

Stressor grouping	stressor	specifics of stressor	potential impact	Current actions to address stressor	level of concern (1-4) low to high	perceived areal extent of stressor 1-4 (few preserves to preserve system wide)	information/ research needs	comments
<b>1. Urban development</b>								
	1.a urban runoff	summer water allowing for movement of non-native species	loss of native aquatic species - expansion of aquatic exotic species	none	2	unknown	initially need a GIS/recent imagery analysis to determine extent	potentially coordinate efforts with WQ agencies since urban runoff has been linked to WQ issues down stream
	1.b presence of urban development adjacent to reserve edge		Potential increase in use/density of small native predators (skunks, raccoons, etc.)	increased predation on native species (bird nests etc.)	2	unknown		review SDTT work to see if there is info that shows predators of concern (skunks, etc) increase in areas closer to urban development
	1.c exotic species invasion							
		1.c.2 Argentine ants	displacement of native ants and loss of prey for some species (contributing factors include moisture for landscape watering and yard waste adjacent to or disposed of within ther reserve), If wide spread the results cold be (1) reduction in effective reserve size and (2) creation of intra-preserve fragmentation for prey species	none	3	unknown- but may be wide spread	survey land managers, use maps generated in summer water mapping exercise to inform spatial extent of issue- may require surveys to quantify- potentially a stressor monitored at the preserve level- IEMM should consider	some preserve managers have mentioned this but if may not be on many managers radar screen as a potetial issue

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		1.c.2 landscape plants (palm trees, pampas grass, eucalyptus trees, etc.)	increase in cost to manage preserve and loss of native habitats	actions occur at the preserve mgt. level, no system to set priorities from the preserve system level	2	unknown	invasive plan mapping may help inform spatial extent and level of concern	urban runoff may exacerbate the problem, more information should be obtained to determine to what extent the stressor may be affecting covered species- i.e. is it more of a let's not have the species in our preserve vs its seriously affecting covered species and significantly affecting the amount or quality of available habitat
	1.d fragmentation		loss of diversity within fragments				some work has already been done- Crooks, SDTT data, Fisher et. al. Should there be a long term diversity monitoring protocol to track changes?	fragmentation associated with development anticipated by the plans was addressed in the plans and is dealt with under the connectivity discussion
	1.e other edge effect							
		1.e.1 human intrusion	loss of usable habitat and potential reduction in species populations	addressed in preserve level management plans	2	3	work with land manager groups to identify extent of this issue	an education program may need to be developed- review Phoenix area open space parks efforts- adjacent landowners helping as park stewards, eyes and ears
		1.e.2 trash dumping,	increase in non-native species- argentine ants, rats, etc. Could result in increase use of rodenticides and insecticides along edges of preserves	to some extent address at the preserve level- efforts vary and may be a more significant issue in HOA managed lands	1	1	work with land manager groups to identify extent of this issue	an education program may need to be developed- review Phoenix area open space parks efforts- adjacent landowners helping as park stewards, eyes and ears

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		1.e.3 homeless camps	loss of habitat and reduction in number of nesting birds, potential increase in non-native species (rats, Argentine ants, etc.) - Riparian and lagoon areas may be most affected	enforcement efforts have focused on this issue on some preserves- transnet funded DFG wardens have assisted	3	probably small but severe where it is occurring	need to get information from land managers regarding extent of this stressor	potentially need to work with agencies that deal with the homeless to improve the situation over the long-term (maybe alternative camp areas or accept there will be sacrifice areas and adapt management strategies to minimize impacts)
	1.f Light and noise		unknown		1	1		was anticipated by the plans
<b>2. Invasive/exotic species</b>								
	2.a Plants							

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		2.a.1 change in invasive annual plant species	reduction or loss of covered species plant or animal (vernal pool species etc.) populations	herbicides, dethatching, mowing, etc.	3	4	invasive plant mapping (on-going), analysis of treatment programs to evaluate control methods, natural community monitoring will provide some information, preserve managers appear to pay attention to invasive annuals. IEMM should include some measure of change of annual plant community in the revised framework management plan (spatial and composition change should both be included). Some research is needed into how various species are spread (wind, roads, human use of preserves including monitoring, etc.)	IEMM contract should provide critical information based on adaptive management. (monitoring program design and implementation), South County land managers group (Transnet Grant) will provide needed info based on adaptive management approach
		2.a.2 perennials	eucalyptus, palm trees, pampas grass, etc.	addressed at the preserve level	2	unknown but likely isolated based on input from preserve managers	obtain additional information from preserve managers. IEMM should include some measure change in framework management plan.	visibility of this stressor may attract greater attention than what the effects on species and habitats may justify because of visibility

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	1.b Animals	aquatic species (bass, sunfish, crawfish, clawed frogs, non-native turtles, etc.	predators and/or competitors with WPT, arroyo toad etc.	USGS has developed control methods to benefit extant populations of WPT	4	4	need to set priority areas for control based on focal species benefits and monitoring to determine effectiveness (probably at different levels of effort)	2011 Transnet grant program identifies this as a focal effort-
		pigs	habitat destruction and loss of populations of some covered plant species, increased mortality of western pond turtle (nest predation, etc) and other ground nesting species	group meeting to discuss control efforts-	4	2 (with high potential to become a \$ if not dealt with)	See CBI report	there seems to be some foot dragging by USFS and DFG (hunting opportunity concern?)
	1.c Nitrogen deposition		increased in non-native species growth that eliminates native species including CSS plant species	none at the local level-	1	2		long term reduced vehicle emission will result in reduced nitrogen deposition
<b>3. Altered Fire Regime</b>								
	3.1 Frequency		vegetation community recovery/conversion					

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	3.2 Intensity		loss of micro habitats- opportunities for demographic recovery	no direct action to address stressor but actions to address the impacts of the stressors- cactus plantings	3	3	post fire monitoring (USGS) will provide information on the severity and temporal extent of the impacts. Further analysis of data and implications for connectivity is needed	post fire monitoring data needs to be further analyzed to identify potential demographic recovery opportunities for species slow to return to burned areas- probably narrow niche species. more prefire planning should be considered if narrow niche species are slow to recover - potential for specific efforts to preserve some critical areas if they are pre-identified - who should take the lead on fire issues
	3.3 spatial extent		inter- and intra preserve fragmentation due to vegetation community changes and loss of opportunities for demographic recovery					
		Response to fire	bare areas - invasive species invasion points	addressed in post fire response	1	1		
<b>4. Altered Hydrology</b>								
	4.a increased or decreased watershed runoff (see also 1.a urban runoff	increased duration or decreased duration of vernal pools	change in vernal pool vegetation community- loss of sensitive species- plants and animals		4	1	quantify extent as part of vernal pool monitoring plan	

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	4.b dams	reduced peak flows	lack of flood flows to maintain dynamic substrate/vegetation on community-arroyo habitat loss? Change in riparian plant community	unknown	2	2	areal extent needs to be further analyzed	consider working with flood control, water and water quality entities to further clarify the issues
	4.c urban development and flood control facilities	reduced peak flows- also related to dams in some situations	loss of flows to move sediments out of lagoons	lagoon management entities considering dredge purchase to allow more frequent dredging of lagoon mouths	2	2		lagoon managers addressing sediment issue and it may not be possible to modify runoff or desirable depending on water quality issues
<b>5. Herbivory/predation (see also exotic species)</b>								
	5.a. enhanced native predator/ herbivore populations							

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		5.a.1 skunks, racoons, burrowing owls, corvids, raptors	nest, young and adult predation-nesting shorebirds	active program to identify and remove predators at shorebird nesting areas-little happening with other species	3	3	the relationship between management actions regarding predators and survival of nesting shorebirds needs to be determined (predator or habitat management issue or both)	DFG may be addressing this through changes in CALT monitoring program and the plans anticipated the need to maintain bobcats, coyotes, mtn. lions in the system to help control some species. Some predaton issues (e.g. burrowing owls on least terns may be an on'going issues because of reserve configuration)
		5.a.2 coyotes and raptors-coastal wetlands	predation on burrowing owls	none	3	1	will be addressed in south county BUOW recovery work	could be a species recovery issue-land management efforts should not seek to increase raptor nesting opportunitiesfor raptors adjacent to BUOW not areas
		5.a.3 raptors	predation on cactus wrens	none	2	2	should be addressed at the preserve level and during the development of	land management efforts should not attempt to increase cactus wren nesting in areas with adjacent raptor nesting habitat present and should not improve raptor nesting/foraging opportunities if cactus wrens are present
		5.a.4 snails and other small herbivores	impacts to covered plant species populations		1	1	should be addressed in plant and/or preserve level monitoring program	this may be a limited issue but it has been raised as the cause of impacts for at least one plant population
<b>6. Pesticides /rodenticides/ herbicides</b>								



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	6.1 herbicides		could impact non-target species (butterflies, native bees and other pollinators)	IEMM to conduct fusilade/quino studies	4	2	as new herbicides are considered for reserve management the impacts to non-target species should be addressed	attention should also be given to what plant species might invade after controlling the target species- IEMM should address this in new framework management plan
	6.2 rodenticides	indirect ingestion (from prey)	increased susceptibility to other diseases	none	unknown	unknown	accumulation in mtn. lions and bobcats has been widely documented in other areas- blood samples should collected for analysis if other monitoring efforts include handling canids, felids and mustelids	
	6.3 insecticides		direct mortality of invertebrates	none	unknown	unknown		probably not a big issue but may want to address this stressor where vernal pools are close to urban areas and runoff might carry insecticide to the pool and affect fairy shrimp
<b>7. Parasitism and disease</b>								
	7.1 parasitism		cow bird nest parasitism	USGS doing research on frequency of needed control efforts	3	3	being addressed by USGS in regards to cowbirds	could be an issue with other species (CAGN) in certain situations- maybe consider addressing the issue at the preserve management plan level

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	7.2 disease		loss of isolated populations- probably most likely for predators because of low populations	none	2	2	could be related to anticoagulant accumulation in predators- include disease testing when studies of predators include handling the animals	monitor the potetial for this to be a significant SD through interactions with other researchers include UCD Wildlife Health Center
<p><b>8. Powerline and Wind Power Facilities</b></p> <p>direct mortality from collisions- raptors and bats</p> <p>none</p> <p>1</p> <p>1</p> <p>Additional wind energy development in the east county should in clude additional review of this issue and the impacts on conserve lands (e.g. does it affect the populations on conserved lands even though the facitities are removed from them by distance). There is some indication in the golden eagle data that wind generation facilities in other parts of the west are killing eagles hatched in San Diego County- could create a recruitment problem-</p>								
<b>9. Roads</b>								
	9.1 fragmentation of habitats		loss of connectivity affecting demographic recovery or genetic drift	see Connectivity Monitoring Strategic Plan	3	4	see Connectivity Monitoring Strategic Plan	out year funding for connectivity improvements should utilize the connectivity monitoring results to help guide priorities

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	9.2 direct mortality		loss of populations/demographic recovery issues	work anticipated to start in 2011 to install fencing improve culverts for species movement	3	3	resurvey CBI choke points and develop SOW for improvements	EEMP grants and other funding sources should be targeted to start improving existing w/l crossing areas
<b>10. Human use of preserves</b>								
	10.a Illegal use							
		10.a.1 unauthorized recreational use including hiking, biking, etc.	see below		3	3	see below	most information of the extent of these activities is anecdotal
		10.a.2 homeless encampments/camps used by illegal immigrants (see above)	degradation of habitat loss and source of ignition of wildfires		3	1		appears to be a much larger issue south county issue in regards to traveling through preserves to move north- reduction in this stressor primarily lies with Border Patrol
		10.a.3 hiking by illegal immigrants			2	2		appears to be a much larger issue south county issue in regards to traveling through preserves to move north- reduction in this stressor primarily lies with Border Patrol
		10.a.4 OHV use	habitat destruction, direct mortality of species, etc.	DFG and Sheriff's enforcement efforts funded by Transnet	3	2	could use imagery to try and quantify impacts areal extent of impacts	major eyesore but impacts have not been quantified
	10.b Authorized use							

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		10.b.1 border patrol	direct impacts to species and habitats- death, destruction and displacement	some education	4	3		Is additional work on an education program for border patrol officers needed? Would it be effective? - BLM has done some of this. Since DFG Wardens are part of a larger team involved in securing the borders should they be utilize as a conduit to get information to the on the ground border patrol officers
		10.b.2 hiking/birding	direct impacts to species and habitats, indirect impacts to species and habitats, potentially precluding foraging opportunities for raptors and other species	none	3	3	need research into the magnitude of recreational impacts and if significant, potential mitigation measures (timing of uses, extent of uses, location of uses, etc) should be identified	The literature indicates that human use of preserves can reduce the populations of species that a preserve can support. Most of the work done has been in Colorado and the SF Bay area and may not be readily applicable to the species and habitats in San Diego. Uses affect differently species differently and effects cannot be generalize (e.g. in some instances hiking with dogs on leash had the same impacts as having no dog but not in all situations).
		10.b.3 biking	direct impacts to species and habitats, indirect impacts to species and habitats	none	3	3		

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		10.b.4 hunting/fishing	species and habitat disturbance, potential for degradation, introduction of exotic species (fish by fishers),	none	2	1		
		10.b.5 equestrian	habitat degradation, introduction of exotic species, reduction in usable habitat areas	none	3	3		
		10.b.6 preserve and species monitoring		none	1	4		some monitoring programs (vernal pool, vegetation) have recognized that their monitoring could result in impacts to species and the vegetation community. Some effort may be needed to review monitoring efforts and identify the extent to which they may affect species and habitats.