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REGIONALIZED WATER MANAGEMENT: AN EVOLVING HYDROCOMMONS?

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REGIONALIZED WATER MANAGEMENT: AN EVOLVING HYDROCOMMONS?

By Gary D. Weatherford[1]

The foremost water challenge of the 21st century will be figuring out how to satisfy the water demands of 8 billion-9 billion people while at the same time protecting the aquatic environment that all terrestrial species depend on. The key elements of a new water management paradigm to meet this challenge include: (1) raising water productivity through investments in conservation, efficiency, recycling, and reuse; (2) accounting for the valuable but unpriced ecological services that natural water systems provide: (3) developing creative, participatory planning aimed at meeting water needs in an economically, socially, and environmentally sound manner; (4) building new partnerships among ecologists, engineers, planners, and other professionals; and (5) promoting a water ethic grounded in the principles of efficiency, equity, and ecosystem protection.[2]

I. Water and Growth: An Incomplete Equation?

Growth in the arid western United States has heightened water scarcity, spurring the reallocation of irrigated agricultural water supplies to both the municipal/industrial and environmental sectors.

Water and population growth are physically linked, irrespective of whether water is supplied to induce or to accommodate growth. Water is essential for new development, whether the water be from existing developed supplies (conserved, reclaimed, recycled, or not) or from newly acquired, supplemental supplies. Land and air uses associated with growth can degrade water quality, affect the amount of runoff and even influence climate.

The relationship between water and growth differs from area to area and, most importantly, cannot be understood apart from a host of social, economic, political and ecological

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[2] Sandra L. Postel, "Water and World Population Growth," American Water Works Journal 131 (April 2000), at 138.

forces and conditions that impinge upon and help define the relationship. Water management and growth management are complex endeavors shaped by communities of interest whose values, agendas and resources differ markedly.

While the water and growth relationship is complex, let me venture some generalizations, based on California experience, in the form of two hypotheses: first, water development and management are not presently significant determinants of growth[3] and, second, future growth will be supported mainly by agricultural water.

> ...[W]e care about [water and growth] because of the impact on agriculture. There's enough water for about 300 million people in [California], probably 400 million if you stretched it. The reason we care about this is that if we continue to grow like this, it isn't that there won't be enough water to accommodate the growth, its clearly going to be there. It's going to come from agriculture. That's why ag is concerned. And that is, to some extent, why other people are concerned. The idea that somehow the use of water can control growth does circulate. I don't think anyone who's really analyzed it believes that. There is no place that I know of that has been successful over the long term, except in tiny little communities to constrain growth using water....
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> This debate is really about the effect on agriculture and the shift from lower value to higher value crops. That's a good reason to be concerned about it, but I think that's where the focus should be and not on: "Does water control growth?" Or, "Does growth create the demand for water?" Those things are going to happen. The only question is how we accommodate it and how we deal with the effects on it.[4]

What such determinism -- or fatalism -- , assumes, of course, is that no successful political

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[3] A limited amount of growth has been accommodated by the implementation of water conservation measures in urban service areas.

[4] Gerald Meral, Executive Director of Planning and Conservation League, in "Water and Growth: A Roundtable Discussion," Western Water (March/April 2000), at 11.

counter movement will arise to stem seriously the ag-to-urban water conversion.[5] What such determinism does not answer is: "Who will decide the rate, location and extent of the urban-suburban expansion and the agricultural contraction?"[6] The answer, however frustrating, now and for the foreseeable future, is: "An alphabet soup of existing institutions -- hopefully working better and together."

The thesis of this short paper is that the relevant growth management and resource management institutions need to enter into collaborative alliances more rigorously to generate better information, to integrate diverse policies and values, to coordinate actions and to support the resolution or management of conflict. The two questions I will be leaving with you are: 1) How regional, if at all, should those alliances be; and 2) How comprehensive should the subject matter of those alliances be? My questions far exceed my answers.

II. Contemporary Context: Colliding Values and Communities of Interest.

As a society we value objectives that often are in competition or conflict. Freedom of movement and procreation, the opportunity to enjoy private property ownership and qualified control of that property, as well as the right to choose where to reside, are fundamental features of our collective life and experience. Yet the expression of such freedoms in the aggregate can result in population settlements and concentrations that erode valued qualities of life and lead to the destruction of vital natural systems -- even the extinction of species.

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[5] From a regional perspective, I believe that such an assumption is a safe one for the foreseeable future. When anti-growth sentiment prevails in one location, it probably shifts prospective water demand elsewhere in the region rather than eliminating it entirely.

[6] Greater efficiencies in cropping and on-farm management practices have dampened the impact of agricultural land water reduction in California. From the mid-80s to the mid-90s, California saw 71,000 nonirrigated acres and more than 218,000 irrigated acres being converted to urban use, yet the agricultural sector offset that loss by developing marginal land and by enhancing its economic yields per unit of water. The state's farm productivity index has doubled since 1949. See Eric Brazil, "Agricultural Irrigation: Efficient Techniques Help State Growers Squeeze Abundance from Shrinking Land," San Francisco Examiner, May 14, 2000.

These competing values are embodied variously in constitutional, legislative and regulatory provisions, discretionary administrative policies, economic incentives and disincentives, and cultural customs and beliefs. And they are held by various communities of interest that influence both public decision making and private market activity relative to population growth and settlement as well as water development and management.

III. Growth Management Through Planning, Land Use Regulation and Environmental Reporting.

Prohibiting growth is neither practically possible nor philosophically consonant with our democratic principles. Managing growth through planning and land use controls, however, has become acceptable and is being widely pursued with varying success.

The origins of growth management via the planning and regulation of private land use are found in selective provisions of state legislation of the 1970's (e.g. Hawaii, Vermont, California, Colorado, North Carolina, Florida and Oregon) that promoted state-mandated comprehensive land-use planning.[7] The 1980's and 1990's saw more evolution in growth management legislation (e.g. New Jersey, Maine, Rhode Island, Georgia, and Washington State). From this multi-state experience two concepts of major importance arose: consistency and concurrency. The plans implemented by local, regional and state agencies are to be consistent with the state-level growth management goals set by the legislature. The second concept, concurrency, "mandates that infrastructure facilities" (such as water, waste management and streets) be either "in place concurrently with the impacts of new development" or "made up over time."[8]

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[7] National land use legislation was deliberately rejected in the 1970s, including amendments that might have linked land and water planning. See Jane E. Daly, "A Glimpse of the Past - A Vision for the Future: Senator Henry M. Jackson and National Land-Use Legislation," 28 The Urban Lawyer 7 (Winter 1996).

[8] Peter A. Buchsbaum and Larry J. Smith (eds.), State & Regional Comprehensive Planing: Implementing New Methods of Growth Management (American Bar Association, 1993), at 5.

In reaction to suburbanization and sprawl, and the relative failure of conventional land use controls to prevent the loss of open space and agricultural lands,[9] there evolved through local ordinances an objective "to channel development into locations, uses, and densities adequate to support an appropriate urban form, one that discourages low-density sprawl and encourages serviceable densities."[10] The hallmark 1972 New York case of Golden v. Planning Board of Town of Ramapo[11] "established the principle of 'reasonable use' over a 'reasonable period of time'" and legitimated the integration of "the development plan, the capital improvement budget, subdivision regulation, affordable housing, and zoning."[12]

Since Ramapo there has been a movement toward tiered, sequenced, and channelized urbanization and suburbanization with concurrent public facility development.

> Many communities throughout the U.S. have experimented with a number of techniques to manage growth. The techniques most commonly used include comprehensive planning, zoning and subdivision control, environmental controls and utility extension control. The more complicated and innovative growth management systems have combined several of these techniques. Although the techniques have both similarities and differences, and may involve variations in application based on local needs, they can generally be classified into two types, to wit: (1) controls based on availability of public utilities and services; and (2) controls based on number, location and mix of residential units.[13]

The spectrum of statewide land use planning and regulation controls in California that

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[9] Robert H. Frelich, From Sprawl to Smart Growth (Chicago: American Bar Association, 1999), at 2-3..

[10] *Id* at 6.

[11] 30 N.Y. 2d 359, appeal dismissed, 409 U.S. 1003 (1972).

[12] Frelich, note 4, *supra*, at 6-7.

[13] Longtin's California Land Use (2d ed., 1987), at 274-5.

bear upon water and growth includes general plan coverage,[14] standards for adequacy and safety of supply,[15] regulation of local agency formation and spheres of influence,[16] urban water management planning,[17] environmental disclosure and reporting,[18] and authority to limit water utility extensions or impose moratoria on hookups.[19] This array of rules did not forestall

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[14] California Government Code, section 65302(d): "That portion of the conservation element [of the general plan] including waters shall be developed in coordination with any county wide water agency and with all district and city agencies which have developed, served, controlled or conserved water for any purpose for the county or city for which the plan is prepared."

[15] See, e.g. California Health & Safety Code, sections 116540-116590; 22 California Code of Regulations, sections 64560-64644.

[16] California Government Code, section 56300 et seq. In the approval of annexations the county-wide local agency formation commissions (LAFCOS) are to consider the "availability of public utility services," section 56375(d)(4).

[17] California Water Code, sections 10620-10642.

[18] The California Environmental Quality Act requires that cumulative impact analysis cover growth-inducing impacts. See California Public Resources Code, section 21100(a); also, related guidelines at 14 California Code of Regulations, section 15126.2(d). Water, land use, ecosystems and population distribution are mentioned in the same sentence of the guidelines pertaining to the content of an environmental impact report; see 14 California Code of Regulations, section 15126.2(a).

[19] See California Water Code, section 350-358; also, Swanson v. Marin Municipal Water District, 56 CA3d 512 (1976); Building Industry Association v. Marin Municipal Water District (1991); County of Del Norte v. City of Crescent City, 71 Cal. App.4th 965 (1999); Gilbert v. State, 218 Cal. App.3d 234 (1990); Hollister Park Inv. Co. v. Goleta Co. Water District, 82 Cal. App.3d 290 (1978); Dateline Builders, Inc. v. City of Santa Rosa, 146 Cal. App.3d 520 (1983); and Residents for Adequate Water v. Redwood Valley County Water District, 34 Cal. App. 4th 1801 (1995). The Redwood Valley case, at 1807, does illustrate that water unavailability can stop growth in local settings where water augmentation cannot be attained:

> These [California] statutes and regulations clearly impose an obligation on the district to determine whether an adequate water supply exists to serve existing needs before new service connections may be added and prohibit new service connections if these state requirements are not met. The trial court made factual findings that the district lacked a legal source of water sufficient to

California's "attainment" of a population of 32 million by 1995. The projection for 2020 is 47.5 million, in which event there could be a water shortfall between 2.4 MAF (average water year) or 6.2 MAF (drought year), assuming no increased storage, reallocation or augmented supply.[20] What the array of state controls (in conjunction with local government regulations) hopefully has done, and will do, is to affect positively the timing, location, density and infrastructure reliability of the development associated with such population. "Smart" growth initiatives in California and elsewhere in the West are touted for making things demonstrably better than they would be otherwise, not for preserving images of yesteryear.

One important administrative check point for displaying growth and water supply issues side by side can be found in state-mandated environmental reporting for proposed development projects. This is exemplified by 1995 California legislation requiring that public water system assessments of the adequacy of water supply, as well as information concerning plans to augment water supply, be included in environmental impact reports.[21] Limited case law under the California Environmental Quality Act has led one commentator to suggest that "a developer may have to choose between laying out the money up front to purchase a water supply, or taking a chance that the water supplies identified and analyzed in the [environmental impact report] will be found to be too sketchy or unrealistic".[22] One California case has been interpreted in a manner suggesting that "a water agency cannot justify obtaining a water supply based on a draft general

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meet then current normal needs or maximum demand conditions. We are bound by those findings of fact.

Tentative maps can be extended during a water or sewer moratorium, California Government Code, section 66452.6(a).

[20] California Department of Water Resources, California Water Plan Update, Bulletin 160-68, Executive Summary (November 1998), at ESI-2.

[21] CA S.B. 901 (Costa), sections 10910-10915, California Water Code.

[22] Scott Shapiro, "The Shrinking Range of Water Supply Options for California Development," California Water Law & Policy Reporter 129 (March 2000), at 131, interpreting Stanislaus Natural Heritage Project v. County of Stanislaus, 48 Cal. App.4th 182 (1996).

plan because doing so will preclude the proper environmental review... of the growth inducing impacts of water and the interconnectedness of development and water."[23] If nothing more this illustrates an increasingly functional relationship between land planning, water management and growth.

IV. Water Management's Role in Smart Growth

Many public and private water purveyors began to undertake their own "integrated" form of planning during the 1990s.

> [Integrated Resources Planning (IRP)] is a logical way to tackle the wide range of interconnected issues that affect and are affected by water resource planning. IRP is extremely comprehensive. It begins with the premise that a wide range of traditional and innovative supply-side and demand-side resources must be considered.[24]

The principal elements of integrated resources planning, as borrowed from the electric utility industry and applied to water, are demand forecasting, identification of policy objectives, development of evaluation criteria, analysis of supply-side and demand-side options (e.g. potential resources, conservation alternatives), consideration of uncertainties, shaping of resource sequences and strategies, examination of possible institutional structures, and the making of final recommendations.[25] The scale, timing, location, density and type of potential development -- facets of growth within the water purveyor's service area -- are of direct relevance to this IRP process. Information exchange, substantive engagement, and continuing coordination between the water purveyor and the land planning, land-use regulation, electric utility, air quality management, waste management, transportation management and other appropriate agencies can

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[23] *Id.*, at 132-133, interpreting County of Amador v. El Dorado County Water Agency, 76 Cal. App. 931 (1999).

[24] Gary Fiske and Anh Dong, "IRP: A Case Study From Nevada," American Water Works Journal 12 (June 1995), at 73.

[25] *Id.*, at 75-80.

be started or sustained by IRP. IRP can complement or become a component part of whatever smart growth initiatives exist or arise in an area. It is not intended as a one-time exercise but rather a continuing, disciplined way of institutional living.[26]

Water supply assessments, at a level equivalent to an IRP or lower, can be mandated by state legislation. California, for example, requires urban water management plans of purveyors of municipal/industrial supplies[27] and agricultural water management plans of irrigation water suppliers.[28] The urban plans must consider population , climate and demography.[29] Specifically,

> [t]he projected population estimates shall be based upon data from the state, regional, or local service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.[30]

One proposed legislative amendment in California would mandate that, in developing water demand forecasts, public water suppliers:

> Incorporate information from the land use elements of general plans prepared by cities and counties within the public water system's service boundaries.
>
> Collect water use data and compile it by customer classification within census track boundaries... [and]

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[26] See, e.g. Susan L. Robinson, "Integrated Water Resource Planning in Las Vegas," Integrated Water Resources Planning for the 21st Century (Michael F. Domenica, ed.) (1995), at 548, 551.

[27] Sections 10620-10642, California Water Code.

[28] Agricultural water management planning is mandated at California Water Code, sections 10800-10855.

[29] Section 10631(a), California Water Code.

[30] *Id.*

> Utilize available land use density models in preparing water demand forecasting estimates.[31]

Only time will tell whether such a compulsory approach to the integration of land use planning and water management will be adopted and prove workable.

V. Parallel Quests for Ecosystem Management and Functional Land Units.

The intricate array of regulatory and management tools that have evolved over the past 30 years to deal with the intersection of land, water and growth does not tell the whole story. Growth management, land use regulation and water management - however much coordinated and integrated - are only part of the proverbial elephant. A more comprehensive management framework has been rising before our eyes: ecosystem management on the public lands and in the administration of the Endangered Species Act.

At root, the ecosystem encloses all the resources that conceivably could be managed.

> An ecosystem can be described in simple terms as a biological community (all of the organisms in a given area) plus its abiotic (nonliving) environment.[32]

The spatial dimensions of an ecosystem are not always apparent or scientifically known, however.[33] Whatever are determined to be the boundaries of the fragmented governmental

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[31] CA A.B. 1219 (Kuehl; January 13, 2000 version), section 3 (that, *inter alia*, would amend Water Code Sec. 10631(e)).

[32] John M. Blair et al., "Ecosystems as Functional Units in Nature," 14 Natural Resources & Environment 150, at 151 (Winter 2000).

[33] Id., at 155:

> The ecosystem concept is often applied to well-defined and relatively small geographic entities in nature, where the input and outflow of energy and materials is reasonably well delineated. The

authority over biological communities and abiotic environments, those boundaries rarely correspond neatly with ecosystem units (once defined). (One exception can be ecosystems within large federally-owned expanses, but even there one often finds the intrusion of inholdings and the boundaries of local, state and tribal governments .) Because of the prominent role played by water in terrestrial natural systems, the watershed is commonly preferred as the functional unit in ecosystem approaches to natural resource management. Such has been the choice of the agency having critical influence over the implementation of the Endangered Species Act (ESA), the U.S. Fish & Wildlife Service (USFWS), for example.

> Although individual members of the scientific community have offered various thoughts on how to define ecosystems geographically for the purpose of practical management, there is not unanimous agreement on this topic. The USFWS therefore decided to base its ecosystem approach on a type of natural system that has widely recognized and generally well-defined boundaries: watersheds.
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> Based on watersheds mapped by the U.S. Geological Survey, the USFWS has clearly defined 53 management units and ecosystem teams have been formed for each of them. *** The ecosystem teams encourage cross-program interaction to deal with the issues that affect a specific geographic area. In this way, the ecosystem teams also practice an interdisciplinary approach, bringing in knowledge and expertise from the various branches of the science

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ecosystem concept, however, can also be applied to systems in nature that are less clearly bounded, including larger geographic areas that often contain several smaller ecosystems in whole or in part. These ecosystems may be more difficult to manage, unless management is scaled to definable subunits. This explains, perhaps, why ecosystem management is better developed in some ecosystems (forested watersheds) than others (coastal ocean areas, large rivers). In fact, it may be more difficult to apply ecosystem management approaches to large ecosystems that interact in many complex ways with the surrounding landscape, as is the case with coastal estuaries.

field.[34]

Whatever the geographical unit, the issue remains: What is "ecosystem management"? There are competing definitions of "ecosystem management,"[35] one of which reads:

> ... integrating scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over the long term.[36]

Ecosystem management has been a rallying cry of the Clinton Administration. By 1994 at least 18 federal agencies reportedly were committed to its principles,[37] the most notable of which was the U.S. Fish and Wildlife Service (USFWS).[38] The USFWS soon joined forces with the

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[34] Jim Rappaport Clark, "The Ecosystem Approach from a Practical Point of View," 13 Conservation Biology 679 (June 1999). Early in 2000, the Secretaries of Agriculture and Interior announced a joint initiative to unify departmental water quality activities along watershed lines, under the title, "Unified Federal Policy to Ensure a Watershed Approach to Federal Land and Resource Management".

It is noteworthy that basins and watersheds have been geographical units of choice. See A. Doel, "Evolution of Watershed Planning and Management in National Water Policy" in Proceedings of Watershed '93: A National Conference on Watershed Management, Alexandria, VA (EPA 840-R-94-0021), at 107-113. In the western United States, a loose coalition called the Watershed Management Council has been holding biennial conferences since 1986.

[35] See Norman L. Christensen, et al., "The Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management,"" 6 Ecological Applications 665 (1996), at 668.

[36] R.E. Grumbine, "What is Ecosystem Management," 8 Conservation Biology 27-38 (1994), quoted in Id., at 668.

[37] Note 31, supra, at 668.

[38] See, e.g., USFWS, An Ecosystem Approach to Fish and Wildlife Conservation: An Approach to More Effectively Conserve the Nation's Biodiversity (March 1994).

National Marine Fisheries Service (NMFS)[39] to infuse the ecosystem approach into the administration of the ESA.[40] The mechanism for this has been the Section 9 provisions prohibiting the taking of species, particularly the "harm rule".[41]

The record of ecosystem management is incomplete, disputed and evolving. Large-scale undertakings such as the Interior Columbia Basin Ecosystem Management Project,[42] South Florida Ecosystem Restoration initiatives,[43] and CALFED Bay-Delta efforts[44] challenge our

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[39] See Notice of Interagency Cooperative Policy for the Ecosystem Approach to the Endangered Species Act, 59 Federal Register 34,273 (July 1, 1994).

[40] Section 2(c) of the ESA has contained a reference to "ecosystems" since the Act's inception: "...provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved," 16 U.S.C. § 1531(b),. But the ESA is dominantly single-species in its express orientation. See J.B. Ruhl, "Ecosystem Management, the ESA, and the Seven Degrees of Relevance," 14 Natural Resources & Environment 156 (Winter 2000).

[41] J.B. Ruhl, "Ecosystem Management, the ESA, and the Seven Degrees of Relevance," 14 Natural Resources & Environment 156 (Winter 2000), at 160-162 (discussion of Babbitt v. Sweet Home Chapter of Communities for a Greater Oregon, 515 U.S. 687 (1995) and circuit court decisions following).

[42] Rebecca W. Watson, "Ecosystem Management in the Northwest" 'Is Everybody Happy'?", 14 Natural Resources & Environment 173 (Winter 2000), at 175-178.

[43] Alfred R. Light, "Ecosystem Management in the Everglades," Natural Resources & Environment 166 (Winter 2000), at 169-172.

[44] Since about 1993, the Bay-Delta estuary in Northern California has been the setting for one of the most ambitious federal-state-stakeholder resource management undertakings in the nation. Among other forces, the ESA, water quality standard setting and Central Valley Project Reform Act converged to compel interagency cooperation, first between state agencies and between federal agencies, then between state and federal agencies, in search of long-term solutions for endangered fisheries, water quality degradation and water supply problems. In 1994, a "framework" agreement formalized an interagency and public-input process and an "accord" (3 year, later extended) was reached that led to funded and implemented measures to monitor and improve Delta outflow, among other things. Hundreds of millions of dollars have since been committed to environmental restoration under the aegis of its current moniker, "CALFED". While the political coalition sustaining the program is strained, CALFED is close to releasing a final environmental impact statement and a record of decision, setting out the program's next phases.

present institutional capacity to understand complex natural systems and implement strategies. "Adaptive" ecosystem management may be a necessary end game for humans on the planet, but we are still groping in the search for effective institutional approaches and manageable geographical scales for such an enterprise. Serious questions remain as to how much alignment can occur between the boundaries of institutions and ecosystems, and as to how to coordinate effectively the regulation of private land and the management of public land in the western states.

VI. Interagency Regionalization And the Notion of a Hydrocommons

For the foreseeable future, improved management of both growth and natural resources depends upon interagency collaboration among existing institutions. The best geographical scale for that collaboration needs to be decided in each setting. One scale I offered for consideration a decade ago was the "hydrocommons."[45]

The "hydrocommons" is a geographical unit comprehending both natural drainages and adjacent water service areas in a hybrid fashion. Interconnectedness and interdependency among voluntary associations and public agencies that rely on a common source of water had become evident by 1990. My essay on the hydrocommons pointed out how regulatory rules variously can unify and divide stakeholders within the hydrocommons. Water quality planning, for example, was noted as a force for the better integration of multi-purpose water management.[46] Other

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[45] Gary D. Weatherford, "From Basin to 'Hydrocommons': Integrated Water Management Without Regional Governance" (Natural Resource Law Center, University of Colorado: Western Water Policy Project Discussion Series, Paper No. 5, 1990). The natural drainage/service area hybrid unit already existed in practice in some settings, one example being the regions and service areas recognized in both the 1922 Colorado River Compact (Art. II; see House of Representatives Document No. 605, 67th Congress, 4th Session, March 2, 1923) and 1948 Upper Colorado River Compact (Art. II; 63 Stat. 31).

[46] The emerging impact of TMDL (total maximum daily load) regulation by EPA is a contemporary example of regulatory activity drawing together land and water management. See Section 303(d) of the Clean Water Act, 33 U.S.C. section 1313(d); also, Pronsolino v. Browner, 91 F. Supp.2d 1337 (N.D. Cal., 2000) (EPA authorized to determine TMDLs for nonpoint

integrative factors then identified as both important and operative at the hydrocommons level were infrastructure interconnections; coordinating agreements; water right quantifications; shortage sharing; water conservation, reclamation and reuse; and water reallocation, marketing and pricing.[47] While I think that the "hydrocommons" message was on target as to such forces and factors, as well as to the interplay of voluntary relationships (e.g. watershed associations) and compulsory relationships (e.g. competitive engagement in administrative proceedings and litigation), I must confess that I totally failed to foresee the determinative role that the Endangered Species Act would play in water management in general, and water rights administration in particular, in the West.

Viewed from the new millennium, the "hydrocommons" appears to be more of a metaphor for the way natural resource planning and management continues to be fragmented than it is either an apt description of reality or a normative prescription. Physically, the real commons -- our planetary habitat -- dynamically persists without partitions (or prefixes such as "hydro"). As a matter of intellectual history, one could argue that partitions -- such as land management, water management, air quality management, forest management, grass lands management -- are transitory institutional artifacts. But at present they may be necessary artifacts. While more conceptually satisfying, "ecosystem management" arguably remains too undeveloped, nascent, unauthorized, and wanting in political and institutional support -- to be an immediate substitute. As we gain more resolution and accommodation of value conflicts, however, we will make more progress down the transition path to ecosystem management.

There are reasons our institutions fragment the commons. First, competing communities of interest and values favor specialized management and particularized accountability and returns. Second, manageability requires that the subject matter be "bite-sized" -- there is a "management scale" feasibility factor. (Admittedly this is intricately related to the influence of

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sources).

[47] Note 41, *supra*, at 14-18.

communities of interest.) Third, limited knowledge -- and an appalling lack of integration of that knowledge -- is a barrier.

Regional government per se has not been generally accepted in the United States; successes have been limited and few.[48] Yet, cities, counties and special districts,[49] including water agencies, can "regionalize" their local resource management outlook and activities through interagency programs and joint powers arrangements. Increasingly they are doing so.[50] As they do so they will be playing catch up in many cases to state and federal agencies that have developed regional approaches to problem assessment and problem solving.

VII. Critical Features Needed for Commons Governance and Protection: A Call for Uncommon Co-Existence

The kind of effective "interagency regionalism" envisioned in this paper presumes growing networks of data collection, exchange, and interpretation, as well as deep engagement among participating agencies in the exploration of policy options and institutional reforms.

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[48] See, generally, Peter A. Buchsbaum, note 8, *supra*, and H. V. Savitch and Ronald K. Vogel, Regional Politics: America in a Post-City Age (1996).

[49] There are 458 independent special districts specializing in water services in California. They, along with another 1,742 independent special districts in the state, have recently been told that they are not publicly visible and accountable enough. See California Little Hoover Commission, Special Districts: Relics of the Past or Resources for the Future (May 2000), at iv and 7.

[50] Resource planning and/or management alliances among public agencies at all levels of government have reached prolific proportions. Examples abound in western states (e.g. Sacramento - area Water Forum (40 agencies), Southern Nevada Water Authority (7 regional water and wastewater agencies), Salton Sea Authority, Front Range Mountain Backdrop Project (5 Colorado counties), Healthy Community Indicators Project (4 Colorado counties), Santa Ana Watershed Project Authority, and Orville Lake Joint Powers Authority (3 cities, 1 county, and 1 parks and recreation district). Private-public arrangements are on the increase as well (e.g. memorandum of understanding between the Metropolitan Water District of Southern California and Cadiz, Inc., concerning a desert conjunctive management project).

Regionalization also presumes effective processes for collaboration and for conflict resolution or management. While in some settings consensus can be reached on a set of issues, consensus ought not to be stubbornly sought where conflicting fundamental values linger outside the reach of voluntary accommodation[51]. Limited cooperation and measured collaboration appear to be preferable goals in such circumstances, and can even be complemented by litigation. Opponents increasingly must learn how simultaneously to cooperate around negotiable issues while yielding non-negotiable positions to judges, arbiters, administrators and legislators. There remain resource and growth conflicts in the western United States that run too deep to be negotiated or mediated away. Rule-givers making tough decisions are critical to the West's evolving 21st Century identity. Such leaders need to be identified, appreciated and promoted. All of this assumes a greater sophistication among our citizenry -- and that assumes more effective education and communication.

There is no viable alternative to the time-consuming and painstaking processing of collaboration and conflict, and to the incremental reformation of our institutions. This is a conventional message -- except to the extent that it implies an uncommon commitment to making our institutions work better by adapting to new information. Informed co-existence is the way we can best live on the commons and, while we are at it, modulate the interplay of such heavily value-laden factors as growth and water.

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[51] Marc Reisner of Cadillac Desert fame has been sounding this chord in his presentations of the past year or so.

SELECTED REFERENCES

Barakat & Chamberlin, Inc., Integrated Resource Planning (IRP) Guidelines (February 1994).

Bates, Sarah F. et al., Searching Out the Headwaters: Change and Rediscovery in Western Water Policy (Washington, D.C.: Island Press, 1993).

Benson, Reed D., et al., "Recommendations for an Environmentally Sound Federal Policy on Western Water," 17 Stanford Environmental Law Journal 247 (1998).

Benvenisti, Eyal, "Collective Action in the Utilization of Shared Freshwater: The Challenges of International Water Resources Law," 90 The American Journal of International Law 384 (1996).

Blomquist, William, Dividing The Waters: Governing Groundwater in Southern California (San Francisco: ICS Press, 1992).

Braus, E.H.P., et al (eds.) The Scarcity of Water: Emerging Legal and Policy Responses (London: Kluwer Law International, 1997).

Breckenridge, Lee P., "Reweaving the Landscape: The Institutional Challenges of Ecosystem Management of Lands in Private Ownership," 19 Vermont L. Rev. 363 (1995).

Buchsbaum, Peter A., and Smith, Larry J. (eds.), State & Regional Comprehensive Planning: Implementing New Methods of Growth Management (American Bar Association, 1993).

Byrne, J. Peter, "Are Suburbs Unconstitutional" (Book Review), 85 The Georgetown Law Journal 2265 (1997).

California Little Hoover Commission, Special Districts: Relics of the Past or Resources for the Future (May, 2000).

Cash, David, "Assessing and Addressing Cross-Scale Environmental Risks: Information and Decision Systems for the Management of the High Plains Aquifer," ENRP Discussion Paper #-98-17, Kennedy School of Government, Harvard University.

Christensen, Norman L., et al., "The Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management," 6 Ecological Applications 665 (1996).

Clark, Jamie Rappaport, "The Ecosystem Approach from a Practical Point of View," 13 Conservation Biology 679 (1999).

Coglianese, Cary, "Assessing Consensus: The Promise and Performance of Negotiated Rulemaking," 46 Duke Law Journal 1255 (April, 1997).

Coglianese, Cary, "Litigating Within Relationships: Disputes and Disturbance in the Regulatory Process," 30 Law and Society Review 735 (1996).

Cortner, Hanna J. and Moote, Margaret, The Politics of Ecosystem Management (Washington, D.C.: Island Press, 1999).

Daily, Gretchen (ed.), Nature's Services: Societal Dependence on Natural Ecosystems (1997).

Daly, Jayne E., "A Glimpse of the Past - A Vision for the Future: Senator Henry M. Jackson and National Land-Use Legislation," 28 The Urban Lawyer 7 (Winter 1996).

Davis, Kingsley, and Bernstam, Mikhail S. (eds.), Resources, Environment and Population (New York: Oxford University Press, 1991).

Dellapenna, Joseph W., "Treaties as Instruments for Managing Internationally-Shared Water Resources: Restricted Sovereignty vs. Community Property," 26 Case Western Reserve Journal of International Law 27 (1994).

DuMars, Charles T., "Public Policy Considerations in State Water Allocations and Management," Mineral Law Institute § 24.01 (July 1996).

Dunn, Sandra K., "Endangered Species Act Versus Water Resources Development: The California Experience," 25 Pacific Law Journal 1107 (1994).

Easter, W. M.K., and Hearne, R., "Water Markets and Decentralized Water Resources Management: International Problems and Opportunities," 31 Water Resources Bulletin 9 (February 1995).

Fradkin, Philip L., A River No More: The Colorado River and the West (Berkeley: University of California Press, 1996)

Freemuth, John, "Science, Politics and Watersheds: Thoughts on Their Integration," Proceedings of the Seventh Biennial Watershed Management Council Conference, Boise, Idaho (October 1998).

French, Hilary, Vanishing Borders: Protecting the Planet in the Age of Globalization (New York: W. W. Norton & company, 2000).

Freyfogle, Eric T., "Water Rights and the Common Wealth," 26 Environmental Law 27 (1996).

Frug, Jerry, "The Geography of Community," 48 Stanford Law Review 1047 (May 1996).

Fuentes, Ximena, "The Criteria for the Equitable Utilization of International Rivers," in The British Year Book of International Law 1996 (Oxford: Clarendon Press, 1997).

Getches, David H., "Colorado River governance: Sharing Federal Authority as an Incentive to Create a New Institution," 68 Colorado Law Review 573 (1997).

Gleick, Peter H., "The Human Right to Water," Water Policy 1 (1998).

Glicksman, Robert L., "The Impact of Federal Environmental Protection Laws on Water Allocation," Proceedings of the Institute on Planning, Zoning, and Eminent Domain, Dallas, Texas (November 1995).

Gottlieb, Robert, A Life of Its Own: The Politics and Power of Water (San Diego: Harcourt Brace Jovanovich, 1988).

Gunderson, Holling and Light, (eds.), Barriers and Bridges to the Renewal of Ecosystems and Institutions (New York, NY: Columbia University Press, 1995).

Hey, Ellen, "The Watercourses Convention: To What Extent Does It Provide a Basis For Regulating Uses of International Watercourses", 7 RECIEL 291 (1998).

Hobbs, Gregory J., Jr., "Ecological Integrity, New Western Myth: A Critique of the Long's Peak Report," 24 Environmental Law 157 (1994).

Houck, Oliver, "TMDLs: The Resurrection of Water Quality Standards-Based Regulation under the Clean Water Act," 27 Environmental Law Reporter 10329 (July, 1997).

Ingram, Mann, Weatherford and Cortner, "Guidelines for Improved Institutional Analysis in Water Resources Planning," 20 Water Resources Planning," 20 Water Resources Research 323 (1984).

Innes, Judith Innes, "Growth Management: California Struggles to Save the Dream," 1 Land Use Forum 82 (Winter 1992).

Jansson, AnnMari, et al., Investing in Natural Capital (Washington D.C.: Island Press, 1994).

Kagan, Robert A., "Political and Legal Obstacles to Collaborative Ecosystem Planning," 24 Ecology Law Quarterly 871 (1997).

Kahrl, William L., Water and Power: The Conflict Over Los Angeles' Water Supply in the Owens Valley (Berkeley: University of California Press, 1982).

Kelman, Steven, "Adversary and Cooperationist Institutions for Conflict Resolution in Public Policymaking," 11 J. Policy Analysis & Management 178 (1992).

Kenney, Douglas S., and Lord, William B., "Analysis of Institutional Innovation in the Natural

Resources and Environmental Realm: The Emergence of Alternative Problem-Solving Strategies in the American West" (Research Report RR-21, Boulder Colo.: Natural Resources Law Center, 1999).

Kervin, Cornelius M., "Assessing the Effects of Consensual Process in Regulatory Programs: Methodological and Policy Issues," 32 Am. U. L. Rev. 401 (1983).

Lactos, Jan G., and Carr, Thomas A., "The New Dominant Use Reality on Multiple Use Lands," Mineral Law Institute § 1.01 (July 1998).

La Porte, Todd R., and Consolini, Paula M., 1991, "Working in Practice but Not in Theory: Theoretical Challenges of High-Reliability Organizations," J. of Public Administration Research and Theory 1:19-47.

Lee, Heather B., "Land Use Planning and Water Supply in the Wake of SB 901 and Stanislaus Natural Heritage Project v. County of Stanislaus," 15 California Real Property Journal 36 (1997).

Lee, Kai N., Compass and Gyroscope (Island Press, Washington, D.C. 1993).

Light, Matthew A., "Different Ideas of The City: Origins of Metropolitan Land-Use Regimes in the United States, Germany, and Switzerland," 24 The Yale Journal of International Law 577 (1999).

MacDonnell, Lawrence J., From Reclamation to Sustainability: Water, Agriculture, and the Environment in the American West (Boulder: University of Colorado Press, 1999).

Mazur, L.A. (ed.), Beyond The Numbers: A Reader on Population, Consumption and The Environment (Washington, D.C.: Island Press, 1994).

Milon, Walter J., Kiker, Clyde R., and Lee, Donna J., "Adaptive Ecosystem Management and the Florida Everglades: More than Trial-and-Error?" Water Resources Update, No. 113 (Fall 1998), at 37-46.

O'Brien, Kevin M., and Markham, Barbara, "Tale of Two Coasts: How Two States Link Water and Land Use Planning," Natural Resource & Environment 3 (Fall 1996).

Ostrom, Elinor, Governing the Commons: The Evolution of Institutions for Collective Action (Cambridge: Cambridge University Press 1990).

Patterson, Jeffrey, "Testing the Partnership Model of Growth Management," 7 Pacific Rim Law & Policy Journal 721 (June 1998).

Propst, L., et al., "Meeting the Challenge of Change in Western Communities," 18 Journal of

Land, Resources and Environmental Law 63 (1998).

Reisner, Marc, Cadillac Desert: The American West and Its Disappearing Water (New York: Penguin Books, 1993);

Rodriguez, Daniel B., "The Role of Legal Innovation in Ecosystem Management: Perspectives from American Local Government Law," 24 Ecology Law Quarterly 745 (1997).

Rose, Carol M., "Demystifying Ecosystem Management," 24 Ecology Law Quarterly 865 (1997).

Ruggiero, Jory, "Toward a Law of the Land: The Clean Water Act as a Federal Mandate for the Implementation of an Ecosystem Approach to Land Management," 20 Public Land & Resources Law Review 31.

Ruhl, J.B., "Complexity Theory as a Paradigm for the Dynamical Law-and-Society System: a Wake-up Call for Legal Reductionism and the Modern Administrative State," 45 Duke L.J. 849 (1996).

Ruhl, J.B., "Biodiversity Conservation and Ever-Expanding Web of Federal Laws Regulating Nonfederal Lands: Time for Something Completely Different?," 66 U. Colo. L. Rev. 555 (1995).

Savitch, H.V., and Vogel, Ronald K. (ed.), Regional Politics: America in a Post-City Age (Thousand Oaks: Sage Publications, 1996).

Sax, Joseph, "The Ecosystem Approach: New Departures for Land and Water, Closing Remarks," 24 Ecology Law Quarterly 883 (1997).

Sax, Joseph L., "Understanding Transfers: Community Rights and the Privatization of Water," 1 West-Northwest 13 (Spring 1994).

Saxer, Shelley Ross, "Local Autonomy or Regionalism? Sharing the Benefits and Burdens of Suburban Commercial Development," 30 Indiana Law Review 659 (1997).

Scheiber, Harry N., "From Science to Law to Politics: An Historical View of the Ecosystem Idea and Its Effect on Resource Management," 24 Ecology Law Quarterly 631 (1997).

Schell, Steven R., "Land Use Meets Populism: Citizen Control Growth in Oregon," 77 Oregon Law Review 893 (1998).

Shapiro, Scott, "The Shrinking Range of Water Supply Options for California Development," California Water Law & Policy Reporter 129 (March 2000).

Siemon, Charles L., "Successful Growth Management Techniques: Observations from the

Monkey Cage," 29 The Urban Lawyer 233 (Spring 1997).

Smith, Steven Rathgeb, and Ingram, Helen, "Implications of Choice of Policy Tools for Democracy, Civic Capital and Citizenship," paper prepared for Handbook Authors Conference, Baltimore, June 8-10, 1999.

Stevens, William K., "Water: Pushing the Limits of an Irreplaceable Resource," Natural Resources & Environment 3 (Summer 1999).

Sullivan, Edward J., and Pelham, Thomas G., "Comprehensive Planning and Growth Management," 28 The Urban Lawyer 819 (Fall 1996).

Tarlock, A. Dan, "The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law," 27 Loyola of Los Angeles Law Review 1121 (April 1994).

Tarlock, A. Dan, "Biodiversity Federalism," 54 Maryland Law Review 1315 (1995).

Teclaff, L.A., and Teclaff, E., "Restoring River and Lake Basin Ecosystems," 34 Natural Resources Journal 905 (Fall 1994).

Thompson, Rebecca W., "Ecosystems Management: Great Idea, But What Is It, Will It Work and Who Will Pay?" Natural Resources & Environment (Winter 1995).

Twiss, Robert H., "New Tools for Building the Future of Ecosystem Management," 24 Ecology Law Quarterly 877 (1997).

Watson, Rebecca W., "'Rural Sprawl'- Where the Deer and the Millionaire Roam?," 31 Trends 8 (March/April 2000).

Weatherford, Gary D., From Basin to "Hydrocommons": Integrated Water Management Without Regional Governance (Boulder, Colo.: Natural Resources Law Center, University of Colorado, Western Water Policy Series, 1990).

Wilkinson, Charles F., Crossing the Next Meridian: Land, Water, and the Future of the West (Washington D.C.: Island Press, 1992).

Wilkinson, Charles F., Fire on the Plateau: Conflict and Endurance in the American Southwest (Washington, D.C.: Island Press, 1999).

Wood, Mary Christina, "Reclaiming the Natural Rivers: The Endangered Species Act as Applied to Endangered River Ecosystems," 40 Arizona Law Review 197 (1998).

Young, Oran R., Resource Regimes: Natural Resources and Social Institutions (Berkeley: University of California Press, 1982).

American Water Works Association, "Management in the 21st Century," AWWA Journal (January 2000).

American Water Works Association, "Total Water Management," AWWA Mainstream (November 1994).

Association of California Water Agencies, California's Looming Water Crisis: A Status Report (November 1999).

Association for Community Networking, Community Networking (Quarterly).

General Accounting Office, "Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach" (1994).

Long's Peak Working Group, "America's Waters: A New Era of Sustainability," 24 Environmental Law 125 (1994).

National Research Council, Committee on Scientific and Technical Criteria for Federal Acquisition of Lands for Conservation, Setting Priorities for Land Conservation 113-38 (1993).

National Research Council, Setting Priorities for Land Conservation (1993).

Planning and Conservation League, Restoring the California Dream: Ten Steps to Improving Our Quality of Life, 1999 Legislative Performance Report Card (January 2000)

Planning Commissioners Journal, Sprawl & Today's Landscape, a special collection of reprints from Planning Commissioners Journal (1994-2000).

Population Action International, Sustaining Water: An Update (1995).

Population Action International, Sustaining Water: Population and The Future of Renewable Water Supplies (1993).

University of California Centers for Water and Wildland Resources, Watersheds '94: Respect, Rethink, Restore, Proceedings of the Fifth Biennial Watershed Management Conference (July 1995).

U.S. Government Accounting Office, Ecosystem Management - Additional Actions Needed to Adequately Test A Promising Approach (GAO/RCED-94-111; August 1994).

Western Education Foundation, "Water and Growth: A Roundtable Discussion," Western Water (March/April 2000).

Western Water Policy Review Advisory Commission, Water in the West: The Challenge for the Next Century (June 1998).

World Resources Institute, et al., World Resources Report 2000-2001, People and Ecosystems: The Fraying Web of Life, (2000).