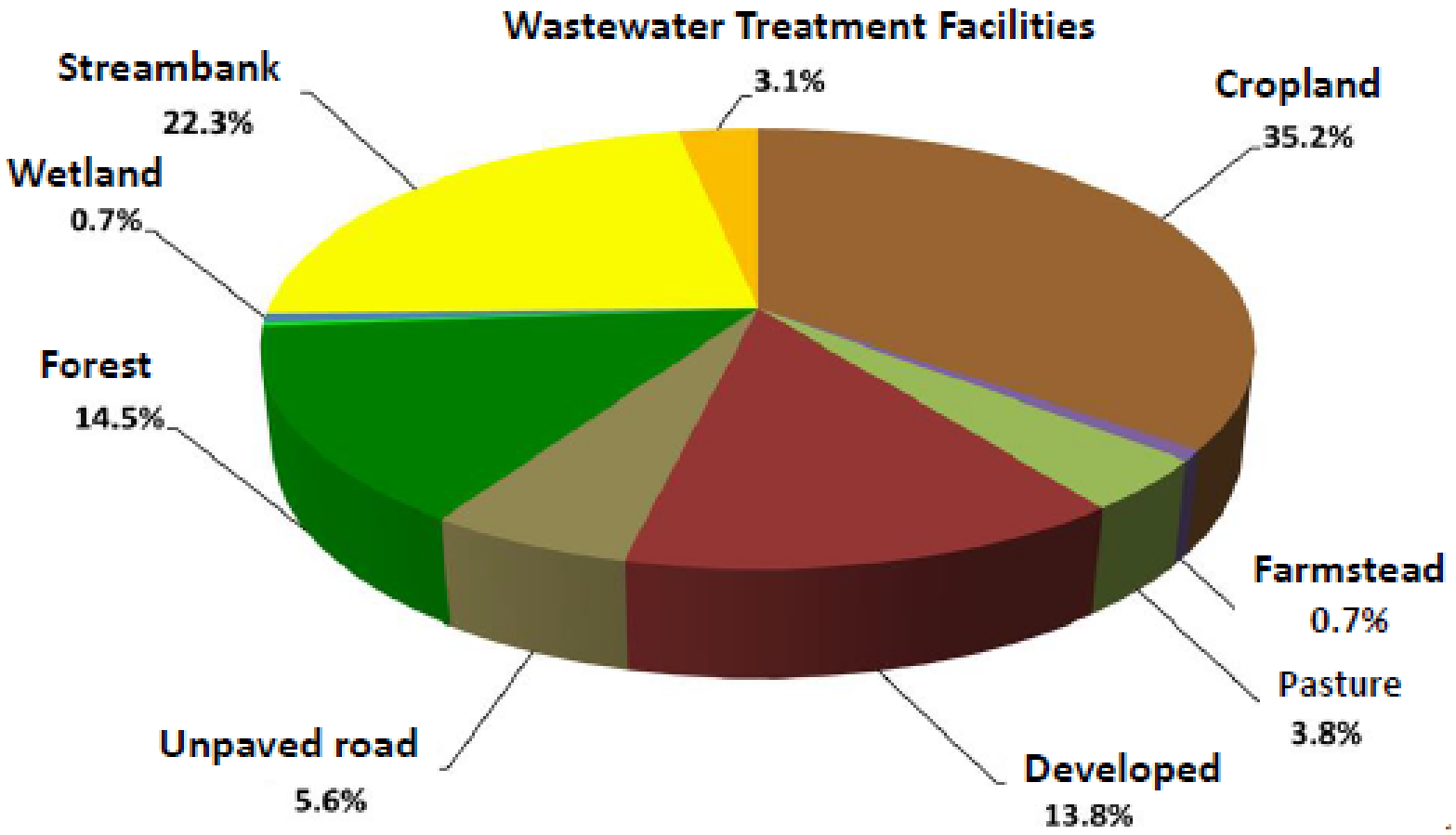
VAAFM BMP Program Update

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
WATER QUALITY DIVISION

Sources of phosphorus in the Vermont portion of the Lake Champlain Basin

(from EPA – Tetra Tech, 2013)

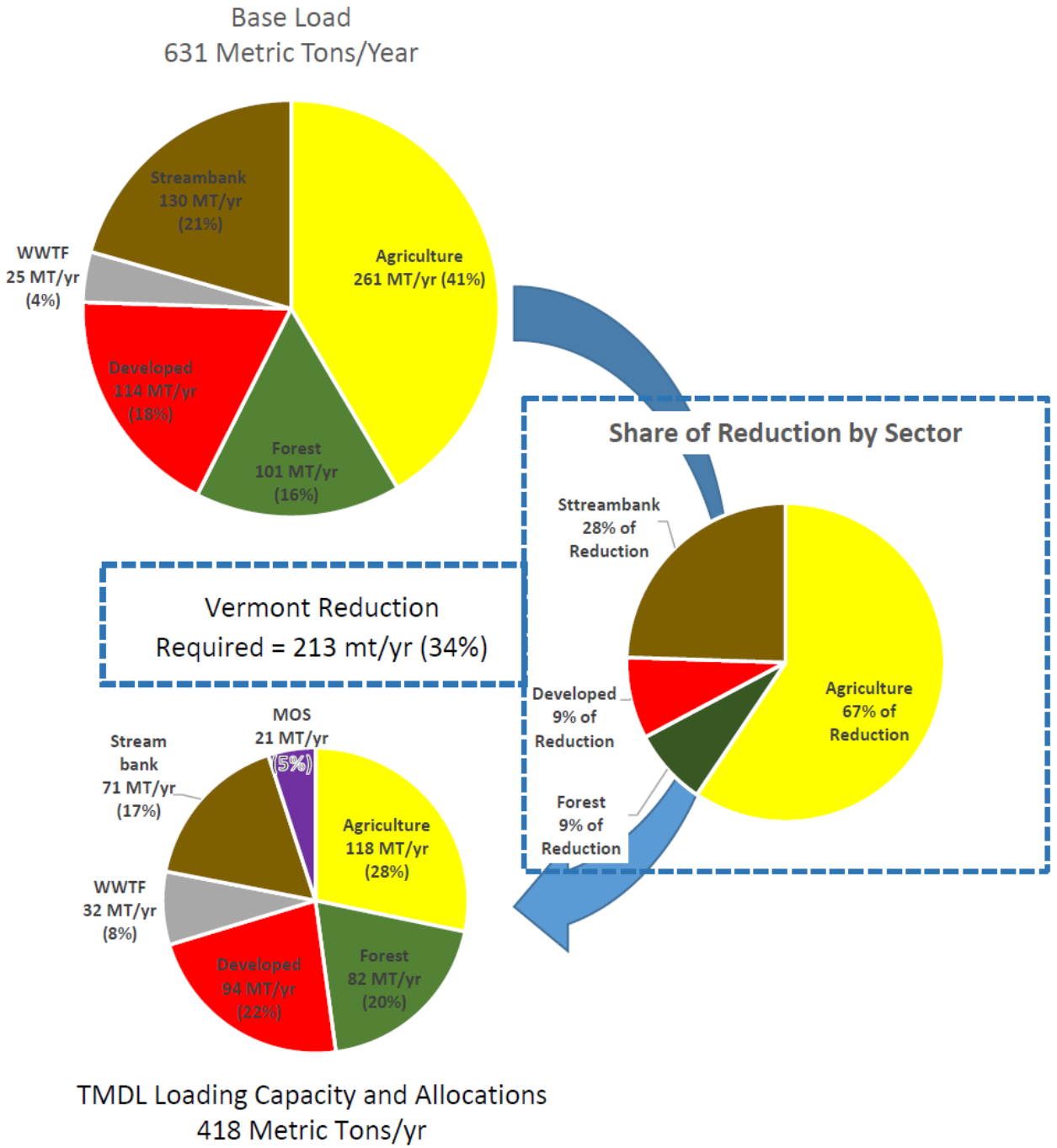


TMDL Equation (reduction requirements)

Lake Segment	WWTF	Develop-ed Land	Ag Prod Area	Forest	Streams	Ag	Total Overall
1. South Lake B	0.0%	23.7%	80.0%	60.0%	30.5%	59.5%	43.4%
2. South Lake A	0.0%	21.0%	80.0%	5.0%		59.5%	52.7%
3. Port Henry		10.6%	80.0%	5.0%		20.0%	15.8%
4. Otter Creek	0.0%	22.2%	80.0%	5.0%	40.1%	46.9%	24.7%
5. Main Lake	61.1%	23.8%	80.0%	5.0%	28.9%	46.9%	21.3%
6. Shelburne Bay	64.1%	21.3%	80.0%	5.0%	55.0%	20.0%	12.5%
7. Burlington Bay	66.7%	38.1%	0.0%	0.0%		0.0%	30.5%
9. Malletts Bay	0.0%	26.3%	80.0%	5.0%	44.9%	23.9%	17.6%
10. NE Arm		9.8%	80.0%	5.0%		20.0%	13.0%
11. St. Albans Bay	59.4%	9.8%	80.0%	5.0%	55.0%	34.3%	24.3%
12. Missisquoi Bay	51.9%	30.1%	80.0%	60.0%	65.3%	82.8%	64.3%
13. Isle LaMotte	0.0%	12.0%	80.0%	5.0%		20.0%	12.4%
Total	42.1%	24.1%	80.0%	23.4%	43.4%	51.5%	33.8%

Vermont Lake Champlain Base Phosphorus Loads, 2001-2010, compared to Vermont Lake Champlain TMDL loading capacity and allocations, by sector, in MT/yr

Sources: Data for base loads are from TetraTech, 2015



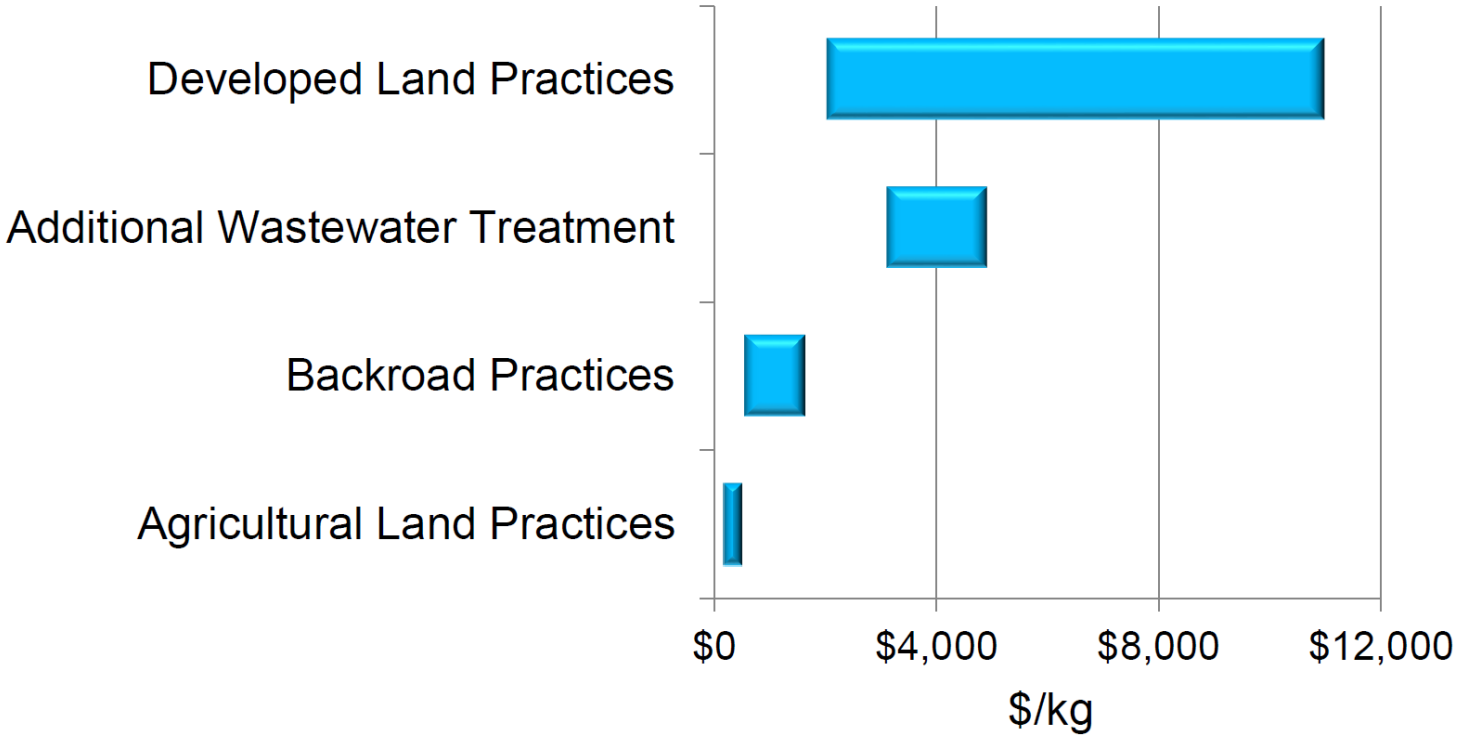
$200 – $11,000

Range of cost-effectiveness of phosphorus reduction practices (dollars per kilogram of phosphorus reduced)

From preliminary EPA estimates for the Lake Champlain TMDL

Relative Cost-Effectiveness of Phosphorus Reduction Practices

(Range of annualized cost per kilogram P reduced annually)



Nonpoint source practice costs are from preliminary EPA estimates for the Lake Champlain TMDL. Wastewater costs are from VT DEC. Estimates include capital costs only, annualized over 20 years at 2% interest.

State-Funded Clean Water Project Results

Annual avereage estimated total phosphorus load reduction (kilograms per year) achieved by state-funded clean water projects implemented/ constructed in SFY 2016–2018 reporting period, by sector, along with projected load reductions based on projects' expected lifespan (SFY 2019–2021).

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
WATER QUALITY DIVISION

Examples of Eligible Equipment:

- Conservation Tillage Equipment
- No-Till Grain Drills for Cover Crops
- Roller Crimpers
- Precision Agriculture Equipment such as Flow Meters and Data Loggers
- Manure Injectors
- Silage Balers/Wrappers
- Dragline Systems
- Phosphorus Removal Equipment/Technology

Eligible Practices

- Cover Cropping
- Conservation Crop Rotation and Nurse Crop Cover Cropping
- Nurse crops
- Strip Cropping
- Cross-Slope Tillage
- Conservation Tillage
- Manure Injection
- Aeration

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
WATER QUALITY DIVISION

Eligible Practices:

- Fence
- Pipeline
- Water Source Development
- Water Tanks
- Improved Permanent Water Area
- Stream Crossings
- Electric Fence Chargers

Eligible Practices:

- Grassed waterway
- Filter strip
- Critical source field area

CONSERVATION RESERVE ENHANCEMENT PROGRAM (CREP)

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
WATER QUALITY DIVISION

Different angle, same site

stream

Different angle, same site

FEDERAL AND STATE FEDERAL ASSISTANCE PROGRAMS

VT NRCS in 2018...

60 NRCS Employees

3 Pathways Students

10 Field Offices

14 Natural Resource Conservation Districts

$1.76 million to conservation partners to leverage NRCS efforts

61 partner employees assisting NRCS with conservation work

$6.35 million of NRCS technical assistance to private landowners

138,000 of acres protected and improved with conservation practices

3,869 acres protected through easements

$1.7 million obligated through the Regional Conservation Partnership Program (RCPP)

$18,681,838 million of financial assistance allocated

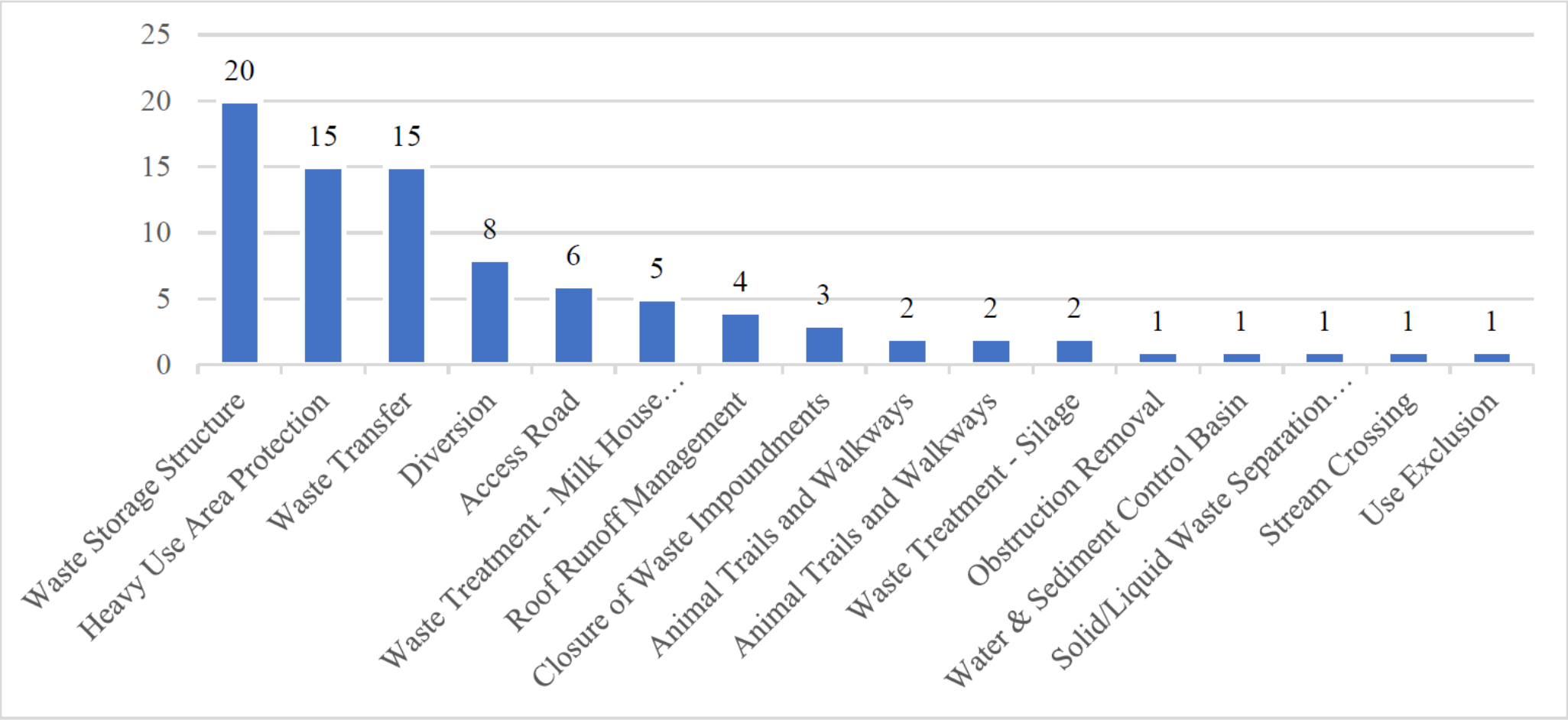
VERMONT

AGENCY OF AGRICULTURE, FOOD & MARKETS
WATER QUALITY DIVISION

SUMMARY OF FY2018 FINANCIAL ASSISTANCE PROGRAMS

PROGRAM	STATE EXPENDITURE	TOTAL OBLIGATION	IMPACT
FAP	$175,552	$249,905	7162 Acres Improved
Sample FAP Practices Installed	3796 Acres : Cover Crop		Average 28% reduction in total P[1]
	716 Acres : Conservation Tillage		Average 27.5% reduction in total P[1]
BMP	$2,516,842	$2,875,230	87 Practices Installed
Sample BMP Practices Installed	20 Waste Storage Structures		42% reduction in total P[2]
	2 Silage Leachate		1 acre of feed storage can lose as much nutrients as 120 acres of cropland[3]
	15 Heavy Use Area Protection & 8 Clean Water Diversion		53% reduction in total P for barnyard runoff management[2]
CREP	$48,297	$48,297	41.57 Acres of Cropland Buffer
Sample CREP Practices	22.1 Acres of Cropland Converted to Riparian Forest Buffer		40% reduction in total P, plus reduction from converting cropland to forest[1]
CEAP	$469,275	$902,400	43 Pieces of Equipment/Technology
Sample CEAP Equipment Aquired	6 Conservation Tillage Equipment		Average 27.5% reduction in total P[1]
	2 Silage Management Equipment		1 acre of feed storage can lose as much nutrients as 120 acres of cropland[3]
	5 Cover Crop Equipment		Average 28% reduction in total P[1]
	1 Phosphorus Removal Technology		Estimated 86.7% removal by concentration of total P[4]
GWFS	*New in 2018		
PSWF	*New in 2018		

Figure 4. FY18 BMP Implementation by Conservation Practice Type



United States Department of Agriculture

In 2018, farmers and landowners in Vermont improved and protected over 138,000 acres with nearly 6,500 conservation practices utilizing financial and technical assistance from NRCS.

	Vermont NRCS -Selected practices implemented in calendar year 2018			
	Practice Name	**units**	**Amount Implemented 2018**	**Number applied**
Agronomic Practices	Cover Crop	acres	23, 097	1900
	Forage and Biomass Planting	acres	2,424	261
	Residue and Tillage Management-No Till	acres	2,682	243
	Residue and Tillage Management-Reduced Till	acres	8,308	573
	Nutrient Management	acres	9,387	878
	High Tunnel Systems	sq. feet	200,816	80
Grazing Practices	Prescribed Grazing	acres	1,280	95
	Watering Facility	each	72	72
	Livestock Pipeline	feet	41,468	35
	Trails and Walkways	feet	14,739	30
Barnyard Improvement	Waste Storage Facility	each	18	18
	Heavy Use Area Protection	square feet	92,531	31
	Roofs and Covers	each	8	8
	Waste Transfer	each	37	37
Forestry and Wildlife	Forest Stand Improvement	acres	243	55
	Early Successional Habitat Management	acres	596	92
	Brush Management	acres	1,048	131
	Forest Trails and Landings	each	52,842	67
	Number of phosphorus-reducing conservation practices in Vermont, implemented in 2018, on fields with high or very high risk of erosion	4,863 practices	76% of all practices were on erodible lands	

BEFORE BARNYARD HEAVY USE AREA

AFTER BARNYARD HEAVY USE AREA

BEFORE

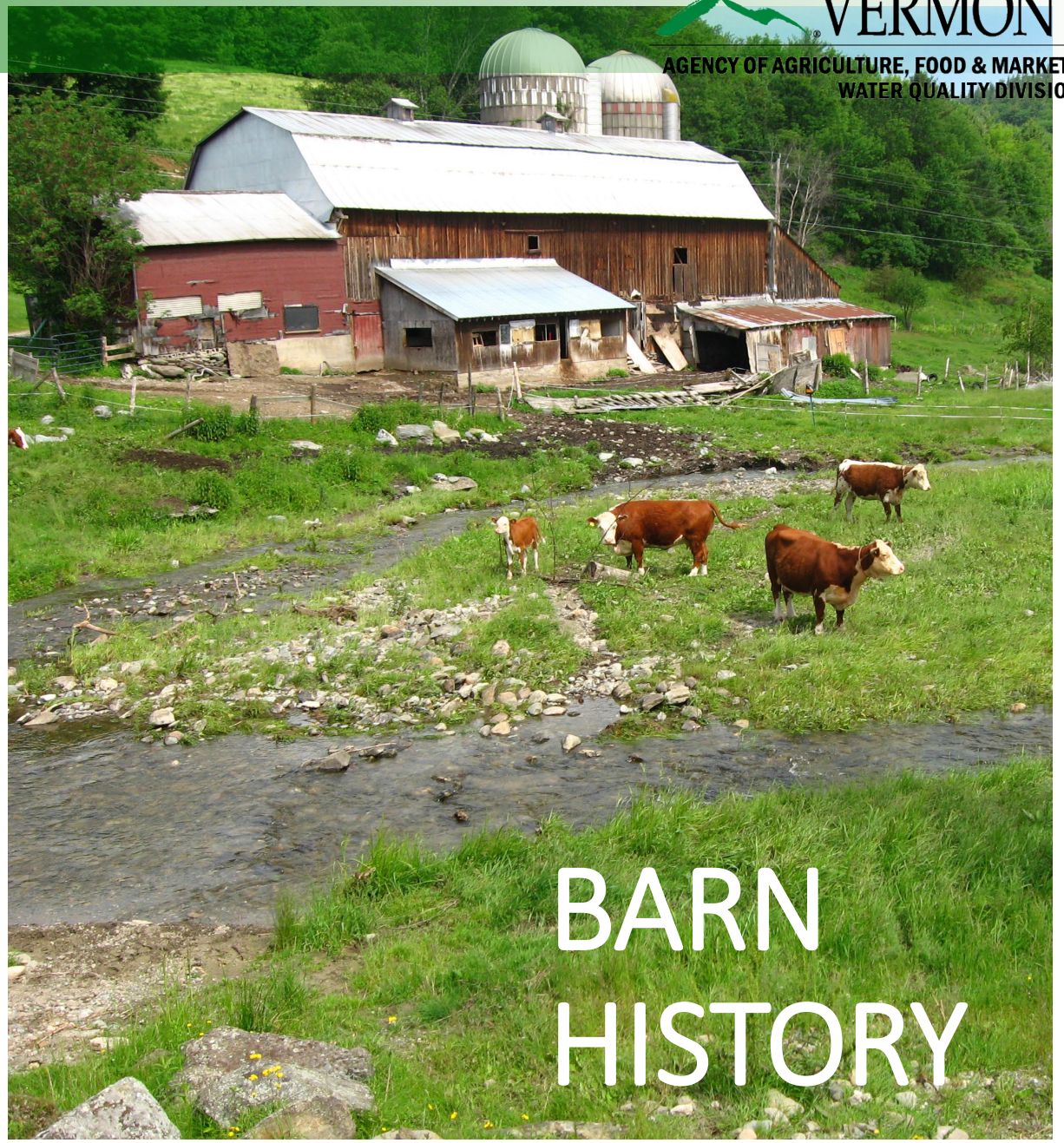
AFTER

BEST MANAGEMENT PRACTICES (BMP) PROGRAM

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
WATER QUALITY DIVISION

BEST MANAGEMENT PRACTICES (BMP) PROGRAM

VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS
WATER QUALITY DIVISION

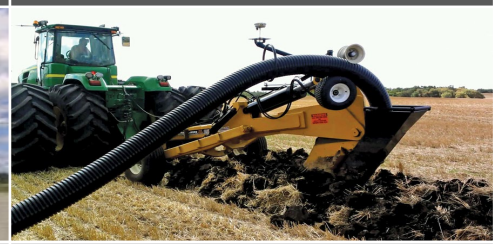


BARN HISTORY

VT STATE PERMITS REQUIRED FOR WATER QUALITY IMRPOVEMENTS ON FARMS

- Flood Hazard Area and River Corridor Permits
- General Construction Permits
- Stream Alteration Permits

Areas Where Wetland Permits Have Been Required Historically

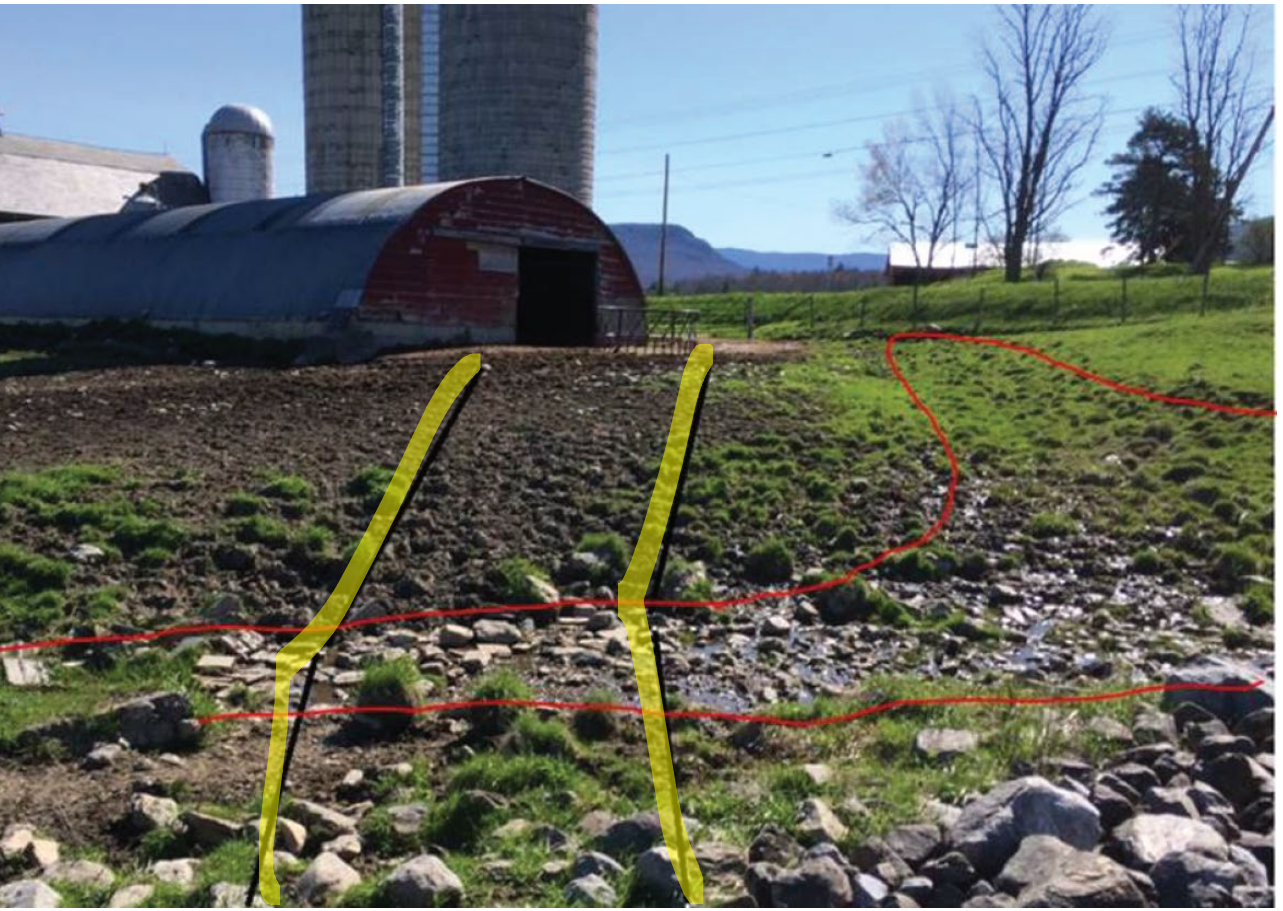
Current Land Use	Farming	Farming	Farming	Wetland
Activity Type	**Farming**	**Development**	**Non-Principally Produced**	**Drainage/Conversion**
Activity Planned				
	Conservation Practice	Development	Slaughter House	Tile Drain
				
	Waste Storage Facility	Development	Maple Production	Conversion
				
	Farm Structure	Development	Dairy Processing Plant	Farm Structure
Wetland Permit Needed?	**No Permit**	**Permit**	**Permit**	**Permit**

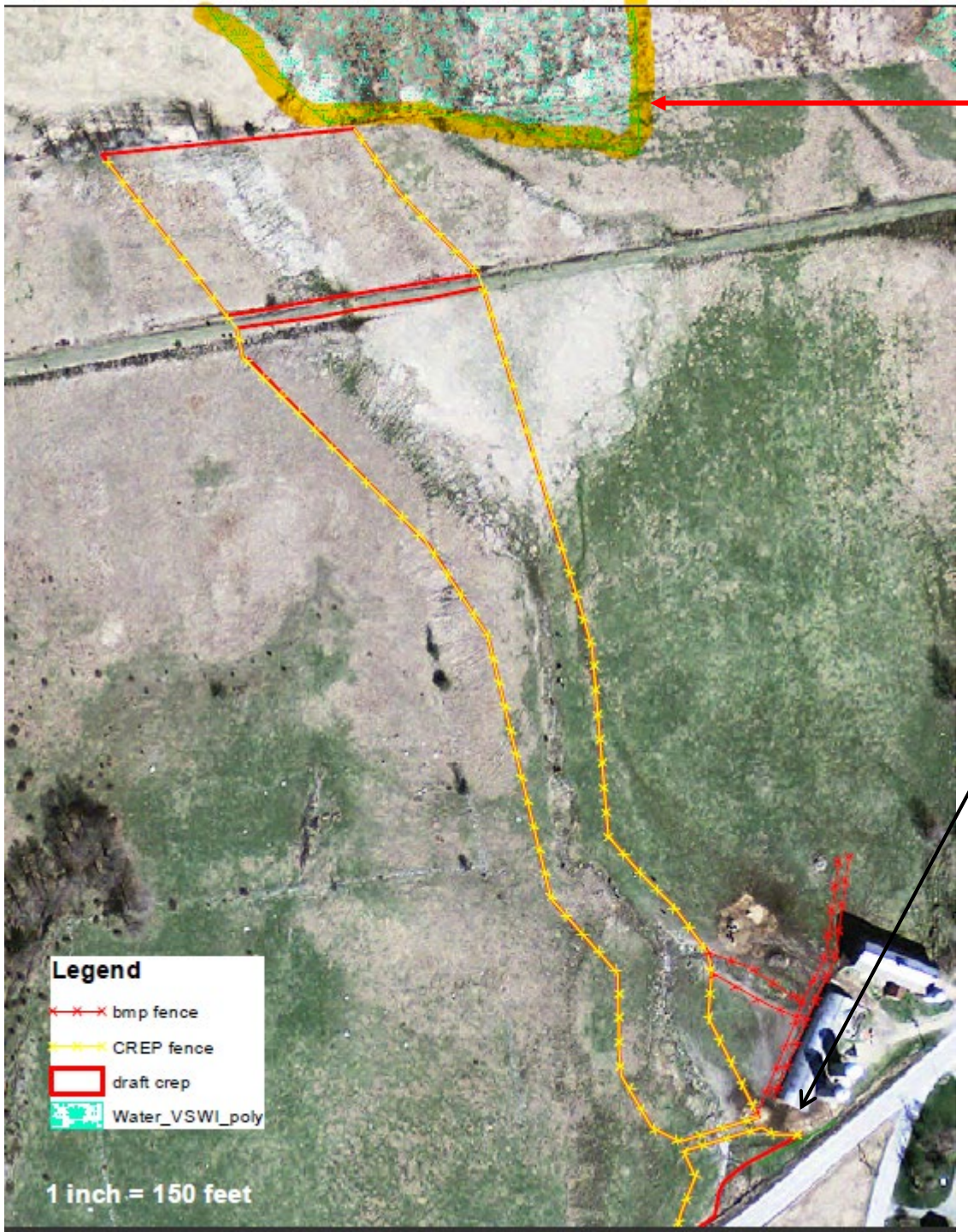
WETLAND FUNCTIONS AND VALUES: SURFACE AND GROUND WATER PROTECTION

Example of NRCS - planned laneway to improve pasture management that follows their Wetland Protection Policy and would be exempt from Army Corp jurisdiction.

BARNYARD THAT NEEDS HEAVY USE AREA IMPROVEMENT

BARNYARD THAT NEEDS HEAVY USE AREA IMPROVEMENT





The nearest mapped class II wetland is over 1500’ downstream from proposed bmps in farmstead and pasture.

WET SOILS AND AGRICULTUAL LAND

Wetlands, Hydric Soils and Hydrologic Group D-Associated Soils