GEOG 560 – David Casey Final Project Description - Option 1: Annotated Bibliography on the Web
A Geospatial Evaluation of Prescribed Wildfire Habitat Management on Wild Bird Species

Systematic fire mapping is critical for fire ecology, planning and management: A case study in the semi-arid Murray Mallee, south-eastern Australia
https://doi.org/10.1016/j.landurbplan.2013.04.017
1,060 fires were mapped in the Murray Mallee region of Victoria, New South Wales and South Australia. Satellite imagery was used to map burn scars indicating fires. 80% of fires mapped were less than 100 hectares. An integrated approach was used to document the spatial and temporal impact of wildfire in this area and how this impacts area biodiversity.

Trading places: opposite colonization and extinction responses of the hermit warbler and western bluebird to the 2021 Dixie Fire
https://doi.org/10.51492/cfwj.110.14
Bielski and Wood evaluated the impact of wildfire on bird species at or around the intersection of contrasting habitat types following the Dixie fire in 2021 in California which consumed 389,837 hectares. While some birds became temporarily extinct in some heavily burned areas, in other areas where no burning occurred other birds became less common due to increased tree canopy growth. Extensive mapping of the burn area helped to differentiate no, low and high burn areas, and their subsequent corresponding avian diversity.

Spatial overlap of wildfire and biodiversity in California highlights gap in non-conifer fire research and management
https://doi.org/10.1111/ddi.13394
Calhoun et al. used Cal Fire's vegetation land cover map and ArcGIS to assess where California wildfires have occurred between 2000 to 2020 in relationship to different types of ecosystems. Mapping of vegetation type across the state was used to identify different types of ecosystems and then compare these ecosystems to the distribution of wildfires. Between 2000 to 2020 shrubland ecosystems were most subject to wildfire (38%), followed by conifer ecosystems (36%), hardwood forests (17%) and grasslands (9%). Identifying these trends can help future community and habitat management practices.

Future fire scenarios: Predicting the effect of fire management strategies on the trajectory of high-quality habitat for threatened species
https://doi-org.oregonstate.idm.oclc.org/10.1016/j.biocon.2019.02.004
Connell et al. used ArcMap mapping software to assess the effect of prescribed fire to manage habitat known to support threatened species. While it is understood that too many fires occurring too frequently can degrade a landscape lowering its ability to support some threatened species, too little wildfire can lead to similarly degraded landscapes that can also lower support for threatened species. The study area was treed mallee shrubland in south-eastern Australia where wildfire simulation modeling assessed different levels of burn intensity and frequency. Prescribed wildfire interventions must carefully target areas to allow proper application of this management practice to effectively support threatened species.

Conserving long unburnt vegetation is important for bird species, guilds and diversity
https://link-springer-com.oregonstate.idm.oclc.org/content/pdf/10.1007/s10531-016-1196-5.pdf
Authors Davis et al. surveyed wild bird species identified within 32 different plots of 2 hectares in size each in the Charles Darwin Reserve North-east of Perth Australia. These plots differed in vegetation growth since most recent wildfire from 11-14 years since last fire (YSLF), 19-32 YSLF, 36-46 YSLF, and 60-84 YSLF. Dating the time since the most recent wildfire was accomplished by using fire scar maps created by others, aerial photographs, historical accounts, and the Australian Firewatch website which maps fire scarred vegetation at regular intervals over time. Managing data for these 32 sites and graphically illustrating research findings included the use of GI systems use as was noted in the acknowledgements at the end of the article. One map was included in this article; the use of additional maps showing different layers could help further illustrate findings.

Accommodating Mixed-Severity Fire to Restore and Maintain Ecosystem Integrity with a Focus on the Sierra Nevada of California, USA

https://doi.org/10.4996/fireecology.130248173

DellaSala et al. recognize the impact that mixed-severity fires have on the Sierra Nevada region in which 11 national forests totaling about 4.6 million hectares reside. Depending upon the scale of wildfire severity spatial measurement, small details on ecosystem vitality and existence may be assayed or missed. Spatial scaling using course filtering may be used to appreciate multiple ecological systems and their interaction, while fine scale filtering allows for identification and study of individual small micro-habitats which may be important to various species of concern. Both course and fine scale filtering should be used by fire managers to allow for both greater regional land management and support species of conservation concern. The use of GIS is integral to this approach.

The effects of fire severity and heterogeneity on post-fire occupancy of a terrestrial wildlife community in the Northwestern United States

https://doi.org/10.1016/j.foreco.2026.123525

Denny et al. studied the impacts of different severity of wildfires in the Colville National Forest, Washington at a time period 4-5 years following burns. Using a base map of the Rapid Assessment of Vegetation after Wildfire (RAVG) national dataset to identify areas of different burn severity, mapping served as the basis for identification of areas of burn severity upon which to then assess. Multiple night camaras deployed at multiple sites across the range of post burn areas of different fire severity, found that fewer species detections were observed in more severely burned areas.

Breeding bird abundance and species diversity greatest in high-severity wildfire patches in central hardwood forests

https://doi.org/10.1016/j.foreco.2022.120715

Greenberg et al. studied multiple sites of different wildfires (intervention) or lack of wildfires (controls) across the Nantahala National Forest in the Appalachian Mountains of western North Carolina, USA over a period of 5 years. Areas of high-severity burns generally resulted in an increase in breeding bird diversity and abundance, including a greater abundance of disturbance-dependent species such as northern bobwhite and golden-winged warbler. Areas of low severity burns tended to not experience an increase in any species relative to unburned forest. Presumably areas of burn severity were previously mapped to identify burn areas, though exactly which data sets were used or how is not explained.

Post-burn and long-term fire effects on plants and birds in floodplain wetlands of the Russian Far East

https://www-webofscience-com.oregonstate.idm.oclc.org/wos/woscc/full-record/WOS:000464767600016

Heim et al. selected 26 paired treatment/control study units within seven US national forests with each unit comprising 100-400 hectares. These units were dominated by ponderosa pine. Units ranged from having not experienced wildfire for over 100 years to units having experienced wildfire 10 or more years ago. 95 species of birds were studied in these areas to assess likelihood of occupancy following prescribed burning. The authors found that, overall, the use of fire can be an effective tool in creating habitat for some species while not greatly impacting others. While explicit use of GIS was not mentioned in the article, it is likely that this was used to manage data for the project.

Patterns of bird species occurrence in relation to anthropogenic and wildfire disturbance: Management implications

https://doi.org/10.1016/j.foreco.2020.117942

Hutto et al. organized 185 field technicians to conduct 7533 bird point counts in 117 sites in recently burned mixed-conifer forests in western Montana to assess species diversity and abundance. The black-backed woodpecker (*Picoides arcticus*) was found almost exclusively in severely and recently areas. This unique occurrence suggests this bird's evolution in the presence of highly burned forests. Post-fire conditions appear to be critical to this bird's prevalence in these areas. The authors identify two forest management issues of importance, first, the full complement of bird species in a landscape is best maintained using land management practices which include severe fire, and second, many species cannot survive in areas where pre and post fire timber harvesting is practiced. While spatial study must have been undertaken to identify different types of areas and their burn history, it is not clear how this was done.

Regional differences in infilling and land-use conversion characterize woody cover increases across the Eastern United States

https://doi.org/10.1016/j.foreco.2025.123446

While woody forest cover has increased across the eastern US over time, it is unclear how these increases are distributed across land-use types and thus what the ecological implications of these increases may be. Ivey et al. studied areas in the eastern US using the US EPA-defined Eastern Temperate Forests Level I (L1) ecoregion. Authors subdivided the eastern U.S. into spatial regions to assess smaller-scale trends in vegetation change over time between 2001 and 2021. Using remotely sensed land-use and vegetation cover data, the authors found that forest expansion is most predominant in the northeast US, while land-use conversion dominates the southeast US.

Changes to vegetation structure and tree species composition drive bird species turnover following disturbance in southwestern United States mixed-conifer forest

https://doi.org/10.1016/j.foreco.2026.123660

Jones et al. modelled avian abundance during the breeding-season occurrence using two years of pre-fire and three years of post-fire data at Bandelier National Monument and then compared this data to three years of data from mixed-conifer sites in Grand Canyon National Park having prescribed burn management. Collected data consisted of 1332 point count surveys from 190 count stations (100 stations at Bandelier, 90 stations at Grand Canyon). Bird community turnover was found to occur more frequently after high-severity wildfires. Bird observations were correlated with vegetation cover and species suggesting mapping of vegetation across regions was involved. Data collected in this study went into the Southern Colorado Plateau Inventory and Monitoring Network's (SCPN) long-term vital signs monitoring program.

Prescribed fire limits wildfire severity without altering ecological importance for birds

https://doi.org/10.1186/s42408-021-00123-2

Latif et al. studied six units in pairs distributed across 20,000 hectares in the Payette National Forest in central Idaho where each pair was similar in vegetation and topography. One unit in each pair underwent prescribed fire treatment. The authors found that while fire-associated bird species can benefit from prescribed fire, prescribed fire is unlikely to resemble wildfire in its ecological value for these species, limiting the value of prescribed fire as a surrogate for wildfire. Instead, the implications of prescribed fire for avian diversity in dry conifer forests may hinge more so on whether and how it shapes the spatial extent of subsequent wildfire. The use of mapping in the development of this study likely played a limited role, except perhaps in the selection of the six study sites wherein each site in each pair needed to closely resemble its mate in the pair.

Topographic Variation in Structure of Mixed-Conifer Forests Under an Active-Fire Regime

https://doi.org/10.1007/s10021-012-9573-8

Lyderson and North identified study plots from stands within the Sierra Nevada based on forest type, recent fire record, and old-growth status using Arc GIS. The authors sampled 150 20 m × 50 m rectangular plots using topographic categorization included slope, aspect, elevation, steepness, configuration, and distance to perennial stream to control for spatial autocorrelation in fire effects on forest structure. The authors found that in plots with restored fire regimes, topography and fire interact to influence fire productivity and intensity. This interaction creates the conditions found in forests with regular fire activity and a mix of old and new vegetation and light and dense vegetation cover.

Short-term benefits of prescribed fire to bird communities of dry forests

https://doi.org/10.1186/s42408-022-00130-x

Saab et al. identified sites to conduct bird point count surveys in areas of mixed severity prescribed burns (320 sites) and low severity prescribed burns (278 sites). The authors then conducted bird point count surveys 1–4 years after prescribed fire treatments at mixed-severity sites and 1–3 years before and after prescribed fire treatments at low-severity sites. The authors found no significant evidence for either short-term prescribed fire treatment impacts or burn severity impacts for most bird species monitored. Results suggest that prescribed fire intended to reduce fuels and lower the risk of high-severity wildfire may help improve habitat for some birds that prefer such areas at least in the short term.

Influence of landscape structure, topography, and forest type on spatial variation in historical fire regimes, Central Oregon, USA

https://doi.org/10.1007/s10980-018-0656-6

Merschel et al. used tree rings to reconstruct a multi-century fire and forest history for 105 plots over a 10,393-hectare area southeast of Mount Bachelor on the Deschutes National Forest in Oregon. The authors classified fire regimes into four types (large fires, small fires, incomplete fires, and longer interval fires) and assessed whether they varied with topography, the soil in volcanic pumice basins that inhibit fire spread, and forest type. At larger regional scales, climate will control fire and forest types, but at smaller landscape and patch scales where ignition and spread occur locally, microclimate, topography, and the local distribution of fuels and vegetation will control fire behavior. The authors found that the spatial patterns of fire types were closely associated with landscape geology, in particular with the distribution of pumice basins that may inhibit fire spread. Additionally, forests where tree composition and age varied at finer scales with where local topography modifies microclimate and soils, these factors impact fire behavior. The study results show that wildfire may be influenced by the proximal landscape and may not always be influenced by forest type alone. The use of many map layers involving the multiple variables considered was of major importance in this study.

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