Durable Freshwater Protection Overview

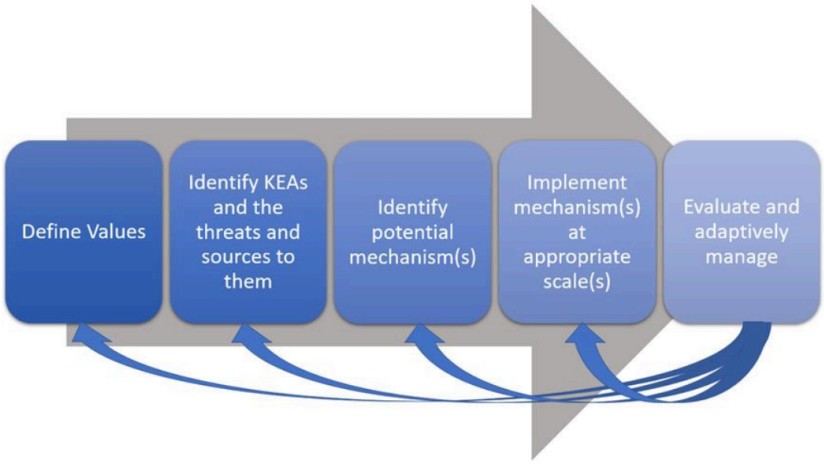
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Durable freshwater protection (DFP) is an approach that moves beyond conventional terrestrial-based protection and management by providing a structure that centers on the unique needs and attributes of freshwater ecosystems, including connectivity, hydrology and water quality. DFP can both encompass and work in concert with restoration, improved management, and avoided impact.

> *DFP safeguards freshwater ecological integrity and associated biodiversity and social values over the long-term through legal or other effective means, sustainable funding, and social support.*

As with durable terrestrial and marine protection, DFP aims to achieve effective long-term conservation of biodiversity and linked social values. But *how* we get to those outcomes may look quite different. To conserve freshwater ecosystems, we need a toolbox of approaches tailored to the systems' special dynamics and vulnerabilities**.** These approaches include, and critically go beyond, conventional land protection. Protection mechanisms must address the unique needs and attributes of freshwater systems at appropriate scales so that the scope of protection accounts for ecological process of and threats to the freshwater ecosystem in question.

DFP is nothing new. TNC and partners have been undertaking freshwater protection projects for years. But we have not been intentional about using DFP to bend the curve of freshwater biodiversity loss by applying it in the world's most important places and taking it to scale. With the introduction in 2021 of the DFP framework,[1] the basic elements of DFP were distilled. Accompanying DFP examples from around the world demonstrated that DFP wasn't a theoretical possibility but a reality.



The DFP Framework. Note the important feedback loops. From Higgins et al. (2021)

[1] Higgins, J.; Zablocki, J.; Newsock, A.; Krolopp, A.; Tabas, P.; Salama, M. Durable Freshwater Protection: A Framework for Establishing and Maintaining Long-Term Protection for Freshwater Ecosystems and the Values They Sustain. *Sustainability* **2021**, *13*, 1950. https://doi.org/10.3390/su13041950

Since the publication of the framework and its intentional application in places around the world, our collective thinking around what constitutes DFP and how to achieve it has grown. In 2023, we produced a short DFP overview. One year later, the way we communicate about DFP has evolved further. For instance, we no longer emphasize the DFP 'checklist,' as it suggests that a project qualifies as DFP if all the boxes are checked, and that a project with unchecked boxes doesn't qualify. In reality, **DFP is a process, not a black or white classification**. Projects nearly always sit somewhere along a path to durable protection, as teams work to strengthen and lengthen protections while mitigating threats as they emerge and spread.

As with conventional terrestrial protected areas, freshwater protections are rarely iron-clad. For instance, we see 'protected' rivers being threatened by dams, mining, and water withdrawals.[2] The strength of a freshwater protection will depend in part on its defenders. Reviews of DFP case studies suggest that where local communities are the engine behind a freshwater protection designation, they will fight to maintain its integrity. That is why we emphasize that the 'durability' of DFP includes local values.

The DFP framework doesn't tell us what to do in any given place, because every place is different. Standard conservation planning approaches, applied through a freshwater lens and unbound by conventional terrestrial interventions, can lead us to DFP solutions. But any single DFP solution may only be a piece of the freshwater conservation puzzle. We may need to leverage multiple DFP mechanisms for a particular system and bring in additional interventions, like best management practices in a protected system's catchment. DFP cannot do everything, but without DFP, remaining intact freshwater systems will continue to be fragmented, drained, polluted, and over-used, and we risk losing hard won gains in restored systems.

Frequently asked questions

What does 'protection' mean in the context of DFP?

In the context of DFP, **'protection' includes but goes beyond protected and conserved areas (PCAs)**. PCAs have historically been designated to conserve terrestrial and more recently marine biodiversity, but they can also be critical tools for conserving freshwater species, systems, and services. Protected areas and other effective area-based conservation measures (OECMs) that align with DFP can either be integrated terrestrial-freshwater (or terrestrial-freshwater-marine) areas or they can be focused exclusively on freshwater systems, such as with a fish reserve.[3] Protected areas should never result in exclusion of Indigenous peoples and local communities from access to water or essential freshwater-related services, and we must always adhere to a rights-based approach in our work.

As detailed in Higgins et al. (2021), protected areas and OECMs are just two of a much longer list of legal and non-legal mechanisms that can be applied in service of freshwater protection. In the end, what

[2] Conservation 'setback' looms as Nepal opens protected areas to hydropower projects (mongabay.com)

[3] The expansion and adaptation of protected areas and OECMs to more effectively conserve freshwater ecosystems and biodiversity is addressed in the 2024 IUCN World Commission on Protected Areas Technical Report that launched at the CBD COP16.

defines protection is whether there is a recognized, formal mechanism for defending against threats identified to freshwater objectives and values. For example, a legal flow reserve might be designated for a river reach to protect against new dams or water withdrawals, but that reserve might not be recognized as a protected area or OECM by the national government. An Indigenous authority through its local governance scheme could establish freshwater conservation commitments within its territory. Or, enforceable regulations might require that a river or lake's water quality not exceed certain parameters, but again the river or lake itself might not be within a protected or conserved area. Individual protection mechanisms may need to be layered, such as by combining water quality regulations with flow reserves to address both quality and quantity ecological attributes.

In short, DFP can encompass conventional protected areas, formally recognized OECMs, and other forms of place-based durable protections. An enabling policy – such as a law allowing for the identification of high quality waters and their protection – would not qualify as DFP on its own, but its application to a particular ecosystem would. This definition of DFP is more expansive than what 'counts' toward the Convention on Biological Diversity's global 30x30 goal (see 'Measurement and Tracking Progress' guidance document).

What qualifies as durable?

The concept of 'durability' has multiple components:

- Durability (longevity) of the protection: IUCN holds protected areas and OECMs to a standard of long-term protection 'intent' for at least 25 years.[4] In some cases, we may find that we cannot hold all durable freshwater protections to that same standard; for instance, water lease agreements, which may be critical for maintaining the hydrological regime KEA, may have legal term limits of shorter duration. In line with the DFP journey, we should always be working towards protections that will be in perpetuity.
- Durability of financing: The term 'durability' has increasingly been associated with sustainable financing, to ensure that funding for management will persist. Identifying and implementing sustainable financing mechanisms for freshwater protections is likely no harder than for terrestrial protections, and perhaps even easier, given the essential services that freshwaters provide. To our knowledge there is no compendium yet of sustainable financing mechanisms that have been applied for freshwater protections around the world.
- Durability of social support: Freshwater protections will only be sustained over time if there is consistent support from local communities, starting before the protection is even enacted. Local communities will be the defenders of the protected systems over time and, given the physical proximity of communities to most freshwaters, a 'social compact' (an implicit agreement among the members of a society to cooperate for social benefits) may be essential for broad adherence to any restrictions.

[4] Fitzsimons, J., Stolton, S., Dudley, N. and Mitchell, B. 2024. Clarifying 'long-term' for protected areas and other effective area-based conservation measures (OECMs): why only 25 years of 'intent' does not qualify. DOI: 10.2305/GLFT9809

How does DFP relate to protected areas that were designed for terrestrial and marine objectives?

Historically, inland protected and conserved areas were all referred to as 'terrestrial' protected areas, regardless of whether they included freshwater ecosystems or objectives. TNC has been actively working with the UN Environment Programme World Conservation Monitoring Centre, who is responsible for the World Database on Protected Areas and the World Database on OECMs, to change this label to 'terrestrial and inland water' areas. The DFP team asks for your support in helping to sustain the adoption of this improved terminology in your respective countries.

Existing and new protected and conserved areas will almost always contain freshwater systems, and there are ways that those areas can be managed to maximize the benefits to the freshwaters within them. We are leaving a lot of freshwater conservation on the table if we do not take advantage of those opportunities. And, some inland protected and conserved areas will be so extensive in size that almost by definition they will confer some degree of protection to the freshwaters within them. This is especially the case if they are in headwater areas.

However, in most instances we should not assume that the freshwaters within protected and conserved areas designated and managed for terrestrial and/or marine objectives are providing durable freshwater protection. When rivers form the boundaries of protected areas, which is often the case, they are at most receiving 'half' protection. There are also many examples around the world of dams being built within protected areas, or even protected and conserved areas being designated to protect reservoirs. Ideally, new protected area systems, and new individual protected areas, will be designed to achieve integrated freshwater and terrestrial and/or marine biodiversity objectives. We know that this leads to greater efficiencies in outcomes.[5]

Given these nuances, we report on 'protection coverage' of freshwater ecosystems when we lack information about whether a particular area or set of areas is being deliberately and effectively managed to achieve freshwater outcomes. The global Durable Freshwater Protection team can assist in shaping messaging when there is uncertainty around how to communicate about a particular protection achievement.

Where does restoration fit into DFP?

Generally, protections are implemented to preserve freshwater systems that are important for biodiversity (e.g., areas of high species richness or endemism, important breeding or feeding sites) and have high ecological integrity. If an area is important for biodiversity but has been degraded, restoration can be a necessary conservation investment. Protections will also be important for restored systems to ensure that gains aren't lost. An example is coupling dam removal with subsequent river protection. Keeping in mind that DFP is a process, restoration may be a step along the path to eventual protection. For systems that are already protected, restoration of the protected systems themselves as well as of their catchments may be necessary. Fully intact freshwater systems are increasingly rare, and we know that both restoration and protection are essential and complementary tools in our conservation toolbox.

[5] Cecília G. Leal et al. Integrated terrestrial-freshwater planning doubles conservation of tropical aquatic species. Science 370,117-121(2020). DOI:10.1126/science.aba7580

Does a DFP project have to protect and maintain all five key ecological attributes?

In short, no. The five key ecological attributes (hydrologic regime, connectivity, water quality, habitat condition, and biotic composition) provide a useful framework for ensuring that we are considering freshwater systems holistically and designing interventions (protections and other measures) that address key threats to them.

In most cases, no single DFP mechanism will be able to maintain all five key ecological attributes, and even a project that layers multiple DFP mechanisms may still be unable to prevent threats to KEAs (especially hydrologic regime and water quality) originating upstream, downstream, and in unprotected parts of a catchment.

In addition, the DFP framework encourages focusing on or prioritizing those KEAs that are most integral to the freshwater objectives/values in the area of focus. For example, if you are focused on supporting habitats for successful spawning and juvenile development of fish, macroinvertebrates, etc., but dissolved oxygen conditions are lethal throughout the year, or water quality is being threatened by a proposed point source discharge, water quality may need to be the central focus, with other attributes being treated more generally.

Importantly, understanding the baseline conditions of KEAs in the system of interest, the limits of a given project, and mapping out a plan for addressing external threats to KEAs as they arise is part of the DFP journey.

How can we say a freshwater system is protected if its catchment isn't? And how can we deal with external threats?

Where whole catchments are protected, we can have a degree of confidence that the freshwaters within them will have good ecological integrity. But in most places, whole-catchment protection with strict use restrictions would require displacing people or limiting essential livelihood activities. Instead, we should look at what will be required to manage catchment land and water uses in ways that are supportive of and compatible with the protected freshwater system. This is a challenge and requires marrying DFP with nature-based solutions (e.g. reforestation), best management practices on working landscapes (e.g. conservation tillage or cover crops), and integrated water resources management (e.g. multi-sectoral water use efficiencies). But the difficulty of doing this should not be a barrier to starting with the protection of critically important freshwater systems and then building management solutions outward. The stronger the freshwater protection, the more 'teeth' it will have if an external threat – like a proposed upstream or even downstream dam – emerges that would impair the values for which the protection was established.

How does DFP relate to climate change?

Freshwater ecosystems are by nature dynamic, and with climate change we should neither expect them to remain static nor work to restore unachievable past baselines. With its focus on ecosystem health, DFP helps to build and maintain resilience in those systems, and that resilience will enable persistence, adaptation, and in more extreme cases transformation in response to disturbance.

Who is the TNC DFP team?

TNC's global DFP team, housed in Global Protect, works to advance the practice and scale the implementation of DFP around the world, in collaboration with TNC colleagues, partners, and other actors. The small team has expertise in freshwater ecology and conservation biology, conservation and spatial planning, and policy. We work on influencing global policy; developing DFP-relevant tools, data, and approaches; building capacity; integrating DFP into large-scale sustainable financing mechanisms; and assisting in on-the-ground DFP design and delivery. We are not DFP gatekeepers, and our aim with this guidance is to democratize the practice of DFP and strengthen TNC's DFP expertise and leadership in regional and country programs.

From: Unlocking the potential of protected areas for freshwaters Abell et al. (2007)