University of Idaho
Forest Utilization Research and Outreach (FUR)

STRATEGIC PLAN

FY2018-FY2022

Forest Utilization Research and Outreach (FUR)

MISSION STATEMENT

The Forest Utilization Research and Outreach (FUR) program is located in the College of Natural Resources at The University of Idaho. Its purpose is to increase the productivity of Idaho's forests and rangelands by developing, analyzing, and demonstrating methods to improve land management and related problems such as post-wildfire rehabilitation using state-of-the-art forest and rangeland regeneration and restoration techniques. Other focal areas include sustainable forest harvesting and livestock grazing practices, including air and water quality protection, as well as improved nursery management practices, increased wood use, and enhanced wood utilization technologies for bioenergy and bioproducts. The program also assesses forest products markets and opportunities for expansion, the economic impacts of forest and rangeland management activities, and the importance of resource-based industries to communities and the state's economic development. In addition the Policy Analysis Group follows a legislative mandate to provide unbiased factual and timely information on natural resources issues facing Idaho's decision makers. Through collaboration and consultation FUR programs promote the application of science and technology to support sustainable lifestyles and civic infrastructures of Idaho's communities in an increasingly interdependent and competitive global setting.

VISION STATEMENT

The scholarly, creative, and educational activities related to and supported by Forest Utilization Research and Outreach (FUR) programs will lead to improved capabilities in Idaho's workforce to address critical natural resource issues by producing and applying new knowledge and developing leaders for land management organizations concerned with sustainable forest and rangeland management, including fire science and management, and a full spectrum of forest and rangeland ecosystem services and products. This work will be shaped by a passion to integrate scientific knowledge with natural resource management practices. All FUR programs will promote collaborative learning partnerships across organizational boundaries such as governments and private sector enterprises, as well as landowner and non-governmental organizations with interests in sustainable forest and rangeland management. In addition, FUR programs will catalyze entrepreneurial innovation that will enhance stewardship of Idaho's forest and rangelands, natural resources, and environmental quality.

AUTHORITY and SCOPE

The Forest Utilization Research (FUR) program is authorized by Idaho Statute to enhance the value and understanding of vital natural resources and associated industry sectors via the Policy Analysis Group, Rangeland Center, Experimental Forest and Forest and Seedling Nursery through research, education and outreach to legislators, industry and the Idaho citizenry.

GOAL 1: Scholarship and Creativity

Achieve excellence in scholarship and creative activity through an institutional culture that values and promotes strong academic areas and interdisciplinary collaboration.

Objective A: *Promote an environment that increases faculty, student, and constituency engagement in disciplinary and interdisciplinary scholarship.*

Performance Measures:

I. ***Number of CNR faculty, staff, students and constituency groups involved in FUR-related scholarship or capacity building activities.***

FY14 (2013-2014)	**FY15** (2014-2015)	**FY16** (2015-2016)	**FY17** (2016-2017)	**Benchmark**
35 participants	**61 participants**	**46 participants**	**46 participants**	**20% growth**

Benchmark: *Number of CNR faculty, staff, students and constituency groups involved in FUR-related scholarship or capacity building activities.*[1] (BY FY2023)

II. Number and diversity of courses that use full or partially FUR funded projects, facilities or equipment to educate, undergraduate, graduate and professional students.

FY14 (2013-2014)	**FY15** (2014-2015)	**FY16** (2015-2016)	**FY17** (2016-2017)	**Benchmark**
	New Measure	**26 courses**	**23 courses**	**15% growth**

Benchmark: *Number of courses using FUR funded projects, facilities or equipment during instruction.*[2] (BY FY2023)

Objective B: *Emphasize scholarly and creative outputs that reflect our research-extensive and land-grant missions, the university and college's strategic themes, and stakeholder needs, especially when they directly support our academic programming in natural resources.*

Performance Measures:

I. An accounting of products (e.g., research reports, economic analysis, BMPs) and services (e.g., protocols for new species shared with stakeholders, policy education programs and materials provided, accessible data bases or market models).

FY14 (2013-2014)	**FY15** (2014-2015)	**FY16** (2015-2016)	**FY17** (2016-2017)	**Benchmark**
46 products	**39 products**	**43 products**	**31 products**	**15% growth**

Benchmark: *Numbers and types of products and services delivered and stakeholders serviced.*[3] (BY FY2023)

II. An accounting of projects recognized and given credibility by external reviewers through licensing, patenting, publishing in refereed journals, etc.

FY14 (2013-2014)	**FY15** (2014-2015)	**FY16** (2015-2016)	**FY17** (2016-2017)	**Benchmark**
15 referred articles	**14 referred articles**	**15 referred articles**	**13 referred articles**	**25% growth**

Benchmark: *Number of courses using FUR funded projects, facilities or equipment during instruction.*[4] (BY FY2023)

GOAL 2: Outreach and Engagement

Engage with the public, private and non-profit sectors through mutually beneficial partnerships that enhance teaching, learning, discovery, and creativity.

Objective A: *Build upon, strengthen, and connect the College of Natural Resources with other parts of the University to engage in mutually beneficial partnerships with stakeholders to address areas targeted in FUR.*

Performance Measures:

I. Document cases: Communities served and resulting documentable impact; Governmental agencies served and resulting documentable impact; Non-governmental agencies and resulting documentable impact; Private businesses and resulting documentable impact; and Private landowners and resulting documentable impact. Meeting target numbers for

audiences identified below and identifying mechanisms to measure economic and social impacts.

FY14 (2013-2014)	**FY15** (2014-2015)	**FY16** (2015-2016)	**FY17** (2016-2017)	**Benchmark**
			New measure	**1,250 total participants**

Benchmark: Number of external participants served.[5] (BY FY2023)

GOAL 3: Financial Efficiency and Return on Investment (ROI)
Efficient financial management of FUR state appropriated dollars supporting Goals 1 and 2 and leveraging resources to secure external funding (e.g., external grants, private funding, and cooperatives)

<u>**Objective A:**</u> *Leveraging state funds to secure additional financial resources to increase impact on products, services and deliverables.*

<u>**Performance Measures:**</u>

I. New funding sources from external granting agencies, private and public partnerships and other funding groups.

Baseline data/Actuals:

FY14 (2013-2014)	**FY15** (2014-2015)	**FY16** (2015-2016)	**FY17** (2016-2017)	**Benchmark**
		New Measure	**13 new projects**	**25% growth**

Benchmark: *Number of new research projects per year.*[6] (BY FY2023)

Key External Factors
The key external factors likely to affect the ability of FUR programs to fulfill the mission and goals are as follows: (1) the availability of funding from external sources to leverage state-provided FUR funding; (2) changes in human resources due to retirements or employees relocating due to better employment opportunities; (3) continued uncertainty relative to global, national and regional economic conditions; and (4) changing demand for the state and region's ecosystem services and products.

Evaluation Process
Quarterly status meetings between FUR units, including PAG, Rangeland Center, Experimental Forest and Research Nursery to ensure coordinated work, identification of new opportunities, and projects. Assessment of external proposals and new funding sources for leveraging for match opportunities to increase impacts of research, outreach, and technology transfer. Annual review of strategic plan to determine applicable progress toward benchmark and growth.

[1] Increased staff resources in 2016 will allow us to involve more faculty, staff, students and constituency groups in FUR-related scholarship activities.

[2] Based on College and program goals to enhance coordination of course offerings and research.

[3] Based on critical need to communicate with external stakeholders, and increase the pace of products produced.

[4] Increased staff resources in 2016 focused on research will increase scientific outreach and communication.

[5] New measure based on UI and college strategic goal to increase involvement and communication with external stakeholders. Benchmark established from internal analysis of recent year participants served.

[6] Based on analysis of projects started and completed in recent years, staff capacity, and critical need to increase the pace of projects completed annually

Appendix 1

	State Board of Education Goals			
	Goal 1: A WELL EDUCATED CITIZENRY	*Goal 2: INNOVATION AND ECONOMIC DEVELOPMENT*	*Goal 3: DATA-INFORMED DECISION MAKING*	*Goal 4: EFFECTIVE AND EFFICIENT EDUCATIONAL SYSTEM*
Institution/Agency Goals and Objectives				
GOAL 1: SCHOLARSHIP and CREATIVITY ***Achieve excellence in scholarship and creative activity through an institutional culture that values and promotes strong academic areas and interdisciplinary collaboration.***				
Objective A: Promote an environment that increases faculty, student, and constituency engagement in disciplinary and interdisciplinary scholarship	✓		✓	✓
Objective B: Emphasize scholarly and creative outputs that reflect our research-extensive and land-grant missions, the university and college's strategic themes, and stakeholder needs, especially when they directly support our academic programming in natural resources.	✓	✓	✓	
GOAL 2: OUTREACH and ENGAGEMENT ***Engage with the public, private and non-profit sectors through mutually beneficial partnerships that enhance teaching, learning, discovery, and creativity.***				
Objective A: Build upon, strengthen, and connect the College of Natural Resources with other parts of the University to engage in mutually beneficial partnerships with stakeholders to address areas targeted in FUR.				✓
GOAL 3: FINANCIAL EFFICIENCY and RETURN ON INVESTMENT ***Efficient financial management of FUR state appropriated dollars supporting Goals 1 and 2 and leveraging resources to secure external funding (e.g., external grants, private funding, and cooperatives)***				
Objective A: Leveraging state funds to secure additional financial resources to increase impact on products, services and deliverables.		✓	✓	

Cybersecurity Overview and Critical Security Controls Assessment Report

Date: June 19, 2017

Status: FINAL

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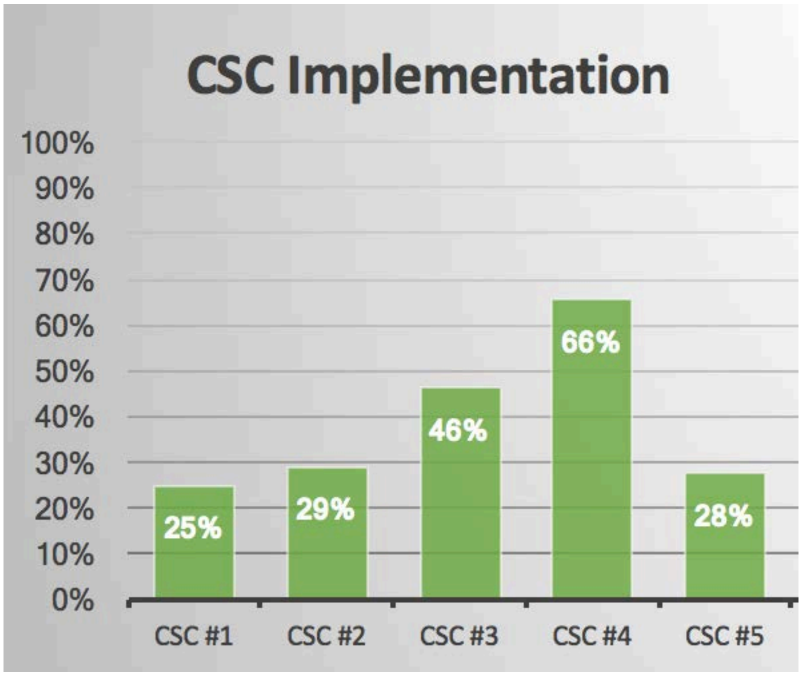
Contents

Executive Summary

In response to increasing cybersecurity threats and the Idaho Governor's Executive Order 2017-02 issued January 16, 2017, UI ITS personnel initiated an assessment of current cybersecurity measures as well as UI's status in respect to the Center for Internet Security (CIS) Critical Security Controls (CSC) 1-5. The CSC assessment was scored using the AuditScripts initial assessment tool recommended by the State Office of the CIO and acting Chief Information Security Officer, Lance Wyatt. Direction from the State Office of the CIO was to complete only the assessment by June of 2017, with any new implementation activities to occur in Fiscal Year 2018.

Between March 2 and May 15, 2017, the ITS team reviewed each of the Critical Security Controls from version 6.1 of CIS. That assessment shows a 0.39 (out of 1.0) overall implementation for the first 5 controls.



Overall completion for each control combines scoring for policy, implementation, automation and reporting. A 100% score could be achieved by approving the written policy, implementing and automating a control for all systems, and reporting it to the executive level. For some specific controls, 100% implementation will not be desirable or achievable on a university network. Prioritization, scope, and target percentage of specific controls will be assessed and prioritized.

The results of this assessment will be used within the FY18 IT Security Plan and will be prioritized with other technology risks to meet the goals of our target profile under the NIST Cybersecurity Framework.

High Level Cybersecurity Assessment

Summarized below are several measures taken by the University to protect its technology and information from internal and external breaches.

Policies/Procedures

The University has established policies and procedures over the following areas:

- Administrative Systems and Applications
- Information Technology Services (ITS) Security Access
- User Provided Software on ITS Systems
- Computer User Account Procedures
- University Data Classification and Standards
- Acceptable Use of Technology Resources
- Networked Computing Device Standards
- Proactive UI Network Security Measures
- UI Password/Pass-phrase Policy
- Managing Systems for Employee Turnover
- Computer File Backup and Recovery
- Scheduling and Notification of Central Computer System Outages
- Computer Security Violations
- Banner Training and Authorization
- Payment Card Processing

External Review

In 2013, the University engaged an external higher education consulting team to provide an objective view of the state of information technology policy and security at the University. Many recommendations were implemented, including the establishment of an Information Security Office, the hiring of an Information Security Officer, and the development of a number of policies, standards, and best practices.

Technology Security Advisory Council

In 2014, the University formed a nine-member council to advocate for improved security, identify potential IT security issues, and advise the Information Security Officer on strategies, priorities, and communication. This council meets monthly.

Employee Training and Awareness

In 2017, the University required all employees to complete an on-line training module on cyber security risk. The University has achieved a 96% completion rate. In addition, the University Information Security Officer has conducting phishing awareness campaigns to educate employees on how to protect their data and devices from phishing attacks.

Encryption

The University has implemented the first phase of a device encryption program based on the University data classification policy. This project has encrypted 338 devices as of June 19, 2017, representing 95% of identified devices with potentially high risk data.

Governor's Executive Order No. 2017-02

Two of the ten directives listed in the EO are:

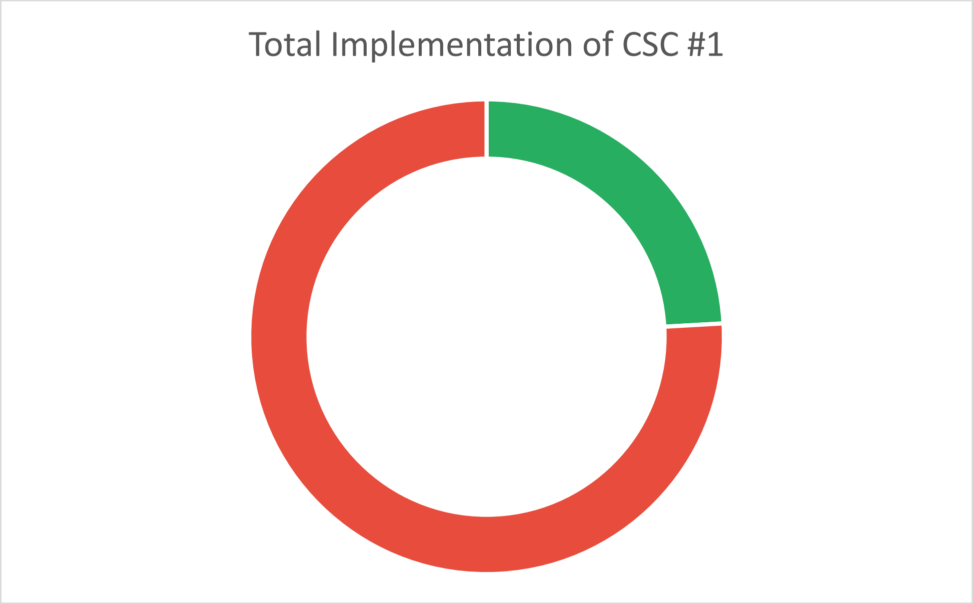
- Adoption and implementation of the National Institute of Standards and Technology (NIST) cybersecurity framework; and
- Implementation of the first five Center for Internet Security (CIS) critical security controls.

The University has adopted the NIST framework and has conducted a self-assessment of the CIS controls (no.'s 1-5) and is discussed later in this document. The results of the self-assessment have been communicated to the University President. The University Information Security Officer is also near completion of a cyber security strategic plan which will outline recommended action items for the University going forward.

Critical Security Controls

Using the AuditScripts tool, the following pages show the overall risk for each control. This assumes that any control not fully implemented has been implicitly, if not explicitly, accepted as a risk. Detailed answers on each control are not provided, but are on file in the ITS Information Security Office.

CSC #1: Inventory of Authorized and Unauthorized Devices



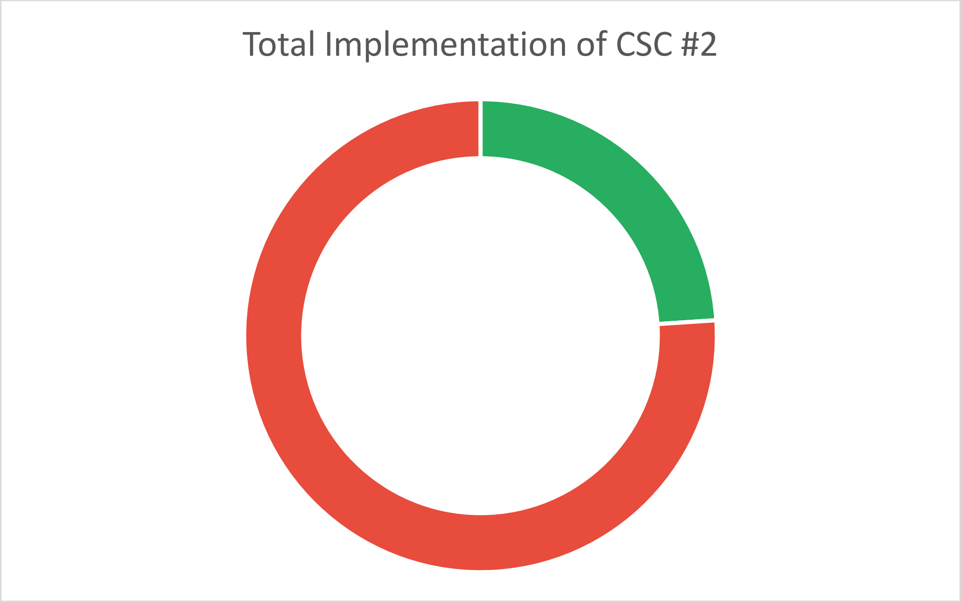
Total Implementation of CSC #1

Risk Addressed:	24%
Risk Accepted:	76%

ID	Critical Security Control Detail
1.1	Deploy an automated asset inventory discovery tool and use it to build a preliminary inventory of systems connected to an organization’s public and private network(s). Both active tools that scan through IPv4 or IPv6 network address ranges and passive tools that identify hosts based on analyzing their traffic should be employed.

1.2	If the organization is dynamically assigning addresses using DHCP, then deploy dynamic host configuration protocol (DHCP) server logging, and use this information to improve the asset inventory and help detect unknown systems.
1.3	Ensure that all equipment acquisitions automatically update the inventory system as new, approved devices are connected to the network.
1.4	Maintain an asset inventory of all systems connected to the network and the network devices themselves, recording at least the network addresses, machine name(s), purpose of each system, an asset owner responsible for each device, and the department associated with each device. The inventory should include every system that has an Internet protocol (IP) address on the network, including but not limited to desktops, laptops, servers, network equipment (routers, switches, firewalls, etc.), printers, storage area networks, Voice Over-IP telephones, multi-homed addresses, virtual addresses, etc. The asset inventory created must also include data on whether the device is a portable and/or personal device. Devices such as mobile phones, tablets, laptops, and other portable electronic devices that store or process data must be identified, regardless of whether they are attached to the organization’s network.
1.5	Deploy network level authentication via 802.1x to limit and control which devices can be connected to the network. The 802.1x must be tied into the inventory data to determine authorized versus unauthorized systems.
1.6	Use client certificates to validate and authenticate systems prior to connecting to the private network.

CSC #2: Inventory of Authorized and Unauthorized Software

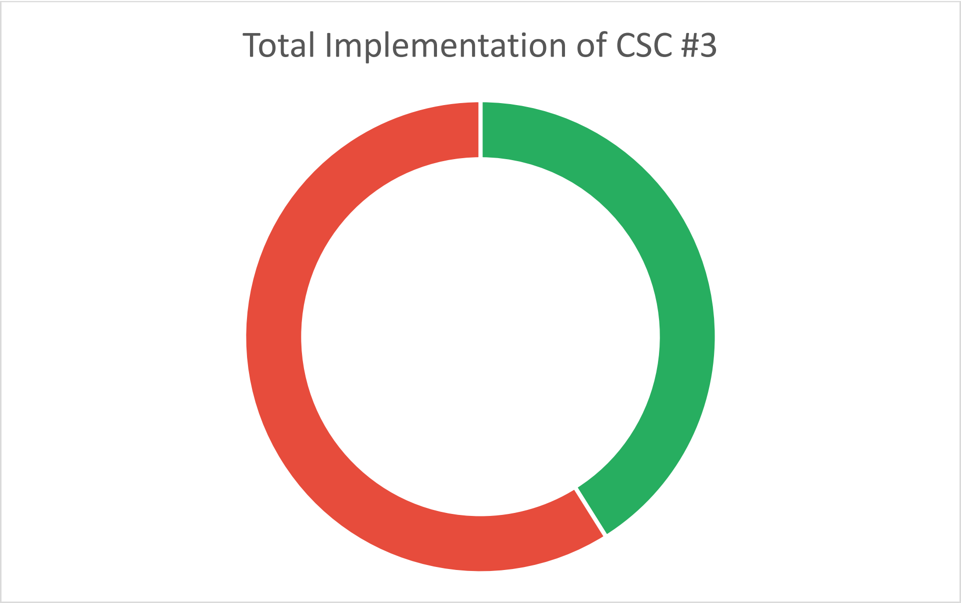


Risk Addressed:	24%
Risk Accepted:	76%

ID	Critical Security Control Detail
2.1	Devise a list of authorized software and version that is required in the enterprise for each type of system, including servers, workstations, and laptops of various kinds and uses. This list should be monitored by file integrity checking tools to validate that the authorized software has not been modified.
2.2	Deploy application whitelisting technology that allows systems to run software only if it is included on the whitelist and Protects execution of all other software on the system. The whitelist may be very extensive (as is available from commercial whitelist vendors), so that users are not inconvenienced when using common software. Or, for some special-purpose systems (which require only a small number of programs to achieve their needed business functionality), the whitelist may be quite narrow.

2.3	Deploy software inventory tools throughout the organization covering each of the operating system types in use, including servers, workstations, and laptops. The software inventory system should track the version of the underlying operating system as well as the applications installed on it. The software inventory systems must be tied into the hardware asset inventory so all devices and associated software are tracked from a single location.
2.4	Virtual machines and/or air-gapped systems should be used to isolate and run applications that are required for business operations but based on higher risk should not be installed within a networked environment.

CSC #3: Secure Configurations for Hardware and Software



Risk Addressed: 41%

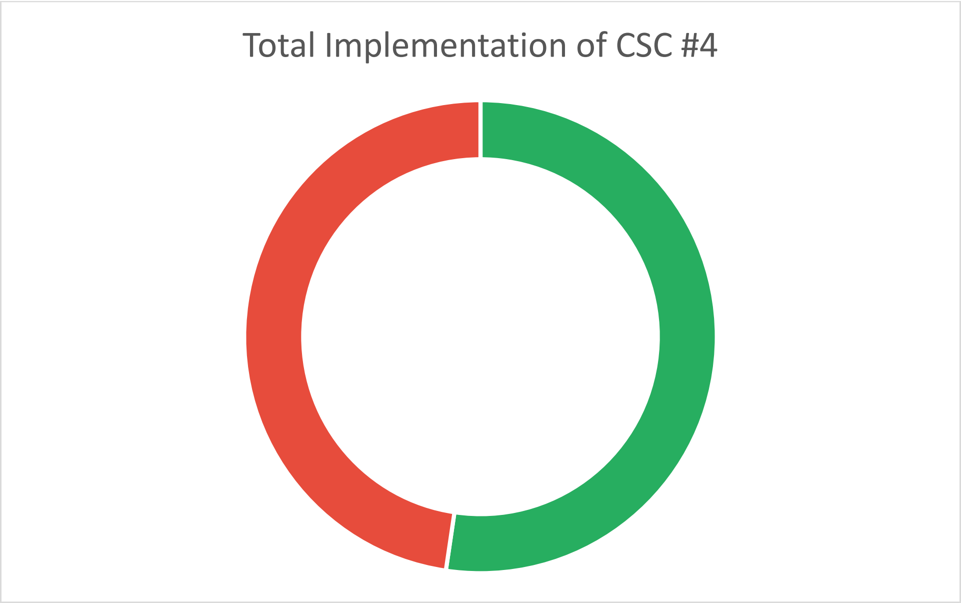
Risk Accepted: 59%

ID	Critical Security Control Detail
3.1	Establish standard secure configurations of your operating systems and software applications. Standardized images should represent hardened versions of the underlying operating system and the applications installed on the system. These images should be validated and refreshed on a regular basis to update their security configuration in light of recent vulnerabilities and attack vectors.
3.2	Follow strict configuration management, building a secure image that is used to build all new systems that are deployed in the enterprise. Any existing system that becomes compromised should be re-imaged with the secure build. Regular updates or exceptions to this image should be integrated into the organization's change management processes. Images should be

	created for workstations, servers, and other system types used by the organization.
3.3	Store the master images on securely configured servers, validated with integrity checking tools capable of continuous inspection, and change management to ensure that only authorized changes to the images are possible. Alternatively, these master images can be stored in offline machines, air-gapped from the production network, with images copied via secure media to move them between the image storage servers and the production network.
3.4	Perform all remote administration of servers, workstation, network devices, and similar equipment over secure channels. Protocols such as telnet, VNC, RDP, or others that do not actively support strong encryption should only be used if they are performed over a secondary encryption channel, such as SSL, TLS or IPSEC.
3.5	Use file integrity checking tools to ensure that critical system files (including sensitive system and application executables, libraries, and configurations) have not been altered. The reporting system should: have the ability to account for routine and expected changes; highlight and alert on unusual or unexpected alterations; show the history of configuration changes over time and identify who made the change (including the original logged-in account in the event of a user ID switch, such as with the su or sudo command). These integrity checks should identify suspicious system alterations such as: owner and permissions changes to files or directories; the use of alternate data streams which could be used to hide malicious activities; and the introduction of extra files into key system areas (which could indicate malicious payloads left by attackers or additional files inappropriately added during batch distribution processes).
3.6	Implement and test an automated configuration monitoring system that verifies all remotely testable secure configuration elements, and alerts when unauthorized changes occur. This includes detecting new listening ports, new administrative users, changes to group and local policy objects (where applicable), and new services running on a system. Whenever possible use tools compliant with the Security Content Automation Protocol (SCAP) in order to streamline reporting and integration.

3.7	Deploy system configuration management tools, such as Active Directory Group Policy Objects for Microsoft Windows systems or Puppet for UNIX systems that will automatically enforce and redeploy configuration settings to systems at regularly scheduled intervals. They should be capable of triggering redeployment of configuration settings on a scheduled, manual, or event-driven basis.

CSC #4: Continuous Vulnerability Assessment and Remediation

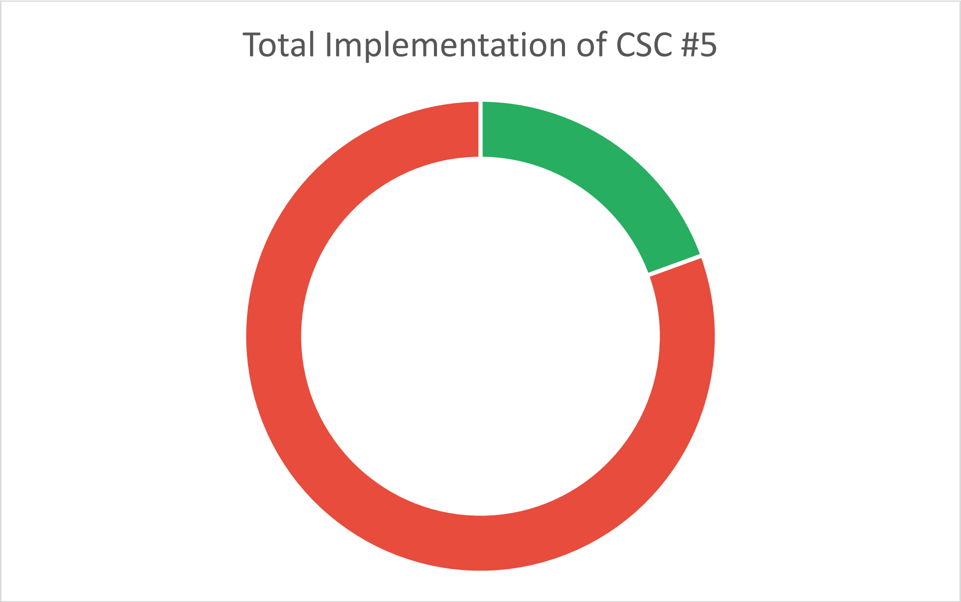

Total Implementation of CSC #4

Risk Addressed:	52%
Risk Accepted:	48%

ID	Critical Security Control Detail
4.1	Run automated vulnerability scanning tools against all systems on the network on a weekly or more frequent basis and deliver prioritized lists of the most critical vulnerabilities to each responsible system administrator along with risk scores that compare the effectiveness of system administrators and departments in reducing risk. Use a SCAP-validated vulnerability scanner that looks for both code-based vulnerabilities (such as those described by Common Vulnerabilities and Exposures entries) and configuration-based vulnerabilities (as enumerated by the Common Configuration Enumeration Project).

4.2	Correlate event logs with information from vulnerability scans to fulfill two goals. First, personnel should verify that the activity of the regular vulnerability scanning tools is itself logged. Second, personnel should be able to correlate attack detection events with prior vulnerability scanning results to determine whether the given exploit was used against a target known to be vulnerable.
4.3	Perform vulnerability scanning in authenticated mode either with agents running locally on each end system to analyze the security configuration or with remote scanners that are given administrative rights on the system being tested. Use a dedicated account for authenticated vulnerability scans, which should not be used for any other administrative activities and should be tied to specific machines at specific IP addresses. Ensure that only authorized employees have access to the vulnerability management user interface and that roles are applied to each user.
4.4	Subscribe to vulnerability intelligence services in order to stay aware of emerging exposures, and use the information gained from this subscription to update the organization’s vulnerability scanning activities on at least a monthly basis. Alternatively, ensure that the vulnerability scanning tools you use are regularly updated with all relevant important security vulnerabilities.
4.5	Deploy automated patch management tools and software update tools for operating system and software/applications on all systems for which such tools are available and safe. Patches should be applied to all systems, even systems that are properly air gapped.
4.6	Monitor logs associated with any scanning activity and associated administrator accounts to ensure that this activity is limited to the timeframes of legitimate scans.
4.7	Compare the results from back-to-back vulnerability scans to verify that vulnerabilities were addressed either by patching, implementing a compensating control, or documenting and accepting a reasonable business risk. Such acceptance of business risks for existing vulnerabilities should be periodically reviewed to determine if newer compensating controls or subsequent patches can address vulnerabilities that were previously accepted, or if conditions have changed, increasing the risk.
4.8	Establish a process to risk-rate vulnerabilities based on the exploitability and potential impact of the vulnerability, and segmented by appropriate groups of assets (example, DMZ servers, internal network servers, desktops, laptops). Apply patches for the riskiest vulnerabilities first. A phased rollout can be used to minimize the impact to the organization. Establish expected patching timelines based on the risk rating level.

CSC #5: Controlled Use of Administrative Privileges



Total Implementation of CSC #5

Risk Addressed: **19%**

Risk Accepted: **81%**

ID	Critical Security Control Detail
5.1	Minimize administrative privileges and only use administrative accounts when they are required. Implement focused auditing on the use of administrative privileged functions and monitor for anomalous behavior.
5.2	Use automated tools to inventory all administrative accounts and validate that each person with administrative privileges on desktops, laptops, and servers is authorized by a senior executive.
5.3	Before deploying any new devices in a networked environment, change all default passwords for applications, operating systems, routers, firewalls, wireless access points, and other systems to have values consistent with administration-level accounts.
5.4	Configure systems to issue a log entry and alert when an account is added to or removed from a domain administrators' group, or when a new local administrator account is added on a system.

5.5	Configure systems to issue a log entry and alert on any unsuccessful login to an administrative account.
5.6	Use multifactor authentication for all administrative access, including domain administrative access. Multi-factor authentication can include a variety of techniques, to include the use of smart cards, certificates, One Time Password (OTP) tokens, biometrics, or other similar authentication methods.
5.7	Where multi-factor authentication is not supported, user accounts shall be required to use long passwords on the system (longer than 14 characters).
5.8	Administrators should be required to access a system using a fully logged and non-administrative account. Then, once logged on to the machine without administrative privileges, the administrator should transition to administrative privileges using tools such as Sudo on Linux/UNIX, RunAs on Windows, and other similar facilities for other types of systems.
5.9	Administrators shall use a dedicated machine for all administrative tasks or tasks requiring elevated access. This machine shall be isolated from the organization's primary network and not be allowed Internet access. This machine shall not be used for reading e-mail, composing documents, or surfing the Internet.

Appendix A: References

Tracking of key references useful for this report.

Executive Order 2017-01	Findings of the Idaho Cybersecurity Taskforce	https://gov.idaho.gov/mediacenter/execorders/eo17/EO%202017-02.pdf
Critical Security Controls	Version 6.1	https://www.cisecurity.org/controls/
Audit Scripts	Free Assessment Resources	http://www.auditscripts.com/free-resources/critical-security-controls/