# Yakama Nation's Wetlands and Riparian Restoration Project

**Project Number 1992-06200**

## Fiscal Year 2014 Annual Report

**Submitted to:**
**Bonneville Power Administration**

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**Yakama Nation Wildlife Resources Management**

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Cover photo: Yakama Nation fuels team igniting pre-mowed wetland at South Lateral A.

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## Introduction

This is the annual activities report for the Lower Yakima Valley Riparian and Wetland Restoration Project, project number 1992-06200. Under this project, the Yakama Nation Wildlife Program protects, restores, and managed land to mitigate for wildlife habitat losses incurred during construction and operation of the McNary, John Day, the Dalles, and Bonneville dams on the lower Columbia River. An important goal of the project is to protect and manage 27,000 acres of wildlife habitat in the Yakama Reservation. To date 21,000 acres have been protected. These wildlife areas protect over 91 stream miles of middle Columbia steelhead habitat (figure 1).

This report conveys the highlights of budget year 2014, which ran from April 1st, 2014 to March 31st, 2015. For other activities and further details please consult the Pisces scope of work and status reports.

## Land Securing Activities

In fiscal year 2014 the project's land protection continued with the renewal of three leases on the Toppenish Creek Floodplain totaling 246 acres. The process for these leases was initiated with a farm plan and lease application. Although it may take the Bureau of Indian Affairs (BIA) some time to completely process the lease, control of the parcels now rests with the Yakama Wildlife Program and we will continue managing the parcels for restoration and habitat protection.

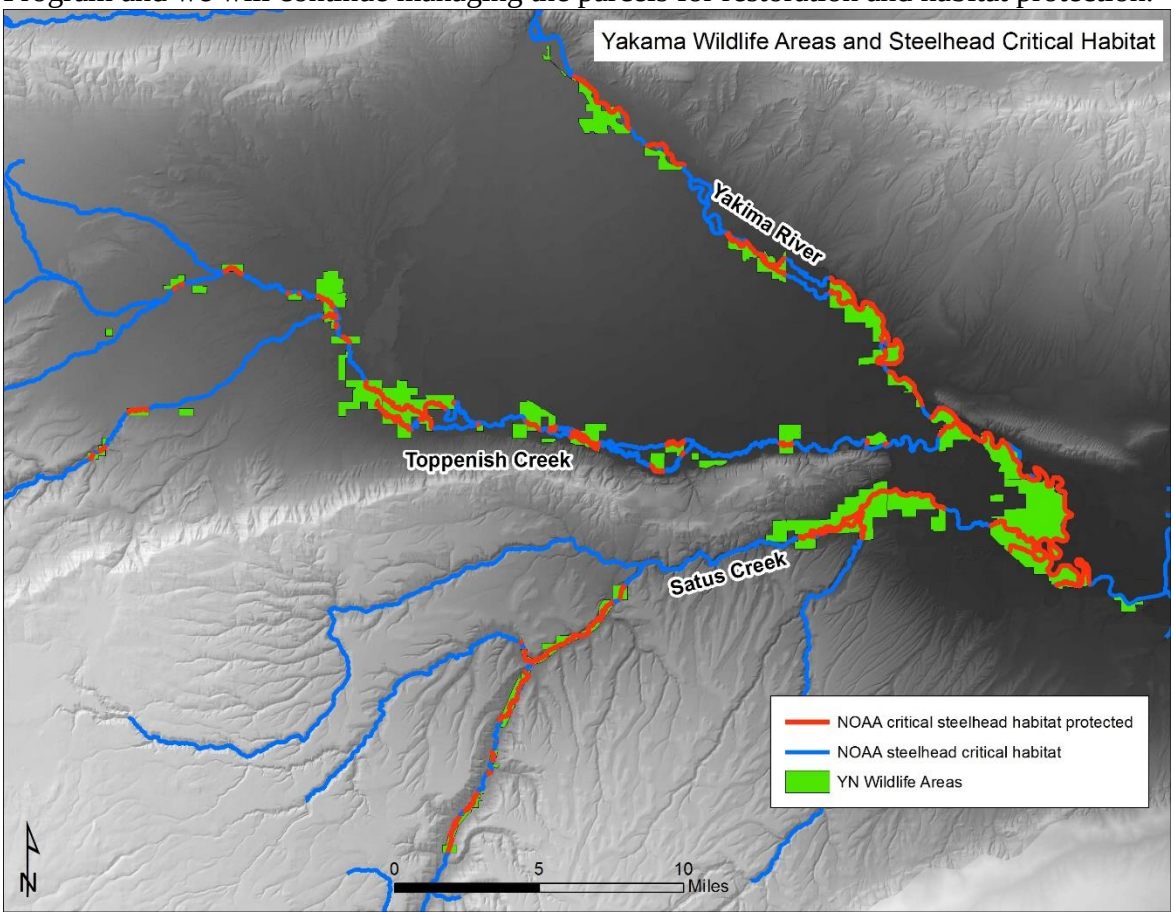



Figure 1. Yakama Wildlife Areas protect over 91 stream miles of NOAA critical habitat for middle Columbia steelhead.

## Hydrological Management Activities

Ongoing, annual hydrologic management of wetlands is necessary to achieve habitat objectives. Management objectives entail filling, adjusting water levels, and draining wetlands through the operation of water control structures. The area of wetland complex managed in this way, including wetlands and adjacent upland habitat, covers 2,500 acres in the Island Road, South Lateral A, Old Goldendale, and Satus Wildlife Area. Over 30 water control structures must be regularly inspected and cleaned or adjusted during the wet season from October through August. The hydrology of the wetlands is managed to mimic the natural floodplain flow regime. This allows vegetation, fish, and wildlife that have evolutionarily adapted to the natural flow regime to follow their natural life cycle. For example, resident waterfowl begin to breed during the late winter and spring and then raise their young during the spring when water levels are high. Warming temperatures in the spring combined with high water levels also produce abundant insect hatches that are consumed by the young waterfowl. The following figures illustrate this important wetlands management principle.

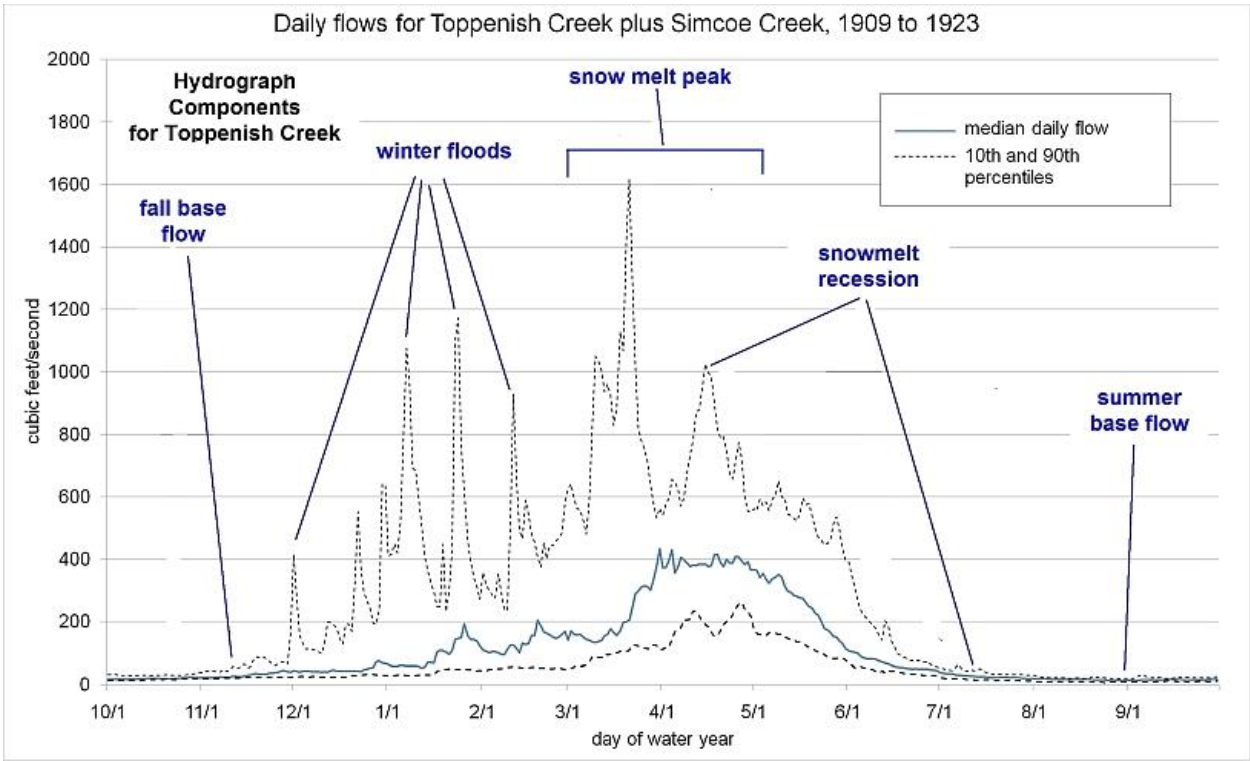



Figure 2. Annual hydrograph for Toppenish Creek, an unregulated stream, with hydrograph components labelled.

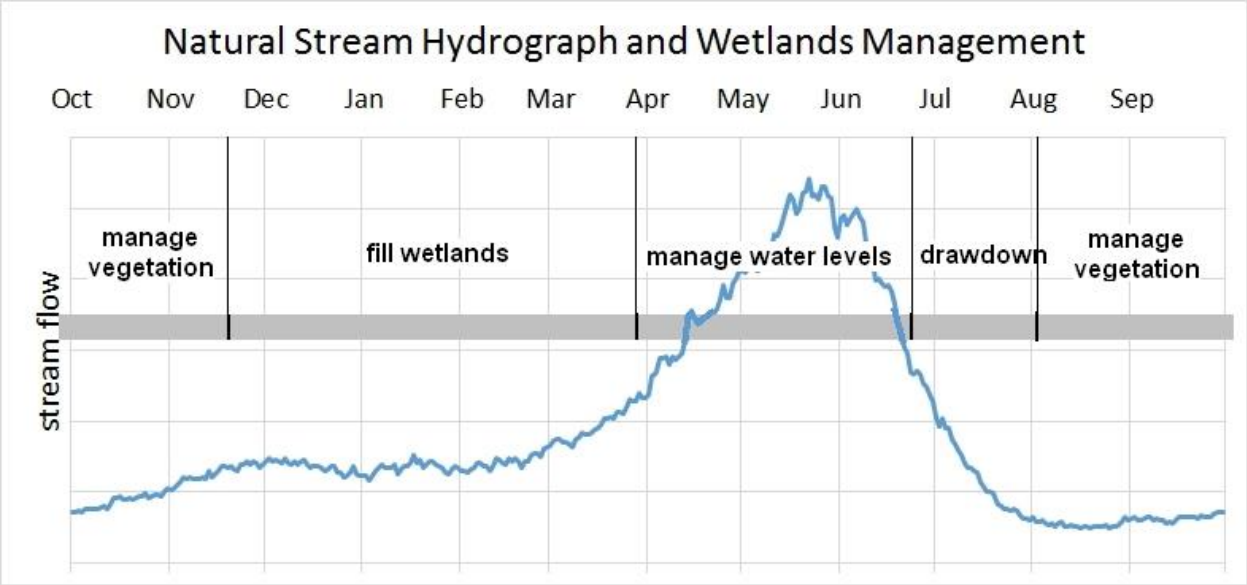


Figure 3. Cycle of hydrologic management in wetlands synchronized with natural flow regime.

## Floodplain Vegetation Restoration Activities

The Yakama Nation Wildlife Program focuses on creating sustainable native habitat that provides a variety of wildlife, cultural and natural resource values. Terrestrial vegetation management and restoration occurs on an estimated 500-1,000 acres per year within the project area. Intensive restoration activities require approximately five years of higher labor and materials costs, followed by smaller maintenance costs needed to prevent re-infestation of noxious weeds.

Sites vary widely in their hydrology and vegetation. Properties also vary in their use history; some properties were homesteads, others were farmed and still others were grazed or used as stockyards. The broad steps involved are site preparation, weed control, revegetation with grasses, and reintroduction of forbs and shrubs. The methods used are selected to reduce initial construction costs as well as long-term maintenance costs.

Pre-planting weed control typically occurs for 1-3 years to control or suppress weed species required to allow native plant establishment. Native grasses adapted to particular site conditions are seeded using rangeland drills in the fall prior to rains. Genetically local seed sources of Basin wildrye (*Elymus cinereus*), bluebunch wheatgrass (*Pseudoregneria spicata*), and squirreltail (*Elymus elymoides*) are available; these species were collected from the Reservation and are propagated as a seed crop by a regional seed producer. Occasionally, funding is supplemented by NRCS grants such as the Wildlife Habitat Improvement Program or groups such as Pheasants Forever funding for purchase of native grass seed. Post-planting weed control generally is required for 1-2 years as slow-growing species native to the arid west become established. Upland native shrubs and forbs may be reintroduced after native grasses are established. Costs per acre are kept to a minimum by utilizing large-scale agricultural methods and rotating weed control techniques to reduce chemical herbicide use.

*Site preparation*

- removal of structures, debris and interior fences
- construction of interior or exterior fences to exclude trespass cattle
- removal of invasive trees that prevent restoration

*Weed control*

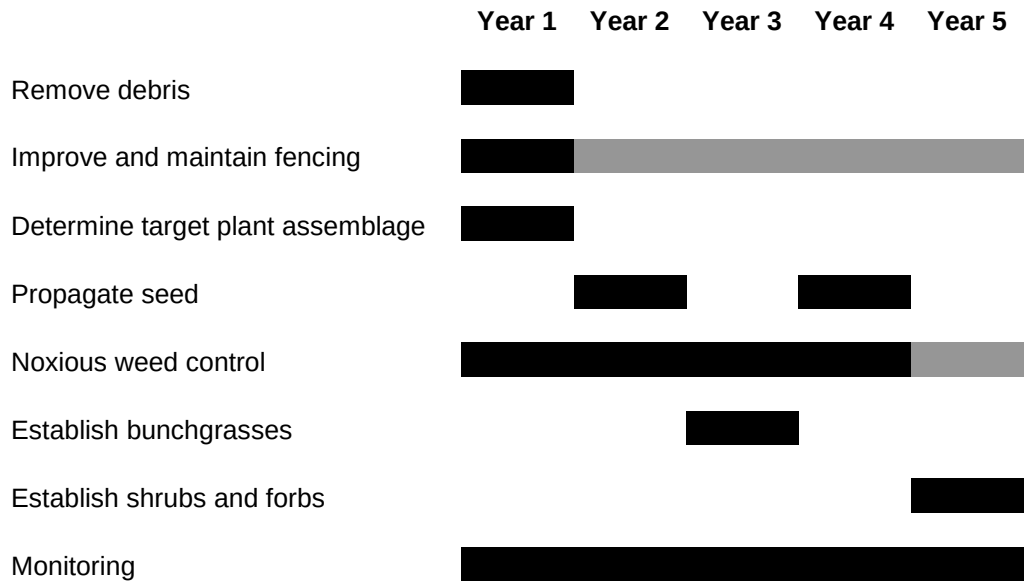
- weed control prior to revegetation
  - 1-3 years pre-treatment for perennial/difficult to control weeds
  - 1 year treatment for annual weeds
- weed control after revegetation
  - 1-3 years treatment during grass establishment to control broadleaf weeds.
- includes mowing, disking, broadcast spray of herbicides and hand spray of herbicides.

*Revegetation*

- native bunchgrasses are introduced after weeds are successfully suppressed
- native forbs and shrubs are introduced after grass establishment is successful
- grasses and shrubs grow very slowly in our region (6-9" average precipitation), especially with deeper water tables'

The table below illustrates the average timeline for floodplain terrace restoration projects:

Table 1. restoration timeline




## Invasive Plant Species Control Activities

Noxious weeds are one of the primary threats to terrestrial habitats under this project, and thus weed management is a focal maintenance activity. General noxious weed control is one of the most cost-effective methods of protecting habitats from degradation. Weed management is a broad approach to protecting and restoring habitats for wildlife. In remote areas or relatively undisturbed areas, weed management includes treatment of noxious weed populations as they are

located, or as they occur, and preventing weed populations from expanding into uninfested areas. Where habitats have high resource values, such as riparian corridors and wildlife movement corridors, but where the habitats are moderately to severely degraded, weed management is achieved through habitat restoration to native species that assist with long-term suppression of noxious weeds.

Our approach to prioritizing weed management is summarized by the chart below.

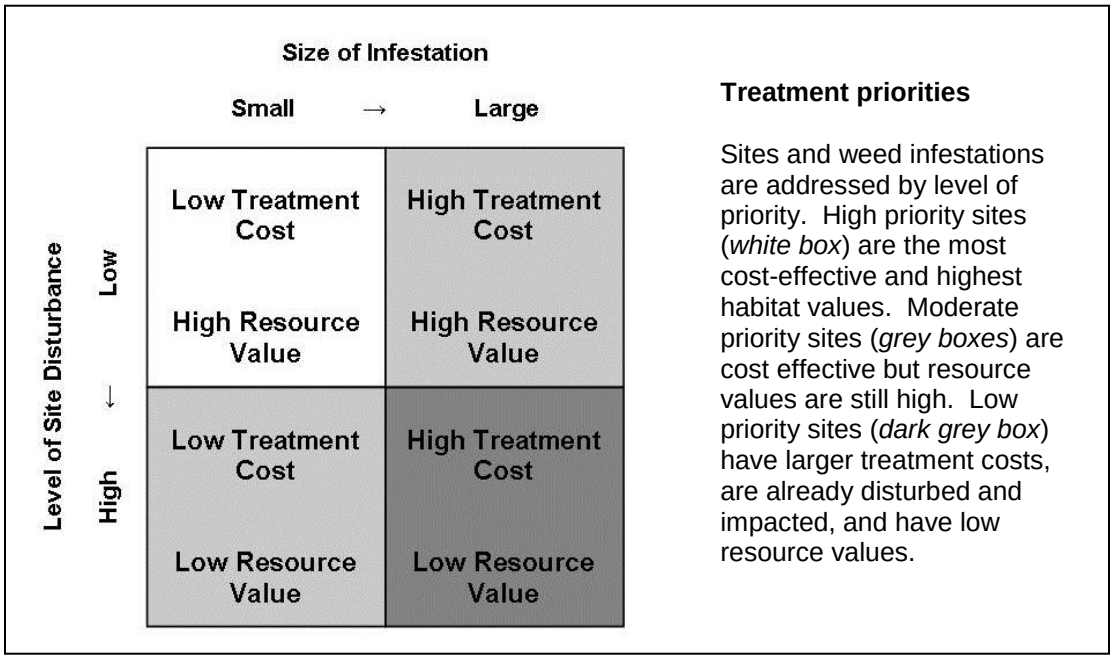



Figure 4: Approach for prioritizing weed management.

Weed treatments are selected based on site conditions and weed species' biology. Weed management activities include the following actions.

Mapping

Weed mapping is a critical component of invasive species management. Target weeds are mapped on selected properties using GPS units. Data is recorded and analyzed in a Geographical Information System.

Chemical treatment

Herbicide treatments (used in accordance with BPA policies on herbicides and adjuvants) are generally highly effective and more cost-effective than mechanical or manual methods for many species. Weed suppression may require 1-5 years of treatment to eliminate weed infestations. Due to the location of floodplain and riparian habitats of the over 21,000 project acres within a larger agricultural setting, ongoing surveys and weed treatment of new infestations is required.

Mechanical removal

Mechanical removal has proved to be effective for the removal of mature Russian olive trees. This method entails using an excavator to pluck Russian olive trees in late summer

and fall when presumably the trees are drought-stressed. The excavator is operated extremely carefully so as to minimize ground disturbance. To date, resprouting of Russian olive has been minimal using this method.

Habitat restoration

Restoration includes reintroduction of native species that assist with suppression of noxious weed species. Restoration requires a higher short-term cost input than chemical treatment, but results in lower long-term maintenance costs. Restoration typically requires a minimum five-year investment to reach weed suppression. Restoration is addressed in detail under the heading "Vegetation Restoration for Weed Suppression". Information about grazing management is reported in the Floodplain Vegetation Restoration Activities section of this report.

Grazing management

Grazing includes weed suppression using domestic livestock in areas where habitat restoration in the short-term is not feasible. For example, a property infested with noxious weeds that requires hydrologic restoration is a good candidate for grazing management. When hydrologic features are improved, resulting in higher water table, habitat restoration is feasible. In the interim, grazing management is a very cost-effective tool to prevent noxious weeds from expanding. Grazing management prescriptions are developed and local ranchers selected to implement prescriptions at no cost. Information about grazing management is reported in the Vegetation Management section of this report.

In 2014, project-wide invasive plant control took place across approximately 2,500 acres of managed properties. This included use of herbicide spray and mechanical removal of Russian olive. All herbicide spraying was approved and reported through the BPA herbicide reporting process. The following species were targeted for control over their respective acres. Species treatment areas overlap so the acres do not sum to the total acres treated. These control activities are separate and distinct from weed control on sites that are under active restoration.

Table 2. Invasive species targeted for control in non-restoration areas

| **species** | **acres** |
|---|---|
| Russian olive (*Elaeagnus angustifolia*) | 1,000 |
| Scotch thistle (*Onopordum acanthium*) | 1,100 |
| poison hemlock (*Conium maculatum*) | 1,100 |
| goatheads (*Tribulus terrestris*). | 10 |

## Vegetation Management Activities

In order to maintain habitat values, ongoing management of native vegetation communities is needed. This is necessary and important because of altered ecological processes, including disturbance regimes, relative to pre-European conditions. For example, freshwater wetlands most likely experience less disturbance in the form of fire and trampling by large ungulates than in historical times; therefore management activities such as managed burns, mowing, controlled grazing, and tilling must be used to maintain desired habitat conditions. The tables below show

the objective for each type of management actions, and units and acres with respect to each type of management action.

Table 3. Objectives for each management action

| action | habitat type | objective |
|---|---|---|
| Burning | wetlands | remove biomass, accelerate nutrient cycling, increase vegetation diversity |
| | uplands | remove biomass, accelerate nutrient cycling, rejuvenate dominant grasses |
| Mowing | wetlands | reduce cover of dominants, remove biomass (when hay is baled), increase vegetation diversity |
| Managed grazing | Reed canary (*Phalaris arundinaceae*)grass dominated wetlands | increase open water habitat by reducing vegetation height and density |
| Managed grazing | uplands | suppress invasive species |
| Tilling | wetlands | increase open water habitat, decrease cover of dominant monocots, increase vegetation diversity |

Table 4. 2014 Vegetation Management Activities by management unit and acres

| activity | management unit | acres | note |
|---|---|---|---|
| burning (initial burn) | North White Swan | 15 | Grassland |
| | South Lateral A | 32 | Wetland |
| | Buena | 20 | Grassland |
| burning (Russian Olive piles) | Island Road | 1 | burn piles of pulled Russian Olive trees |
| | **total acres burned** | **68** | |
| mowing | Carl Property | 65 | |
| | South Lateral A | 115 | |
| | Satus Wildlife Area | 410 | |
| | Campbell Road | 140 | |
| | Old Goldendale | 70 | |
| | Island Road | 30 | |
| | **total acres mowed** | **830** | |
| managed grazing | Island Road | 875 | |
| | Olney Flat Drain | 115 | |
| | Campbell Road | 130 | |
| | Satus Wildlife Area | 1660 | |
| | Carl Property | 70 | |
| | Yost Road | 155 | |
| | **total acres grazed** | **3005** | |

| | | | |
|---|---|---|---|
| tilling | South Lateral A | 9 | |

**Buena Wildlife Area Grassland Burn**

As part of an on-going burn rotation, part of the restored grassland in the Buena Wildlife Area was burned on February 26, 2014. The grassland was planted in 2002 and was in a mature condition before the burn. The prescribed fire was timed to burn off the dead tops of perennial basin wildrye clumps before the grass had started growing in the spring. The treatment was successful in rejuvenating the grassland; the release of nitrogen from the ash stimulated growth and resulted in grass heights of 12 to 15 feet in the spring following the burn, providing high quality wildlife habitat. The following 4 photographs show the grassland during the fire and in the re-growth period.


Figure 5. Yakama Nation fuels crews igniting the grassland.

Figure 6. Yakama Nation fuels crews checking for hotspots after the flames had subsided.

Figure 7. Early regrowth of basin wildrye perennial bunch grasses after the fire.

Figure 8. Yakama Nation biologist Katherine Fitch standing in regrowth that is 8 feet high 2.5 months post burn.

## Vegetation Mapping and Long Term Monitoring

In order to assess long term changes in vegetation communities, a vegetation mapping project is underway using Central Washington University (CWU) as the contractor. CWU provides project design and management by faculty researchers and graduate students as field technicians, which results in cost-effective project implementation. CWU maps vegetation associates and creates GIS databases with the data. The plan is to repeat the mapping every five to ten years at key sites in order to evaluate trends in vegetation such as the prevalence of noxious weeds, changes in vegetation associated with hydrological changes, and habitat structure. The annual report for this work has been uploaded to Pisces for the 2014 fiscal year.

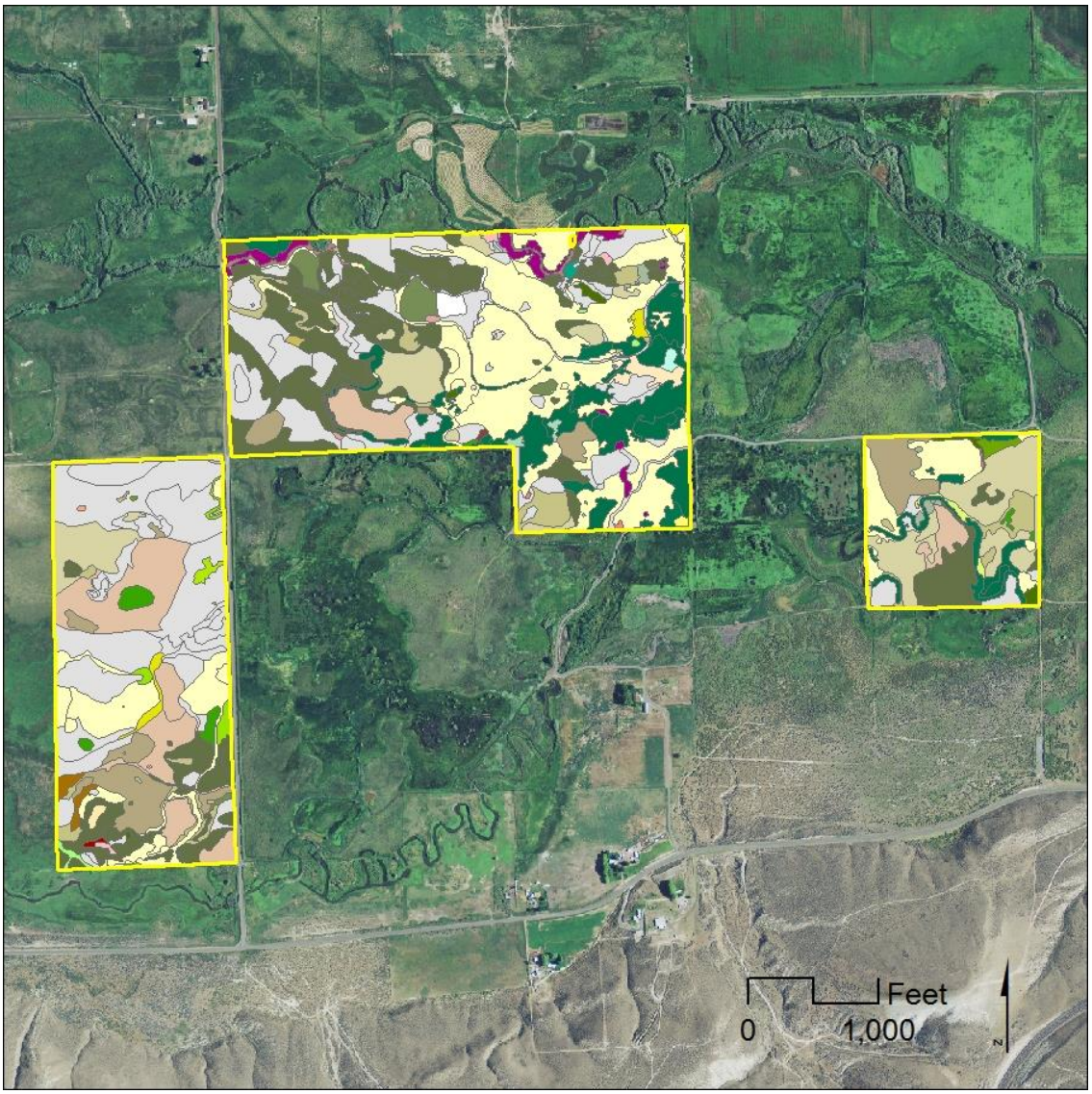


Figure 9. Vegetation communities identified on the Old Goldendale property mapped by CWU in 2014.

## Cost Share

Each year staff of the Yakama Nation Wildlife program actively seek grants to complement BPA funding and to accelerate the pace of hydrological and vegetation restoration. In 2014-2015 we were awarded grants from the Environmental Protection Agency (EPA) for $104,000, the State of Washington Department of Natural Resources (WADNR) for $21,295, and the State of Washington Department of Transportation (WSDOT) for $64,695. These grants totaled $189,990.

The EPA grant was used to acquire new LIDAR and aerial imagery of Toppenish and Satus Creeks for project planning. This data was also used to begin mapping vegetation communities in conjunction with our ground based work though Central Washington University. The WADNR funding was used to treat purple loosestrife, a noxious weed, along the Yakima River.

The WSDOT funding is being used to plan the planting of cottonwoods and willows at a site near the Yakima River.

**Wildlife Surveys**

The Yakama Nation Wildlife Resource Management Program (YNWRMP) conducts wildlife surveys in the valley portion of the Yakama Reservation. These surveys provide an index to wildlife populations. They also provide information on wildlife responses to our restoration efforts. Although most surveys are conducted through the whole valley, wildlife trends on or near properties managed by the YNWRMP show a positive trend in wildlife numbers.

Waterfowl Breeding Pair Counts

We conduct waterfowl breeding pair annually during the second week of May. These counts are conducted at 14 different sites. These counts allow us to monitor duck responses to our restoration efforts and make proper management decisions. Results from these counts indicate that the total number of breeding pairs of dabbling ducks has increased since 1955 (Figure 13). Teal (figure 10), Wood Ducks (figure 11) and Mallard (figure 12) numbers have remained relatively constant.

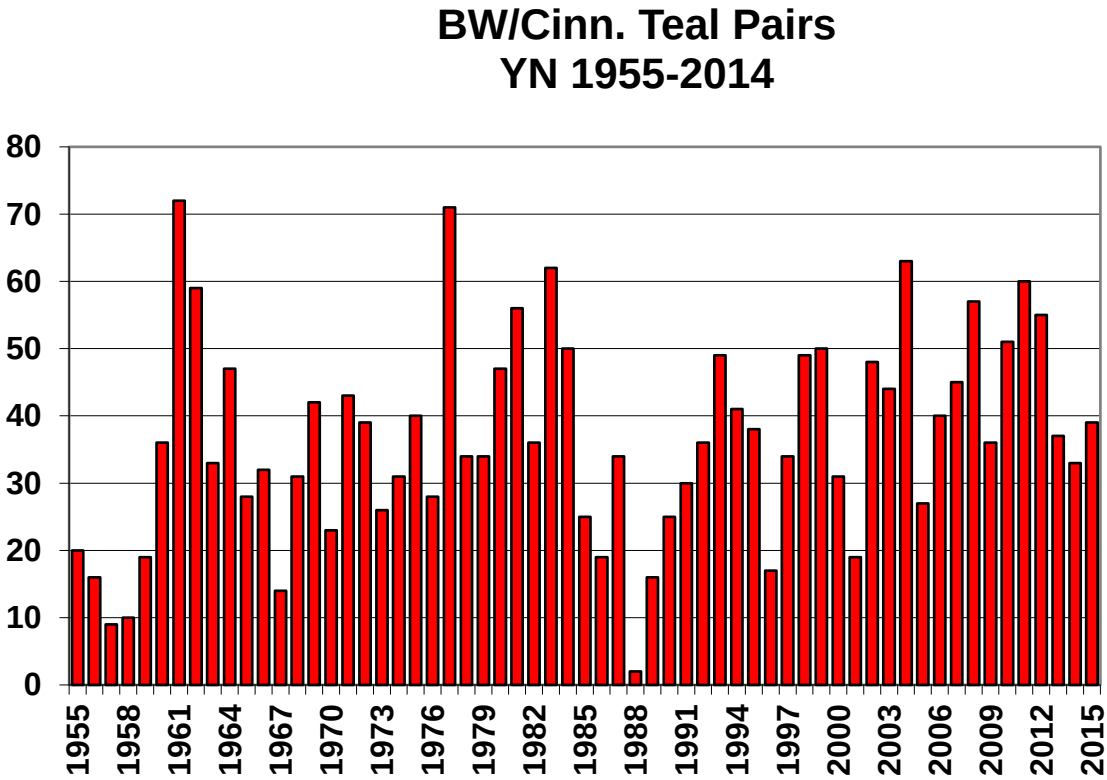


Figure 10: Number of breeding pairs of Blue Wing and Cinnamon Teal observed during counts conducted from 1955-2014 on the Yakama Reservation.

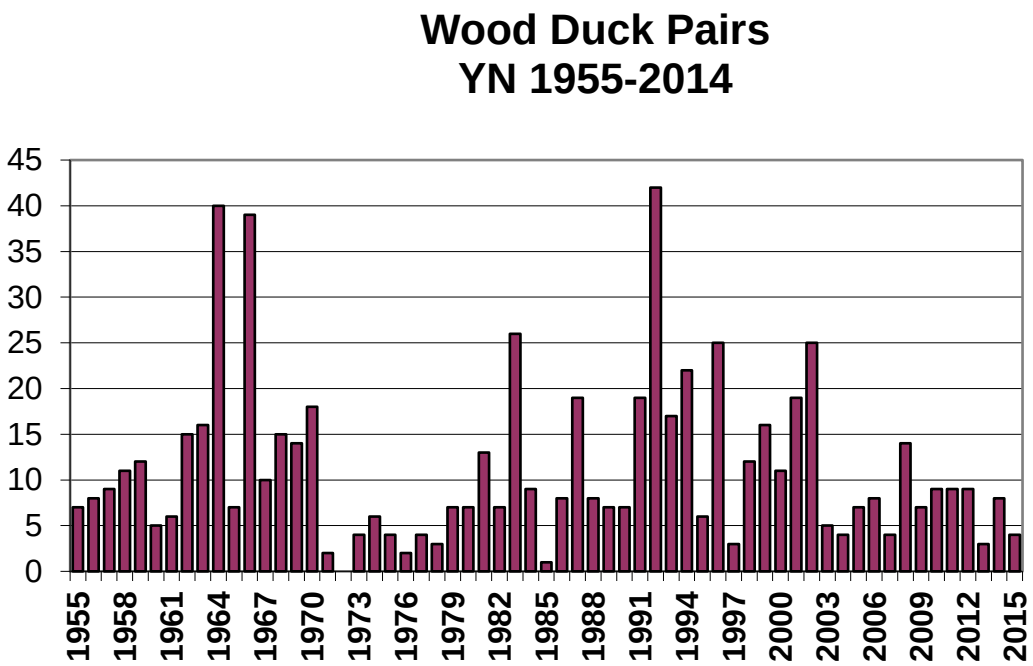



Figure 11: Number of breeding pairs of Wood Duck observed during counts conducted from 1955-2014 on the Yakama Reservation.

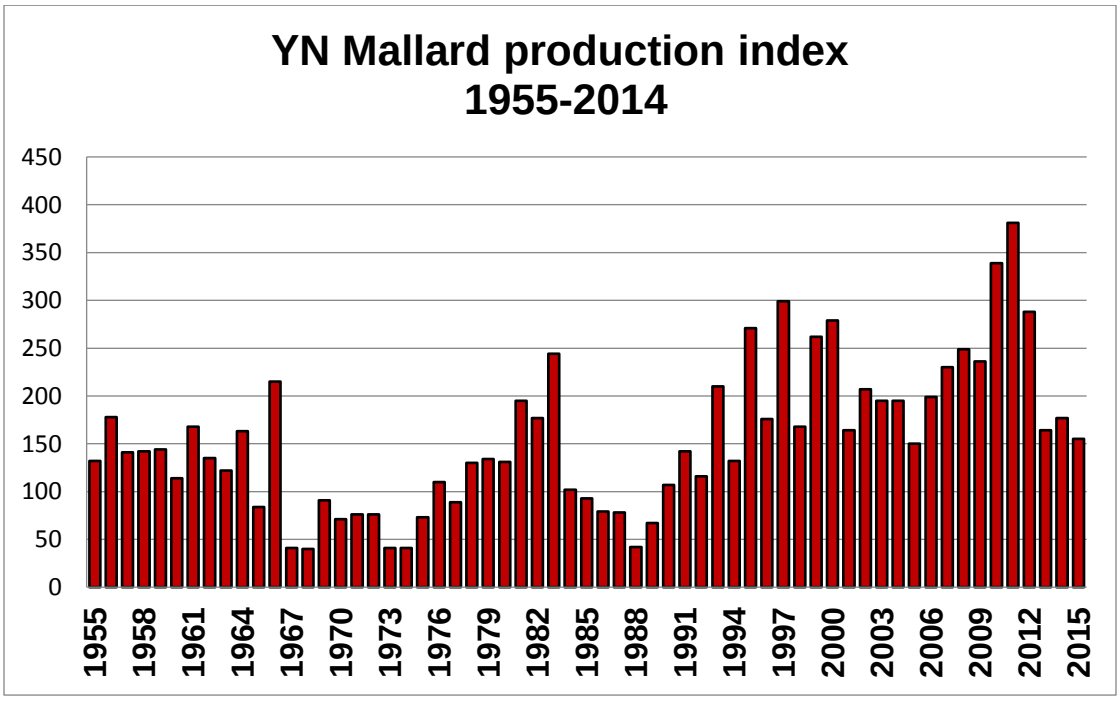



Figure 12. Number of breeding pairs of Mallards observed during counts conducted from 1955-2014 on the Yakama Reservation

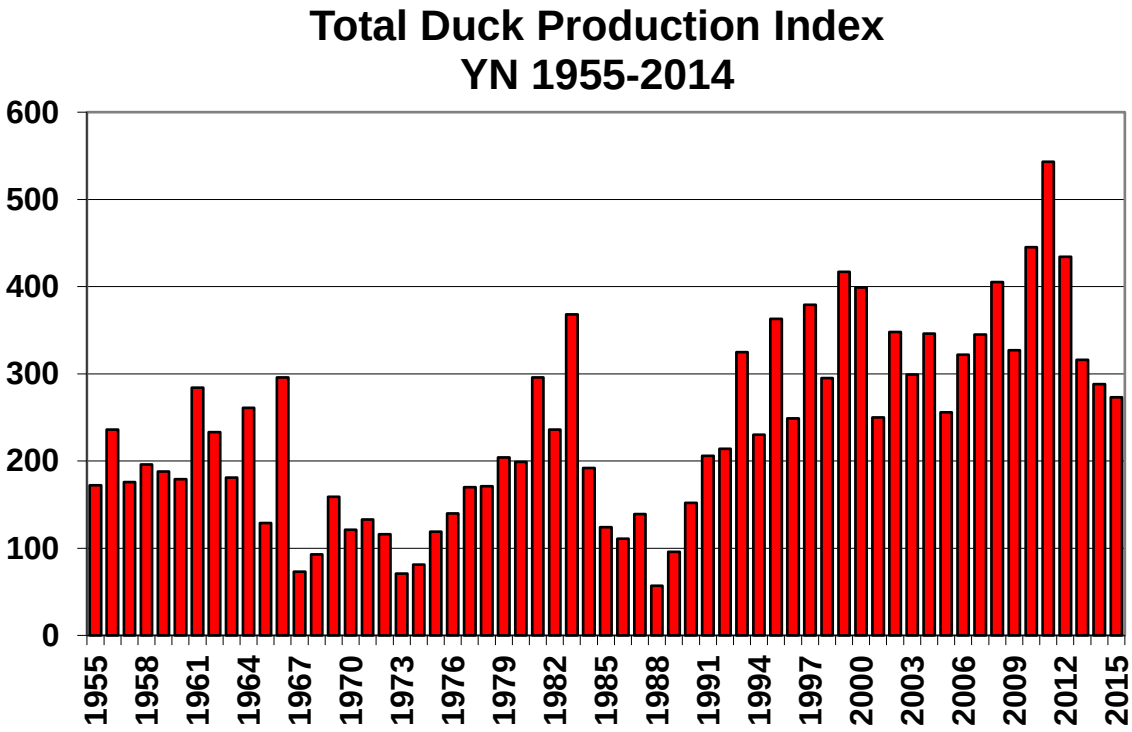



Figure 13. Number of breeding pairs of dabbling ducks observed during counts conducted from 1955-2014 on the Yakama Reservation

Upland Game Bird Brood Counts

During the last 2 weeks of July and the first week of August, we conduct annual counts of ring-necked pheasant, and California quail broods to index population levels. These counts are done on 4 standardized routes once a week. Quail counts indicate that populations have fluctuated from year to year but the average has been more or less constant since 2004 (figure 14). The number of doves seen per mile has been more or less steady since 1993 (figure 15). The number of pheasants seen per mile has also remained relatively stable since a decline from the numbers in the mid-1990s (figure 16).

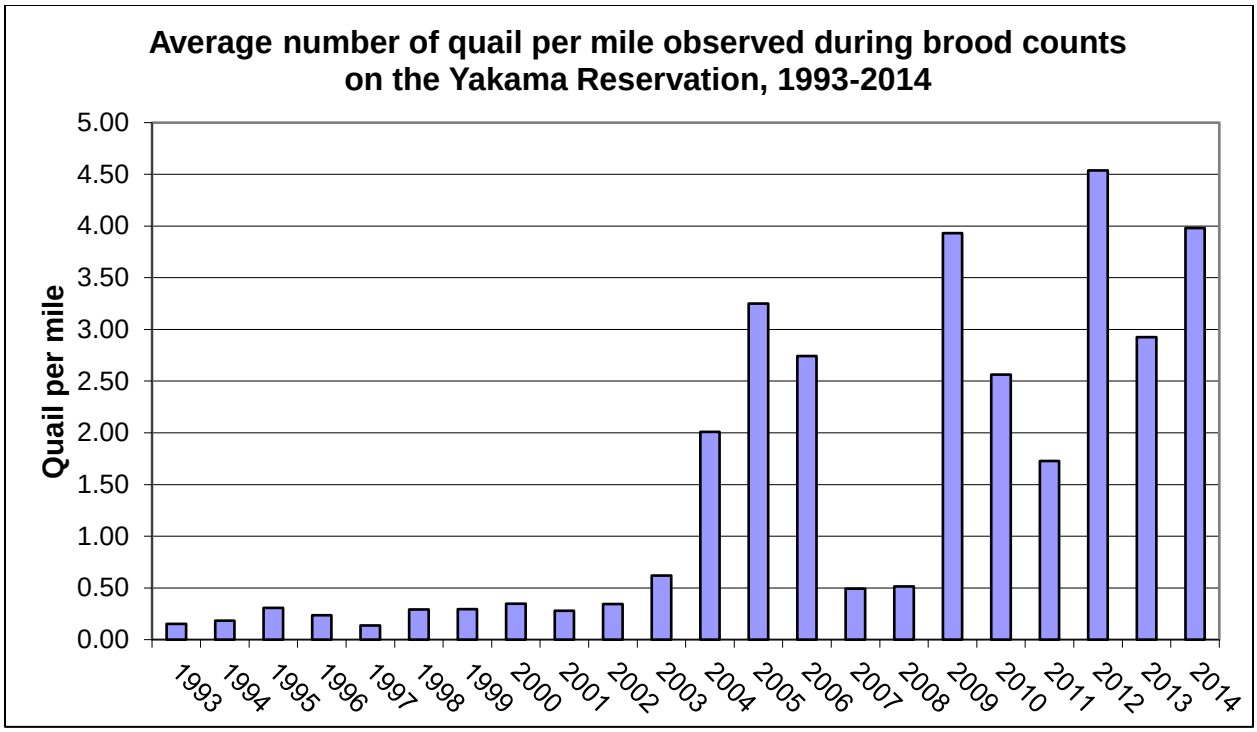


Figure 14. Average number of California quail seen per mile on the Yakama Reservation in Washington from 1993 through 2014.

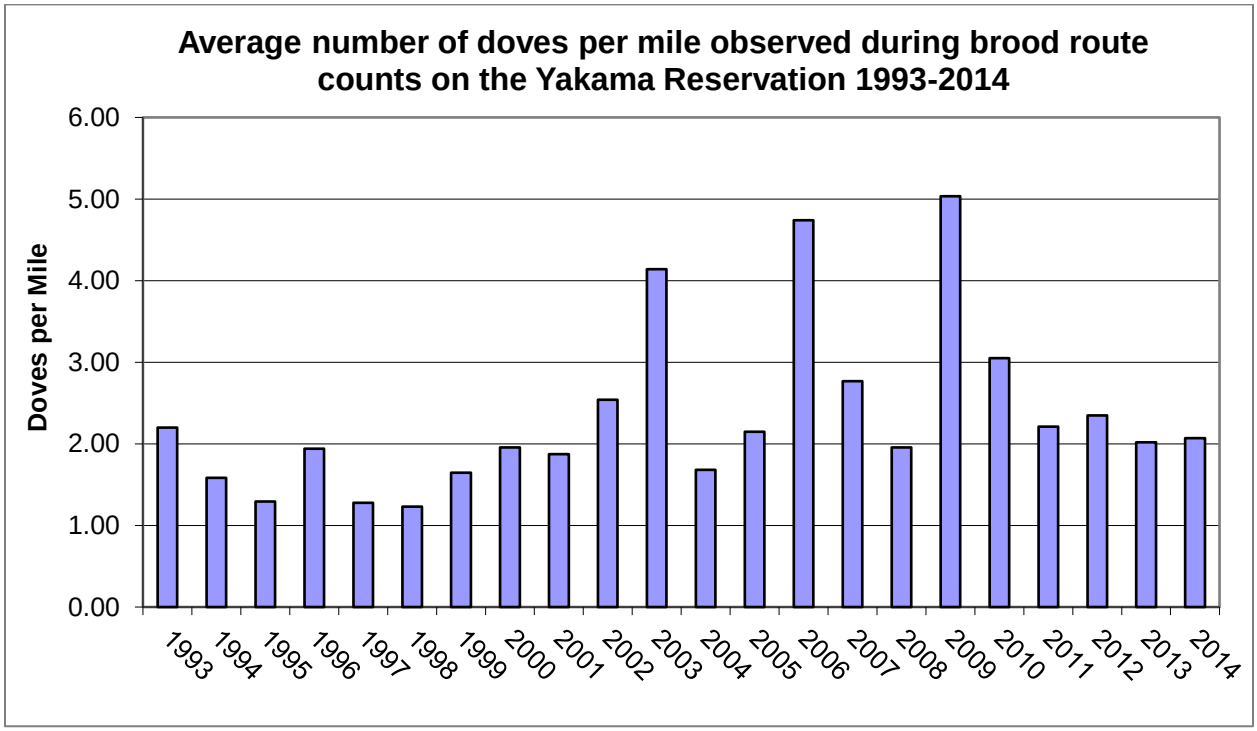


Figure 15. Average number of mourning doves seen per mile on the Yakama Reservation in Washington from 1993 through 2014.

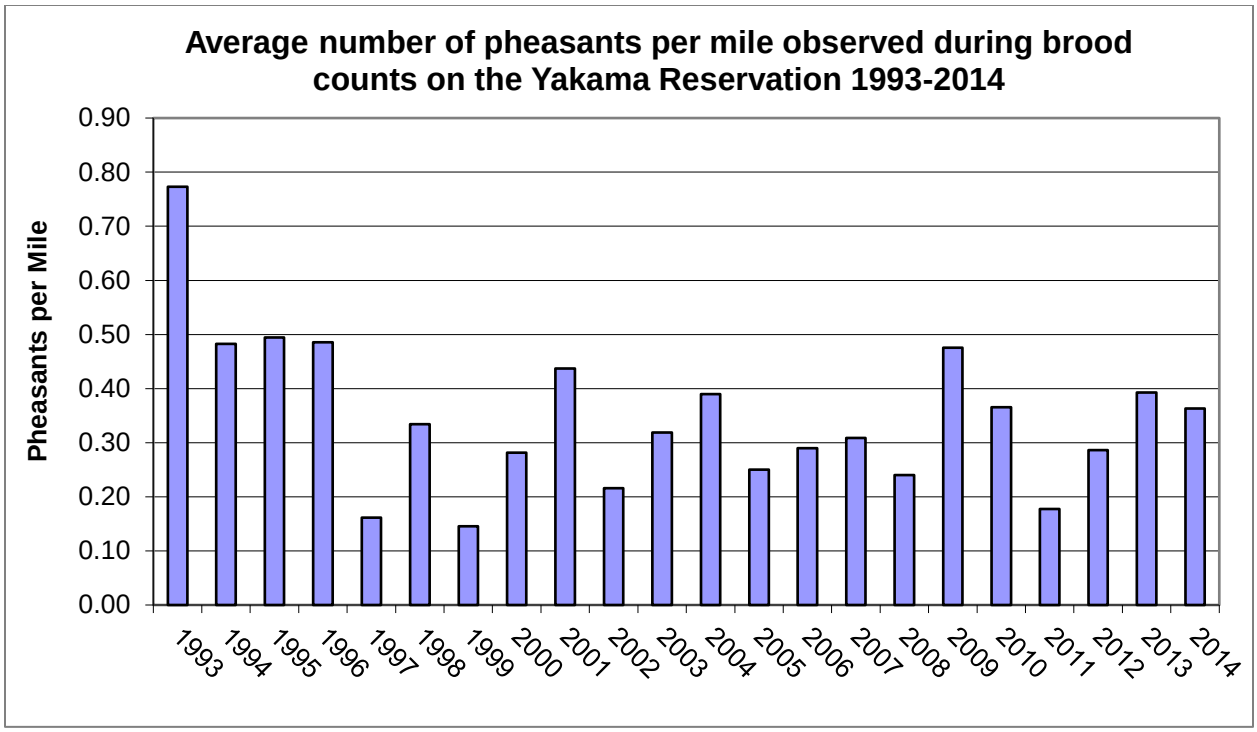



Figure 16. Average number of pheasants seen per mile on the Yakama Reservation in Washington from 1993 through 20014.