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INTRODUCTION

Hawaiian water law has been in turmoil for nearly thirteen years. On January 10, 1973, in McBryde Sugar Co. v. Robinson,1 the Supreme Court of Hawaii overturned a long-established system of rights.2 Litigation testing the validity of McBryde has since wended its way through the federal and state courts. On February 20, 1985, the United States Court of Appeals for the Ninth Circuit effectively overturned McBryde.3 In the meantime, the Hawaiian legislature established an Advisory Study Commission on Water Resources ("Advisory Commission"). The Commission issued its report ("Commission Report") on January 14, 1985.4 The stage is thus set for Hawaii now to resolve its water conflicts.

Hawaii's key choice relates to transferability. Pre-McBryde law, like that of most prior appropriation states, permitted transfer of water rights as long as the transfer inflicted no injury on other water users.5 This

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1. 504 P.2d 1330 (Hawaii 1973).

2. The court held that "normal surplus waters," seemingly amounting to the vast bulk of reliable surface water supplies in the islands, were no longer to be held as private property. McBryde Sugar Co. v. Robinson, 54 Hawaii 174, 180-87, 504 P.2d 1330, 1335-39, aff'd on rehearing, 55 Hawaii 260, 517 P.2d 26 (1973), appeal dismissed for want of jurisdiction and cert. denied, 417 U.S. 962 (1974) [hereinafter cited as McBryde]. Instead, they were to be regarded as the property of the state. Under the doctrine that prescription does not run against the state, those who had been using normal surplus waters for many decades could not validate their titles against the state's newly discovered ownership. Id. at 198, 504 P.2d at 1344-45.

Normal surplus waters consist of all waters other than (1) "appurtenant" rights (rights based on ancient use, especially for the cultivation of taro), (2) prescriptive rights, and (3) "storm and freshet" surplus waters (consisting of intermittent surplus flows). See Robinson v. Ariyoshi, 441 F. Supp. 559, 562 n.1 (D. Hawaii 1977) aff'd in part and rev'd in part, 753 F.2d 1468 (9th Cir. 1985), petition for cert. filed, 52 U.S.L.W. 3170 (Sept. 10, 1985). In the the course of the litigation, the Ninth Circuit referred certain questions about Hawaiian law to the Hawaiian supreme court. Its responses appear in Robinson v. Ariyoshi, 658 P.2d 287 (Hawaii 1982).

3. See Robinson v. Ariyoshi, 753 F.2d 1468 (9th Cir. 1985), petition for cert. filed, ___U.S.L.W. ( , 1985). The court held that the state could not, consistent with the Fourteenth Amendment, interfere with rights vested under pre-McBryde law unless it provided just compensation.


principle, or something like it, appears to have prevailed in Hawaii even before the arrival of Captain Cook in 1778. The similarity between pre-
McBryde Hawaiian law and prior appropriation is hardly surprising. Ha-
waii’s geography is quite similar to that of the western states dominated
by the law of prior appropriation. Rainfall is concentrated in mountainous
regions unsuitable to cultivation; broad low-lying plains, enjoying little
direct rainfall, depend for productivity on water transferred from the
mountains. For such terrain, ready transferability is virtually essential if
the available water supplies are to make anywhere near their maximum
contribution to aggregate personal welfare.

The Advisory Commission’s proposals contrast sharply with the law
of prior appropriation and pre-McBryde Hawaiian law. The Commission
proposes that no transfer or even use modification should be allowed
except by permission of the controlling agency. Under the Commission’s
proposals, securing permission promises to be a time-consuming, costly,
and somewhat unpredictable enterprise, for the agency is to consider
virtually any factor that might bear on the desirability of the transfer or
modification.

Hawaii thus may be close to a critical break with its past. The purpose
of this article is to study the system of prior appropriation for possible
lessons for Hawaii and, of course, other states that may contemplate
major adjustments in their water law. The likelihood of useful lessons
seems great. Hawaii and the mainland states that use prior appropriation
share similar geography. Pre-McBryde Hawaiian law and the dominant

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The court’s observation that “interahupuaa transfers were made in ancient times,” is a grudging
one, as the Hawaii Supreme Court has, in and since McBryde, been resolutely hostile to the idea
of transferable private water rights. The court accordingly endeavored to hedge the concession with
assertions that the chiefs entitled to make the transfers acted as trustees. See Reppun v. Board of
Water Supply, 65 Hawaii 531, 548 n.14, 656 P.2d 57, 68-69 n.14 (1983). However, the court
adduced no serious anthropological support for this contention and, in fact, its concurrent assertion
that the chief’s “power and authority (mana) were complete,” id. at 548 n.14, 656 P.2d at 68 n.14,
seems inconsistent with the assertion of a trust relation.

7. See W.A. Hutchins, The Hawaiian System of Water Rights 6-7 (1946) [hereinafter cited as Hutchins, Hawaii].

8. See Recommended State Water Code §—40 (Proposed Draft, Jan. 14, 1985) [hereinafter cited as Recommended Code]. The Recommended Code appears as Appendix E of the Commission Report. References always include a blank space, to be filled in with whatever chapter number may be
assigned to the code. It is not altogether clear whether the controlling agency is the Board of
Land and Natural Resources, or the Department of Land and Natural Resources, so the word “agency”
will be used in future reference.

9. See Recommended Code, id. which provides that the applications are to be treated as initial
permit applications and to be subject to requirements for permit issuance set forth. It requires findings
that the proposed use: “(1) Is a reasonable-beneficial use as defined; (2) will not interfere with any
existing legal use of water; and (3) is consistent with the public interest and the provisions of the
state water plan.” The “state water plan,” in turn, is to be a “program for the development, protection,
conservation, and management of the Waters of the State,” to be adopted after consideration of
every possibly relevant factor.
version of prior appropriation law agree on the key point of transferability. It seems probable that geography is destiny.

This survey of prior appropriation law will not, however, be conducted wearing rose-colored glasses. The paper will try to indicate not only what Hawaii might usefully draw upon, but also what it might well discard.

SURFACE WATERS UNDER PRIOR APPROPRIATION

Initiation and Quantification

Under prior appropriation, a person establishes a water right by applying water to some use. For example, he takes it out of the stream and uses it for irrigation or for mining. The size of his right is said to be determined by the quantity of water "reasonably" needed for that use. Almost all appropriation states now require that the appropriator initiate his right by filing with an administrative office, such as that of the state engineer; his right is dated from the time of filing. Once the permit is issued, the appropriator must diligently pursue the task of putting the water to use.

Students of Hawaiian water rights will note that prior appropriation's rules for vesting and quantification are quite similar to those for Hawaiian appurtenant rights. For such rights, also, it is actual use that defines the origin and scope of the right. Hawaiian appurtenant rights are different, however, in that (1) only one use is recognized as a basis for initial creation of appurtenant rights, namely use for the cultivation of taro, and (2) that use must have been established at a specific moment in history—1848, the time when royal lands were transferred into private ownership, an event known as the Great Mahele.

The law of prior appropriation is, then, a Rule of Capture. It developed in the West as a matter of custom, and its core concept, "first in time is first in right," paralleled the way in which miners established property rights in minerals in the public domain. Whatever the justifications of history, however, such a system contains two severe flaws. First, it stimulates premature development. A project may be economically attractive...
only because it has the side effect of transferring a water right from the public domain to the developer. Because racing to win under the Rule of Capture requires construction of facilities to apply the water to use, it consumes and wastes real resources.\(^\text{17}\)

Second, the Rule of Capture effectively shifts rights in the water from the state to private persons without the recipients compensating the state for the transfer. It thus belies the standard declaration of the constitutions of western states that unappropriated waters of the state belong to "the public."\(^\text{18}\)

To the extent that any Hawaiian surface water remains outside private ownership,\(^\text{19}\) the state could arrange for the creation of private rights by means that involve neither waste nor uncompensated transfers. The most obvious system for achieving this is for the state to sell water rights at auction to the highest bidder. Such a system would be innovative so far as water law is concerned. A comparable approach has been applied, however, for other government-owned resources. Since 1920, for example, the United States government has auctioned off leases of government-owned oil, gas, and coal.\(^\text{20}\) By use of auctions, the state would capture the market value of auctioned rights for the state treasury, and the rights would shift into private ownership without parties being lured into waste of resources.

It is important to recognize that a system of private rights need involve no "giveaways" of resources that are initially "public" in the sense of belonging to no one. Indeed, both prior appropriation, a system of private rights, and short-term discretionary permits, a system of bureaucratic control,\(^\text{21}\) have in common that the private holder of water rights obtains those rights without giving compensation to the state. By contrast, transfer by means of an auction would avoid any such "giveaway" feature.\(^\text{22}\)

\(^{17}\) The waste is measured by the present value of (1) the net increase in costs from accelerating construction, minus (2) the net increase in benefits from such acceleration. See Williams, The Requirement of Beneficial Use as a Cause of Waste in Water Resource Development, 23 NAT. RES. J. 7, 8-11 (1983).

\(^{18}\) See, e.g., Colo. Const. art. XVI, § 5. Similarly, the Hawaiian Constitution declares that the state has an obligation to "protect, control, and regulate the use of Hawaii's water resources for the benefit of the people." Hawaii Const. art. XI, § 7.

\(^{19}\) Private ownership is used to denote waters owned either by private persons or by government agencies in a proprietary sense.


\(^{21}\) Although the Advisory Commission ultimately recommended permanent permits with heavily fettered transferability, it gave very serious consideration to a short-term permit system and appears to have rejected it only reluctantly. See Commission Report, supra note 4, at 19-20. Moreover, under the Commission's proposals, the state agency would issue its permanent permits without requiring compensation to the state.

\(^{22}\) There are two aspects of initiation of private rights that have thus far been disregarded. The first is the requirement, common but not universal in the appropriation states, that the water be
Allocation in Time of Shortage

As the term "prior appropriation" implies, rights created pursuant to the doctrine depend on chronology. When streamflow is insufficient to satisfy all appropriators, the state engineer forces cutbacks, beginning with rights of the most recent date and working gradually back to the older ones. By contrast, Hawaiian appurtenant rights are subject to pro rata reduction in time of shortage.23

Surprisingly little is at stake in this issue. So long as rights are clearly defined and fully transferable, parties can adjust to risk under either system by making suitable transfers. For example, under prior appropriation parties can pool risk by participating in mutual ditch companies, which own rights of various dates and which, among their owners, share reductions pro rata. On the other hand, under a system of pro rata reduction, parties for whom security of supply is critical can acquire enough rights to assure any specified level of flow in time of the direst drought. In times of plenty, they can lease their extra supplies. Accordingly, there seems no reason for Hawaii to abandon its traditional reliance on pro rata reduction as the principle of allocation in times of shortage.

Transferability

Transferability encompasses every possible kind of alteration in the use or ownership of water including adoption of a new use on the same tract; change in point of diversion; change in point of return to the stream; any sale of a water right separate from the tract of current use; lease of a right for use on another tract; and sale or lease for use in a completely different watershed.

A high degree of transferability is critical if a legal system is to maximize water's contribution to aggregate welfare. First, it enables new and innovative users to find supplies of water at reasonable cost. Circumstances are constantly changing; carriages and harnesses yield to autos, candles to light bulbs, sugar and pineapples to houses or to uses that we cannot now imagine. If firms, new and old, are to meet new needs and use new technologies, they must have access to resources, including water.

Second, transferability is necessary to prevent waste. When rights are fully transferable, there is no need for a horde of government agents to snoop about and uncover waste. There is no need for laws to prohibit waste or for courts to define it. Suppose United Pineapple (a purely hypothetical firm) uses ten million gallons per day (mgd) on its plantation,
but a smarter pineapple grower were able to grow the same number of
pineapples with one-half the water.\textsuperscript{24} If water rights are readily transfer-
able, the innovators can buy United Pineapple’s plantation, install new
irrigation devices, and sell the extra water. So long as they are able to
sell the water they have saved, they have every incentive to make the
necessary investment to achieve the saving. And, anticipating their gains
from the sale of the extra water, they can make bids to United Pineapple
that will induce that firm to sell its water rights. Alternatively, they can
offer their services as consultants to owners who have failed to spot
opportunities for saving. In either event, however, parties who initiate
water-saving typically can reap its rewards only if they can sell the water
that is freed for use on other land.

Free transferability also gives United Pineapple an incentive to avoid
waste. If the firm persists in wasting water, it must forego the profits
from the sale of land or water rights. Under full transferability, waste is
costly for an owner; it incurs an “opportunity cost,” or the loss of potential
revenue increases whenever it neglects a chance for diminishing waste.

New Mexico and some of the other prior appropriation states have
achieved transferability simply by permitting it.\textsuperscript{25} As was true of appur-
tenant rights in Hawaii before \textit{McBryde}, transfer in such states has been
subject only to the condition that the transfer may not injure other water
users. The no-injury condition arises almost entirely out of the fact that
downstream users depend for their supplies on return flow from upstream
users. For example, if an appropriator is diverting ten mgd and returning
five mgd to the stream, clearly any attempt by him to transfer his water
rights in full to another basin would deprive users in the original basin
of five mgd. Accordingly, if other users are to be protected, the original
water right must, as part of the process of transfer, be redefined. The
standard redefinition for this example would be to provide that only five
mgd can be diverted into the new basin. Such an outcome leaves appro-
priators in the original basin with the five mgd that they were accustomed
to receiving in the form of return flow.

\textsuperscript{24} Reducing the water consumption is socially desirable only if the present value of the water
saved exceeds the present value of the costs that must be incurred to save it. So long as market
conditions are such that an owner can realize the value of the water saved, he has an incentive to
incur the costs of saving up to the optimal point but no further.

\textsuperscript{25} See Fuller v. Swan River Placer Mining Co., 12 Colo. 12, 19, 19 P. 847, 848 (1900); COLO.
New Mexico amended its statute to authorize the state engineer to refuse permission to transfer if
he finds the proposed transfer “contrary to conservation of water within the state” or “detrimental
to the public welfare.” 1985 N.M. Laws ch. 201, § 5. Although the exact operational significance
of the amendments cannot be known, it seems sure to introduce uncertainty into the process and
thus obstruct transfer. Statutes in some states virtually prohibit transfer: NEV. REV. STAT. § 533.040
(1983), 533.325 (1979); OKLA. STAT. Tit. 82, § 105.22 (1984 Supp.); S.D. COMP. LAWS ANN. §§ 46-
5-33-35 (1983 Supp.).
A variety of mechanisms are possible for monitoring water transfers.26 New Mexico's system of transfers seems to have worked especially well. Parties who seek to transfer a water right apply to the state engineer. Notice is published and those opposed have an opportunity to protest.27 Fewer than four percent of the applications trigger a protest; the average cost of a hearing, when protest occurs, has been evidently only about $300. Only very rarely does anyone appeal the state engineer's ruling. The upshot is that transfers have been quite frequent; applications have averaged about 275 a year recently, and virtually all applications have gone through.28

A consultant to Hawaii's Advisory Commission has suggested that permanent, vested, legally transferable rights "would minimize flexibility" and that a system of discretionary, short-term permits would afford greater flexibility.29 Neither theory nor experience supports this view.30

Consider a small new firm seeking water under a system of discretionary short-term permits. It cannot simply scan the papers for notices of water rights that are for sale. It must apply to the water agency for a permit. As the permits are short-term, some, of course, are always expiring. In principle, all the agency has to do is to deny renewal to the current user and issue our hopeful new firm its permit. Simple.

The simplicity of discretionary short-term permits is deceptive. Every outstanding permit is going to represent an ongoing business that relies upon water. These established businesses will have employees. Being, by definition, established firms, they, and perhaps their customers, and their employees or their unions, may well have influential connections. An established firm will argue that it has relied on the water and that many people have depended on the firm. To take away its water, and thus its chance to exist, would be wasteful and terribly unfair. If the incumbent firm's permit is not renewed, it will get nothing in compensation. Quite a lot of people will be outraged if the agency pulls the rug out from under the old firm. It will take a fearless administrator—or at

least an unusually insouciant one—to deny the old firm's renewal application.

The above may seem too drastic a scenario. Water for the new firm might be obtained by monitoring the current users for waste. By cutting back a little here and there, the agency might secure water for the new firm. Furthermore, because the decision is to be handled "scientifically," there will be no need for it to become the political football described above.

This vision of the scientific and impartial administrator is appealing. If private firms rely on experts to devise new ways of saving water, why can't a government agency do essentially the same thing?

The answer lies primarily in problems of motivation and responsibility. An engineer retained by a private firm to evaluate its water use for its own internal purposes has a powerful incentive to be accurate; if the firm adopts his proposal and his judgments are correct, he will have gone far toward establishing a reputation. If he exaggerates the benefits of his proposals, or if he misses opportunities for water-saving that another engineer spots, he will not look good. To do well he should not err materially in either direction.

However, a government agency is far less likely to have access to unbiased data. In adversarial proceedings before the water agency, each expert will expect to be rewarded by his client for putting its case in the best light. Experts for the new firm, seeking to expose waste in the old firm's use, will tend to push their case as far as they can, constrained mainly by the laws against perjury and, of course, fear of appearing ignorant. The old firm's experts will lean as sharply in the opposite direction. There will be reports and experts galore, but probably not much light on the realities of water use. If the experts are at all evenly matched, the agency will almost surely take the path of least political resistance and renew the old firm's permit.

Moreover, in the absence of a market for water rights, it will be hard, if not impossible except in obvious cases, to identify waste at all. Waste is "a preventable loss the value of which exceeds the cost of avoidance." Under a short-term discretionary permit system, where water has no explicit price, an engineer may be able to calculate that an investment of $40,000 can save one mgd. But unless water has a price, how can he determine whether the saving is worth it? Unless there is a water market,
an engineer cannot accurately compare the value of the water savings with the cost of achieving them.

Finally, the battle will itself cost money—fees for lawyers, hydrologists, and engineers. But only rarely will a drop of water be pried loose. Experience has demonstrated the hazards of relying on non-renewal of short-term permits as a source of flexibility. Federal Communications Commission licenses for TV stations are for terms of only five years. Yet, in the first twenty-five years of commercial television, through 1969, only two licenses were denied renewal. Similarly, in Florida, which has had a system of short-term discretionary permits for water for over ten years, non-renewal is "very infrequent." Renewal of federal grazing permits is so regular that the value of the use of the federal land is capitalized into the value of the fee to which it has been by practice attached. In New Mexico, by contrast, as we have seen, fully transferable water rights provide genuine flexibility: applications for voluntary transfer have run at a rate of about 275 every year and virtually all are granted.

It must be conceded that even in a state such as New Mexico, which appears to have exceeded all others in achieving transferability, water rights are not as readily transferable as land. The essential impediment is largely, however, hydrologic reality: shifts in the place or manner of one party's use may adversely affect others' uses. That hydrologic reality will, of course, be equally present under a short-term permit system. Even after the water agency has denied a permittee renewal, any actual shift in the place where the water is used will involve precisely the same risks to other users as are present under a system of vested transferable rights.

Hawaii's Advisory Commission has recommended that Hawaiian sur-

33. Both existing holders and new claimants will be motivated to spend resources for lawyers, lobbyists, hydrologists, etc., up to the value of the water right that they may gain or lose, discounted by the risk factor. Thus, if both holder and claimant believe a water right to be worth $100,000, and that the holder's chance of losing it and the claimant's chance of gaining it are one-in-ten, each may spend as much as $10,000 to preserve (secure) the right. All these expenses constitute a waste of valuable resources.

34. See 47 U.S.C. § 307(c)(1982); the term was formerly three years.


36. Telephone conversation with John Wehle, Assistant to the Secretary, Florida Department of Environmental Regulation, July 6, 1984.


38. See Gisser & Johnson, supra note 28, at 149.

39. The only way to avoid those obstructions is to define each right holder as having a full property interest in the return flow from his initial use, so that others may not rely on such water without his consent. Under such a rule, of course, the initial user may preserve his flexibility by limiting the rights of those who rely on his return flow. Thus far no jurisdiction has been willing, except in relatively limited circumstances, to adopt such a view. See Williams, supra note 26 at 311-21.
face water rights be transferable, but that transfer be severely fettered. As noted above, each transfer—again, the term is used in the broadest sense—requires agency approval. Approval is to be granted only if the agency, after a wide-ranging inquiry, is satisfied that the transfer will serve the "public interest" and advance a vaguely defined "state water plan." While such an inquiry is doubtless intended to advance the public interest, it seems likely to retard it. Such an inquiry, with its attendant out-of-pocket costs, delay, and unpredictability of outcome, will raise the cost of transfer. An increase in cost reduces the net return on making a transfer and thus reduces the opportunity cost that rights holders incur when they indulge in waste. The consequence would be stultification of uses and more waste than would occur under a system like that of New Mexico.

**Beneficial Use**

The typical state requirement that water be appropriated only for a "beneficial use" prevents the acquisition of private rights in water without application of the water to some immediate physical use. As we have already argued, the requirement thus bars the holding of water rights for future sale or use and forces those who anticipate valuable future uses to invest prematurely in facilities for immediate use.

In addition, the beneficial use requirement operates as a tool by which state courts and water agencies monitor water uses with the apparent purpose of preventing waste. This monitoring takes two forms. First, courts or water agencies occasionally decide that a particular type of use will be classified as nonbeneficial. Such decisions are rare and seem usually confined to relatively exotic uses. In one memorable case, for example, a court held that the drowning of gophers was not a beneficial use, despite the harm inflicted by the gophers on the farmers' crops. Moreover, legislatures, water agencies, and courts sometimes find that a particular quantity of use is excessive and therefore nonbeneficial. It

40. See supra note 9. Moreover, because each transfer request is to be treated as a new application, and in the event of competing applications the agency is to approve the one that “best serves the public interest as set forth in the state water plan,” there is at least a possibility that application for transfer might lead to such a comparative hearing and end in termination of the transfer applicant’s right.


42. See supra text accompanying notes 10-22. For a recent application of the concept in New Mexico, see Jicarilla Apache Tribe v. United States, 657 F.2d 1126, 1133-35 (10th Cir. 1981).

43. See Tulare Irrigation District v. Lindsay-Strathmore Irrigation Dist., 3 Cal.2d 489, 567-68, 45 P.2d 972, 1007 (1935). Among the water uses occasionally classified as nonbeneficial are recreational or esthetic uses. Although such decisions appear to be a thing of the past, they pose a problem for instream uses and are considered below in connection with that issue; see text at notes 62-74, infra.

44. See 1 W. Hutchins, Water Rights Laws in the Nineteen Western States 497-503, 506-13 (1971) [hereinafter cited as Hutchins, Nineteen States]; in re Alleged Waste and Unreasonable
appears to be the consensus that such findings typically restrict only the most egregious forms of waste.\footnote{See Getches, supra note 26, at 103-04.} Given the difficulties of any state agency in determining what conduct is wasteful,\footnote{The difficulties referred to are the problems of motivation and responsibility that obstruct both the acquisition of needed data and action in light of that data. See supra section entitled Transferability.} this is hardly surprising.

Hawaii should do without the beneficial use concept. The most promising incentives to avoid waste derive from full transferability of vested rights. Full transferability gives people who are smart about saving water an incentive to detect waste and a chance to realize the value of the potential savings. It subjects wasteful users to a corresponding pressure to avoid waste. If they fail to cure wasteful practices, they forego the profits that would accrue from doing so; if they fail to sell to more competent water users, they forego the gains from those sales. We do not seek to avoid wasteful land use by confiscating the land of owners who do not employ their land in ways that have been politically classified as beneficial. There is no reason why we should do so with water.

**Preferences**

Prior appropriation states sometimes also use preference provisions to allocate water to more valuable uses through direct government intervention. The typical line-up is to place domestic and municipal uses at the top, followed by agricultural and, at or near the end, industrial uses. But there is considerable variety among states.\footnote{Use of Water by Imperial Irrigation Dist., California State Water Resources Control Bd., Decision 1600 (June 1984); Thompson v. Colorado Ground Water Comm'n., 194 Colo. 489, 495-99, 575 P.2d 371, 377-80 (1978); cf. Crandall v. Water Resources Dep't., 290 Or. 771, 626 P.2d 877 (1981).}

The preference structure can operate in any of three ways. First, a statute or constitutional provision may appear to allow preferred uses of late date to take precedence over low-ranked rights of early date in times of scarcity. Giving literal effect to such a provision would reduce the priority system to chaos, so the courts have managed to evade the literal language of such provisions.\footnote{Id.; HUTCHINS, NINETEEN STATES, supra note 44, at 429-33; Phillips v. Gardner, 2 Or. App. 423, 469 P.2d 42 (1970); Hickman v. Loup River Public Power Dist., 173 Neb. 428, 437-38, 113 N.W.2d 617, 623 (1962).}

Second, every western state allows municipalities to exercise eminent domain to acquire water rights.\footnote{Getches, supra note 26, at 108-09.} Such power, although exercised against the will of the prior owner, requires compensation, and accordingly does little to upset security of title. It seems little different from the standard municipal power to acquire land by eminent domain. Some jurisdictions even allow parties other than municipalities to use eminent domain for

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\footnote{Getches, supra note 26, at 109.}
acquisition of preferred uses. Though the extension of eminent domain to private parties is puzzling, the requirement of compensation reduces its destructive potential.

Third, states sometimes provide that where conflicting applications to appropriate are filed with the water engineer at roughly the same time, the engineer should observe the preference list in issuing permits. New Mexico, generally viewed as the most successful of the prior appropriation systems, has no preference provisions at all except, of course, the municipal eminent domain power.

All of these preference schemes arise from a confusion between average and marginal values. In colloquial speech, people typically express their preferences in terms of average values. Suppose someone says that he prefers hamburgers to hotdogs. He will normally not be taken to mean that he never eats hotdogs; he probably means only that he prefers to eat more hamburgers than hotdogs. The economist will expect the person in fact to allocate his income in such a way that the satisfaction he derives from the last dollar devoted to hamburgers in any period of time is equal to the satisfaction he derives from the last dollar devoted to hotdogs in the same period. If it were not, the economist would expect him to make a reallocation of dollars, as between hamburgers and hotdogs, to bring about that equality. Until equality of the margin is achieved, that is, until the utility from the last dollar spent on each type of food is the same, he can always increase his total satisfaction by making a reallocation.

Similarly, one may well say that the "most valuable" or "preferred" use of water is for domestic purposes. Water for drinking is, after all, essential to survival and, almost always, more valuable than, say, water for industrial purposes. That superiority in value, however, clearly does not establish that every drop of water applied to domestic use generates more value than every drop applied to industrial use. For example, the millions of gallons that are annually "used" for domestic purposes through leaks in the pipes of houses and apartment buildings are not likely to be more valuable than, say, a few thousand gallons needed to operate a pharmaceutical factory.

53. Suppose that in any month in which Joe buys twenty burgers and ten hotdogs, the utility provided by the last dollar spent on hotdogs is ten and the utility supplied by the last dollar spent on hamburgers is fifteen. By reallocating a dollar from hotdogs to hamburgers, assuming the usual gradually declining marginal utility from each, Joe will increase his total satisfaction. ("Utils" are a mythical unit conceived originally by the early utilitarians).
54. But consider the drinking water used by a drunkard in his glass of Scotch.
55. It may seem unduly cautious to say that the leaked gallons are "not likely to be more valuable"
Preference provisions reflect not only confusion over the concept of comparative value but, as is so often true in water law, a blindness to the way in which the market is able to allocate water. If water rights are freely transferable, water will be so allocated as to maximize the aggregate value of its use, as individual preferences are reflected in the market. If water is being applied to domestic uses of low value, as through leakage or indulgence in vast lawns, and if there is demand for water for industrial uses of higher value, industry will bid the water away from domestic users. And, more to the concern of those who favor preferences, if industries are using water for purposes of lower value than that of domestic demands, domestic users will bid the water away from industry. The process will continue until the contribution of the gallon being applied to the least valuable purpose, that is, the "marginal" gallon, is equal in all types of uses. At that point, no further value-maximizing transfers are possible. Of course, in a dynamic economy, with people constantly spotting new ways of improving water use, the process is unceasing. Accordingly, there is no need whatever for using politically formulated preference categories to allocate water. Hawaii would do well to emulate New Mexico's avoidance of such schemes.

**Terminations of Water Rights: Abandonment and Forfeiture**

In most prior appropriation states, a water right, once initiated, can be lost through simple non-use. This occurs under two doctrines. First, a right holder is deemed to have abandoned his right if he fails to use it over an extended period of time under circumstances supporting the inference that he intended to abandon it. As people rarely intend to abandon a valuable property right, the doctrine is only occasionally applicable. Second, "forfeiture" statutes provide that a right shall lapse after a specified period of non-use. Courts will excuse non-use, however, on a showing that it was impossible to put the right to use.

Like beneficial use and preferences, these two schemes of termination are misconceived efforts to avoid waste. In a jurisdiction allowing free transferability, it is the opportunity to gain from a sale or lease that spurs owners to avoid waste, or to transfer their rights to those who will not

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56. This requires that the municipal water agency is pricing its water at marginal cost, an assumption that is, unfortunately, rarely valid. See J. Hirschliefener, J.C. De Haven & J.W. Milliman, Water Supply: Economics, Technology and Policy 44-46 (1960).


59. Getches, supra note 26, at 181.
waste them. In such a jurisdiction, the "use-it-or-lose-it" provisions of abandonment and forfeiture are unnecessary.60

One might argue for the provisions on the ground that they clarify title by wiping out unused paper rights. In fact their result would seem to be the opposite. Although nominally self-executing, the doctrines are both fuzzy enough that no one would rely on termination of a right in the absence of adjudication; yet they force any buyer of a water right to perform the chore of verifying actual use patterns and deny him the ability to rely on paper title. A state can fully meet the public interest in eradicating rights that are truly abandoned simply by requiring rights holders periodically to record documents reflecting their claims.61

Instream Uses

Many valuable uses of water such as fishing, rafting, and just plain viewing require that it simply be left in the stream. Nonetheless, these instream uses have until recently fared ill under prior appropriation schemes.

Prior appropriation law has been perceived as generating two doctrinal hurdles for these uses. First, there has been genuine doubt whether aesthetic and recreational uses qualified as "beneficial." Recently, however, courts facing the issue have been ready to find that such uses meet that test.62 In New Mexico, however, doubt evidently remains about the recognition of instream uses.63 Second, courts have often taken the view that the vesting of an appropriative right requires a diversion from the stream.64 Moreover, it has been argued that appropriations for instream uses would contradict state constitutional provisions that "the right to divert and appropriate the unappropriated waters of any natural stream . . . shall never be denied."65 The current trend, however, seems clearly to remove these obstacles to instream uses.66

60. It is sometimes suggested that such provisions actually inspire waste, because they tell the right holder that if he "conserves" he will lose his right to the water saved. See S. Angelides & E. Bardach, Water Banking: How to Stop Wasting Agricultural Water 10-11 (1978) (Institute for Contemporary Studies) (effect of practice of treating any water unused in one year as presumptively not a beneficial use). Assuming, however, that the jurisdiction allows free transfer and that waters saved by an owner from evaporation are included among those owned and transferable by him, it is hard to see why the use-it-or-lose-it rule should have such an effect. When an owner effects a permanent saving in a jurisdiction allowing free transfer, he can sell the right to the water saved. If he effects only a temporary saving, he can lease the right and thereby put it to use.

61. See Texaco, Inc. v. Short, 454 U.S. 516 (1982), upholding the constitutionality of such a requirement for dormant mineral interests.


63. See Jicarilla Apache Tribe v. United States, 657 F.2d 1126, 1136 (10th Cir. 1981).


Nonetheless, instream uses pose special problems. First, such uses are likely to involve "free riders." Owners of an instream right may find it too costly to fence off the area and charge all those who "use" the right, for example, by simply gazing at a waterfall. Indeed, public access may even make charging users impossible. Standard economic theory suggests that in such cases the private market will undersupply the good.\(^6\) Second, if a private party could acquire such a right by the standard appropriation method, that is, simply by putting it to the stated use, a single party could perhaps secure a monopoly in all or most of the waters of a stream by simply starting some passive uses. Although possibly disabled from charging enough for the stream for actual instream uses (the first problem), persons would be tempted to secure a monopoly instream right in order to be able to exact money from would-be consumptive water users. No consumptive use that impinged on the instream right could occur in the stretch of river covered by the right or above it. Moreover, as any shift of a water use upstream from the lowest point of the instream use would potentially impinge upon the upstream use, the private holder could use his instream right to veto such transfers, or to sell off his veto at monopoly prices.\(^6\) Finally, if many parties held instream rights, would-be consumptive users might have to buy from multiple monopolists. While courts in the prior appropriation states have swept aside the doctrinal hurdles to instream uses, they have done so only where the "appropriating" party was an agency of the state.\(^6\) Such a limitation corresponds to the practical problems noted above. First, the "free rider" feature creates an argument for a public subsidy for their acquisition and maintenance. Second, a state agency authorized to advance fish cultivation, say, is unlikely to exact monopoly charges from consumptive uses.

As rights holders, however, government agencies bring their own problems. Flexible response to changing values and opportunities requires a readiness to engage in transfers. Instream flow rights will in some instances constitute a legal obstruction to value-increasing upstream transfers, obstructions that could be solved by transactions between the would-be transferors and the instream rights holders. But most bureaucrats, fearing the cry of "sell-out," would be far more reluctant than private parties to relinquish any part of their agency's rights. This reluctance would likely extend to many relinquishments that are valuable on a net basis, that is, cases where the value increase generated exceeds value lost through reduction in recreation or aesthetic benefits.\(^7\)

\(^6\) The good provides an "external benefit," i.e., a benefit which suppliers disregard, in deciding how much to supply, because of their practical inability to realize its value.

\(^6\) Of course if the instream flow right in question were of a quantity less than what was normally left over after upstream consumptive uses of higher priority, then consumption could be transferred upstream without materially injuring the instream flow right.


\(^7\) In economic terms, the suggestion in the text is that agencies will not respond to opportunity costs as readily as private parties. The assertion assumes that the agency can legally collect full compensation.
The mainland provides at least four models for handling instream flows. First, a state agency may be authorized to use appropriated funds to acquire existing use rights and convert them to instream flow uses. In the exercise of such power, the agency’s budget constraints reduce the risk that excessive amounts of water will be dedicated to instream flows. They do not, however, eliminate the risk. Putting aside the possibility that the legislature might appropriate excessive funds, there is the risk, considered above, that a state agency may not feel the costs of holding onto its rights, in terms of revenue foregone, as acutely as would a private owner. Thus, it may not relinquish part of its right to permit an upstream transfer even though that transfer would create values in excess of its costs.

Second, an agency may be authorized to make new instream appropriations. Here the agency is not constrained by its budget. On the other hand, the risk that the instream use will come at the expense of a more valuable consumptive use is less than in the prior situation, where the instream flow right came at the expense of an existing consumptive use. Unappropriated water is clearly water that has not yet been worth anyone’s while to divert to an out-of-stream use, so that the immediate opportunity cost of instream use is zero. As time passes, however, opportunities for new upstream consumptive uses may arise, as well as opportunities for valuable upstream transfers; the state agency is likely to block them by refusing to engage in a compensated relinquishment of its rights, even where their value exceeds that of the reduction in recreational or aesthetic values.

Third, some states have provided that when applications for permits to appropriate are filed, the agency passing on them may condition the permits in order to protect instream flows or may limit the permit by affecting a “reservation” of water from appropriation. Courts may find authority for such a decision in the so-called “public trust” doctrine. Obviously, such a system increases the risks of precluding consumptive uses that are more valuable than the instream uses they preclude. It imposes an immediate cost of precluding or diminishing a presumptively valuable consumptive use. Moreover, it seems to invite comprehensive government planning. Such planning entails very high costs such as out-

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73. See Tarlock, supra note 69, at 233-40.
75. However, curtailment of a consumptive use that has a net negative value (a sort of use that prior appropriation law can stimulate—see supra section entitled Initiation and Quantification would be welcome).
of-pocket administrative expenses, uncertainty, and delay, and the resulting decisions are likely to be based on dubious data. Overall, then, a "reservation" system is a costly way of protecting instream uses.

Fourth, a state administrative agency may have authority, even after an appropriation has been perfected, to reconsider "public trust" values such as recreation and in the light of that reconsideration, to diminish the holder's right. Such a rule is clearly inconsistent with any effort to establish a system of vested rights. It makes every water right subject to reduction or elimination on the basis of bureaucratic discretion, unconstrained by any duty on the bureaucrat's part to compensate the loser.

The purchase of existing rights, the first device used to accommodate instream uses, is obviously an option that is relevant and suitable only as to rights that have passed into private ownership. The second and third devices, anticipatory reservation or appropriation, and reservation concurrent with administrative disposition of an application to appropriate, operate in connection with the passage of rights from the public domain into private ownership. If Hawaii were to adopt an auction approach, as suggested above, the state could, in lieu of the second and third devices, authorize a state agency to bid against consumptive users. While the price of any rights purchased by the state would simply go from one state pocket to another, the bidding process would highlight the opportunity costs of the state's commitment to instream flows and thus, perhaps, induce it to make more careful judgments than could otherwise be hoped for.

Alternatively, operating within conventional appropriation principles, Hawaii might involve the private sector by permitting appropriations by private organizations permanently committed to preserving nature, such as the Nature Conservancy or the Audubon Society. To prevent excesses, these appropriations would be subject to review by a state board, in which representatives of some consumptive users would have at least a voice.

Such a private organization seems far more likely than a state agency to be responsive to bids from competing users. It will typically enjoy a broad mandate in the general area of nature preservation, so that it will recognize the alternative uses of the revenue that partial relinquishments may yield. As right holders, these organizations would, of course, be

77. This includes, as before, proprietary holdings of government entities.
78. See supra section entitled Initiation and Quantification.
79. Perhaps the most well-known example is the Audubon Society's oil and gas leasing in the Rainey Preserve in Louisiana. The Society, comparing the potential revenue from oil and gas operations (conducted under severe and precise constraints), and the good it could accomplish with that revenue, with the relatively minor sacrifice of environmental quality at the preserve itself, found the transaction to be an overall benefit to its mission. See Baden & Stroup, Saving the Wilderness—A Radical Proposal, REASON 28-36 (July 1981).
authorized to negotiate modifications of their rights, in exchange for cash or other consideration. Thus, they would be able to exercise their presumptively greater sensitivity to opportunity costs.

Such a mingling of public and private sectors, though doubtless imperfect, may be the best available solution for instream flows.

GROUNDWATER

Hawaiian law on nontributary groundwater is somewhat inchoate. Although Hawaiian courts have adopted the principle of correlative rights, they have not clearly spelled out the relationship between overlying owners. Examples from mainland states following prior appropriation law are, regrettably, mainly negative. These range from the Rule of Capture to regimes that regulate groundwater mining by means of exhaustion periods, selected either by a state legislature or a state bureaucracy, in either event without apparent economic rationale. None of the prior appropriation systems create the sort of clearly defined, fully transferable rights that enable a market to achieve, or at least to approach, optimal allocation of a resource. This section will point out the primary failings of the prevailing rules, will briefly consider legal treatment of the analogous problem of oil and gas rights, and will suggest some affirmative lessons that may be drawn from the oil and gas experience.

Initiation of Private Rights

New Mexico: A Rule of Capture

New Mexico has let the Rule of Capture run riot. A statute provides that any person seeking to extract water from an underground basin, in excess of trivial quantities, should apply to the state engineer, who is directed to grant the application if he finds that there are unappropriated waters or that the proposed appropriation would not impair existing rights, and if he also makes certain findings relating to water conservation and the public interest. Pursuant to that authority, the state engineer appears to have adopted a variety of approaches, typically involving a timetable for partial exhaustion but in any event selected ad hoc. Those who

80. Hutchins, Hawaii, supra note 7, at 178-86.
82. See White, Perspectives on New Mexico Water Law, in Water Law in the West 30, 32, in Water Law in the West 30, 32 (July 1984) (Proceedings of the 29th Annual New Mexico Water Conference, WRRI Rep. No. 181); telephone conversation with Peter Thomas White, Special Assistant Attorney General, State Engineer's Office, July 18, 1985. One approach is to say that unappropriated water remains unless existing extractors are in the aggregate withdrawing at such a rate that at the end of 40 years less than one-third of the original supply would remain in the basin. See Mathers v. Texaco, Inc., 77 N.M. 239, 421 P.2d 771 (1966).
started extraction before adoption of the statute are able to continue withdrawing at the same rate as before until exhaustion, although they may incur higher pumping and drilling costs as a result of later appropriations.

The system suffers a number of flaws. First, it rewards those who go in earliest and with the largest pumps. The system thus entails the Rule of Capture's usual incentive to premature development, as was the case with surface water, but due to the non-renewable character of the resource, with some additional distortions that are considered below. Second, in view of the state engineer's refusal even to state a principle or set of principles governing mining, it seems probable that the exhaustion timetables adopted bear only an accidental relation to the optimal rate for mining the basin. Third, under the evenhanded application of New Mexico's rules, considered without regard to special provisions relating to water export, out-of-state parties may lawfully drill wells in a New Mexico basin and thereby obtain a legal right to remove New Mexico's water, all without paying any New Mexican for the water. Simply by holding that title to water lay in the owner of the overlying land and was limited to the amount of water below such land, New Mexico could have assured that out-of-staters would have to pay owners of New Mexico land for the value of the New Mexico water.

As noted above, prior appropriation involves the uncompensated transfer of resources out of the public domain and into private hands. New Mexico's current groundwater export dilemma is merely an ironic variation on that persistent pattern. Happily, of course, no comparable problem exists in Hawaii. This article will reconsider the first two issues, perverse incentives and the problem of groundwater mining, after a brief look at Colorado.

**Colorado: a Rule of Capture for Some and a Rule of Overlying Ownership for Others**

In Colorado, two quite different sets of rules govern the development of groundwater basins. "Designated" groundwater basins are subject to a regulatory scheme essentially equivalent to those of New Mexico. The scheme differs from New Mexico's in that the constraint on mining is that depletion over a twenty-five year period should not exceed forty

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83. See infra section entitled Conditions for Optimal Mining of Groundwater.
84. The concept of an optimal rate is considered id.
85. New Mexico in fact has several statutes especially relating to water export. Their validity is reviewed in El Paso v. Reynolds, 597 F. Supp. 694 (D.N.M. 1984).
86. It may have to pay for land in order to have a place on which to drill the well.
87. As indicated in the text at note 92 infra, the legislature essentially left it to the Ground Water Commission's discretion as to which basins should in fact be designated.
percent of the water in a circle centered on the proposed well and having a three-mile radius. For groundwater basins that have not been "designated," a concept of qualified overlying ownership applies. For wells in such a basin, the state engineer is to issue a permit only if there is unappropriated water; but the statute provides that "only that quantity of water underlying the land owned by the applicant or by the owners of the area, by their consent, to be served is considered to be unappropriated." In addition, wells are not to be permitted if the effect would be to exhaust the reservoir in less than one hundred years. Moreover, permits are not to be issued if the resulting extraction would cause "material injury to vested water rights," evidently protecting the rate of extraction of those who drilled before the statute's effective date. Because of the protection for "vested rights," the term "qualified overlying ownership" will be used in reference to this system.

As "designation" radically alters the rules governing extraction, one might suppose the legislature would have carefully specified the criteria for designation. Far from it. The statute turns the matter over to the Colorado Ground Water Commission and requires only that, before designation, the Commission make findings about the boundaries of the aquifer, the amount of water stored there, and other elements which are sure to exist for any groundwater basin. Thus, the Commission is essentially without constraint in selecting which legal regime will apply to a particular Colorado groundwater basin. The qualified overlying ownership scheme sharply reduces the improper incentive effects of the Rule of Capture. As potential new drillers are limited to the quantity of water underlying their own land, plus, seemingly, that underlying the land of consenting landowners, a landowner who defers drilling is assured that the water underlying his tract will not be extracted by persons drilling post-statutory wells.

Colorado's qualified overlying ownership does not, however, entirely eliminate the Rule of Capture's race to appropriate. First, a landowner who defers drilling may see the water under his tract withdrawn to satisfy the grandfathered rights of those who drilled before the statute was enacted. Second, one who waits may face higher extraction costs, as the extraction by others lowers the water table in his area. Further, as was true for the Rule of Capture applicable in New Mexico and in designated Colorado basins, any resemblance of the resulting aggregate rate of extraction to the ideal rate is entirely coincidental.

90. See also State of Colorado, Dep't. of Natural Resources v. Southwestern Colorado State Water Conservation Dist., 671 P.2d 1294 (Colo. 1983). The decision is generally known in Colorado as the Huston case.
93. Discussed infra in section entitled Conditions for Optimal Mining of Groundwater.
Conditions for Optimal Mining of Groundwater

Rules for the consumption of a groundwater basin's periodic recharge seem comparatively easy to formulate. If each driller's periodic entitlement is limited to the recharge allocable to his tract, there is no need to race. The extraction by others will neither exhaust his supply nor markedly increase his drilling or pumping costs. The year-to-year variation in recharge around some average figure may create some difficulty, but this may perhaps be solved by requiring each owner to make certain that a moving five-year average\(^{94}\) of his extraction does not exceed the basin's average annual recharge.

The mining of basins, however, presents new problems.\(^{95}\) Under the Rule of Capture, as we have seen, extraction by one owner imposes "external" costs on others and induces wasteful behavior. Fear that others will extract first, thus exhausting the supply and increasing one's own extraction costs, leads to faster and more costly extraction than if one owner controlled the entire reservoir. Nor does constraining the Rule of Capture by administrative establishment of extraction rates achieve impressive results. Colorado, for instance, based its selection of the twenty-five year period on the standard time for amortization of a well loan. While such a period may be conventional for farmers and bankers, that fact is no evidence that it represents the optimal period for effective exhaustion of a water basin. A hypothetical groundwater basin in the sole ownership of a single party provides the model for identifying the optimal rate of extraction. Such a party's incentives would be to select a rate of extraction that would maximize the present net value of the water. That rate would be one which causes the net marginal value of water extracted in each period to be equal. Where any inequality exists, the exclusive owner could increase his welfare by increasing the extraction in any period where the marginal value was greater than that in any other period.\(^{96}\)

Determining the rate of extraction that satisfies this requirement is very hard. Further, no one can say with certainty whether correct decisions stem from self-conscious manipulation of technical economic information, from exceptional intuition, or from some combination of factors. In any event, delegation of the choice to administrative bodies, whose members will not reap special rewards for correct decisions, seems unlikely to produce the desired results. Some of the extraction formulae developed by New Mexico and Colorado may be correct; in such a difficult

\(^{94}\) A "moving five-year average" is an average calculated every year but always covering a five-year period. This device is employed, for example, in the Colorado River Compact, Article III(d).

\(^{95}\) Mining may be inappropriate in Hawaii, because of the conditions of the aquifers. Letter from Richard H. Cox to the author (September 3, 1985).

\(^{96}\) The optimization problem is essentially the same as that of adjusting one's purchases between hamburgers and hotdogs, considered in note 53 supra. For more detailed expositions, see S.L. Macdonald, The Leasing of Federal Lands for Fossil Fuel Production 47-63 (1979); Williams, Running Out: The Problem of Exhaustible Resources, 8 J. Legal Stud. 165 (1978).
area it would be hard to prove them wrong. What one can say is that neither state has adopted a process that is especially likely to produce a correct result.

The extraction of oil and gas similarly presents the problem of extracting a finite resource over time. A common law rule of capture applies, but this is subject to substantial statutory modifications. One modification consists of direct regulation of extraction through well-spacing rules which prohibit more than one well for a specified area and "allowables" which limit the rate of extraction. As these rules and rates are determined by administrators who cannot reap direct rewards from good decisions, they are, like Colorado's and New Mexico's extraction formulae, not likely to be the product of very energetic efforts at maximizing the value of the resource.97

The second device employed for oil and gas is "unitization." Voluntary unitization occurs when all or some of the owners in a reservoir agree upon a plan of joint extraction. Compulsory unitization, allowed by statute in all oil-and-gas producing states except Texas, provides that agreement by a statutorily specified majority, say 65 percent, will bind all owners. This makes it possible to overcome some owners' impulse to hold out for a disproportionate share of the gains produced by agreement, a tendency that may often prevent any agreement ever being reached. As a result of unitization, owners' rewards will not turn on the amount of production from wells on their property, but on their share of the underlying mineral and their contribution to the costs of the extraction process. This is obviously essential where, for example, optimal extraction requires using some wells to inject water or chemicals. As unitization enables the owners to benefit from sound extractive decisions, it clearly has greater prospects of inducing them to invest in careful calculation of the optimal extraction pattern and to put that pattern into practice.

**Transferability**

New Mexico expressly provides for changes in well location and water use, subjecting such changes to the principle applied to surface water transfers: that owners are entitled to make such transfers so long as the effect is not to inflict injury on others.98 For all the reasons discussed in connection with surface rights, such transferability is essential if a system is to be adequately flexible and, more generally, to enable water to provide the maximum contribution to social welfare.


98. N.M. STAT. ANN. § 72-12-7 (1978); 1985 N.M. Laws, ch. 201, § 8 (adding conservation and public welfare requirements). The 1985 amendment qualifies the statement in the text; although its exact operation cannot be known in advance, it seems inevitably to introduce very considerable uncertainty and thus seems to obstruct transfers.
There appears to be no requirement in either New Mexico or Colorado that water from a groundwater basin be used on land within the basin. The allowance of out-of-basin uses is entirely proper. If full transferability is available, the water will be applied at such places as maximize its net value.

Assuming a rule that initially allocates rights in the flow and stock of the basin in proportion to the water located under each overlying tract, however, it should be obvious that place of use properly affects the application of that principle. If the annual recharge allocable to a particular tract is five hundred acre-feet, for example, an owner of the tract who plans to apply it to a fifty percent consumptive use in the basin should be allowed a gross withdrawal of 1000 acre-feet, for a net withdrawal of the five hundred to which he is entitled. If the same owner proposes to use his flow entitlement out-of-basin, however, he should be limited to five hundred acre-feet. The same principle would apply if he proposed to change his use to a one hundred percent consumptive in-basin use.

Hawaii can and should escape the Rule of Capture in its selection of principles for groundwater law. Both for renewable supplies and for any groundwater mining, the starting point should be an allocation in proportion to overlying ownership. With fixed shares that are not susceptible to loss by non-use, the parties have a firm starting point for negotiating unitization agreements. State provision for compulsory unitization can facilitate that negotiation.

CONCLUSION

The current uncertainty in Hawaii’s common law system of water rights creates an unusual opportunity to learn both from the mistakes and successes of the mainland. The most positive lesson from the prior appropriation states is that New Mexico’s treatment of surface water, with its vested, permanent, and readily transferable rights, can achieve flexibility and provide incentives to curtail waste and to improve water use. Hawaii, however, is in a position to adjust the New Mexico system so as to eliminate the adverse features of prior appropriation, such as the incentive to premature development, uncompensated transfers into private ownership, and the doctrines of beneficial use, abandonment, and forfeiture.

99. Compare the so-called “reasonable use” rule at common law, which prohibits out-of-basin uses, and the “correlative rights” doctrine of California, which gives in-basin uses a preferred status over out-of-basin ones. See Getches, supra note 26, at 238-41.

100. Ideally, the system would also allow an the out-of-basin user to retain a property right in any water not consumed by that use. Cf. City & County of Denver v. Fulton Irrigation Ditch Co., 605 P.2d 144 (Colo. 1972); Williams, supra note 26 at 311-21.

101. Different areas of the reservoir are likely to vary in thickness. If ascertaining the hydrologic data is not too costly, it may be appropriate to allocate the water in proportion to the actual quantity of water that each tract overlies.
Instream uses could be integrated into such a system by, for example, providing for auctions at which all parties, including a state agency, could bid for such rights. If groundwater is allocated according to overlying ownership, as in some basins in Colorado, a basis will be laid for the development of unitization systems that can lead to private decisions maximizing the water’s value.

A carefully crafted water law system will provide private individuals with incentives to invest time and ingenuity in improving water use. Those incentives require only that individuals have a right to enjoy a substantial fraction of their ingenuity’s product. State officials, no matter how high-sounding the mandate under which they make decisions, simply are not subject to such incentives. Endless bureaucratic or judicial monitoring for waste, and review of proposed changes for their overall social desirability, cannot provide a substitute for citizens responding to reasonable incentives.