Testimony of David Hogan, Center for Biological Diversity

State Water Resources Control Board
IID/SDCWA Transfer Petition Hearing
Phase 2

The Imperial Valley - San Diego Water Transfer and its growth-inducing effects of on globally significant biological resources of San Diego County

The Imperial Valley - San Diego water transfer will provide a new, reliable, expanded, and independent water supply for San Diego County Water Authority service area in coastal San Diego. Utilizing this source, resulting new urban development will significantly harm globally important biological resources and undermine regional multi-species planning.

Debate over whether population growth follows infrastructure is unproductive and beside the point: it remains that the population of San Diego is expected to expand, and this simply cannot occur in the absence of new and expanded water supplies. It is essential therefore, that the proposed new water transfer for San Diego addresses the impacts of the growth it will engender.

I. The water transfer will induce urban expansion in coastal San Diego County

The proposed Imperial Valley - San Diego water transfer will induce new urban growth in coastal San Diego because it will provide the San Diego County Water Authority a new and expanded water source independent of that provided by the Metropolitan Water District, and it will make available water more secure and reliable.

The Draft EIR/EIS concludes that the water transfer will not induce growth because the project purportedly will not increase the amount of water delivered to the region. This analysis is incorrect for at least two reasons, both of which are explained in detail in the letter and the exhibits attached thereto of Johnson & Cross to the SWRCB dated April 9, 2002. First, the underlying assumption is simply not correct: the transfer provides rights to a new and expanded supply of 200,000, and potentially 300,000 acre-feet of water independent of the Metropolitan Water District, and to which San Diego County would not otherwise have access.

Second, the analysis ignores the crucial fact – indeed, the stated purpose for the transfer – that the project provides a secure, reliable source of water to sustain San Diego County's projected growth, reliability which does not currently exist. This assured and reliable water

source to insure against drought is itself growth-inducing, even if the amount of water supplied to the region in normal years remains constant.

Both of these conclusions are supported by statements by the U.S. Department of the Interior and San Diego County Water Authority. According to Interior,

> [The San Diego County Water Authority] seeks to acquire an independent, reliable alternate long term water supply to provide drought protection and to accommodate current and projected demand for municipal, domestic and agricultural water uses.[1]

According to the water authority:

> A water transfer agreement with [the Imperial Irrigation District] will give the San Diego region a reliable new water supply, which is essential to our economy and quality of life.[2]
>
> The San Diego County Water Authority has reached two agreements that will make available to the San Diego region a new supply of up to 200,000 acre-feet of water annually well into the 21st century.[3]
>
> The drought and this assessment indicated that the Authority needed to diversify it's water supplies to meet future demands and improve existing supply reliability.[4]
>
> San Diego will gain a new water source that helps to ensure the reliability of its supply well into the next century.[5]

Further explanation of why the IID water transfer to SDCWA will be growth inducing is contained in the letter of Craig Jones, a professional planner from San Diego to the SWRCB dated April 9, 2002.

In southern California, where water is imported and where there is significant political will to invite population growth with urban expansion, it is historically true that any increased water availability and/or improved water supply reliability has consistently been growth-inducing. While it may be considered desirable to establish a more reliable water supply, it is

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[1] Emphasis added. Federal Register 64 (186): 52102-52104, September 27, 1999.

[2] Emphasis added. Comment by water authority General Manager Maureen Stapleton, Water Transfer Update, Issue #11, July 1997, "News / Publications" section of the water authority web site, August 23, 2001.

[3] Emphasis added. Water Transfer and Exchange Agreements, "Water Management" section of the San Diego County Water Authority web site, August 23, 2001.

[4] Emphasis added. Ibid.

[5] Emphasis added. Ibid.

simultaneously inherent that improved reliability encourages and induces growth. This is obvious throughout the developmental history of southern California. The Draft EIR/EIS itself recognizes that it continues to be true, today and into the future when it states:

> All of the projections [for growth in the San Diego region] are based on the assumption that the necessary water supplies would continue to be available to the region in the future.[6]

The growth-inducing effect of water availability are even more apparent in light of California's recently adopted Senate Bill 221: Water suppliers and distributors now are directly and explicitly involved in the determination of whether urban development can proceed based on water supply availability. Urban developments may not proceed without the water agencies' determination, making the availability of water a necessity for development as a matter of law, and giving the water agencies an active role in growth management. This Project, in providing a new, expanded and independent water supply, and/or improving reliability, will make it directly possible for water suppliers to authorize new urban growth. The Draft EIR/EIS entirely fails to consider S.B. 221.

II. Water transfer-induced urban growth will significantly harm globally important San Diego County biological resources

San Diego County contains globally important biological resources

The concept of "biodiversity hotspots" has been used to identify biogeographic trends and conservation priorities. These analyses invariably identify south-coastal California, including coastal San Diego County, as a global hotspot for species diversity, endemism, endangerment, and conservation priority.

South-coastal California is considered a hotspot for nearly every group of species, including plants, invertebrates, birds, mammals, and reptiles. A version of a recent hotspot map for the continental United States and Hawaii produced by The Nature Conservancy in cooperation with The Association for Biodiversity Information, showed that Southern California stands out as one of the six greatest hotspots for imperiled species in the U.S. Of these six hotspots, Southern California supports the second greatest number of federally threatened and endangered species after Hawaii.

At a global scale, southern California lies within the California Floristic Province, which extends from southern Oregon to northern Baja and includes most of California west of the interior deserts and the Sierran Crest. This is one of only five floristic provinces in the world that are defined by Mediterranean climatic conditions – hot, dry summers and cool, moist winters, mediated by proximity to oceans.

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[6] (dEIR/EIS Section 5.2.2, page 5-37)

All five of these provinces are global hotspots, each with an exceptionally high proportion of endemic plants. Of the five, the California Floristic Province has the greatest diversity of soil types and moisture regimes,[7] which further contributes to its dazzling array of plant communities and associated species – from Mediterranean shrublands such as coastal sage scrub and maritime chaparral to coniferous forests, and from perennial grasslands to alkali marshes, riparian forests, oak woodlands, vernal pools, and myriad other unique habitat types.

The California Floristic Province supports one of the richest plant assemblages in the world. In fact, although it represents only about 1.25 percent of North America's surface north of Mexico, the California Floristic Province supports about 25 percent of all plant species occurring north of Mexico—and about half of these species are endemic to the province[8] [9].

Within the broad and diverse California Floristic Province, that portion lying generally south and west of the Transverse and Peninsular mountain ranges along the Pacific coast comprises the South Coast Ecoregion. The South Coast Ecoregion is truly a "hotspot within a hotspot"—supporting more endemic species (at least 138) and more imperiled species (158 and counting) than any other ecoregion in the U.S.[10] According to the California Department of Fish and Game,[11] this ecoregion supports more than 1/3 of the plant species in all of California, on only 8 percent of the land area.

Coastal San Diego County lies within the South Coast Ecoregion. San Diego County itself is a highly diverse biogeographic area, with unique vegetation communities and assemblages of wildlife species, including coastal sage scrub, chaparral, riparian habitats, oak woodlands, vernal pools, grasslands, and coastal salt marshes and succulent scrub habitats. Unique soil types, such as clays and gabbros, support a variety of endemic plant species. San Diego County is also characterized by the confluence of several biogeographic provinces, including elements more common in Baja California and the Sonoran Desert. San Diego County is known to support over 380 rare and sensitive species, nearly 40 of which are listed as

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[7] Stebbins, G.L. and Major, J. 1965. Endemism and speciation in the California flora. Ecological Monographs 35:1-35.

[8] Mittermeier, R.A., N. Myers, P.R. Gil, and C.G. Mittermeier. 1999. Hotspots: Earth's biologically richest and most endangered terrestrial ecoregions. Conservation International.

[9] Raven, P.H. and Axelrod, D.I. 1978. Origin and relationships of the California flora. University of California Publications in Botany 72:1-134.

[10] Stein, B.A., L.S. Kutner, and J.S. Adams, eds. 2000. Precious heritage: the status of biodiversity in the United States. Oxford University Press. 399 pp.

[11] California Department of Fish and Game. 1996. California wildlife habitat relationships system, version 5.2.

endangered or threatened.[12]

The general effects of urbanization on biological resources

The principal causes of species endangerment are the direct removal of habitat and fragmentation of remaining habitat areas into smaller and more isolated areas.[13] [14] [15] [16] Recent reviews have found that about 85% of imperiled species in the U.S. are affected by habitat loss, (*Ibid* Stein *et al.* 2000) and in Southern California the principal causes of endangerment are residential and industrial development, exotic species, heavy equipment use, and livestock grazing *(Id.* Flather *et al.* 1998). Loss of habitats is known to differentially affect species with large area requirements. These large area-dependent species (e.g., mountain lions, mule deer, golden eagles) are often left with too little habitat to complete their life cycles (e.g., find adequate food, breeding habitat, allow seasonal migrations) and are pushed into greater proximity to roads and developments. Losses of habitat also result in decreases in total population size of species with reduced habitat area requirements, leaving the remaining individuals at a greater risk of local extinction due to stochastic events (e.g., fire, weather patterns, disease outbreaks) and adverse genetic effects from inbreeding.

Aside from the direct removal of natural habitats, development produces a variety of indirect impacts to remaining habitats. As development fragments habitat areas into smaller patches, the amount of habitat edge increases. Habitat edges are the interfaces between natural habitats and adjacent human land uses. This interface is where many adverse indirect impacts to remaining natural open space originate.[17] [18] [19] Indirect impacts include increases in lights and

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[12] U.S Fish and Wildlife Service. 2001. Threatened and endangered species system (TESS). Updated December 8, 2000.

[13] Noss, R.F., M.A. O'Connell, and D.D. Murphy. 1997. The Science of Conservation Planning: Habitat Conservation under the Endangered Species Act. Island Press, Washington, D.C.

[14] Flather, C.H., M.S. Knowles, and I.A. Kendall. 1998. Threatened and endangered species geography: characteristics of hot spots in the coterminous United States. BioScience 48: 365-376.

[15] Stein, B.A., L.S. Kutner, and J.S. Adams, eds. 2000. Precious heritage: the status of biodiversity in the United States. Oxford University Press. 399 pp.

[16] Czech, B., P.R. Krausman, and P.K. Devers. 2000. Economic associations among causes of species endangerment in the United States. BioScience 46

[17] Lovejoy, T.E., R.O. Bierregaard, Jr., and A.B. Rylands. 1986. Edge and other effects of isolation on Amazon forest fragments. Pages 257-285 *in* Conservation biology: the science of scarcity and diversity, Soulé, M.E., editor. Sunderland, MA: Sinauer Associates.

[18] Yahner, R.H. 1988. Changes in wildlife communities near edges. Conservation Biology 2:33-339.

noise, exotic plant and animal species invasions, increased mortality from road kill, changes in fire cycles, disturbance of vegetation by foot and vehicle traffic, changes in hydrology and storm water runoff quality. The long-term adverse effects of the majority of these indirect impacts are not fully understood but it is clear that they can severely degrade the quality of habitats that are not directly impacted by development.

Developments and associated roadways result in elevated light and noise levels compared to undeveloped areas. Elevated light levels are receiving more attention as a causal factor of biological change. Nocturnal animals, such as owls and many snakes, may have their foraging activities disrupted by excessive light levels. Recent research by the USGS (Fisher in prep) indicates that some nocturnal snake species are not found in proximity to developments, and they speculate that excessive lighting is responsible. Elevated noise has long been recognized as having the potential to adversely affect species that communicate by vocalizing.[20] Song birds (e.g., least Bell's vireo, Southwestern willow flycatcher) that establish breeding territories and attract mates with vocalizations can have their reproductive success reduced by excessive ambient noise levels.

Development and other human land uses generally facilitate the invasion of non-native plant and animal species into adjacent natural habitats, especially in small habitat fragments.[21] [22] [23] [24] Exotic species in landscaping adjacent to natural open space often escape, become established, and spread further into the interior of open space areas. Many of the species can spread rapidly and are difficult to control (e.g., pampas grass, eucalyptus, iceplant). In addition, many human activities, such as road and other infrastructure construction (e.g., pipelines and transmission lines), or passive and active recreational activities within open space areas, result in

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[19] Sauvajot, R.M. and M. Buechner. 1993. Effects of urban encroachment on wildlife in the Santa Monica Mountains. Pages 171-180 *in* Interface between ecology and land development in California, Keeley, J.E., editor. Los Angeles, CA: Southern California Academy of Sciences, Los Angeles.

[20] Regional Environmental Consultants (RECON). 1989. Comprehensive species management plan for the least Bell's vireo. Prepared for San Diego Association of Governments. May.

[21] McConnaughay, K.D.M. and F.A. Bazzaz. 1987. The relationship between gap size and performance of several colonizing annuals. Ecology 68(2):411-416.

[22] Tyser, R.W. and C.A. Worley. 1992. Alien flora in grasslands adjacent to road and trail corridors in Glacier National Park, Montana (U.S.A.). Conservation Biology 6(2):253-262.

[23] Brothers, T.S. and A. Spingarn. 1992. Forest fragmentation and alien plant invasion of central Indiana old-growth forests. Conservation Biology 6(1):91-100.

[24] Matlack, G.R. 1993. Microenvironment variation within and among forest edge sites in the eastern United States. Biological Conservation 66:185-194.

disturbance of existing vegetation, compaction of soils, and changes in runoff patterns. These alterations facilitate the invasion of non-native plants, particularly annual grasses and forbs, by providing points of establishment within the interior of open space areas where the non-native species can successfully out-compete native species in the altered physical environment. In addition, free-ranging pets (e.g. cats and dogs) can cause substantial mortality to some wildlife species, particularly birds, reptiles, and small mammals.

Development and the construction of roads often alter movement patterns of many wildlife species, particularly mobile species such as larger mammals (e.g., mule deer, coyotes, bobcats, and mountain lions). Development can force these mobile species to move more frequently across roadways to reach fragmented habitat patches. Road crossings by wildlife often result in increased mortality from road kill on busy roadways.[25] [26] This is particularly true on newly constructed roads that cross existing movement corridors. This increased source of mortality, coupled with reduced habitat quantity and quality from direct and indirect impacts, may be enough to produce local extinction of some species.

Most upland vegetation communities in southern California have evolved with fire, which is thought to have burned at intervals of 20-50 years.[27] Overly frequent fires can type-convert shrub habitats to grassland habitats. The establishment of non-native grasses provides a fuel load that decreases the return interval between fires, creating a positive feedback loop that continues to favor non-native grasses over native species.[28] On the other hand, human fire suppression can lead to overly mature habitats and increased fuel loads, which result in larger, hotter, fires when a burn does occur. Development and fragmentation of habitats does not allow natural fire regimes to continue without placing adjacent homes and businesses at risk, thereby increasing pressure on fire protection agencies to suppress wildfires. In addition, in natural open space areas, fire frequency has actually increased due to human sources of ignition (e.g. Off highway vehicles, cigarettes, homeless campfires).

Residential developments in close proximity to natural open space areas generally result in increased disturbances from foot, bicycle, and motorized vehicular traffic. Establishment of

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[25] Beier, P. 1993. Determining minimum habitat areas and habitat corridors for cougars. Conservation Biology 7:94-108.

[26] Beier, P. 1995. Dispersal of juvenile cougars in fragmented habitat. J. Wildlife Management 59:228-237.

[27] Keeley. J.E. 1986. Resilience of Mediterranean shrub communities to fires. Pages 95-112 in B. Dell, A.J.M. Hopkins, and B.B. Lamont (eds.) Resilience in Mediterranean-type ecosystems. Dr W. Junk Publishers, Dordrecht, Hetherlands.

[28] Minnich, R.A. and R.J. Dezzani. 1998. Historical decline of coastal sage scrub in the Riverside-Perris plain, California. Western Birds 29(4):366-391.

unauthorized trails is a large management issue in most open space areas in San Diego County, resulting in the loss of vegetation and compaction and erosion of underlying soils. These trails are also routes for the invasion of non-native species. In some instances (e.g., Otay Mesa), these disturbances can produce severe, virtually permanent habitat degradation.

It is well known that storm water runoff from developed areas can carry significant loads of urban pollutants.[29] Runoff from impermeable surfaces such as buildings, streets, and landscaped areas transports a number of water quality constituents, such as metals, fertilizers, herbicides, and pesticides, to downstream water bodies. These constituents have been shown to cause toxicity to aquatic organisms and cause eutrophication of receiving waters. Less studied, but potentially as significant, is the influence of altered stream hydrology on riparian biological communities. Many species have evolved under specific hydrologic regimes and can be sensitive to changes in the magnitude, frequency, and duration of flows. There is increasing evidence that modifications of riverine hydrologic characteristics by urban development and irrigated agriculture can greatly affect the composition of the riparian and aquatic communities. In many instances, altered hydrologic characteristics favor non-native species at the expense of native species. For example, recent research by the USGS shows that historically intermittent drainages that now have permanent baseflow from irrigated landscaping or agriculture no longer support arroyo southwestern toads. This pattern has been attributed to the successful establishment of non-native aquatic species (e.g., bullfrogs, bass, and sunfish) that prey on or compete with larval toads. Research by the Conservation Biology Institute at Los Penasquitos Creek[30] shows that increasing watershed development has greatly altered stream hydrology (increasing peak flood flows, total runoff, and summer baseflow) and appears to have produced a shift in riparian vegetation community composition. Permanent summer flow can encourage the establishment of non-native plant species, such as giant reed. Greer[31] showed that urban development in the Los Penasquitios Creek watershed and other land use modifications have resulted in the replacement of salt marsh habitat with freshwater marsh and riparian species.

Urban sprawl harms San Diego County ecosystems

Based on research by Brian Czech, Ph.D. of the U.S. Fish & Wildlife Service, the National Wildlife Federation in 2001 presented the first-ever quantitative assessment of the

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[29] Paul, M.J. and J.L. Meyer. 2001. Streams in the urban landscape. Annual Review of Ecology and Systematics 32:333-365.

[30] White, M.D. In preparation. Urbanization-induced changes in stream hydrology and riparian vegetation communities in Los Penasqutios Creek, California.

[31] Greer. K.A. 2001. Vegetation type conversion in Los Penasquitos Lagoon: An examination of the role of watershed urbanization. Master Thesis, San Diego Sate University. Department of Geography.

causes of species imperilment in California.[32] National Wildlife found that sprawl development is the leading cause of species imperilment in the state. Outranking all other factors, sprawl imperils 188 of the 286 California species listed as threatened or endangered under the federal Endangered Species Act. This data holds true for many listed species in San Diego County and within the service area of the San Diego County Water Authority.

Impacts to biological resources from anticipated urbanization in North County San Diego incorporated cities – all located within the San Diego County Water Authority service area – provide a good example of the likely magnitude of impacts to resources that can be expected from water transfer-induced growth. Of the 29,895 acres of natural habitats remaining in these cities – Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, Vista – it is anticipated that approximately 10,524 acres (35%) will be directly lost to development. Assuming edge effects extend 200 meters into habitat patches, approximately 15,412 acres of the remaining habitat will be fragmented and further degraded by indirect effects of development.

By focusing on specific vegetation communities known to support key imperiled species, we can gain a better understanding of the anticipated direct impacts to these resources as a result of development. Three highly sensitive vegetation communities in San Diego County – coastal sage scrub, southern maritime chaparral, and grasslands – have all experienced significant losses due to development. These are good examples of three of the rarest vegetation communities in California – urbanization has reduced southern maritime chaparral to a mere 5% of its former extent – and support key sensitive species such as the California gnatcatcher, San Diego horned lizard, and golden eagles, as well as numerous plant species that occur nowhere else in the world.

It is anticipated that of the 8,569 acres of coastal sage scrub estimated to still exist in the North County incorporated cities, 3,398 acres (40%) will be directly lost to development, leaving much of that remaining in small, relatively isolated fragments. There are currently 5,209 acres of grasslands in the cities, of which, 3,612 acres (69%) are expected to be lost to development. It is also anticipated that 198 acres of the 968 acres remaining of southern maritime chaparral will be lost to development. These vegetation community losses directly affect the species that rely on them as habitat.

Sightings of golden eagles are becoming increasingly rare in western San Diego County and nesting locations are largely restricted to inland locations, likely as a result of direct and indirect impacts of existing developments. Golden eagles require large areas of open scrub and grassland areas for foraging. In the North County incorporated cities, future development is expected to eliminate 69% of the remaining grassland habitats potentially used by eagles for foraging. In addition, the development of infrastructure (e.g., electrical transmission lines) to support new population growth has also shown to be a source of mortality to eagles, as are other human impacts such as shooting and nest disturbances that are associated with increasing frequency of human recreation and contact.

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[32] Paving Paradise: Sprawl's Impact on Wildlife and Wild Places in California, National Wildlife Federation, February 2001

The California gnatcatcher has been the focus of much conservation attention because of its reliance on rapidly disappearing coastal sage scrub habitats. Within the North County incorporated cities, there is a total estimated population size of 400 to 600 California gnatcatcher pairs. It is estimated that development associated with future growth will result in the loss of 38% of the total estimated population of gnatcatchers, and 42% of the highest quality gnatcatcher habitat. In addition, habitat fragmentation for this species will increase and core habitat size will decrease, resulting in increasing pressure on remaining gnatcatchers from adverse edge effects.

The San Diego horned lizard has declined significantly along the coast in the last 50 years because of increasing loss of habitat and human impacts. It is conservatively estimated that 5,986 acres of the 13,922 acres (43%) of potential horned lizard habitat in the North County incorporated cities will be lost to future development. Because of the unique microhabitat requirements of this species, the actual loss of occupied habitat is likely to be higher. Existing and future development also substantially fragments horned lizard habitat, likely eliminating potential gene flow across the planning area. The movements of this species, as with many other reptiles and smaller wildlife species are likely blocked by even small roads. Thus, small, isolated patches of habitat in which this species becomes locally extinct are unlikely to be re-colonized from other areas. In addition, irrigation runoff from landscaping is known to encourage the invasion of Argentine ants into natural open space areas. Argentine ants out-compete native ant species and are inedible by horned lizards. Thus indirect impacts of human developments can significantly degrade remaining horned lizard habitats. It is expected that, over time, the horned lizard will be extirpated from much of the region within the cities.

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