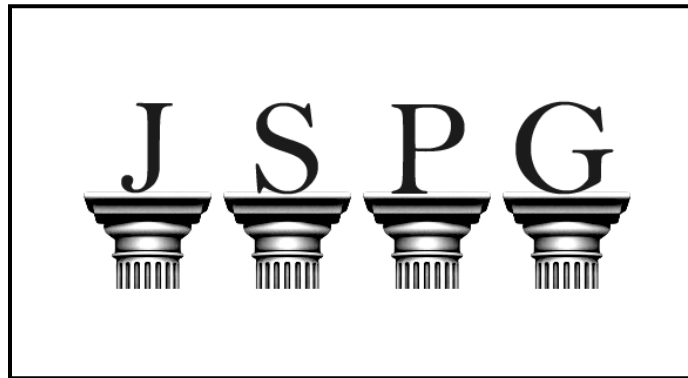


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Policy Memo:

THE HUNDRED YEAR ASSESSMENT: A TOOL TO STREAMLINE DAM REMOVAL POLITICS

BY

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Executive Summary

Dam removals hold strong restorative potential for degraded watersheds, but have been fraught with delay, expense, and political acrimony. America needs a stable management framework to efficiently decide the future of aging dams. I propose that each dam on the United States Army Corps of Engineers' (ACE) National Inventory of Dams be assessed when it is 100 years old, and then either be removed, or maintained and licensed for 50 years. The assessment would be done by a broad working group of river stakeholders, and the dam owners would pay the costs of removal or maintenance. This would bring dams into compliance with current laws and regulations, stabilize funding, and incorporate the perspectives of all relevant interests.

To: United States Senate Committee on Environment and Public Works, proposing an amendment to the Clean Water Act to address aging dams.

Introduction to the Political Challenge of Dam Removal

Dam removal is the best way to fix physically and biologically damaged rivers, restoring natural processes and spreading economic and ecological benefits throughout a watershed (Roni 2012). A dam removal reconnects upstream, downstream, and floodplain habitat, allowing re-colonization by anadromous fish, to the benefit of all species that feed upon them (Bednarek 2001). Removals tend to release silt and material that help build up downstream banks, beaches, and estuaries (Willis and Griggs 2002), and, removals also replace flatwater impoundment with natural riparian habitat and species (Bednarek 2001). These rewards benefit both ecosystems and human communities. But dam removals are politically controversial and technically complicated, confronting stakeholders with major and multiple challenges. Foremost among these challenges

is political uncertainty about how to proceed with the end of a dam's useful life, given the presence of overlapping private and public interests in the dam and the river. This doubt and absence of structure creates lengthy delays, which are expensive for stakeholders and damaging for the watershed. As dams age, rivers degrade, and stakeholders organize, there are likely to be many more dam removals in the near future. A streamlined, standardized dam assessment process will benefit all river stakeholders. It will reduce acrimony, provide a forum for all perspectives, and be shorter and cheaper for activists and dam owners alike.

Background on Dam Removal in the United States

America's rivers are shaped, controlled and degraded by an estimated 2.5 million dams (Pejchar & Warner, 2001). They halt the downstream flow of water, nutrients, and silt, scouring away shorelines, beaches, and the structure of the riverbed (Schmidt et al. 1998). Reservoirs act as vectors for invasive species, sending spores and contaminants downstream and filling riverbeds with algal blooms (EPA 2007). Dams alter many aquatic species' habitat, but they are particularly catastrophic for anadromous fish. Without access to spawning grounds, Pacific salmonid (*Oncorhynchus* spp.) runs are badly depleted; 32 out of 52 are federally listed (NOAA 2011), and 106 major *Oncorhynchus* populations have been extirpated (Nehlsen, Williams, & Lichatowich, 1991). Adult salmon often cannot pass over dams to spawning sites, and succumb to diseases from inhospitable dam-created temperature changes (Bednarek, 2001), while juvenile fish are sucked into ditches (Bender, 1997) and ground up in turbines (Collier et al. 1996).

Dams' benefits, from water storage to flood control to hydropower, sometimes balance their environmental costs, but this is increasingly rare. America's dams are getting old. By 2020, 85% of them will be past their useful lifetimes (Doyle et al., 2004). More than 4,400 American

dams are over 100 years old (ACE, 2012). Many of them are abandoned – the National Inventory of Dams (NID) shows 481 dams with no listed owner, and 3400 dams with no known use. The NID only includes the 84,134 dams above six feet tall, so there are undoubtedly many more defunct structures across the country. Many of these are likely to be “feral dams” (Van Dyke 2012) that were built to create a small livestock pond or to run a mill and then abandoned as land uses changed. Sporadically recorded and regulated, it would be appropriate to approach them through state or local bodies, though federal funding or technical assistance would be appropriate. A project to authoritatively list these dams would be very useful, but extremely challenging, and as such such dams are beyond the scope of this proposal’s focus on the large dams listed in the NID.

Increasingly, the response to this glut of ageing and destructive dams is to remove them. In the 1970s and 1980s the few dams removed were economic or safety liabilities, but by the 1990s by far the most important reason for removal was environmental effects (Pohl, 2002). The era of widespread dam removal is considered to have begun with the 1999 Edwards Dam decommissioning, in Maine’s Kennebec River (Pejchar and Warner, 2001, Lowry, 2003). Since then there have been several major removals with regional or even national profiles. I focus here upon Marmot Dam (2007, Sandy River, Oregon), Savage Rapids Dam (2009, Rogue River, Oregon), and Elwha and Glines Canyon Dams (ongoing, Elwha River, Washington). All were in the Pacific Northwest and so share some distinctive ecological and cultural features, but the legal and political issues that shaped their removal processes are likely to be representative of those faced across the country and to be instructive for removal decisions in the future. There have been at least 450 dam removals since 1999 (AR 2010) after only 151 in the entire 20th century (Pohl, 2002).

Current Policies on Dam Removal

The number of removals is remarkable, as dam removal occurs in an uneven and poorly developed political landscape. Dam removals are guided by the major federal resource laws, most notably the National Environmental Policy Act, the Clean Water Act, and the Endangered Species Act: blunt political instruments intended to halt activities harmful to the environment more than to mandate restoration. Dam removals are also, in part, regulated by state and local agencies, most notably by states' diverse water right structures, which govern diversion of water from dam operations. The United States Constitution's Supremacy Clause, however, makes such regulations subservient to federal laws. Amidst all of these various and at times conflicting or ambiguous regulations, there is little explicit guidance for the management of the end of infrastructural life. This is the major policy challenge for dam removal, which I address here.

It is no accident that most of the major removals listed above were removals of hydroelectric dams. The Federal Energy Regulatory Commission (FERC) re-licensing process provides a structured opportunity to assess energy projects after 30, 40, or 50 years. After the 1986 Electric Consumers Protection Act required FERC to give equal consideration to non-power values such as the environment, the Commission has made quite balanced evaluations of hydro projects.

Thus, the only major regulatory framework that explicitly addresses dam removal deals only with dams as electric power producers. Most dams, however, are not hydroelectric dams. Power is the primary use for just 2,210 dams out of 84,134 on the NID, and the most common primary dam use in the database is recreation. Stakeholders hoping to reassess the worth of a non-hydropower dam, thus, have few options to begin such an assessment.

There have been some programs supporting dam removal outside of FERC. From 2005-2012, NOAA helped fund 90 dam removals through its Open Rivers Initiative, but the program was on relatively small-scale and no longer offers funding (NOAA 2012). There have also been some state-run efforts. Most notably, Pennsylvania has removed at least 149 dams (American Rivers (AR), 2008, 2009, 2010), but the state Department of Environmental Protection's expeditious approach is unlikely to apply in states with more challenging geographies, scarcer water resources, and more reliance on large-scale hydropower. A state-by-state approach, moreover, would not be appropriate to the national issue of aging dams and degraded waterways. Rivers and fisheries are national resources, and dam reassessment demands a national framework that incorporates local, regional, and federal interests.

The major failure of dam removal policy is that it fails to account for dams' non-market amenity impacts. The Savage Rapids and Elwha controversies were extended for years by people whose attachment to their dams and the artificial lakes they formed had little to do with the market economics of what the dams produced in terms of power and irrigation water. The reservoir is a popular part of the local landscape; for example, water-skiers loved Savage Rapids Lake (BOR, 2006). Reservoirs also change groundwater levels, and draining them may affect nearby wells. Artificial reservoir ecosystems may sustain popular wildlife – the Elwha reservoirs hosted trumpeter swans. Much of the resistance to dam removal springs from such issues (Hiljus and Davis, 1994; Chastain, 2011), with local people feeling that they were losing something beyond hydropower or irrigation water. The American political system gives such stakeholders little specific opportunity to quantify or incorporate these values into decisions, but ample opportunity to express them and to slow the progress of a removal decision. My proposal will allow the values of such stakeholders to be included in the decision-making process. While it

may not reconcile different values, it may allow for such losses to be mitigated and will blunt the common rural accusations of marginalization by environmental elitists and appeals to legislators to take the situation in hand (Adams, 2011). The lack of a political forum to express such concerns and values gives actors political leeway to pursue their own interests through the political and legal systems, expensively and at length.

The Hundred Year Assessment

I propose that Congress amend Title IV of the Clean Water Act to direct the Army Corps of Engineers to perform a reassessment of each dam on the National Inventory of Dams 100 years after the dam's first year of operation. It is necessary to limit this approach to NID dams because there is no national database for smaller dams, making them difficult to assess and regulate. This is just as well, however, as dams over two meters (i.e., those included in the NID) are likely to present larger ecological, functional, and safety issues. This approach is modeled on the Federal Energy Regulatory Commission relicensing program, with modifications incorporating the experiences of recent major dam removals. A schedule-based approach will give stakeholders the opportunity to assess options for the future well in advance of reassessment. The central points of the Hundred Year Assessment:

- Dams will be assessed as if the project were a new one, as hydroelectric dams are by the FERC. Owners will be required to bring their dams into compliance with current federal laws and regulations.

- Dam owners will be responsible for the cost of upgrades or removal, including silt removal and contaminant cleanup, but not for post-removal ecological restoration work. During the process, income from the dam will not be subject to federal taxes.
- Dam owners will partner with ACE and assemble a broad working group to perform the assessment. This group will take public comments as required under NEPA. The group must include state and federal resource and land management agencies, affected tribes, representatives of the county and municipality in which the dam stands, representatives of relevant environmental and/or fishing groups, area watershed councils, and any other holder of an economically significant water right that would be affected by the dam, in quality or quantity. Its decision will be legally binding. The assessment will include a plan for long-term restoration and monitoring.

This action is appropriate given ACE's responsibilities for navigability, and for water quality under the Clean Water Act. ACE will be specifically ceded authority in these assessments to avoid jurisdictional overlap with the Environmental Protection Agency. The Hundred Year Assessment should be eagerly embraced by Congress as a mechanism to create construction jobs in nearly every member's district. The assessment will not apply to FERC-licensed hydroelectric dams.

The assessment will result in either dam removal or the establishment of a new dam operation plan, licensed for 50 years. If there are significant ecological or structural concerns but the dam still merits retention, the working group will have the option of issuing a 30- or 40-year license, in line with the established FERC relicensing process. This guarantees reasonable stability for dam users. The working group must be assembled by the dam's 95th year, the

removal/operation plan must be submitted to ACE by the dam's 100th year, and the plan's physical implementation must be in progress five years later. This schedule will allow the dam operator to apply at least five years' income to the costs of removal, as occurred with the Marmot Dam (Esler, 2012).

The plan is not comprehensive, given the many smaller dams not in the NID, but it will be a great improvement on the present policy void. The focus on very old dams will make for a natural pilot program in the next ten years. Older dams are more likely to be in an advanced state of disrepair, and to be smaller and less productive. Only 1,964 dams turn 100 in this decade (NID 2012). This will allow the assessment process to improve as any practical flaws manifested themselves.

The establishment of owner responsibility for dam removal is a major advantage of the Hundred Year Assessment. This been a question for removals in the past, but dam owners cannot reasonably complain that they should not be responsible for the end of their structure's life any more than a private person can abdicate responsibility for disposing of a broken-down car – especially, to extend the analogy, a car that is blocking a public highway. Owners are likely to get a good economic deal in any case, as the dam's production during the assessment would be free of federal income tax, and as the costs of removal are often less than the costs of maintenance and mitigation, as in the case of Savage Rapids Dam and Marmot Dams (BOR 1995, Esler, 2012). Owners' responsibility will include sediment removal, for which ACE issues Section 404 permits, but not the subsequent restoration program. The Hundred Year Assessment will encourage dam owners to maintain their dams proactively so as to minimize their costs during the assessment. It will also serve to minimize their liability – owners of century-old structures and reservoirs run significant risks of failure or accidents.

Dam owners will be required to exercise due diligence throughout the process. Failure to comply, or abandonment of the dam at any point after the passage of the amendment, will result in surrender of dam ownership and eventually in full financial responsibility for post-removal restoration work as well as the removal itself. Owners who wish to engage in the assessment sooner will be rewarded with restitution of one percent of the costs of removal or mitigation for each year earlier that they began their assessment, to be paid after the project's completion. In-water restoration work, overseen by ACE, will be paid out of Department of Defense appropriations. Ecological restoration work will be paid out of appropriations to resource agencies.

The most difficult challenge is to incorporate all stakeholders and uses. Arguments are often made for the value of the standing dam and the public enjoyment of the reservoir, similar to arguments for public enjoyment of standing forests (Hiljus and Davis, 1994). To incorporate these perspectives, the assessments' working groups will include local elected officials and watershed and interest group representatives.

It is not possible for all stakeholders to value the same things, but a transparent and conciliatory approach that deals straightforwardly with applicable laws and the dam owner's economic and legal responsibilities may defuse a great deal of potential conflict. In the case of the Marmot Dam, Roslyn Lake (a forebay for a powerhouse) was the center of a beloved park. Public meetings were held in which the dam owner, a regional utility, listened to local concerns and pledged to maintain public recreation at the site if possible while making it clear that their focus was on the good of their ratepayers. There was some local disgruntlement but no significant grassroots opposition to the removal or the restoration project (Esler, 2012). The utility engaged with the town of Sandy, where the park was, and the Sandy River Basin

Watershed Council, which included a wide range of river users. The result was an efficient, amicable process. This was in contrast to long conflicts on rivers like Oregon's Rogue, where local communities felt ignored and marginalized (Adams, 2011).

These problems underline the importance of publicly engaging with all users. The establishment of the Hundred Year Assessment will encourage stakeholders to begin the public conversation early. At the start of the public comment period the owners must make an unambiguous statement of their dam's uses and functions, to be read by all commenters before they submit their thoughts on the process. Local peoples' conception of the dam's functions can be quite different from reality; people ascribed uses like flood control to the Elwha Dams, when in fact the dams did nothing of the sort (Rains, 1994). A public education effort by local river groups should be encouraged as a useful way to handle this issue.

The Hundred Year Assessment will create a framework, a schedule, and a funding structure to approach ageing dams and dam removal. It is fair, open, and efficient. While it is impossible to satisfy everyone, the Hundred Year Assessment will contain and reduce many of the problems bedeviling restoration efforts, and allow for unified approaches to restore American rivers.

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