



**SCH #2003062074**

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**California Department of Parks and Recreation**

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## General Plan Inquiries

The Tomales Bay State Park General Plan was prepared by the Department of Parks and Recreation Northern Service Center and North Bay District staff. For general information regarding this document, or to request additional copies, please contact:

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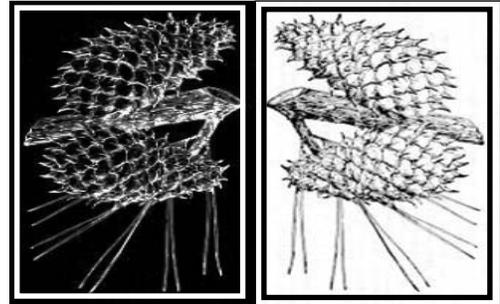
Attention: Tomales Bay State Park General Plan Team

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# *APPENDICES*





## APPENDIX A: SUMMARY OF PUBLIC SCOPING MEETING COMMENTS

Number of Comments: 87    Number of Respondents: 24

<b>Resource and Viewshed Protection</b>	<b># Comments</b>
Keep park's quiet refuge character (Heart's Desire Area)	5
Protect viewsheds-keep facilities minimal and hidden	3
Remove exotic plants	3
Keep Millerton and Tomasini Points natural	2
Protect Bishop pines	2
No dogs on trails to protect wildlife	2
Supports dog walking at Millerton Point	1
Protect native plants	1
Protect water quality of Tomales Bay	1
Supports restoration of Heart's Desire Creek outlet	1
Supports leaving North Marshall Area natural	1
<b>Recreation</b>	
Supports mountain biking on trails	12
Supports hike/bike camping	11
Opposes RV camping	7
Supports trail connections	4
Supports group camping	4
Opposes encouraging kayak use on bay	3
Supports car camping	2
Opposes car camping	2
Supports boat camping	2
Opposes group camping	1
Wants RV camping	1
Keep parking for Millerton Uplands at existing bayside parking lot	1
Opposes equestrian use in Inverness Area	1
Supports multi-use group and family picnic area at Heart's Desire	1
Develop Marconi Cove for day-use only & boat launching	1
Supports "Waterdogs" classes & Dance Palace Camp use	1
Limit boat launching at Marconi Cove to cartop boats	1
<b>Operations and Security</b>	
Support staff housing	2
Concern with ability to staff/monitor new facilities and activities	3
Supports consideration of wildfire danger in planning	1
Supports consolidation of public ownership on Inverness Ridge	1
Supports removal of N. Dream Farm Rd. structures and trailers	1
<b>Inter-agency Coordination</b>	
Supports inter-agency efforts to deal with boating issues	1
<b>Interpretation</b>	
Establish small museum area in ranger station	1



## APPENDIX B: EXISTING FACILITIES AT TOMALES BAY STATE PARK

Facility	Area	Description	ADA Access	# Picnic Tables	# BBQ Pits	# Parking Spaces (215)	Comments
Headquarters Building	Heart's Desire (HD)	Admin.	No	0	0	6	Fee Collection, Ranger office, Information
Bone yard	HD	Maintenance	No	0	0	0	Well, water pump and water storage tank
Maintenance Facility	HD	Maintenance	No	0	0	10	Fuel station, equipment storage
Maintenance Trailer Pad	HD	Residence	No	0	0	0	Located in Maintenance area
Heart's Desire Residence 1	HD	Residence	No	0	0	2	
Heart's Desire Residence 2	HD	Residence	No	0	0	3	
Heart's Desire Trailer Pad	HD	Residence	No	0	0	0	Located Near HD Residence 1
Indian Beach	HD	Beach	No	0	0	0	Overnight education, 1/2 mile hike from HD Parking
Heart's Desire Beach	HD	Beach	Yes	17	10	64	Bulletin boards Picnic Facilities
Picnic Area Hike/Bike	HD	Day Use	No	45	15	80	6 former hike/bike camp sites, 6 food lockers
Pebble Beach	HD	Beach	No	0	0	0	1/2 mile hike from Heart's Desire Parking
Shell Beach 1	HD	Beach	No	0	0	15	1/4 mile hike from Shell Beach Parking
Shell Beach 2	HD	Beach	No	0	0	0	1/4 mile hike from Shell Beach Parking
Jepson Trail	HD	Trail	No	N/A	N/A	N/A	Hiking and Equestrian
Johnstone Trail	HD	Trail	No	N/A	N/A	N/A	Hiking and Equestrian
Indian Beach Trail	HD	Trail	No	N/A	N/A	N/A	Interpretive signage
Dream Farm Residence	Inverness	Residence	No	0	0	2	Residence currently abandoned
Dream Farm Trailer 1	Inverness	Residence	No	0	0	0	Abandoned
Dream Farm Trailer 2	Inverness	Residence	No	0	0	0	Abandoned
Millerton Pull-out	Millerton	Day use	No	3	0	30	Unofficial trail Loop, Picnic tables
Millerton Residence	Millerton	Residence	No	0	0	3	
Marconi Cove	Marconi	Day Use	No	0	0	0	Boat ramp and abandoned building



**APPENDIX C: WEST MARIN RECREATION FACILITIES SUMMARY**

FACILITY	TYPE	LOCATION	OWNER	ACRES	CAMP-GROUNDS	BACK-PACK ONLY SITES	HIKE/BIKE SITES	WALK-IN SITES (less than 800' walk)	CAR SITES	GROUP SITES	BOAT-IN SITES	HORSE SITES	ADA SITES	RV COMPATIBLE SITES	TOTAL CAMP-SITES	CABINS	LODGES (# OF ROOMS OR BEDS)	TRAILS/FIRE ROADS (MILES)	PICNIC FACILITIES	GROUP PICNIC SITES
Point Reyes National Seashore	Public	W Marin Co.	NPS	65083	5	0	45	0	0	6	20	All but Glen	0	0	71	0	44	140	Yes	1
Golden Gate National Recreation Area	Public	SW Marin Co.	NPS	30949	4	8	0	7	0	0	0	0	0	0	15	0	0	70	Yes	2
Muir Woods National Monument	Public	SW Marin Co.	NPS	522	0	0	0	0	0	0	0	0	0	0	0	0	0	6	No	0
Tomales Bay State Park	Public	West Marin Co.	CSP	2224	0	0	0	0	0	0	0	0	0	0	0	0	0	5.6	Yes	0
Samuel P. Taylor State Park	Public	West Marin Co.	CSP	2707	4	0	4	0	61	4	0	1	6	0	70	0	0	45	Yes	2
Mt. Tamalpais	Public	West Marin Co.	CSP	6243	4	0	1	31	0	2	0	1	0	0	35	9	0	60	Yes	1
Marconi Conference Center	Restricted Public Access	Marconi	CSP	48	0	0	0	0	0	0	0	0	0	0	0	0	40	0	Yes	1
Marin Municipal Water District	Restricted Public Access	SW Marin Co.	MMWD	18872	0	0	0	0	0	0	0	0	0	0	0	0	0	130	Yes	0
Gary Giacomini Open Space Preserve	Public	SW Marin Co.	MOSD	1507	0	0	0	0	0	0	0	0	0	0	0	0	0	12.2	No	0
White Hill Open Space Preserve	Public	SW Marin Co.	MOSD	358	0	0	0	0	0	0	0	0	0	0	0	0	0	4.2	No	0
Cascade Open Space Preserve	Public	SW Marin Co.	MOSD	539	0	0	0	0	0	0	0	0	0	0	0	0	0	9.7	No	0
Baltimore Canyon Open Space Preserve	Public	SW Marin Co.	MOSD	203	0	0	0	0	0	0	0	0	0	0	0	0	0	5	No	0
Blithedale Summit Open Space Preserve	Public	SW Marin Co.	MOSD	585	0	0	0	0	0	0	0	0	0	0	0	0	0	9.2	No	0
King Mountain Open Space Preserve	Public	SW Marin Co.	MOSD	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0
Roy's Redwoods Open Space Preserve	Public	SW Marin Co.	MOSD	305	0	0	0	0	0	0	0	0	0	0	0	0	0	8.5	No	0
French Ranch Open Space Preserve	Public	SW Marin Co.	MOSD	355	0	0	0	0	0	0	0	0	0	0	0	0	0	5.2	No	0
Maurice Thorner Open Space Preserve	Public	SW Marin Co.	MOSD	30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	No	0
Loma Alta Open Space Preserve	Public	SW Marin Co.	MOSD	467	0	0	0	0	0	0	0	0	0	0	0	0	0	5.8	No	0
Camino Alta Open Space Preserve	Public	SW Marin Co.	MOSD	169	0	0	0	0	0	0	0	0	0	0	0	0	0	3	No	0
Bald Hill Open Space Preserve	Public	SW Marin Co.	MOSD	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0
Agate Beach	Public	Bolinas	MOSD	6.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	No	0
Bolinas Park	Public	Bolinas	MOSD	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0
Whitehouse Pool Park	Public	West of Point Reyes Station	MOSD	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	No	0
Deer Park	Public	Fairfax	MOSD	54	0	0	0	0	0	0	0				0			0.75	Yes	0
Miller Park Boat Launch	Public	3 miles north of Marshall	MOSD	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Yes	0
Tomales Bay Ecological Reserve	Restricted Public Access	West Marin Co.	California State Lands Comm.	442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0
Audubon Canyon Ranch, Bolinas Lagoon Preserve	Restricted Public Access	Bolinas	Audubon Canyon Ranch	1020	0	0	0	0	0	0	0	0	0	0	0	0	0	9	No	0
Audubon Canyon Ranch, Cypress Grove Preserve	Restricted Public Access	North of Marshall	Audubon Canyon Ranch	500	0	0	0	0	0	0	0	0	0	0	0	0	0	2	No	0
Lawson's Resort	Private	Dillon Beach	Lawson's Resort	N/A	1	0	0	0	0	1	0	0	0	900	901	3	0	0	Yes	1
Olema Ranch Campground	Private	Olema	Olema Ranch	N/A	1	0	0	0	175	0	0	0	0	99	274	0	0	0	No	0
Five Brooks Ranch	Private	Olema	Five Brooks Rnch	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0
Camp Tamarancho	Private	West Marin Co.	Boy Scouts of America	N/A	1	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0
Tamal Saka Kayaking	Private	Marshall	Tamal Saka	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0
Blue Waters Kayaking	Private	Inverness	Blue Waters Kayaking	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0
<b>TOTALS</b>				<b>133360</b>	<b>20</b>	<b>8</b>	<b>50</b>	<b>38</b>	<b>236</b>	<b>13</b>	<b>20</b>	<b>2</b>	<b>6</b>	<b>999</b>	<b>1366</b>	<b>12</b>	<b>84</b>	<b>533</b>		<b>8</b>



### APPENDIX D: TOMALES BAY BEACHES AND ACCESS AREAS

Access Area	Location	Accessed Via	Ownership	Type	Boat Launch	Shore	Night Parking	Camp-ing	Rest-room
Tomales Beach	Point Reyes NS	Tomales Bay Only	Public	Beach	No	West	No	Yes	0
Rope Swing Beach	Point Reyes NS	Tomales Bay Only	Public	Beach	No	West	No	Yes	0
Blue Gum Beach	Point Reyes NS	Tomales Bay Only	Public	Beach	No	West	No	Yes	0
Avalis Beach	Point Reyes NS	Tomales Bay Only	Public	Beach	No	West	No	Yes	0
Kilkenny Beach	Point Reyes NS	Tomales Bay Only	Public	Beach	No	West	No	Yes	0
Marshall Beach	Point Reyes NS	L Ranch Road	Public	Beach	No	West	No	Yes	0
Heart's Desire Beach	Tomales Bay SP	Heart's Desire parking Jepson Trail parking	Public	Beach	Car Top	West	No	No	1
Indian Beach	Tomales Bay SP	Heart's Desire parking	Public	Beach	No	West	No	No	1
Pebble Beach	Tomales Bay SP	Heart's Desire parking Jepson Trail parking	Public	Beach	No	West	No	No	1
Shell Beach 1	Tomales Bay SP	Shell Beach parking Jepson Trail parking	Public	Beach	No	West	No	No	1
Shell Beach 2	Tomales Bay SP	Shell Beach parking Jepson Trail parking	Public	Beach	No	West	No	No	1
Millerton Point	Tomales Bay SP	Millerton Point parking	Public	Beach	No	East	No	No	1
Marconi Cove	Tomales Bay SP	Marconi Cove parking (not currently open)	Public	Ramp	Trailer	East	No	No	0
White House Pool	W. of PR Station	White House parking	Public	Beach	Car Top	West	No	No	1
Chicken Ranch Beach	Inverness	Chicken Ranch Beach parking lot	Public	Beach	Car Top	West	No	No	1
Miller County Park	Miller City Park	Miller Park parking	Public	Ramp	Trailer	East	Yes	No	1
Lawson's Landing	Dillon Beach	Lawson's Lndg parking	Private	Ramp	Trailer	East	Yes	Yes	1
Golden Hinde Motel	Inverness	Golden Hinde parking	Private	Ramp	Trailer	West	Yes	No	1
Tamal Saka Kayaks	Marshall	Tamal Saka parking	Private	Beach	Car Top	West	Yes	No	1
Blue Water Kayak	Inverness	Blue Water parking	Private	Beach	Car Top	West	Yes	No	1

Appendices

Tomales Bay State Park Preliminary General Plan & Draft EIR  
February 2004



**APPENDIX E: UTILITIES AT TOMALES BAY STATE PARK**

FACILITY	PARCEL	LPG	PHONE	PAY PHONE	RESTROOM	RR TYPE	WATER	POWER
Headquarters Building	Heart's Desire	Yes	Yes	1	Yes	Septic	Yes	Yes
Boneyard	Heart's Desire	No	No	0	No	N/A	Yes	Yes
Maintenance Facility	Heart's Desire	Yes	Yes	0	Yes	Septic	Yes	Yes
Maintenance Trailer Pad	Heart's Desire	No	No	0	Yes	Septic	Yes	Yes
HD Residence 1	Heart's Desire	Yes	Yes	0	Yes	Septic	Yes	Yes
HD Residence 2	Heart's Desire	Yes	Yes	0	Yes	Septic	Yes	Yes
HD Trailer Pad	Heart's Desire	Yes	Yes	0	Yes	Septic	Yes	Yes
Indian Beach	Heart's Desire	No	No	0	Yes	Pit	Yes	No
Heart's Desire Beach	Heart's Desire	Yes	No	0	Yes	Septic	Yes	No
Picnic Area Hike/Bike	Heart's Desire	Yes	No	0	Yes	Septic	Yes	No
Pebble Beach	Heart's Desire	No	No	0	Yes	Pit	No	No
Shell Beach 1	Heart's Desire	No	No	0	Yes	Pit	No	No
Shell Beach 2	Heart's Desire	No	No	0	Yes	Pit	No	No
Jepson Trail	Heart's Desire	No	No	0	No	N/A	No	No
Johnstone Trail	Heart's Desire	No	No	0	No	N/A	No	No
Indian Beach Trail	Heart's Desire	No	No	0	No	N/A	No	No
Dream Farm Residence	Inverness	No	Yes	0	Yes	Septic	Yes	Yes
Dream Farm Trailer 1	Inverness	No	No	0	No	N/A	No	No
Dream Farm Trailer 2	Inverness	No	No	0	No	N/A	No	No
Millerton Pull-out	Millerton	No	No	0	Yes	Pit	No	No
Millerton Residence	Millerton	Yes	Yes	0	Yes	Septic	Yes	Yes
Marconi Cove	Marconi	No	No	0	No	N/A	Yes	Yes



## APPENDIX F: PLANT COMMUNITY CLASSIFICATIONS CROSSWALK

SAWYER & KEELER- WOLF	HOLLAND	WHR
Arroyo willow alliance	Central coast arroyo willow riparian forest	Freshwater emergent wetland
Bishop pine alliance	Closed-cone coniferous forest	Closed pine-cypress
Blue blossom alliance	Blue brush chaparral	Mixed chaparral
California annual grassland weedy alliance	Non-native grassland	Annual grassland
California annual grasslands with native component	Non-native grassland	Annual grassland
California bay alliance	California bay forest	Coastal oak woodland
California wax myrtle alliance	none	Coastal oak woodland
Coast live oak alliance	Coast live oak woodland	Coastal oak woodland
Cordgrass alliance	Northern coastal salt marsh	Saline emergent wetland
Coyote brush alliance	Central Lucian coastal scrub	Coastal scrub
Douglas fir alliance	Coast range mixed conifer forest	Douglas-fir
Dunes	Active coastal dunes	Coastal dunes
Eucalyptus spp. Alliance	Eucalyptus	Eucalyptus
Introduced perennial grassland	Coastal terrace prairie	Perennial grassland
Mixed manzanita mapping unit	Chaparral	Mixed chaparral
Pacific reedgrass alliance	Coastal terrace prairie	Perennial grassland
Pickleweed alliance	Northern coastal salt marsh	Saline emergent wetland
Red alder alliance	Red alder riparian forest	Montane riparian
Rush alliance	Freshwater seep	Fresh emergent wetland
Saltgrass alliance	Northern coastal salt marsh	Saline emergent wetland
Willow mapping unit	Willow riparian	Riparian

**APPENDIX G: SENSITIVE PLANT SPECIES AND COMMUNITIES KNOWN TO OCCUR WITHIN TOMALES BAY STATE PARK**

<b>PLANT SPECIES</b>	<b>COMMON NAME</b>	<b>LIST STATUS* (CNPS/State/Federal)</b>
<i>Arctostaphylos virgata</i>	Marin manzanita	1B/none/none
<i>Campanula californica</i>	swamp harebell	1B/none/SOC
<i>Carex lyngbyei</i>	Lyngbye's sedge	2/none/none
<i>Ceanothus gloriosus var. gloriosus</i>	Point Reyes ceanothus	4/none/none
<i>Ceanothus gloriosus var. porrectus</i>	Mount Vision ceanothus	1B/none/SOC
<i>Cordylanthus maritimus ssp. palustris</i>	Point Reyes bird's-beak	1B/none/SOC
<i>Elymus californicus</i>	California bottlebrush grass	4/none/none
<i>Fritillaria affinis var. tristulis</i>	Marin checker lily	1B/none/none
<i>Fritillaria liliacea</i>	fragrant fritillary	1B/none/SOC
<i>Gilia millefoliata</i>	dark-eyed gilia	1B/none/none
<i>Grindelia hirsutula var. maritima</i>	San Francisco gumplant	1B/none/SOC
<i>Grindelia stricta var. platyphylla</i>	gumweed	4/none/none
<i>Microseris paludosa</i>	marsh microseris	1B/none/none
<i>Polygonum marinense</i>	Marin knotweed	3/none/SOC
<i>Ribes victoris</i>	Victor's gooseberry	4/none/none

**SENSITIVE PLANT COMMUNITIES KNOWN TO OCCUR IN PARK**

*Coastal Terrace Prairie*

*Northern Coastal Salt Marsh*

\* California Native Plant Society Ranks: List 1A = Presumed extinct in California; List 1B = Rare or Endangered in California and Elsewhere; List 2 = Rare or Endangered in California, more common elsewhere; List 3 = Plants for which we need more information (a review list); List 4 = Plants of limited distribution (a watch list). State ranks: CR = California (State) Rare; CE = California (State) Endangered; SOC = Species of Concern. Federal ranks: FE= Federal Endangered; SOC = Species of Concern.

**APPENDIX H: SENSITIVE PLANT SPECIES AND COMMUNITIES POTENTIALLY OCCURRING WITHIN TOMALES BAY STATE PARK**

<b>SENSITIVE PLANT SPECIES FOR WHICH SUITABLE HABITAT EXISTS IN PARK</b>	<b>LIST STATUS (CNPS/State/Fed)</b>
<i>Abronia umbellata</i> ssp. <i>breviflora</i>	1B/none/SOC
<i>Agrostis blasdalei</i>	1B/none/ SOC
<i>Alopecurus aequalis</i> var. <i>sonomensis</i>	1B/none/FE
<i>Amsinckia lunaris</i>	1B/none/none
<i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i>	1B/none/none
<i>Blennosperma nanum</i> var. <i>robustum</i>	1B/CR/SOC
<i>Calamagrostis crassiglumis</i>	2/none/SOC
<i>Calystegia purpurata</i> ssp. <i>saxicola</i>	1B/none/none
<i>Carex leptalea</i>	2/none/none
<i>Castilleja ambigua</i> ssp. <i>humboldtiensis</i>	1B/none/SOC
<i>Ceanothus masonii</i>	1B/CR/SOC
<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>	1B/none/SOC
<i>Chorizanthe cuspidata</i> var. <i>villosa</i>	1B/none/none
<i>Chorizanthe valida</i>	1B/CE/FE
<i>Cirsium andrewsii</i>	1B/none/none
<i>Clarkia concinna</i> ssp. <i>raichei</i>	1B/none/SOC
<i>Delphinium bakeri</i>	1B/CR/FE
<i>Delphinium luteum</i>	1B/CR/FE
<i>Dirca occidentalis</i>	1B/none/none
<i>Erigeron supplex</i>	1B/none/SOC
<i>Gilia capitata</i> ssp. <i>chamissonis</i>	1B/none/none
<i>Gilia capitata</i> ssp. <i>tomentosa</i>	1B/none/none
<i>Hemizonia congesta</i> ssp. <i>leucocephala</i>	3/none/none
<i>Hesperervax sparsiflora</i> var. <i>brevifolia</i>	2/none/none
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	1B/none/SOC
<i>Horkelia marinensis</i>	1B/none/SOC
<i>Lasthenia macrantha</i> ssp. <i>macrantha</i>	1B/none/none
<i>Layia carnososa</i>	1B/CE/FE
<i>Lessingia hololeuca</i>	3/none/none
<i>Lilium maritimum</i>	1B/none/SOC
<i>Limnanthes douglasii</i> ssp. <i>sulphurea</i>	1B/CE/SOC
<i>Lupinus tidestromii</i>	1B/CE/FE
<i>Phacelia insularis</i> var. <i>continentis</i>	1B/none/SOC

<b>SENSITIVE PLANT SPECIES FOR WHICH SUITABLE HABITAT EXISTS IN PARK (continued)</b>	<b>LIST STATUS (CNPS/State/Fed) (continued)</b>
<i>Piperia elegans ssp. decurtata</i>	1B/none/none
<i>Rhynchospora californica</i>	1B/none/SOC
<i>Sidalcea calycosa ssp. rhizomata</i>	1B/none/none
<i>Sidalcea hickmanii ssp. viridis</i>	1B/none/SOC
<i>Trifolium amoenum</i>	1B/none/FE
<i>Triphysaria floribunda</i>	1B/none/SOC
<b>SENSITIVE PLANT COMMUNITIES FOR WHICH SUITABLE HABITAT EXISTS IN PARK</b>	
<i>Central Dune Scrub</i>	
<i>Coastal and Valley Freshwater Marsh</i>	
<i>Northern Maritime Chaparral</i>	
<i>Northern Vernal Pool</i>	
<b>CALIFORNIA NATIVE PLANT SOCIETY (CNPS) RANKS</b>	
<p>List 1A = Presumed extinct in California  List 1B = Rare or Endangered in California and elsewhere  List 2 = Rare or Endangered in California, more common elsewhere  List 3 = Plants for which we need more information - REVIEW LIST  List 4 = Plants of limited distribution - WATCH LIST  STATE RANK CODES:  CR = California (State-listed) Rare  CE = California (State-listed) Endangered  SOC = Species of Concern  FEDERAL RANK CODES: FE = Federal Endangered; SOC = Species of Concern</p>	

**APPENDIX I: NON-NATIVE PLANT SPECIES KNOWN TO OCCUR WITHIN TOMALES  
BAY STATE PARK**

<b>SPECIES</b>	<b>COMMON NAME</b>	<b>CALIPC CATEGORY*</b>
<i>Acacia decurrens</i>	green wattle	need more information
<i>Acacia verticillata</i>	star acacia	none
<i>Agave sp.</i>	century plant	none
<i>Agrostis viridis</i>	bentgrass	none
<i>Aira caryophylla</i>	hairgrass	none
<i>Anagallis arvensis</i>	scarlet pimpernel	none
<i>Avena barbata</i>	slim oat	annual grasses
<i>Avena sativa</i>	cultivated oat	none
<i>Bellis perennis</i>	English daisy	none
<i>Brassica nigra</i>	black mustard	List B
<i>Brassica rapa</i>	field mustard	none
<i>Briza maxima</i>	rattlesnake grass	none
<i>Briza minor</i>	baby rattlesnake grass	none
<i>Bromus diandrus</i>	ripgut grass	annual grasses
<i>Bromus hordeaceus</i>	soft chess	none
<i>Bromus madritensis ssp. madritensis</i>	madrid brome	none
<i>Bromus sterilis</i>	poverty brome	none
<i>Brunsvigia rosea</i>	naked ladies	none
<i>Cakile maritima</i>	sea rocket	none
<i>Caprobrotus chilensis</i>	sea fig	considered, but not listed
<i>Caprobrotus edulis</i>	hottentot fig	List A-1
<i>Capsella bursa-pastoris</i>	shepard's purse	none
<i>Carduus pycnocephalus</i>	Italian thistle	List B
<i>Castanea sativa</i>	Spanish chestnut	none
<i>Centaurea melitensis</i>	napa thistle, tocalote	List B
<i>Cerastium glomeratum</i>	mouse-ear chickweed	none
<i>Chamomilla suaveolens</i>	pineapple weed	none
<i>Cirsium vulgare</i>	bull thistle	List B
<i>Conium maculatum</i>	poison hemlock	List B
<i>Conyza canadensis</i>	horseweed	none
<i>Cotula coronopifolia</i>	brass buttons	none
<i>Cupressus macrocarpa</i>	Monterey cypress	need more information
<i>Cynosurus echinatus</i>	dogtail	none

SPECIES	COMMON NAME	CALIPC CATEGORY*
<i>Cyperus involucratus</i>	umbrella plant	none
<i>Cytisus scoparius</i>	Scotch broom	List A-1
<i>Dactylis glomerata</i>	orchard grass	none
<i>Delairea odorata</i>	cape ivy	List A-1
<i>Digitalis purpurea</i>	foxglove	considered, but not listed
<i>Dipsacus sativus</i>	teasel	considered, but not listed
<i>Erechtites glomerata</i>	Australian fireweed	List B
<i>Erechtites minima</i>	Australian fireweed	List B
<i>Erodium botrys</i>	broad-leaved filaree	none
<i>Erodium cicutarium</i>	red-stemmed filaree	none
<i>Erodium moschatum</i>	white-stemmed filaree	none
<i>Eucalyptus globulus</i>	blue gum	List A-1
<i>Euphorbia peplus</i>	petty spurge	none
<i>Festuca arundinacea</i>	alta fescue	List B
<i>Festuca pratensis</i>	meadow fescue	none
<i>Galium aparine</i>	goose grass	none
<i>Genista monspessulana</i>	French broom	List A-1
<i>Geranium dissectum</i>	cut-leaf cranesbill	none
<i>Geranium molle</i>	soft cranesbill	none
<i>Gnaphalium luteo-album</i>	annual cudweed	none
<i>Gunnera tinctoria</i>		none
<i>Hainardia cylindrica</i>	rat tail grass	none
<i>Hirschfeldia incana</i>	summer mustard	need more information
<i>Holcus lanatus</i>	velvet grass	List B
<i>Hordeum marinum ssp. gussoneanum</i>	Mediterranean barley	none
<i>Hordeum murinum ssp. leporinum</i>	farmer's foxtail	none
<i>Hypochaeris glabra</i>	smooth cat's-ear	none
<i>Hypochaeris radicata</i>	rough cat's-ear	need more information
<i>Ilex aquifolium</i>	English holly	List B
<i>Knopfia uvaria</i>	red-hot poker	none
<i>Leontodon taraxacoides ssp. taraxacoides</i>	hawkbit	none
<i>Linum bienne</i>	flax	none
<i>Lolium multiflorum</i>	ryegrass	annual grasses

<b>SPECIES</b>	<b>COMMON NAME</b>	<b>CALIPC CATEGORY*</b>
<i>Lolium perenne</i>	perennial ryegrass	none
<i>Lotus corniculatus</i>	bird's foot trefoil	none
<i>Lythrum hyssopifolium</i>	purple loosestrife	none
<i>Madia sativa</i>	coast tarweed	none
<i>Malva nicaeensis</i>	bull mallow	none
<i>Medicago arabica</i>	spotted medick	none
<i>Medicago polymorpha</i>	bur clover	considered, but not listed
<i>Melilotus indica</i>	sweet clover	none
<i>Mentha pulegium</i>	European pennyroyal	List A-2
<i>Myosotis latifolia</i>	forget-me-not	none
<i>Narcissus sp.</i>	daffodil	none
<i>Opuntia basilaris</i>	beavertail cactus	none
<i>Parapholis incurva</i>	sickle grass	none
<i>Paspalum dilatatum</i>	dallis grass	none
<i>Phalaris aquatica</i>	harding grass	List B
<i>Picris echioides</i>	oxtongue	considered, but not listed
<i>Pinus radiata</i>	Monterey pine	need more information
<i>Plantago lanceolata</i>	ribwort	none
<i>Plantago major</i>	common plantain	none
<i>Poa annua</i>	annual bluegrass	none
<i>Polygonum arenastrum</i>	dooryard knotweed	none
<i>Polygonum persicaria</i>	lady's thumb	none
<i>Polypogon monspeliensis</i>	rabbitfoot grass	none
<i>Prunus sp.</i>		none
<i>Ranunculus muricatus</i>	prickle-fruit buttercup	none
<i>Raphanus sativus</i>	radish	none
<i>Raphanus sativus x R. raphanistrum</i>	radish	none
<i>Romulea rosea var. australis</i>		none
<i>Rubus discolor</i>	Himalayan blackberry	List A-1
<i>Rumex acetosella</i>	sheep sorrel	none
<i>Rumex conglomeratus</i>		none
<i>Rumex crispus</i>	curly dock	none
<i>Saline gallica</i>	windmill pink	none
<i>Scandix pecten-veneris</i>	shepard's needle	none
<i>Senecio vulgaris</i>	common groundsel	none

SPECIES	COMMON NAME	CALIPC CATEGORY*
<i>Sequoia sempervirens</i>	coast redwood	none
<i>Sherardia arvensis</i>	field madder	none
<i>Silybum marianum</i>	milk thistle	considered, but not listed
<i>Sinapis arvensis</i>	charlock	none
<i>Sisymbrium officinale</i>	hedge mustard	none
<i>Solanum americanum</i>	black nightshade	none
<i>Soliva sessilis</i>		none
<i>Sonchus asper</i>	sow thistle	none
<i>Sonchus oleraceus</i>	sow thistle	none
<i>Spergula arvensis ssp. arvensis</i>	spurrey	none
<i>Spergularia rubra</i>	sand spurrey	none
<i>Stellaria media</i>	chickweed	none
<i>Tamarix sp.</i>	tamarisk	none
<i>Taraxacum officinale</i>	dandelion	none
<i>Tetragonia tetragonioides</i>	New Zealand spinach	none
<i>Trifolium dubium</i>	shamrock	none
<i>Trifolium hirtum</i>	rose clover	none
<i>Trifolium repens</i>	white clover	none
<i>Trifolium subterraneum</i>	subterranean clover	none
<i>Veronica arvensis</i>	speedwell	none
<i>Vicia sativa ssp. nigra</i>	vetch	none
<i>Vicia sativa ssp. sativa</i>	vetch	none
<i>Vinca major</i>	periwinkle	List B
<i>Vulpia bromoides</i>	fescue	none
<i>Vulpia myuros var. myuros</i>	fescue	none

\* California Invasive Plant Council (CalIPC) Category Definitions (from October, 1999 list):  
List A = most invasive wildland pest plants. Documented as aggressive invaders that displace natives and disrupt natural habitats. Includes two sub-lists:  
List A-1 = widespread pests that are invasive in more than 3 regions identified in The Jepson Manual: Higher Plants of California (Hickman, J., ed., 1993)  
List A-2 = regional pests invasive in 3 or fewer regions identified in the Jepson Manual  
List B = wildland pest plants of lesser invasiveness. Invasive pest plants that spread less rapidly and cause a lesser degree of habitat disruption. May be widespread or regional.  
Red Alert = pest plants with potential to spread explosively. Infestations currently small or localized. If found, alert CalIPC, County Agricultural Commissioner, or California Dept. of Food and Agriculture.  
Need More Information = plants for which current information does not adequately describe nature of the threat to wildlands, distribution or invasiveness. More information requested from informed observers.  
Annual Grasses = a preliminary list of annual grasses, abundant and widespread in California, that pose major threats to wildlands. Information is requested to support further definition of this category.  
Considered, But Not Listed = plants that, after review of status, do not appear to pose a major threat.

**APPENDIX J: SENSITIVE WILDLIFE SPECIES OCCURRING IN (OR FOR WHICH POTENTIAL HABITAT EXISTS IN)  
TOMALES BAY STATE PARK**

TYPE	COMMON NAME	SPECIES NAME	STATUS	PROBABILITY IN TBSP
<b>INVERTEBRATES</b>	California brackishwater snail	<i>Tryonia imitator</i>	Local concern	Possible
	Tomales isopod	<i>Caecidotea tomalensis</i>	Local concern	Possible
	California freshwater shrimp	<i>Syncaris pacifica</i>	FE, SE	Possible
	Monarch butterfly (Winter roosts)	<i>Danaus plexippus</i>	Local concern	Possible
	Myrtle's silverspot	<i>Speyeria zerene myrtleae</i>	FE	Possible
<b>FISHES</b>	Coho salmon	<i>Onchorynchus kisutch</i>	FT, SE	Possible
	Steelhead trout	<i>Onchorynchus mykiss</i>	FT	Probable
	Tomales roach	<i>Lavinia symmetricus</i>	CSC	Possible
	Tidewater goby	<i>Eucyclogobius newberryi</i>	FE, CSC	Present
<b>AMPHIBIANS</b>	California red-legged frog	<i>Rana aurora draytonii</i>	FT, CSC	Present
	Foothill yellow-legged frog	<i>Rana boylei</i>	FSC, CSC	Present
<b>REPTILES</b>	Northwestern pond turtle	<i>Clemmys marmorata marmorata</i>	FSC, CSC	Present
<b>BIRDS</b>	Common loon	* <i>Gavia immer</i>	FSC, CSC	Present
	American white pelican	* <i>Pelecanus erythrorhynchos</i>	CSC	Present
	Brown pelican	* <i>Pelecanus occidentalis californicus</i>	FE, SE	Present
	Double-crested cormorant	* <i>Phalacrocorax auritus</i>	CSC	Present
	Great blue heron	* <i>Ardea herodias</i>	Local concern	Present
	American bittern	<i>Botaurus lentiginosus</i>	FSC	Possible
	Snowy egret	* <i>Egretta thula</i>	FSC	Present
	Black-crowned night heron	* <i>Nycticorax nycticorax</i>	Local concern	Possible



<b>BIRDS (cont'd)</b>	White-faced ibis	<i>*Plegadis chihi</i>	FSC, CSC	Possible
	Canvasback	<i>*Aythya valisineria</i>	Local Concern	Probable
	Aleutian Canada goose	<i>(W)Branta Canadensis leucopareia</i>	FSC (Delisted)	Present
	Barrow's goldeneye	<i>*Bucephala islandica</i>	CSC	Present
	Harlequin duck	<i>*Histrionicus histrionicus</i>	FSC, CSC	Possible
	Cooper's hawk	<i>*Accipiter cooperi</i>	CSC	Present
	Sharp-shinned hawk	<i>*Accipiter striatus</i>	CSC	Present
	Golden eagle	<i>*(W)Aquila chrysaetos</i>	CSC, CFP	Present
	Ferruginous hawk	<i>(W)Buteo regalis</i>	FSC, CSC	Possible
	Northern harrier	<i>*Circus cyaneus</i>	CSC	Present
	White-tailed kite	<i>*Elanus leucurus</i>	FSC, CFP	Present
	Bald eagle	<i>*(W)Haliaeetus leucocephalus</i>	FT, FPD, SE	Possible
	Osprey	<i>*Pandion haliaetus</i>	CSC	Present
	Merlin	<i>(W)Falco columbarius</i>	CSC	Possible
	Prairie falcon	<i>*Falco mexicanus</i>	CSC	Possible
	American peregrine falcon	<i>*Falco peregrinus anatum</i>	FSC, SE, CFP	Possible
	California black rail	<i>Laterallus jamaicensis coturniculus</i>	FSC, ST	Present
	Black oystercatcher	<i>*Haematopus bachmani</i>	Local Concern	Present
	Long-billed curlew	<i>*Numenius americanus</i>	FSC, CSC	Present
	California gull	<i>*Larus californicus</i>	CSC	Present
	Caspian tern	<i>*Sterna caspia</i>	Local Concern	Present
	Elegant tern	<i>*Sterna elegans</i>	FSC, CSC	Present
	Forster's tern	<i>*Sterna forsteri</i>	Local Concern	Present
	Short-eared owl	<i>*Asio flammeus</i>	CSC	Present
	Long-eared owl	<i>*Asio otus</i>	CSC	Possible
	Burrowing owl	<i>*Athene cunicularia</i>	FSC, CSC	Present
	Northern spotted owl	<i>Strix occidentalis caurina</i>	FT	Present



<b>BIRDS (cont'd)</b>	Vaux's swift	* <i>Chaetura vauxi</i>	FSC, CSC	Possible
	Black swift	* <i>Cypseloides niger</i>	FSC, CSC	Possible
	Rufous hummingbird	<i>Selasphorus rufus</i>	Local Concern	Possible
	Allen's hummingbird	* <i>Selasphorus sasin</i>	FSC	Present
	Lewis' woodpecker	* <i>Melanerpes lewis</i>	FSC	Possible
	Red-breasted sapsucker	* <i>Sphyrapicus ruber</i>	FSC	Probable
	Olive-sided flycatcher	* <i>Contopus cooperi</i>	FSC	Probable
	Willow flycatcher	* <i>Empidonax trailii</i>	SE	Possible
	Loggerhead shrike	* <i>Lanius ludovicianus</i>	FSC, CSC	Probable
	California horned lark	<i>Eremophila alpestris actia</i>	CSC	Probable
	Purple martin	* <i>Progne subis</i>	CSC	Possible
	Bank swallow	* <i>Riparia riparia</i>	FSC, ST	Possible
	Hermit warbler	* <i>Dendroica occidentalis</i>	FSC	Probable
	Yellow warbler	* <i>Dendroica petechia brewsteri</i>	CSC	Probable
	Saltmarsh common yellowthroat	<i>Geothlypis trichas sinuosa</i>	FSC, CSC	Present
	Yellow-breasted chat	* <i>Icteria virens</i>	CSC	Possible
	Lark sparrow	* <i>Chondestes grammacus</i>	FSC	Possible
	Brewer's sparrow	* <i>Spizella breweri</i>	Local concern	Possible
	Chipping sparrow	* <i>Spizella passerina</i>	Local concern	Probable
	Tricolored blackbird	* <i>Agelaius tricolor</i>	FSC, CSC	Probable

**Status Codes:** FE = Federal Endangered; FT = Federal Threatened; FC = Federal Candidate for listing; FPD = Federal Proposed for Delisting; FSC = Federal Species of Concern; SE = State Endangered; ST = State Threatened; CFP = California Fully Protected; CSC = California Species of Concern



## **APPENDIX K: IDENTIFYING AND PRESERVING PARK AESTHETIC VALUES AND SPIRIT OF PLACE**

There is a difference between identifying “aesthetic values” and “spirit of place” for the purposes of this document: aesthetic values are based on impressions from the commonly-known five individual human senses, and “spirit of place” refers to the overall feeling imparted by combining those sensory impressions and is created by the natural and cultural resource base in which a visitor is immersed in the park. Individuals will most likely define perception of a place differently; however, there are many impressions that would be common to most park visitors.

Identifying and documenting these qualities for use in park development and interpretive, resource and maintenance programs is an important first step in improving visitor experience at the park and preserving these qualities for the future.

The following paragraphs outline a process for achieving and maintaining the General Plan goals of preserving and promoting positive aesthetic values and the park’s natural spirit of place. Please refer to the plan’s Adaptive Management Process information as a way of maintaining these values into the future.

### **Identification of the Park’s Spirit of Place and Aesthetic Values**

As specific park projects and programs are implemented, more detailed definitions of the park’s aesthetic and spirit of place values can be developed through the process outlined below.

If possible, park design professionals, resource specialists, and operations staff should all contribute to the development of a definition of the park’s overall positive and negative aesthetic values and spirit of place. Public input is valuable as well. The values documented as a first step in completion of individual projects should accumulate and contribute to this overall definition, to be further used in the creation of each new project.

### **Process for Specific Park Projects and Programs**

#### Identifying Aesthetic Values in a Project Site

In order to define the qualities of a place that constitute its aesthetic values, attention must be paid to both small details and the larger picture. The process should include analyzing such elements as visual patterns and textures and expanding vistas or focused views; the ambient qualities of light, temperature,

scent, humidity, and sound; the movement of air, plants, animals and water; the characteristics and feel of soil, rock and terrain; and include existing knowledge of the place (including park and resource history) or memories. In addition, existing park facilities must be evaluated as part of a visual (and possibly other senses) inventory of public use and operations areas of the park.

The first step in identifying aesthetic values at a specific project site is to spend enough time at the site to be familiar with its existing elements, both positive and negative. Ideally, visits to the project site to gather sensory data (raw aesthetic data) should occur at different times of day and in all seasons, and information gathered should be recorded in a clear format for future use. For example, the following descriptive format could be used, or there could be a simple “bullet” listing of sensory impressions:

**June 23, 2003: Impressions of the Indian Beach project site**

Smelled the spicy scent of a grove of bay trees. Saw the sensuous red skin of a peeling madrone and felt the forest’s mossy quiet. Saw shimmering strands of spider silk catching a shaft of sunlight (beautiful – like glimmering silver). Heard the faint roar of the Pacific drifting over the ridge with the evening fog (delightful – made me feel the power of the ocean, even though so far away). Felt a deer watching me by the creek before I saw it through the foliage (mystical). Picked up a strange fishbone on the mud of a retreating tide, prompting questions in my mind about sea life in the bay. Heard the yodeling summer call of the loon echoing off the bay (mysterious – what’s it talking about?). Touched the dark nacreous earth where the Indians ate shellfish for centuries—it looked rich with organic matter, and felt dense, fine-grained, and greasy. Saw the unkempt gravel parking lot with haphazard vehicle parking and dilapidated signs. Saw garbage containers from a distance with animal-scattered trash around them.

Identifying the “Spirit of Place” in a Project Site

From a combination of all sensory impressions, an overall sense (or “spirit”) of place can be felt and defined. Collected sensory data (above) should be used in formulating a description of the site’s natural spirit of place. For example, using the data above, the following spirit of place description could be developed:

**Indian Beach Spirit of Place**

Indian Beach, except on the stormiest of days, has an overall quality of peace and quiet, with moderate- to low-level intermittent sounds of wildlife and waves, both from Tomales Bay and the

Pacific Ocean over the ridge to the west; an ephemeral atmosphere of cool, moist fog and sunlight; in the estuary, variable-colored, textured, and scented vegetation of differing heights that rest the eye and delight the nose, especially in summer, and birds twittering in the foliage above; dark and shell-filled earth created over thousands of years of human habitation that feels good on the hands and imparts a sense of history; a wide, long beach that invites relaxation and play, and has the potential of creating excitement through beach-combing and discovering unusual natural specimens; and the potential of hearing and seeing wildlife that people experience only in isolated places like this.

#### Using Aesthetic and Spirit of Place Definitions in Facility and Program Development and Maintenance

After completing the process outlined above, the project team should create a "Project Site Aesthetics and Spirit of Place" document as part of a first step (or in the "study phase") in implementing the project. This document should function as a shorthand method of remembering site values and to introduce future project team members to important aesthetic values at the site. In reviewing this information, a team member would have the benefit of a compilation of many impressions and hours spent at the site by other individuals. The information should help in building the comprehensive base of knowledge necessary for completion of a relevant, successful project for the public. The document should also be included in the park's resource inventory database.

Using the information generated above, the positive elements of a project site can be more easily retained and enhanced and negative situations modified. Creative project design and construction methods, and interpretation, resource management, and maintenance programs should highlight and interpret positive aesthetic values and the site's spirit of place to help create stronger connections to the site and improve visitor experiences at the park.

Operations staff should incorporate the document's information into maintenance procedures and programs to help preserve these important park values into the future. The document should be added to over the years by future project teams and other interested parties to create a more comprehensive documentation of the park's aesthetic and spirit of place values through time.



## APPENDIX L: PLANNING INFLUENCES

Existing State Park system-wide planning influences that cross park and regional boundaries may affect planning decisions regarding Tomales Bay State Park. The following represent such influential policies, regulations, and plans.

### System-Wide Planning Influences

#### Federal:

- Americans with Disabilities Act of 1990, Title II and III
- Clean Water Act, Section 404
- Federal Endangered Species Act
- Federal Migratory Bird Treaty Act
- National Environmental Policy Act (NEPA)
- Secretary of the Interior's Standards for the Treatment of Historic Properties, revised in 1992

#### State:

- California Code of Regulations
- California Department of General Services, Division of the State Architect, Access Compliance
- California Endangered Species Act
- California Environmental Quality Act (CEQA)
- California Fish and Game Code
- California Native Plant Protection Act
- California Public Resources Code:
  - Section 5019.50 State Park Classification
  - Section 5024 Preserving and Maintaining all State-owned Historical Resources
  - Section 5097.99 Felony Possession of Native American Human Remains and Artifacts
  - Section 5097.991 Repatriation
  - Section 5020.1(g) Native American Heritage and Department of Parks and Recreation Gathering Policy
  - Section 21083.2 Unmitigated Significant Effects on Archeological Sites
- Natural Communities Conservation Planning Act

#### California Department of Parks and Recreation:

- California Department of Parks and Recreation Operations Manual

- California Department of Parks and Recreation Administrative Manual
- California Recreational Trails Plan
- California State Park and Recreation Commission Statements of Policy
- California State Parks System Plan
- Planning Handbook
- California State Parks Access to Parks Guidelines
- California State Parks Mission Statement
- Park Concessions Policies
- Policies, Rules, Regulations, and Orders of the California State Park and Recreation Commission and the California Department of Parks and Recreation
- Resource Management Directives. These directives amplify the legal codes contained in the Public Resources Code, the California Code of Regulations, and the California State Park and Recreation Commission's Statement of Policy and Rules of Order. The directives most pertinent to existing or potential issues at Tomales Bay State Park are:
  - #1 State Park System resources definition
  - #2 State Park Resource Manager description
  - #3 State Park inventory
  - #4 State Park acquisition objectives
  - #5 State Park development
  - #7 Natural and scenic resource analysis for State Parks and Reserves
  - #9 Boundaries and Developments in Natural Preserves
  - #24 Primary objective of the Department of Parks and Recreation
  - #25 Program establishment for identification, description, and evaluation of all resources
  - #26 Identification and management of environmental and human-related factors influencing State Park lands
  - #28 Visitor use impacts
  - #29 Vegetation management
  - #31 Environmental resource management
  - #32 Resource management programs
  - #33 Exotic plant management
  - #34 Invasive vegetation control
  - #35 Natural wildlife habitat preservation
  - #36 Wildlife population balance
  - #37 Soil conservation and erosion control
  - #40 Paleontological resource identification
  - #41 Paleontological resource protection
  - #42 Allowable uses to protect water features
  - #43 Water quality control
  - #44 Water diversion
  - #45 Water pollution control

- #46 Environmental quality
- #50 Statewide inventory, preservation, protection, and interpretation of archeological sites
- #51 Preservation of native California Indian resources
- #52 Native California Indian community participation in cultural resource management
- #54 Identification, evaluation, and description of historic resources
- #55 Criteria for determination of significant historic resources
- #57 Inventory of significant cultural resources
- #58 Cultural resource protection
- #59 Approval for underground work
- #60 Management and interpretation of human history
- #61 Adaptive use of historic structures
- #63 Cultural resource management programs
- #69 Archeological resources
- #70 Archeological values, identification, recordation, evaluation, and protection
- #74 Recreation development/use

### **Regional Planning Influences**

The policies, plans and programs of agencies and organizations in the region affect the park in various ways. These influences represent government on many levels and address regional issues that may affect planning decisions at Tomales Bay State Park.

#### Federal:

- U.S. Department of Commerce National Marine Fisheries Service
- U.S. Department of Commerce (Gulf of the Farallones National Marine Sanctuary)
- U.S. Department of Interior, National Park Service (Point Reyes National Seashore, Golden Gate National Recreation Area)
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers

#### State:

- California Coastal Commission
- California Department of Fish and Game
- California Department of Forestry and Fire Protection
- California Department of Transportation
- California Regional Water Quality Control Board

County and Local:

- Bay Area Air Quality Management District
- County of Marin
- Marin Municipal Water District
- San Francisco Regional Water Quality Control Board
- Tomales Bay Watershed Council

## APPENDIX M: GLOSSARY OF GEOLOGIC TERMS

Definitions in this glossary are predominately excerpted from the American Geology Institute (AGI) Dictionary of Geological Terms, with some definitions supplemented from the USGS Geologic Glossary webpage. Words underlined within a definition are also defined in this glossary.

**Alluvium** – sand, gravel, silt, and clay deposited by rivers and streams in valley bottoms or on beaches.

**Basalt** – A fine-grained, dark extrusive igneous rock with low silica content (40% to 50%), rich in iron, magnesium and calcium. Basalt generally occurs in flows and also as dikes. It is the most abundant volcanic rock in the Earth's crust and makes up most of the ocean floor. See igneous rock chart at end of glossary.

**Chert** – a hard, dense, microcrystalline variety of quartz that forms in a marine environment from the altered silica shells of radiolarians (tiny protozoans (animals) similar to plankton).

**Clay** – A particle of sediment less than 1/256 of a millimeter in diameter. Also, a family of platy silicate minerals that commonly form as a product of weathering.

**Conglomerate** – a coarse-grained sedimentary rock composed of rounded to subangular fragments larger than 2 millimeters in diameter (gravel, cobbles, boulders) in a finer-grained matrix of sand and/or silt, cemented with calcium carbonate, iron oxide, silica, or hardened clay.

**Cretaceous** – the final period of the Mesozoic Era, from 135 to 65 million years ago (see geologic time scale at end of glossary).

**Feldspar** – a group of silicate minerals containing varying amounts of potassium, sodium, and calcium along with aluminum, silicon, and oxygen. Potassium (alkali) feldspars contain considerable potassium. Plagioclase feldspars contain considerable sodium and calcium.

**Granite** – a light-colored, coarse-grained igneous rock consisting of alkali feldspar (orthoclase) and quartz, with lesser amounts of sodic plagioclase feldspar, micas, and hornblende. See igneous rock chart at end of glossary.

**Granitic** – of, pertaining to, or composed of granite or granite-like rock.

**Granodiorite** – a group of coarse-grained intrusive igneous rocks intermediate in composition between quartz diorite and quartz monzonite, containing quartz, oligoclase or andesine (plagioclase), and potassium feldspar, with lesser amounts of biotite or hornblende. See igneous rock chart at end of glossary.

**Gravel** – all sedimentary particles (rock or mineral) larger than 2 millimeters and smaller than 64 millimeters in diameter.

**Greenstone** – a field term for any compact dark-green altered or metamorphosed basic igneous rock (such as basalt) that owes its green color to actinolite, chlorite, or epidote (green-colored silicate minerals).

**Greywacke** – a dark grey, well indurated, coarse-grained sandstone that consists of poorly sorted angular to subangular grains of quartz, feldspar, and rock fragments embedded in a compact clayey matrix with the general composition of shale.

**Holocene** – An epoch of the Quaternary Period, from the end of the Pleistocene, approximately 8,000 years ago to the present time (see geologic time scale at end of glossary).

**Igneous** – a rock or mineral that solidified from molten or partly molten material, i.e. from a magma. Extrusive igneous, or volcanic rocks, are erupted onto the earth's surface and are usually fine-grained with some larger crystals. Intrusive igneous, or plutonic rocks, cool and solidify at depth and are usually coarse-grained.

**Jurassic** – the second period of the Mesozoic Era, covering the time span from 190 to 135 million years ago (see geologic time scale at end of glossary.)

**Limestone** – a sedimentary rock consisting chiefly of the mineral calcite (calcium carbonate,  $\text{CaCO}_3$ ) with or without magnesium carbonate. Common impurities include chert and clay. Limestone is the most widely distributed of the carbonate rocks and is the consolidated equivalent of limey mud, calcareous sand, and/or shell fragments.

**Magma** – naturally occurring molten rock material, generated within the earth and capable of intrusion and extrusion, from which igneous rocks have been derived through cooling and solidification.

**Mantle** – the zone of the earth below the crust and above the core.

**Marble** – a metamorphic rock consisting of predominately fine-grained to coarse-grained recrystallized calcite (calcium carbonate) and/or dolomite (magnesium carbonate). Formed from metamorphism of a sedimentary limestone rock.

**Mesozoic** – One of the eras of geologic time, following the Paleozoic and succeeded by the Cenozoic Era. The Mesozoic comprises the Triassic, Jurassic, and Cretaceous periods, from 245 to 66.4 million years ago (see geologic time scale at end of glossary).

**Metamorphic** – pertaining to the process of metamorphism or to its result.

**Metamorphism** – the mineralogical, chemical, and structural adjustment of solid rocks to physical and chemical conditions imposed at depth below the earth's surface. Increases in temperature and pressure cause new minerals to grow.

**Mica Schist** – a metamorphic rock, containing abundant mica (platy silicate minerals) with a strongly foliated (linear) habit. The platy minerals are aligned parallel to each other and often in distinct bands of dark and light minerals, giving the rock a shiny appearance.

**Paleozoic** - One of the eras of geologic time, following the Precambrian and succeeding the Mesozoic. The Paleozoic comprises the Cambrian, Ordovician, Silurian, Devonian, Carboniferous, and Permian periods, from 570 to 245 million years ago. See geologic time scale at end of glossary.

**Plagioclase** – a member of the feldspar mineral family. Plagioclase feldspars are silicates that contain considerable sodium and calcium.

**Pleistocene** – an epoch of the Quaternary Period, after the Pliocene of the Tertiary and before the Holocene. It began 1.6 million years ago and lasted until about 8,000 years ago (Holocene). Syn: *ice age; glacial epoch*

**Pliocene** – The latest epoch of the Tertiary period, beginning about 5.3 million years ago and ending 1.6 million years ago. See geologic time scale at end of glossary.

**Pluton** – an igneous intrusion or body of rock formed by emplacement of magma at depth.

**Quartz Diorite:** An igneous rock having the composition of diorite, but with 5-20% quartz. (Diorite – an intrusive igneous rock made up of plagioclase feldspar and amphibole or pyroxene. Similar to gabbro, but with less dark (mafic) minerals and more silica. See igneous rock chart at end of glossary.

**Quartzite** – an even-grained metamorphic rock consisting mainly of quartz, formed by recrystallization of sandstone by regional or thermal metamorphism.

**Quaternary** – The most recent period of the Cenozoic era, encompassing the time interval of 1.6 million years ago through today. See geologic time scale at end of glossary.

**Roof Pendant** – a downward projection of country rock into an igneous intrusion. The country rock is the older sediments that were intruded by the magma and metamorphosed.

**Sand** – loose particles of rock or mineral that range from 0.0625-2.0 millimeters in diameter.

**Sandstone** – a clastic sedimentary rock composed of grains of sand-sized particles (usually quartz or feldspar) in a matrix of silt and/or clay and cemented to some degree by silica, iron oxide, or calcium carbonate.

**Scheelite** – a brown tungsten ore, chemical formula  $\text{CaWO}_4$ . It is found in quartz veins associated with granitic rocks and in metamorphosed roof pendants.

**Shale** – a fine-grained detrital sedimentary rock, formed by the compaction of clay, silt, or mud. It has a finely laminated structure, which gives it a fissility along which the rock tends to split readily.

**Silt** - loose particles of rock or mineral that range from 0.002-0.0625 millimeters in diameter.

**Subduction Zone** – an elongate region along which a crustal block descends relative to another crustal block, such as the descent of the Pacific plate beneath the Andean plate along the Andean trench.

**Turbidity Current** – an underwater bottom-flowing current laden with suspended sediment, moving swiftly downslope and spreading horizontally on the ocean floor (continental shelf).

**Volcanic rock** – an igneous rock that cools and solidifies at or very near the Earth's surface.

**Volcanic arc** – an arcuate chain of volcanoes formed above a subduction zone. The arc forms where the descending plate becomes hot enough to release water and gases into the overlying mantle and cause it to melt.

## APPENDIX N: GENERAL PLAN CONTRIBUTORS

<b>Northern Service Center Team Members</b>
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