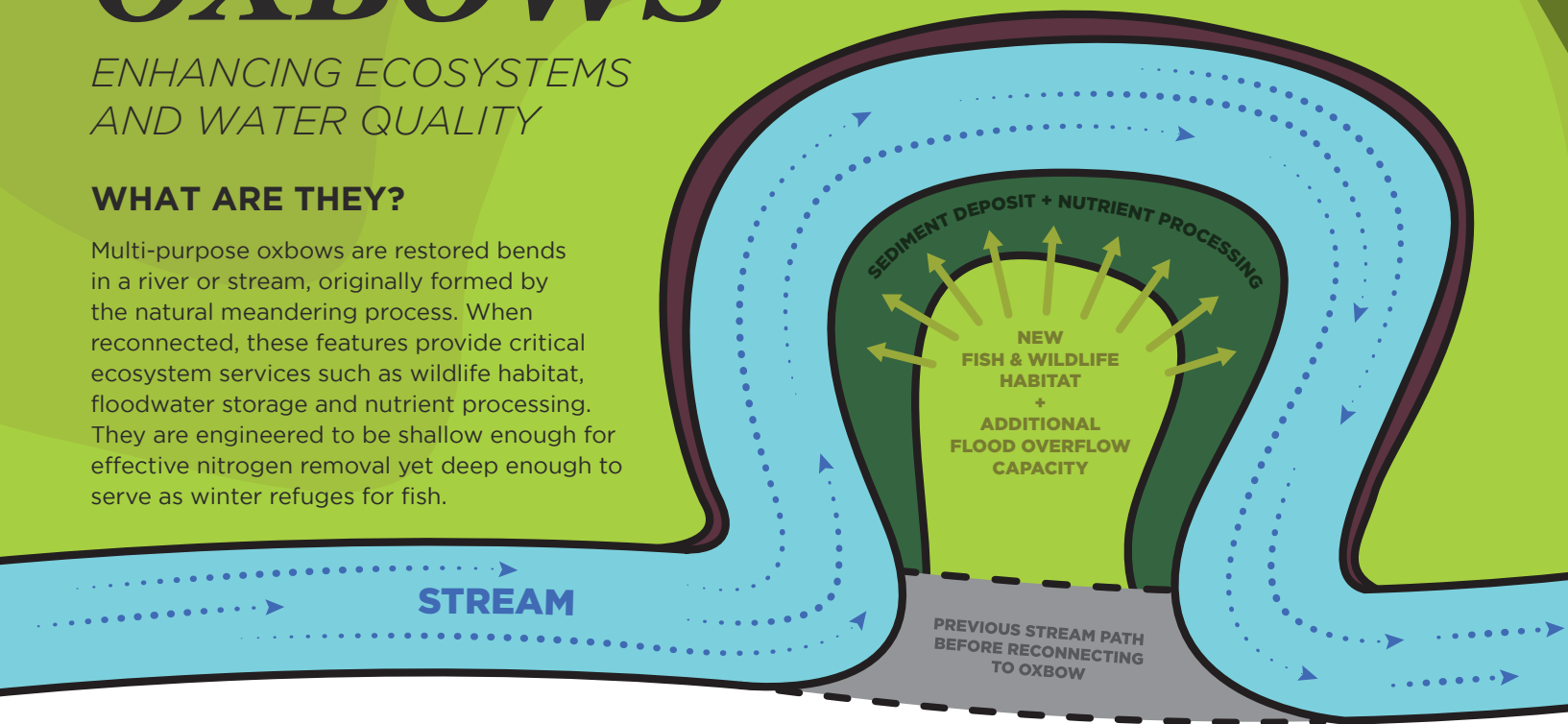


MULTI-PURPOSE OXBOWS

ENHANCING ECOSYSTEMS
AND WATER QUALITY

WHAT ARE THEY?

Multi-purpose oxbows are restored bends in a river or stream, originally formed by the natural meandering process. When reconnected, these features provide critical ecosystem services such as wildlife habitat, floodwater storage and nutrient processing. They are engineered to be shallow enough for effective nitrogen removal yet deep enough to serve as winter refuges for fish.



MULTIPLE PURPOSES

Fish & Wildlife Habitat:

Creates valuable habitats by providing sheltered areas for fish, especially during overwintering, while also supporting diverse wildlife.

Overflow Capacity:

Offers natural floodwater storage by reconnecting to streams, helping to manage excess water during heavy rainfall.

Nutrient Processing:

Filters nutrients from water, particularly nitrogen, reducing nitrate pollution and improving water quality through natural processes.



WHY YOU SHOULD IMPLEMENT OXBOWS

These structures offer a multifaceted approach to managing agricultural runoff, enhancing biodiversity and mitigating flood impacts. They represent a symbiotic relationship between agricultural land management and natural water purification processes, providing a habitat for wildlife while reducing nutrient loads in waterways.

WHERE CAN THEY BE IMPLEMENTED?

Location Criteria: Ideally situated near streams on marginal lands not used for crops. They should be connected to pipe discharges to maximize nitrogen removal.

Floodplain Integration: Necessary to be part of the floodplain for natural connectivity to streams, facilitating aquatic life migration.

IMPACT AND COST

Environmental Benefits: Oxbows can achieve 42 to 63 percent reduction in nitrate loads, contributing significantly to water quality improvement, while also maintaining wildlife habitats.

Design Considerations: The size of the oxbow is determined by the extent of the historic meander, with recommendations for the pool size to be 1 to 2 percent of the drainage area to optimize nitrate reduction.

Economic Efficiency: With average installation costs between \$10,000 and \$12,500, and a practice cost of \$9.44 per pound of nitrogen removed, oxbows present an economically viable option for environmental stewardship and agricultural runoff management.

Multi-purpose oxbows embody a proactive approach to ecological restoration and nutrient management, showcasing how agricultural landscapes can incorporate natural features for the benefit of water quality and biodiversity.

SOURCE: AGRICULTURAL DRAINAGE MANAGEMENT COALITION (ADMC)