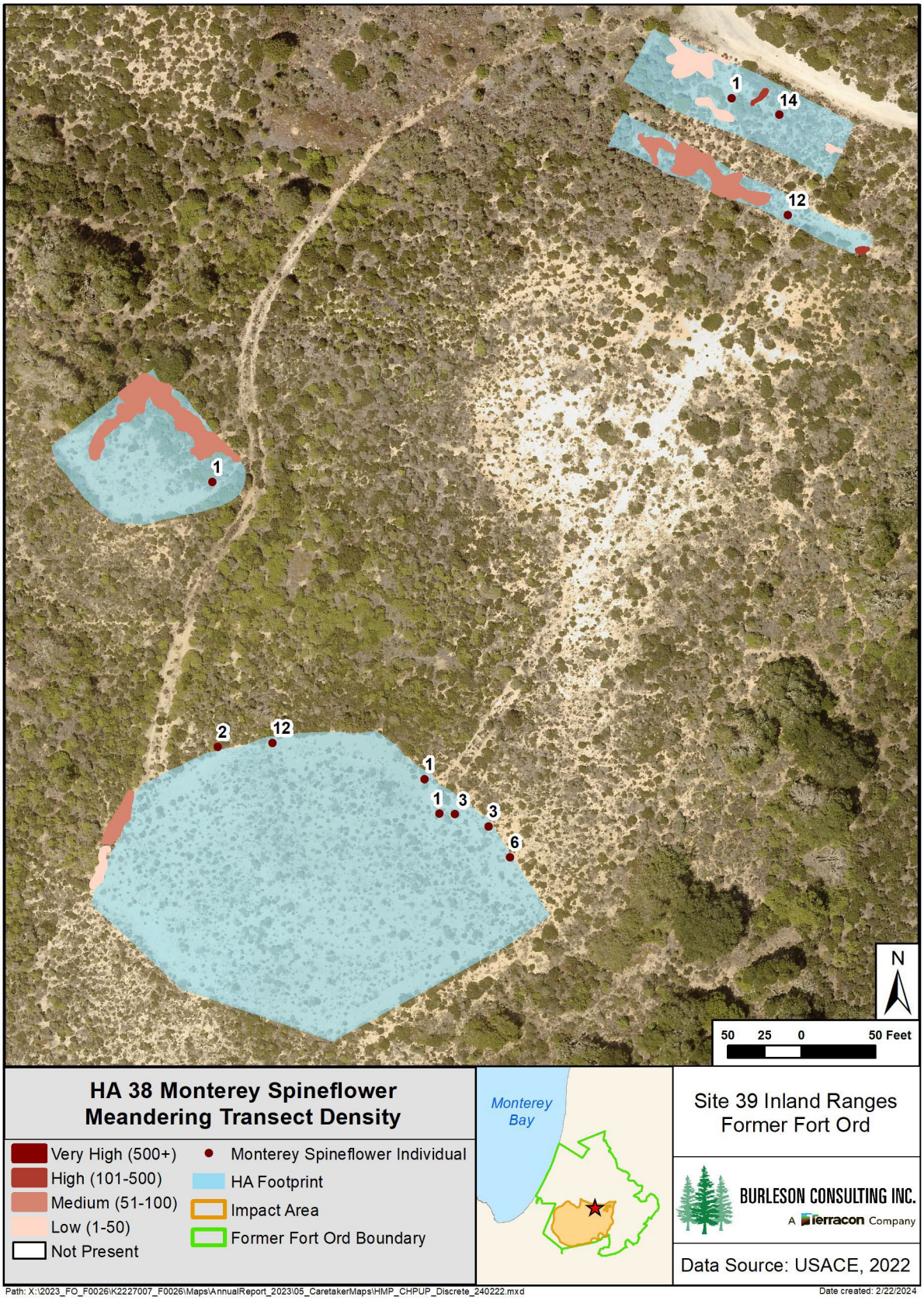


Figure 8-35. HA 38 Monterey Spineflower Meandering Transect Density Map

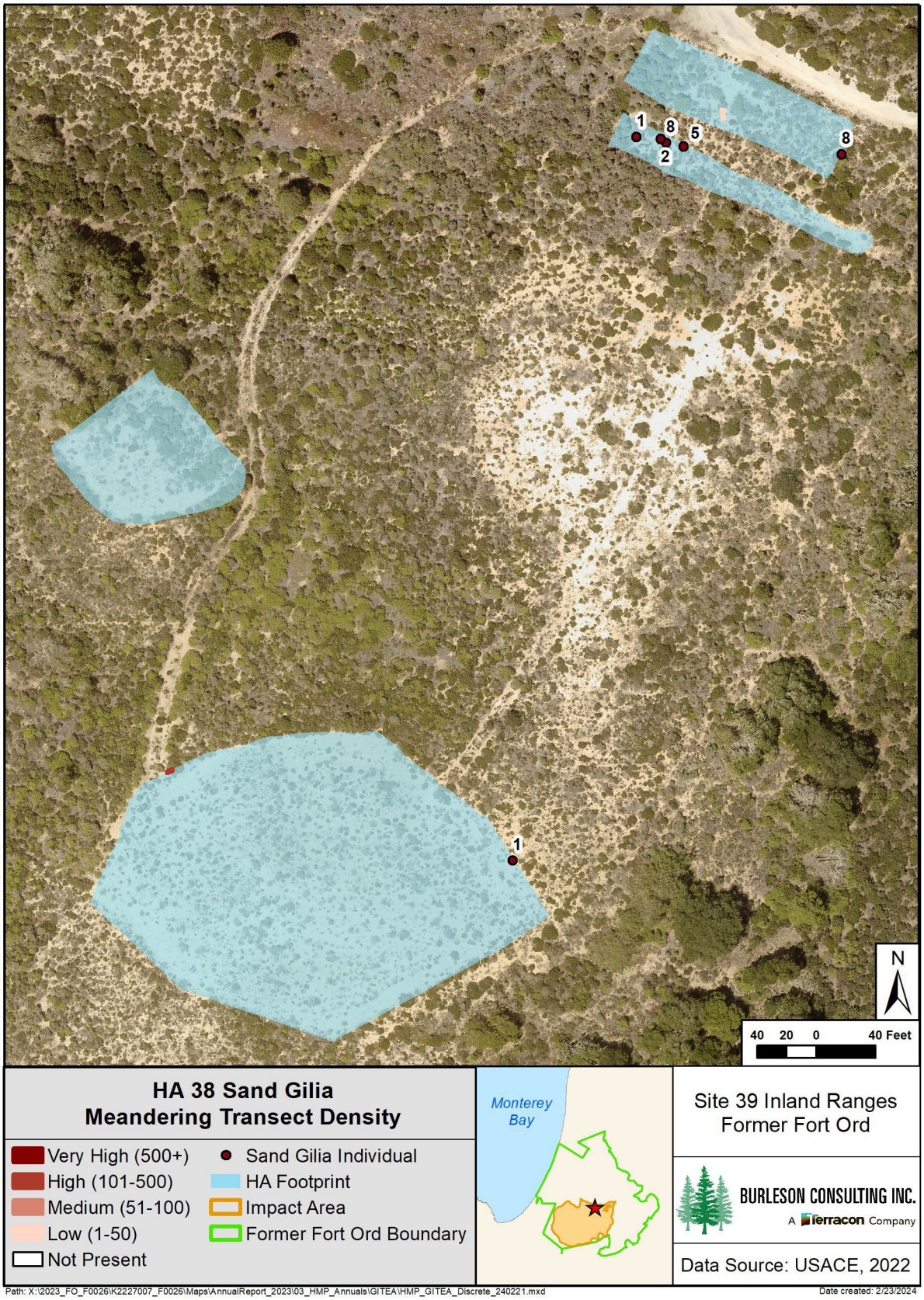


Figure 8-36. HA 38 Sand Gilia Meandering Transect Density Map

8.14.2.2 Species Richness

Sixty-two species were observed at HA 38. Of those, 32 were native shrubs or perennials, 14 were native annual herbaceous species, and 15 were non-native species (see Table 8-75). Species richness decreased by three species since 2022. Native shrub and perennial species richness increased by one, native herbaceous species richness decreased by four, and non-native species richness decreased by one. Due to subtle phenological differences between *Lupinus albifrons* var. *albifrons* and *Lupinus chamissonis* and the timing of surveys, the two species were combined for analysis of species richness and comparison to the success criteria (see section 6.1.4).

Table 8-75. Species Observed on HA 38, 2023

Scientific Name	Common Name	Code	Category
Achillea millefolium	common yarrow	ACMI	NP
Acmispon glaber	deerweed	ACGL	NP
Acmispon heermannii var. *orbicularis*	Heermann's lotus	ACHEO	NP
Acmispon strigosus	Bishop's lotus	ACST	NF
Adenostoma fasciculatum	chamise	ADFA	NP
Aira caryophyllea	silver hair grass	AICA	NNF
*Arctostaphylos hookeri**	Hooker's manzanita	ARHO	NP
*Arctostaphylos montereyensis**	Monterey manzanita	ARMO	NP
*Arctostaphylos pumila**	sandmat manzanita	ARPU	NP
Arctostaphylos tomentosa	shaggy-bark manzanita	ARTO	NP
Baccharis pilularis	coyote brush	BAPI	NP
Bowlesia incana	hoary bowlesia	BOIN3	NF
Briza maxima	rattlesnake grass	BRMA	NNF
Bromus diandrus	ripgut brome	BRDI	NNF
Bromus madritensis ssp. rubens	foxtail chess	BRMAR	NNF
Camissoniopsis micrantha	small primrose	CAMI	NF
Carex sp.	sedge	CA	NP
Carex tumulicola	foothill sedge	CATU	NP
Carpobrotus edulis	hottentot fig	CAED	NNP
*Ceanothus rigidus**	Monterey ceanothus	CERI	NP
Centaurea melitensis	tocalote	CEME	NNF
Chorizanthe diffusa	diffuse spineflower	CHDI	NF
*Cordylanthus rigidus ssp. littoralis**	seaside bird's-beak	CORIL	NF
Croton californicus	California croton	CRCA	NP
Cryptantha sp.	cryptantha	CR	NF
Diplacus aurantiacus	sticky monkeyflower	DIAU	NP
Elymus glaucus	blue wild-rye	ELGL	NP
Eriastrum virgatum	virgate eriastrum	ERVI	NF
Ericameria ericoides	mock heather	ERER	NP
*Ericameria fasciculata**	Eastwood's goldenbush	ERFA	NP
Eriophyllum confertiflorum	golden yarrow	ERCO	NP
Erodium botrys	long-beaked filaree	ERBO	NNF

Scientific Name	Common Name	Code	Category
Erodium cicutarium	red-stemmed filaree	ERCI	NNF
Festuca myuros	rattail sixweeks grass	FEMY	NNF
Festuca octoflora	sixweeks grass	FEOC	NF
Gamochaeta ustulata	purple cudweed	GAUS	NP
Garrya elliptica	coast silk tassel	GAEL	NP
*Gilia tenuiflora ssp. arenaria**	sand gilia	GITEA	NF
Heterotheca grandiflora	telegraph weed	HEGR	NF
Horkelia cuneata	wedge-leaved horkelia	HOCU	NP
Hypochaeris glabra	smooth cat's ear	HYGL	NNF
Hypochaeris radicata	rough cat's ear	HYRA	NNP
Iris douglasiana	douglas iris	IRDO	NF
Koeleria macrantha	june grass	KOMA	NP
Lessingia pectinata	common lessingia	LEPE	NF
Logfia filaginoides	California cottonrose	LOFI	NF
Logfia gallica	daggerleaf cottonrose	LOGA	NNF
Lomatium parvifolium	coastal biscuitroot	LOPA	NP
Lupinus chamissonis/albifrons	silver bush lupine	LUCH/LUAL	NP
Microseris paludosa	Marsh microseris	MIPA	NP
Piperia michaelii	Michael's rein orchid	PIMI6	NP
Plantago erecta	California plantain	PLER	NF
Polycarpon tetraphyllum var. tetraphyllum	four-leaved allseed	POTET	NNF
Pseudognaphalium beneolens	fragrant everlasting	PSBE	NP
Pseudognaphalium ramosissimum	pink everlasting	PSRA	NP
Pseudognaphalium sp.	cudweed	PS	
Pteridium aquilinum var. pubescens	western bracken fern	PTAQP	NP
Rumex acetosella	sheep sorrel	RUAC	NNP
Salvia mellifera	black sage	SAME	NP
Senecio vulgaris	common groundsel	SEVU	NNF
Solanum umbelliferum	blue witch	SOUM	NP
Toxicodendron diversilobum	poison oak	TODI	NP

*HMP Species

8.14.3 Discussion

8.14.3.1 HMP Annual Density

Monterey spineflower density was within the acceptable limit for HMP annual density at HA 38. The SSRP baseline density class for Monterey spineflower was low. Year 6 and year 9 Monterey spineflower restoration plot results show that the density met the success criterion under Objective 3 for two out of five plots. In addition, Monterey spineflower was present outside the restoration plots. Discrete observations, with density that met or exceeded the success criterion, covered 0.069 acre of HA 38.

Sand gilia density was within the acceptable limit for HMP annual density at HA 38. The SSRP baseline density class for sand gilia was low. Year 3 and year 6 sand gilia restoration plot results show that the density met the success criterion under Objective 3 for five out of five plots. In addition, sand gilia was

present outside the restoration plots. Two discrete patches, with density that met or exceeded the success criterion, covered 0.001 acre of HA 38.

Seaside bird's beak was within the acceptable limit for HMP annual density at HA 38. The SSRP baseline density class for seaside bird's beak was low. Year 3 seaside bird's beak restoration plot results show that the density met the success criterion under Objective 3. Seaside bird's beak was not observed outside of the restoration plot.

Monterey spineflower, sand gilia, and seaside bird's beak restoration plot results indicated that all HMP species met the success criterion in 2023.

8.14.3.2 Species Richness

Deerweed, chamise, Hooker's manzanita, Monterey manzanita, sandmat manzanita, shaggy-bark manzanita, coyote brush, Monterey ceanothus, and black sage were present. HA 38 included 32 native shrub and perennial species and met the success criterion for Objective 1.

8.14.3.3 HA 38 Status

HA 38 was in year 9 of monitoring in 2023. Year 9 does not normally require monitoring, but since HMP annual seeded plots were established in several different years, some plots were in a monitoring year and HMP annual density monitoring was conducted for Monterey spineflower, sand gilia, and seaside bird's beak. Site visits and photo documentation were also completed (See Appendix D, page D-15).

For a comprehensive review of site progress towards success criteria and past recommendations, see the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2027 (see Table 8-73). Table 8-76 summarizes the status of the HA including which success criteria were met and likelihood of meeting criteria by year 13.

Table 8-76. Status for Achieving Success Criteria at HA 38

Success Criterion	Category	Acceptable Limits	Year 5 (2019) Met	Year 8 (2022) Met	Likelihood of Achieving Success by Year 13 (2027)	Notes
Objective 1 – No. 1	Species richness	9 Required species: ACGL, ADFA, ARHO, ARMO, ARPU, ARTO, BAPI, CERI, SAME	Yes	Yes	HIGH	**Year 5**: met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	≥ 20%	Yes	Yes	HIGH	**Year 5**: 43.47% **Year 8**: 27.71% (LUCH/LUAL cover decreased by 19.74% between years 5 and 8)
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 2: 1-5%	Yes	Yes	HIGH	**Year 5**: 2.29% **Year 8**: 4.07%
Objective 3 – No. 4	HMP shrub cover by species	ARMO ≥ 1% CERI ≥ 1% ARHO ≥ 1% ARPU ≥ 4%	No	No	HIGH for ARMO LOW for CERI LOW for ARHO MODERATE for ARPU	**Year 5**: ARMO 0.61% CERI 0.00% ARHO 0.00% ARPU 1.68% **Year 8**: ARMO 1.88% CERI 0.00% ARHO 0.00% ARPU 2.19% (CERI planted in 2020/2021)**
Objective 3 – No. 4	HMP annual density	Low density for CHPUP, GITEA, and CORIL	Yes for GITEA Yes for CHPUP No for CORIL	Yes	NA	(CORIL plot established in 2020/2021. Monitoring will occur in 2024, 2025, and 2028)

**Planted as part of Adaptive Management Plan

8.15 HA 39/40

HA 39/40 was used by the Army as a small-arms firing range. Soil remediation was completed in 2010; approximately 6,500 cubic yards of soil were excavated from 2.4 acres (Shaw, 2008). HA 39/40 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 39/40 is broken up into four distinct areas. Plots 1-4 are located in the upland zone of a vernal pool with surface water runoff from the south draining towards the north into the vernal pool. Plot 1 is grassland habitat, Plot 2 is a combination of grassland and wet meadow, Plot 3 is wet meadow which can be submerged depending on the water-year, and Plot 4 is a combination of coastal scrub and grassland which includes the active restoration area.

The SSRP plant palettes for this site were based on baseline data from transects within the footprint as well as supplemental species appropriate for each plot (Shaw, 2009a). Baseline transects were established in Plots 1, 3, and 4. In baseline, native species cover for Plot 1 was 24.1%, Plot 3 was 22.7%, and Plot 4 was 10.3%. Plot 1 had four native species present and was dominated by clustered field sedge (*Carex praegracilis*) and rattail sixweeks grass (*Festuca myuros*). Plot 3 had one native species present and was dominated by clustered field sedge and ripgut brome (*Bromus diandrus*). Plot 4 had 16 native species present across three transects and was dominated by ripgut brome with a mixture of non-native grasses and common yarrow (*Achillea millefolium*) and an average of approximately 1% or less of all other native species. Both ripgut brome and rattail sixweeks grass are non-native species.

HA 39/40 is located on the northeastern portion of Site 39, occurring within the Aromas formation containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for HA 39/40 included both passive and active restoration consisting of hand broadcast non-irrigated seed and installing native container-grown plants. HA 39/40 is relatively flat to moderately sloped and has some potential for erosion; special care should be taken to prevent runoff from entering the vernal pool.

Restoration at HA 39/40 initially occurred between 2011 and 2013. Quantitative monitoring began in 2013, additional seed was broadcast in 2020, and additional plants were installed in 2021. HA 39/40 was monitored for twelve years by photo documentation and site visits, eight years for HMP annual density in plots, five years for HMP annual density across the HA, and four years for species richness and vegetative cover (see Table 8-77). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-37 shows the HA footprint, passive restoration area, active restoration area, and transect survey locations. Success criteria for HA 39/40 are summarized in Table 8-78.

Table 8-77. Historic Summary of Restoration and Monitoring Activities at HA 39/40

Activity	Monitoring Years												
			1	2	3	4	5	6	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2020	2021	2022	2023	2025
Restoration: Active, Passive, Erosion Control	●	●	●						●	●			
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●	●	●				
Sand Gilia Plots			●	●	●	●	●	●	●	●			
Seaside Bird's Beak Plots			●	●	●	●	●	●	●				
HMP Annual Density across HA						●	●	●	●	●			
Species Richness						●	●	●	●				●
Vegetative Cover						●	●	●	●				●

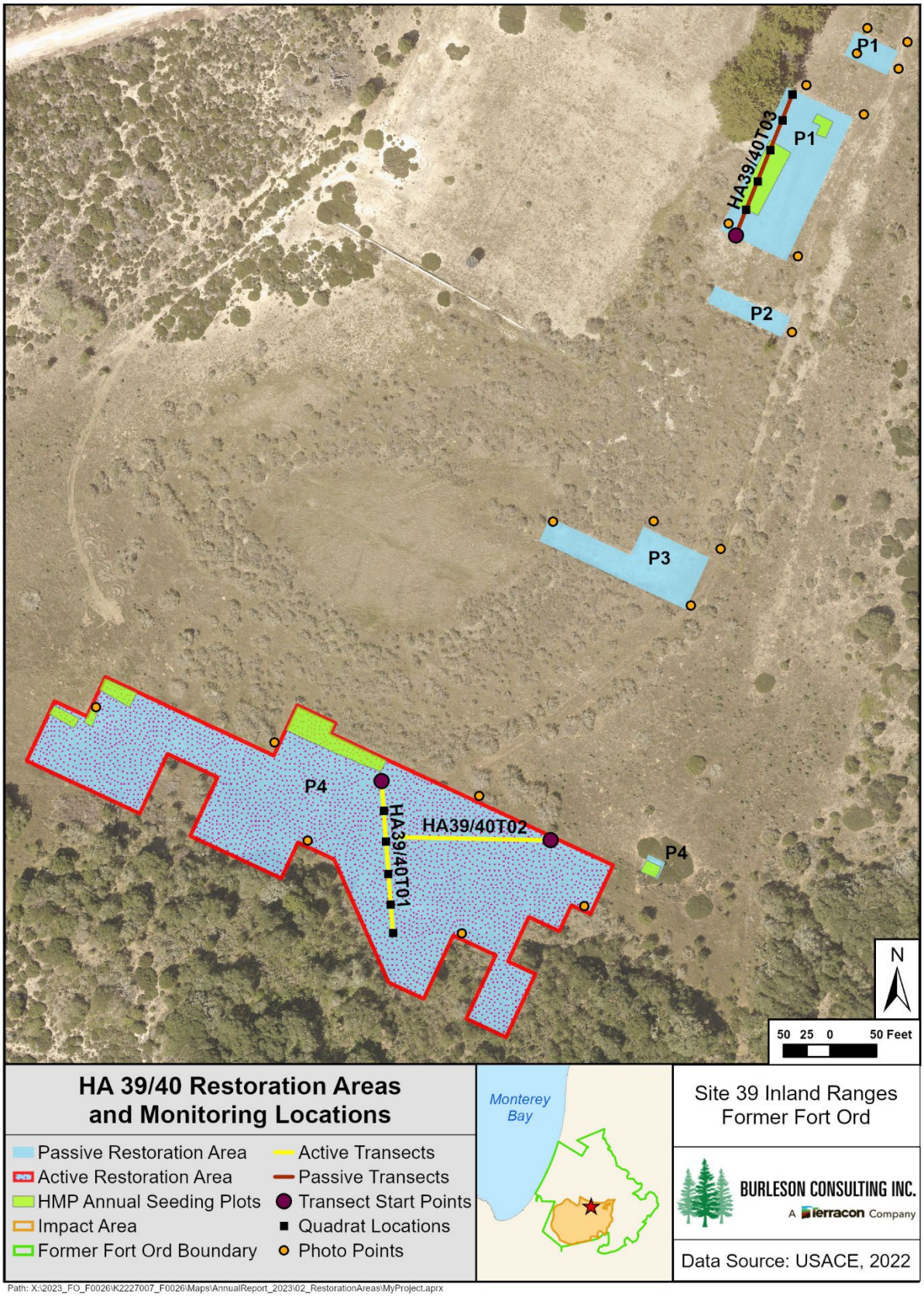


Figure 8-37. HA 39/40 Restoration Areas and Monitoring Locations Map

Table 8-78. Success Criteria and Acceptable Limits for Restoration of HA 39/40

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			common yarrow coyote brush sedge saltgrass blue wild-rye California poppy rush wedge-leaved horkelia yellow bush lupine silver bush lupine deerweed sticky monkeyflower
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP†.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline surveys indicate that non-native weeds were present in lands adjacent to HA-39/40. Therefore, no more than 5% non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 1 (0% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Baseline data indicated no HMP shrubs. Therefore, no HMP shrubs need to be present at this restoration site.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low Sand gilia density class: Low Seaside bird's beak density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† Each habitat zone (P1-P4) will be evaluated separately based on its unique plant palette

8.15.1 Restoration Activities

No passive or active restoration activities were conducted at HA 39/40 in 2023. See 2022 Habitat Restoration Annual Report for historic planting and seed broadcast data (Burleson, 2023).

8.15.2 Monitoring Results

HA 39/40 was in year 11 of monitoring in 2023. Year 11 does not require monitoring and only site visits and photo documentation were completed (see Appendix D, page D-16).

8.15.3 Discussion

8.15.3.1 HA 39/40 Status

There are no updates to the HA 39/40 status discussion; see Table 8-79Table 8-82 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2025 (see Table 8-77). Reevaluation of the success criteria may be considered at that time.

Table 8-79. Status for Achieving Success Criteria at HA 39/40

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	12 required species: ACMI, BAPI, Carex sp., DISP, ELGL, ESCA, Juncus sp., HOCU, LUAR, LUCH/LUAL, AGCL, DIAU	Yes	Yes	HIGH	**Year 5**: met **Year 8**: met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	LOW	**Year 5**: 7.98% **Year 8**: 17.10% (AMP planting occurred in 2021)
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 1: 0%	NA	NA	NA	NA, no HMP shrubs at baseline
Objective 3 – No. 4	HMP shrub cover by species	NA	NA	NA	NA	NA, no HMP shrubs at baseline
Objective 3 – No. 4	HMP annual density	Low density for CHPUP, GITEA, and CORIL	Yes	Yes	NA	(Year 13 monitoring not required)

8.16 HA 43

HA 43 was used by the Army as a long-distance small-arms firing range. Munitions removal and soil remediation were completed in 2010; 150 cubic yards of lead-contaminated soil were excavated from 0.09 acre. HA 43 rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 43 is relatively flat with surface water runoff draining to the west. Adjacent lands are high quality habitat areas which contain intact native vegetation that may promote natural recruitment within restoration areas.

HA 43 is located on the north central portion of Site 39, occurring within the sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 43 consisted of hand broadcasting non-irrigated seed and annual weed management activities. HA 43 is relatively flat with little potential for erosion.

Restoration at HA 43 occurred in 2011, 2012, 2019, 2020, 2021, and 2022. Quantitative monitoring began in 2013. HA 43 was monitored for 13 years by photo documentation and site visits; nine years for HMP annual density in plots; six years for HMP annual density across the HA; and five years for species richness and vegetative cover (see Table 8-80). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-38 shows the HA footprint, passive restoration area, and transect monitoring locations. Success criteria for HA 43 are summarized in Table 8-81.

Table 8-80. Historic Summary of Restoration and Monitoring Activities at HA 43

Activity	Monitoring Years													
			1	2	3	4	5	6	7	8	9	10	11	13
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2025
Restoration: Active and Passive	●	●							●	●	●	●		
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Monterey Spineflower Plots			●	●	●	●	●	●		●				
Sand Gilia Plots			●	●	●	●	●	●		●	●	●		
Seaside Bird's Beak Plots			●	●	●	●	●	●		●				
HMP Annual Density across HA						●	●	●		●	●	●		
Species Richness						●	●	●	●	●				●
Vegetative Cover						●†	●	●	●	●				●

† Vegetative cover was monitored using quadrats in 2016

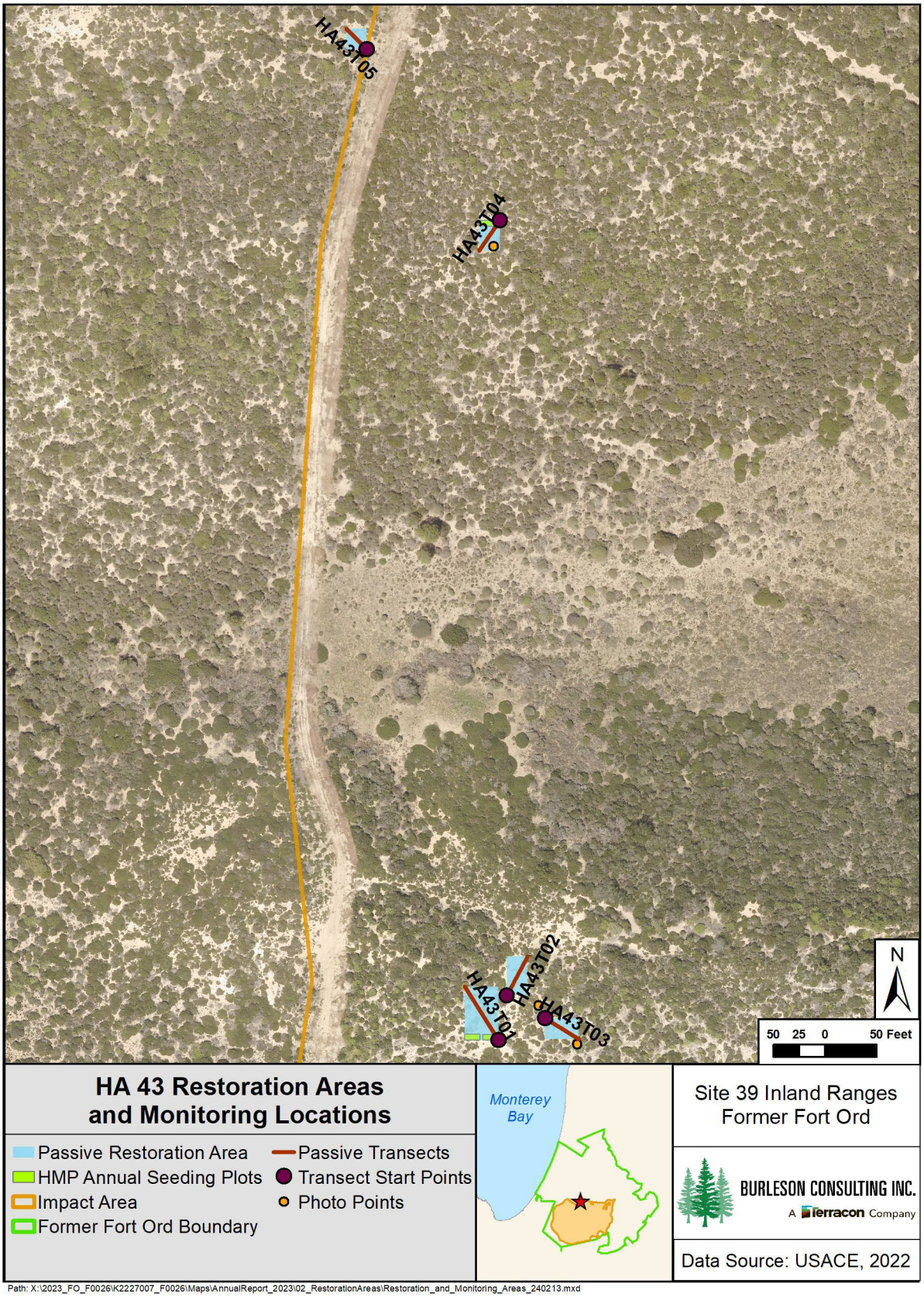


Figure 8-38. HA 43 Restoration Areas and Monitoring Locations Map

Table 8-81. Success Criteria and Acceptable Limits for Restoration of HA 43

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise sandmat manzanita† shaggy-bark manzanita coyote brush Monterey ceanothus† dwarf ceanothus mock heather golden yarrow peak rush-rose wedge-leaved horkelia deerweed sticky monkeyflower coffeeberry black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data did not indicate non-native target weed species. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 6.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 15.
			Eastwood's goldenbush percent cover, as an average of transect data, must be equal or greater than 1.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Medium Sand gilia density class: Medium Seaside bird's beak density class: Medium

* Objectives presented in HRP (Shaw, 2009b)
† HMP Species

8.16.1 Restoration Activities

No passive or active restoration activities were conducted at HA 43 in 2023. See 2022 Habitat Restoration Annual Report for historic planting and seed broadcast data (Burleson, 2023).

8.16.2 Monitoring Results

HA 43 was in year 11 of monitoring in 2023. Year 11 does not require monitoring, only photo documentation, and site visits were completed. (See Appendix D, page D-17).

8.16.3 Discussion

8.16.3.1 HA 43 Status

There are no updates to the HA 43 status discussion; see Table 8-82 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in year 13, 2025 (see Table 8-80).

Table 8-82. Status for Achieving Success Criteria at HA 43

Success Criterion	Category	Acceptable Limits	Year 5 (2017) Met	Year 8 (2020) Met	Likelihood of Achieving Success by Year 13 (2025)	Notes
Objective 1 – No. 1	Species richness	14 required species: ADFA, ARPU, ARTO, BAPI, CERI, CEDE, ERER, ERCO, CRSC, HOCU, ACGL, DIAU, FRCA, SAME	No	Yes	HIGH	**Year 5**: DIAU absent **Year 8**: met (AMP planting occurred in 2018/19)
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	MODERATE	**Year 5**: 25.38% **Year 8**: 30.31%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	Yes	Yes	HIGH	**Year 5**: 10.60% **Year 8**: 20.14%
Objective 3 – No. 4	HMP shrub cover by species	CERI ≥ 15% ARPU ≥ 6% ERFA ≥ 1%	No for CERI Yes for ARPU No for ERFA	No for CERI Yes for ARPU No for ERFA	LOW for CERI HIGH for ARPU MODERATE for ERFA	**Year 5**: CERI 2.50% ARPU 8.10% ERFA 0.00% **Year 8**: CERI 3.45% ARPU 16.69% ERFA 0.00% (ERFA planted in early 2022)**
Objective 3 – No. 4	HMP annual density	Medium density for CHPUP, GITEA, and CORIL	Yes for CHPUP Yes for CORIL No for GITEA	Yes for CHPUP Yes for CORIL No for GITEA	NA	**Year 5**: not met **Year 8**: not met (GITEA was also monitored in 2022 and did not meet criterion) (Year 13 monitoring not required)

**Planted as part of Adaptive Management Plan

8.17 HA 44

HA 44 was used by the Army as a range for anti-tank weapons and other explosive munitions. Approximately 2,900 cubic yards of soil was excavated over 1.8 acres. HA 44 rests within unprotected maritime chaparral with mean annual temperatures ranging between 56° and 58° F and regular fog typical of maritime climates (USFS, 2007). HA 44 is relatively flat with a southwest aspect and is surrounded by very high-quality habitat.

HA 44 is located on the northern portion of Site 39, within the sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for HA 44 included both passive and active restoration consisting of hand broadcast non-irrigated seed, annual weed management activities, and installing native container-grown plants. HA 44 is relatively flat with little potential for erosion.

Restoration at HA 44 occurred in 2017, 2018, and 2020 and quantitative monitoring began in 2016. The initial monitoring in 2016 was to assess the level of natural recruitment occurring at that site. HA 44 was monitored for eight years by photo documentation and site visits, HMP annual density across the HA, species richness, and vegetative cover, and three years for plant survivorship (see Table 8-83). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-39 shows the HA footprint, restoration areas, and transect monitoring locations. The success criteria for HA 44 are summarized in Table 8-84.

Table 8-83. Historic Summary of Restoration and Monitoring Activities at HA 44

Activity		Monitoring Years								
			1	2	3	4	5	6	8	13
	2016	2017	2018	2019	2020	2021	2022	2023	2025	2030
Restoration: Active and Passive		●	●		●					
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●	●
HMP Annual Density across HA	●	●	●	●	●	●	●		●	
Species Richness	●	●	●	●	●	●	●		●	●
Vegetative Cover	●	●	●	●	●	●	●		●	●
Plant Survivorship			●	●	●					

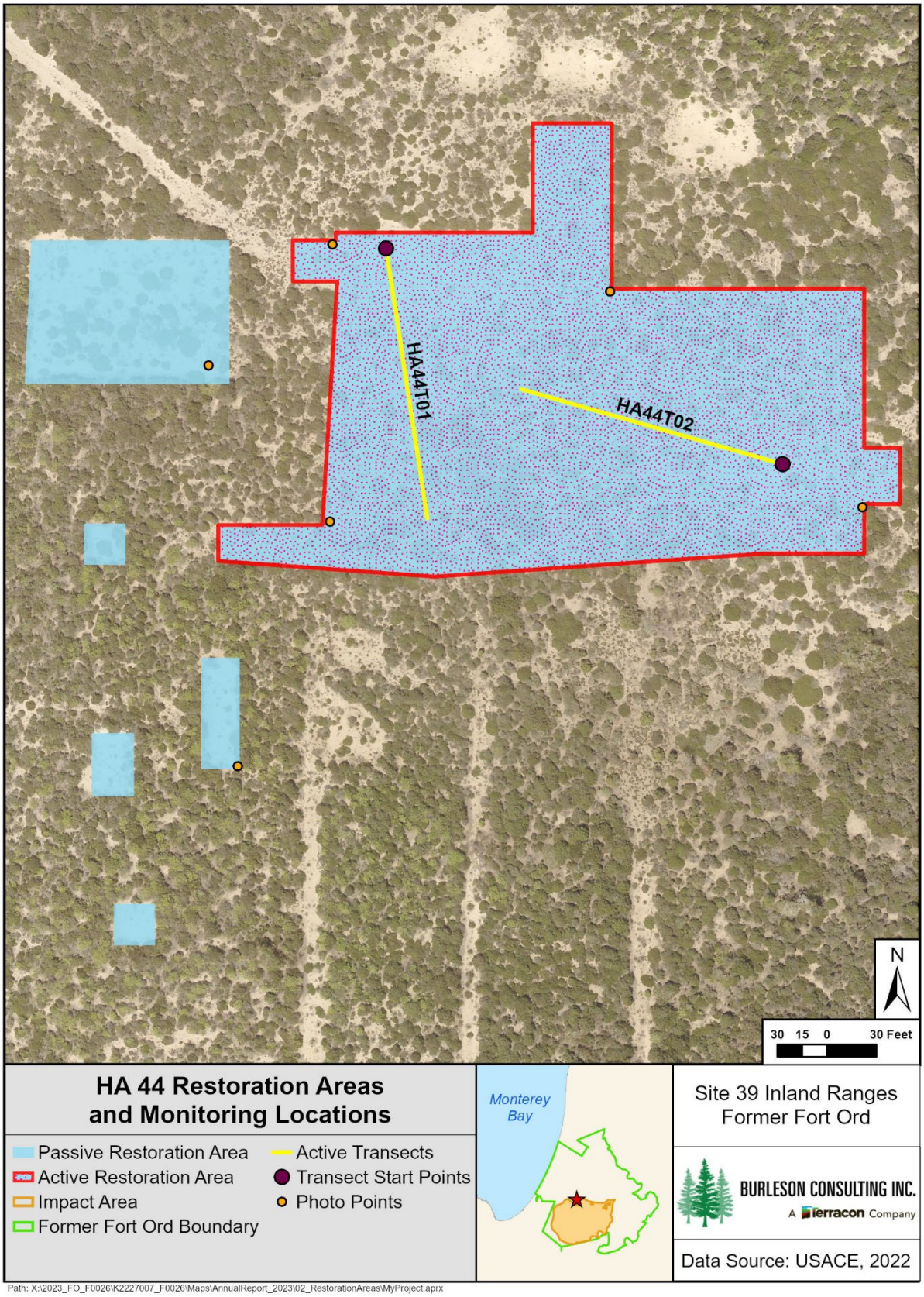


Figure 8-39. HA 44 Restoration Areas and Monitoring Locations Map

Table 8-84. Success Criteria and Acceptable Limits for Restoration of HA 44

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness: chamise sandmat manzanita† shaggy-bark manzanita Monterey ceanothus† California coffeeberry
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data indicated absence of non-native target weed species. In the event of their establishment, no more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 2.
			Monterey ceanothus percent cover, as an average of transect data, must be present however, less than 10 percent is acceptable.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low Sand gilia density class: Low Seaside bird's beak density class: Low

* Objectives presented in HRP (Shaw, 2009b)
† HMP Species

8.17.1 Restoration Activities

No passive or active restoration activities were conducted at HA 44 in 2023. See 2022 Habitat Restoration Annual Report for historic planting and seed broadcast data (Burleson, 2023).

8.17.2 Monitoring Results

HA 44 was in year 6 of monitoring in 2023. Year 6 does not require monitoring and only site visits and photo documentation were completed (See Appendix D, page D-18).

8.17.3 Discussion

8.17.3.1 HA 44 Status

There are no updates to the HA 44 status discussion; see Table 8-85 for a summary of the most recent HA status and likelihood of achieving success criteria. An in-depth discussion of past trends and recommendations is available in the 2022 Annual Report (Burleson, 2023). The site will continue to be monitored by photo documentation, HMP annual density surveys, species richness meandering transects, vegetative cover line-intercept transects, and plant survivorship in monitoring year 8, 2025 (see Table 8-83).

Table 8-85. Status for Achieving Success Criteria at HA 44

Success Criterion	Category	Acceptable Limits	Year 5 (2022) Met	Recommendation	Notes
Objective 1 – No. 1	Species richness	5 required species: ADFA, ARPU, ARTO, CERI, FRCA	Yes	None	**Year 5**: met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	None, reassess at year 8	**Year 5**: 27.01%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	None	**Year 5**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	Yes	None	**Year 5**: 20.08%
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 2% CERI = present	Yes	None	**Year 5**: ARPU 18.72% CERI 1.36%
Objective 3 – No. 4	HMP annual density	Low density for CHPUP, GITEA, and CORIL	Yes	Establishment of restoration plots not necessary	**Year 5**: met

8.18 HA 48

HA 48 was used by the Army as a range for mortars, weapons demonstrations, sniper training, anti-tank weapons, and various other weapons. Approximately 150 cubic yards of soil were excavated over 0.05 acre. HA 48 is within unprotected maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). HA 48 is relatively flat with a southeast aspect and is surrounded by very high-quality habitat.

HA 48 is located on the northern portion of Site 39, within the sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at HA 48 consisted of hand broadcast non-irrigated seed and annual weed management activities. HA 48 has little potential for erosion.

Restoration at HA 48 occurred in 2019 and quantitative monitoring began in 2016. HA 48 was monitored for eight years by photo documentation and site visits, six years for HMP annual density across the HA and species richness, and five years for vegetative cover (see Table 8-86). Monitoring years are counted from a year when at least 50% of SSRP prescription has been applied to a site. Figure 8-40 shows the HA footprint, passive restoration areas, and photo point monitoring locations. Success criteria for HA 48 are summarized in Table 8-87.

Table 8-86. Historic Summary of Restoration and Monitoring Activities at HA 48

Activity	Monitoring Years								
	1	2	3	4	5	6	7	8	13
	2016	2017	2018	2019	2020	2021	2022	2023	2028
Restoration: Active and Passive				●					
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●
HMP Annual Density across HA	●	●	●	●	●			●	
Species Richness	●	●	●	●	●			●	●
Vegetative Cover		●	●	●	●			●	●

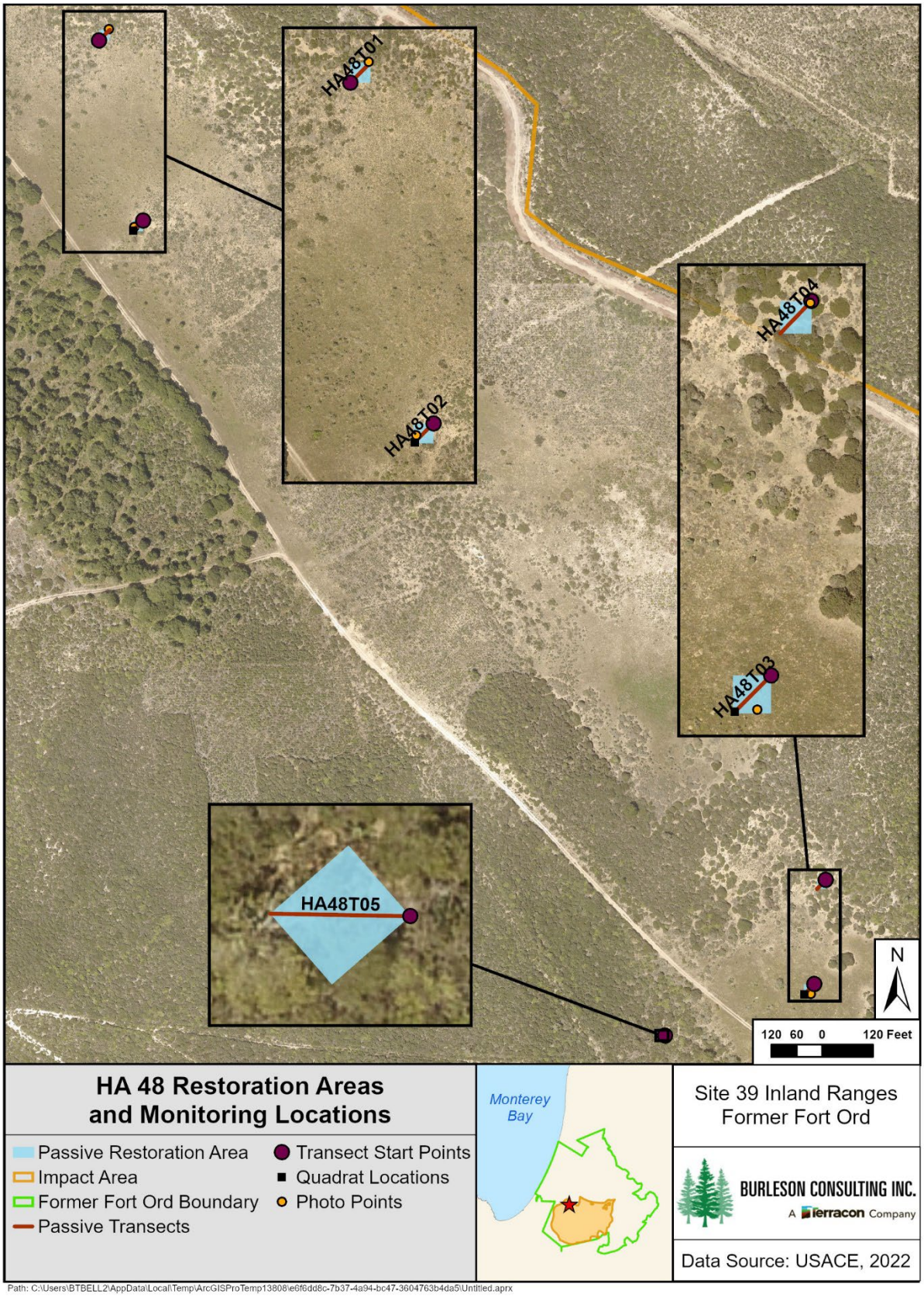


Figure 8-40. HA 48 Restoration Areas and Monitoring Locations Map

Table 8-87. Success Criteria and Acceptable Limits for Restoration of HA 48

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			chamise sandmat manzanita† shaggy-bark manzanita Monterey ceanothus† wedge-leaved horkelia black sage silver bush lupine peak rush-rose
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data did not indicate presence of non-native target weed species. No more than 5 percent non- native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or less than 1 percent.
			Monterey ceanothus percent cover, as an average of transect data, must be present however, less than 4 percent is acceptable.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low Sand gilia density class: Low

* Objectives presented in HRP (Shaw, 2009b)
† HMP Species

8.18.1 Restoration Activities

No passive or active restoration activities were conducted at HA 48 in 2023. See 2022 Habitat Restoration Annual Report for historic planting and seed broadcast data (Burleson, 2023).

8.18.2 Monitoring Results

HA 48 was in year 8 of monitoring in 2023. Year 8 requires species richness, HMP annual density, and vegetative cover transect monitoring in addition to the site visits and photo documentation that were also completed in 2023 (see Appendix D, page D-19).

8.18.2.1 HMP Annual Density

No restoration plots were established for HMP annuals at HA 48 because the species were present throughout the site (Burleson, 2017). However, HMP annuals were mapped as a part of the meandering transect survey. This survey was completed for Monterey spineflower and sand gilia at HA 48.

Two individual occurrences and five discrete patches of Monterey spineflower were mapped and individuals counted within each patch (see Figure 8-41). Densities ranged from low to high and the total acreage of Monterey spineflower patches with a density at or above the SSRP baseline density class of low was 0.02 acre. From 2020 to 2023, the density range and acreage above the SSRP baseline decreased.

Thirteen individual occurrences of sand gilia were mapped at HA 48 (see Figure 8-42). The density ranged from low to high and the total acreage of the sand gilia patch with a density at or above the SSRP baseline density class of low was 0.0002 acre. From 2020 to 2023, the density range increased and acreage above the SSRP baseline decreased.

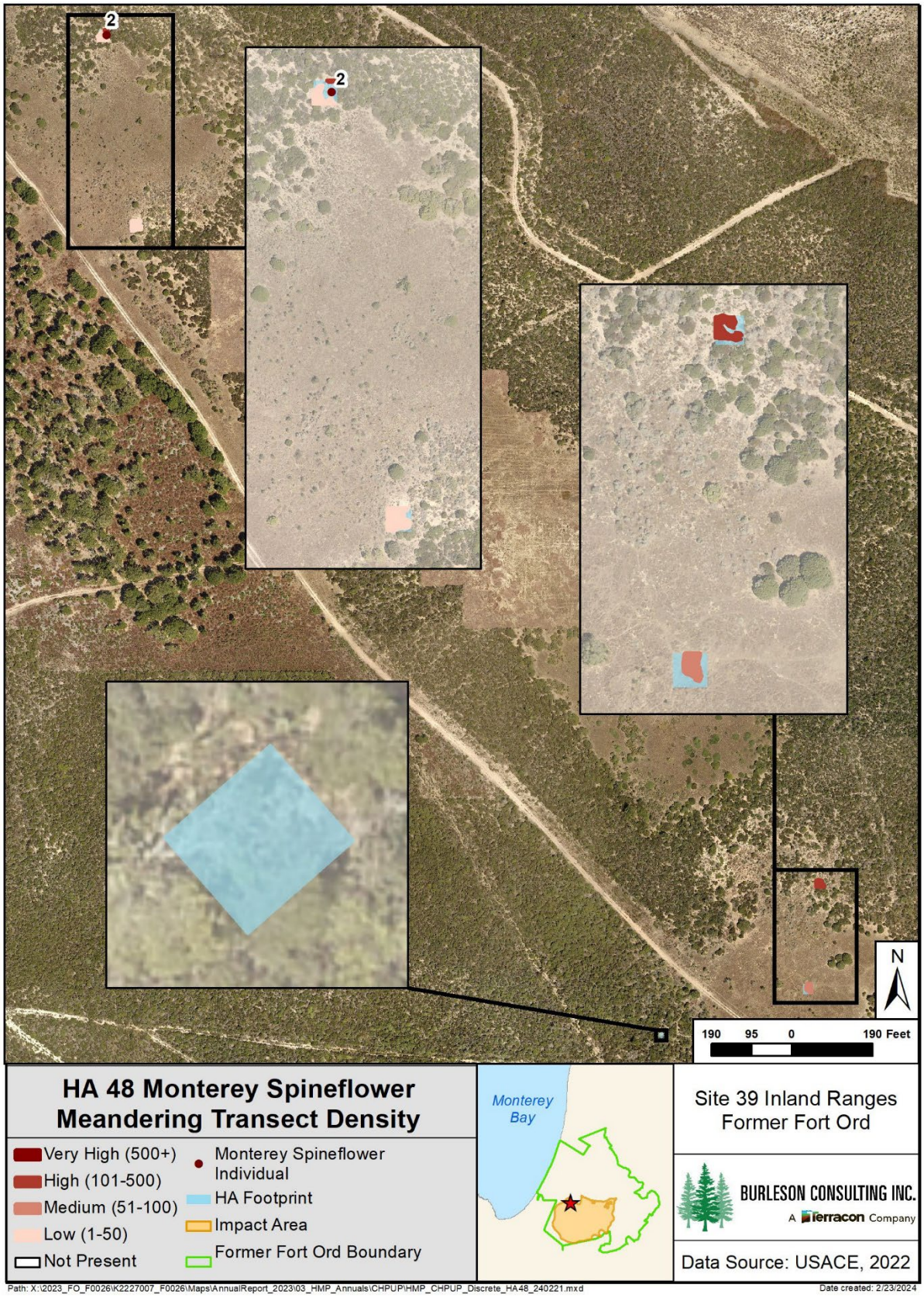


Figure 8-41. HA 48 Monterey Spineflower Meandering Transect Density Map

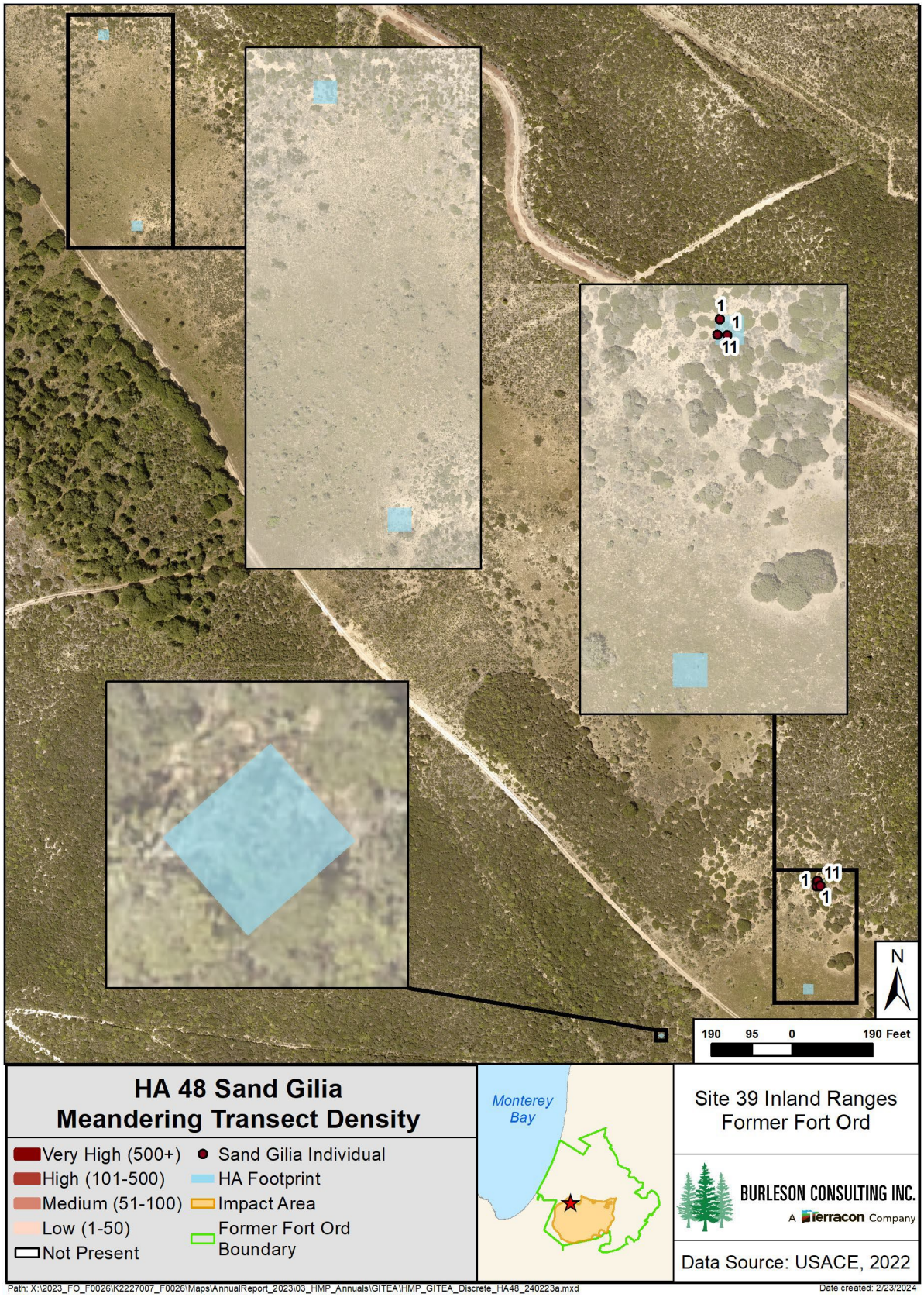


Figure 8-42. HA 48 Sand Gilia Meandering Transect Density Map

8.18.2.2 Vegetative Cover

Burleson surveyed five line-intercept transects at HA 48 that vary from 4.5 to 11-meters in length. The mean vegetative cover of native shrub and perennial species was 29.74%. The mean vegetative cover of native shrub and perennial species was greater in 2023 than 2020 by 1.36%, but was 0.75% less than the native shrub and perennial cover in 2019 (30.49%). Table 8-88 summarizes vegetative cover and Table 8-89 presents vegetative cover by species for HA 48.

Table 8-88. Table Transect Survey Summary for HA 48

Transect	Total Vegetative Cover (%)	Native Vegetative Cover (%)	Non-Native Vegetative Cover (%)	Thatch (%)	Bare Ground (%)
HA48T01	54.32	53.26	1.05	49.16	41.16
HA48T02	66.55	56.36	10.18	31.00	29.82
HA48T03	64.00	6.95	57.05	85.33	5.33
HA48T04	55.29	55.29	0.00	42.29	45.29
HA48T05	53.78	51.56	2.22	74.00	12.00
Passive Average	**59.98**	**42.78**	**17.20**	**54.89**	**26.96**
Site Average	**59.98**	**42.78**	**17.20**	**54.89**	**26.96**

Table 8-89. Transect Survey Results for HA 48 by Species

Transect	ACGL %	ADFA %	ARPU %	AVBA %	CAEX %	CATU %	CHPUP %	COFI %	CRSC %	ERBO %	ERER %	ESCA %
HA48T01	0.00	0.00	44.11	0.00	0.00	0.00	1.47	2.95	0.00	0.00	0.00	2.74
HA48T02	0	6.36	0.00	0.00	1.64	0.00	0.00	3.82	0.00	0.00	29.91	5.18
HA48T03	2.76	0.00	0.00	1.52	0.00	0.00	0.00	0.00	0.00	38.48	0.00	0.00
HA48T04	3	0.00	46.14	0.00	0.00	1.43	0.00	0.00	4.71	0.00	0.00	0.00
HA48T05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Average	**1.18**	**1.65**	**17.46**	**0.38**	**0.42**	**0.24**	**0.33**	**1.65**	**0.78**	**9.51**	**7.74**	**1.95**

Table 8-89. (continued) Transect Survey Results for HA 48 by Species

Transect ID	FEMY %	LAPL %	LEPE %	LOGA %	LUAR %	LUCH /LUAL %	QUAG %	RUAC %	TH %	BG %
HA48T01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.16	41.16
HA48T02	0.00	0.00	13.64	10.18	0.00	5.82	0.00	0.00	49.73	29.82
HA48T03	0.00	1.14	0.00	1.43	3.05	0.00	0.00	15.71	85.33	5.33
HA48T04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.29	45.29
HA48T05	2.22	0.00	0.00	0.00	0.00	0.00	51.56	0.00	74	12
Site Average	**0.24**	**0.28**	**3.53**	**2.99**	**0.75**	**1.51**	**5.46**	**3.88**	**59.74**	**26.96**

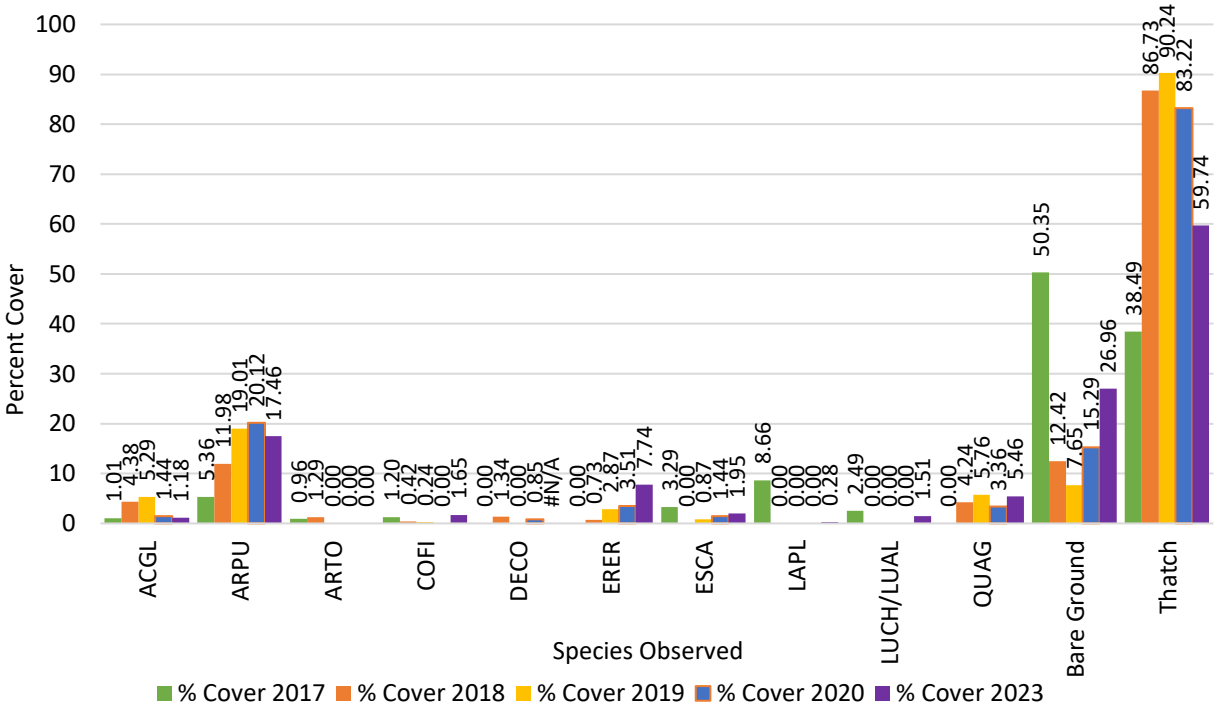


Figure 8-43. Percent Cover of Dominant Species at HA 48 in 2017, 2018, 2019, 2020, and 2023

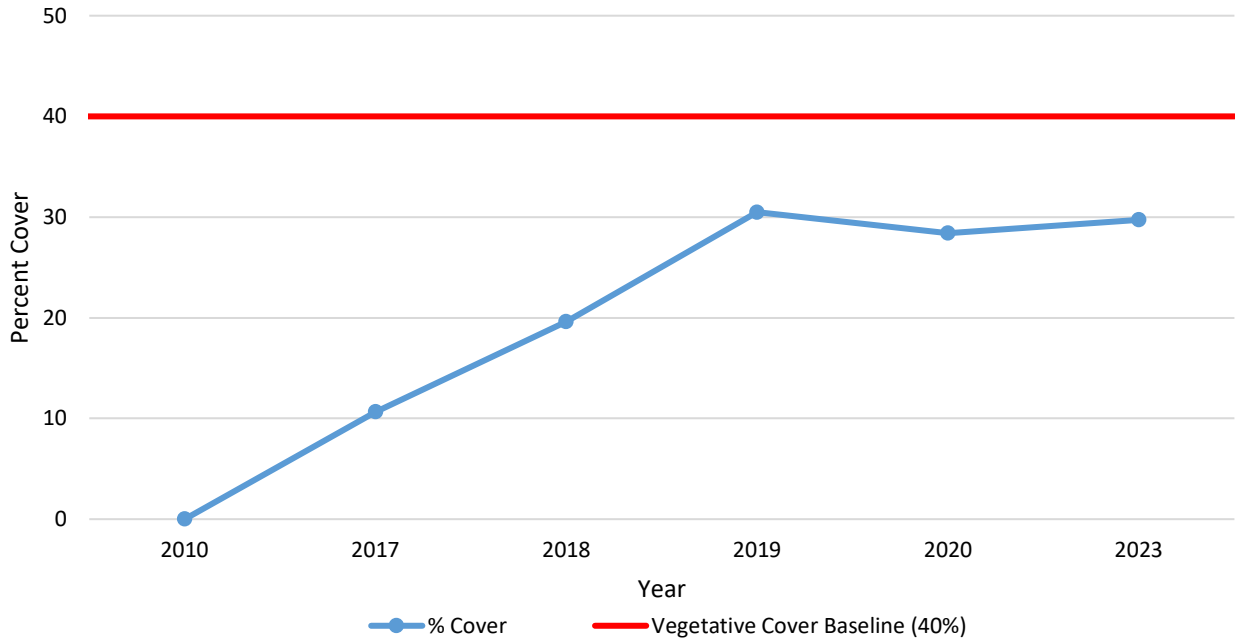


Figure 8-44. Native Vegetation Cover Compared to Success Criteria at HA 48

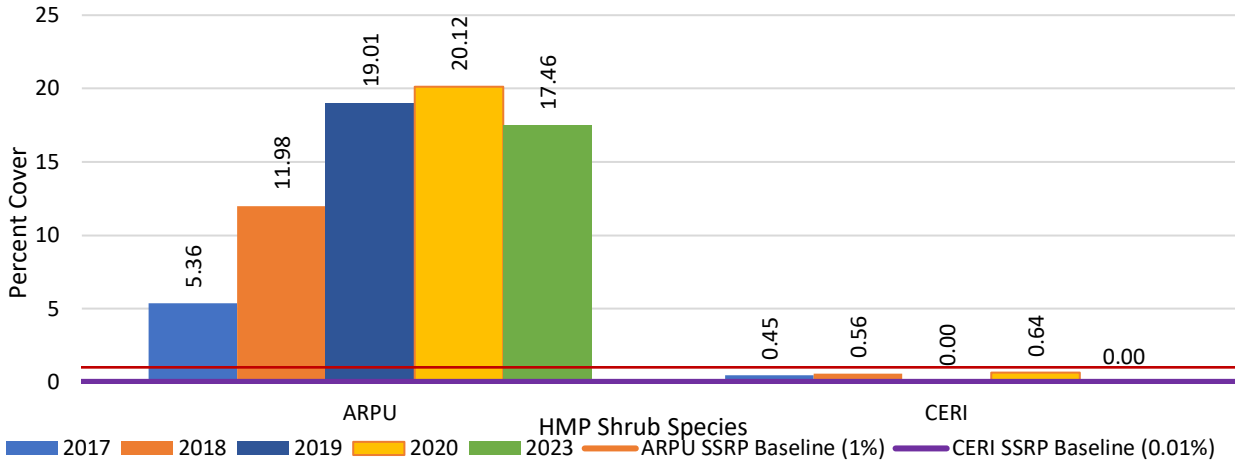


Figure 8-45. Percent Cover of HMP Shrubs Comparison to Success Criteria at HA 48

8.18.2.3 Species Richness

Fifty-eight species were observed at HA 48. Of those, 23 were native shrubs or perennials, 25 were native annual herbaceous species, and 15 were non-native species (see Table 8-90). Species richness did not change since 2020. Native shrub and perennial species richness decreased by one, native herbaceous species richness increased by six, and non-native species richness did not change. Due to subtle phenological differences between *Lupinus albifrons* var. *albifrons* and *Lupinus chamissonis* and the timing of surveys, the two species were combined for analysis of species richness and comparison to the success criteria (see section 6.1.4).

Table 8-90. Species Observed on HA 48, 2023

Scientific Name	Common Name	Code	Category
Achillea millefolium	common yarrow	ACMI	NP
Acmispon glaber	deerweed	ACGL	NP
Acmispon strigosus	Bishop's lotus	ACST	NF
Adenostoma fasciculatum	chamise	ADFA	NP
Aira caryophyllea	silver hair grass	AICA	NNF
Amsinckia intermedia	common fiddleneck	AMIN	NF
*Arctostaphylos pumila**	sandmat manzanita	ARPU	NP
Arctostaphylos tomentosa	shaggy-bark manzanita	ARTO	NP
Avena barbata	slender wild oat	AVBA	NNF
Bromus diandrus	ripgut brome	BRDI	NNF
Bromus hordeaceus	soft chess	BRHO	NNF
Bromus madritensis ssp. rubens	foxtail chess	BRMAR	NNF
Carex sp.	sedge	CA	NP
Carex tumulicola	foothill sedge	CATU	NP
Carpobrotus edulis	hottentot fig	CAED	NNP
Castilleja exserta ssp. exserta	purple owl's-clover	CAEX	NF
Ceanothus dentatus	dwarf ceanothus	CEDE	NP
*Ceanothus rigidus**	Monterey ceanothus	CERI	NP
Ceanothus thyrsiflorus	blueblossom	CETH	NP
*Chorizanthe pungens var. pungens**	Monterey spineflower	CHPUP	NF
Clarkia purpurea ssp. quadrivulnera	winecup clarkia	CLPUQ	NF
Corethrogyne filaginifolia	common sandaster	COFI	NP
Crassula connata	pygmy-weed	CRCO	NF
Crocanthemum scoparium	peak rush-rose	CRSC	NP
Cryptantha sp.	cryptantha	CR	NF
Eriastrum virgatum	virgate eriastrum	ERVI	NF
Ericameria ericoides	mock heather	ERER	NP
Eriophyllum confertiflorum	golden yarrow	ERCO	NP
Erodium botrys	long-beaked filaree	ERBO	NNF
Erodium cicutarium	red-stemmed filaree	ERCI	NNF
Eschscholzia californica	California poppy	ESCA	NF
Festuca myuros	rattail sixweeks grass	FEMY	NNF
Festuca octoflora	sixweeks grass	FEOC	NF
Gamochaeta ustulata	purple cudweed	GAUS	NP
*Gilia tenuiflora ssp. arenaria**	sand gilia	GITEA	NF
Heterotheca grandiflora	telegraph weed	HEGR	NF
Horkelia cuneata	wedge-leaved horkelia	HOCU	NP
Hypochaeris glabra	smooth cat's ear	HYGL	NNF
Hypochaeris radicata	rough cat's ear	HYRA	NNP
Koeleria macrantha	june grass	KOMA	NP
Layia platyglossa	tidy-tips	LAPL	NF
Lessingia pectinata	common lessingia	LEPE	NF
Logfia gallica	daggerleaf cottonrose	LOGA	NNF
Lupinus arboreus	yellow bush lupine	LUAR	NP
Lupinus bicolor	miniature lupine	LUBI	NF

Scientific Name	Common Name	Code	Category
Lupinus chamissonis/albifrons	silver bush lupine	LUCH/LUAL	NP
Madia exigua	little tarweed	MAEX	NF
Madia gracilis	slender tarweed	MAGR	NF
Navarretia hamata ssp. parviloba	hooked navarretia	NAHAP	NF
Pectocarya sp.	combseed	PE	NF
Petrorhagia dubia	hairypink	PEDU	NNF
Plantago erecta	California plantain	PLER	NF
Pseudognaphalium sp.	cudweed	PS	0
Quercus agrifolia	coast live oak	QUAG	NP
Rumex acetosella	sheep sorrel	RUAC	NNP
Salvia mellifera	black sage	SAME	NP
Silene gallica	small-flower catchfly	SIGA	NNF
Sisyrinchium bellum	western blue-eyed grass	SIBE	NP
Spergularia sp.	sand-spurrey	SP	0
Stipa pulchra	purple needle grass	STPU	NP
Stylocline gnaphaloides	everlasting neststraw	STGN	NF
Trifolium ciliolatum	foothill clover	TRCI	NF
Trifolium gracilentum	pinpoint clover	TRGR	NF
Trifolium macraei	Macrae's clover	TRMA	NF
Trifolium microcephalum	small-head clover	TRMI	NF
Vicia sativa ssp. nigra	narrow-leaved vetch	VISAN	NNF

*HMP Species

8.18.3 Discussion

8.18.3.1 HMP Annual Density

No restoration plots were established for HMP annuals at HA 48 because the species were present throughout the site (Burleson, 2017). However, HMP annuals were mapped as part of the meandering transect survey. Both Monterey spineflower and sand gilia met or exceeded the density success criterion.

8.18.3.2 Vegetative Cover

The native vegetative cover criterion was not met in 2020 or 2023, however native cover increased by 1.36% over that time. The criterion for HMP shrub cover by species was met in 2020, but not in 2023 due to the lack of Monterey ceanothus presence in this year's vegetative cover surveys. In 2020, Monterey ceanothus was only detected on one of five transects, therefore it is possible that the plant(s) detected in past years may have died or transect placement could have been inconsistent between 2020 and 2023. Monterey ceanothus was observed outside of transects in 2023 and has been documented at HA 48 every year that species richness data was collected.

8.18.3.3 Species Richness

Chamise, Monterey manzanita, shaggy-bark manzanita, Monterey ceanothus, peak rush-rose, silver bush lupine, and black sage were present. HA 26 included 37 native shrub and perennial species and met the success criterion for Objective 1.

8.18.3.4 HA 48 Status

HA 48 was in year 8 of monitoring in 2023 and responded variably to restoration efforts. In 2020, year 5 of monitoring, the site met five of six success criteria (see Table 8-91). In 2023, year 8 of monitoring, the site met four of six success criteria.

Recommendations were developed from a combination of prior recommendations and restoration efforts. SSRP restoration prescriptions have not been fulfilled at HA 48. Per recommendations in the 2016 Annual Report, chamise was planted in the 2018/2019 season to support the species richness criterion (Burleson, 2017). The Army does not recommend applying the SSRP prescription for HMP annuals since HMP annual densities met the success criteria in 2023. HA 48 needs time to respond to the restoration effort and continued monitoring to evaluate areas that may require additional effort in the future. A qualitative overview was documented by photo points (see Appendix D, page D-19).

HA 48 will continue to be monitored by photo documentation, species richness meandering transects, and vegetative cover line-intercept transects in monitoring year 13, 2028 (Table 8-86). Table 8-91 summarizes the status of HA 48 including which success criteria were met and the likelihood of meeting criteria by year 13.

Table 8-91. Status for Achieving Success Criteria at HA 48

Success Criterion	Category	Acceptable Limits	Year 5 (2020) Met	Year 8 (2023) Met	Likelihood of Achieving Success by Year 13 (2028)	Notes
Objective 1 – No. 1	Species richness	8 required species: ADFA, ARPU, ARTO, CERI, CRSC, HOCU, LUCH/LUAL, SAME	Yes	Yes	HIGH	**Year 5**: met
Objective 1 – No. 2	Native vegetation cover	≥ 40%	No	No	LOW	**Year 5**: 28.38% **Year 8**: 29.74%
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Yes	Yes	HIGH	**Year 5**: 0.00% **Year 8**: 0.00%
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	Yes	Yes	HIGH	**Year 5**: 20.75% **Year 5**: 17.46%
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 1% CERI = present	Yes	No	HIGH	**Year 5**: ARPU 20.12% CERI 0.64% **Year 8**: ARPU 17.46% CERI 0.00%
Objective 3 – No. 4	HMP annual density	Low density for CHPUP and GITEA	Yes	Yes	NA	**Year 5**: met **Year 8**: met

8.19 Austin Road Stockpile

Austin Road Stockpile encompasses approximately 0.45 acres and was used by the Army as a stockpile for soil remediation and by the Presidio of Monterey Fire Department to provide water to helicopters. The top six inches of soil at the Austin Road Stockpile were removed. The Austin Road Stockpile rests within maritime chaparral with mean annual temperatures ranging between 56° and 58°F and regular fog typical of maritime climates (USFS, 2007). The Austin Road Stockpile is relatively flat. Adjacent lands were not developed and contain intact native vegetation that may promote natural recruitment within restoration areas.

The Austin Road Stockpile is located on the western portion of Site 39, occurring within sand hill formation maritime chaparral containing the Baywood soils series based on previous baseline data (USACE, 1992). Baywood soils consist of very deep, somewhat excessively drained soils on old sand dunes and narrow valleys. Typically, the surface layer is brown, slightly acid loamy sand, and 17 inches thick. The underlying material to a depth of 61 inches is brown, slightly acid loamy sand, and sand. In a few areas, the surface layer is fine sand (USFS, 2007).

The SSRP prescription for passive restoration at the Austin Road Stockpile consists of hand broadcast non-irrigated seed and annual weed management activities. Austin Road Stockpile is relatively flat with little potential for erosion.

Restoration activities have not occurred at Austin Road Stockpile. Quantitative monitoring began in 2016. Austin Road Stockpile was monitored for eight years by photo documentation and site visits and HMP annual density across the HA, and seven years for species richness (see Table 8-92). Figure 8-46 shows the site footprint, passive restoration area, and photo point monitoring locations. Success criteria for Austin Road Stockpile are summarized in Table 8-93.

Table 8-92. Historic Summary of Monitoring Activities at Austin Road Stockpile

Activity	Monitoring Years								
	2016	2017	2018	2019	2020	2021	2022	2023	2026
Photo Points and Site Visit	●	●	●	●	●	●	●	●	●
HMP Annual Density across HA	●	●	●	●	●	●	●	●	●
Species Richness	●	●	●	●	●	●	●		●

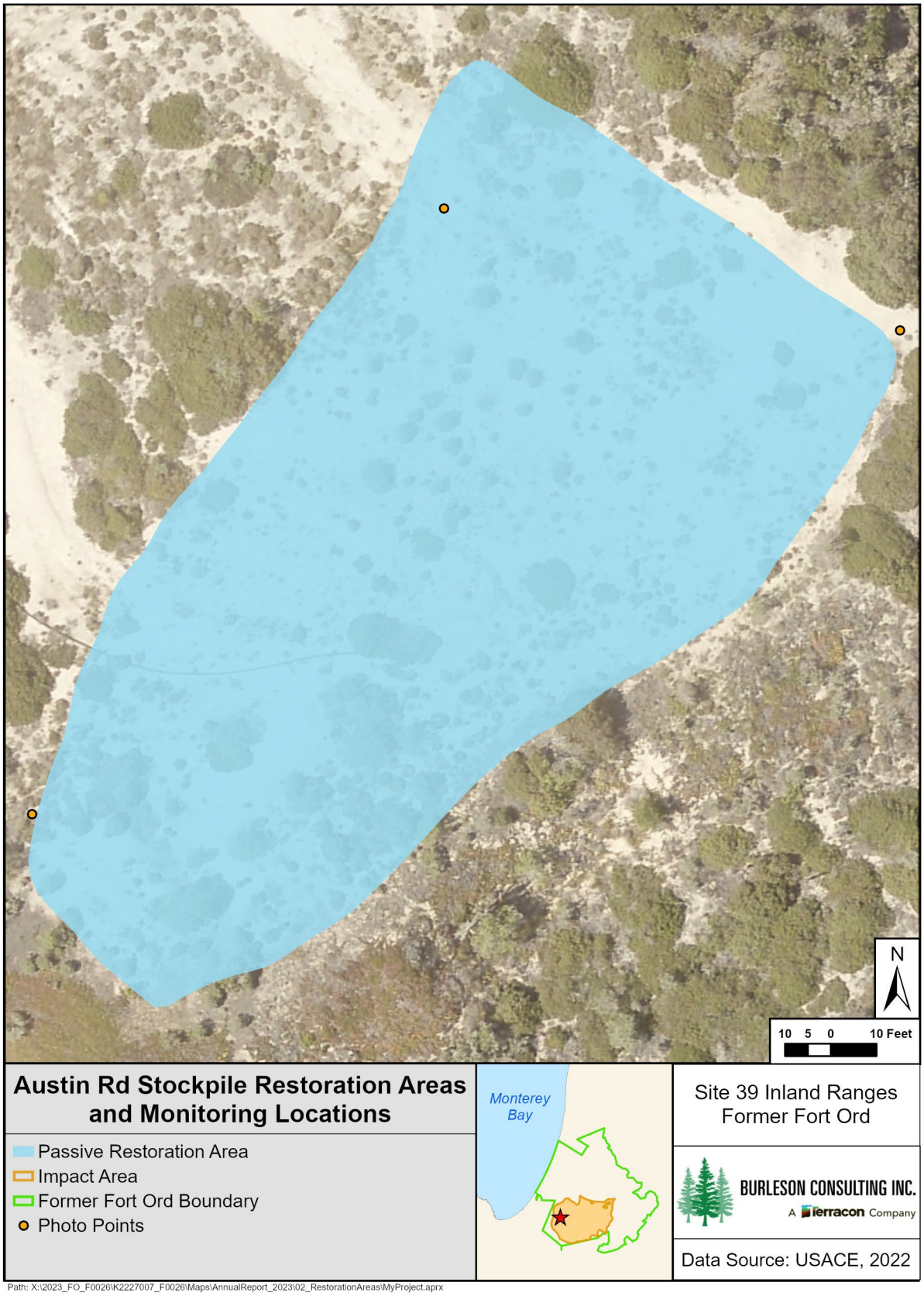


Figure 8-46. Austin Road Stockpile Restoration Areas and Monitoring Locations Map

Table 8-93. Success Criteria and Acceptable Limits for Restoration of Austin Road Stockpile

No.	Success Element	Decision Rule	Acceptable Limits
	Objective 1*		
1	Restoration demonstrates native species richness	Equivalent native species richness equal to baseline data.	Native species that must be present to demonstrate richness:
			common yarrow chamise Hooker's manzanita† shaggy-bark manzanita sandmat manzanita† coyote brush Monterey ceanothus† Monterey spineflower† mock heather golden yarrow peak rush-rose wedge-leaved horkelia deerweed silver bush lupine sticky monkeyflower black sage
2	Percent cover of native species	Percent cover equals 40 percent for native species	For the restoration area, percent cover monitoring data must meet or exceed 40 percent for native species listed as part of the plant palette in Table 2 of the SSRP.
	Objective 2*		
3	Percent cover of non-native target weeds	Percent cover of non-native target weeds must be equal or less than baseline data or equal or less than 5 percent [whichever is lower]	Baseline data did not indicate non-native target weed species. No more than 5 percent non-native target weeds may be present at this restoration site.
	Objective 3*		
4	HMP shrubs percent cover, density, and diversity	HMP shrub cover class must meet or exceed baseline data	Cover class: 3 (6-25% of absolute cover)
		No net-loss of HMP shrubs, percent cover, density, diversity must equal baseline HMP data	Sandmat manzanita percent cover, as an average of transect data, must be equal or greater than 25.
			Monterey ceanothus percent cover, as an average of transect data, must be equal or greater than 4.
			Hooker's manzanita percent cover, as an average of transect data, must be equal or greater than 1.
	HMP annuals percent cover and abundance [density class]	HMP annuals density class must meet or exceed baseline data	Monterey spineflower density class: Low

* Objectives presented in HRP (Shaw, 2009b)

† HMP Species

8.19.1 Restoration Activities

No passive or active restoration activities occurred at Austin Road Stockpile in 2023.

8.19.2 Monitoring Results

8.19.2.1 HMP Annual Density

No restoration plots were established for HMP annuals at Austin Road Stockpile. However, HMP annuals were mapped as a part of the meandering transect survey. This survey was completed for Monterey spineflower and sand gilia at Austin Road Stockpile.

Five individual plants and two discrete patches of Monterey spineflower were mapped and individuals counted within each patch (see Figure 8-47). Densities were all low and the total acreage of Monterey spineflower patches with a density at or above the SSRP baseline density class of low was 0.059 acre. From 2022 to 2023, the density range and acreage above the SSRP baseline decreased.

Sand gilia was not observed at Austin Road Stockpile in 2023 which is consistent with 2022. However, sand gilia was previously observed on site in 2017.

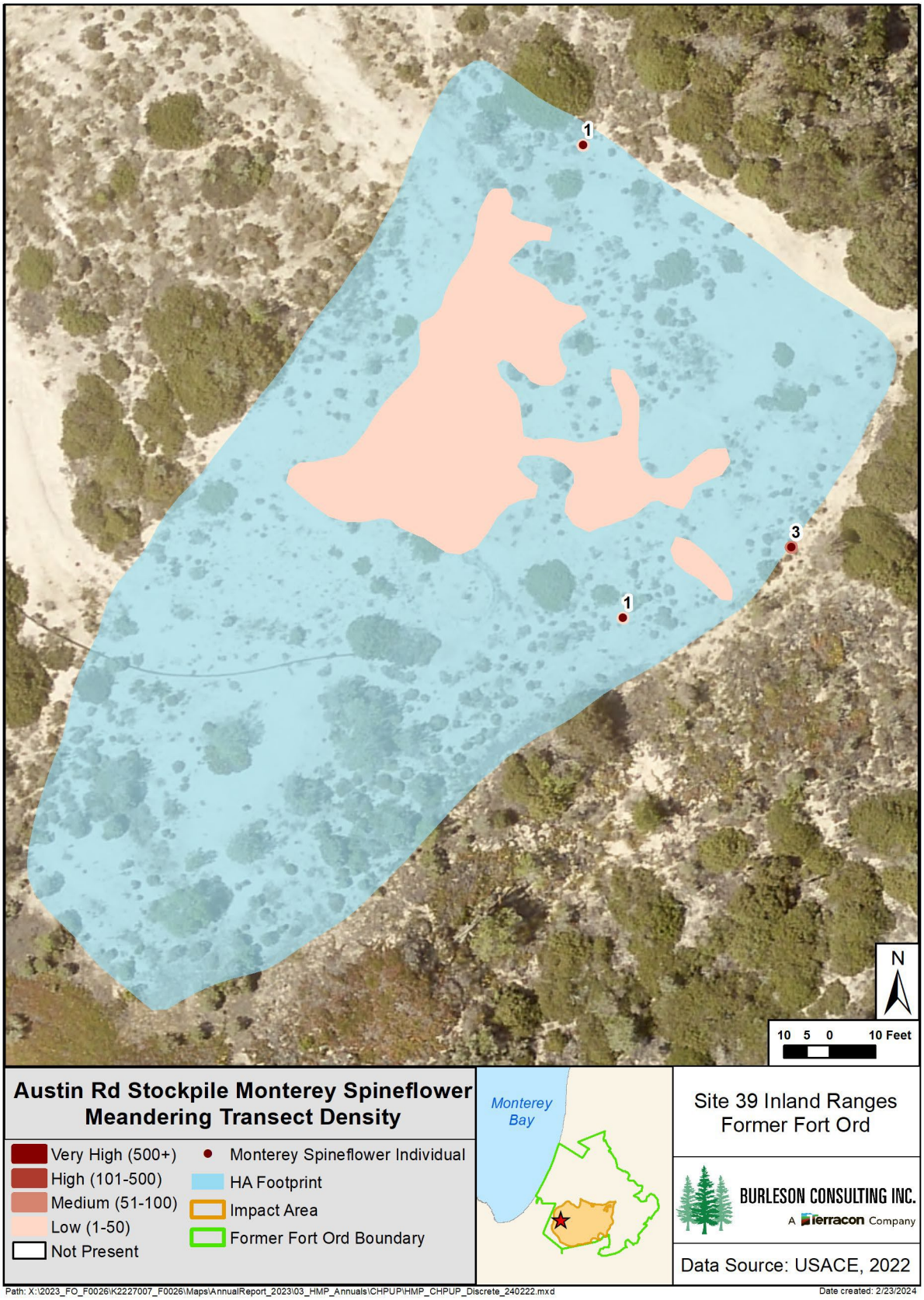


Figure 8-47. Austin Road Stockpile Monterey Spineflower Meandering Transect Density Map

8.19.2.2 Species Richness

Thirty-six species were observed at Austin Road Stockpile. Of those, 23 were native shrubs or perennials, five were native annual herbaceous species, and 8 were non-native species (see Table 8-94). Species richness decreased by nine species since 2022. Native shrub and perennial species richness increased by three, native herbaceous species richness decreased by four, non-native species richness decreased by eight, and uncategorized species richness did not change. Due to subtle differences between *Lupinus albifrons* var. *albifrons* and *Lupinus chamissonis* and the timing of surveys, the two species were combined for analysis of species richness and comparison to the success criteria (see section 6.1.4).

Table 8-94. Species Observed on Austin Road Stockpile, 2023

Scientific Name	Common Name	Code	Category
Acmispon glaber	deerweed	ACGL	NP
Acmispon heermannii var. orbicularis	Heermann's lotus	ACHEO	NP
Adenostoma fasciculatum	chamise	ADFA	NP
*Arctostaphylos pumila**	sandmat manzanita	ARPU	NP
Arctostaphylos tomentosa	shaggy-bark manzanita	ARTO	NP
Avena barbata	slender wild oat	AVBA	NNF
Baccharis pilularis	coyote brush	BAPI	NP
Bromus madritensis ssp. rubens	foxtail chess	BRMAR	NNF
Cardionema ramosissimum	sand mat	CARA	NP
Carex sp.	sedge	CA	NP
Ceanothus dentatus	dwarf ceanothus	CEDE	NP
*Ceanothus rigidus**	Monterey ceanothus	CERI	NP
*Chorizanthe pungens var. pungens**	Monterey spineflower	CHPUP	NF
Corethrogyne filaginifolia	common sandaster	COFI	NP
Crocanthemum scoparium	peak rush-rose	CRSC	NP
Dudleya farinosa	bluff lettuce	DUFA	NP
Ericameria ericoides	mock heather	ERER	NP
*Ericameria fasciculata**	Eastwood's goldenbush	ERFA	NP
Eriophyllum confertiflorum	golden yarrow	ERCO	NP
Horkelia cuneata	wedge-leaved horkelia	HOCU	NP
Hypochaeris glabra	smooth cat's ear	HYGL	NNF
Logfia gallica	daggerleaf cottonrose	LOGA	NNF
Lupinus chamissonis/albifrons	silver bush lupine	LUCH/LUAL	NP
Lupinus concinnus	bajada lupine	LUCO	NF
Lupinus truncatus	Nuttall's annual lupine	LUTR	NF
Lysimachia arvensis	scarlet pimpernel	LYAR	NNF
Navarretia hamata ssp. parviloba	hooked navarretia	NAHAP	NF
Orobanche californica ssp. californica	broomrape	ORCAC	NP
Plantago erecta	California plantain	PLER	NF
Polycarpon tetraphyllum var. *tetraphyllum*	four-leaved allseed	POTET	NNF
Pseudognaphalium beneolens	fragrant everlasting	PSBE	NP
Pseudognaphalium ramosissimum	pink everlasting	PSRA	NP
Pseudognaphalium stramineum	cotton-batting plant	PSST	NP
Rumex acetosella	sheep sorrel	RUAC	NNP
Salvia mellifera	black sage	SAME	NP
Silene gallica	small-flower catchfly	SIGA	NNF

*HMP Species

8.19.3 Discussion

8.19.3.1 HMP Annual Density

No restoration plots were established for HMP annuals at Austin Road Stockpile. However, HMP annuals were mapped as a part of the meandering transect survey. Monterey spineflower met the density success criterion.

8.19.3.2 Species Richness

Deerweed, chamise, sandmat manzanita, shaggy-bark manzanita, coyote brush, Monterey ceanothus, Monterey spineflower, peak rush-rose, golden yarrow (*Eriophyllum confertiflorum*), mock heather (*Ericameria ericoides*), wedge-leaved horkelia, silver bush lupine, and black sage were present. Common yarrow, sticky monkeyflower, and Hooker's manzanita were not present. Austin Road Stockpile included 23 native shrub and perennial species; however, the site did not meet the success criterion for Objective 1.

8.19.3.3 Austin Road Stockpile Status

Austin Road Stockpile did not receive any SSRP prescription activities by 2023. The site is used by the Presidio of Monterey Fire Department to supply water to helicopters for the Army's Fort Ord Prescribed Burn Program and will not be restored until those activities are complete. A qualitative overview was documented by photo points (see Appendix D, page D-20). Restoration activities will occur in the future at the site.

Austin Road Stockpile will be monitored in 2024 by photo documentation, HMP annual density surveys, and species richness meandering transects. Table 8-95 summarizes the status of Austin Road Stockpile including which success criteria were met and recommendations.

Table 8-95. Status for Achieving Success Criteria at Austin Road Stockpile

Success Criterion	Category	Acceptable Limits	Met	Recommendation	Notes
Objective 1 – No. 1	Species richness	16 required species: ACGL, ACMI, ADFA, ARHO, ARTO, ARPU, BAPI, CERI, CHPUP, DIAU, ERER, ERCO, CRSC, HOCU, LUCH/LUAL, SAME	No	Wait for restoration to begin	ACMI, ARHO, and DIAU absent in 2023
Objective 1 – No. 2	Native vegetation cover	≥ 40%	Cannot assess	Install transects when appropriate	
Objective 2 – No. 3	Non-native target weed cover	≤ 5%	Cannot assess	Install transects when appropriate	
Objective 3 – No. 4	HMP shrub cover	Cover class 3: 6-25%	Cannot assess	Install transects when appropriate	
Objective 3 – No. 4	HMP shrub cover by species	ARPU ≥ 25% CERI ≥ 4% ARHO ≥ 1%	Cannot assess	Install transects when appropriate	
Objective 3 – No. 4	HMP annual density	Low density for CHPUP	Yes	Establishment of restoration plots not necessary	

8.20 Summary of Former Fort Ord Inland Ranges Site 39

HAs are in the final stages of restoration and at various stages of monitoring. Passive and/or active restoration was implemented in all but Austin Road Stockpile. Restoration is complete at HAs 18, 19, 22, 23, 27, 27A, 28, 29, 33, 34, 36, 38, 39/40, 43, 44, and 48. Based on when the restoration effort took place, HAs range from year 6 to year 11 for monitoring. According to the HRP, at the fifth year, each site undergoes a five-year review to determine whether substantial corrective measures should be undertaken to put the site on target to meet success criteria in year 13 (Shaw, 2009b). The Army recommends the same corrective measures for HAs 39/40 as outlined in past reports. Corrective measures are outlined in the HA Status subsection of the discussion section for HAs in a benchmark monitoring year. Additionally, the HRP states HMP annual monitoring is complete after year 8 and a data review is needed to determine whether the sites have met the success criterion (Shaw, 2009b). HMP annual monitoring is in year 8 at HAs 26 and 48. Both sites met or exceeded baseline density requirements.

HA 26 is the one restoration site of of the 19 HAs that met the complete success criteria. HA 27A is now evaluated by the northern and southern polygons but is not considered two separate sites. Of the 20 areas evaluated by success criteria, 18 met the species richness criterion, six met the native vegetation cover criterion, 19 met the non-native target weed cover criterion, ten met the HMP shrub cover class criterion, and three met the HMP shrub cover by species criterion. Of the 14 sites that have HMP annual criteria, 13 sites met the HMP annual density criterion. Table 8-96 summarizes the status of Site 39 in meeting the success criteria.

The Army recommends the following changes to SSRPs, monitoring, and the success criteria:

- HA 33 – broadcast production seed (existing inventory) in barren areas to address the native vegetation cover criterion.
    - Seed broadcast planned for early 2024.
- HA 39/40 – install an additional transect in Plot 3 to better assess restoration progress, broadcast production seed to address native vegetative cover criterion (recommendation repeated from previous years). Install prior to Spring 2025, when year 13 monitoring will be conducted.
- HA 34 – broadcast production seed (existing inventory) in barren areas to address the native vegetation cover criterion. Sand gilia did not meet medium density class criterion after corrective measures; no further sand gilia seeding is recommended. HA34 is currently meeting low density class.
    - Seed broadcast planned for early 2024.

Table 8-96. 2023 Status for Achieving Success Criteria at Historic Areas in Former Fort Ord Inland Ranges Site 39

HA	Monitoring Year (2023)	Success Criteria					
		Species Richness	Native Vegetation Cover	Non-native Target Weed Cover	HMP Shrub Cover Class	HMP Shrub Cover by Species	HMP Annual Density
18	11	No	Yes	Yes	Yes	No	Yes
19	10	Yes	No	Yes	Yes	Yes	Yes
22	11	Yes	Yes	Yes	No	No	Yes
23	11	Yes	No	Yes	Yes	No	Yes
26	8	Yes	Yes	Yes	Yes	Yes	Yes
27	11	Yes	No	Yes	No	No	NA
27A North	11	Yes	No	Yes	No	No	NA
27A South	11	Yes	NA	Yes	NA	NA	NA
28	9	Yes	Yes	Yes	Yes	No	Yes
29	11	Yes	No	Yes	No	No	NA
33	11	Yes	No	Yes	No	No	Yes
34	9	Yes	Yes	Yes	No	No	NA
36	11	Yes	No	Yes	No	No	NA
37	9	Yes	No	Yes	Yes	No	Yes
38	9	Yes	Yes	Yes	Yes	No	Yes
39/40	11	Yes	No	Yes	NA	NA	Yes
43	11	Yes	No	Yes	Yes	No	No
44	6	Yes	No	Yes	Yes	Yes	Yes
48	8	Yes	No	Yes	Yes	No	Yes
Austin Rd Stockpile	0	No	Cannot assess*	Cannot assess*	Cannot assess*	Cannot assess*	Yes

HAs in years 1-5, 8, and 13 are in monitoring years and the status of each success criterion is based on current data. For sites not in these monitoring years, the status of each success criterion may be from past monitoring years.

* HAs where transect monitoring has not been completed cannot be compared to the success criterion. Transect monitoring will be performed in the future.

NA - the success criterion does not apply.

For HAs in year 8 of monitoring or beyond, the likelihood for meeting success criteria by year 13 was projected based on the trajectory of monitoring data collected at years 5 and 8 compared to success criteria (Table 8-97). Implications for low, moderate, and high likelihood projections are described below.

- Low: There is a low likelihood that the success criterion will be met by year 13. The site may or may not be trending toward meeting the success criterion and is unlikely to meet it by year 13 at the current trajectory. It is also not likely that the success criterion will be met within five years of year 13 at the current trajectory.
- Moderate: There is a moderate likelihood that the success criterion will be met by year 13. The site is trending toward meeting the success criterion and is very likely to meet it within five years of year 13.
- High: There is a high likelihood that the success criterion will be met by year 13. The site is trending toward meeting the success criterion and is highly likely to meet it by year 13.

Table 8-97. Project Likelihood for Achieving Success Criteria by Year 13 at Historic Areas in Former Fort Ord Inland Ranges Site 39

HA	Current Monitoring Year (2023)	Monitoring Year 13	Success Criteria					
			Species Richness	Native Vegetation Cover	Non-native Target Weed Cover	HMP Shrub Cover Class	HMP Shrub Cover by Species	HMP Annual Density
18	11	2025	HIGH	HIGH	HIGH	HIGH	HIGH	met
19	10	2026	HIGH	HIGH	HIGH	HIGH	HIGH	met
22	11	2025	HIGH	HIGH	HIGH	MODERATE	LOW	met
23	11	2025	HIGH	HIGH	HIGH	HIGH	LOW	met
26	8	2028	HIGH	HIGH	HIGH	HIGH	HIGH	met
27	11	2025	HIGH	HIGH	HIGH	LOW	LOW	NA
27A North	11	2025	HIGH	HIGH	HIGH	LOW	LOW	NA
27A South	11	2025	HIGH	NA	HIGH	NA	NA	NA
28	9	2027	HIGH	HIGH	HIGH	HIGH	LOW	met
29	11	2025	HIGH	HIGH	HIGH	LOW	LOW	NA
33	11	2025	HIGH	MODERATE	HIGH	LOW	LOW	met
34	9	2027	HIGH	HIGH	HIGH	LOW	LOW	NA
36	11	2025	HIGH	LOW	HIGH	MODERATE	LOW	NA
37	9	2027	HIGH	HIGH	HIGH	HIGH	MODERATE	met
38	9	2027	HIGH	HIGH	HIGH	HIGH	LOW	met**
39/40	11	2025	HIGH	LOW	HIGH	NA	NA	met
43	11	2025	HIGH	MODERATE	HIGH	HIGH	LOW	not met
44	6	2030	NA	NA	NA	NA	NA	NA
48	8	2028	HIGH	LOW	HIGH	HIGH	HIGH	met
Austin Rd Stockpile	0	NA	NA	Cannot assess*	Cannot assess*	Cannot assess*	Cannot assess*	NA

HAs in years 1-5, 8, and 13 are in monitoring years and the status of each success criterion is based on current data. For sites not in these monitoring years, the status of each success criterion may be from past monitoring years.

* HAs where transect monitoring has not been completed cannot be compared to the success criterion. Transect monitoring will be performed in the future.

** HA 38 met criterion for CHPUP and GITEA at year 8. CORIL plot established in 2020/2021, will be monitored until 2028.

NA - the success criterion does not apply.

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9. COMMUNITY INVOLVEMENT WORKSHOP / OPEN HOUSE BUS TOUR

In addition to general restoration activities, Burleson developed a PowerPoint presentation highlighting the restoration progress at various HAs over time for the former Fort Ord Clean-Up Open House held on February 11, 2023, at the Kemron Building. Burleson also participated in the former Fort Ord Clean-Up Open House at the Kemron Building and the Bus Tour of Site 39 Inland Range on July 15, 2023.

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10. ANNUAL SITE 39 HABITAT RESTORATION MEETING

In accordance with the HRP, annual meetings were held with regulatory agencies and USACE to review and discuss restoration site data, restoration activities, annual monitoring results, and proposed adaptive management strategies for improving restoration success. These meetings also evaluated weed management, sampling protocols, passive versus active restoration approaches, the need to implement corrective measures, and assessment of the 13-year monitoring end point proposed in the HRP.

The Twelfth Annual Site 39 Habitat Restoration and Habitat Monitoring Meeting was held on April 19, 2023. Participants included Chenega Support Services, USFWS, California Department of Fish and Wildlife, US Environmental Protection Agency, USACE, BRAC, Bureau of Land Management, Burleson, and UC Santa Cruz Natural Reserves.

Burleson presented details on Site 39 habitat restoration activities for the 2022 calendar year and the overall status of restoration progress.

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APPENDIX A

Seed Inventory

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Table A-1. Production Seed Inventory (as of December 31, 2023)

Scientific Name	Common Name	HA	Inventory (lb)*
Achillea millefolium	common yarrow	-	7.10
Acmispon glaber	deerweed	-	16.30
Elymus glaucus	blue wildrye	-	338.47
Hordeum sp.	sterile barley	-	5.60
Stipa pulchra	purple needlegrass	-	837.50
TOTAL			**1204.97**

Table A-2. Production Seed Test Results

Scientific Name	Common Name	Test Date	Pure Seed (%)	Germination (%)	Pure Live Seed (%)	Live Seeds per lb
Stipa pulchra	purple needlegrass	9/11/2023	99.69	85.00	84.74	85,330

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APPENDIX B

Restoration Activities

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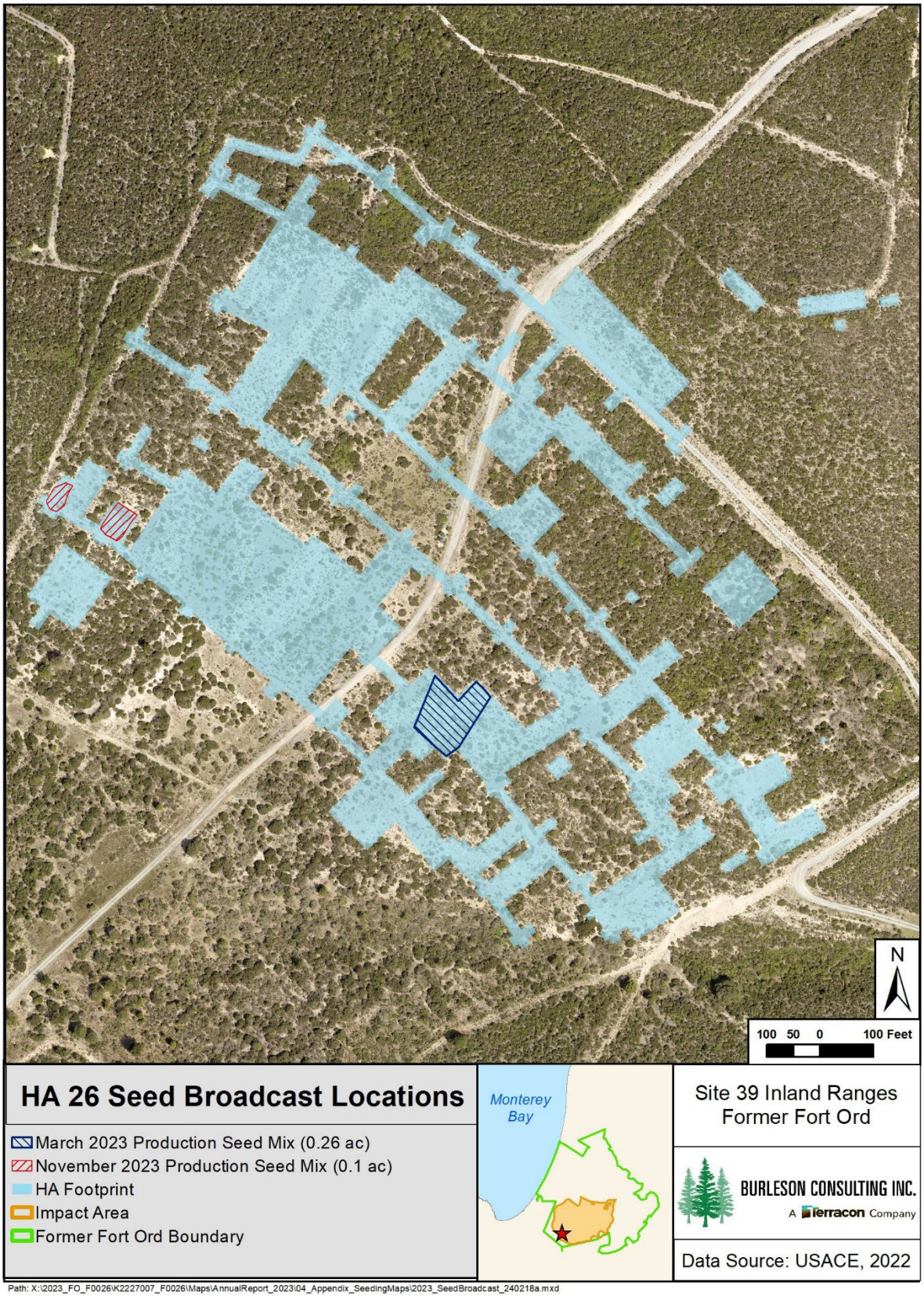

Figure B-1. HA 26 Seed Broadcast Locations, Former Fort Ord

Table B-1. HA 26 Production Seed Mix (March 2023)

Species	Amount (lbs)
Achillea millefolium **(common yarrow)**	2.5
Acmispon glaber **(deerweed)**	1.25
Elymus glaucus **(blue wild-rye)**	2.5
Hordeum sp. **(sterile barley)**	1.25
Stipa pulchra **(purple needlegrass)**	2.5
TOTAL	**10.0**

Table B-2. HA 26 Production Seed Mix (Nov 2023)

Species	Amount (lb)
Achillea millefolium **(common yarrow)**	0.2
Acmispon glaber **(deerweed)**	0.4
Elymus glaucus **(blue wild-rye)**	0.9
Stipa pulchra **(purple needlegrass)**	0.9
TOTAL	**2.4**

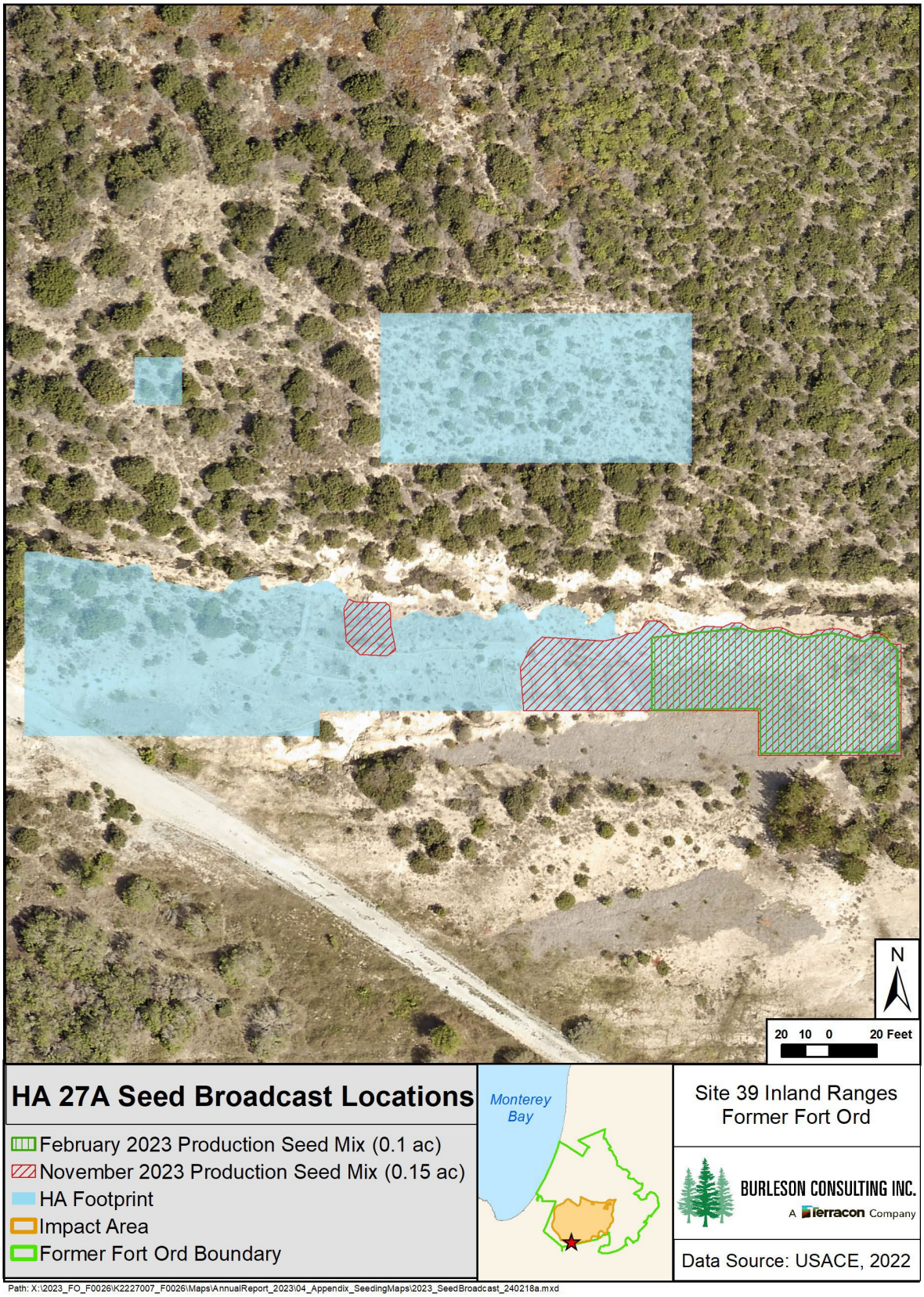

Figure B-2. HA 27A Seed Broadcast Locations, Former Fort Ord

Table B-3. HA 27A Production Seed Mix (February 2023)

Species	Amount (lbs)
Achillea millefolium **(common yarrow)**	1.0
Acmispon glaber **(deerweed)**	0.5
Elymus glaucus **(blue wild-rye)**	1.0
Hordeum sp. **(sterile barley)**	0.5
Stipa pulchra **(purple needlegrass)**	1.0
TOTAL	**4.0**

Table B-4. HA 27A Production Seed Mix (Nov 2023)

Species	Amount (lb)
Achillea millefolium **(common yarrow)**	0.3
Acmispon glaber **(deerweed)**	0.6
Elymus glaucus **(blue wild-rye)**	1.5
Stipa pulchra **(purple needlegrass)**	1.5
TOTAL	**4.0**

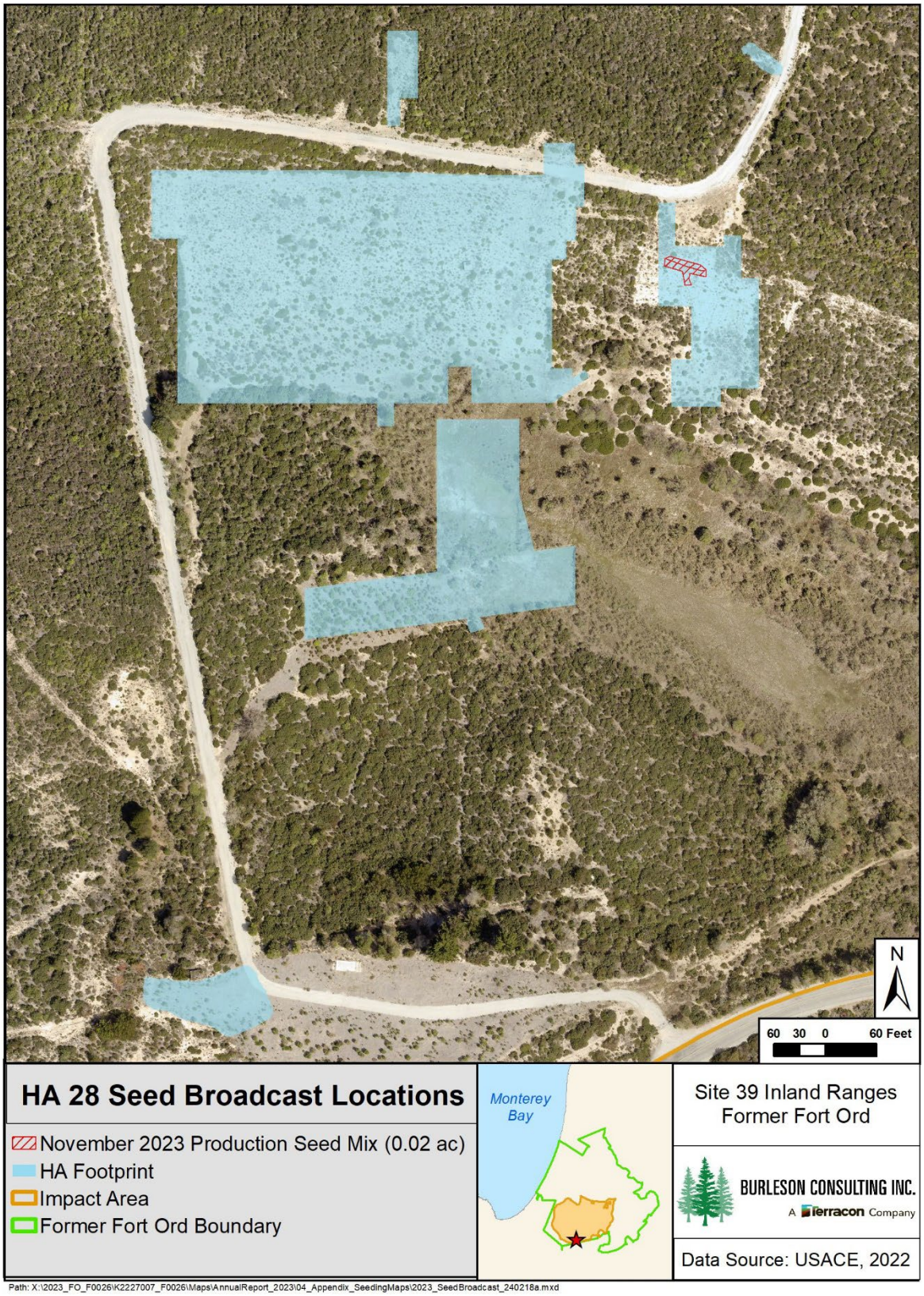

Figure B-3. HA 28 Seed Broadcast Locations, Former Fort Ord

Table B-5. HA 28 Production Seed Mix (Nov 2023)

Species	Amount (lb)
Achillea millefolium **(common yarrow)**	0.03
Acmispon glaber **(deerweed)**	0.07
Elymus glaucus **(blue wild-rye)**	0.2
Stipa pulchra **(purple needlegrass)**	0.2
TOTAL	**0.4**

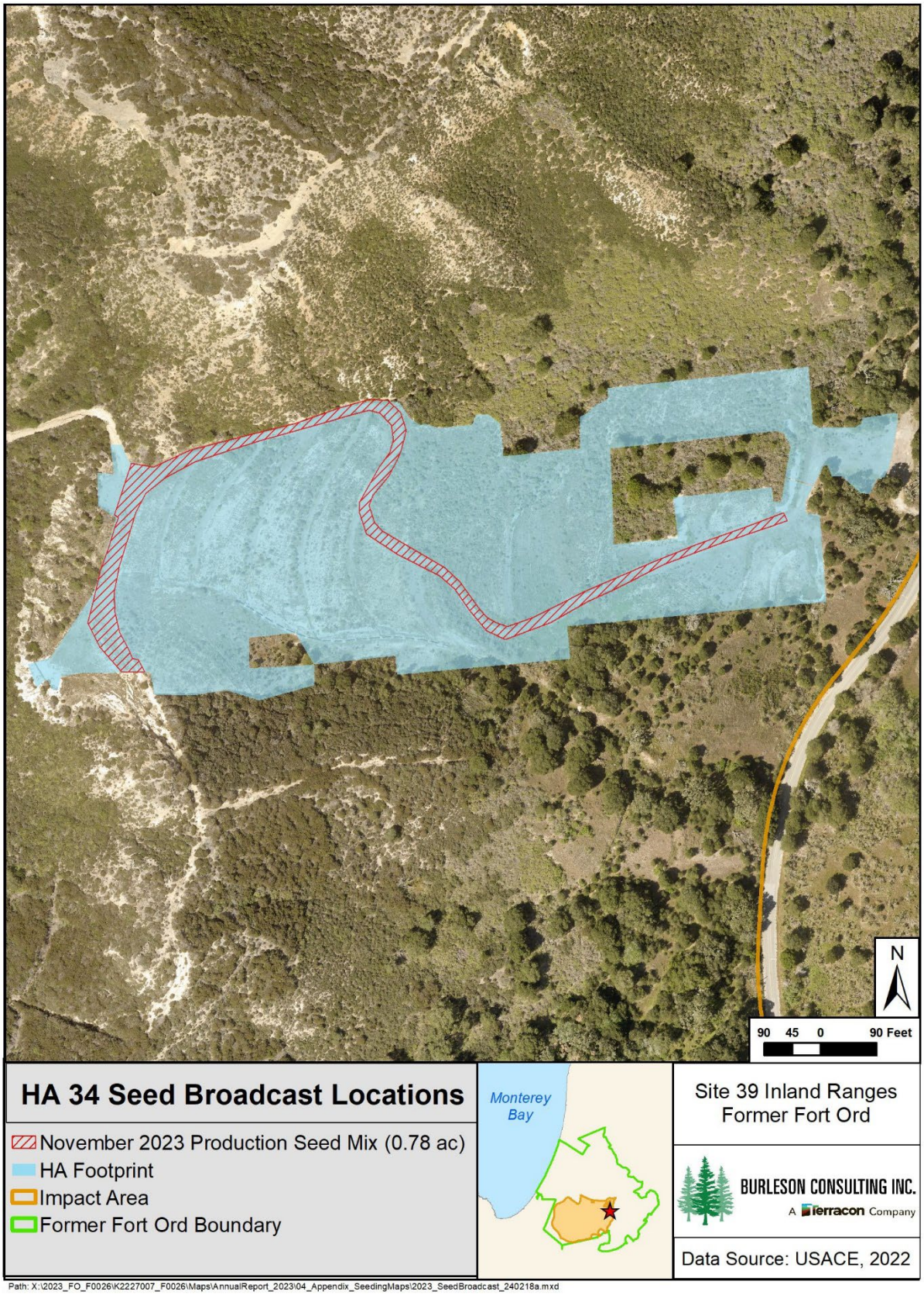

Figure B-4. HA 34 Seed Broadcast Locations, Former Fort Ord

Table B-6. HA 34 Production Seed Mix (Nov 2023)

Species	Amount (lb)
Achillea millefolium **(common yarrow)**	1.6
Acmispon glaber **(deerweed)**	3.1
Elymus glaucus **(blue wild-rye)**	7.8
Stipa pulchra **(purple needlegrass)**	7.8
TOTAL	**20.4**

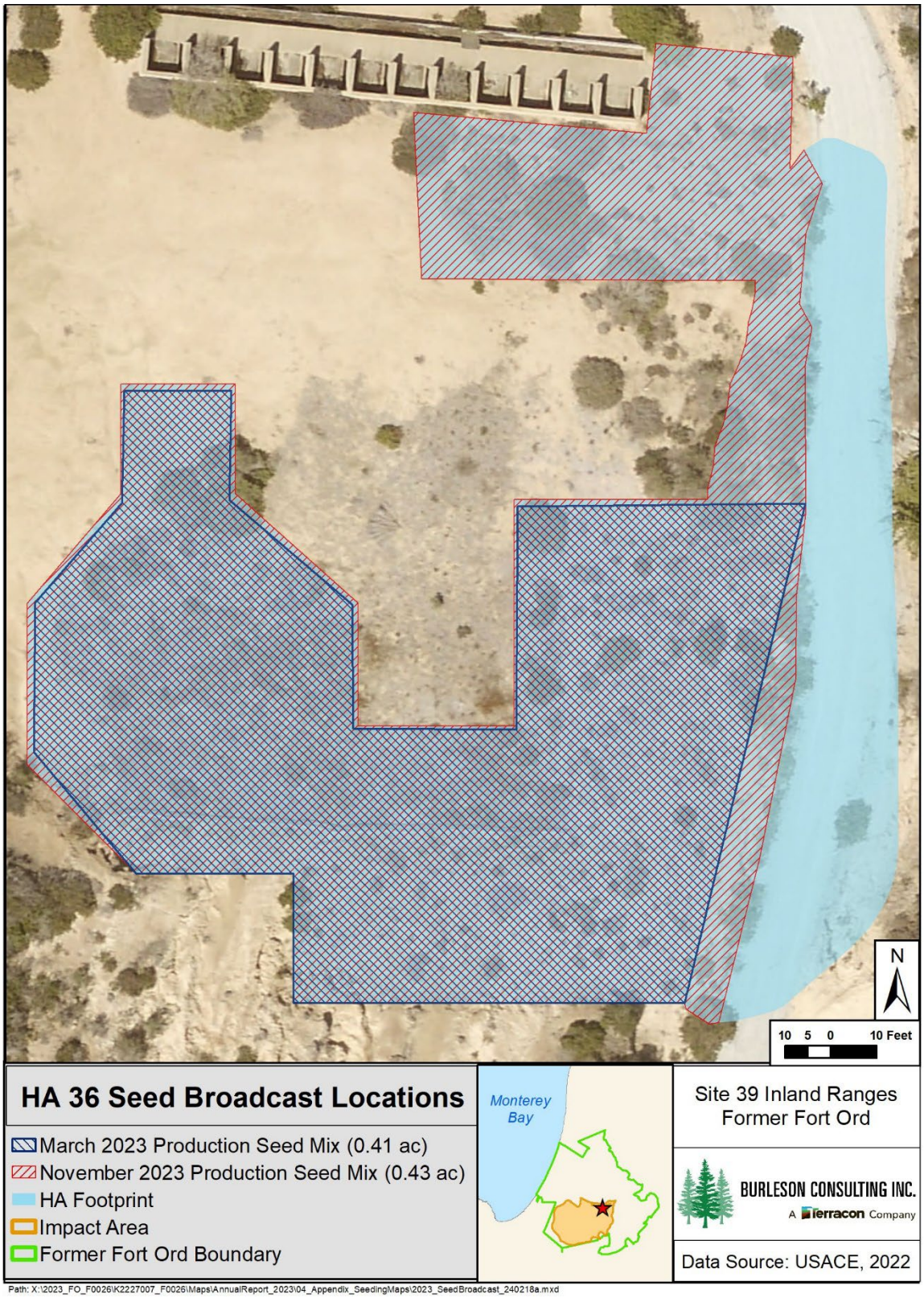

Figure B-5. HA 36 Seed Broadcast Locations, Former Fort Ord. March 2023 seed broadcast was for erosion control purposes, and November 2023 broadcast was for passive restoration.

Table B-7. HA 36 Production Seed Mix for Erosion Control (March 2023)

Species	Amount (lbs)
Achillea millefolium **(common yarrow)**	3.1
Acmispon glaber **(deerweed)**	1.55
Elymus glaucus **(blue wild-rye)**	3.1
Hordeum sp. **(sterile barley)**	1.55
Stipa pulchra **(purple needlegrass)**	3.1
TOTAL	**12.4**

Table B-8. HA 36 Production Seed Mix for Passive Restoration (Nov 2023)

Species	Amount (lb)
Achillea millefolium **(common yarrow)**	1.04
Acmispon glaber **(deerweed)**	2.08
Elymus glaucus **(blue wild-rye)**	5.21
Stipa pulchra **(purple needlegrass)**	5.21
TOTAL	**13.54**

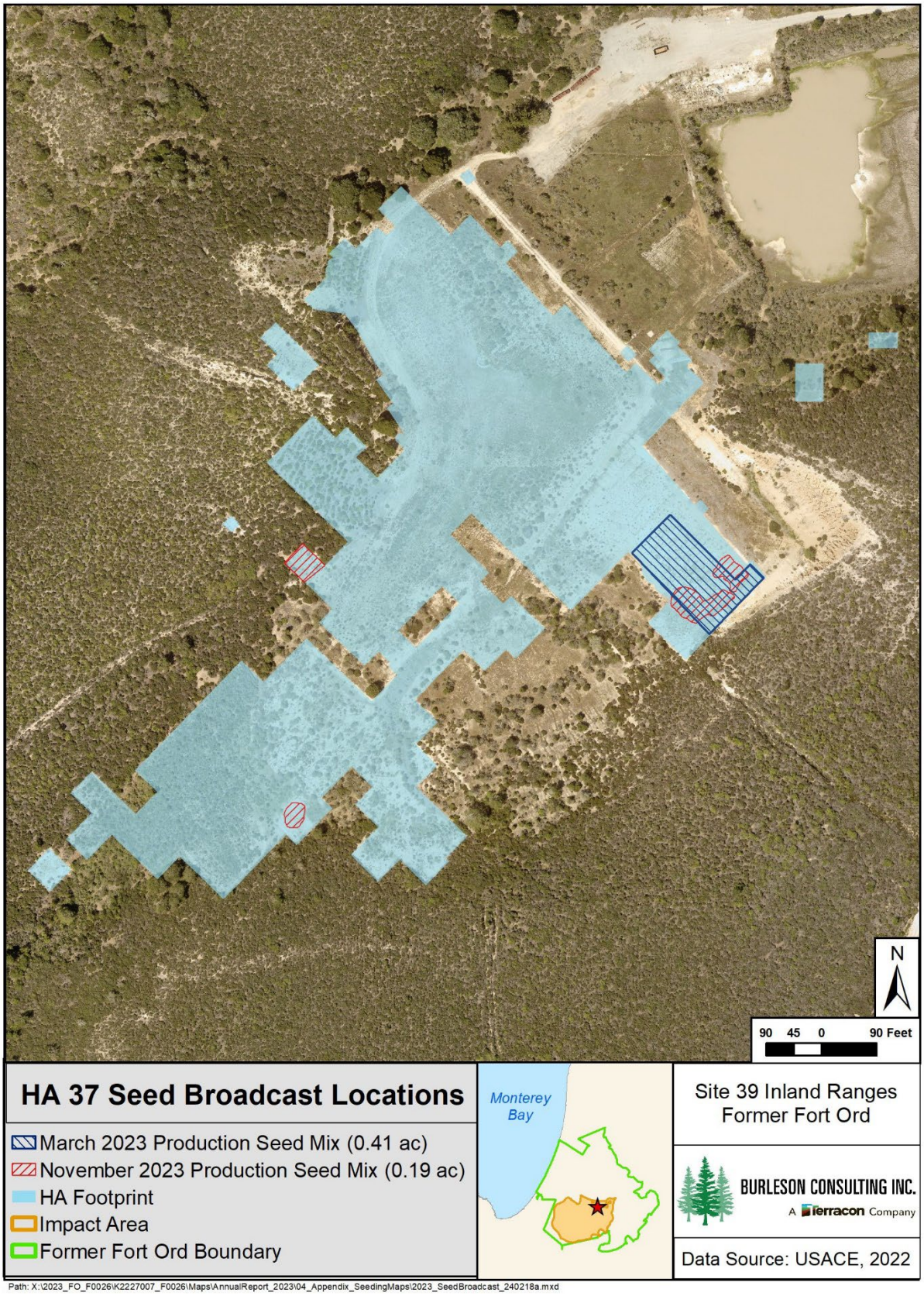

Figure B-6. HA 37 Seed Broadcast Locations, Former Fort Ord

Table B-9. HA 37 Production Seed Mix (February-March 2023)

Species	Amount (lbs)
Achillea millefolium **(common yarrow)**	4.0
Acmispon glaber **(deerweed)**	2.0
Elymus glaucus **(blue wild-rye)**	4.0
Hordeum sp. **(sterile barley)**	2.0
Stipa pulchra **(purple needlegrass)**	4.0
TOTAL	**16.0**

Table B-10. HA 37 Production Seed Mix (Nov 2023)

Species	Amount (lb)
Achillea millefolium **(common yarrow)**	0.4
Acmispon glaber **(deerweed)**	0.8
Elymus glaucus **(blue wild-rye)**	1.9
Stipa pulchra **(purple needlegrass)**	1.9
TOTAL	**5.0**

APPENDIX C

Photo Log

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Photo Description	Photo
Seed Production Purple needlegrass (*Stipa pulchra*) production plot at S&S Seeds in April 2023 **C-1**	
Seed Production Purple needlegrass production plot at S&S Seeds in September 2023 after harvest **C-2**	

Photo Description	Photo
Seed Production Close view of purple needlegrass production plot at S&S Seeds in September 2023 after harvest **C-3**	
Passive Restoration Burleson biologist broadcasting seed and seed-free rice straw in erosion repair area at HA 26 **C-4**	

Photo Description	Photo
Passive Restoration Burleson biologist broadcasting seeded area with straw at HA 27A **C-5**	
Passive Restoration Burleson biologist broadcasting seeded area with straw at HA 28 **C-6**	

Photo Description	Photo
Passive Restoration Burleson biologist broadcasting seed and straw around the newly installed straw wattle at HA 28 **C-7**	
Passive Restoration Erosion repair area after seed and straw broadcast at HA 28 **C-8**	

Photo Description	Photo
Passive Restoration Burleson biologist broadcasting seeded area with straw at HA 34 **C-9**	
Caretaker of previous HA Burleson biologist removing limbs from a Monterey pine (*Pinus radiata*) prior to felling the tree at HA 19 **C-10**	

Photo Description	Photo
Caretaker of previous HA Burleson biologist pre-cutting smaller tree branches before felling a Monterey pine at HA 19 **C-11**	
Caretaker of previous HA Herbicide (marked with blue dye) after being applied to the stump of a removed Monterey pine at HA 19 **C-12**	

Photo Description	Photo
Caretaker of previous HA Burleson biologist making a secondary cut with a chainsaw to fell a Monterey pine at HA 26 **C-13**	
Caretaker of previous HA Burleson biologist felling a tree stump before herbicide is applied at HA 26 **C-14**	

Photo Description	Photo
Caretaker of previous HA Burleson biologist manually removing pampas grass (*Cortaderia* sp.) at HA 27A **C-15**	
Monitoring Monterey spineflower (*Chorizanthe pungens* var. *pungens*) **C-16**	

Photo Description	Photo
Monitoring Seaside bird's beak (*Cordylanthus rigidus* ssp. *littoralis*) **C-17**	
Monitoring Sand gilia (*Gilia tenuiflora* ssp. *arenaria*) **C-18**	

Photo Description	Photo
Monitoring Burleson biologist flagging populations of Monterey spineflower at HA 26 **C-19**	
Monitoring Burleson biologist taking measurements to monitor survivorship at HA 26 **C-20**	

Photo Description	Photo
Monitoring Burleson biologist surveying for Monterey spineflower at HA 37 **C-21**	
Monitoring Burleson biologist capturing photo points at HA 48 **C-22**	

Photo Description	Photo
Monitoring Burleson biologist conducting vegetative cover transects at HA 48 **C-23**	
Erosion Control Burleson biologist installing a wattle at HA 28 **C-24**	

Photo Description	Photo
Erosion Control New wattles installed to replace degraded wattles at HA 28 **C-25**	
Erosion Control New wattles installed to replace damaged wattles at HA 34 **C-26**	

Photo Description	Photo
Erosion Control Coir fabric on north facing slope installed in August 2023 at HA 34 **C-27**	
Erosion Control Coir fabric installed in September 2023 at HA 34 **C-28**	

Photo Description	Photo
Erosion Control Burleson biologist inspecting proposed area before installing wattle at HA 37 **C-29**	
Erosion Control Burleson biologist installing wattle at HA 37 **C-30**	

Photo Description	Photo
Erosion Control New wattles installed to replace degraded wattles in September 2023 at HA 37 **C-31**	
Erosion Control Coir fabric installed in September 2023 at HA 37 **C-32**	

Photo Description	Photo
Erosion Control New wattle to be installed to replace damaged infrastructure at HA 26 **C-33**	
Erosion Control Burleson biologists installing wattles HA 27A **C-34**	

Photo Description	Photo
Erosion Control Burleson biologist installing a wattle at HA 28 **C-35**	
Erosion Control Burleson biologists securing coir fabric with wood stakes on steep slope at HA 34 **C-36**	

Photo Description	Photo
Erosion Control Burleson biologist broadcasting seed and straw on the former road at HA 34 **C-37**	
Erosion Control Burleson biologists collapsing rills at HA 37 **C-38**	

Photo Description	Photo
Community Involvement Workshop (CIW) Burleson biologists along with their display table at the Community Involvement Workshop **C-39**	
Community Involvement Workshop (CIW) Burleson biologist engaging with the public at the Community Involvement Workshop **C-40**	

APPENDIX D

Photo Points

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Photo Points	
	
HA 18 | October 2011	HA 18 | April 2023

Photo Points	
	
HA 19 | May 2013	HA 19 | April 2023

Photo Points	
	
HA 22 | October 2011	HA 22 | April 2023

Photo Points	
	
HA 23 | October 2011	HA 23 | April 2023

Photo Points	
	
HA 26 | May 2016	HA 26 | April 2023

Photo Points	
	
HA 27 | October 2011	HA 27 | April 2023

Photo Points	
	
HA 27A North | October 2011	HA 27A North | April 2023

Photo Points	
	
HA 27A South | October 2011	HA 27A South | April 2023

Photo Points	
	
HA 28 | April 2014	HA 28 | April 2023

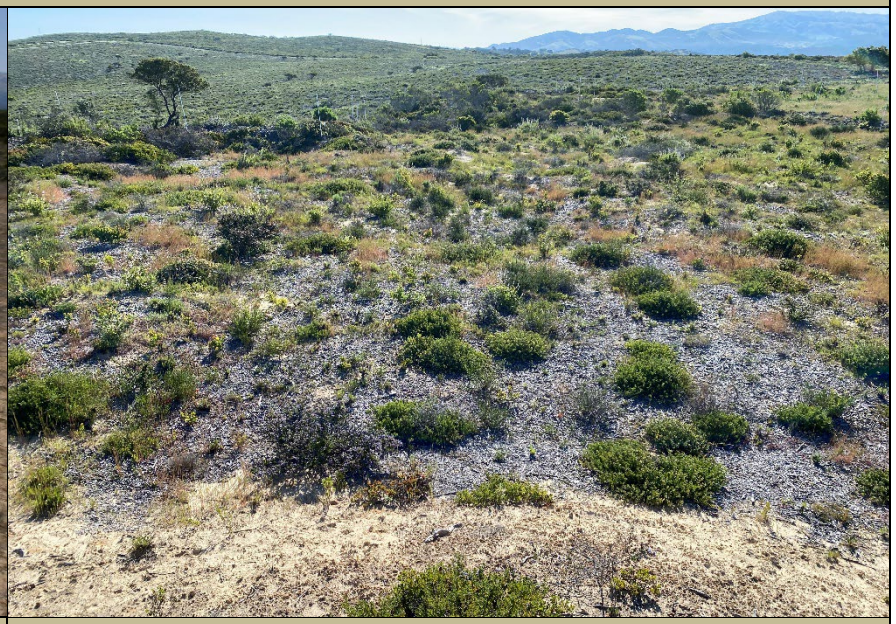
Photo Points	
	
HA 29 | October 2011	HA 29 | April 2023

Photo Points	
	
HA 33 | October 2011	HA 33 | April 2023

Photo Points	
	
HA 34 | January 2013	HA 34 | April 2023

Photo Points	
	
HA 36 | October 2011	HA 36 | April 2023

Photo Points	
	
HA 37 | April 2014	HA 37 | April 2023

Photo Points	
	
HA 38 | April 2014	HA 38 | April 2023

Photo Points	
	
HA 39/40 | October 2011	HA 39/40 | April 2023

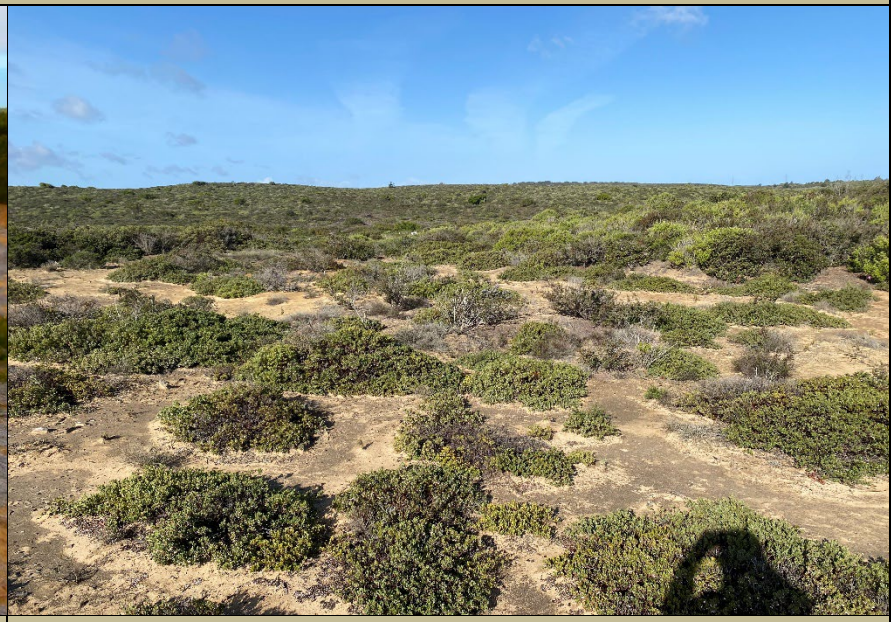
Photo Points	
	
HA 43 | October 2011	HA 43 | April 2023

Photo Points	
	
HA 44 | May 2016	HA 44 | April 2023

Photo Points	
	
HA 48 | April 2016	HA 48 | April 2023

Photo Points	
	
Austin Road Stockpile | May 2016	Austin Road Stockpile | April 2023

APPENDIX E

Photo Points
Time Lapse Series for HAs in Year 8

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Photo Points – HA 26		
		
May 2016	May 2017	May 2018
		
April 2019	April 2020	April 2023

Photo Points – HA 48

April 2016

October 2017

May 2018

April 2019

May 2020

April 2023