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. But while Marines have a wide variety of individual assignments, the focus of every Marine is and always has been 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] Even with the conclusion of military operations in Afghanistan in 2021, by which time the U.S. military presence had been reduced to just 2,500 military personnel, the general shortage of amphibious ships and the absence of any necessity to deploy large numbers of Marines on amphibious shipping still resulted in few opportunities for Marines to gain such experience. Consequently, the Corps' connection to the sea has continued to fade.[2]

Recognizing this shortfall, the Corps' leadership 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 was 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 next several years and into the 2030s.[3]

As necessary an effort as FD 2030 is, however, the force envisioned by the project has yet to be built (though meaningful progress is being made[4]) 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 of May 2022, "approximately 30,000 Marines [were] forward-deployed or forward-stationed, with hundreds more on watch at our embassies across the globe."[5] During the year preceding its fiscal year (FY) 2023 budget request:

> [T]he Marine Corps conducted activities in support of 18 named operations, participated in 11 amphibious operations, engaged in nine theater security cooperation events / programs, participated in 89 named exercises, supported three response efforts associated with Defense Security Cooperation Agency (DSCA) requests, and executed seven response efforts associated with the Coronavirus 2019 (COVID-19) pandemic. Amphibious Ready Groups / Marine

> Expeditionary Units (ARG/MEU) conducted operations in support of combatant commands (COCOMs) along-side regional partners providing a range of deliberate and crisis response options. Joint Task Force – Crisis Response, led by Task Force 51 / 5th Marine Expeditionary Brigade, deployed over 2,000 Marines from the 24th Marine Expeditionary Unit and the Special Purpose Marine Air Ground Task Force - Crisis Response - Central Command (SPMAGTF-CR-CC) to Kabul, Afghanistan in support of non-combatant evacuation operations. The Marine Corps provided crisis response and contingency operations for AFRICOM, EUCOM, and INDOPACOM. In an effort to deepen partner alliance with the United Kingdom (UK), Marine Fighter Attack Squadron (VMFA) 211 deployed ten F-35B Lightning II Joint Strike Fighters onboard Her Majesty's Ship Queen Elizabeth in support of the first operational deployment of the UK Carrier Strike Group since 2011....[6]

The Marine Corps has always prized its crisis-response contributions to national security, and senior service leaders have emphasized this point consistently 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. Marine Corps leadership has emphasized that China serves as the pacing challenge for the Corps, which means that the military capabilities that China has and is developing, as well as the severity of the challenge presented by China, are a benchmark against which to measure "the level of capabilities that we will need in order to have a relative advantage now and into the future."[7] These capabilities will be applicable not only in a fight with China, but also in other scenarios and regions involving other enemies of lesser magnitude.

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.[8]

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.[9]

The service has redesignated 3rd Marines, one of its infantry regiments, as 3rd Marine Littoral Regiment (MLR), a new organizational construct it is

using to test ideas put forward in FD 2030.[10] Unlike a conventional Marine regiment, the MLR will have a single Littoral Combat Team (LCT) based on an infantry battalion but also possessing an anti-ship missile battery, a Littoral Anti-Air Battalion, and a Combat Logistics Battalion. The LCT will focus on employment of platoons, which is radically different from a standard battalion's use of companies.[11] While a bold move, 3rd MLR will serve as an operational test bed, deriving experience and insights that feed back into the FD 2030 effort. It is not a standard experimental organization in that it is operationally employed as a full component of the Corps' operating forces, but because it has not yet been standardized across the Corps, it cannot yet serve reliably as a reference by which to assess the Corps.

Infantry. In 2011, the Marine Corps maintained 27 infantry battalions in its Active Component at an authorized end strength of 202,100.[12] 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,[13] Congress began to fund gradual increases in end strength, returning the Corps to 24 infantry battalions. The deactivation of 3rd Battalion 8th Marines on May 18, 2021, and 2nd Battalion 3rd Marines on January 21, 2022,[14] left the Corps with 22 infantry battalions. Marine Corps leadership plans to stand down one more battalion, which will bring the Corps to 21 battalions supported by an end strength of 177,000,[15] which is where the Commandant believes it will be stable.[16] The Corps operated with 177,249 Marines in FY 2022.[17]

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 comprising a regimental-like headquarters, three battalions, a school/training organization, and various supporting elements.[18] In 2010, the Corps established a cyberspace element,[19] 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.

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 the 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. On May 3, 2022, the Corps published an update to its Aviation Plan (AVPLAN),[20] something it had not done since 2019. The current AVPLAN notes that several initiatives undertaken in 2014 have led to marked improvements in readiness with the Corps setting an objective of 75 percent aviation readiness for FY 2021. To this end, the service has increased funding for aviation-related operations and maintenance by 84 percent since FY 2016. Manning of its aviation units appears to remain a problem in some specialties: The Corps has only 66 percent of the pilots it needs for its fixed-wing aircraft and only one-half of its requirement for its two front-line fighters, the F-35 (40 percent) and F/A-18 (72 percent). However, it has reported strong numbers for its rotary-wing pilots (95 percent) and its enlisted community of maintainers (also 95 percent).[21]

The Corps maintains 18 squadrons of fixed-wing fighter/attack aircraft in its Active Component, one-third of which are equipped with the F-35.[22] Eighteen is a substantial reduction from the approximately 28 it had during Desert Storm.[23] The reduction corresponds with the general shrinking of the U.S. military since the end of the Cold War but is also a consequence of budget restrictions caused by the Budget Control Act of 2011,[24] the costs of operations over the past 20 years without a corresponding increase in funding, and the current budget ceilings imposed by the White House and Congress. The reorientation of Marine Aviation in its capacity, type of aircraft, and balance among the various platforms is dictated by FD 2030, which itself is informed by both budget and operational threat realities.

Although 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.[25] This primary tactical aviation 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.[26] A similar effort will keep the venerable AV-8B Harrier in use until FY 2027.[27] At present, the Marines have acquired 142 F-35B—the STOVL (Short Take-Off and Vertical Landing) variant of the Joint Strike Fighter (JSF)—and 22 F-35C (carrier capable) aircraft of a planned 353 F-35B and 67 F-35C models.[28] 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.[29]

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,"[30] 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.[31] 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.[32]

As for the CH-53K heavy-lift helicopter, the service has reported that the aircraft has achieved initial operational capability (IOC),[33] opening the door for full production of operational units. The service procured nine aircraft in FY 2021 and 11 in FY 2022 and will purchase an additional 10 in FY 2023.[34] Ultimately, the Corps plans to acquire 88 aircraft that will equip five squadrons by FY 2027.[35]

The Corps continues to search for improvements in its MV-22B Osprey, to include testing a version of an electronic warfare radar jamming pod that it uses on other aircraft.[36] 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 2021, 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 "boneyard" 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.[37]

The Marines have also divested two MV-22 squadrons, standing down VMM-264 in FY 2020 and VMM-166 in FY 2021. Though FD 2030 originally proposed reducing MV-22 squadrons to 14, subsequent experimentation led the Commandant to revise his direction to specify retaining 16 squadrons in the Active force while changing the number of aircraft per squadron from 12 to 10.[38] Continuing with its plan to restructure its helicopter fleet, the Corps shuttered a light-attack helicopter squadron in April 2022[39] and will deactivate two more by the end of FY 2023.[40] The Corps is also reducing the number of its heavy-lift squadrons of CH-53s; it deactivated HMH-463 in April 2022[41] and plans to deactivate two more by FY 2024.[42]

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.[43]

- 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.[44]

- In February 2021, the Corps released an unclassified version of its *Tentative Manual for Expeditionary Advanced Base Operations*, which provided substantial details about the service's evolved thinking about the tactical and organizational challenges posed by high-threat maritime environments.[45]

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).[46] 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.[47]

With the evolution of FD 2030 and refinement of related supporting concepts and material requirements, the Corps is now making the case for 31 traditional amphibious ships as the bare minimum needed to execute operations as envisioned in FD 2030, augmented by LAWs.[48] Five companies have been awarded contracts for further concept development of LAWs,[49] but procurement of the first ship has been delayed. According to the Congressional Research Service:

> [T]he Navy had previously envisioned procuring the first LAW in FY2023, but the Navy's FY2023 budget submission defers the procurement of the first LAW to FY2025. The Navy's FY2023 five-year (FY2023-FY2027) shipbuilding plan calls for procuring the first LAW in FY2025, the second in FY2026, and the third and fourth in FY2027. The Navy's FY2023 budget submission states that the contract for the construction of the first LAW would be awarded in December 2024, and that the ship would be delivered in July 2028.[50]

Meanwhile, the number of traditional amphibious ships stood at 32 as of August 2022.[51]

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 engaged in 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, which means that the service has been getting rid of some capabilities that are less relevant to expected operational demands and reducing 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. On June 15, 2021, for example:

> Making his case before the House Armed Services Committee…for the Marine Corps' $47.86 billion [FY 2022] 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.
>
> "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."
>
> 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.[52]

On May 11, 2022, in an earlier appearance before the House Armed Services Committee, General Berger similarly emphasized the efforts of the Corps to use existing funds, taken from divestment of various capabilities and realignment of spending, to support changed priorities and new initiatives, noting that the service had self-funded $17 billion of its modernization.[53]

Programs such as the Amphibious Combat Vehicle (ACV), F-35, CH-53K, Naval Strike Missile, and

Light Amphibious Warship continue to be 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.[54] 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.[55]

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 50 years old and the LAV averaging 40 years old.[56] The Corps had moved to extend the service life of the AAV but abandoned that program as progress with the ACV accelerated.[57] 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).[58]

The Marine Corps has also been exploring the possibility of replacing its aged Light Armored Vehicle with a collection of vehicles under the Advanced Reconnaissance Vehicle (ARV) program.[59] It requested $48.6 million in its FY 2022 budget submission for research and design work and $70.6 million in its FY 2023 budget request "to provide an initial operational capability of an advanced reconnaissance vehicle and to expand the ARV capability to other mission roles and integrate capabilities that emerge from other programs to further develop and enhance LAR [Light Armored Reconnaissance] operations."[60]

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.[61] AAV operations were resumed in April 2021 following inspection and modification of vehicles and related training and certification of AAV crews on the improvements.[62] Nine months later, however, the Corps permanently restricted water operations for the AAV, relegating it to a land-only armored vehicle.

"[G]iven] the current state of the amphibious vehicle program," according to a statement issued by the Corps:

> [T]he Commandant of the Marine Corps has decided the AAV will no longer serve as part of regularly scheduled deployments or train in the water during military exercises; AAVs will only return to operating in the water if needed for crisis response. This decision was made in the interest of the long-term health of the amphibious vehicle programs and future capabilities. The AAV will continue to operate on land; 76 percent of its tasks are land-based. In doing so, we reserve the capability to reverse this decision should the need arise.[63]

The Corps, recognizing the problems of its AAV fleet and the urgent need to update for capabilities in line with FD 2030, has accelerated procurement of the ACV. It procured 72 ACVs in FY 2021, purchased another 88 in FY 2022, and has requested funding for 74 in FY 2023.[64] Combined with the 112 vehicles acquired in previous years, the additions bring the number of ACVs in the Corps' inventory to 346 out of a total program objective of 632.[65]

Acquisition of the Joint Light Tactical Vehicle (JLTV) is steady. Since 2017, when fielding of the HMMWV replacement began, the Marines have acquired 5,167 vehicles and have placed another 413 on order with its FY 2023 budget request.[66] Budget documents show plans for the Corps to purchase an additional 2,676 vehicles from FY 2024 through FY 2027.[67] The acquisition objective for JLTV has varied over the years from 5,500 to just over 9,000.[68] Representatives from Marine Corps Systems Command have reported that the objective has been revised again to have the JLTV be a one-for-one replacement for all of the almost 11,000 HMMWVs currently in the inventory.[69]

Aircraft. Fixed-wing fighter-attack aircraft—specifically the AV-8B Harrier and F/A-18 Hornet—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 and, to meet the need to train new pilots even as the service retires the aircraft the pilots will fly, has taken such steps as folding the responsibilities of a formal training squadron into an operational unit.[70]

The Corps has acquired 142 of the 353 F-35B aircraft that it plans to purchase and 48 of the 67 F-35Cs, the version designed for use aboard aircraft carriers.[71] 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.[72] "As the Commander of United States Indo-Pacific Command (USINDOPACOM) recently noted during testimony," according to General Berger, "'The importance of the F-35 cannot be overstated.'"[73] Additionally, not only is the F-35 "the most advanced fighter, strike, and sensor platform in the world," but "aircraft like the F-35B provide combatant commanders a competitive warfighting advantage," and the Corps "remains focused on accelerated transition to an all F-35 tactical aviation (TACAIR) fleet in order to stay in front of our pacing challenge."[74] 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 has completed the MV-22's full acquisition objective.[75] 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.[76] This has led to increased logistical requirements as maintainers have had to be trained to each configuration and not all spare parts are shared. The Marine Corps 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 and continues as a component of the Corps' V-22 Readiness Program.[77]

The USMC's heavy-lift replacement program, the CH-53K, conducted its first flight on October 27, 2015.[78] The CH-53K will replace the Corps' CH-53E, which is now over 30 years old. Although "unexpected redesigns to critical components" delayed a low-rate initial production decision,[79] the program achieved Milestone C in April 2017. The Corps received $1 billion in FY 2019 to purchase seven aircraft,[80] $848 million for another six in FY 2020,[81] $1.1 billion for an additional nine in FY 2021, and $1.5 billion for 11 more in FY 2022.[82] Its FY 2023 budget request includes $1.67 billion for another 10 aircraft.[83]

Readiness

Riding alongside the Corps' principal Title 10 responsibility to provide "fleet marine forces...for service with the fleet 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"[84] is its contribution as the military's crisis-response force. 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.[85] 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.*[86]

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."[87]

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.[88] 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.[89]

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. It should be noted, however, that 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 or two reveals that the Corps prefers not to share such information, at least currently. Corps officials have shared very encouraging anecdotal reports of lessons being learned in force-on-force exercises and the testing of new equipment and weapons that appear to validate the direction and objectives of FD 2030, but 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 preparing for current and future employment.

As mentioned, the Marine Corps has undertaken a great reorientation to ready itself for war not just against China, but against any adversary that has the ability to field modern weapons and sensors in a heavily contested maritime environment. The service believes that the changes it is pursuing to this end will be relevant and necessary for combat environments outside of the Indo-Pacific as well, 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 and rapid progress in realizing the goals of its great reorientation.[90]

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 nearly half (extending the eight-week course to 14 weeks) 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.[91]

- "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." 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."[92]

- 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.[93]

- On the landward side of testing new capabilities, over the past 18 months, the Marines have conducted a series of force-on-force exercises (free-play exercises employing units with the ability to respond creatively to events rather than being limited to scripted or controlled play), have deployed new force designs in novel ways, and have operationally proved the utility of new force packages in real-world settings, all of which has validated the initial arguments framing FD 2030 and driven adjustments to the effort.[94]

- The Corps has transitioned its 3rd Marine Regiment, based in Hawaii, to a new organizational construct reflecting FD 2030 initiatives. The 3rd Marine Littoral Regiment is serving as the tactical and operational test bed for the service's many initiatives.[95]

Such efforts, from improvements to infantry training to war gaming to large exercises, are steps that appear to be having a positive effect on currently fielded forces. Although proof at scale has yet to be seen, 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 to the force by senior leaders 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 Corps' attention to its level of readiness. The extended operational demands of Iraq and Afghanistan having concluded, the force is reconstituting 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 therefore an optimistic one.

Scoring the U.S. Marine Corps

Capacity Score: Weak

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).[96] 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 editions of the *Index*. 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 rather than 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.[97] 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 22 infantry battalions to 21 battalions 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.[98]

Manpower is by far the biggest expense for the Marines. In the Corps' FY 2022 budget, the military personnel account was approximately $14.6 billion (an increase of $200 million over FY 2021),[99] dwarfing both the approximately $9.2 billion allocated for operations and maintenance[100] and the $3.1 billion allocated for the procurement of new equipment.[101] 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, in which the Marines would employ many small, highly distributed units, 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, the archetype for countries developing new tools and operational concepts that will likely require the distribution of the Marine Corps across a large, contested littoral battlespace. Though the Corps has been refining its sense of what these formations will require, they have yet to be proven in operational employment at significant scale. Consequently, we can only assess the service's current status against historical demand. 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, especially with the trend bending downward to even fewer.

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 2022 Level:** 22 battalions.

The Corps is operating with 73 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 22 battalions to 21 battalions. Marine Corps capacity is therefore scored as "weak," a drop in score from the *2022 Index*. Reducing operational strength by another battalion would bring it to just 70 percent of the strength it should have.

Capability Score: Strong

The Corps receives scores of "marginal" for "Capability of Equipment," "marginal" for "Age of Equipment," "strong" for "Health of Modernization Programs," and "strong" for "Size of Modernization Program." This *Index* recognizes that within the Capability and Age portfolios, the old equipment exists mostly in ground combat vehicles. The Marines have modernized their aviation assets almost completely and are moving aggressively to introduce new ground platforms like the ACV and JLTV to offset the deteriorating condition of the AAV and HMMWV fleets, respectively. In the aggregate, the service's aviation arm and its rapid introduction of new munitions, weapons, and a host of communications equipment, sensors, and unmanned platforms likely compensate for the aged AAV, HMMWV, and AV-8B Harriers, resulting in a score of "strong" for Marine Corps capability.

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. However, the history of military services is littered with the debris of grand vision statements and futuristic concepts that were unrealized in practical implementation.

The Marine Corps' effort appears to be substantially 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, rapid acquisition of new capabilities, and profound redesign of operational units. The real changes in programs and organizations that reflect its published rhetoric are compelling evidence that the Corps means what it has been saying about maintaining readiness. The authors of the *2023 Index* believe it to be 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 *2023 Index* assesses Marine Corps readiness as "strong," a continuation of the assessment made in the *2022 Index*.

Overall U.S. Marine Corps Score: Strong

The score for the Marine Corps was raised to "strong" from "marginal" in the *2022 Index*, and it remains "strong" in this edition for two reasons: (1) because the *2021 Index* lowered the threshold for capacity from 36 infantry battalions to 30 battalions in acknowledgment of the Corps' argument that it is a one-war force that also stands ready for a broad range of smaller crisis-response tasks and (2) because of the Corps' extraordinary, sustained efforts to modernize (which improves capability) and enhance its readiness during the assessed year.

Of the five services, the Marine Corps is the only one that has a compelling story for change, has a credible and practical plan for change, and is effectively implementing its plan to change. However, in the absence of additional funding in FY 2023, the Corps intends to reduce the number of its battalions even further from 22 to 21, and this reduction, if implemented, will limit the extent to which it can conduct distributed operations as it envisions and to replace combat losses (thus limiting its ability to sustain operations).

Though the service remains hampered by old equipment in some areas, it has nearly completed modernization of its entire aviation component, is making good progress in fielding a new amphibious combat vehicle, and is fast-tracking the acquisition of new anti-ship and anti-air weapons. Full realization of its redesign plan will require the acquisition of a new class of amphibious ships, for which the Corps needs support from the Navy.

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 2022 ■ Pending

Light Wheeled Vehicle

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
HMMWV Inventory: **10,859** Fleet age: **24** Date: **1983** The HMMWV, better known as the Humvee, is a light wheeled vehicle used to transport troops and various weapons systems with limited protection against small arms, fragmentation, and blast damage. Initially introduced in the 1980s, HMMWVs are being replaced by the Joint Light Tactical Vehicle (JLTV).	2	2	**Joint Light Tactical Vehicle (JLTV)** Timeline: **2017–2023** The JLTV program is a joint program with the Army, meant eventually to replace all HMMWVs. Full-rate production was achieved in FY 2019. The first set of JLTVs were fielded in March 2019; IOC was achieved in mid-summer 2019. In the fourth quarter of FY 2022, a new contract will be signed to continue production of JTLVs. **PROCUREMENT** 5,167 ■ 3,089 **SPENDING** *($ millions)* $2,239 ■ $3,828	3	4
JLTV Inventory: **5,167** Fleet age: **3** Date: **2019** The Joint Light Tactical Vehicle (JLTV) is taking the place of the HMMWV as a light wheeled vehicle for troop transport. The vehicle provides stronger protection from IEDs and threats with which the Humvee struggled during the conflicts in Iraq and Afghanistan. The JLTV improves reliability, survivability, and transportability while retaining the capability to be outfitted for specific missions.	5	5			

NOTE: See page 448 for details on fleet ages, dates, timelines, and procurement spending. JLTV spending figures reflect the full joint program spending

MARINE CORPS SCORES

1 2 3 4 5
Weakest ⟷ Strongest

Procurement and Spending ■ Through FY 2022 ■ Pending

Amphibious Assault Vehicle

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
AAV Inventory: **1,200** Fleet age: **50** Date: **1972** The Amphibious Assault Vehicle (AAV) is an amphibious landing vehicle designed to transport Marines from vessels at sea to shore. Though old, the AAV has received numerous upgrades over the years to keep it viable for land combat operations. In 2021, the decision was made to permanently restrict AAVs from amphibious operations due to their age and threat to safety. The AAV will be replaced by the ACV.	1	1	**Amphibious Combat Vehicle (ACV)** Timeline: **2018–2026** The Amphibious Combat Vehicle (ACV) is a wheeled amphibious vehicle that will supplement and eventually replace the AAV. It is designed for increased survivability, the most notable difference being the increased protection from IED's and mines. The ACV features a new remote weapons system, improving situational awareness and ability to track and fire upon targets. The ACV achieved Initial Operational Capability in 2020. **PROCUREMENT** 167 363 **SPENDING** *($ millions)* $1,597 $2,904	3	4
LAV-25 Inventory: **488** Fleet age: **40** 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 in most terrains. It will be in service until 2035.					

NOTE: See page 448 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 2022 ■ Pending

Attack Helicopters

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
AH-1Z Viper Inventory: **159** Fleet age: **8** Date: **2010** The AH-1Z Viper replaced the AH-1W Super Cobra as the much improved attack helicopter for the Marine Corps. 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 expected operational life span of the Viper is 30 years.	4	5	None		

Tactical Aircraft

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
AV-8B Inventory: **53** Fleet age: **30** Date: **1985** The Harrier is the Marine Corps ground attack aircraft. It is a subsonic jet capable of hovering similar to a helicopter. The Harrier has a vertical/short takeoff and landing (V/STOL) system, designed to fly from amphibious assault ships and unconventional runways. These unique capabilities allow it to operate in a variety of environments that other jets find inaccessible. The aircraft is being replaced by the F-35B and will be fully retired around 2024.	1	1	**F-35B/C** Timeline: **2007–2031** The F-35B (STOVL Variant) is replacing the AV-8B Harrier, providing the Corps a 5th Generation stealth STOVL aircraft. Specifically designed for the Marine Corps, the B-model achieved IOC in 2015. It is being procured at a much higher quantity than the C-model, and full operational capability is expected in the late 2020s. The F-35C (Carrier Variant) is also being procured by the Marine Corps, taking over the role of the F/A-18. Designed for operations by aircraft carrier, the F-35C is being procured to give Marines the ability to launch from carrier while the F-35B launches from amphibious assault ships. The Marines activated their first F-35C squadron in December of 2020. Full operational capability is expected in the late 2020s. **PROCUREMENT** 164 205 **SPENDING** *($ millions)* $24,414 $26,674	4	4
F/A-18 C-D Inventory: **41** Fleet age: **31** Date: **1978** The F/A-18 Hornet is a fighter and attack jet, primarily used by the Marine Corps for traditional strike missions, fleet air defense, and air support. The F/A/18 will no longer fly on carriers and will be replaced by the F-35C. The F/A-18 fleet life has been extended until 2030 in order to bridge the gap between the two aircraft platforms.	2	1			

NOTE: See page 448 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 2022 ■ Pending

Tactical Aircraft (Cont.)

PLATFORM	Age Score	Capability Score
F-35B Lightning II (STOVL) Inventory: **116** Fleet age: **6** 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. The 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 Vertical Landing (STOVL) system, allowing for operation from flight decks and unconventional runways. This combines the unique operational capabilities of the AV-8B Harrier with the new technology offered by the JSF program.	5	5
F-35C Lightning II (CV) Inventory: **10** Fleet age: **1** 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. The next-generation technology allows it to dominate multiple types of combat missions without being detected by the enemy. The C-Model, also known as the carrier variant (CV), is specially designed for operation on aircraft carriers. Although the C-Model is used primarily by the Navy, the Marine Corps implemented its first C-Model squadron in December 2020 to complement its pre-existing F-35B fleet. The F-35C will replace the F/A-18 in the Marine Corps inventory.	5	5

NOTE: See page 448 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 2022 ■ Pending

Medium Lift

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
MV-22B Osprey Inventory: **296** Fleet age: **15** Date: **2007** The Osprey is a vertical takeoff, tilt-rotor aircraft, combining the vertical capabilities of a helicopter and a traditional fixed-wing aircraft. Similar to the AV-8B, this allows the aircraft to take off and land in environments where normal aircraft cannot go. The Osprey provides transport for personnel, cargo lift, and support for expeditionary assaults. The life expectancy of the MV-22B is 23 years.	3	5	**MV-22B** Timeline: **2007–TBD** Fielding of the Osprey was completed in 2019 with the MV-22B replacing the CH-46E helicopter. The modernization program is not facing any serious issues. **PROCUREMENT** 359 / 5 **SPENDING** *($ millions)* $30,502 / $23,095	5	5

Heavy Lift

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
CH-53E Super Stallion Inventory: **136** Fleet age: **33** Date: **1981** The CH-53E is a heavy-lift rotary-wing aircraft. The Super Stallion transports heavy equipment and supplies for amphibious assault operations. The aircraft will operate through 2027, to be replaced by the more advanced CH-53K. The program life of the CH-53E is 41 years.	2	1	**CH-53K** Timeline: **2017–2030** The CH-53K King Stallion program is currently in development. It will replace the aging CH-53E and provide increased range, survivability, and payload. The King Stallion achieved IOC in April of 2022 and is scheduled to deploy in 2024. **PROCUREMENT** 40 / 156 **SPENDING** *($ millions)* $6,397 / $18,428	5	3

Tanker

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
KC-130J Inventory: **63** Fleet age: **12** Date: **2005** The KC-130J is a large multi-role aircraft, used primarily as a tanker and cargo transport and can be equipped for various missions to include air-to-air refueling, reconnaissance, 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 planned to be complete by 2024. **PROCUREMENT** 79 / 32 **SPENDING** *($ millions)* $6,098 / $4,616	4	4

NOTE: 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.

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99. Exhibit PB-30A, "Summary of Requirements by Budget Program," in U.S. Department of the Navy, *Department of the Navy Fiscal Year (FY) 2023 Budget Estimates, Justification of Estimates, Military Personnel, Marine Corps (MPMC)*, April 2022, p. 2, https://www.secnav.navy.mil/fmc/fmb/Documents/23pres/MPMC_Book.pdf (accessed August 4, 2022).
100. Exhibit O-1, "FY 2023 President's Budget, Total Obligational Authority," in U.S. Department of the Navy, *Department of the Navy Fiscal Year (FY) 2023 Budget Estimates*, *Justification of Estimates: Operations and Maintenance, Marine Corps*, April 2022, pp. 9, 11, and 13, https://www.secnav.navy.mil/fmc/fmb/Documents/23pres/OMMC_Book.pdf (accessed August 4, 2022).
101. Exhibit P-1, "FY 2023 President's Budget, Total Obligational Authority," in U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2023 Budget Estimates, Navy, Justification Book Volume 1 of 1: Procurement, Marine Corps*, p. Volume 1-viii.