

WORKSHEET 1. ASSESS A CONNECTION TO GROUNDWATER



Use the following questions to assess whether iGDE polygons are connected to groundwater.	Lower Santa Clara River - above 101	Lower Santa Clara River - below 101	McGrath Lake	Ormond Beach	Mugu Lagoon	Lower Calleguas Creek	Revolon Slough
GENERAL QUESTIONS FOR ALL GDE TYPES							
Is the iGDE underlain by a shallow unconfined or perched aquifer that has been delineated as being part of a Bulletin 118 principal aquifer in the basin?	Yes, Oxnard Aquifer	Yes, Semi-perched Aquifer	Yes, Semi-perched Aquifer	Yes, Semi-perched Aquifer	Yes, Semi-perched Aquifer	Yes, Semi-perched Aquifer	Yes, Semi-perched Aquifer
Is the depth to groundwater under the iGDE less than 30 feet?	Yes	Yes	Yes	Yes	Yes	Insufficient Data	Insufficient Data
Is the iGDE located in an area known to discharge groundwater (e.g., springs/seeps)?	No	No	No	No	No	No	No
<p><i>If you answer Yes to any of the above questions, then you likely have a GDE. Stop here. If you selected No or Insufficient Data or cannot confidently answer any of the above questions, then answer the following questions to infer groundwater dependency.</i></p>							
RIVERS, STREAMS, AND ESTUARIES							
Is the iGDE located in a portion of a river or stream that is likely a gaining reach?	No	Yes				No	
Are water temperatures around the iGDE relatively constant over time, indicating a potential for gaining conditions?							
Are there stable/permanent natural flows detected by stream gauges near the iGDE, indicating a potential for gaining conditions?						Yes, WWTP discharge required 6 cfs flow	
Is there water or flows around the iGDE during summer months?						Yes	Inflow from agricultural return flow
For iGDEs near estuaries, does the salinity drop below that of seawater in the absence of surface water inputs (e.g., surface runoff or stormwater)?							

Are the isohaline contour lines of the saline wedge relatively constant under an iGDE?							
WETLANDS							
Is the level of water around the iGDE maintained during extended dry periods without surface water inflow or management?							

Use the following questions to assess whether iGDE polygons are connected to groundwater.	Lower Santa Clara River - above 101	Lower Santa Clara River - below 101	McGrath Lake	Ormond Beach	Mugu Lagoon	Lower Calleguas Creek	Revolon Slough
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Is the location of the iGDE consistently associated with known areas of groundwater discharge (e.g., springs or seeps) in terrestrial and/or coastal environments?							
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TERRESTRIAL VEGETATION							
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Does vegetation in the iGDE remain green and physiologically active during extended dry periods of the year?							
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Does the iGDE have higher evapotranspiration rates in summer months compared to other nearby vegetation unlikely to be dependent on groundwater?							
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SEEPS AND SPRINGS							
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Are there breaks in the slope of the land surface or areas of stratigraphic change causing groundwater to emerge or vegetation to congregate on the surface?							
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Is there a presence of hydric (very wet) soils in areas with little summer precipitation, indicating persistent soil saturation throughout the year?							
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Are there elevated surface water temperatures from an influx of geothermal groundwater discharge?							
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*If you answered **Yes** to any of the questions above, then you likely have a GDE. If you answered **No** to all the questions, then you likely do not have a GDE.*
*If you answered **Insufficient Data** to all the questions, then assume you have a GDE until sufficient data is collected.*
Refer to Appendix IV and Step 4.

WORKSHEET 2. GDE ECOLOGICAL INVENTORY



Ecological Inventory for GDE Unit ID Lower Santa Clara River

		DESCRIPTION/NOTES
Species	<input type="radio"/> Locally Important or Endemic <input checked="" type="radio"/> Special Status <input type="radio"/> Rare <input checked="" type="radio"/> Threatened <input checked="" type="radio"/> Endangered <input type="radio"/> Presence of Native _____% Non-native _____%	<p>Santa Ana sucker; western pond turtle; tidewater goby; coast horned lizard; white rabbit-tobacco; Southern Riparian Scrub; least Bell's vireo (CNDDDB, 2016); steelhead</p>
Habitat	<input checked="" type="radio"/> Critical Habitat <input checked="" type="radio"/> Recognized Wetland <input checked="" type="radio"/> Part of a Protected Area <input type="radio"/> Part of Local Conservation Plan <input type="radio"/> Part of a Wildlife Corridor Plan	<p>Critical Habitat: Southwestern willow flycatcher critical habitat (569 acres); Tidewater goby critical habitat (22 acres); Western snowy plover critical habitat (35 acres); Steelhead critical habitat (Source- CH, 2016)</p> <p>Audubon California Important Bird Area</p> <p>Recognized Wetland: 1,180 acres (93%) (Sources- NWI, 2016; pGDE, 2016)</p> <p>Protected Area: The Nature Conservancy (160 acres); City of Ventura (1.2 acres)</p>
Environmental Beneficial Uses*	<input type="radio"/> Aquaculture <input type="radio"/> Cold Freshwater Habitat <input type="radio"/> Estuarine Habitat <input type="radio"/> Inland Saline Water Habitat <input type="radio"/> Marine Habitat <input checked="" type="radio"/> Migration of Aquatic Organisms <input type="radio"/> Preservation of Biological Habitats of Special Significance <input checked="" type="radio"/> Rare, Threatened, or Endangered Species <input type="radio"/> Protected/Special Status/Sensitive Species <input checked="" type="radio"/> Spawning, Reproduction, and/or Early Development <input type="radio"/> Warm Freshwater Habitat <input checked="" type="radio"/> Wildlife Habitat <input checked="" type="radio"/> Wetlands (WET) <input checked="" type="radio"/> Other: Water Contact Recreation (REC-1) <input checked="" type="radio"/> Other: Noncontact Water Recreation (REC-2) _____	<p>RARE: East of Hitch Rd</p>

* Relevant environmental beneficial uses listed in Bulletin 118 (2003 update)—Appendix E.

WORKSHEET 2. GDE ECOLOGICAL INVENTORY



Ecological Inventory for GDE Unit ID McGrath Lake

		DESCRIPTION/NOTES
Species	<input type="radio"/> Locally Important or Endemic <input type="radio"/> Special Status <input type="radio"/> Rare <input checked="" type="radio"/> Threatened <input checked="" type="radio"/> Endangered <input type="radio"/> Presence of Native _____% Non-native _____%	<p>Belding's savannah sparrow; burrowing owl; California least tern; least Bell's vireo; salt marsh bird's-beak; sandy beach tiger beetle; silvery legless lizard; Ventura Marsh milk-vetch (CNDDDB, 2016).</p> <p>Sandy beach tiger beetle, brown pelican, Western least bittern, white-faced ibis, osprey, white-tailed kite, Northern harrier, sharp-shinned hawk, Cooper's hawk, Light-footed clapper rail, Western snowy plover, long-billed curlew, California least tern, Western yellow-billed cuckoo, burrowing owl, Southwestern willow flycatcher, loggerhead shrike, Least Bell's Vireo, yellow warbler, yellow-breasted chat, Belding's Savannah sparrow, California red-legged frog, Southwestern pond turtle, silvery legless lizard, San Diego horned lizard, two-striped garter snake, South coast garter snake, Townsend's big-eared bat (Table 3-2, ESA, 2003)</p>
Habitat	<input checked="" type="radio"/> Critical Habitat <input checked="" type="radio"/> Recognized Wetland <input checked="" type="radio"/> Part of a Protected Area <input type="radio"/> Part of Local Conservation Plan <input type="radio"/> Part of a Wildlife Corridor Plan	<p>Critical Habitat: Southwestern willow flycatcher critical habitat (32 acres); Tidewater goby critical habitat (18 acres); Ventura Marsh Milk-vetch critical habitat (78 acres);</p> <p>Audubon California Important Bird Area</p> <p>Recognized Wetland: 197 acres (71%)</p> <p>Protected Area : McGrath State Beach (56 acres); Mandalay State Beach (29 acres); Mandalay County Park (0.7 acres)</p>
Environmental Beneficial Uses*	<input type="radio"/> Aquaculture <input type="radio"/> Cold Freshwater Habitat <input checked="" type="radio"/> Estuarine Habitat (EST) <input type="radio"/> Inland Saline Water Habitat <input type="radio"/> Marine Habitat <input type="radio"/> Migration of Aquatic Organisms <input type="radio"/> Preservation of Biological Habitats of Special Significance <input checked="" type="radio"/> Rare, Threatened, or Endangered Species (RARE) <input type="radio"/> Protected/Special Status/Sensitive Species <input type="radio"/> Spawning, Reproduction, and/or Early Development (SPWN) <input type="radio"/> Warm Freshwater Habitat <input checked="" type="radio"/> Wildlife Habitat (WILD) <input checked="" type="radio"/> Wetlands (WET) <input checked="" type="radio"/> Other: Water Contact Recreation (REC-1) <input checked="" type="radio"/> Other: Noncontact Water Recreation (REC-2)_____	

WORKSHEET 2. GDE ECOLOGICAL INVENTORY



Ecological Inventory for GDE Unit ID Ormond Beach Wetlands

		DESCRIPTION/NOTES
Species	<input type="radio"/> Locally Important or Endemic <input checked="" type="radio"/> Special Status <input type="radio"/> Rare <input checked="" type="radio"/> Threatened <input checked="" type="radio"/> Endangered <input type="radio"/> Presence of Native _____% Non-native _____%	<p>Belding's savannah sparrow; California least tern; Coulter's goldfields; California brackishwater snail; salt marsh bird's-beak; tidewater goby; western snowy plover (CNDDDB, 2016).</p> <p>Western Snowy Plover, California Least Tern, California Brown Pelican, Light-footed Clapper Rail, Least Bell's Vireo. Southern California saltmarsh shrew, San Diego black-tailed jackrabbit, Double-crested Cormorant, American Bittern, Great Blue Heron, Great Egret, Snowy Egret, Black-crowned Night Heron, White-faced Ibis, White-tailed Kite, Northern Harrier, Cooper's Hawk, Sharp-shinned Hawk, Merlin, Mountain Plover, Long-billed Curlew, Western Burrowing Owl, Loggerhead Shrike, Yellow warbler, California Horned Lark, Tricolored Blackbird, South Coast garter snake, tiger beetle, sandy beach tiger beetle, wandering skipper, globose dune beetle, red sand-verbena, spiny rush, and woolly seablite. (WRA, 2007)</p>
Habitat	<input checked="" type="radio"/> Critical Habitat <input checked="" type="radio"/> Recognized Wetland <input checked="" type="radio"/> Part of a Protected Area <input type="radio"/> Part of Local Conservation Plan <input type="radio"/> Part of a Wildlife Corridor Plan	<p>Critical Habitat: Tidewater goby critical habitat (88 acres); Western snowy plover critical habitat (26 acres);</p> <p>Audubon California Important Bird Area</p> <p>Recognized Wetland: 207 acres (96%)</p> <p>Protected Area: The Nature Conservancy (129 acres); Port Hueneme Beach Park (1.3 acres)</p>
Environmental Beneficial Uses*	<input type="radio"/> Aquaculture <input type="radio"/> Cold Freshwater Habitat <input checked="" type="radio"/> Estuarine Habitat (EST) <input type="radio"/> Inland Saline Water Habitat <input type="radio"/> Marine Habitat <input type="radio"/> Migration of Aquatic Organisms <input type="radio"/> Preservation of Biological Habitats of Special Significance <input checked="" type="radio"/> Rare, Threatened, or Endangered Species (RARE) <input type="radio"/> Protected/Special Status/Sensitive Species <input type="radio"/> Spawning, Reproduction, and/or Early Development (SPWN) <input type="radio"/> Warm Freshwater Habitat <input checked="" type="radio"/> Wildlife Habitat (WILD) <input checked="" type="radio"/> Wetlands (WET) <input checked="" type="radio"/> Other: Water Contact Recreation (REC-1) <input checked="" type="radio"/> Other: Noncontact Water Recreation (REC-2)_____	

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WORKSHEET 2. GDE ECOLOGICAL INVENTORY

Ecological Inventory for GDE Unit ID Mugu Lagoon and Wetlands

		DESCRIPTION/NOTES
Species	<input type="radio"/> Locally Important or Endemic <input checked="" type="radio"/> Special Status <input type="radio"/> Rare <input checked="" type="radio"/> Threatened <input checked="" type="radio"/> Endangered <input type="radio"/> Presence of Native _____% Non-native _____%	arroyo chub; Belding's savannah sparrow; burrowing owl; California brown pelican; California least tern; Coulter's goldfields; estuary seablite; ferruginous hawk; globose dune beetle; least Bell's vireo; light-footed clapper rail; salt marsh bird's-beak; sandy beach tiger beetle; senile tiger beetle; Southern Coastal Salt Marsh; tidewater goby; wandering (=saltmarsh) skipper; western snowy plover (CNDDDB, 2016). peregrine falcon
Habitat	<input checked="" type="radio"/> Critical Habitat <input checked="" type="radio"/> Recognized Wetland <input checked="" type="radio"/> Part of a Protected Area <input type="radio"/> Part of Local Conservation Plan <input type="radio"/> Part of a Wildlife Corridor Plan	Critical Habitat: Western snowy plover critical habitat (51 acres); Wetland of Regional Importance in the Western Hemisphere Shorebird Reserve Network; Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) are designated for Pacific Coast Groundfish and Coastal Pelagic Species in the nearshore marine and estuarine habitats; Laguna Point to Latigo Point Area of Special Biological Significance. Audubon California Important Bird Area Recognized Wetland: 5,943 acres (93%) Protected Area : Point Mugu State Park (0.1 acres)
Environmental Beneficial Uses*	<input type="radio"/> Aquaculture <input type="radio"/> Cold Freshwater Habitat <input checked="" type="radio"/> Estuarine Habitat (EST) <input type="radio"/> Inland Saline Water Habitat <input checked="" type="radio"/> Marine Habitat (MAR) <input checked="" type="radio"/> Migration of Aquatic Organisms (MIGR) <input checked="" type="radio"/> Preservation of Biological Habitats of Special Significance (BIOL) <input checked="" type="radio"/> Rare, Threatened, or Endangered Species (RARE) <input type="radio"/> Protected/Special Status/Sensitive Species <input checked="" type="radio"/> Spawning, Reproduction, and/or Early Development (SPWN) <input type="radio"/> Warm Freshwater Habitat <input checked="" type="radio"/> Wildlife Habitat (WILD) <input checked="" type="radio"/> Wetlands (WET) <input checked="" type="radio"/> Shellfish Harvesting (SHELL) <input checked="" type="radio"/> Other: Water Contact Recreation (REC-1 potential) <input checked="" type="radio"/> Other: Noncontact Water Recreation (REC-2)_____	

WORKSHEET 2. GDE ECOLOGICAL INVENTORY



Ecological Inventory for GDE Unit ID Lower Calleguas Creek

		DESCRIPTION/NOTES
Species	<input type="radio"/> Locally Important or Endemic <input type="radio"/> Special Status <input type="radio"/> Rare <input type="radio"/> Threatened <input checked="" type="radio"/> Endangered <input type="radio"/> Presence of Native _____% Non-native _____%	arroyo chub; two-striped gartersnake; least Bell's vireo (CNDDDB, 2016).
Habitat	<input type="radio"/> Critical Habitat <input checked="" type="radio"/> Recognized Wetland <input type="radio"/> Part of a Protected Area <input type="radio"/> Part of Local Conservation Plan <input type="radio"/> Part of a Wildlife Corridor Plan	Recognized Wetland: 6 acres (4%)
Environmental Beneficial Uses*	<input type="radio"/> Aquaculture <input checked="" type="radio"/> Cold Freshwater Habitat (COLD) <input type="radio"/> Estuarine Habitat (EST) <input type="radio"/> Inland Saline Water Habitat <input type="radio"/> Marine Habitat <input type="radio"/> Migration of Aquatic Organisms <input type="radio"/> Preservation of Biological Habitats of Special Significance <input checked="" type="radio"/> Rare, Threatened, or Endangered Species (RARE) <input type="radio"/> Protected/Special Status/Sensitive Species <input type="radio"/> Spawning, Reproduction, and/or Early Development (SPWN) <input checked="" type="radio"/> Warm Freshwater Habitat (WARM) <input checked="" type="radio"/> Wildlife Habitat (WILD) <input checked="" type="radio"/> Wetlands (WET) <input checked="" type="radio"/> Other: Water Contact Recreation (REC-1) <input checked="" type="radio"/> Other: Noncontact Water Recreation (REC-2)_____	

* Relevant environmental beneficial uses listed in Bulletin 118 (2003 update)—Appendix E.

WORKSHEET 2. GDE ECOLOGICAL INVENTORY



Ecological Inventory for GDE Unit ID Revolon Slough

		DESCRIPTION/NOTES
Species	<input type="radio"/> Locally Important or Endemic <input checked="" type="radio"/> Special Status <input type="radio"/> Rare <input type="radio"/> Threatened <input type="radio"/> Endangered <input type="radio"/> Presence of Native _____% Non-native _____%	Arroyo chub (CNDDDB, 2016); least Bell's vireo (Dellith, 2017)
Habitat	<input type="radio"/> Critical Habitat <input checked="" type="radio"/> Recognized Wetland <input type="radio"/> Part of a Protected Area <input type="radio"/> Part of Local Conservation Plan <input type="radio"/> Part of a Wildlife Corridor Plan	Recognized Wetland: 2 acres (8%)
Environmental Beneficial Uses*	<input type="radio"/> Aquaculture <input type="radio"/> Cold Freshwater Habitat (COLD) <input type="radio"/> Estuarine Habitat (EST) <input type="radio"/> Inland Saline Water Habitat <input type="radio"/> Marine Habitat <input type="radio"/> Migration of Aquatic Organisms <input type="radio"/> Preservation of Biological Habitats of Special Significance <input type="radio"/> Rare, Threatened, or Endangered Species (RARE) <input type="radio"/> Protected/Special Status/Sensitive Species <input type="radio"/> Spawning, Reproduction, and/or Early Development (SPWN) <input checked="" type="radio"/> Warm Freshwater Habitat (WARM) <input checked="" type="radio"/> Wildlife Habitat (WILD) <input checked="" type="radio"/> Wetlands (WET) <input checked="" type="radio"/> Other: Water Contact Recreation (REC-1) <input checked="" type="radio"/> Other: Noncontact Water Recreation (REC-2) _____	For Reach 4 (Revolon Slough)

* Relevant environmental beneficial uses listed in Bulletin 118 (2003 update)—Appendix E.

Sources:

- California Department of Fish & Wildlife (CDFW). 2016. California Natural Diversity Database (CNDDDB), Rarefind, Version 3.1.1. Heritage section, CDFW, Sacramento. Last accessed October 2016.
- CPAD: Greeninfo Network. 2016. California Protected Area Network, 2016b. Oakland, California. <http://www.calands.org/>.
- NWI: US Fish and Wildlife Service. 2016. National Wetlands Inventory, v2, California Wetlands. Accessed May 2016.
- CH: U.S. Fish and Wildlife Service, Endangered Species Program, ECOS Joint Development Team. 2016. Critical Habitat Polygons and Lines. Accessed from <https://ecos.fws.gov/ecp/report/table/critical-habitat.html> in December 2016.
- iGDE: The Nature Conservancy, California Department of Fish and Wildlife, California Department of Water Resources. 2018. Potential Groundwater Dependent Ecosystems Database, v0.3.
- WRA Environmental Consultants. 2007. Final Biological Assessment Ormond Beach, Oxnard, Ventura County, California.
- Environmental Science Associates (ESA). 2003. McGrath State Beach Natural Resources Management Plan. Prepared for California Department of Parks and Recreation. April.
- Dellith, C. 2017. Personal Communication. Email exchange regarding presence of least Bell's vireo in Revolon Slough. June 30, 2017.

WORKSHEET 3. POTENTIAL EFFECTS ON GDE SUMMARY



GDE Unit ID	Lower Santa Clara River below 101	McGrath Lake	Ormond Beach	Mugu Lagoon	Lower Calleguas Creek	Revolon Slough
Ecological Value (Step 1.2)	<input checked="" type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input checked="" type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input checked="" type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input checked="" type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable
Susceptibility to Changing Groundwater Conditions (Step 2.1)	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low <input type="checkbox"/> Insufficient Data/Not Applicable
Corresponding Sustainability Indicator	Interconnected Surface Water 	Interconnected Surface Water 	Interconnected Surface Water 	Interconnected Surface Water 	Interconnected Surface Water 	Interconnected Surface Water
Hydrologic Data (Step 2.1)	Groundwater elevation	Groundwater elevation	Groundwater elevation	Groundwater elevation	Groundwater elevation	Groundwater elevation
Baseline Average (Step 2.1)	9.5 ft bgs at GDE Reference Point for 2N22W30A03S*	3 ft bgs at GDE Reference Point for GW-3*	6.6 ft bgs at GDE Reference Point for 01N22W27C04S*	1.1 ft bgs at GDE Reference Point for MW6-6A*		
Baseline Range (Step 2.1)	7-11 ft bgs at GDE Reference Point for 2N22W30A03S*	0 - 6 ft bgs at GDE Reference Point for GW-3*	2.5 - 11.5 ft bgs at GDE Reference Point for 01N22W27C04S*	0 - 2.4 ft bgs at GDE Reference Point for MW6-6A*		

Biological Data (Step 2.2)	NDVI, NDMI	NDVI, NDMI	NDVI, NDMI	NDVI, NDMI	NDVI, NDMI	NDVI, NDMI
Description of Adverse Impacts to GDE (Step 2.3)	None Identified	None Identified	None Identified	None Identified	None Identified	None Identified