U.S. Marine Corps

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The U.S. Marine Corps (USMC) is the nation's expeditionary armed force, positioned and ready to respond to crises around the world. Marine units assigned aboard ships ("soldiers of the sea") or at bases abroad stand ready to project U.S. power into crisis areas. Marines also serve in a range of unique missions, from combat defense of U.S. embassies under attack abroad to operating the President's helicopter fleet.

Although Marines have a wide variety of individual assignments, the focus of every Marine is on combat: Every Marine is first a rifleman. Over the past several decades, the Marine Corps has positioned itself for crisis response, but while the Corps has maintained its historical, institutional, and much of its doctrinal focus on operations in maritime environments, the majority of its operational experience over the past 20 years has been in sustained land operations. This has led to a dramatic decline in the familiarity of most Marines with conventional amphibious operations and other types of employment within a distinctly maritime setting.[1]

Recognizing this shortfall, the Corps' leadership has initiated efforts to reorient the service toward enabling and supporting the projection of naval power in heavily contested littoral environments with a particular focus on the Indo-Pacific region and China as the "pacing threat" against which Marine Corps capabilities are being assessed and modified. This reorientation is much more than a simple refocusing on amphibious operations. Following a comprehensive assessment of the operational challenges that the service's operating forces are most likely to face 10 to 15 years in the future, General David H. Berger, Commandant of the Marine Corps, issued Force Design 2030 (FD 2030), his directive to the service to reorganize, re-equip, and retrain Marines in ways that will make them relevant and effective in the presumed operating environment of the 2030s.[2]

As necessary an effort as FD 2030 appears to be, however, the force envisioned by the project has yet to be built (though progress is being made) and certainly has not yet been proven in battle. Consequently, this *Index* can only assess the Corps that exists today, and our assessments of capacity, capability (modernity), and readiness therefore pertain to the Marine Corps' current status, not to what it might be in the future.

As reported in 2021, the Corps had 33,500 Marines deployed, roughly one-third of its operational force.[3] During the year preceding its fiscal year (FY) 2022 budget request, "[T]he Marine Corps executed 156 total operations, nine amphibious operations, [and] 36 theater security cooperation events, and participated in 36 exercises" involving numerous countries in Europe, the Middle East, and Asia including Japan, South Korea, Thailand, Malaysia, Singapore, Germany, Norway, Scotland, and Romania.[4]

The Marine Corps has always prized its crisis-response contributions to national security—a point consistently emphasized by

senior service leaders over the years. Maintaining this emphasis, General Berger has made it central to the Corps' efforts to remain combat credible as adversary capabilities evolve, even at the expense of force capacity (the size of the service) and existing capabilities that, while still of value, are perceived as less relevant to the maritime environment of the Indo-Pacific. Service leadership is assuming that defense budgets will not see any appreciable growth in the next several years, so the Commandant has ordered the Corps to retire or reduce assets and capabilities such as tanks, conventional tube artillery, heavy bridging, and some aircraft and continue to reduce manpower end strength in order to make related funding available for other purposes.

In general for the Joint Force, this *Index* focuses on the forces required to win two major wars as the baseline force-sizing metric for the Army, Navy, and Air Force, but it adopts a different paradigm—one war plus crisis response—for the Marine Corps. The three large services are sized for global action in more than one theater at a time; the Marines, by virtue of overall size and most recently by direction of the Commandant, focus on one major conflict while ensuring that all Fleet Marine Forces are globally deployable for short-notice, smaller-scale actions. Marine Corps officials have emphasized that the results of the FD 2030 redesign will ensure that USMC forces are more capable and relevant in any fight, in any region, but the pacing challenge for Corps planners is China.

In previous editions of the *Index*, the capacity of the Marine Corps was assessed against a two-war requirement of 36 battalions: a historical average of 15 battalions for a major conflict (30 for two major conflicts) and a 20 percent buffer, bringing the total to 36. The Corps has consistently maintained that it is a one-war force and has no intention of growing to the size needed to fight two wars, and both its annual budget requests and its top-level planning documents reflect this position.

However, with China as the primary threat driving Marine Corps force planning and given China's extraordinary investment in modernizing its forces across all capabilities, to include the expansion of various sensors, weapons, and platforms that are essential to the creation of an intensely weaponized, layered defense architecture, this *Index* cannot help but note that the Corps will need greater capacity if it is to succeed in war in the very circumstances for which the Marines believe they must prepare and with which this *Index* concurs.

Capacity

The measures of Marine Corps capacity in this *Index* are similar to those used to assess the Army's: end strength and units (battalions for the Marines and brigades for the Army). The Marine Corps' basic combat unit is the infantry battalion, which is composed of approximately 900 Marines and includes three rifle companies, a weapons company, and a headquarters and service company.[5]

Infantry. In 2011, the Marine Corps maintained 27 infantry battalions in its active component at an authorized end strength of 202,100.[6] As budgets declined, the Corps prioritized readiness through managed reductions in capacity, including a drawdown of forces, and delays or reductions in planned procurement levels. After the Marine Corps fell to a low of 23 active component infantry battalions in FY 2015,[7] Congress began to fund gradual increases in end strength, returning the Corps to 24 infantry battalions.

New requirements have also sapped the Corps' conventional deployable strength. In 2005, the Marines were directed to establish a special operations component to which they ultimately committed 2,700 Marines.[8] In 2010, the Corps established a cyberspace element,[9] redirecting more manpower to new capabilities. The point here is that new requirements arise over time. Unless the Marine Corps' end strength is increased accordingly, establishing new units and capabilities means losing capacity in other areas.

The Corps operated with 181,200 Marines in FY 2021, with plans to shrink further to 178,500 in FY 2022 to free funding so that it

can be reapplied to experimentation, retooling, and reorganization as described in Force Design 2030.[10] The current size allows for 24 infantry battalions, but future plans will likely see the number shrink to 21 battalions.[11]

Infantry battalions serve as a surrogate measure for the Corps' total force. As the first to respond to many contingencies, the Marine Corps requires a large degree of flexibility and self-sufficiency, and this drives its approach to organization and deployment of operational formations that, although typically centered on infantry units, are composed of ground, air, and logistics elements. Each of these assets and capabilities is critical to effective deployment of the force, and any one of them can be a limiting factor in the conduct of training and operations.

Aviation. Despite being stressed consistently by insufficient funding, the Marine Corps has made significant progress in regaining capability and readiness in its aviation component, achieving its objective of 80 percent aviation readiness in FY 2020[12] and achieving 86 percent to 96 percent pilot manning in its rotary wing community, a status the Corps considers healthy.[13] The Corps has not published an update to its Aviation Plan since 2019. At that time, the service stated that it possessed 16 tactical fighter squadrons,[14] compared to 19 in 2017[15] and approximately 28 during Desert Storm.[16] Service officials have stated repeatedly that the number of manned aircraft, and therefore squadrons, will likely continue to decline as the Corps divests itself of older aircraft without replacing them on a one-for-one basis, shifts investment to unmanned platforms, and retools the force for distributed operations undertaken by smaller units per Force Design 2030.

While the Corps is introducing the F-35 platform into the fleet, F/A-18 Hornets remain "the primary bridging platform to F-35B/C" and will remain in the force until 2030.[17] This primary tactical air (TACAIR) capability has to be managed carefully as it is no longer in production. Through various programs, the Marines have extended the service life of their F/A-18 fleet to 10,000 flight hours, making it possible to keep them in service until FY 2030. A similar effort will keep the venerable AV-8B Harrier in use until FY 2027.[18] At present, the Marines have acquired 101 F-35B—the Short Take-Off and Vertical Landing (STOVL) variant of the Joint Strike Fighter (JSF)—and nine F-35C (aircraft carrier capable) aircraft[19] of a planned 353 F-35B and 67 F-35C models.[20] This has enabled the service to stand up 10 JSF squadrons: six operational, two fleet replacement (used to train new pilots), and one test for F-35Bs and one operational squadron of F-35C aircraft.[21]

The activation of and achievement of full operational capable status for the F-35C squadron are especially important given the end of operational service of the last squadron flying its predecessor aircraft, the F/A-18C. Marine Fighter Attack Squadron 323 (VMFA 323) returned from its final deployment aboard the USS *Nimitz* (CVN-68) with Carrier Air Wing 17 at the end of February 2021.[22] The Corps' F-35Cs will eventually replace the now operationally retired F/A-18C for duty aboard the Navy's aircraft carriers.

In its heavy-lift rotary-wing fleet, the Corps began a reset of the CH-53E in 2016 to bridge the procurement gap between the CH-53E and the CH-53K King Stallion and aimed to "reset...the entire 143-aircraft fleet by FY20,"[23] but reporting in 2020 indicated that the Corps was moving rather slowly in this effort, and it was only one-third of the way through the process toward the close of the fiscal year.[24] Even when the reset is complete, the service will still be 57 aircraft short of the stated heavy-lift requirement of 200 airframes and will not have enough helicopters to meet its heavy-lift requirement without the transition to the CH-53K.[25]

As for the CH-53K heavy-lift helicopter, the service has reported good news about the per-unit cost, once an exorbitant $125 million per aircraft. In testimony to the House Armed Services Committee's Subcommittee on Tactical Air and Land Forces, Lieutenant General Mark Wise said that the cost per aircraft had dropped to $97 million and could drop further to $94

million per plane.[26] The Marines have acquired four of these new helicopters for testing and hope to have the King Stallion available for deployment by 2024.[27]

The Corps continues to search for improvements to its MV-22B Osprey, most recently by testing a version of an electronic warfare radar jamming pod that it uses on other aircraft.[28] In the absence of conventional pylons on which weapons and sensors can be mounted, new capabilities have to be reconfigured to fit inside the aircraft or mounted on the aircraft fuselage.

Notably, the Corps has moved aggressively to implement aviation-related actions specified or implied by FD 2030. In May, it disestablished HMLA-367, a light-attack helicopter squadron in Hawaii, sending its still relatively new attack and utility helicopters to Davis–Monthan Airbase in Arizona where they will be placed in the "bone yard" for possible use in the future. The 27 AH-1Z Viper attack helicopters and 26 UH-1Y Venom utility helicopters that were decommissioned represented approximately one-fifth of the Marine Corps' inventory of such aircraft.[29] The Marines have also started divestiture of three MV-22 squadrons, an additional light-attack helicopter squadron, and nearly three heavy-lift squadrons.[30]

Amphibious Ships. Amphibious ships, although driven by the Corps' articulation of what it needs to execute its operational concepts, remain a Navy responsibility. A trio of documents describe the rationale for and nature of the Marine Corps' thinking about how it plans to contribute to the projection of naval power in highly contested environments such as that found in the Indo-Pacific region should the U.S. find itself at war with China.

- In 2017, the Corps and the U.S. Navy jointly released *Littoral Operations in a Contested Environment* (LOCE), in which the services presented general ideas about how to conduct naval operations against a very capable enemy.[31]

- Several months after taking office, General Berger published FD 2030, which set objectives for redesigning the force so that it could do the things implied by LOCE.[32]

- In February 2021, the Corps released an unclassified version of the *Tentative Manual for Expeditionary Advanced Base Operations*, in which the service provided substantial details about its evolved thinking about the tactical and organizational challenges posed by high-threat maritime environments.[33]

These documents informed and reinforced Marine Corps and Navy plans to develop and acquire upwards of 35 light amphibious warships (LAWs), new amphibious vessels that would be smaller than those constituting the current fleet and optimized to support naval operations in the contested environments envisioned by LOCE and Expeditionary Advance Base Operations (EABO).[34] The Marine Corps held 38 amphibious ships as the minimum requirement for many years but stepped away from that as a prelude to redefining its amphibious operations capabilities.[35] With the evolution of FD 2030 and refinement of related supporting concepts and material requirements, the Corps is now making the case for 28 to 31 traditional amphibious ships augmented by LAWs.[36] Though five companies have been awarded contracts for further concept development of LAWs,[37] procurement is not expected to begin until FY 2023 and will extend through FY 2026.[38] Meanwhile, the number of traditional amphibious ships had dropped to 31 as of August 2021.[39]

The USMC continues to invest in the recapitalization of legacy platforms in order to extend platform service life and keep aircraft and amphibious vehicles in the fleet, but as these platforms age, they also become less relevant to the evolving modern operating environment. Thus, although they do help to maintain capacity, programs to extend service life do not provide the capability enhancements that modernization programs provide. The result is an older, less capable fleet of equipment that costs more to maintain.

Capability

The nature of the Marine Corps' crisis-response role requires capabilities that span all domains. The USMC ship requirement is managed by the Navy, as indicated in the preceding section on capacity, and is covered in the Navy's section of the *Index*. The Marine Corps is focused on a force-wide redesign per FD 2030 with modernization and divestiture programs shaped accordingly. General Berger has emphasized that his force redesign initiatives are being self-funded, meaning that the service will get rid of some capabilities that are less relevant to expected operational demands and will reduce manpower to redirect that funding to other priorities of greater relevance. Nevertheless, defense funding has not kept pace with inflation, and there are some things for which the Corps needs additional money. According to one account:

> Making his case [on June 15, 2021] before the House Armed Services Committee… for the Marine Corps' $47.86 billion budget request, Berger said he has reduced headquarters staffing by 15%, cut legacy systems and end strength, and has nothing left to draw from to fund programs and projects.
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> "We have wrung just about everything we can out of the Marine Corps internally," Berger said. "We're at the limits of what I can do."
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> The Marine Corps' budget request represents a 6.2% increase from fiscal 2021, even as the service plans to reduce the size of the active-duty force by 2,700, to 178,500 Marines. The service ultimately wants to reach 174,000 by 2030—roughly the size it was in fiscal 2002.
>
> Berger is using the money he has saved by reorganizing the Marine Corps and shedding capabilities such as tanks and artillery to invest in new technologies and platforms.[40]

Programs such as the Amphibious Combat Vehicle (ACV), F-35, CH-53K, Naval Strike Missile,[41] and Light Amphibious Warship are at the top of the list of major items of equipment and weapons, but the Corps is also pursuing a variety of unmanned systems (air, ground, and sea) and has placed great emphasis on smaller pieces of gear and individual-level weapons that will enable tactical units to be more effective.[42] These latter items are typically small in cost when compared with aircraft and armored vehicles, but they can have a decisive effect in small-unit actions in the field.

Vehicles. Of the Marine Corps' current fleet of vehicles, its amphibious vehicles—specifically, the Assault Amphibious Vehicle (AAV-7A1) and Light Armored Vehicle (LAV)—are the oldest, with the AAV-7A1 averaging more than 49 years old and the LAV averaging 39 years old.[43] The Corps had moved to extend the service life of the AAV but abandoned that program as progress with the ACV accelerated.[44] The Corps has stated that:

> [W]e continue to make strategic choices in the divestiture of certain programs to reallocate funds toward building a more lethal, modern, multi-domain, expeditionary force. This has included accepting near-term capacity risk by reducing depot level maintenance for the legacy Amphibious Assault Vehicle (AAV) as we transition to the Amphibious Combat Vehicle (ACV).[45]

The Marine Corps has also been exploring the possible replacement of its aged Light Armored Vehicle (LAV) with a collection of vehicles under the Advanced Reconnaissance Vehicle (ARV) program and has requested $48.6 million in its FY 2022 budget submission for research and design work. General Berger, however, has said that he is "unconvinced that additional wheeled, manned armored ground reconnaissance units" are needed and that the Corps' light armored reconnaissance units "must be re-evaluated in light of the emerging concept of multi-domain mobile

reconnaissance," indicating that the requirement for the ARV is being reconsidered.[46]

The AAV program hit rough waters on July 30, 2020, with the sinking of an AAV off the California coast near San Clemente Island. In addition to halting all AAV operations until various investigations were completed, the Corps installed supplementary emergency breathing devices in the vehicle and took other steps to improve its safety and survivability.[47] AAV operations were resumed in April 2021 following inspection and modification of vehicles and related training and certification of AAV crews on the improvements.[48]

The Corps has accelerated procurement of the ACV in recognition of the problems of its AAV fleet and the urgent need to update force capabilities per FD 2030. It procured 56 ACVs in FY 2020 and 72 in FY 2021 and has requested funding sufficient to acquire 92 in FY 2022.[49] Combined with the 56 vehicles acquired in previous years, the additions in 2020 and 2021 bring the number of ACVs in the Corps' inventory to 184 out of a total program objective of 632.[50]

A note about the Corps' heavy armor: The operational challenges, organizational design, and tactical capabilities addressed in FD 2030 called for the Marines to retire their inventory of M1A2 Abrams main battle tanks and associated support capabilities like heavy bridging and recovery vehicles. The Marine Corps retired its last active-duty tank unit in May 2021,[51] bringing to a close nearly a century of experience with tanks. The Corps retains some tanks in various storage configurations (for example, aboard Maritime Prepositioning Squadron ships and in equipment storage caves in Norway) but will transfer them to the Army by FY 2023.[52]

Acquisition of the Joint Light Tactical Vehicle (JLTV) continues to move apace. Since 2017, when fielding of the HMMWV replacement began, the Marines have acquired 4,531 vehicles (out of a requirement for 9,091[53]) and have placed another 613 on order with its FY 2022 budget request.[54] Budget documents do not indicate plans for purchase beyond FY 2022,[55] most likely because decisions extending from FD 2030 initiatives have yet to be made.

Aircraft. Fixed-wing fighter-attack aircraft continue to age while the Corps pursues delivery of replacement aircraft: the F-35B STOVL variant to replace the AV-8B, in service since 1985, and the F-35C to replace its carrier-capable F/A-18s. To account for a lengthy transition period, the Corps has undertaken various efforts to extend the service life of its Hornets and Harriers to keep them in service until the end of the decade.[56]

The Corps has acquired approximately one-third of the F-35B aircraft that it plans to purchase but has only started to outfit its aviation element with the F-35C, the version designed for use aboard aircraft carriers. Though the F-35 program has been the subject of vigorous criticism ever since it began, much of this criticism is misplaced today given the superior capabilities the aircraft brings to air operations in heavily contested environments featuring peer-level enemies and the steady decrease in per-unit cost.[57] The Corps' current concerns about the aircraft have less to do with its capabilities than they do with the overall cost of modern aircraft in general in the constrained budget environment within which the service is working to redesign its force.

Today, the USMC MV-22 Osprey program is operating with few problems and nearing completion of the full acquisition objective of 360 aircraft.[58] The Marine Corps now has 16 fully operational MV-22 squadrons in the active component.[59] The MV-22's capabilities are in high demand from the Combatant Commanders (COCOMS), and the Corps is adding such capabilities as fuel delivery and use of precision-guided munitions to the MV-22 to enhance its value to the COCOMs.

The Corps has struggled with sustainment challenges in the Osprey fleet. In the years since procurement of the first MV-22 in 1999, the fleet has developed more than 70 different configurations.[60] This has resulted in increased logistical requirements as maintainers have had to be trained to each configuration and not all spare parts are shared. The Marine Corps

has developed its Common Configuration–Reliability and Modernization program to consolidate the inventory to a common configuration at a rate of "2–3 aircraft installs per year." The program was initiated in FY 2018.[61]

The USMC's heavy-lift replacement program, the CH-53K, conducted its first flight on October 27, 2015.[62] The CH-53K will replace the Corps' CH-53E, which is now 30 years old. Although "unexpected redesigns to critical components" delayed a low-rate initial production decision,[63] the program achieved Milestone C in April 2017. The Corps received $1 billion in 2019 to purchase seven aircraft,[64] continued this effort by purchasing six in FY 2020 for $848 million, and bought an additional nine in FY 2021 for $1.1 billion.[65] This aircraft is of increasing importance because the Marine Corps maintains only 138 CH-53Es and will not have enough helicopters to meet its heavy-lift requirement of 200 aircraft without the transition to the CH-53K.

Readiness

Riding alongside the Corps' principal Title 10 responsibility to provide "fleet marine forces [for service] in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign"[66] is its contribution as the crisis-response force for the military. This aspect of USMC contributions to national defense has been reinforced by service leaders who take pains to allay concerns that their focus on China and the Indo-Pacific will distract them from this important role. The Corps' readiness must therefore account for both high-end conflict against a major opponent in the most complex operational settings and pop-up crises against lesser opponents that cannot be predicted, all of which implies a force that is ready to go at a moment's notice.

Marine Corps guidance identifies multiple levels of readiness that can affect the ability to conduct operations:

> Readiness is the synthesis of two distinct but interrelated levels. a. unit readiness—The ability to provide capabilities required by the combatant commanders to execute their assigned missions. This is derived from the ability of each unit to deliver the outputs for which it was designed. b. joint readiness—The combatant commander's ability to integrate and synchronize ready combat and support forces to execute his or her assigned missions.[67]

To this the Commandant has added an expanded perspective that includes force modernization as an essential element to ensure that combat forces remain relevant and therefore ready. As General Berger and Air Force Chief of Staff General Charles Q. Brown, Jr., have argued, only by divesting old capabilities that would not be useful in changed circumstances and investing in new capabilities that account for more capable enemies and the characteristics of key operational theaters can U.S. forces be ready. "To do this," however, "we cannot let our focus on near-term availability consume the resources necessary to generate truly relevant future readiness through adaptive modernization."[68]

Divestiture carries with it some risk unless replacement capabilities are brought into the force as old or legacy capabilities are retired. For example, the Marine Corps' decision to get rid of tanks and a large percentage of its tube artillery means that the service will not have these capabilities should it be called into battle before new items can be fielded. Early reports of promising replacement capabilities to compensate for the loss of the Abrams main battle tank, for example, are encouraging, but the Corps now no longer has tanks while the improved replacement remains to be fielded.[69] This has a bearing on readiness to the extent that the force has a *current* ability to win in combat. The force might be ready, but in a different posture. For a few years, the Marines could be more light-infantry than the middle-weight "two-fisted fighter" proudly described by a former Commandant a decade ago.[70]

Unfortunately for this *Index,* the Corps reports its current readiness in vague, generalized terms instead of providing data by which external audiences can independently assess the status of the service, although this approach is generally used by all of the services. Detailed readiness reports are classified to prevent potential enemies from obtaining sensitive information.

In the past, the services' leaders would report to Congress in formal testimony the various percentages of key equipment that were or were not available, share the status of primary units or types of force capabilities, and perhaps provide insight into maintenance or supply backlogs. The absence of such details from Marine Corps statements during the past year reveals that the Corps prefers not to share such information, at least currently. Consequently, our assessment of the Corps' readiness must rely on the tone of statements and discussions, inferences derived from the totality of efforts and programs, and the sense one gets from anecdotal evidence of the seriousness with which the service is taking preparations for current and future employment.

As mentioned, the Marine Corps has undertaken a great reorientation to ready itself for war against China in a heavily contested maritime environment. The service believes that the changes it is pursuing to this end will be relevant and necessary for other combat environments because many countries are acquiring capabilities that are now possible and affordable with modern technologies. With this as the driver, combined with the reiteration of the Corps' role as a force in readiness, the service's words, actions, and policies strongly imply a focused commitment to combat readiness.[71]

To improve force capabilities from the level of the individual to the most senior operational commands, the service is pushing several initiatives. Among them:

- The Marine Corps School of Infantry has revamped its training for entry-level infantry Marines, lengthening its course by half and including new coursework and field training intended to sharpen the thinking skills of Marines who will likely find themselves operating more independently than has been the case in the past.[72]

- "In May [2021], the Marine Corps broke ground on a new, state-of-the-art wargaming facility intended to house various capabilities to enhance warfighter preparedness."[73] The Corps intends that the center, planned for use as early as 2024, will "help Marines better visualize the threat environment" and participate in war games of various sizes with a focus on realism and that it will also "provide data to inform decisions affecting force development [and] support existing and developing weapons platforms and capabilities in all regions of the globe."[74]

- Taking this emphasis on thinking, training, and war-gaming scenarios to the field, the Corps and the Navy teamed to execute a two-week Large Scale Exercise 2021, billed as the largest the services have conducted in many years, that involved 25,000 personnel, 36 live units, 50 virtual units, and a half-dozen major commands spread across 17 time zones.[75]

Such efforts, from improvements to infantry training to war gaming to large exercises, are steps that will have effects in the future rather than the present. However, they do reveal attitudes, priorities, and perspectives that reflect a level of seriousness about warfighting.

Within the Marine Corps, perhaps because it is a smaller service, changes in direction and attitude are more easily conveyed by senior leaders to the force and adopted force-wide than is the case in the larger services. While this does not directly replace hard data on mission-capable rates for equipment used by the Marines or cleanly substitute for unclassified reports about the readiness of units composing the Fleet Marine Force, it can be seen

as a surrogate for the attention being paid by the Corps to its level of readiness. In addition, now that the extended operational demands of Iraq and Afghanistan have concluded, the force can reconstitute its readiness as it reorients toward the requirements of FD 2030, LOCE, and EABO.

Lacking any other direct reporting, this *Index*'s assessment of the Corps' readiness for current operations is an optimistic one.

Scoring the U.S. Marine Corps

Capacity Score: Marginal

Based on the deployment of Marines across major engagements since the Korean War, the Corps requires roughly 15 battalions for one major regional contingency (MRC).[76] This requirement is based on the presumption of a rather conventional force using known (current) equipment and capabilities against a similar opponent.

This *Index* acknowledges the service's work to develop new capabilities and approaches to fighting and is certainly aware of the trends in new technologies and associated thinking about how warfare *might* change in the future, but until this happens, one can assess only what can be known at present. Consequently, the Corps' historical need for 15 battalions (and associated enabling elements) for one major conflict translates to a force of approximately 30 battalions to fight two MRCs simultaneously if we were to retain the metric used in previous *Indexes*. The government force-sizing documents that discuss Marine Corps composition support the larger measure. Though the documents that make such a recommendation count the Marines by divisions, not battalions, they are consistent in arguing for three Active Marine Corps divisions, which in turn requires roughly 30 battalions.

With a 20 percent strategic reserve, the ideal USMC capacity for a two-MRC force-sizing construct is 36 battalions. However, the Corps has repeatedly made the case that it is a one-war force that must also have the ability to serve as the nation's crisis-response force.[77] It has just as consistently resisted growing in end strength even during the years of high operational demand associated with peak activities in Operation Iraqi Freedom (Iraq) and Operation Enduring Freedom (Afghanistan). Most recently, General Berger has stated flatly that the Corps will trade manpower for modernization and that he intends to shrink the Corps from its current 24 infantry battalions to 21 battalions in order both to free resources so that they can be applied to new formations and to maintain capability investments in other areas such as Marine Special Operations Command.[78]

Manpower is by far the biggest expense for the Marines. As allocated for the Corps' FY 2021 budget, the military personnel account was approximately $14.68 billion (an increase of $730 million over FY 2020),[79] dwarfing both the approximately $8.4 billion allocated for operations and maintenance[80] and the $2.7 billion allocated for the procurement of new equipment, with both accounts seeing a decline in spending compared with the previous year.[81] Nevertheless, the historical record of the use of Marine Corps forces in a major contingency argues for the larger number. More than 33,000 Marines, for example, were deployed in Korea, and more than 44,000 were deployed in Vietnam. In the Persian Gulf, one of the largest Marine Corps missions in U.S. history, some 90,000 Marines were deployed, and approximately 66,000 were deployed for Operation Iraqi Freedom.

One could reasonably presume that in a war with China, the demand for forces would be similar to the demand during these historical instances of Marine Corps employment. The pacing threat for the Corps is China, which is developing new tools and operational concepts that will likely require the distribution of Marine Corps forces across a large, contested littoral battlespace. But because the Corps has

not yet refined what its envisioned formations will require, much less proven them in operational employment, we can only assess the service's current status against historical demand. Consequently, even a one-major-war Marine Corps should possess a larger end strength and more tactical units (infantry battalions as the surrogate measure for the total Corps) than it currently has.

As a one-war force that also needs the ability to provide crisis-response forces, sustain operations in the face of combat losses, and sustain its support for efforts that are not USMC-specific such as its service component contribution to U.S. Special Operations Command, the Corps should have a minimum of 30 battalions.

- **One-MRC-Plus Level:** 30 battalions.
- **Actual 2021 Level:** 24 battalions.

The Corps is operating with 80 percent of the number of battalions it should have relative to the revised benchmark set by this *Index* and has stated its intent to shrink from its current 24 battalions to 21 battalions. Marine Corps capacity is therefore scored as "marginal," the same as it was scored in the *2021 Index* but only because the bar has been lowered. Reducing operational strength by three battalions, or 12.5 percent, would drive the Corps' capacity score down to "weak."

Capability Score: Strong

The Corps receives scores of "marginal" for "Capability of Equipment," "marginal" for "Age of Equipment," "very strong" for "Health of Modernization Programs," and "strong" for "Size of Modernization Program." Therefore, the aggregate score for Marine Corps capability is "strong," an increase from the *2021 Index* score of "marginal."

The Corps is aggressively pursuing a host of new capabilities that will modernize the force over the next decade, and those capabilities—specifically, the JLTV, ACV, and F-35B—are slowly entering the force. Admittedly, the score was helped by the retirement of the old M1A2 Abrams tank. At the small-unit level, the force will still depend on old AAVs, HMMWVs, LAVs, cargo trucks, and various items of support equipment procured in the 1990s and early 2000s, but the increasing quantity of JLTVs and the aggressive acquisition of ACVs will offset the problem of old equipment as the Corps enters FY 2022.

Readiness Score: Strong

The Corps has exhibited an especially focused and aggressive commitment to ensuring that Marine Corps forces are ready for action. This is the point of FD 2030. That said, however, the history of military services is littered with the debris of grand vision statements and futuristic concepts unrealized in practical implementation.

The Marine Corps' effort appears to be quite different, as evidenced by nearly irrevocable decisions to cashier old equipment and implement significant changes in education and training programs, dramatic investments in experimentation and war gaming, acquisition of new capabilities, and profound redesign of operational units. The Corps seems to mean what it has been saying by making real changes in its programs and organizations that reflect its published rhetoric. This *2022 Index* believes it a low-risk proposition to apply the evidence of preparing for the future to current forces in terms of their focus on readiness for combat. The force remains encumbered by old primary equipment, but the service's effort to spend the money needed to keep it serviceable mitigates this problem to a reasonable extent.

The Corps is still too small, but the force it has is fully focused on warfighting. Consequently, the *2022 Index* assesses Marine Corps readiness as "strong," a marked improvement over the *2021 Index* score of "marginal" and quite a jump in a short three-year period over the *2019 Index* measure of "weak."

Overall U.S. Marine Corps Score: Strong

The Marine Corps has made substantial strides in the past few years in regaining its

material readiness and stabilizing key modernization programs and, over the past two years, in profoundly changing its battle orientation, conceptual underpinnings, organizational design, and acquisition of the tools that it believes it will need to win in combat. This admittedly has been accomplished at the expense of capacity, but better to have a combat-relevant force, even if small, than a large force that is ill-suited for war.

The *2022 Index* score of "strong" is buoyed by the status of the Corps' modernization and readiness efforts. The Marine Corps does run the risk of becoming too small relative to the task of enabling the projection of naval power into the most challenging combat environments, and this will be determined by the level of funding it receives in the coming years. The same holds true for its modernization efforts if the Administration and Congress elect to underfund defense.

But these are future problems. For FY 2021, the Corps achieved fine form, and its efforts augur well for FY 2022.

U.S. Military Power: Marine Corps

	VERY WEAK	WEAK	MARGINAL	STRONG	VERY STRONG
Capacity			✓		
Capability				✓	
Readiness				✓	
OVERALL				✓	

MARINE CORPS SCORES

1 2 3 4 5
Weakest ⟷ Strongest

Procurement and Spending ■ Through FY 2021 ■ Pending

Main Battle Tank

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
M1A1 Abrams Inventory: **DEACTIVATED** Fleet age: **18** Date: **1990** The M1A1 Abrams was the main battle tank of the USMC and provided the Marines with heavy-armor direct fire capabilities. Following the release of Force Design 2030, the Marine Corps decided to discontinue the use of their tanks in order to adapt their fighting capabilities to potential conflicts in the Pacific.			None		

Light Wheeled Vehicle

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
HMMWV Inventory: **10,859** Fleet age: **23** Date: **1983** The HMMWV, better known as the "Humvee," is a light wheeled vehicle that is used to transport troops with some measure of protection against small arms, blast, and fragmentation. Initially introduced in the 1980s, HMMWVs will be replaced by the Joint Light Tactical Vehicle (JLTV).	2	2	**Joint Light Tactical Vehicle (JLTV)** Timeline: **2017–2022** The JLTV program is a joint program with the Army for the eventual replacement of all HMMWVs. Full-rate production is scheduled for early 2019. JLTVs should be at full operational capability in FY 2022. The first set of JLTVs were fielded in March 2019; IOC was achieved in mid-summer 2019 with fielding at Camp Lejeune, North Carolina. **PROCUREMENT** 4,531 / 613 **SPENDING** *($ millions)* $1,918 / $322	5	5
JLTV Inventory: **4,531** Fleet age: **1** Date: **2019** The Joint Light Tactical Vehicle (JLTV) is replacing the HMMWV as a light wheeled vehicle for troop transport. The vehicle provides a long-term solution to IEDs and other unorthodox tactics with which the Humvee struggled during the conflicts in Iraq and Afghanistan. The JLTV improves reliability, survivability, and strategic and operational transportability. It achieved initial operational capability in 2019.	5	5			

NOTE: See page 475 for details on fleet ages, dates, timelines, and procurement spending. JLTV spending figures reflect the full joint program spending

Amphibious Assault Vehicle

PLATFORM	Age Score	Capability Score
AAV Inventory: **692** Fleet age: **49** Date: **1972** The Amphibious Assault Vehicle (AAV) is an amphibious landing vehicle that transports Marines from large naval vessels to land. Similar to a tank in being fully tracked and armored, the AAV is designed for assault on shores in hostile territory. The AAV will eventually be replaced by the ACV.	1	1
LAV-25 Inventory: **494** Fleet age: **39** Date: **1983** The Light Armored Vehicle (LAV) is an eight-wheeled, armored reconnaissance vehicle. It is designed for off-road and moderate amphibious capabilities. This allows for highly mobile fire support, operational in most terrains. The LAV will be in service until 2035.		2
ACV Inventory: **98** Fleet age: **0.5** Date: **2020** The Amphibious Combat Vehicle (ACV) is an amphibious landing vehicle that is intended to supplement and eventually replace the AAV. It is designed for increased survivability, the most notable difference being increased ground clearance to reduce the harm from IEDs and mines. A new remote weapons system improves the ACV's situational awareness and ability to track and fire on targets. The ACV is also equipped with tires instead of tracks and has a redesigned interior.	5	5

REPLACEMENT PROGRAM	Size Score	Health Score
Amphibious Combat Vehicle (ACV) Timeline: **2018–2021** The ACV is tasked with replacing the aging AAV. The vehicle achieved IOC in November 2020, and full-rate production was ordered to begin in 2021. **PROCUREMENT** 98 92 **SPENDING** *($ millions)* $1,310 $4,200	3	5

NOTE: See page 475 for details on fleet ages, dates, timelines, and procurement spending.

MARINE CORPS SCORES

1 2 3 4 5
Weakest ⟷ Strongest

Procurement and Spending ■ Through FY 2021 ■ Pending

Attack Helicopters

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
AH-1W Super Cobra Inventory: **20** Fleet age: **25** Date: **1986** The Super Cobra was the attack helicopter that provided Marines with close air support and armed reconnaissance. After more than 30 years of effective and dependable service, the AH-1W was retired in October 2020. It is being replaced by the more advanced AH-1Z Viper	1	2	**AH-1Z** Timeline: **2014–2022** The new AH-1Z Viper program is part of a larger program for modification of the H-1 platform. Replacing the AH-1W, the Z-Variant will serve as the next generation of attack aircraft. The AH-1Z features upgrades across multiple dimensions. It is scheduled to achieve full operational capability in 2021. **PROCUREMENT** 189 **SPENDING** *($ millions)* $6,012 $7	5	5
AH-1Z Viper Inventory: **125** Fleet age: **7** Date: **2010** The AH-1Z Viper is replacing the AH-1W Super Cobra as the USMC's premier attack helicopter. The Viper has greater speed, payload, and range as well as upgraded landing gear, advanced weapons systems, and a fully integrated glass cockpit. The Viper provides Marines with close air support, armed escort/reconnaissance, and anti-armor capabilities. The Viper's expected operational life span is 30 years.	5	5			

Airborne Electronic Attack Aircraft/Ground Attack Aircraft

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
AV-8B Inventory: **109** Fleet age: **29** Date: **1985** The Harrier is the Marine Corps' ground attack aircraft. It is a subsonic jet and, like a helicopter, is capable of hovering. The Harrier has a Vertical/Short Take-Off and Landing (V/STOL) system and is designed to fly from amphibious assault ships and unconventional runways. These unique capabilities allow it to operate in a variety of environments that are inaccessible to other jets. The aircraft is being replaced by the F-35B and will be fully retired in or near 2024.	5	1	**F-35B/C** Timeline: **2007–2031** The Marine Corps is purchasing 353 F-35Bs and 67 F-35Cs. The F-35B is the USMC version of the Joint Strike Fighter program. It is meant to replace the AV-8B Harrier, completing transition by 2030. The B-variant achieved initial operational capability in July 2015. Full operational capability for both variants is expected in the late 2020s. The F-35C is the version built for employment on aircraft carriers. It is primarily for the U.S. Navy, but the Marines augment carrier operations and will use the F-35C for this purpose. **PROCUREMENT** 124 245 **SPENDING** *($ millions)* $16,821 $27,853	4	4

NOTE: See page 475 for details on fleet ages, dates, timelines, and procurement spending.

Airborne Electronic Attack Aircraft/Ground Attack Aircraft (Cont.)

PLATFORM	Age Score	Capability Score
F/A-18 A-D Inventory: **224** Fleet age: **30** Date: **1978** The F/A-18 Hornet is a fighter and attack jet that the Marine Corps uses primarily for traditional strike missions, fleet air defense, and air support. It will be replaced by the F-35C model; however, the F/A-18 fleet's life has been extended to 2030 in order to bridge the gap between the two platforms.	2	2
F-35B Lightning II (STOVL) Inventory: **130** Fleet age: **5** Date: **2015** The F-35B is the Marine Corps variant of the Joint Strike Fighter (JSF) Program. It is a fifth-generation, stealth multi-role fighter. Its next-generation technology allows it to dominate combat missions without being detected by the enemy. Unique to the other variants, the B-model is designed with a Short Take-Off-off and Vertical Landing (STOVL) system that allows it to operate from amphibious assault ships and unconventional runways. This combines the unique operational capabilities of the AV-8B Harrier with a supersonic, fifth-generation stealth fighter.	5	5
F-35C Lightning II (CV) Inventory: **11** Fleet age: **0.5** Date: **2020** The F-35C is the aircraft carrier variant of the Joint Strike Fighter (JSF) program used by both the Navy and the Marine Corps. It is a fifth-generation, stealth multi-role fighter. Its next-generation technology allows it to dominate combat missions without being detected by the enemy. The C-model, also known as the carrier variant (CV), is equipped for traditional carrier catapult launches and tailhook landings. It also features a slightly larger combat radius than the B-model. Although the C-model is used primarily by the Navy, the Marine Corps implemented its first squadron in December 2020 to complement its F-35B fleet.	5	5

NOTE: See page 475 for details on fleet ages, dates, timelines, and procurement spending.

MARINE CORPS SCORES

1 2 3 4 5
Weakest ⟷ Strongest

Procurement and Spending ■ Through FY 2021 ■ Pending

Medium Lift

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
MV-22B Osprey Inventory: **309** Fleet age: **14** Date: **2007** The Osprey is a tilt-rotor aircraft that combines the vertical capabilities of a helicopter (V/STOL) with the speed and range of a fixed-wing aircraft. Similar to the AV-8B, this allows the aircraft to take off and land in unconventional environments. The Osprey provides transport for ground personnel, cargo lift, and support for raid operations. IOC was achieved in 2007, and the program is still in production. The MV-22B's life expectancy is 23 years.	4	5	**MV-22B** Timeline: **2007–2019** Fielding of the Osprey was completed in 2019 with the MV-22 replacing the CH-46E helicopter, and the platform is meeting performance requirements. The modernization program does not face any serious issues. **PROCUREMENT** 349 11 **SPENDING** *($ millions)* $30,782 $3,087	5	5

Heavy Lift

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
CH-53E Super Stallion Inventory: **138** Fleet age: **29** Date: **1981** The CH-53E is a heavy-lift rotary-wing aircraft. The Super Stallion transports heavy equipment and supplies for amphibious assault. The aircraft will operate through 2027 and will then be replaced by the more advanced CH-53K. The CH-53E's program life is 41 years.	2	1	**CH-53K** Timeline: **2017–2029** The program is in development. It is meant to replace the CH-53E and provide increased range, survivability, and payload. The program still has not fully developed the necessary critical technology. The helicopter is scheduled to complete initial testing in 2021 and to be fielded as early as 2023. **PROCUREMENT** 20 176 **SPENDING** *($ millions)* $3,030 $18,026	5	3

NOTE: See page 475 for details on fleet ages, dates, timelines, and procurement spending.

Tanker

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
KC-130J Inventory: **45** Fleet age: **9** Date: **2005** The KC-130J is a large multi-role aircraft, used primarily as a tanker and cargo transport aircraft. It is equipped for a variety of missions, including troop and equipment transport, air-to-air refueling, and medevac operations. The airframe is expected to last 38 years.	4	5	**KC-130J** Timeline: **2005–2031** The KC-130J is both a tanker and transport aircraft. The procurement program for the KC-130J is not facing acquisition problems. **PROCUREMENT** 68 43 **SPENDING** *($ millions)* $4,676 $5,111	4	4

NOTES: See Methodology for descriptions of scores. Fleet age is the average between the last year of procurement and the first year of initial operational capability. The date is when the platform achieved initial operational capability. The timeline is from the start of the platform's program to its budgetary conclusion. Spending does not include advanced procurement or research, development, test, and evaluation (RDT&E). Total program dollar value reflects the full F–35 joint program, including engine procurement. As part of the F–35 program, the Navy is purchasing 67 F-35Cs for the U.S. Marine Corps that are included here. The MV-22B program also includes some costs from U.S. Air Force procurement. AH-1Z costs include costs of UH-1 procurement.

U.S. Marine Corps Modernization Table Citations

GENERAL SOURCES

- U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2022 Budget Estimates, Navy, Justification Book Volume 1 of 1: Procurement, Marine Corps*, May 2021, https://www.secnav.navy.mil/fmc/fmb/Documents/22pres/PMC_Book.pdf (accessed August 20, 2021).
- U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2022 Budget Estimates, Navy, Justification Book Volume 1 of 3: Aircraft Procurement, Navy, Budget Activities 01–04*, May 2021, https://www.secnav.navy.mil/fmc/fmb/Documents/22pres/APN_BA1-4_Book.pdf (accessed August 20, 2021).
- U.S. Department of Defense, "Department of Defense Comprehensive Selected Acquisition Reports for the Annual 2019 Reporting Requirement as Updated by the President's Fiscal Year 2021 Budget," https://media.defense.gov/2020/Nov/19/2002538295/-1/-1/0/SAR-SUMMARY-TABLES-DEC-2019-UPDATED.PDF (accessed August 20, 2021).
- "North America," in International Institute for Strategic Studies, *The Military Balance 2021: The Annual Assessment of Global Military Capabilities and Defence Economics* (London: Routledge, 2021).

PROGRAM SOURCES

M1A1 Abrams:

- Todd South, "New in 2021: The Final Year for Marine Tankers," *Marine Corps Times*, December 28, 2020, https://www.marinecorpstimes.com/news/your-marine-corps/2020/12/28/new-in-2021-the-final-year-for-marine-corps-tanks/ (accessed August 20, 2021).

HMMWV:

- Matthew Cox, "JLTV Is Tougher and Faster, but Troops Will Still Ride into Battle on Humvees," Military.com, February 10, 2019, https://www.military.com/daily-news/2019/02/10/jltv-tougher-and-faster-troops-will-still-ride-battle-humvees.html (accessed August 20, 2021).

Amphibious Assault Vehicle:

- Andrew Feickert, "Marine Corps Amphibious Combat Vehicle (ACV): Background and Issues for Congress," Congressional Research Service *Report for Members and Committees of Congress* No. R42723, updated July 23, 2020, https://fas.org/sgp/crs/weapons/R42723.pdf (accessed August 20, 2021).

LAV-25:

- "LAV-25 Armored Reconnaissance Vehicle," Military-Today.com, http://www.military-today.com/apc/lav_25.htm (accessed August 20, 2021).
- Staff Writer, "LAV-25 (Light Armored Vehicle 25) 8x8 Wheeled Armored Reconnaissance Vehicle (1983)," MilitaryFactory.com, last edited February 13, 2019, https://www.militaryfactory.com/armor/detail.php?armor_id=57 (accessed August 20, 2021).

ACV:

- Mallory Shelbourne, "Marines Defend ACV Development as Program Matures," U.S. Naval Institute News, updated February 19, 2021, https://news.usni.org/2021/02/18/marines-defend-acv-development-as-program-matures (accessed August 20, 2021).
- Peter Ong, "USMC Receives First ACVs for Service as BAE Systems Designs More Variants," *Naval News*, December 1, 2020, https://www.navalnews.com/naval-news/2020/12/usmc-receives-first-acvs-for-service-as-bae-systems-designs-more-variants/ (accessed August 20, 2021).
- News release, "U.S. Marine Corps Awards $184 Million Contract for Full-Rate Production of the Amphibious Combat Vehicle Following IOC Declaration," BAE Systems, December 10, 2020, https://www.baesystems.com/en/article/u-s-marine-corps-awards--184-million-contract-for-full-rate-production-of-the-amphibious-combat-vehicle-following-ioc-declaration (accessed August 20, 2021).

AH-1W Cobra:

- "AH-1W/AH-1Z Super Cobra Attack Helicopter," Naval Technology, https://www.naval-technology.com/projects/ah1w-supercobra-helicopter/ (accessed August 20, 2021).
- U.S. Marine Corps, "AH-1W Cobra," https://web.archive.org/web/20070816230216/http:/hqinet001.hqmc.usmc.mil/AVN/documents/aircraft/rotarywing/ah1.htm (accessed August 20, 2021).
- Press release, "United States Marines Retire Bell AH-1W After 34 Years of Service," Bell Textron, October 19, 2020, https://news.bellflight.com/en-US/192399-united-states-marines-retire-bell-ah-1w-after-34-years-of-service (accessed August 20, 2021).

AH-1Z Viper:

- Zaal Tchkuaseli, "AH-1Z Viper Attack Helicopter," Military-Today.com, http://www.military-today.com/helicopters/ah1z_viper.htm (accessed August 20, 2021).
- John Keller, "Navy Asks Bell to Build 25 AH-1Z Viper Attack Helicopters and Avionics for Marine Corps," *Military & Aerospace Electronics*, January 21, 2019, https://www.militaryaerospace.com/sensors/article/16722056/navy-asks-bell-to-build-25-ah1z-viper-attack-helicopters-and-avionics-for-marine-corps (accessed August 20, 2021).
- U.S. Navy, Naval Air Systems Command, "AH-1Z Viper," updated June 2020, https://www.navair.navy.mil/product/AH-1Z-Viper (accessed August 20, 2021).

AV-8B:

- Boeing, "AV-8B Harrier II (V/STOL) Aircraft," https://www.boeing.com/history/products/av-8-harrier-ii.page (accessed October 16, 2020).
- Dan Alex, "Boeing (BAe Systems / McDonnell Douglas) AV-8B Harrier II Short Take-Off and Vertical Landing (STVOL) Strike Aircraft (1985)," MilitaryFactory.com, last edited March 30, 2021, https://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=47 (accessed August 20, 2021).

F-35:

- Lockheed Martin, "F-35 Lightning II: About the F-35: F-35B Lightning II," https://www.f35.com/f35/about.html (accessed August 20, 2021).
- Harm Venhuizen, "Marine Corps' First F-35C Squadron Ready to Deploy on Carriers," *Marine Corps Times*, December 6, 2020, https://www.marinecorpstimes.com/news/your-marine-corps/2020/12/06/the-marine-corps-first-f-35c-squadron-is-ready-to-deploy-on-carriers/ (accessed August 20, 2021).

F/A-18 A-D

- Boeing, "Defense, Space & Security: F/A-18 Hornet," last updated July 29, 2005, https://web.archive.org/web/20120521030622/http:/www.boeing.com/defense-space/military/fa18/fa18_milestones.htm (accessed August 20, 2021).

MV-22

- U.S. Navy, Naval Air Systems Command, "MV-22B Osprey," updated September 2020, https://www.navair.navy.mil/product/MV-22B-Osprey (accessed August 20, 2021).

CH-53E Sea Stallion:

- "CH-53E Super Stallion," Military.com, https://www.military.com/equipment/ch-53e-super-stallion (accessed August 20, 2021).
- "CH-53E Super Stallion Heavy-Lift Helicopter," Air Force Technology, https://www.airforce-technology.com/projects/sikorsky-ch53e-super-stallion/ (accessed August 20, 2021).
- "Marine Corps CH-53K Passes Air Refueling Tests," *Seapower*, April 10, 2020, https://seapowermagazine.org/marine-corps-ch-53k-passes-air-refueling-tests/ (accessed August 20, 2021).

KC-130J:

- "KC-130J Hercules," Military.com, https://www.military.com/equipment/kc-130j-hercules (accessed August 20, 2021).

Endnotes

1. Philip Athey, "The Marine Corps Needs to Restore Its Amphibious Competency, Commandant Says," *Marine Corps Times*, June 2, 2021, https://www.marinecorpstimes.com/news/your-marine-corps/2021/06/02/marine-corps-needs-to-restore-amphibious-capabilities-commandant-says/ (accessed August 18, 2021).
2. For the primary document driving the Corps' effort, see General David H. Berger, Commandant of the Marine Corps, "Force Design 2030," U.S. Department of the Navy, U.S. Marine Corps, March 2020, https://www.hqmc.marines.mil/Portals/142/Docs/CMC38%20Force%20Design%202030%20Report%20Phase%20I%20and%20II.pdf?ver=2020-03-26-121328-460 (accessed August 18, 2021). In an unpublished (but in the public domain) February 23, 2021, memorandum to the Secretary of Defense, General Berger stated a number of propositions underpinning FD 2030: China will remain the pacing threat for the next decade; the Corps will continue to operate as a Force-in-Readiness; INDOPACOM is the primary theater of operations for the Marines; and USMC forces will be the United States' "'stand-in force' operating persistently inside China's Weapons Engagement Zone (WEZ)," implying the need for Marines to be highly mobile, possessing advanced reconnaissance capabilities, and able to operate with minimal footprint and signature (physical size, electronic emissions, reduced need for logistical resupply, etc.). For an extended discussion of the Marine Corps' efforts to reorient to the operational challenge presented by China in the Indo-Pacific region, see Dakota Wood, "The U.S. Marine Corps: A Service in Transition," Heritage Foundation *Backgrounder* No. 3501, June 16, 2020, https://www.heritage.org/sites/default/files/2020-06/BG3501_0.pdf.
3. U.S. Department of the Navy, Office of Budget, *Highlights of the Department of the Navy FY 2022 Budget*, 2021, p. 1-12, https://www.secnav.navy.mil/fmc/fmb/Documents/22pres/Highlights_Book.pdf (accessed August 18, 2020).
4. Ibid., p. 7-7.
5. To be clear, the Corps has thought of itself in terms of Marine Air Ground Task Forces (MAGTFs), a collection of ground, aviation, and logistics capabilities under a common commander, for nearly six decades, but because its size and composition vary by task, the MAGTF is not helpful as a consistent reference for capacity; thus, we use battalions as a measure that is generally understood by most students of military affairs. For an expanded discussion, see Dakota L. Wood, *Rebuilding America's Military: The United States Marine Corps*, Heritage Foundation *Special Report* No. 211, March 21, 2019, pp. 15–16, https://www.heritage.org/defense/report/rebuilding-americas-military-the-united-states-marine-corps. With specific reference to the Corps' infantry battalions, the service is engaged in a fundamental redesign as a subcomponent of FD 2030. But until the reorganization effort is complete, the force the Corps would use in an emerging crisis for the foreseeable future will consist of the standard infantry battalions and supporting arms and units that it possesses today. For additional information, see U.S. Marine Corps, "2030 Infantry Battalions," August 2, 2021, https://www.marines.mil/News/News-Display/Article/2708161/2030-infantry-battalions/ (accessed August 18, 2021).
6. U.S. Department of the Navy, *Department of the Navy Fiscal Year (FY) 2011 Budget Estimates, Justification of Estimates: Military Personnel, Marine Corps*, February 2010, p. 4, http://www.secnav.navy.mil/fmc/fmb/Documents/11pres/MPMC_Book.pdf (accessed August 18, 2020).
7. Table A-1, "Combat Force Structure Overview," in U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, *United States Department of Defense Fiscal Year 2016 Budget Request: Overview*, February 2015, p. A-1, http://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2016/FY2016_Budget_Request_Overview_Book.pdf (accessed July 29, 2020).
8. Wood, "Rebuilding America's Military: The United States Marine Corps," p. 41.
9. Alan J. McCombs, "Marines Launch into Cyberspace Mission with New Command," U.S. Army, January 29, 2010, https://www.army.mil/article/33744/Marines_launch_into_cyberspace_mission_with_new_command/ (accessed August 18, 2021).
10. U.S. Department of the Navy, Office of Budget, *Highlights of the Department of the Navy FY 2022 Budget*, pp. 1-18 and 1-19, https://www.secnav.navy.mil/fmc/fmb/Documents/22pres/Highlights_Book.pdf (accessed August 18, 2021).
11. Andrew Feickert, "New U.S. Marine Corps Force Design Initiatives," Congressional Research Service *Insight* No. IN11281, updated March 2, 2021, p. 1, https://crsreports.congress.gov/product/pdf/IN/IN11281 (accessed August 18, 2021).
12. Testimony of General David H. Berger, Commandant, U.S. Marine Corps, in Congressional Quarterly, "House Armed Services Committee Holds Hearing on Fiscal 2021 Budget Request for the Navy," CQ Congressional Transcripts, February 27, 2020, https://plus.cq.com/doc/congressionaltranscripts-5845986?0 (accessed August 18, 2021).
13. Testimony of Lieutenant General Mark Wise, Deputy Commandant for Aviation, U.S. Marine Corps, in hearing, *Fiscal Year 2022 Rotary Wing Aviation Budget Request*, Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, U.S. House of Representatives, June 30, 2021, comments made from 53:10 to 53:30, https://armedservices.house.gov/hearings?ID=015887BD-CD41-4336-A74C-25F88C6AAE14 (accessed August 18, 2021). Cited hereafter as Wise testimony, June 30, 2021.

14. U.S. Marine Corps, *2019 Marine Corps Aviation Plan*, p. [39], https://www.aviation.marines.mil/portals/11/2019%20avplan.pdf (accessed August 18, 2021). As this book was being prepared, the Marine Corps had not publicly released an updated plan for 2020 or 2021.
15. U.S. Marine Corps, *2017 Marine Aviation Plan*, p. 54, www.aviation.marines.mil/Portals/11/2017%20MARINE%20AVIATIOIN%20PLAN.pdf (accessed August 18, 2021).
16. Testimony of Lieutenant General Jon M. Davis, Deputy Commandant for Aviation, U.S. Marine Corps, in hearing, *Aviation Readiness*, Subcommittee on Readiness, Committee on Armed Services, U.S. House of Representatives, 114th Cong., 2nd Sess., July 6, 2016, p. 25, https://www.govinfo.gov/content/pkg/CHRG-114hhrg20796/pdf/CHRG-114hhrg20796.pdf (accessed August 18, 2021).
17. U.S. Marine Corps, *2019 Marine Corps Aviation Plan*, p. [43].
18. Lieutenant General Mark Wise, Deputy Commandant for Aviation, U.S. Marine Corps, in hearing, *Fiscal Year 2022 Budget Request of the Department of Defense for Fixed-Wing Tactical and Training Aircraft Programs*, Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, U.S. House of Representatives, July 13, 2021, comments made from 27:15 to 28:10, https://armedservices.house.gov/hearings?ID=D50BE244-286E-41DD-88CF-C1523BEC70E4 (accessed August 18, 2021). Cited hereafter as Wise testimony, July 13, 2021.
19. Testimony of Lieutenant General Eric Fick, Program Executive Officer, F-35 Joint Program Office, Office of the Undersecretary of Defense for Acquisition and Sustainment, in joint hearing, *Update on F-35 Program Accomplishments, Issues, and Risks*, Subcommittee on Tactical Air and Land Forces and Subcommittee on Readiness, Committee on Armed Services, U.S. House of Representatives, April 22, 2021, comments made from 2:55:50 to 2:56:15, https://armedservices.house.gov/hearings?ID=EBD9430F-7760-4485-8398-7B34D4A31D54 (accessed August 18, 2021).
20. Wise testimony, July 13, 2021, comments made from 28:30 to 29:40.
21. Zarrin Ahmed, "First Marine Corps F-35C Squadron Reaches Full Operational Capability," United Press International, July 1, 2021, https://www.upi.com/Defense-News/2021/07/01/f35c-aircraft-foc/9521625164804/ (accessed August 18, 2021).
22. Richard R. Burgess, "Admiral Praises Marine Corps' Last Hornet Carrier Deployment," *Seapower*, March 1, 2021, https://seapowermagazine.org/admiral-praises-marine-corps-last-hornet-carrier-deployment/ (accessed August 18, 2021).
23. U.S. Marine Corps, *2018 Marine Aviation Plan*, p. 10, https://www.aviation.marines.mil/Portals/11/2018%20AvPlan%20FINAL.pdf (accessed August 18, 2021).
24. "US Marines' Four CH-53E Aircraft Complete Maintenance Overhaul," *Naval Technology*, June 11, 2020, https://www.naval-technology.com/news/us-navy-marines-conclude-maintenance-process-of-four-ch-53e/ (accessed August 18, 2021).
25. Lieutenant General Steven R. Rudder, Deputy Commandant for Aviation, U.S. Marine Corps, statement on "Aviation Readiness" before the Subcommittee on Readiness, Committee on Armed Services, U.S. House of Representatives, November 9, 2017, p. 7, https://docs.house.gov/meetings/AS/AS03/20171109/106611/HHRG-115-AS03-Bio-RudderS-20171109.pdf (accessed August 18, 2021).
26. Wise testimony, June 30, 2021, comments made from 1:33:00 to 1:34:30.
27. Megan Eckstein, "Marine Corps Conducting Fleet Flight Tests of CH-53K Ahead of IOT&E This Summer," U.S. Naval Institute News, February 24, 2021, https://news.usni.org/2021/02/24/marine-corps-conducting-fleet-flight-tests-of-ch-53k-ahead-of-iote-this-summer (accessed August 18, 2021).
28. Joseph Trevithick, "Marine Osprey Flies with New Radar-Scrambling Intrepid Tiger System for the First Time," The War Zone, June 25, 2021, https://www.thedrive.com/the-war-zone/41282/marine-osprey-flies-with-new-radar-scrambling-intrepid-tiger-system-for-the-first-time (accessed August 18, 2021).
29. Kevin Knodell, "Marines Scrap Hawaii-Based Attack Helicopters After Just Three Years," Honolulu Civil Beat, May 21, 2021, https://www.civilbeat.org/2021/05/marines-scrap-hawaii-based-attack-helicopters-after-just-three-years (accessed August 18, 2021).
30. General David H. Berger, Commandant of the Marine Corps, "Force Design 2030: Annual Update," U.S. Department of the Navy, U.S. Marine Corps, April 2021, p. 5, https://s3.documentcloud.org/documents/20689736/force-design-2030.pdf (accessed August 18, 2021).
31. U.S. Department of the Navy and U.S. Marine Corps, *Littoral Operations in a Contested Environment*, Unclassified Edition, 2017, https://www.hsdl.org/?view&did=804776 (accessed August 18, 2021).
32. Berger, "Force Design 2030," *passim*.
33. U.S. Department of the Navy, Headquarters, U.S. Marine Corps, *Tentative Manual for Expeditionary Advanced Base Operations*," February 2021, https://s3.documentcloud.org/documents/20616385/tm-eabo-first-edition-rev-20210211.pdf (accessed August 18, 2021).

34. Ronald O'Rourke, "Navy Light Amphibious Warship (LAW) Program: Background and Issues for Congress," Congressional Research Service *Report for Members and Committees of Congress* No. R46374, updated August 10, 2021, pp. 1, 7, and 8, https://crsreports.congress.gov/product/pdf/R/R46374 (accessed August 18, 2021).
35. On July 11, 2019, General David Berger assumed command of the U.S. Marine Corps as 38th Commandant. A short five days later, he issued his "Commandant's Planning Guidance" to announce his priorities for the service. Parting with years of practice, General Berger stated that the Corps would "no longer use a '2.0 MEB requirement' as the foundation for our arguments regarding amphibious ship building" and would "no longer reference the 38-ship requirement memo from 2009, or the 2016 Force Structure Assessment, as the basis for" USMC force structure naval amphibious support requirements. General David H. Berger, Commandant of the Marine Corps, "Commandant's Planning Guidance: 38th Commandant of the Marine Corps," U.S. Department of the Navy, U.S. Marine Corps, p. 4, https://www.hqmc.marines.mil/Portals/142/Docs/%2038th%20Commandant%27s%20Planning%20Guidance_2019.pdf?ver=2019-07-16-200152-700 (accessed August 18, 2021).
36. O'Rourke, "Navy Light Amphibious Warship (LAW) Program: Background and Issues for Congress," p. 7.
37. Ibid., p. 15.
38. Ibid., pp. 10–11.
39. Naval Sea Systems Command, Naval Vessel Register, "Fleet Size," last updated August 18, 2021, https://www.nvr.navy.mil/NVRSHIPS/FLEETSIZE.HTML (accessed August 18, 2021).
40. Patricia Kime, "'At the Limits of What I Can Do:' Marine Corps Commandant Makes Pleas for Funding," Military.com, June 16, 2021, https://www.military.com/daily-news/2021/06/16/limits-of-what-i-can-do-marine-corps-commandant-makes-plea-funding.html (accessed August 18, 2021).
41. Sam LaGrone, "Anti-Ship Missiles Top Marines $2.95B Fiscal Year 2022 Wishlist," U.S. Naval Institute News, June 2, 2021, https://news.usni.org/2021/06/02/anti-ship-missiles-top-marines-2-95b-fiscal-year-2022-wishlist (accessed August 18, 2021).
42. See, for example, Connie Lee, "Marines Going After Slew of New Infantry Weapons," *National Defense*, August 24, 2020, https://www.nationaldefensemagazine.org/articles/2020/8/24/marines-going-after-slew-of-new-infantry-weapons (accessed August 18, 2021).
43. Private correspondence with the author, August 6, 2021.
44. Megan Eckstein, "Marine Corps Cancels AAV Survivability Upgrade," U.S. Naval Institute News, September 25, 2018, https://news.usni.org/2018/09/25/marine-corps-cancels-aav-survivability-upgrade (accessed August 18, 2021).
45. U.S. Department of the Navy, Office of Budget, *Highlights of the Department of the Navy FY 2021 Budget*, 2020, p. 3-14, https://www.secnav.navy.mil/fmc/fmb/Documents/21pres/Highlights_book.pdf (accessed August 18, 2021).
46. Andrew Feickert, "Marine Corps Advanced Reconnaissance Vehicle (ARV)," Congressional Research Service *In Focus* No. IF11831, updated July 19, 2021, p. [2], https://fas.org/sgp/crs/weapons/IF11831.pdf (accessed August 18, 2021). See also Berger, "Force Design 2032," p. 5.
47. A concise explanation of the incident and follow-on actions by the Marine Corps is provided in the official press release announcing the findings of the command investigation. See press release, "Marine Corps Releases Command Investigation into the Assault Amphibious Vehicle Mishap off the Coast of Southern California on July 30, 2020," U.S. Marine Corps, March 25, 2021, https://www.marines.mil/News/Press-Releases/Press-Release-Display/Article/2551200/marine-corps-releases-command-investigation-into-the-assault-amphibious-vehicle/ (accessed August 18, 2021). The Corps allocated $39.5 million in FY 2020 and $87.5 million in FY 2021 to AAV improvements in part to address shortfalls identified as a result of the accident. See Exhibit P-40, "Budget Line Item Justification: PB 2022 Navy," P-1 Line Item Number / Title: 2021 / AAV7A1 PIP, in U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2022 Budget Estimates, Navy, Justification Book Volume 1 of 1: Procurement, Marine Corps*, May 2021, pp. Volume 1-1 and Volume 1-2, https://www.secnav.navy.mil/fmc/fmb/Documents/22pres/PMC_Book.pdf (accessed August 18, 2021), and Exhibit P-5, "Cost Analysis: PB 2022 Navy," P-1 Line Item Number / Title: 2021 / AAV7A1 PIP, Item Number / Title [DODIC]: 1 / AAV7A1 PIP, in ibid., pp. Volume 1-3 and Volume 1-4.
48. Gidget Fuentes, "Marines: Limited AAV Operations on Water Resume as Vehicle Inspections, Unit Certifications Required in Fatal Sinking Aftermath," U.S. Naval Institute News, April 21, 2021, https://news.usni.org/2021/04/21/marines-limited-aav-operations-on-water-resume-as-vehicle-inspections-unit-certifications-required-in-fatal-sinking-aftermath (accessed August 18, 2021).
49. Exhibit P-40, "Budget Line Item Justification: PB 2022 Navy," P-1 Line Item Number / Title: 2025 / Amphibious Combat Vehicle Family of Vehicles, in U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2022 Budget Estimates, Navy, Justification Book Volume 1 of 1: Procurement, Marine Corps*, p. Volume 1-5.
50. Andrew Feickert, "The Marine Corps' Amphibious Combat Vehicle (ACV)," Congressional Research Service *In Focus* No. IF11755, updated June 7, 2021, p. [1], https://crsreports.congress.gov/product/pdf/IF/IF11755 (accessed August 18, 2021).

51. Philip Athey, "Marine Corps Deactivates Its Final Active-Duty Tank Battalion," *Marine Corps Times*, May 25, 2021, https://www.marinecorpstimes.com/news/your-marine-corps/2021/05/25/marine-corps-deactivates-its-final-active-duty-tank-battalion/ (accessed August 18, 2021).
52. Todd South, "Goodbye, Tanks: How the Marine Corps Will Change, and What It Will Lose, by Ditching Its Armor," *Marine Corps Times*, March 22, 2021, https://www.marinecorpstimes.com/news/your-marine-corps/2021/03/22/goodbye-tanks-how-the-marine-corps-will-change-and-what-it-will-lose-by-ditching-its-armor/ (accessed August 18, 2021).
53. Andrew Feickert, "Joint Light Tactical Vehicle (JLTV): Background and Issues for Congress," Congressional Research Service *Report for Members and Committees of Congress* No. RS22942, updated July 13, 2020, p. 6, https://crsreports.congress.gov/product/pdf/RS/RS22942 (accessed August 18, 2021).
54. Exhibit P-40, "Budget Line Item Justification: PB 2022 Navy," P-1 Line Item Number / Title: 5095 / Joint Light Tactical Vehicle, in U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2022 Budget Estimates, Navy, Justification Book Volume 1 of 1: Procurement, Marine Corps*, p. Volume 1-313.
55. See Exhibit P-40, "Budget Line Item Justification: PB 2022 Navy," P-1 Line Item Number / Title: 2025 / Amphibious Combat Vehicle Family of Vehicles, in ibid., p. Volume 1-5.
56. Wise testimony, July 13, 2021, comments made from 27:15 to 28:10.
57. For an explanation of current F-35 cost and performance matters, see John Venable, "Swiss Government Purchase of F-35A Fighter Jet Reveals Critical Flaws in U.S. Air Force Decision to Buy F-15EX," Heritage Foundation *Issue Brief* No. 5202, July 12, 2021, https://www.heritage.org/sites/default/files/2021-07/IB5202.pdf.
58. U.S. Department of Defense, *Selected Acquisition Report (SAR): V-22 Osprey Joint Services Advanced Vertical Lift Aircraft (V22) as of FY 2020 President's Budget*, RCS: DD-A&T(Q&A)823-212, December 2018, pp. 39 and 68, https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Selected_Acquisition_Reports/FY_2018_SARS/19-F-1098_DOC_84_V-22_SAR_Dec_2018.pdf (accessed August 18, 2021).
59. U.S. Marine Corps, *2019 Marine Corps Aviation Plan*, p. [72].
60. U.S. Marine Corps, *2018 Marine Aviation Plan*, pp. 76 and 84.
61. U.S. Marine Corps, *2019 Marine Corps Aviation Plan*, pp. [71] and [84].
62. Vice Admiral Paul Grosklags, Representing Assistant Secretary of the Navy (Research, Development and Acquisition); Lieutenant General Jon Davis, Deputy Commandant for Aviation; and Rear Admiral Michael C. Manazir, Director Air Warfare, statement on "Department of the Navy's Aviation Programs" before the Subcommittee on Seapower, Committee on Armed Services, U.S. Senate, April 20, 2016, p. 21, http://www.armed-services.senate.gov/imo/media/doc/Grosklags-Davis-Manazir_04-20-16.pdf (accessed August 18, 2021).
63. U.S. Government Accountability Office, *Defense Acquisitions: Assessments of Selected Weapons Programs*, GAO-16-329SP, March 2016, p. 93, http://www.gao.gov/assets/680/676281.pdf (accessed August 18, 2021).
64. Exhibit P-1, "FY 2021 President's Budget, Total Obligational Authority," in U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *Department of Defense Budget, Fiscal Year 2021, Procurement Programs (P-1)*, February 2020, p. N-4, https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2021/fy2021_p1.pdf (accessed August 18, 2021).
65. Exhibit P-1, "FY 2022 President's Budget, Total Obligational Authority," in U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *Department of Defense Budget, Fiscal Year 2022, Procurement Programs (P-1)*, May 2021, p. N-4, https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2022/FY2022_p1.pdf (accessed August 20, 2021).
66. 10 U.S. Code § 8063, "United States Marine Corps: Composition; Functions," https://www.law.cornell.edu/uscode/text/10/8063 (accessed August 18, 2021).
67. U.S. Marine Corps, *Commander's Readiness Handbook*, May 2014, p. iv, https://www.hqmc.marines.mil/Portals/138/HiRes%20Commanders%20Readiness%20Handbook.pdf (accessed August 18, 2021).
68. General Charles Q. Brown, Jr., and General David H. Berger, "Redefine Readiness or Lose," War on the Rocks, March 15, 2021, https://warontherocks.com/2021/03/redefine-readiness-or-lose/ (accessed August 18, 2021).
69. "[Lieutenant General Eric] Smith used the anti-armor mission as an example of how the service [is] evolving. Before, the Marines would use their own tanks to target enemy tanks. Now, the service is divesting its entire fleet of tanks to free up money to invest in higher priorities. Instead, it can use long-range precision munitions launched from the back of a JLTV to destroy enemy tanks from a more mobile posture and from longer ranges. ¶ 'The experimentation that we've done now to date successfully using lightweight mounted fires—think the back of a Joint Light Tactical Vehicle—is killing armor at ranges, rough calculation, about 15, 20 times the range that a main battle tank can kill another main battle tank,' Smith said. He added the Marine Corps didn't get rid

of its tanks because they weren't good at taking out adversary tanks, but rather 'we can kill armor formations at longer ranges using additional and other resources without incurring a 74-ton challenge trying to get that to a shore, or to get it from the United States into the fight. You simply can't be there in time.'" Megan Eckstein, "Early Experiments Are Proving out Tank-Free Marine Corps Concept," U.S. Naval Institute News, February 10, 2021, https://news.usni.org/2021/02/10/early-experiments-are-proving-out-tank-free-marine-corps-concept (accessed August 18, 2021).

70. J. R. Wilson, "State of the Corps: The Final Interview with Gen. James T. Conway, Commandant of the Marine Corps," Defense Media Network, October 24, 2010, https://www.defensemedianetwork.com/stories/state-of-the-corps/ (accessed August 18, 2021).
71. See note 2, *supra*.
72. See Sarah Cammarata, "Infantry Training More Intense as Marine Corps Makes Major Changes, Commandant Tells Senators," *Stars and Stripes*, June 25, 2021, https://www.stripes.com/branches/marine_corps/2021-06-24/Infantry-training-more-intense-as-Marines-Corps-makes-major-changes-commandant-tells-senators-1793441.html (accessed August 20, 2021); Chad Garland, "Marine Corps Seeks to Make 'Smarter' Infantry Force with New Course," *Stars and Stripes*, February 22, 2021, https://www.stripes.com/theaters/us/marine-corps-seeks-to-make-smarter-infantry-force-with-new-course-1.663144 (accessed August 20, 2021); and Gidget Fuentes, "Marines Retooling Infantry Training for Complex Warfare in Pacific," U.S. Naval Institute News, May 6, 2021, https://news.usni.org/2021/05/06/marines-retooling-infantry-training-for-complex-warfare-in-pacific (accessed August 20, 2021).
73. Matt Gonzales, "Breaking New Ground: Corps' Wargaming Center Ready for Construction," U.S. Marines, June 24, 2021, https://www.marines.mil/News/News-Display/Article/2670179/breaking-new-ground-corps-wargaming-center-ready-for-construction/ (accessed August 18, 2021).
74. Ibid.
75. Diana Stancy Correll, "Navy, Marine Corps Aim to Refine, Test Modern Warfighting Concepts in Large Scale Exercise 2021," *Navy Times*, August 9, 2021, https://www.navytimes.com/news/your-navy/2021/08/09/navy-marine-corps-aim-to-refine-test-modern-warfighting-concepts-in-large-scale-exercise-2021/ (accessed August 18, 2021), and Sam LaGrone, "Large Scale Exercise 2021 Tests How Navy, Marines Could Fight a Future Global Battle," U.S. Naval Institute News, August 9, 2021, https://news.usni.org/2021/08/09/large-scale-exercise-2021-tests-how-navy-marines-could-fight-a-future-global-battle (accessed August 18, 2021).
76. This count is based on an average number of 1.5 divisions deployed to major wars (see Table 1, "Historical U.S. Force Allocation," p. 350) and an average of 10–11 battalions per division.
77. General David H. Berger and Ryan Evans, "A Chat with the Commandant: Gen. David H. Berger on the Marine Corps' New Direction," War on the Rocks, April 6, 2020, https://warontherocks.com/2020/04/a-chat-with-the-commandant-gen-david-h-berger-on-the-marine-corps-new-direction/ (accessed August 20, 2021), and General David H. Berger, Commandant of the Marine Corps, "The 38th Commandant's Intent," U.S. Marine Corps, https://www.hqmc.marines.mil/Portals/142/THE%2038TH%20COMMANDANT%27S%20INTENT-CSG.pdf?ver=2019-07-16-164244-723 (accessed August 20, 2021).
78. Berger, "Force Design 2030," pp. 2, 7, 8, and 11.
79. Exhibit M-1, "FY 2022 President's Budget, Total Obligational Authority," in U.S. Department of the Navy, *Department of the Navy Fiscal Year (FY) 2022 Budget Estimates, Justification of Estimates: Military Personnel, Marine Corps (MPMC)*, May 2021, p. 2, https://www.secnav.navy.mil/fmc/fmb/Documents/22pres/MPMC_Book.pdf (accessed August 20, 2021).
80. Exhibit O-1, "FY 2022 President's Budget, Total Obligational Authority," in U.S. Department of the Navy, *Department of the Navy Fiscal Year (FY) 2022 Budget Estimates*, *Justification of Estimates: Operations and Maintenance, Marine Corps*, May 2021, p. 9, https://www.secnav.navy.mil/fmc/fmb/Documents/22pres/OMMC_Book.pdf (accessed August 20, 2021).
81. Exhibit P-1, "FY 2022 President's Budget, Total Obligational Authority," in U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2022 Budget Estimates, Navy, Justification Book Volume 1 of 1: Procurement, Marine Corps*, May 2021, p. Volume 1-vii.